



असम ऑयल डिवीजन
Assam Oil Division

इंडियन ऑयल कॉर्पोरेशन लिमिटेड

एओडि - डिगबोई रिफाइनरी

पो.ओ. डिगबोई, पिन-786171, असम

Indian Oil Corporation Limited

AOD - Digboi Refinery

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Ref: HSE: 01 -714/26

Dated: 22.06.2026

To,

**The Regional Officer,
Integrated Regional Office, Guwahati,
Ministry of Environment, Forest and Climate Change,
4th Floor, Housefed Building, G.S. Road, Rukminigaon,
Guwahati - 781022**

**Sub: Submission of the Half-Yearly Compliance Report for the period (1st Oct'25 to 31 March'26)
on Environmental Stipulations pertaining to various units of Digboi Refinery.**

Dear Sir,

Please find enclosed herewith the six-monthly compliance status of Digboi Refinery on the Environmental Clearance Stipulations of the Environmental Clearance letters referred to above for the period (October '2025-March '2026).

Thanking you,

Yours sincerely,
For Indian Oil Corporation (AOD)

T K Dutta
Deputy General Manager (HSE)

तपन कुमार दत्ता
TAPAN KUMAR DUTTA
डी.जी.एम. (एच एस एंड ई) DGM (HS & E)
आई.ओ.सी.एल. (एओडी) डिगबोई
I.O.C. LTD. (AOD) DIGBOI

Copy To:

1. The Member Secretary, Pollution Control Board, Assam, Guwahati-21.
2. The Environmental Engineer, North Eastern Zonal Office, CPCB, Shillong-14
3. The Regional Executive Engineer, PCBA Dibrugarh-786001

**HALF YEARLY COMPLIANCE REPORT
OF ENVIRONMENTAL CLEARANCE
DIGBOI REFINERY
(1st October 2025 – 31st March 2026)**



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**ENVIRONMENTAL CLEARANCE (J-11011/12/87-1A, dated –
19-10-1987) FOR DIGBOI
REFINERY MODERNISATION PROJECT**

SL. NO	STIPULATIONS	COMPLIANCE STATUS AS ON 31.03.2026
1.0	The concentration levels of all the parameters of the effluent (gaseous & liquids) discharged must comply with MINAS and in the light of MINAS, the Assam oil, Digboi must review the entire effluent generation, routing, treatment and disposal system.	The concentration levels of all the parameters of treated effluent from ETP meets the MINAS specification. Digboi Refinery meets the stipulations for all 21 parameters of effluent as per revised guideline of CPCB Six monthly compliance Report on Quantum Limit (Kg/1000 MT Crude processed) is attached in Annexure-3. Online effluent monitoring & connectivity to CPCB server has been continued since 28th December 2015. WebSite: <u>Online Emission and Effluent Monitoring System (cpcb.gov.in)</u> New OCMS Website: https://cems.cpcb.gov.in/ in line with effect from Feb'2026
2.0	Monitoring with respect to physical, chemical and biological parameters must be carried out for effluent discharged as well as for the samples of river waters where effluents are discharged.	These tests are carried out regularly and reports submitted to the Pollution Control Board, Assam. Monitoring of receiving water bodies is also carried out every month. Six-monthly Reports on 21 MINAS parameter of ETP effluent (Polishing Pond outlet) by external agency M/s Nitya Laboratories [43, sector -A1 Ext. Bhalla Enclave, channi Himmat, Jammu-180015, J&K (UT), India] is enclosed as Annexure-1 Six monthly nearby river water sample by AOD QC Laboratories is enclosed as Annexure-2.
3.0	The sludge drains must be properly covered to avoid land and water pollution during incessant rains.	All OWS systems are completely closed /covered.
4.0	The sludge dumping area should be made impervious so that ground water is not affected due to leaching and seepage of associated water containing pollutants.	One HDPE lined concrete oily sludge storage tank of 400m³ capacity was constructed in 2014 to prevent leaching and seepage of oil to ground water. Bottom of another storage pit is made of concrete to avoid leaching.
5.0	The ambient air around Refinery should be monitored at least at four monitoring stations for SPM, SOx, NOx, Hydrocarbons and H ₂ S.	Four nos. of Ambient Air quality monitoring stations have been installed around Digboi Refinery-(I) Bazar Gate, (II) Wax Sector Cooling Tower, (III) New Tank Farm and (IV) Effluent treatment Plant. One no. of Continuous Ambient Air Quality Monitoring Station installed and commissioned in September 2012 at Welfare Center which is connected with CPCB and PCBA server.



		Ambient air quality monitoring is carried out monthly by external agency. Six-monthly Ambient Air Quality Monitoring Report by external agency M/s Nitya Laboratories [43, sector -A1 Ext. Bhalla Enclave, Channi Himmat, Jammu-180015, J&K (UT), India] is attached as Annexure-5
6.0	The stack emission from processes, power generating units and Boilers must be regularly monitored and proper type of stack monitoring/instruments must be procured and installed.	Monitoring of stack emissions is carried out with the help of a portable monitoring kit. Fixed on-line analyzers are also installed in AVU, DCU, CPP HRSG's, CRU, SDU, HDT, HGU and MSQU and monitoring through RTDBMS. Online connectivity established with CPCB Server and PCBA for Furnaces having heat capacity of more than 10 MMkCal/hr (HGU & HRSG's Stacks). Apart from own monitoring, external agency M/s Nitya Laboratories 43, Sector -A1 Ext. Bhalla Enclave, Channi Himmat, Jammu-180015, J&K (UT), India is also employed to conduct stack emission analysis on regular basis. 6 Months (Quarterly Report) Stack Emission Reports by external agency M/s Nitya Laboratories are enclosed as Annexure-4.
7.0	Fugitive emissions arising during handling and storage of low boiling petroleum fractions and from effluent treatment plant, leakage through valves and flanges must also be monitored regularly.	Regular monitoring of Hydrocarbons is done with GMI Gas surveyors and as well as with VOC detectors in plant & offsite areas by an external CPCB approved agency. Leak detection and repair (LDAR) report for the Q 3 and Q4 of FY 2025-26 is attached as Annexure-6.
8.0	Land filling, if any, must be done with fill material only from within battery limits of the Refinery.	It is being followed accordingly.
9.0	The Assam Oil Division must take up development of green belt as proposed.	Digboi Refinery is surrounded by the Upper Dehing Reserve Forest on the south and southwest side, which acts as a natural Green Belt. The green belt is developed with regular tree plantation around Refinery premises and township area. Since 2002, Digboi Refinery has planted around 324985 trees till March'26 in and around Digboi Refinery achieving a green belt coverage of 52.87% of the total IOCL area.

**ENVIRONMENTAL CLEARANCE (J-13011/3/1987-1A dated -
18-06-1987) FOR
CAPTIVE POWER PLANT**

SL. NO	STIPULATIONS	COMPLIANCE STATUS AS ON 31.03.2026
1.0	Only sweet natural gas will be used as feed stock.	Digboi Refinery uses only sweet Natural Gas.
2.0	Under the envisaged modernization programme for the refinery, Sulphur recovery units to be provided to reduce emission of SO ₂ . Efforts should also be made to reduce the emissions of NO _x . The existing sulphuric acid plant should be scrapped.	Digboi Refinery processes only indigenous sweet Assam crude with Sulphur content less than 0.25 wt%. A Sulphur Recovery Unit (SRU) has been installed and commissioned in 2004 as a part of Hydrotreater Project. Since the refinery is using natural gas, the formation of NO_x is very low and always remains within the prescribed limit. Further, low NO_x burners are also fitted in all the new units viz. Solvent De-waxing Unit, Hydro-treater Unit, Delayed Coking Unit and MSQ Unit.
3.0	The liquid effluent emanating from the captive power plant and the existing refinery should be treated as per the standards prescribed by the State Pollution Control Board.	Liquid effluent generated from the power plant is negligible, which is also routed to ETP for further treatment.
4.0	The height of the stack should not be less than 50 meters.	Complied.
5.0	Green belt around the power plant should be raised.	Digboi Refinery is surrounded by the Upper Dehing Reserve Forest on the south and southwest side, which acts as a natural Green Belt. The green belt is developed with regular tree plantation around Refinery premises and township area. Since 2002, Digboi Refinery has planted around 324985 trees till March'2026 in and around Digboi Refinery achieving a green belt coverage of 52.87% of the total IOCL area.
6.0	Adequate precautionary measures for preventing and controlling fire and explosion hazards should be taken up, especially in the gas storage area.	Natural gas used in the plants is transported through pipeline ex M/s OIL India Ltd. There is no storage of natural gas in the Refinery. Fire fighting facilities are provided at CPP, all process plants and tank farm area for controlling fire and explosion hazards.



ENVIRONMENTAL CLEARANCE (J-11011/8/89-1A dated 26-07-1989) FOR CATALYTIC REFORMER UNIT

SL. NO	STIPULATIONS	COMPLIANCE STATUS AS ON 31.03.2026																				
1.0	The project authority must strictly adhere to the stipulations made by State govt. and the State Pollution Control Board.	The stipulations made by the State Govt. and the State Pollution Control Board are strictly followed regarding effluent and emission norms. The existing CTO has been renewed till 31st March 2028. Digboi Refinery meets all parameters of effluent as per revised CPCB guideline.																				
2.0	The project authority will not increase the throughput capacity of the refinery from the existing level.	Crude processing capacity of Digboi Refinery was based on neat Assam crude. The actual crude throughput is based on Govt MoU maintaining all the environmental parameters within the stipulated norm.																				
3.0	The project authority must submit a rapid EIA report within a month and a comprehensive EIA report within 15 months to the Ministry for review.	Complied.																				
4.0	Gaseous emissions of SO ₂ , Hydrocarbons and oxides of Nitrogen should not exceed the prescribed standard stipulated by Central/State Pollution Control Board. At no time should the emission level be beyond the stipulated standard. 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 systems are rectified to achieve the desired efficiency.	Complied. The reported gaseous emission of SO_x and NO_x by external agency M/s Nitya Laboratories 43, sector -A1 Ext. Bhalla Enclave, channi Himmat, Jammu-180015, J&K (UT), India are: - <table><tr><td></td><td>CRU-HDT (SO_x) mg/Nm³</td><td>CRU-HDT (NO_x) mg/Nm³</td><td>CRU-OBSEG (SO_x) mg/Nm³</td><td>CRU-OBSEG (NO_x) mg/Nm³</td></tr><tr><td>October'25</td><td>10</td><td>24</td><td>5</td><td>49</td></tr><tr><td>December'25</td><td>12</td><td>68</td><td>6</td><td>56</td></tr><tr><td>February'26</td><td>14</td><td>63</td><td>8</td><td>63</td></tr></table>		CRU-HDT (SO _x) mg/Nm ³	CRU-HDT (NO _x) mg/Nm ³	CRU-OBSEG (SO _x) mg/Nm ³	CRU-OBSEG (NO _x) mg/Nm ³	October'25	10	24	5	49	December'25	12	68	6	56	February'26	14	63	8	63
	CRU-HDT (SO _x) mg/Nm ³	CRU-HDT (NO _x) mg/Nm ³	CRU-OBSEG (SO _x) mg/Nm ³	CRU-OBSEG (NO _x) mg/Nm ³																		
October'25	10	24	5	49																		
December'25	12	68	6	56																		
February'26	14	63	8	63																		
5.0	The project authority must explore the possibility of maximum recycling of effluent either as process water or for afforestation.	Treated effluent from ETP is recycled to refinery as make up for Fire water tank, Coke Cutting water at delayed coking unit, Wax Sector Cooling Tower, cleaning and gardening purposes. During October'25 – March'26, 100 % of treated effluent was reused.																				
6.0	The entire quantity of liquid effluent coming out of the complex should strictly confirm to MINAS both in terms of quantity and quality before discharge in to the drainage system. The process plant effluent should be discharged through pipeline/closed channel.	Effluent is meeting MINAS specifications both in quality and quantity before being discharged. Six monthly compliance report on Quantum Limit (Kg/1000 MT Crude processed) is attached in Annexure-3.																				

7.0	The project authorities must set up minimum of four air quality monitoring stations at different location of the plant and in the nearby areas. The air quality will be monitored as per standard procedure. The monitoring of gaseous emissions should also include oxides of nitrogen and hydrocarbons. All the stacks of the plant must be provided with continuous automatic air quality monitoring equipment and stacks emission levels must be recorded. Reports should be submitted to Pollution Control Board once in three months and to this Ministry once in six months.	4 (Four) numbers of Ambient Air quality monitoring stations have been installed around Digboi Refinery-(i)Bazar Gate (ii)Wax Sector Cooling Tower (iii)New Tank Farm (iv) Effluent treatment Plant. Ambient air quality monitoring is being carried out on a monthly basis. 1(One) number of Continuous Ambient Air Quality Monitoring Station installed and commissioned in September 2012 at Welfare centre. Online CAAQMS parameters are being monitored regularly through https://aicpl.glensserver.com/#/login Six-monthly Ambient Air Quality Monitoring Report by external agency Nitya laboratories 43, sector -A1 Ext. Bhalla Enclave, channi Himmat, Jammu-180015, J&K (UT), India attached as Annexure-5 Fixed on-line analyzers are also installed in AVU, DCU, CPP HRSG's, CRU, SDU, HDT, HGU and MSQU and being monitored regularly through RTDBMS. Online connectivity established with CPCB Server and PCBA server for Furnaces having heat capacity of more than 10 MMkCal/hr (HGU & HRSG's Stacks). Apart from own monitoring, external agencies are also employed to conduct stack emission analysis on a regular basis. Online stack monitoring is done regularly through Website http://www.envsaindia.com/cpcb/login.php New OCMS :- https://cems.cpcb.gov.in/#/p/login
8.0	The liquid effluent quality must be ensured on a daily basis. At least five water quality monitoring stations must be set up in consultation with the State Pollution Control Board. This should include the monitoring of oil content in the river. If the effluent quality exceeds the standard prescribed at any time, the corresponding units of the plant which are contributing to the excessive pollutant load shall be immediately stopped from operation till the quality of effluent discharged from the units are brought down to the required level.	Water quality monitoring stations were set up - one near ETP, three at Digboi Nullah and one at oily sludge area. Liquid effluent quality from ETP outlet is monitored regularly daily. 1. 8 (eight) parameters on daily basis by QC (AOD) 2. 21 (twenty-one) parameters on monthly tested by SPCB approved outside agency. 3. In addition to the above four parameters - BOD, COD, TSS & pH being monitored through online analyzers connected with CPCB Server, 4. Sample from Digboi River and Dihing River are being collected and analyzed by QC (AOD) on monthly basis.
9.0	The project authority must monitor aquatic life (like fish, tortoise etc.) and report should be submitted to the Ministry once in six months.	Bio-monitoring of aquatic life in lotic and lentic water bodies in and around Digboi Refinery" has been carried out through external agency by M/S S K Mitra 74B, A.J.C. Bose Road, 5th Floor, Shrachi Centre, Kolkata-700016 India on October'25-March '26. The report is enclosed as Annexure-11.



10.	The project must start construction only after the approval of the Chief Controller of Explosives and a copy of the consent letter should be made available to this Ministry.	Complied. Present PESO License P/HQ/AS/15/880 is valid till 31.12.2026.
11.	The project authority must provide oil separators in the nullah and the effluents should be discharged through covered drains.	At present an oil separator is being provided and the effluents are discharged through covered drain.
12.	No change of stack should be made without the prior approval of the State Pollution Control Board. Alternate pollution control system and/or proper design (steam injection system) of the stacks should be made to minimize hydrocarbon emission due to failure in the flare system in the plant.	Complied.
13.	The project authority must submit the Disaster Management Plan incorporating worst accident scenario and its probable consequence duly approved by the nodal agency of the State Govt. within 3 months.	Disaster Management Plan duly certified by PNGRB empanelled party. Copy of plan submitted to CIF Guwahati & DC, Tinsukia. Offsite drills are carried out regularly, once a year, along with District Administration, Mutual Aid Partners & NGOs. Onsite Disaster Mock drills are carried out once in a quarter with different scenarios. Emergency Response & Disaster Management Plan (ERDMP) of Digboi refinery as per guidelines of PNGRB has been drawn up and certified by M/S SafeNet Industrial solutions PLL. Last Offsite Disaster drill was carried out on 19.03.2026 at 10:05 hrs. on scenario of <i>"Profuse leakage of Isomerase from 6" Reformate / Isomerase transfer line near Refinery boundary wall during Isomerase transfer from Refinery to NTF (New Tank Farm) leading to vapour cloud and subsequently fire in the area"</i>. Last Odd-hours Onsite Disaster drill was carried out on 24/12/2025 at 23:00 Hrs. on scenario of <i>"Naphtha comes out from roof drain of tank TK-569 in tank dyke, due to overfilling of tank subsequently fire inside dyke"</i>. Last L2 level Onsite Disaster drill was carried out on 08/09/2025 at 10:55 Hrs. <i>"Profuse H2S leakage from the downstream body flange gasket of Acid gas K.O. drum SRU-11-VV-00-001"</i>.
14.	The Project authority must ensure that the effluent plant fully operational within the next 3 months.	ETP has been fully operational since its inception in 1989.
15.	The project authority must set up laboratory facilities in the existing premises for testing and analyzing gaseous emissions and water quality.	Digboi Refinery has set up its own state of art Quality Control Laboratories inside the Refinery premises with NABL Accreditation ISO/IEC 17025:2017

16.	The project authority must provide necessary infrastructural facilities to the construction workers during construction.	Complied. Provided as per requirement.
17.	The project must submit a revised green belt design for the plant and township to this Ministry within three months for approval. The green belt should have minimum tree density of 1000 trees per acres.	Digboi Refinery is surrounded by the Upper Dehing Reserve Forest on the south and southwest side, which acts as a natural Green Belt. The green belt is developed with regular tree plantation around Refinery premises and township area. Since 2002, Digboi Refinery has planted around 324985 trees till September'2025 in and around Digboi Refinery achieving a green belt coverage of 52.87% of the total IOCL area.
18.	Additional area under the control of project which is not being used for the plant utilities should be afforested and fund for this should be suitably provided.	It is followed as part of IOCL's green belt development.
19.	A separate environmental management cell with suitably qualified people to carry out various functions related to environmental management should be set up under the control of a senior technical person who will directly report to the head of the organization.	Digboi Refinery has a full-fledged Health, Safety and Environment (HSE) unit functioning under Chief General Manager with direct reporting to Head of Organization. HSE Department team consists of General Manager, Chief Manager and Assistant Managers. The HSE team regularly monitors and reviews the effectiveness of the EMP implementation.
20.	Adequate fund provision (capital and recurring expenditure) so provided for environmental control measures should not be diverted to any other purpose. The implementation schedule for environmental measure must be strictly adhered to.	The HSE department is supported with budgetary allocation. The allocation for the last six years is as follows: ➤ 2020-21: Rs 7.74 Cr. ➤ 2021-22: Rs 7.78 Cr. ➤ 2022-23: Rs 8.83 Cr. ➤ 2023-24: Rs 3.51 Cr ➤ 2024-25: Rs. 7.00 Cr. ➤ 2025-26: Rs. 4.00 Cr.



ENVIRONMENTAL CLEARANCE (J-11011/41/97-1A.II(I) dated
-05-3-1998)
FOR SOLVENT DEWAXING UNIT

SL. NO	STIPULATIONS	COMPLIANCE STATUS AS ON 31.03.2026
1.0	The project authority should submit a Risk Analysis Report within a period of six months and submit the same to the Ministry.	Risk analysis has been carried out by M/s KLG-TNO in 1999 covering all the new units and report submitted to Ministry. A fresh round of Quantitative Risk Analysis (QRA) was carried out by M/s Alfa Project Services Pvt. Ltd, Vadodara in 2005. All the recommendations have already been implemented. Quantitative Risk Analysis study for all the units, including MSQU, was carried out in March 2012 & in Aug' 2013 post installation of Wax Palletization Unit. Further Quantitative Risk Analysis (QRA) study for all the units of DR was carried out in 2019 by M/s Techniche Engineering Private Limited, Pune and final report received in February 2020. The QRA study report was submitted to the office of IRO-Guwahati, MoEF & CC during Dec'2022 EC Compliance inspection Monitoring. The latest QRA study with all existing DR units and including facilities for capacity augmentation of Digboi refinery to 1 MMTPA was carried out by M/s Techniche Engineering Private Limited, Pune in the month of June'25.



**ENVIRONMENTAL CLEARANCE (J-11013/71/99-1A(II) dated -
13-05-1999)
FOR HYDROTREATER UNIT**

SL. NO	STIPULATIONS	COMPLIANCE STATUS AS ON 31.03.2026
1.0	The project authority should submit a Risk Analysis Report within a period of six months and submit the same to the Ministry.	Risk analysis has been carried out by M/s KLG-TNO in 1999 covering all the new units and report submitted to Ministry. A fresh round of Quantitative Risk Analysis (QRA) was carried out by M/s Alfa Project Services Pvt. Ltd, Vadodara in 2005. All the recommendations have already been implemented. Quantitative Risk Analysis study for all the units, including MSQU, was carried out in March, 2012 & in Aug' 2013 post installation of Wax Pelletisation Unit. Further Quantitative Risk Analysis (QRA) study for all the units of DR was carried out in 2019 by M/s Techniche Engineering Private Limited, Pune and final report received in February 2020. The QRA study report was submitted to the office of IRO-Guwahati, MoEF & CC during Dec'2022 EC Compliance inspection Monitoring. The latest QRA study with all existing DR units and including facilities for capacity augmentation of Digboi refinery to 1 MMTPA was carried out by M/s Techniche Engineering Private Limited, Pune in the month of June'25.

**ENVIRONMENTAL CLEARANCE (J-11011/482/2007-IA II (I),
DATED – 18-03-2008) FOR M S QUALITY IMPROVEMENT
PROJECT AT DIGBOI REFINERY.**

A Specific Conditions		
SL. NO	STIPULATIONS	COMPLIANCE STATUS AS ON 31.03.2026
1	The company shall comply with new standards/norms that are being proposed by the CPCB for petrochemical plants and refineries.	Digboi Refinery strictly complies with all the norms and parameters of effluent and gaseous emission as per revised CPCB guideline.
2	The process emissions (SO ₂ , NO _x , HC, VOCs and Benzene) from various units shall conform to the standards prescribed by the Assam State Pollution Control Board from time to time. At no time, the emission levels shall go beyond the stipulated standards. In the event of failure of pollution control system(s) adopted by the unit the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved.	The various process Emissions are within the prescribed limits and meets the norms as prescribed by MoEF & CC and Assam State Pollution Control Board as mentioned in the CTO. The various Emission reports from Refinery are submitted to Assam State Pollution Control Board and MoEF & CC on a regular basis.
3	Ambient air quality monitoring stations. [SPM, SO ₂ , NO _x and NMHC, Benzene] shall 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 ₂ and NO _x .	5(Five) no's of Ambient Air Quality monitoring stations are already in operation in the Refinery premises as per direction of Pollution Control Board, Assam. Out of five stations, one Continuous Ambient Air Quality Monitoring Station is connected with CPCB server. Furnaces having a heat capacity of more than 10MMkcal/hr. (HGU & HRSG's Stacks) are continuously connected with CPCB Server and PCBA server. Online stack monitoring analyzers are already installed for monitoring stack emissions. Apart from own monitoring, external agencies are also employed to conduct stack emission analysis on regular basis as per CPCB guideline.
4	Quarterly monitoring of fugitive emissions shall be carried out as per the guidelines of CPCB by fugitive emission detectors and reports shall be submitted to the Ministry's regional office at Shillong. For control of fugitive emission all unsaturated hydrocarbon will be routed to the flare system and the flare system shall be designed for smoke less burning.	Quarterly monitoring of fugitive emission (VOC) is being carried out regularly by external agency. The report is submitted regularly to the office of MoEF & CC with six monthly compliance reports. For control of fugitive emissions, dual seals have been installed in all light oil pumps with provision of venting to Flare system. Leak detection and repair (LDAR) report for the Q 3 and Q 4 of FY 2025-26 is attached as Annexure-6.

5	Fugitive emissions of HC from product storage tank yards etc must be regularly monitored. Sensors for detecting HC leakage shall also be provided at strategic locations. The company shall use low sulphur fuel to minimize SO2 emission.	Fugitive emissions of HC from product storage tank yards etc. are being monitored quarterly by an external agency. HC detectors are already provided at strategic locations at plants and tank farm areas. HC detectors are maintained by the vendors on a quarterly basis. HC detectors also provided at MS Quality up gradation unit. Digboi Refinery uses sweet natural gas with average sulphur content of ~ 2.5 ppm.
6	The company shall strictly follow all the recommendation mentioned In the charter on corporate responsibility for environmental protection (CREP).	The latest compliance status of CREP is enclosed as Annexure -7. Also, Digboi Refinery has carried out various CSR activities in and around Digboi with a total CSR budget of Rs 52.25 Cr during last four fiscal years. FY-2022-23: 11.95 Cr FY-2023-24: 15.66 Cr FY-2024-25: 22.59 Cr FY-2025-26: 14.00 Cr The major activities include empowering underprivileged young girls by enrolling 60 students each year in Nursing course (BSc & GNM), empowering 44 students from economically underprivileged section with Medical & Engineering coaching, skill development of local women, provision of Drinking water facility in schools, water supply to non IOCL consumers in and around Digboi etc.
7	The Company shall take necessary measures to prevent fire hazards, containing oil spills and soil remediation as needed. At place of ground flaring. The overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during flaring.	At Digboi Refinery, flaring is done at the height of 108 meters through flare stack. Knockout drums are provided in the flare system Further, modern fire fighting system and hydrant network system have been provided meeting OISD STD 116. Firefighting facility at MSQ project is as per OISD-116. Remote HVL R System has been commissioned in October 2013. Installation of Rim Seal Fire Protection System of Fire Water network commissioned for Tank nos. 001, 607, 560 & 452.
8.	To prevent fire and explosion at oil & gas facility, potential ignition should be kept to a minimum and adequate separation distance between potential ignition sources and flammable materials shall be in place.	Separation distance between potential ignition sources and flammable materials are maintained as per OISD STD 118.
9.	Occupational Health surveillance of worker shall be done on a regular basis and records maintained as per the Factory Act.	Occupational Health surveillance for employees is being carried out as per Factory Act and records maintained at Occupational Health Centre of AOD hospital.



10.	Green belt shall be developed to mitigate the effect of fugitive emission all around the plant in a minimum 30 % plant area in consultation with DFO and as per CPCB guidelines.	Digboi Refinery is surrounded by the Upper Dehing Reserve Forest on the south and southwest side, which acts as a natural Green Belt. The green belt is developed with regular tree plantation around Refinery premises and township area. Since 2002, Digboi Refinery has planted around 324985 trees till March'2026 in and around Digboi Refinery achieving a green belt coverage of 52.87% of the total IOCL area.
B. General Conditions		
1	The project authorities must strictly adhere to the stipulations made by the concerned State Pollution Control Board (SPCB) and the State Government and any other statutory body.	The stipulations made by the State Govt. and the State Pollution Control Board are strictly followed regarding effluent and emission norms. The existing CTO has been renewed till 31st March 2028. Digboi Refinery meets all parameters of effluent as per revised CPCB guideline.
2	No further expansion or modification in the project shall be carried without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to the Ministry for clearance, a fresh reference shall be made to the Ministry.	Complied.
3	At no time, the emissions should go beyond the prescribed standards. In the event of failure of any pollution control system, the respective well site should be immediately put out of operation and should not be restarted until the desired efficiency has been achieved. Provision of adequate height of stack attached to DG sets & flare is to be done.	Stack emission quality data of Sox and NOx are regularly monitored. Apart from own monitoring, external agencies are also employed to conduct stack emission analysis on a regular basis as per CPCB guideline.
4	Wastewater shall be properly collected and treated to conform to the standards prescribed under EP Act & Rules and mentioned in the Consents provided by the relevant SPCB.	Digboi Refinery had installed Effluent Treatment Plant (ETP) in the year 1989, for the treatment of wastewater generated from various units of the refinery. Digboi Refinery meets all MINAS parameters related to effluent discharge as per revised CPCB guideline and CTO.

5	The overall noise levels in and around the premises shall be limited within the prescribed standards (75 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).	Acoustic hoods are available all over the refinery and silencers exist in all sensitive parts of the plant where noise is a major concern. Moreover, speed of all vehicle/trucks is limited to 20 km/hr inside the refinery, which is also less than 75 DB. Quarterly Noise survey is also being carried out by Occupational Health Centre of AOD hospital.
6	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 expansion project, if required, Requisite On-site and Off-site Disaster Management Plans will be prepared and implemented.	Digboi Refinery strictly follows the provisions made in the Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 as amended in 2000 and later for handling of hazardous chemicals. Present PESO License P/HQ/AS/15/880 is valid till 31.12.2026. Disaster Management Plan duly certified by PNGRB empanelled party. Copy of plan submitted to CIF Guwahati & DC, Tinsukia. Offsite drills are carried out regularly, once a year, along with District Administration, Mutual Aid Partners & NGOs. Onsite Disaster Mock drills are carried out once in a quarter with different scenarios. Emergency response & Disaster Management Plan (ERDMP) of Digboi refinery as per guidelines of PNGRB has been drawn up and certified by M/S SafeNet Industrial Solution PLL.
7	Disposal of hazardous wastes shall be as per the Hazardous Wastes. (Management and Handling) Rules, 2003 Authorization from the State Pollution Control Board must be obtained for collections / treatment /storage/disposal of hazardous wastes.	Digboi Refinery has been granted Hazardous Waste Authorization WB/T-311/21-22/115/101 and is valid till 31-Mar-2027. Digboi Refinery annually files Hazardous Wastes Return to PCBA. Last Annual Hazardous Wastes Return for FY 2025-26 has been duly submitted to Pollution Control Board, Assam on 20.05.2026.
8	The project authorities will provide adequate funds as nonrecurring and recurring expenditure 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.	The HSE department is supported with budgetary Allocation. The allocation for the last six years is as follows: ➤ 2020-21: Rs 7.74 Cr. ➤ 2021-22: Rs 7.78 Cr. ➤ 2022-23: Rs 8.83 Cr. ➤ 2023-24: Rs. 3.50 Cr. ➤ 2024-25: Rs. 7.00 Cr. ➤ 2025-26: Rs. 4.0 Cr.



9	The company shall develop rainwater harvesting structures to harvest the runoff water for recharge of ground water.	Storage Cum Percolation Pond (SCP) was commissioned in 2018 utilizing run-off water of 9 interlinked natural catchment areas around Digboi, first of its type in eastern Asia. The usage of rainwater has proven to be very cost effective and environmentally friendly to increase the water table in the Digboi area. During FY 2025-26, 32.0 % of industrial water requirements were met through harvested rainwater as Cooling Tower Make up, feed to DM plant, Service water and fire water make up.
10	The stipulated conditions will be monitored by the concerned Regional Office of this Ministry /Central Pollution Control Board/State Pollution Control Board. A six-monthly compliance report and the monitored data should be submitted to them regularly. It will also be displayed on the Website of the Company	Six-monthly EC compliance reports are duly submitted to IRO Guwahati. Last report submitted on 15 October 2025. Previous EC compliance reports of Digboi Refinery are uploaded on Indian Oil website. Link to the website is below. https://iocl.com/statutory-notice
11	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 http://www.envfor.nic.in 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 concerned Regional office of this Ministry	The advertisement in local newspapers was published.
12	A separate environment management cell with fully fledged laboratory facilities to carry out various management and monitoring functions shall be set up under the control of a Senior Executive.	Digboi Refinery has a full-fledged Health, Safety and Environment (HSE) unit functioning under Chief General Manager with direct reporting to Head of Organization. HSE Department team consists of Dy General Manager (1), Chief Manager (2), Senior Managers (2) and Officer (1), reporting to General Manager and Chief General Manager in hierarchy. The HSE team regularly monitors and reviews the effectiveness of the EMP implementation.
13	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.	All the formalities for closure of project have been completed and project capitalized on 28.12.2010

**ENVIRONMENTAL CLEARANCE (J-11011/482/2007-IA II (I)
dated 01-01-2024) FOR Capacity Augmentation of Digboi
Refinery to 1 MMTPA**

A	Specific Conditions	
SL. NO	STIPULATIONS	COMPLIANCE STATUS AS ON 31.03.2026
1	Environmental clearance is subject to obtaining prior clearance from the wildlife angle, including clearance from the Standing Committee of the National Board for Wildlife, as applicable, as per the Ministry's OM dated 8th August, 2019. Grant of environmental clearance does not necessarily imply that Wildlife Clearance shall be granted to the project and that their proposal for Wildlife Clearance will be considered by the respective authorities on its merit and decision taken. PP shall also strictly follow the conditions mentioned in existing NBWL clearance.	NBWL Minutes was issued on 26.06.25 recommending the project with 4 conditions. Letter from PCCF to DR issued on 11.07.2025 with decision taken and conditions to be complied. Refinery submitted the compliance report to PCCF (Wildlife) & CWW, Assam on 16.07.2025 (Enclosed as Annexure -8)
2	The project proponent shall prepare a site-specific conservation plan and wildlife management plan in case of the presence of Schedule-1 species in the study area, as applicable to the project, and submit it to Chief Wildlife Warden for approval. The recommendations shall be implemented in consultation with the State Forest/Wildlife Department in a time bound manner.	Site specific conservation plan and wildlife management plan have been prepared and submitted to DFO, Digboi on 14.03.2023 for onward forwarding to Chief Wildlife Warden. DFO forwarded the same to PCCF vide letter dated 10.05.2023. (Enclosed as Annexure -9)
3	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.	Actions taken for strict compliance to EIA/EMP and risk mitigation measures during designing & construction phase of Digboi Refinery Capacity Augmentation project to 1 MMTPA.
4	The effluent generation post expansion of the refinery shall not exceed 2352 m3/day which will be treated through Effluent Treatment Plant which shall be re-used inside refinery.	The effluent generation post expansion of the refinery has been considered within 2352 m3/day during engineering and shall be complied with post commissioning of the project. Treated effluent from ETP shall be recycled to refinery as make up for Fire water tank, coke cutting water at Delayed Coking Unit, Wax Sector Cooling Tower, cleaning and gardening purposes.
5	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.	Shall be complied



6	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.	Project has been conceived for implementation with state-of-the-art technology with equipment to ensure negligible VOC emission to comply EC norm. Digboi refinery doesn't use any liquid fuel and Natural Gas & Fuel Gas (FG) is being used. No Liquid fuel burning is considered under DR 1.0 project as well. Use of Low Nox burners, adequate stack height etc. have been considered in engineering design. Currently, quarterly monitoring of fugitive emission (VOC) is being carried out regularly by CPB/MoEFCC approved external agency and shall also be continued post DR 1.0 project commissioning.
7	As proposed, the total SOx emission from post project shall not exceed 16.61 kg/hr (i.e. 0.398 TPD).	SOx emission from Stack shall be maintained within stipulated limit.
8.	All the commitments made to the public during public hearing/public consultation meeting held on 04.03.2023 shall be satisfactorily implemented and adequate budget provision shall be made accordingly.	DR has allocated Rs. 5.0 Crores towards Extended EMP (CER) which shall be spent as submitted in CER plan by involving local villages and administration. All the activities under CER shall be completed before the commissioning of the plant.
9.	Total freshwater requirement after proposed expansion shall not exceed 13032 KLPD which will be met from the existing pumping station at Nazirating. Necessary permission in this regard shall be obtained from the concerned regulatory authority.	No Objection Certificate to withdraw 14400 KLPD is obtained vide letter no. EE/WRD/DBR/2022-23/D-3/Pt IV/790 dated 15/03/2023 from Dibrugarh Water Resource Division. Total freshwater requirements shall be ensured within 13032 KLPD.
10.	The additional effluent generation shall not exceed 8 m3/hr from the proposed expansion i.e. the refinery (including DM Plant regeneration wastewater, process units, Cooling towers blowdown), which will be treated in the existing Effluent Treatment Plant (ETP). The existing ETP capacity is 375 m3/hr with present load of 90 m3/hr from refinery.	The present ETP load is around 90 m3/hr. & post DR 1.0 additional load is considered within 8 m3/hr.
11	Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond.	Process and storm drains are separate systems and not allowed to mix. All process effluent is routed to ETP. Storm water channel is provided with hay filter and Oil boom to catch any accidental oil spillage prior to routing to Digboi Nallah.
12	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.	All hazardous chemicals shall be stored in tanks & drums. All solvent & chemical transfer shall be done through pumps, and manual transfer shall be avoided. Flame arrestor in tank farm shall be

		provided as per safe engineering practice.
13	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.	Process organic residues (ETP Bio sludge) are allowed to dry and weather in sludge drying beds at ETP. Bio-sludge is then transferred to secured land fill for bioremediation. After completion, the same is disposed of in the low lying non crop area. No evaporation salt is generated from ETP.
14	The company shall undertake waste minimization measures as below: Metering and control of quantities of active ingredients to minimize waste. Reuse of by-products from the process as raw materials or as raw material substitutes in other processes. Use of automated filling to minimize spillage. Use of Close Feed system into batch reactors. Venting equipment through vapour recovery system. Use of high pressure hoses for equipment clearing to reduce wastewater generation.	Slop oil generated, if any, is reprocessed as per prevailing practice. The process handles close loop systems without any provision for manual filling. Vents from process equipment to FG header/Flare have been considered. Use of high-pressure hoses for equipment cleaning (e.g exchanger) shall be ensured.
15	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	Green belt developed with regular tree plantation around Refinery premises and township area. Currently, Digboi refinery has 52.87 % greenbelt covers of the total refinery area and already achieved min. 33% greenbelt areas as per guidelines prescribed by MoEFCC.
16	PP proposed to allocate Rs. 5.0 Crores towards Extended EMP (CER) which shall be spent as submitted in CER plan. Further, all the proposed activities under CER shall be completed before the commissioning of the plant in consultation with District Administration.	Digboi Refinery has allocated 5.0 Crore towards extended EMP as per the proposed activities mentioned in the EIA report. Accordingly preliminary activities started and all the CER recommendations shall be completed before commissioning of the plant.
17	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.	Shall be complied
18	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.	A comprehensive Fire protection system shall be installed and activated prior to commissioning of new facilities under DR 1.0 project. The same shall also be vetted through external audit like OISD & PESO.



19	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.	Online connectivity established with CPCB Server and PCBA for Furnaces having heat capacity of more than 10 MMkCal/hr (HGU & HRSG Stacks). ETP is already installed with real time analyzers (pH, COD, BOD, TSS) and connected to CPCB and PCBA server. Online Oil & Grease analyser Commissioned in August'2025 at ETP effluent line. Installation of web camera with night vision capability in the channel/drain carrying effluent within the premises has been installed to monitor at 6 locations.
20	PP shall allocate at least Rs. 0.5 Crore/annum for Occupational Health Safety. Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	PME and WPME are being carried out as per Factories Act with. Budgeted provision of 0.5 Crore/Annum for Occupational Health Safety shall be ensured.
21	Process safety and risk assessment studies shall be further carried out using advanced models, and the mitigating measures shall be undertaken/implemented accordingly.	RRA study of DR 1.0 project has been carried out using PHAST by M/s EIL. All the RRA recommendations shall be considered and ensured implementation during DR 1.0 Project implementation along with HAZOP recommendations. The latest QRA study with all existing DR units and including facilities for capacity augmentation of Digboi refinery to 1 MMTPA has been carried out by M/s Techniche Engineering Private Limited, Pune in the month of June'25.
22	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.	ETP is already installed with real time analyzers (pH, COD, BOD, TSS, O&G) and connected to CPCB and PCBA server. Further online Oil & Grease analyser commissioned August'25 at ETP effluent line. The effluent quality meets all the MINAS standard.
23	PP shall sensitize and create awareness among the people working within the project area as well as its surrounding area on the ban of Single Use Plastic in order to ensure the compliance of Notification published by MOEFCC on 12th August, 2021. A report along with photographs on the measures taken shall also be included in the six- monthly compliance report being submitted to concerned authority.	Under Mission LIFE campaign, awareness regarding ban of Single Use Plastic is being carried out through distribution of leaflets, display of banners and posters and conducting Nukkad natak etc. World Environment Day 2025 was also observed at DR with various awareness programs and campaigns like waste segregation, carrying jute bags to market to avoid use of plastic bags etc.

B.	General Conditions	
1	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.	Shall be complied
2	The energy source for lighting purpose shall be preferably LED based, or advanced having preference in energy conservation and environment betterment.	LED based lighting is only used for lighting purpose
3	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).	Acoustic hoods are available all over the refinery and silencers exist in all sensitive parts of the plant where noise is a major concern. Moreover, all vehicle/trucks speed is limited to 20 km/hr inside the refinery. The ambient noise levels conform to the standards prescribed under the Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (daytime and 70 dBA (nighttime). Quarterly Noise survey is carried out by the Occupational Health Centre of Digboi Refinery hospital.
4	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.	DR has allocated Rs. 5.0 Crores towards Extended EMP (CER) which shall be spent as submitted in CER plan by involving local villages and administration. Actions have already been initiated and planned to complete prior to commissioning of DR 1.0 project facilities.
5	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.	Shall be complied & ensured.
6	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.	Complied (No such suggestion / representations received from any bodies)



7	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 of the company.	Shall be complied with current practice.
8	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.	Shall be complied with current practice.
9	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 https://parivesh.nic.in/ . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in 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 Attached As Annexure 10
10	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.	Shall be ensured & complied
11	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.	Shall be ensured & complied

BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
AOD, Digboi, Dist. Tinsukia, Assam, INDIA

ULR No. : TC148142500006422F
Test Report Date: 11/10/2025

Sample Particulars

Nature of the Sample : Treated Effluent
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 04/10/2025
Test Started On : 04/10/2025
Test Completed On : 10/10/2025
Method of Sampling : SOP/B/D-3
Date of Sampling : 01/10/2025
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	pH	...	7.74	6.0-8.5	IS:3025 (P-11)
2	Total Suspended Solids (TSS)	mg/L	10	20	IS:3025 (P-17)
3	Oil & Grease (O&G)	mg/L	2	5	IS:3025 (P-39)
4	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	11	15	IS:3025 (P-44)
5	COD	mg/L	60	125	IS:3025 (P-58)
6	Ammonical Nitrogen	mg/L	0.59	15	IS:3025 (P-34)
7	Total Kjeldhal Nitrogen	mg/L	0.84	40	IS:3025 (P-34)
8	Lead as Pb	mg/L	ND [DL-0.01]	2	APHA 23 rd Ed.
9	Chromium Hexavalent as Cr ⁺⁶	mg/L	ND [DL-0.1]	0.1	APHA 23 rd Ed.
10	Chromium as Cr	mg/L	ND [DL-0.05]	2.0	APHA 23 rd Ed.
11	Copper as Cu	mg/L	0.02	1.0	APHA 23 rd Ed.
12	Zinc as Zn	mg/L	ND [DL-0.05]	5.0	APHA 23 rd Ed.
13	Sulphide as S ²⁻	mg/L	ND [DL-0.05]	2.0	IS:3025 (P-29)
14	Mercury as Hg	mg/L	ND [DL-0.05]	0.01	APHA 23 rd Ed.
15	Phenolic Compounds(C ₆ H ₅ OH)	mg/L	ND [DL-1]	0.35	IS:3025 (P-43)
16	Nickel as Ni	mg/L	ND [DL-0.1]	1.0	APHA 23 rd Ed.

Remark
ND-Not Detected



NOTE: The laboratory accepts the responsibility for content of report. The results contained in this test report related only to the sample tested. Test report shall not be reproduced except in full, without written approval of the laboratory. This report is intended only for your guidance and not for legal purpose or for advertisement. This report shall not be reproduced except in full without the written approval of this organization. Samples will be destroyed after 30 days from the date of issue of test certificate unless otherwise specified. Any complaints about this report should be communicated in writing within 7 days of issue of this report. Total liability of Nitya Laboratories is limited invoiced amount only. If you have any complaint/feedback regarding the sample collection/testing/test report, please send an email at info@nityalab.com and call at +91-191-2465597, +91-9873924093

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
AOD, Digboi, Dist. Tinsukia, Assam, INDIA

Test Report No. : 202510010110
Test Report Date: 11/10/2025

Sample Particulars

Nature of the Sample : **Treated Effluent**
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 04/10/2025
Test Started On : 04/10/2025
Test Completed On : 10/10/2025
Method of Sampling : SOP/B/D-3
Date of Sampling : 01/10/2025
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	Cyanide as CN	mg/L	ND [DL-0.01]	0.2	IS:3025 (P-27)
2	Total Phosphorous as P	mg/L	0.38	3	IS:3025 (P-31)
3	Vanadium as V	mg/L	ND [DL-0.01]	0.1	IS:3025 (P-56)
4	Benzene	mg/L	ND [DL-0.0001]	0.1	USEPA-8270C
5	Benzo (a) pyrene	mg/L	ND [DL-0.0001]	0.2	USEPA-8270C

Remark:
ND-Not Detected



NOTE: The laboratory accepts the responsibility for content of report. The results contain id in this test report related only to the sample tested. Test report shall not be reproduced except in full, without written approval of the laboratory. This report is intended only for your guidance and not for legal purpose or for advertisement. This report shall not be reproduced except in full without the written approval of this organization. Samples will be destroyed after 30 days from the date of issue of test certificate unless otherwise specified. Any complaints about this report should be communicated in writing within 7 days of issue of this report. Total liability of Nitya Laboratories is limited invoiced amount only. If you have any complaint/feedback regarding the sample collection/testing/test report, please send an email at info@nityalab.com and call at +91-191-2465597, +91-9873924093

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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
AOD, Digboi, Dist. Tinsukia, Assam, INDIA

ULR No. : TC148142500007057F
Test Report Date: 12/11/2025

Sample Particulars

Nature of the Sample : Treated Effluent
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 06/11/2025
Test Started On : 06/11/2025
Test Completed On : 11/11/2025
Method of Sampling : SOP/B/D-3
Date of Sampling : 03/11/2025
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	pH	...	7.25	6.0-8.5	IS:3025 (P-11)
2	Total Suspended Solids (TSS)	mg/L	10	20	IS:3025 (P-17)
3	Oil & Grease (O&G)	mg/L	3	5	IS:3025 (P-39)
4	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	10	15	IS:3025 (P-44)
5	COD	mg/L	72	125	IS:3025 (P-58)
6	Ammonical Nitrogen	mg/L	0.60	15	IS:3025 (P-34)
7	Total Kjeldhal Nitrogen	mg/L	1.12	40	IS:3025 (P-34)
8	Lead as Pb	mg/L	ND [DL-0.01]	2	APHA 23 rd Ed.
9	Chromium Hexavalent as Cr ⁺⁶	mg/L	ND [DL-0.1]	0.1	APHA 23 rd Ed.
10	Chromium as Cr	mg/L	ND [DL-0.05]	2.0	APHA 23 rd Ed.
11	Copper as Cu	mg/L	0.06	1.0	APHA 23 rd Ed.
12	Zinc as Zn	mg/L	ND [DL-0.05]	5.0	APHA 23 rd Ed.
13	Sulphide as S ²⁻	mg/L	ND [DL-0.05]	2.0	IS:3025 (P-29)
14	Mercury as Hg	mg/L	ND [DL-0.05]	0.01	APHA 23 rd Ed.
15	Phenolic Compounds(C ₆ H ₅ OH)	mg/L	ND [DL-1]	0.35	IS:3025 (P-43)
16	Nickel as Ni	mg/L	ND [DL-0.1]	1.0	APHA 23 rd Ed.

Remark:
ND-Not Detected



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
AOD, Digboi, Dist. Tinsukia, Assam, INDIA

Test Report No. : 202511030110

Test Report Date: 12/11/2025

Sample Particulars

Nature of the Sample : Treated Effluent
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 06/11/2025
Test Started On : 06/11/2025
Test Completed On : 11/11/2025
Method of Sampling : SOP/B/D-3
Date of Sampling : 03/11/2025
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	Cyanide as CN	mg/L	ND [DL-0.01]	0.2	IS:3025 (P-27)
2	Total Phosphorous as P	mg/L	0.45	3	IS:3025 (P-31)
3	Vanadium as V	mg/L	ND [DL-0.01]	0.1	IS:3025 (P-56)
4	Benzene	mg/L	ND [DL-0.0001]	0.1	USEPA-8270C
5	Benzo (a) pyrene	mg/L	ND [DL-0.0001]	0.2	USEPA-8270C

Remark:
ND-Not Detected


(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
AOD, Digboi, Dist. Tinsukia, Assam, INDIA

ULR No. : TC148142500008115F
Test Report Date: 26/12/2025

Sample Particulars

Nature of the Sample : Treated Effluent
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 19/12/2025
Test Started On : 19/12/2025
Test Completed On : 25/12/2025
Method of Sampling : SOP/B/D-3
Date of Sampling : 15/12/2025
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	pH	...	7.34	6.0-8.5	IS:3025 (P-11)
2	Total Suspended Solids (TSS)	mg/L	59	100	IS:3025 (P-17)
3	Oil & Grease (O&G)	mg/L	2	5	IS:3025 (P-39)
4	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	16	30	IS:3025 (P-44)
5	COD	mg/L	80	125	IS:3025 (P-58)
6	Ammonical Nitrogen	mg/L	0.29	15	IS:3025 (P-34)
7	Total Kjeldhal Nitrogen	mg/L	1.01	40	IS:3025 (P-34)
8	Lead as Pb	mg/L	ND [DL-0.01]	2	APHA 23 rd Ed.
9	Chromium Hexavalent as Cr ⁶⁺	mg/L	ND [DL-0.1]	0.1	APHA 23 rd Ed.
10	Chromium as Cr	mg/L	ND [DL-0.05]	2.0	APHA 23 rd Ed.
11	Copper as Cu	mg/L	0.07	1.0	APHA 23 rd Ed.
12	Zinc as Zn	mg/L	0.29	5.0	APHA 23 rd Ed.
13	Sulphide as S ²⁻	mg/L	ND [DL-0.05]	2.0	IS:3025 (P-29)
14	Mercury as Hg	mg/L	ND [DL-0.05]	0.01	APHA 23 rd Ed.
15	Phenolic Compounds(C ₆ H ₅ OH)	mg/L	ND [DL-1]	0.35	IS:3025 (P-43)
16	Nickel as Ni	mg/L	ND [DL-0.1]	1.0	APHA 23 rd Ed.

Remark:
ND-Not Detected

(AUTHORISED SIGNATORY)
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Test Report

Issued To M/s Indian Oil Corporation Limited

Bongaigaon Refinery

Distt. Chirang-783 380, Assam, India

Test Report No. : 202512150120

Test Report Date: 26/12/2025

Sample Particulars

Nature of the Sample : **Treated Effluent**
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 19/12/2025
Test Started On : 19/12/2025
Test Completed On : 25/12/2025
Method of Sampling : SOP/B/D-3
Date of Sampling : 15/12/2025
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	Cyanide as CN	mg/L	ND [DL-0.01]	0.2	IS:3025 (P-27)
2	Total Phosphorous as P	mg/L	0.68	3	IS:3025 (P-31)
3	Vanadium as V	mg/L	ND [DL-0.01]	0.1	IS:3025 (P-56)
4	Benzene	mg/L	ND [DL-0.0001]	0.1	USEPA-8270C
5	Benzo (a) pyrene	mg/L	ND [DL-0.0001]	0.2	USEPA-8270C

Remark:

ND-Not Detected

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(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
AOD, Digboi, Dist. Tinsukia, Assam, INDIA

ULR No. : TC148142600000218F
Test Report Date: 24/01/2026

Sample Particulars

Nature of the Sample : Treated Effluent
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 19/01/2026
Test Started On : 19/01/2026
Test Completed On : 23/01/2026
Method of Sampling : SOP/B/D-3
Date of Sampling : 15/01/2026
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	pH	...	7.23	6.0-8.5	IS:3025 (P-11)
2	Total Suspended Solids (TSS)	mg/L	48	100	IS:3025 (P-17)
3	Oil & Grease (O&G)	mg/L	3	5	IS:3025 (P-39)
4	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	18	30	IS:3025 (P-44)
5	COD	mg/L	85	125	IS:3025 (P-58)
6	Ammonical Nitrogen	mg/L	0.32	15	IS:3025 (P-34)
7	Total Kjeldhal Nitrogen	mg/L	0.97	40	IS:3025 (P-34)
8	Lead as Pb	mg/L	ND [DL-0.01]	2	APHA 23 rd Ed.
9	Chromium Hexavalent as Cr ⁺⁶	mg/L	ND [DL-0.1]	0.1	APHA 23 rd Ed.
10	Chromium as Cr	mg/L	ND [DL-0.05]	2.0	APHA 23 rd Ed.
11	Copper as Cu	mg/L	0.09	1.0	APHA 23 rd Ed.
12	Zinc as Zn	mg/L	0.16	5.0	APHA 23 rd Ed.
13	Sulphide as S ²⁻	mg/L	ND [DL-0.05]	2.0	IS:3025 (P-29)
14	Mercury as Hg	mg/L	ND [DL-0.05]	0.01	APHA 23 rd Ed.
15	Phenolic Compounds(C ₆ H ₅ OH)	mg/L	ND [DL-1]	0.35	IS:3025 (P-43)
16	Nickel as Ni	mg/L	ND [DL-0.1]	1.0	APHA 23 rd Ed.

Remark:
ND-Not Detected



(AUTHORISED SIGNATORY)
Authorised
(RAYINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited

Bongaigaon Refinery
Distt. Chirang-783 380, Assam, India

202601150120

Test Report Date: 24/01/2026

Sample Particulars

Nature of the Sample	:	Treated Effluent
Sample Quantity & Packaging	:	1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab	:	19/01/2026
Test Started On	:	19/01/2026
Test Completed On	:	23/01/2026
Method of Sampling	:	SOP/B/D-3
Date of Sampling	:	15/01/2026
Monitoring Conducted By	:	M/s Nitya Laboratories
Sampling Location	:	ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	Cyanide as CN	mg/L	ND [DL-0.01]	0.2	IS:3025 (P-27)
2	Total Phosphorous as P	mg/L	0.58	3	IS:3025 (P-31)
3	Vanadium as V	mg/L	ND [DL-0.01]	0.1	IS:3025 (P-56)
4	Benzene	mg/L	ND [DL-0.0001]	0.1	USEPA-8270C
5	Benzo (a) pyrene	mg/L	ND [DL-0.0001]	0.2	USEPA-8270C

Remark:
ND-Not Detected

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(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
AOD, Digboi, Dist. Tinsukia, Assam, INDIA

ULR No. : TC148142600000732F
Test Report Date: 26/02/2026

Sample Particulars

Nature of the Sample	: Treated Effluent
Sample Quantity & Packaging	: 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab	: 20/02/2026
Test Started On	: 20/02/2026
Test Completed On	: 25/02/2026
Method of Sampling	: SOP/B/D-3
Date of Sampling	: 16/06/2026
Monitoring Conducted By	: M/s Nitya Laboratories
Sampling Location	: ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	pH	...	7.38	6.0-8.5	IS:3025 (P-11)
2	Total Suspended Solids (TSS)	mg/L	36	100	IS:3025 (P-17)
3	Oil & Grease (O&G)	mg/L	4	5	IS:3025 (P-39)
4	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	14	30	IS:3025 (P-44)
5	COD	mg/L	74	125	IS:3025 (P-58)
6	Ammonical Nitrogen	mg/L	0.70	15	IS:3025 (P-34)
7	Total Kjeldhal Nitrogen	mg/L	1.0	40	IS:3025 (P-34)
8	Lead as Pb	mg/L	ND [DL-0.01]	2	APHA 23 rd Ed.
9	Chromium Hexavalent as Cr ⁺⁶	mg/L	ND [DL-0.1]	0.1	APHA 23 rd Ed.
10	Chromium as Cr	mg/L	ND [DL-0.05]	2.0	APHA 23 rd Ed.
11	Copper as Cu	mg/L	0.08	1.0	APHA 23 rd Ed.
12	Zinc as Zn	mg/L	0.27	5.0	APHA 23 rd Ed.
13	Sulphide as S ²⁻	mg/L	ND [DL-0.05]	2.0	IS:3025 (P-29)
14	Mercury as Hg	mg/L	ND [DL-0.05]	0.01	APHA 23 rd Ed.
15	Phenolic Compounds(C ₆ H ₅ OH)	mg/L	ND [DL-1]	0.35	IS:3025 (P-43)
16	Nickel as Ni	mg/L	ND [DL-0.1]	1.0	APHA 23 rd Ed.

Remark:
ND-Not Detected



TC-14814

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(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited

Bongaigaon Refinery

Distt. Chirang-783 380, Assam, India

Test Report No.: 202602160110

Test Report Date: 26/02/2026

Sample Particulars

Nature of the Sample : **Treated Effluent**
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 20/02/2026
Test Started On : 20/02/2026
Test Completed On : 25/06/2026
Method of Sampling : SOP/B/D-3
Date of Sampling : 16/02/2026
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	Cyanide as CN	mg/L	ND [DL-0.01]	0.2	IS:3025 (P-27)
2	Total Phosphorous as P	mg/L	0.74	3	IS:3025 (P-31)
3	Vanadium as V	mg/L	ND [DL-0.01]	0.1	IS:3025 (P-56)
4	Benzene	mg/L	ND [DL-0.0001]	0.1	USEPA-8270C
5	Benzo (a) pyrene	mg/L	ND [DL-0.0001]	0.2	USEPA-8270C

Remark:

ND-Not Detected

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
AOD, Digboi, Dist. Tinsukia, Assam, INDIA

ULR No. : TC148142600001078F
Test Report Date: 25/03/2026

Sample Particulars

Nature of the Sample : Treated Effluent
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 19/03/2026
Test Started On : 19/03/2026
Test Completed On : 24/03/2026
Method of Sampling : SOP/B/D-3
Date of Sampling : 16/03/2026
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	pH	...	7.36	6.0-8.5	IS:3025 (P-11)
2	Total Suspended Solids (TSS)	mg/L	15	20	IS:3025 (P-17)
3	Oil & Grease (O&G)	mg/L	ND	5	IS:3025 (P-39)
4	Bio-Chemical Oxygen Demand (3 days at 27°C) (BOD)	mg/L	13	15	IS:3025 (P-44)
5	COD	mg/L	70	125	IS:3025 (P-58)
6	Ammonical Nitrogen	mg/L	3.12	15	IS:3025 (P-34)
7	Total Kjeldhal Nitrogen	mg/L	4.48	40	IS:3025 (P-34)
8	Lead as Pb	mg/L	ND [DL-0.01]	2	APHA 23 rd Ed.
9	Chromium Hexavalent as Cr ⁶⁺	mg/L	ND [DL-0.1]	0.1	APHA 23 rd Ed.
10	Chromium as Cr	mg/L	ND [DL-0.05]	2.0	APHA 23 rd Ed.
11	Copper as Cu	mg/L	0.04	1.0	APHA 23 rd Ed.
12	Zinc as Zn	mg/L	ND [DL-0.05]	5.0	APHA 23 rd Ed.
13	Sulphide as S ²⁻	mg/L	ND [DL-0.05]	2.0	IS:3025 (P-29)
14	Mercury as Hg	mg/L	ND [DL-0.05]	0.01	APHA 23 rd Ed.
15	Phenolic Compounds(C ₆ H ₅ OH)	mg/L	ND [DL-1]	0.35	IS:3025 (P-43)
16	Nickel as Ni	mg/L	ND [DL-0.1]	1.0	APHA 23 rd Ed.

Remark:
ND-Not Detected



TC-14814



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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
AOD, Digboi, Dist. Tinsukia, Assam, INDIA

Test Report No. : 202603160110
Test Report Date: 25/03/2026

Sample Particulars

Nature of the Sample : **Treated Effluent**
Sample Quantity & Packaging : 1 L HDPE Can+150 ml Sterile Container
Sample Received at Lab : 19/03/2026
Test Started On : 19/03/2026
Test Completed On : 24/03/2026
Method of Sampling : SOP/B/D-3
Date of Sampling : 16/03/2026
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Location : ETP Polishing Pond-Outlet

Test Report

Sr. No.	Parameter	Unit	Result	Permissible Limit	Protocol
1	Cyanide as CN	mg/L	ND [DL-0.01]	0.2	IS:3025 (P-27)
2	Total Phosphorous as P	mg/L	0.78	3	IS:3025 (P-31)
3	Vanadium as V	mg/L	ND [DL-0.01]	0.1	IS:3025 (P-56)
4	Benzene	mg/L	ND [DL-0.0001]	0.1	USEPA-8270C
5	Benzo (a) pyrene	mg/L	ND [DL-0.0001]	0.2	USEPA-8270C

Remark:
ND-Not Detected

(AUTHORISED SIGNATORY)
Authorised
(RAVINDER MITTAL)

NOTE: The laboratory accepts the responsibility for content of report. The results contained in this test report related only to the sample tested. Test report shall not be reproduced except in full, without written approval of the laboratory. This report is intended only for your guidance and not for legal purpose or for advertisement. This report shall not be reproduced except in full without the written approval of this organization. Samples will be destroyed after 30 days from the date of issue of test certificate unless otherwise specified. Any complaints about this report should be communicated in writing within 7 days of issue of this report. Total liability of Nitya Laboratories is limited to the amount only. If you have any complaint/feedback regarding the sample collection/testing/test report, please send an email at info@nityalab.com and call at +91-191-2465597, +91-9873924093

CORPORATE OFFICE & CENTRAL LABORATORIES :-

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गुणवत्ता नियंत्रण विभाग (QUALITY CONTROL DEPARTMENT)
इंडियन ऑयल कॉर्पोरेशन लिमिटेड (INDIAN OIL CORPORATION LIMITED)
(असम ऑयल डिवीजन (ASSAM OIL DIVISION)
डिगबोई रिफाइनरी, असम (DIGBOI REFINERY, ASSAM)



Test Report of Dihing and Digboi Rivers Water Sample

Source: Dihing and Digboi Rivers

रिपोर्ट संख्या/ Report No.: DR/QC/Oct-2025

Date of Report: 29.10.2025

Date of Sample Collection :-25.10.2025

PARAMETER		pH	Oil & Grease	Phenol	Sulphide	COD	BOD (3 Days) @ 27°C
Test Method		IS 3025 (Part 11)	APHA-5520-B	APHA-5530-D	IS 3025 (Part 29)	APHA-5220-B	IS-3025 PART-44
Unit			mg/l	mg/l	mg/l	mg/l	mg/l
Requirements as per MINAS norms (Minimum National Standards)		6.0-8.5	Max 5.0 mg/l	Max 0.35 mg/l	Max 0.5 mg/l	Max 125 mg/l	Max 15.0 mg/l
S.No	Sample Details	Test Results					
1	Digboi River Water in Kenduguri Area	7.2	2.8	0.17	0.09	56.0	10.0
2	Digboi River Water (15 km away from Digboi Refinery on Digboi	7.1	2.5	0.11	BDL	48.0	8.0
3	Digboi River Water (26 km away from Digboi Refinery on Digboi	7.1	2.1	0.10	BDL	42.0	7.0
4	Dihing River water before confluence with Digboi river	7.4	1.9	0.07	BDL	26.0	5.0
5	Dihing River water after confluence with Digboi river	7.3	1.0	0.04	BDL	30.0	6.0

***BDL = Below Detection Limit

Test Report Released By :-
Dr. Gopal Maurya (QCM)
Inter Com No:-3593



गुणवत्ता नियंत्रण विभाग (QUALITY CONTROL DEPARTMENT)
इंडियन ऑयल कॉर्पोरेशन लिमिटेड (INDIAN OIL CORPORATION LIMITED)
(असम ऑयल डिवीजन (ASSAM OIL DIVISION)
डिगबोई रिफाइनरी, असम (DIGBOI REFINERY, ASSAM)



Test Report of Dihing and Digboi Rivers Water Sample

Source: Dihing and Digboi Rivers

रिपोर्ट संख्या/ Report No.: DR/QC/Nov-2025

Date of Report: 29.11.2025

Date of Sample Collection :-25.11.2025

PARAMETER		pH	Oil & Grease	Phenol	Sulphide	COD	BOD (3 Days) @ 27°C
Test Method		IS 3025 (Part 11)	APHA-5520-B	APHA-5530-D	IS 3025 (Part 29)	APHA-5220-B	IS-3025 PART-44
Unit			mg/l	mg/l	mg/l	mg/l	mg/l
Requirements as per MINAS norms (Minimum National Standards)		6.0-8.5	Max 5.0 mg/l	Max 0.35 mg/l	Max 0.5 mg/l	Max 125 mg/l	Max 15.0 mg/l
S.No	Sample Details	Test Results					
1	Digboi River Water in Kenduguri Area	6.7	2.9	0.22	0.09	62.0	9.0
2	Digboi River Water (15 km away from Digboi Refinery on Digboi	6.8	2.1	0.18	BDL	43.0	8.0
3	Digboi River Water (26 km away from Digboi Refinery on Digboi	7.0	1.9	0.14	BDL	40.0	8.0
4	Dihing River water before confluence with Digboi river	7.1	1.7	0.10	BDL	30.0	7.0
5	Dihing River water after confluence with Digboi river	7.0	1.5	0.08	BDL	28.0	5.0

***BDL = Below Detection Limit

Test Report Released By :-
Dr. Gopal Maurya (QCM)
Inter Com No:-3593



गुणवत्ता नियंत्रण विभाग (QUALITY CONTROL DEPARTMENT)
इंडियन ऑयल कॉर्पोरेशन लिमिटेड (INDIAN OIL CORPORATION LIMITED)
(असम ऑयल डिवीजन (ASSAM OIL DIVISION)
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Test Report of Dihing and Digboi Rivers Water Sample

Source: Dihing and Digboi Rivers

रिपोर्ट संख्या/ Report No.: DR/QC/Dec-2025

Date of Report: 31.12.2025

Date of Sample Collection :-25.12.2025

PARAMETER		pH	Oil & Grease	Phenol	Sulphide	COD	BOD (3 Days) @ 27°C
Test Method		IS 3025 (Part 11)	APHA-5520-B	APHA-5530-D	IS 3025 (Part 29)	APHA-5220-B	IS-3025 PART-44
Unit			mg/l	mg/l	mg/l	mg/l	mg/l
Requirements as per MINAS norms (Minimum National Standards)		6.0-8.5	Max 5.0 mg/l	Max 0.35 mg/l	Max 0.5 mg/l	Max 125 mg/l	Max 15.0 mg/l
S.No	Sample Details	Test Results					
1	Digboi River Water in Kenduguri Area	7.1	3.4	0.24	0.09	68.0	9.0
2	Digboi River Water (15 km away from Digboi Refinery on Digboi	6.9	2.9	0.19	BDL	60.0	8.0
3	Digboi River Water (26 km away from Digboi Refinery on Digboi	6.8	2.7	0.14	BDL	54.0	5.0
4	Dihing River water before confluence with Digboi river	6.9	2.4	0.11	BDL	40.0	3.0
5	Dihing River water after confluence with Digboi river	7.0	1.9	0.08	BDL	42.0	4.0

***BDL = Below Detection Limit

Test Report Released By :-
Dr. Gopal Maurya (QCM)
Inter Com No:-3593



गुणवत्ता नियंत्रण विभाग (QUALITY CONTROL DEPARTMENT)
इंडियन ऑयल कॉर्पोरेशन लिमिटेड (INDIAN OIL CORPORATION LIMITED)
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डिगबोई रिफाइनरी, असम (DIGBOI REFINERY, ASSAM)



Test Report of Dihing and Digboi Rivers Water Sample

Source: Dihing and Digboi Rivers

रिपोर्ट संख्या/ Report No.: DR/QC/Jan-2026

Date of Report: 30.01.2026

Date of Sample Collection :-21.01.2026

PARAMETER		pH	Oil & Grease	Phenol	Sulphide	COD	BOD (3 Days) @ 27°C
Test Method		IS 3025 (Part 11)	APHA-5520-B	APHA-5530-D	IS 3025 (Part 29)	APHA-5220-B	IS-3025 PART-44
Unit			mg/l	mg/l	mg/l	mg/l	mg/l
Requirements as per MINAS norms (Minimum National Standards)		6.0-8.5	Max 5.0 mg/l	Max 0.35 mg/l	Max 0.5 mg/l	Max 125 mg/l	Max 15.0 mg/l
S.No	Sample Details	Test Results					
1	Digboi River Water in Kenduguri Area	6.9	3.1	0.19	0.09	62.0	11.0
2	Digboi River Water (15 km away from Digboi Refinery on Digboi	7.0	2.6	0.15	BDL	59.0	9.0
3	Digboi River Water (26 km away from Digboi Refinery on Digboi	7.1	2.1	0.10	BDL	52.0	8.0
4	Dihing River water before confluence with Digboi river	7.2	1.8	0.07	BDL	45.0	6.0
5	Dihing River water after confluence with Digboi river	7.2	1.2	0.06	BDL	39.0	5.0

***BDL = Below Detection Limit

Test Report Released By :-
Dr. Gopal Maurya (QCM)
Inter Com No:-3593



गुणवत्ता नियंत्रण विभाग (QUALITY CONTROL DEPARTMENT)
इंडियन ऑयल कॉर्पोरेशन लिमिटेड (INDIAN OIL CORPORATION LIMITED)
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Test Report of Dihing and Digboi Rivers Water Sample

Source: Dihing and Digboi Rivers

रिपोर्ट संख्या/ Report No.: DR/QC/Feb-2026

Date of Report: 27.02.2026

Date of Sample Collection :-14.02.2026

PARAMETER		pH	Oil & Grease	Phenol	Sulphide	COD	BOD (3 Days) @ 27°C
Test Method		IS 3025 (Part 11)	APHA-5520-B	APHA-5530-D	IS 3025 (Part 29)	APHA-5220-B	IS-3025 PART-44
Unit			mg/l	mg/l	mg/l	mg/l	mg/l
Requirements as per MINAS norms (Minimum National Standards)		6.0-8.5	Max 5.0 mg/l	Max 0.35 mg/l	Max 0.5 mg/l	Max 125 mg/l	Max 15.0 mg/l
S.No	Sample Details	Test Results					
1	Digboi River Water in Kenduguri Area	6.8	3.2	0.14	0.09	60.0	18.0
2	Digboi River Water (15 km away from Digboi Refinery on Digboi	7.0	2.8	0.10	BDL	52.0	9.0
3	Digboi River Water (26 km away from Digboi Refinery on Digboi	7.0	2.0	0.08	BDL	46.0	8.0
4	Dihing River water before confluence with Digboi river	7.3	1.4	0.02	BDL	32.0	4.0
5	Dihing River water after confluence with Digboi river	7.2	1.0	0.02	BDL	38.0	5.0

***BDL = Below Detection Limit

Test Report Released By :-
Dr. Gopal Maurya (QCM)
Inter Com No:-3593



गुणवत्ता नियंत्रण विभाग (QUALITY CONTROL DEPARTMENT)
इंडियन ऑयल कॉर्पोरेशन लिमिटेड (INDIAN OIL CORPORATION LIMITED)
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Test Report of Dihing and Digboi Rivers Water Sample

Source: Dihing and Digboi Rivers

रिपोर्ट संख्या/ Report No.: DR/QC/March-2026

Date of Report: 31.03.2026

Date of Sample Collection :-16.03.2026

PARAMETER		pH	Oil & Grease	Phenol	Sulphide	COD	BOD (3 Days) @ 27°C
Test Method		IS 3025 (Part 11)	APHA-5520-B	APHA-5530-D	IS 3025 (Part 29)	APHA-5220-B	IS-3025 PART-44
Unit			mg/l	mg/l	mg/l	mg/l	mg/l
Requirements as per MINAS norms (Minimum National Standards)		6.0-8.5	Max 5.0 mg/l	Max 0.35 mg/l	Max 0.5 mg/l	Max 125 mg/l	Max 15.0 mg/l
S.No	Sample Details	Test Results					
1	Digboi River Water in Kenduguri Area	6.7	3.6	0.15	BDL	62.0	9.0
2	Digboi River Water (15 km away from Digboi Refinery on Digboi	6.8	3.0	0.12	BDL	54.0	8.0
3	Digboi River Water (26 km away from Digboi Refinery on Digboi	6.7	2.5	0.10	BDL	45.0	6.0
4	Dihing River water before confluence with Digboi river	6.9	1.2	0.02	BDL	30.0	4.0
5	Dihing River water after confluence with Digboi river	7.0	1.4	0.03	BDL	36.0	5.0

***BDL = Below Detection Limit

Test Report Released By :-
Dr. Gopal Maurya (QCM)
Inter Com No:-3593

Effluent Parameters Test Report									
From October '2025 to March '2026 (IOCL - Digboi Refinery Lab)									
Parameters	Limits	October	November	December	January	February	March	Average	
pH	6.0 - 8.5	6.50	6.70	6.67	7.03	7.16	6.80	6.810	
Oil & Grease	5.0	3.76	3.76	3.82	3.89	3.95	3.93	3.852	
BOD	15.0	9.52	10.25	9.73	9.77	9.61	9.52	9.734	
COD	125.0	66.00	66.59	66.09	66.52	66.68	64.58	66.077	
TSS	20.0	13.48	14.72	14.77	14.61	13.82	14.23	14.272	
Phenols	0.35	0.22	0.23	0.22	0.23	0.23	0.23	0.227	
Sulphides	0.5	0.10	0.10	0.10	0.10	0.10	0.10	0.099	
CN	0.20	0.012	0.011	0.011	0.010	0.010	0.011	0.011	
From October '2025 to March '2026 (Source-External Agency)									
Parameters	Limits	October	November	December	January	February	March	Average	
pH	6.0 - 8.5	7.74	7.25	7.32	7.46	7.23	7.36	7.324	
Oil & Grease	5.0	2.00	3.00	2.00	3.00	2.00	ND	2.500	
BOD	15.0	11.00	10.00	12.00	13.00	11.00	13.00	11.800	
COD	125.0	60.00	72.00	68.00	72.00	60.00	70.00	68.400	
TSS	20.0	10.00	10.00	14.00	16.00	12.00	15.00	13.400	
Phenols	0.35	ND	ND	ND	ND	ND	ND	#DIV/0!	
Sulphides	0.5	ND	ND	ND	ND	ND	ND	#DIV/0!	
CN	0.20	ND	ND	ND	ND	ND	ND	#DIV/0!	
Ammonia as N	15.0	0.59	0.69	1.80	3.08	2.03	3.12	2.144	
TKN	40.0	0.84	1.12	2.24	4.48	3.36	4.48	3.136	
P	3.0	0.38	0.45	0.36	0.57	0.64	0.78	0.560	
Cr (Hexavalent)	0.1	ND	ND	ND	ND	ND	ND	#DIV/0!	
Cr (Total)	2.0	ND	ND	ND	ND	ND	ND	#DIV/0!	
Pb	0.1	ND	ND	ND	ND	ND	ND	#DIV/0!	
Hg	0.01	ND	ND	ND	ND	ND	ND	#DIV/0!	
Zn	5.0	ND	ND	ND	ND	ND	ND	#DIV/0!	
Ni	1.0	ND	ND	ND	ND	ND	ND	#DIV/0!	
Cu	1.0	0.02	0.06	0.04	0.06	0.02	0.04	0.044	
V	0.2	ND	ND	ND	ND	ND	ND	#DIV/0!	
Benzene	0.1	ND	ND	ND	ND	ND	ND	#DIV/0!	
Benzo (a) - Pyrene	0.2	ND	ND	ND	ND	ND	ND	#DIV/0!	

ND- Not Detectable

Checked by:-

तपन कुमार दत्ता
TAPAN KUMAR DUTTA
डी.जी.एम. (एच एस एंड ई) DGM (HS & E)
आई.ओ.सी.एल. (एओडी) डिगबोई

Prepared by:-

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आई.ओ.सी.एल. (एओडी), डिगबोई
I.O.C. LTD. (AOD), DIGBOI

ANNEXURE-3

COMPLIANCE OF EFFLUENT STANDARDS (In Kg/TMT of Crude)

PARAMETER	LIMIT	(October '25 - March '26) Source-External agency					March	Average
		October	November	December	January	February		
pH	--	-	-	-	-	-	-	-
Oil & Grease	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.000
BOD	6.0	0.00	0.00	0.00	0.00	0.00	0.00	0.000
COD	50	0.00	0.00	0.00	0.00	0.00	0.00	0.000
TSS	8.0	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Phenols	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Sulphides	0.2	0.00	0.00	0.00	0.00	0.00	0.00	0.000
CN	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Ammonia as N	6.0	0.00	0.00	0.00	0.00	0.00	0.00	0.000
TKN	16	0.00	0.00	0.00	0.00	0.00	0.00	0.000
P	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Cr (Hexavalent)	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Cr (Total)	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Pb	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Hg	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Zn	2.0	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Ni	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Cu	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.000
V	0.8	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Benzene	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Benzo (a) -Pyrene	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.000

NB:- ND ; Not Done & BDL; Below Detection Level

Remarks **No effluent Discharged outside ETP**

Checked by:


तपन कुमार दत्ता
TAPAN KUMAR DUTTA
 डी.जी.एम. (एच एस एंड ई) DGM (HS & E)
 आई.ओ.सी.एल. (एओडी) डिगबोई
 I.O.C. LTD. (AOD) DIGBOI


 Prepared by:
मुजीब अहमद/ Mujeeb Ahmad
 वरिष्ठ प्रबंधक (एच एस ई)
 Senior Manager (HSE)
 आई.ओ.सी.एल. (एओडी) डिगबोई
 I.O.C. LTD. (AOD) DIGBOI

BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142500007025F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 30/10/2025
Sample Received at Lab : 03/11/2025
Test Started On : 03/11/2025
Test Completed On : 07/11/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : DCU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per the requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 58
Diameter of the Stack(m) : 1.68
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 121
Ambient Air Temperature °C : 29
Flue Gas Velocity (m/s) : 10.47
Quantity of Gas Flow, Nm³/hr : 63225.3
Barometric Pressure, mmHg : 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.5	10	IS:11255(P-1)



NOTE: The laboratory accepts the responsibility for content of report. The results contained in this test report related only to the sample tested. Test report shall not be reproduced except in full, without written approval of the laboratory. This report is intended only for your guidance and not for legal purpose or for advertisement. This report shall not be reproduced except in full without the written approval of this organization. Samples will be destroyed after 30 days from the date of issue of test certificate unless otherwise specified. Any complaints about this report should be communicated in writing within 7 days of issue of this report. Total liability of Nitya Laboratories is limited invoiced amount only. All above Parameters are not in NABL Scope. Results subject to the movement of vehicles at that particular time. If you have any complaint/feedback regarding the sample collection/testing/test report, please send an email at info@nityalab.com and call at +91-129-2241021, +91-191-2465597, +91-9873924093

CORPORATE OFFICE & CENTRAL LABORATORIES :-

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www.nityalab.com

Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No.: 202510290110
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 30/10/2025
Sample Received at Lab	: 03/11/2025
Test Started On	: 03/11/2025
Test Completed On	: 07/11/2025
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: DCU
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per the requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 58
Diameter of the Stack(m)	: 1.68
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 121
Ambient Air Temperature °C	: 29
Flue Gas Velocity (m/s)	: 10.47
Quantity of Gas Flow, Nm ³ /hr	: 63225.3
Barometric Pressure, mmHg	: 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	83	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	24	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	9	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	3.5	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	15.4	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142500007033F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	31/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	MSQU
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	40
Diameter of the Stack(m)	:	1.10
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	178
Ambient Air Temperature °C	:	29
Flue Gas Velocity (m/s)	:	10.53
Quantity of Gas Flow, Nm ³ /hr	:	23823.1
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	5.6	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202510290111
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	31/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	MSQU
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	40
Diameter of the Stack(m)	:	1.10
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	178
Ambient Air Temperature °C	:	29
Flue Gas Velocity (m/s)	:	10.53
Quantity of Gas Flow, Nm ³ /hr	:	23823.1
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	203	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	28.60	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	9.2	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	13.2	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	14.2	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500007000F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 29/10/2025
Sample Received at Lab : 03/11/2025
Test Started On : 03/11/2025
Test Completed On : 07/11/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : HGU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per the requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.00
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 143
Ambient Air Temperature °C : 29
Flue Gas Velocity (m/s) : 10.43
Quantity of Gas Flow, Nm³/hr : 21140.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.5	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No. : 202510290112
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 29/10/2025
Sample Received at Lab : 03/11/2025
Test Started On : 03/11/2025
Test Completed On : 07/11/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : HGU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per the requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.00
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 143
Ambient Air Temperature °C : 29
Flue Gas Velocity (m/s) : 10.43
Quantity of Gas Flow, Nm³/hr : 21140.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	67.5	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	42.1	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	14.2	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	8.1	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	13.2	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit


(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142500007035F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 31/10/2025
Sample Received at Lab : 03/11/2025
Test Started On : 03/11/2025
Test Completed On : 07/11/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CPP (HRSG-4)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per the requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 60
Diameter of the Stack(m) : 3.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 132
Ambient Air Temperature °C : 29
Flue Gas Velocity (m/s) : 11.18
Quantity of Gas Flow, Nm³/hr : 209480.0
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.2	10	IS:11255(P-1)



TC-14814



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt Tinsukia
Assam, INDIA

Test Report No. : 202510290113
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	31/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	CPP (HRSG-4)
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	60
Diameter of the Stack(m)	:	3.0
Sampling Duration: (min)	:	40

Observations:

Flue Gas Temperature °C	:	132
Ambient Air Temperature °C	:	29
Flue Gas Velocity (m/s)	:	11.18
Quantity of Gas Flow, Nm ³ /hr	:	209480.0
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	105	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	16	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	17	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	8.7	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	12.4	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit


(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142500007034F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	31/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	CPP (HRSG-3)
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	50
Diameter of the Stack(m)	:	2.0
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	124
Ambient Air Temperature °C	:	28
Flue Gas Velocity (m/s)	:	10.28
Quantity of Gas Flow, Nm ³ /hr	:	87262.5
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	7.2	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202510290114
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 31/10/2025
Sample Received at Lab : 03/11/2025
Test Started On : 03/11/2025
Test Completed On : 07/11/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CPP (HRSG-3)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per the requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 50
Diameter of the Stack(m) : 2.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 124
Ambient Air Temperature °C : 28
Flue Gas Velocity (m/s) : 10.28
Quantity of Gas Flow, Nm³/hr : 87262.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	51	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	23	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	14.2	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	5.1	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	14.2	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit


(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500007024F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	30/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	CRU (HDT)
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	40
Diameter of the Stack(m)	:	1.1
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	156
Ambient Air Temperature °C	:	28
Flue Gas Velocity (m/s)	:	11.09
Quantity of Gas Flow, Nm ³ /hr	:	26367.7
Barometric Pressure, mmHg	:	752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	5.8	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202510290115
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 30/10/2025
Sample Received at Lab : 03/11/2025
Test Started On : 03/11/2025
Test Completed On : 07/11/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CRU (HDT)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per the requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.1
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 156
Ambient Air Temperature °C : 28
Flue Gas Velocity (m/s) : 11.09
Quantity of Gas Flow, Nm³/hr : 26367.7
Barometric Pressure, mmHg : 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	24	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	42	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	10	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	6.2	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	15.2	-	SOP No.: NL/ SOP / FGA /11

Remark:
ND-Not Detected, DL-Detection Limit


(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142500007036F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 31/10/2025
Sample Received at Lab : 03/11/2025
Test Started On : 03/11/2025
Test Completed On : 07/11/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : SDU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per the requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 46
Diameter of the Stack(m) : 1.38
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 162
Ambient Air Temperature °C : 28
Flue Gas Velocity (m/s) : 10.38
Quantity of Gas Flow, Nm³/hr : 38293.1
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	7.3	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202510290116
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	31/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	SDU
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	46
Diameter of the Stack(m)	:	1.38
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	162
Ambient Air Temperature °C	:	28
Flue Gas Velocity (m/s)	:	10.38
Quantity of Gas Flow, Nm ³ /hr	:	38293.1
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	54	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	21	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	14	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	12.5	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	14.1	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit


(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Dist. Tinsukia
Assam, INDIA

ULR No. : TC148142500007026F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	30/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	OBSG (CRU)- FLV 005-1
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	45
Diameter of the Stack(m)	:	1.8
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	151
Ambient Air Temperature °C	:	27
Flue Gas Velocity (m/s)	:	11.33
Quantity of Gas Flow, Nm ³ /hr	:	56948.0
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	7.6	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202510290117
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	30/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	OBSG (CRU)- FLV 005-1
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	45
Diameter of the Stack(m)	:	1.8
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	151
Ambient Air Temperature °C	:	27
Flue Gas Velocity (m/s)	:	11.33
Quantity of Gas Flow, Nm ³ /hr	:	56948.0
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	49	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	18	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	5	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	13.5	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	15.4	-	SOP No.: NL/ SOP / FGA /11

Remark:
ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142500007027F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	30/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	AVU (CDU/VDU)
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	46.5
Diameter of the Stack(m)	:	1.59
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	141
Ambient Air Temperature °C	:	27
Flue Gas Velocity (m/s)	:	10.52
Quantity of Gas Flow, Nm ³ /hr	:	54162.7
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.7	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202510290118
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 30/10/2025
Sample Received at Lab : 03/11/2025
Test Started On : 03/11/2025
Test Completed On : 07/11/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : AVU (CDU/VDU)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per the requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 46.5
Diameter of the Stack(m) : 1.59
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 141
Ambient Air Temperature °C : 27
Flue Gas Velocity (m/s) : 10.52
Quantity of Gas Flow, Nm³/hr : 54162.7
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	28	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	39	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	12	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	12.1	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	14.2	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142500006999F
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	29/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	HDTU
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	40
Diameter of the Stack(m)	:	1.0
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	176
Ambient Air Temperature °C	:	28
Flue Gas Velocity (m/s)	:	11.49
Quantity of Gas Flow, Nm ³ /hr	:	21574
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	5.3	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202510290119
Test Report Date: 08/11/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	29/10/2025
Sample Received at Lab	:	03/11/2025
Test Started On	:	03/11/2025
Test Completed On	:	07/11/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	HDTU
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per the requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	40
Diameter of the Stack(m)	:	1.0
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	176
Ambient Air Temperature °C	:	28
Flue Gas Velocity (m/s)	:	11.49
Quantity of Gas Flow, Nm ³ /hr	:	21574
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	61	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	18	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	6	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	14.2	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	19.4	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500008210F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : DCU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 58
Diameter of the Stack(m) : 1.68
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 130
Ambient Air Temperature °C : 23
Flue Gas Velocity (m/s) : 11.30
Quantity of Gas Flow, Nm³/hr : 66788.7
Barometric Pressure, mmHg : 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	5.9	10	IS:11255(P-1)



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202512230110
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : DCU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 58
Diameter of the Stack(m) : 1.68
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 130
Ambient Air Temperature °C : 23
Flue Gas Velocity (m/s) : 11.30
Quantity of Gas Flow, Nm³/hr : 66788.7
Barometric Pressure, mmHg : 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	70	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	22	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	11	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	3.6	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	16.6	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500008211F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : MSQU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.10
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 264
Ambient Air Temperature °C : 22
Flue Gas Velocity (m/s) : 14.40
Quantity of Gas Flow, Nm³/hr : 22075.7
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	5.80	10	IS:11255(P-1)



TC-14814



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202512230111
Test Report Date : 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : MSQU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.10
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 264
Ambient Air Temperature °C : 22
Flue Gas Velocity (m/s) : 14.40
Quantity of Gas Flow, Nm³/hr : 22075.7
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	68	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	20	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	12	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	13.6	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	4.2	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

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(RAVINDER WITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142500008212F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : HGU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.00
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 170
Ambient Air Temperature °C : 23
Flue Gas Velocity (m/s) : 14.41
Quantity of Gas Flow, Nm³/hr : 27293.9
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	5.40	10	IS:11255(P-1)



TC-14814



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(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202512230112
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : HGU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.00
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 170
Ambient Air Temperature °C : 23
Flue Gas Velocity (m/s) : 14.41
Quantity of Gas Flow, Nm³/hr : 27293.9
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	78	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	16	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	15	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	2.2	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	18.6	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

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(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500008213F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CPP (HRSG-4)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 60
Diameter of the Stack(m) : 3.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 127
Ambient Air Temperature °C : 24
Flue Gas Velocity (m/s) : 15.74
Quantity of Gas Flow, Nm³/hr : 298447.2
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	8.40	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202512230113
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CPP (HRSG-4)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 60
Diameter of the Stack(m) : 3.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 127
Ambient Air Temperature °C : 24
Flue Gas Velocity (m/s) : 15.74
Quantity of Gas Flow, Nm³/hr : 298447.2
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	92	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	19	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	18	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	4.2	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	15.7	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
RAVINDER MITTAL

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500008214F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CPP (HRSG-2)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 50
Diameter of the Stack(m) : 2.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 142
Ambient Air Temperature °C : 23
Flue Gas Velocity (m/s) : 16.24
Quantity of Gas Flow, Nm³/hr : 131964.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	7.46	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
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Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No. : 202512230114
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CPP (HRSG-2)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 50
Diameter of the Stack(m) : 2.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 142
Ambient Air Temperature °C : 23
Flue Gas Velocity (m/s) : 16.24
Quantity of Gas Flow, Nm³/hr : 131964.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	78	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	20	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	16	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	1.9	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	21.5	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500008215F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	23/12/2025
Sample Received at Lab	:	26/12/2025
Test Started On	:	26/12/2025
Test Completed On	:	30/12/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	CRU (HDT)
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	40
Diameter of the Stack(m)	:	1.1
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	237
Ambient Air Temperature °C	:	24
Flue Gas Velocity (m/s)	:	16.96
Quantity of Gas Flow, Nm ³ /hr	:	33917.0
Barometric Pressure, mmHg	:	752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	7.24	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No. : 202512230115

Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CRU (HDT)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.1
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 237
Ambient Air Temperature °C : 24
Flue Gas Velocity (m/s) : 16.96
Quantity of Gas Flow, Nm³/hr : 33917.0
Barometric Pressure, mmHg : 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	68	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	17	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	12	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	5.6	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	16.7	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500008216F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : SDU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 46
Diameter of the Stack(m) : 1.38
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 185
Ambient Air Temperature °C : 25
Flue Gas Velocity (m/s) : 16.89
Quantity of Gas Flow, Nm³/hr : 54947.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	5.26	10	IS:11255(P-1)



TC-14814



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No. : 202512230116
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : SDU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 46
Diameter of the Stack(m) : 1.38
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 185
Ambient Air Temperature °C : 25
Flue Gas Velocity (m/s) : 16.89
Quantity of Gas Flow, Nm³/hr : 54947.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	84	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	21	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	16	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	14.2	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	7.3	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142500008217F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	23/12/2025
Sample Received at Lab	:	26/12/2025
Test Started On	:	26/12/2025
Test Completed On	:	30/12/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	OBSG (CRU)- FLV 005-1
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	45
Diameter of the Stack(m)	:	1.8
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	324
Ambient Air Temperature °C	:	24
Flue Gas Velocity (m/s)	:	21.56
Quantity of Gas Flow, Nm ³ /hr	:	30443.3
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.28	10	IS:11255(P-1)



TC-14814

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt Tinsukia
Assam, INDIA

Test Report No. : 202512230117
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : OBSG (CRU)- FLV 005-1
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 45
Diameter of the Stack(m) : 1.8
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 324
Ambient Air Temperature °C : 24
Flue Gas Velocity (m/s) : 21.56
Quantity of Gas Flow, Nm³/hr : 30443.3
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	56	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	21	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	6	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	5.8	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	15.4	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500008218F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 23/12/2025
Sample Received at Lab	: 26/12/2025
Test Started On	: 26/12/2025
Test Completed On	: 30/12/2025
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: AVU (CDU/VDU)
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 46.5
Diameter of the Stack(m)	: 1.59
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 175
Ambient Air Temperature °C	: 24
Flue Gas Velocity (m/s)	: 15.34
Quantity of Gas Flow, Nm ³ /hr	: 54947.5
Barometric Pressure, mmHg	: 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	7.20	10	IS:11255(P-1)



TC-14814



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No. : 202512230118
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	23/12/2025
Sample Received at Lab	:	26/12/2025
Test Started On	:	26/12/2025
Test Completed On	:	30/12/2025
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	AVU (CDU/VDU)
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	46.5
Diameter of the Stack(m)	:	1.59
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	175
Ambient Air Temperature °C	:	24
Flue Gas Velocity (m/s)	:	15.34
Quantity of Gas Flow, Nm ³ /hr	:	54947.5
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	76	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	18	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	14	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	2.6	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	17.2	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142500008219F
Test Report Date: 31/12/2025

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 23/12/2025
Sample Received at Lab	: 26/12/2025
Test Started On	: 26/12/2025
Test Completed On	: 30/12/2025
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: HDTU
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 40
Diameter of the Stack(m)	: 1.0
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 121
Ambient Air Temperature °C	: 24
Flue Gas Velocity (m/s)	: 14.64
Quantity of Gas Flow, Nm ³ /hr	: 79172.4
Barometric Pressure, mmHg	: 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	7.60	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202512230119
Test Report Date : 31/12/2025

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 23/12/2025
Sample Received at Lab : 26/12/2025
Test Started On : 26/12/2025
Test Completed On : 30/12/2025
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : HDTU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 121
Ambient Air Temperature °C : 24
Flue Gas Velocity (m/s) : 14.64
Quantity of Gas Flow, Nm³/hr : 79172.4
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	78	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	28	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	8	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	4.9	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	13.4	-	SOP No.: NL/ SOP / FGA /11

Remark:
ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142600000632F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 10/02/2026
Sample Received at Lab	: 16/02/2026
Test Started On	: 16/02/2026
Test Completed On	: 20/02/2026
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: DCU
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 58
Diameter of the Stack(m)	: 1.68
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 133
Ambient Air Temperature °C	: 26
Flue Gas Velocity (m/s)	: 12.12
Quantity of Gas Flow, Nm ³ /hr	: 65789.6
Barometric Pressure, mmHg	: 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.4	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202602100110
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 10/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : DCU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 58
Diameter of the Stack(m) : 1.68
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 133
Ambient Air Temperature °C : 26
Flue Gas Velocity (m/s) : 12.12
Quantity of Gas Flow, Nm³/hr : 65789.6
Barometric Pressure, mmHg : 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	66	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	27	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	12	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	4.6	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	14.10	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142600000633F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	10/02/2026
Sample Received at Lab	:	16/02/2026
Test Started On	:	16/02/2026
Test Completed On	:	20/02/2026
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	MSQU
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	40
Diameter of the Stack(m)	:	1.10
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	266
Ambient Air Temperature °C	:	26
Flue Gas Velocity (m/s)	:	13.75
Quantity of Gas Flow, Nm ³ /hr	:	23108.7
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	5.20	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202602100111
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample	:	Stack Gas Emission
Date of Sampling	:	10/02/2026
Sample Received at Lab	:	16/02/2026
Test Started On	:	16/02/2026
Test Completed On	:	20/02/2026
Purpose of Monitoring	:	To Check the Pollution Load
Sampling Location	:	MSQU
Method of Sampling	:	IS: 11255 (P-7)
Normal Operating Schedule	:	As per requirement
Type of Stack /Duct	:	Mild Steel
Stack height from Ground Level (m)	:	40
Diameter of the Stack(m)	:	1.10
Sampling Duration (min)	:	40

Observations:

Flue Gas Temperature °C	:	266
Ambient Air Temperature °C	:	26
Flue Gas Velocity (m/s)	:	13.75
Quantity of Gas Flow, Nm ³ /hr	:	23108.7
Barometric Pressure, mmHg	:	753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	62	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	18	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	14	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	10.90	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	6.60	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142600000634F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 09/02/2026
Sample Received at Lab	: 16/02/2026
Test Started On	: 16/02/2026
Test Completed On	: 20/02/2026
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: HGU
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 40
Diameter of the Stack(m)	: 1.00
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 174
Ambient Air Temperature °C	: 26
Flue Gas Velocity (m/s)	: 13.96
Quantity of Gas Flow, Nm ³ /hr	: 26562.9
Barometric Pressure, mmHg	: 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.20	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202602100112
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : Stack Gas Emission
Date of Sampling : 09/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : HGU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.00
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 174
Ambient Air Temperature °C : 26
Flue Gas Velocity (m/s) : 13.96
Quantity of Gas Flow, Nm³/hr : 26562.9
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	74	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	19	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	14	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	2.90	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	16.30	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142600000635F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 11/02/2026
Sample Received at Lab	: 16/02/2026
Test Started On	: 16/02/2026
Test Completed On	: 20/02/2026
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: CPP (HRSG-4)
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 60
Diameter of the Stack(m)	: 3.0
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 130
Ambient Air Temperature °C	: 27
Flue Gas Velocity (m/s)	: 14.15
Quantity of Gas Flow, Nm ³ /hr	: 279863.5
Barometric Pressure, mmHg	: 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	7.20	10	IS:11255(P-1)



TC-14814



(AUTHORISED SIGNATORY)

(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No. : 202602100113
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 11/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CPP (HRSG-4)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 60
Diameter of the Stack(m) : 3.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 130
Ambient Air Temperature °C : 27
Flue Gas Velocity (m/s) : 14.15
Quantity of Gas Flow, Nm³/hr : 279863.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	84	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	15	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	19	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	3.80	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	16.80	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)

(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142600000336F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 11/02/2026
Sample Received at Lab	: 16/02/2026
Test Started On	: 16/02/2026
Test Completed On	: 20/02/2026
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: CPP (HRSG-3)
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 50
Diameter of the Stack(m)	: 2.0
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 146
Ambient Air Temperature °C	: 27
Flue Gas Velocity (m/s)	: 15.26
Quantity of Gas Flow, Nm ³ /hr	: 140659.7
Barometric Pressure, mmHg	: 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.45	10	IS:11255(P-1)



TC-14814



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202602100114
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 11/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CPP (HRSG-3)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 50
Diameter of the Stack(m) : 2.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 146
Ambient Air Temperature °C : 27
Flue Gas Velocity (m/s) : 15.26
Quantity of Gas Flow, Nm³/hr : 140659.7
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	69	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	17.5	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	16	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	2.30	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	18.40	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Defected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142600000337F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 10/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : CRU (HDT)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.1
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 239
Ambient Air Temperature °C : 26
Flue Gas Velocity (m/s) : 15.66
Quantity of Gas Flow, Nm³/hr : 34263.8
Barometric Pressure, mmHg : 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.12	10	IS:11255(P-1)



TC-14814



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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No. : 202602100115
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 10/02/2026
Sample Received at Lab	: 16/02/2026
Test Started On	: 16/02/2026
Test Completed On	: 20/02/2026
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: CRU (HDT)
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 40
Diameter of the Stack(m)	: 1.1
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 239
Ambient Air Temperature °C	: 26
Flue Gas Velocity (m/s)	: 15.66
Quantity of Gas Flow, Nm ³ /hr	: 34263.8
Barometric Pressure, mmHg	: 752

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	63	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	15	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	14	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	4.8	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	14.6	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142600000338F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 11/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : SDU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 46
Diameter of the Stack(m) : 1.38
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 187
Ambient Air Temperature °C : 27
Flue Gas Velocity (m/s) : 15.85
Quantity of Gas Flow, Nm³/hr : 55063.8
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	4.92	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No. : 202602100116
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 11/02/2026
Sample Received at Lab	: 16/02/2026
Test Started On	: 16/02/2026
Test Completed On	: 20/02/2026
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: SDU
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 46
Diameter of the Stack(m)	: 1.38
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 187
Ambient Air Temperature °C	: 27
Flue Gas Velocity (m/s)	: 15.85
Quantity of Gas Flow, Nm ³ /hr	: 55063.8
Barometric Pressure, mmHg	: 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	78	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	23	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	16	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	16.90	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	10.40	-	SOP No.: NL/ SOP / FGA /11

Remark:
ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No. : TC148142600000339F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 09/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : OBSG (CRU)- FLV 005-1
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 45
Diameter of the Stack(m) : 1.8
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 326
Ambient Air Temperature °C : 26
Flue Gas Velocity (m/s) : 18.96
Quantity of Gas Flow, Nm³/hr : 29456.8
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	7.12	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

Test Report No. : 202602100117
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample	: Stack Gas Emission
Date of Sampling	: 09/02/2026
Sample Received at Lab	: 16/02/2026
Test Started On	: 16/02/2026
Test Completed On	: 20/02/2026
Purpose of Monitoring	: To Check the Pollution Load
Sampling Location	: OBSG (CRU)- FLV 005-1
Method of Sampling	: IS: 11255 (P-7)
Normal Operating Schedule	: As per requirement
Type of Stack /Duct	: Mild Steel
Stack height from Ground Level (m)	: 45
Diameter of the Stack(m)	: 1.8
Sampling Duration (min)	: 40

Observations:

Flue Gas Temperature °C	: 326
Ambient Air Temperature °C	: 26
Flue Gas Velocity (m/s)	: 18.96
Quantity of Gas Flow, Nm ³ /hr	: 29456.8
Barometric Pressure, mmHg	: 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	63	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	18	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	8	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	6.70	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	18.10	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

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(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142600000340F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 10/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : AVU (CDU/VDU)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 46.5
Diameter of the Stack(m) : 1.59
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 176
Ambient Air Temperature °C : 26
Flue Gas Velocity (m/s) : 14.26
Quantity of Gas Flow, Nm³/hr : 55176.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	5.96	10	IS:11255(P-1)



TC-14814



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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No.: 202602100118
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 10/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : AVU (CDU/VDU)
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 46.5
Diameter of the Stack(m) : 1.59
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 176
Ambient Air Temperature °C : 26
Flue Gas Velocity (m/s) : 14.26
Quantity of Gas Flow, Nm³/hr : 55176.5
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	62	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	14	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	14	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	3.40	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	16.20	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No. : TC148142600000341F
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 09/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : HDTU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 124
Ambient Air Temperature °C : 26
Flue Gas Velocity (m/s) : 15.26
Quantity of Gas Flow, Nm³/hr : 79658.4
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Particulate Matter, (as PM), mg/Nm ³	6.26	10	IS:11255(P-1)



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

Test Report No. : 202602100119
Test Report Date: 21/02/2026

Sample Particulars:

Nature of the Sample : **Stack Gas Emission**
Date of Sampling : 09/02/2026
Sample Received at Lab : 16/02/2026
Test Started On : 16/02/2026
Test Completed On : 20/02/2026
Purpose of Monitoring : To Check the Pollution Load
Sampling Location : HDTU
Method of Sampling : IS: 11255 (P-7)
Normal Operating Schedule : As per requirement
Type of Stack /Duct : Mild Steel
Stack height from Ground Level (m) : 40
Diameter of the Stack(m) : 1.0
Sampling Duration (min) : 40

Observations:

Flue Gas Temperature °C : 124
Ambient Air Temperature °C : 26
Flue Gas Velocity (m/s) : 15.26
Quantity of Gas Flow, Nm³/hr : 79658.4
Barometric Pressure, mmHg : 753

Analysis Report

Sr. No.	Parameter	Test Results	Permissible Limits	Test Method
1	Oxide of Nitrogen (as NO _x), mg/Nm ³	71	350	USEPA OTM-39
2	Carbon Monoxide (as CO), mg/Nm ³	26	-	USEPA OTM-39
3	Oxides of Sulphur (as SO _x), mg/Nm ³	6	50	SOP No.: NL/ SOP / FGA /01
4	Hydrogen Sulphide (as H ₂ S), mg/Nm ³	ND (DL-4)	150	SOP No.: NL/ SOP / FGA /10
5	Carbon Dioxide (as CO ₂), %	5.8	-	SOP No.: NL/ SOP / FGA /11
6	Oxygen (as O ₂), %	16.40	-	SOP No.: NL/ SOP / FGA /11

Remark:

ND-Not Detected, DL-Detection Limit

(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No.: TC148142500006432F, 6544F, 6648F, 6701F, 6794F, 6869F, 6889F, 6951F
7020F
Test Report Date: 10/11/2025

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : Wax Sector Cooling Tower
Purpose of Monitoring : To Check the Pollution Load
Method of Sampling : IS 5182 (Part 14)
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Duration (Hrs.) : 24 Hrs.

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m ³	Particulate Matter (PM10) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzene (C ₆ H ₆ ⁵) µg/m ³
03/10/2025	40.20	72.80	19.40	29.50	31.50	ND	1.58	20.20	ND	ND	ND	ND
06/10/2025	42.40	78.20	17.50	31.90	29.50	ND	0.42	18.40	ND	ND	ND	ND
09/10/2025	53.60	80.30	18.60	27.40	31.60	ND	1.50	18.70	ND	ND	ND	ND
13/10/2025	41.40	66.40	19.20	25.50	33.20	ND	1.58	20.70	ND	ND	ND	ND
16/10/2025	40.40	70.40	18.40	26.40	27.80	ND	1.54	18.60	ND	ND	ND	ND
21/10/2025	47.40	67.80	20.80	27.30	31.20	ND	1.63	22.30	ND	ND	ND	ND
23/10/2025	45.20	66.20	19.60	31.20	30.20	ND	1.52	18.90	ND	ND	ND	ND
27/10/2025	43.60	68.20	17.20	29.50	32.30	ND	1.64	19.40	ND	ND	ND	ND
30/10/2025	53.40	74.20	18.90	28.50	28.60	ND	1.57	19.20	ND	ND	ND	ND
Minimum	40.20	66.20	17.20	25.50	27.80	-	0.42	18.40	-	-	-	-
Maximum	53.60	80.30	20.80	31.90	33.20	-	1.64	22.30	-	-	-	-
Average	45.29	71.61	18.84	28.58	30.66	-	1.44	19.60	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP /AAQ-13	NL/SOP /AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt Tinsukia
Assam, INDIA

ULR No.: TC148142500006433F, 6545F, 6649F, 6702F, 6795F, 6870F, 6890F, 6952F
7021F
Test Report Date: 10/11/2025

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Bazaar Gate**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
03/10/2025	40.30	79.30	14.20	27.20	29.40	ND	1.52	16.40	ND	ND	ND	ND
06/10/2025	42.60	70.60	13.40	31.40	31.40	ND	0.44	19.20	ND	ND	ND	ND
09/10/2025	44.80	74.80	14.50	33.50	28.50	ND	1.45	22.20	ND	ND	ND	ND
13/10/2025	41.80	65.20	15.20	30.70	30.70	ND	1.54	18.40	ND	ND	ND	ND
16/10/2025	43.50	67.40	16.30	32.50	32.40	ND	1.56	20.80	ND	ND	ND	ND
21/10/2025	42.30	67.80	17.40	31.80	30.50	ND	1.52	19.40	ND	ND	ND	ND
23/10/2025	44.60	72.50	14.60	29.60	33.20	ND	1.58	22.50	ND	ND	ND	ND
27/10/2025	40.70	74.50	15.20	34.20	29.60	ND	1.50	18.90	ND	ND	ND	ND
30/10/2025	44.90	70.20	15.70	32.80	31.40	ND	1.53	21.80	ND	ND	ND	ND
Minimum	40.30	65.20	13.40	27.20	28.50	-	0.44	16.40	-	-	-	-
Maximum	44.90	79.30	17.40	34.20	33.20	-	1.58	22.50	-	-	-	-
Average	42.83	71.37	15.17	31.52	30.79	-	1.40	19.96	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SO P/AAQ-13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards, Schedule-VII, [Rule 3 (CB)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzen e-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC14814250006493F, 6546F, 6650F, 6703F, 6796F, 6871F, 6891F, 6953F
7022F
Test Report Date: 10/11/2025

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Effluent Treatment Plant**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m ³	Particulate Matter (PM10) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) ug/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) ug/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) ug/m ³
03/10/2025	44.80	73.60	13.20	26.30	28.60	ND	1.54	18.20	ND	ND	ND	ND
06/10/2025	45.20	53.80	15.40	30.70	29.80	ND	0.45	17.60	ND	ND	ND	ND
09/10/2025	47.20	76.30	16.20	27.20	30.20	ND	1.34	21.30	ND	ND	ND	ND
13/10/2025	44.20	77.80	16.30	28.50	26.30	ND	1.40	20.40	ND	ND	ND	ND
16/10/2025	46.40	55.40	13.80	30.20	27.50	ND	1.39	18.60	ND	ND	ND	ND
21/10/2025	43.50	51.30	16.50	29.50	28.20	ND	1.25	19.60	ND	ND	ND	ND
23/10/2025	45.30	73.90	17.20	26.80	29.20	ND	1.40	23.20	ND	ND	ND	ND
27/10/2025	46.30	59.60	13.20	27.40	24.90	ND	1.47	18.20	ND	ND	ND	ND
30/10/2025	45.60	52.80	13.60	25.80	25.80	ND	1.53	17.20	ND	ND	ND	ND
Minimum	43.50	51.30	13.20	25.80	24.90	-	0.45	17.20	-	-	-	-
Maximum	47.20	77.80	17.20	30.70	30.20	-	1.54	23.20	-	-	-	-
Average	45.39	63.83	15.04	28.04	27.83	-	1.31	19.37	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SO P/AAQ-13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzen-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142500006494F, 6547F, 6651F, 6704F, 6797F, 6872F, 6892F, 6954F
7023F
Test Report Date: 10/11/2025

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **New Tank Farm**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m ³	Particulate Matter (PM10) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
03/10/2025	47.20	71.80	15.30	25.50	31.50	ND	1.52	20.20	ND	ND	ND	ND
06/10/2025	45.30	53.20	16.40	26.30	32.60	ND	0.50	19.30	ND	ND	ND	ND
09/10/2025	47.80	76.30	14.80	27.70	29.60	ND	1.44	22.50	ND	ND	ND	ND
13/10/2025	46.50	77.80	17.20	29.40	30.60	ND	1.56	22.60	ND	ND	ND	ND
16/10/2025	47.10	54.50	13.20	28.80	29.20	ND	1.54	17.40	ND	ND	ND	ND
21/10/2025	49.80	72.80	14.90	31.60	29.50	ND	1.53	18.30	ND	ND	ND	ND
23/10/2025	48.50	74.50	15.30	30.40	31.80	ND	1.14	19.60	ND	ND	ND	ND
27/10/2025	43.80	73.90	12.30	27.90	30.40	ND	1.12	19.80	ND	ND	ND	ND
30/10/2025	44.90	59.40	16.80	26.80	28.50	ND	1.42	21.60	ND	ND	ND	ND
Minimum	43.80	53.20	12.30	26.30	28.50	-	0.50	17.40	-	-	-	-
Maximum	49.80	77.80	17.20	31.60	32.60	-	1.56	22.60	-	-	-	-
Average	46.77	68.24	15.13	28.60	30.41	-	1.31	20.14	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SO P/AAQ-13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzen-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analysed within seven days from the date of sampling.



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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142500007116F, 7151F, 7277F, 7342F, 7428F
Test Report Date: 25/11/2025

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Wax Sector Cooling Tower**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
03/11/2025	30.40	62.90	10.90	19.20	24.10	ND	1.40	11.00	ND	ND	ND	ND
06/11/2025	32.60	66.40	11.40	21.40	20.10	ND	1.21	12.30	ND	ND	ND	ND
10/11/2025	43.50	68.10	12.60	18.20	21.60	ND	1.18	13.50	ND	ND	ND	ND
13/11/2025	48.60	55.40	10.60	17.20	23.50	ND	1.27	10.90	ND	ND	ND	ND
17/11/2025	31.50	58.40	13.20	18.90	17.90	ND	1.20	11.50	ND	ND	ND	ND
Minimum	30.40	55.40	10.60	17.20	17.90	-	1.18	10.90	-	-	-	-
Maximum	48.60	68.10	13.20	21.40	24.10	-	1.40	13.50	-	-	-	-
Average	37.32	62.24	11.74	18.98	21.44	-	1.25	11.84	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SO P/AAQ-13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards, Schedule-VII, [Rule 3 (3B)], [Part-II-sec-3(i)] 16.11.2009
ND-Not Detected, ¹Arsenic-ND [DL- 0.5], ²BAP-ND [DL- 0.5], ³Benzene-ND [DL- 0.5], ⁴Lead-ND [DL- 0.5], ⁵Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt Tinsukia
Assam, INDIA

ULR No.: TC148142500007117F, 7152F, 7278F, 7343F, 7429F
Test Report Date: 25/11/2025

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Bazaar Gate**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
03/11/2025	35.20	75.50	6.80	16.20	18.20	ND	1.35	11.90	ND	ND	ND	ND
06/11/2025	36.40	65.10	8.10	19.80	20.50	ND	1.11	10.50	ND	ND	ND	ND
10/11/2025	39.20	68.20	7.50	21.50	22.40	ND	1.10	12.50	ND	ND	ND	ND
13/11/2025	35.60	61.50	9.40	18.50	20.10	ND	1.20	13.60	ND	ND	ND	ND
17/11/2025	38.20	63.20	10.60	20.60	21.60	ND	1.11	10.20	ND	ND	ND	ND
Minimum	35.20	61.50	6.80	16.20	18.20	-	1.10	10.20	-	-	-	-
Maximum	39.20	75.50	10.60	21.50	22.40	-	1.35	13.60	-	-	-	-
Average	36.92	66.70	8.48	19.32	20.56	-	1.17	11.74	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP /AAQ-13	NL/SOP /AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards, Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzen-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



TC-14814



(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt Tinsukia
Assam, INDIA

ULR No.: TC148142500007118F, 7153F, 7279F, 7344F, 7430F
Test Report Date: 10/11/2025

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Effluent Treatment Plant**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzene (C ₆ H ₆ ⁵) µg/m ³
03/11/2025	42.60	51.80	9.40	18.50	19.80	ND	1.32	11.00	ND	ND	ND	ND
06/11/2025	38.10	66.20	7.90	20.10	20.00	ND	1.08	13.80	ND	ND	ND	ND
10/11/2025	41.20	69.20	11.90	20.90	21.10	ND	1.24	12.60	ND	ND	ND	ND
13/11/2025	42.00	53.20	10.00	21.50	18.80	ND	1.30	11.40	ND	ND	ND	ND
17/11/2025	39.10	67.40	9.10	17.80	20.50	ND	1.20	13.00	ND	ND	ND	ND
Minimum	38.10	51.80	7.90	17.80	18.80	-	1.08	11.00	-	-	-	-
Maximum	42.60	69.20	11.90	21.50	21.10	-	1.32	13.80	-	-	-	-
Average	40.60	61.56	9.66	19.76	20.04	-	1.23	12.36	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP/AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP/AAQ-13	NL/SOP/AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



TC-14814



(AUTHORISED SIGNATORY)
(RAVINDER MITTAL)

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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142500007119F, 7154F, 7280F, 7345F, 7431F
Test Report Date: 10/11/2025

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **New Tank Farm**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m ³	Particulate Matter (PM10) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
03/11/2025	38.50	68.10	9.50	16.50	20.10	ND	1.42	13.20	ND	ND	ND	ND
06/11/2025	40.70	50.20	8.20	19.80	21.40	ND	1.19	12.40	ND	ND	ND	ND
10/11/2025	42.90	71.80	7.80	16.60	22.20	ND	1.18	11.80	ND	ND	ND	ND
13/11/2025	39.80	71.10	10.10	17.70	20.50	ND	1.26	10.90	ND	ND	ND	ND
17/11/2025	40.10	68.10	12.20	24.90	22.10	ND	1.30	12.20	ND	ND	ND	ND
Minimum	38.50	50.20	7.80	16.50	20.10	-	1.18	10.90	-	-	-	-
Maximum	42.90	71.80	12.20	24.90	22.20	-	1.42	13.20	-	-	-	-
Average	40.40	65.86	9.56	19.10	21.26	-	1.27	12.10	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP /AAQ-13	NL/SOP /AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

ND-Not Detected, ³Arsenic-ND [DL- 0.5],⁴BAP-ND [DL- 0.5], ⁵Benzen-ND [DL- 0.5], ¹Lead-ND [DL- 0.5],²Nickel-ND [DL- 1.0]

Sample Analysed within seven days from the date of sampling.



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No.: TC148142500007795F, 8032F, 8061F, 8092F, 8156F, 8173F
8210F, 8234F
Test Report Date: 07/01/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Wax Sector Cooling Tower**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁵) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
05/12/2025	29.70	58.20	14.90	19.20	21.30	ND	1.35	13.40	ND	ND	ND	ND
08/12/2025	31.40	61.60	15.80	20.30	17.80	ND	0.45	10.85	ND	ND	ND	ND
12/12/2025	42.10	64.20	12.50	18.10	21.40	ND	1.19	11.55	ND	ND	ND	ND
15/12/2025	47.20	52.40	14.20	17.20	20.10	ND	1.29	12.96	ND	ND	ND	ND
18/12/2025	30.10	54.50	12.60	18.70	16.60	ND	1.20	13.75	ND	ND	ND	ND
22/12/2025	28.80	53.50	15.10	16.80	21.80	ND	1.48	12.09	ND	ND	ND	ND
25/12/2025	36.40	52.30	13.40	18.20	17.20	ND	1.19	10.65	ND	ND	ND	ND
29/12/2025	34.50	53.40	13.00	17.10	20.70	ND	1.40	11.09	ND	ND	ND	ND
Minimum	28.80	52.30	12.50	16.80	16.60		0.45	10.65	-	-	-	-
Maximum	47.20	64.20	15.80	20.30	21.80		1.48	13.75	-	-	-	-
Average	35.03	56.26	13.94	18.20	19.61		1.19	12.04	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guideline s	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ- 11	IS:5182 (P-10)	Method of Air Sampling g & Analysis	NL/SO P/AAQ- 13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analysed within Seven days from the date of sampling.



TC-14814



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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142500007796F, 8033F, 8062F, 8093F, 8157F, 8174F
8211F, 8235F
Test Report Date: 07/01/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Bazaar Gate**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m3	Particulate Matter (PM10) µg/m3	Sulphur Dioxide (as SO2) µg/m3	Nitrogen Dioxide (as NO2) µg/m3	Ozone (as O3) µg/m3	Lead (as Pb ¹) µg/m3	Carbon Monoxide (as CO) mg/m3	Ammonia (as NH3) µg/m3	Nickel (as Ni ²) ng/m3	Arsenic (as As ³) ng/m3	Benzo (a) pyrene (as BAP ⁴) ng/m3	Benzen e (C6H6 ⁵) µg/m3
05/12/2025	34.35	74.30	10.60	16.90	17.90	ND	1.28	10.25	ND	ND	ND	ND
08/12/2025	35.65	63.60	12.60	18.96	19.50	ND	0.25	12.75	ND	ND	ND	ND
12/12/2025	38.25	66.30	9.50	19.30	20.70	ND	1.09	11.45	ND	ND	ND	ND
15/12/2025	34.90	59.80	13.40	17.60	19.90	ND	1.18	10.96	ND	ND	ND	ND
18/12/2025	37.80	61.95	14.50	18.80	20.30	ND	1.19	12.32	ND	ND	ND	ND
22/12/2025	35.70	59.50	12.50	17.10	18.90	ND	1.25	11.56	ND	ND	ND	ND
25/12/2025	38.50	64.40	13.95	16.95	20.00	ND	1.36	14.19	ND	ND	ND	ND
29/12/2025	34.70	66.60	14.00	19.00	17.30	ND	1.35	12.28	ND	ND	ND	ND
Minimum	34.35	59.50	9.50	16.90	17.30	-	0.25	10.25	-	-	-	-
Maximum	38.50	74.30	14.50	19.30	20.70	-	1.36	14.19	-	-	-	-
Average	36.23	64.56	12.63	18.08	19.31	-	1.12	11.97	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP /AAQ-13	NL/SOP /AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ¹Arsenic-ND [DL- 0.5], ²BAP-ND [DL- 0.5], ³Benzene-ND [DL- 0.5], ⁴Lead-ND [DL- 0.5], ⁵Nickel-ND [DL- 1.0]
Sample Analysed within Seven days from the date of sampling.



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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142500007797F, 8034F, 8063F, 8094F 8118F, 8175F
8212F, 8236F
Test Report Date: 07/01/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Effluent Treatment Plant**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m3	Particulate Matter (PM10) µg/m3	Sulphur Dioxide (as SO2) µg/m3	Nitrogen Dioxide (as NO2) µg/m3	Ozone (as O3) µg/m3	Lead (as Pb ¹) µg/m3	Carbon Monoxide (as CO) mg/m3	Ammonia (as NH3) µg/m3	Nickel (as Ni ²) ng/m3	Arsenic (as As ³) ng/m3	Benzo (a) pyrene (as EAP ⁴) ng/m3	Benzen e (C6H6 ⁵) µg/m3
05/12/2025	36.60	66.20	13.50	16.10	19.20	ND	1.35	11.95	ND	ND	ND	ND
08/12/2025	38.72	47.40	12.10	19.30	20.47	ND	0.42	10.48	ND	ND	ND	ND
12/12/2025	40.80	68.10	11.30	16.10	21.10	ND	1.19	13.92	ND	ND	ND	ND
15/12/2025	37.80	69.10	12.40	17.20	19.50	ND	1.28	12.95	ND	ND	ND	ND
18/12/2025	39.50	49.90	12.30	18.10	18.77	ND	1.37	13.19	ND	ND	ND	ND
22/12/2025	36.51	63.50	11.50	19.50	19.50	ND	1.08	10.88	ND	ND	ND	ND
25/12/2025	39.20	65.50	12.50	19.20	20.78	ND	1.28	11.69	ND	ND	ND	ND
29/12/2025	40.16	51.30	14.30	20.30	18.50	ND	1.44	13.84	ND	ND	ND	ND
Minimum	36.51	47.40	11.30	16.10	18.50	-	0.42	10.48	-	-	-	-
Maximum	40.80	69.10	14.30	20.30	21.10	-	1.44	13.92	-	-	-	-
Average	38.66	60.13	12.49	18.23	19.73	-	1.18	12.36	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 C PCB Guideline s	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ- 11	IS:5182 (P-10)	Method of Air Samplin g & Analysis	NL/SO P/AAQ- 13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(ii)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzen e-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analysed within Seven days from the date of sampling.



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No.: TC148142500007798F, 8035F, 8064F, 8095F, 8176F
8213F, 8237F
Test Report Date: 07/01/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **New Tank Farm**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m3	Particulate Matter (PM10) µg/m3	Sulphur Dioxide (as SO2) µg/m3	Nitrogen Dioxide (as NO2) µg/m3	Ozone (as O3) µg/m3	Lead (as Pb ¹) µg/m3	Carbon Monoxide (as CO) mg/m3	Ammonia (as NH3) µg/m3	Nickel (as Ni ²) ng/m3	Arsenic (as As ³) ng/m3	Benzene (a) pyrene (as B(a)P ⁴) ng/m3	Benzene (C6H6 ⁵) µg/m3
05/12/2025	38.52	65.50	12.80	15.60	19.36	ND	1.28	12.35	ND	ND	ND	ND
08/12/2025	36.75	51.10	13.10	14.70	20.27	ND	0.25	10.2	ND	ND	ND	ND
12/12/2025	39.70	68.50	13.30	15.10	21.00	ND	1.09	11.66	ND	ND	ND	ND
15/12/2025	37.80	69.50	12.20	16.60	20.57	ND	1.25	13.27	ND	ND	ND	ND
18/12/2025	39.27	49.90	13.50	16.20	18.47	ND	1.29	10.89	ND	ND	ND	ND
22/12/2025	40.78	63.40	14.90	18.50	17.50	ND	1.32	11.25	ND	ND	ND	ND
25/12/2025	39.56	66.30	12.30	17.80	19.50	ND	0.85	12.55	ND	ND	ND	ND
29/12/2025	38.85	53.40	14.00	14.50	17.20	ND	1.15	12.18	ND	ND	ND	ND
Minimum	36.75	49.90	12.20	14.50	17.20	-	0.25	10.20	-	-	-	-
Maximum	40.78	69.50	14.90	18.50	21.00	-	1.32	13.27	-	-	-	-
Average	38.90	60.95	13.26	16.13	19.23	-	1.06	11.79	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	-	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP /AAQ-13	NL/SOP /AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analysed within Seven days from the date of sampling.



TC-14814



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC14814260000039F, 64F, 136F, 205F, 266F, 384F, 399F, 439F
Test Report Date: 06/02/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Wax Sector Cooling Tower**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m3	Particulate Matter (PM10) µg/m3	Sulphur Dioxide (as SO2) µg/m3	Nitrogen Dioxide (as NO2) µg/m3	Ozone (as O3) µg/m3	Lead (as Pb) µg/m3	Carbon Monoxide (as CO) mg/m3	Ammonia (as NH3) µg/m3	Nickel (as Ni) ng/m3	Arsenic (as As ³) ng/m3	Benzo (a) pyrene (as BAP ⁴) ng/m3	Benzen e (C6H6 ⁵) ug/m3
05/01/2026	42.50	75.40	21.30	31.20	29.20	ND	1.52	18.40	ND	ND	ND	ND
08/01/2026	44.60	80.60	19.60	33.40	31.40	ND	0.62	20.50	ND	ND	ND	ND
12/01/2026	55.20	82.10	20.50	29.10	28.20	ND	1.62	20.90	ND	ND	ND	ND
15/01/2026	43.10	68.30	21.40	28.10	30.10	ND	1.65	22.30	ND	ND	ND	ND
19/01/2026	42.80	72.40	20.10	28.40	29.40	ND	1.48	20.80	ND	ND	ND	ND
23/01/2026	49.20	69.30	22.40	29.20	29.40	ND	1.52	24.50	ND	ND	ND	ND
26/01/2026	47.30	68.30	21.40	33.40	32.20	ND	1.50	20.30	ND	ND	ND	ND
29/01/2026	45.50	70.40	19.10	31.30	30.40	ND	1.49	21.40	ND	ND	ND	ND
Minimum	42.50	68.30	19.10	28.10	28.20	-	0.62	18.40	-	-	-	-
Maximum	55.20	82.10	22.40	33.40	32.20	-	1.65	24.50	-	-	-	-
Average	46.28	73.35	20.73	30.51	30.04	-	1.43	21.14	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guideline s	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ- 11	IS:5182 (P-10)	Method of Air Samplin g & Analysis	NL/SO P/AAQ- 13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



TC-14814



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142600000040F, 65F, 137F, 206F, 267F, 385F, 400F, 440F
Test Report Date: 06/02/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Bazaar Gate**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
05/01/2026	43.80	81.30	16.40	29.40	28.10	ND	1.39	18.20	ND	ND	ND	ND
08/01/2026	44.00	73.20	15.20	33.20	33.20	ND	0.52	21.50	ND	ND	ND	ND
12/01/2026	46.20	76.00	16.80	32.60	30.60	ND	1.36	24.70	ND	ND	ND	ND
15/01/2026	43.30	68.40	17.70	34.10	32.50	ND	1.44	20.30	ND	ND	ND	ND
19/01/2026	45.50	70.20	18.80	33.20	34.60	ND	1.46	22.10	ND	ND	ND	ND
23/01/2026	44.00	69.30	19.20	31.40	32.20	ND	1.42	21.50	ND	ND	ND	ND
26/01/2026	46.70	74.50	16.80	36.00	35.50	ND	1.48	24.70	ND	ND	ND	ND
29/01/2026	42.80	76.10	17.40	35.40	31.30	ND	1.42	21.40	ND	ND	ND	ND
Minimum	42.80	68.40	15.20	29.40	28.10	-	0.52	18.20	-	-	-	-
Maximum	46.70	81.30	19.20	36.00	35.50	-	1.48	24.70	-	-	-	-
Average	44.54	73.63	17.29	33.16	32.25	-	1.31	21.80	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 C PCB Guideline s	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ- 11	IS:5182 (P-10)	Method of Air Samplin g & Analysis	NL/SO P/AAQ- 13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark: *NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



TC-14814



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC14814260000041F, 66F, 138F, 207F, 268F, 386F, 401F, 441F
Test Report Date: 06/02/2026

Sample Particulars

Nature of the Sample : Ambient Air Quality Monitoring
Sampling Location : Effluent Treatment Plant
Purpose of Monitoring : To Check the Pollution Load
Method of Sampling : IS 5182 (Part 14)
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Duration (Hrs.) : 24 Hrs.

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m ³	Particulate Matter (PM10) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzene (C ₆ H ₆ ⁵) µg/m ³
05/01/2026	46.40	75.40	15.40	23.40	26.20	ND	1.46	20.60	ND	ND	ND	ND
08/01/2026	47.70	55.80	18.70	27.50	27.40	ND	0.52	19.40	ND	ND	ND	ND
12/01/2026	49.40	80.20	19.20	29.20	28.10	ND	1.47	23.30	ND	ND	ND	ND
15/01/2026	46.60	79.20	18.40	26.10	24.60	ND	1.32	22.30	ND	ND	ND	ND
19/01/2026	48.20	57.40	15.30	28.40	25.50	ND	1.48	20.60	ND	ND	ND	ND
23/01/2026	45.50	56.70	18.60	27.70	26.40	ND	1.32	21.90	ND	ND	ND	ND
26/01/2026	47.00	76.40	19.00	25.50	27.40	ND	1.52	25.50	ND	ND	ND	ND
29/01/2026	48.00	61.00	18.40	26.00	26.80	ND	1.32	21.80	ND	ND	ND	ND
Minimum	45.50	55.80	15.30	23.40	24.60	-	0.52	19.40	-	-	-	-
Maximum	49.40	80.20	19.20	29.20	28.10	-	1.52	25.50	-	-	-	-
Average	47.35	67.76	17.88	26.73	26.55	-	1.30	21.93	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 63 CPCB Guideline s	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SO P/AAQ-13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



TC-14814



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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142600000042F, 67F, 139F, 206F, 269F, 387F, 402F, 442F
Test Report Date: 06/02/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **New Tank Farm**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m3	Particulate Matter (PM10) µg/m3	Sulphur Dioxide (as SO2) µg/m3	Nitrogen Dioxide (as NO2) µg/m3	Ozone (as O3) µg/m3	Lead (as Pb) µg/m3	Carbon Monoxide (as CO) mg/m3	Ammonia (as NH3) µg/m3	Nickel (as Ni) ng/m3	Arsenic (as As) ng/m3	Benzo (a) pyrene (as BAP) ng/m3	Benzen e (C6H6) µg/m3
05/01/2026	49.40	74.40	17.40	26.20	29.30	ND	1.46	22.40	ND	ND	ND	ND
08/01/2026	47.70	56.20	18.20	24.40	30.40	ND	0.60	21.40	ND	ND	ND	ND
12/01/2026	49.10	79.50	16.60	25.50	27.10	ND	1.32	24.50	ND	ND	ND	ND
15/01/2026	48.30	78.20	19.30	27.10	28.40	ND	1.47	24.60	ND	ND	ND	ND
19/01/2026	49.20	56.40	15.50	26.40	27.70	ND	1.66	19.50	ND	ND	ND	ND
23/01/2026	51.40	74.60	16.10	29.30	28.00	ND	1.68	20.60	ND	ND	ND	ND
26/01/2026	50.20	76.00	17.80	28.60	29.40	ND	1.78	21.50	ND	ND	ND	ND
29/01/2026	45.60	75.50	14.10	25.50	28.10	ND	1.24	20.30	ND	ND	ND	ND
Minimum	45.60	56.20	14.10	24.40	27.10	-	0.60	19.50	-	-	-	-
Maximum	51.40	79.50	19.30	29.30	30.40	-	1.78	24.60	-	-	-	-
Average	48.86	71.35	16.88	26.63	28.55	-	1.40	21.85	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ- 11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP /AAQ- 13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (38)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzen e-ND [DL- 0.5], ⁶Lead-ND [DL- 0.5], ⁷Nickel-ND [DL- 1.0]
Sample Analysed within seven days from the date of sampling.



TC-14814



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142600000518F, 581F, 635F, 672F, 715F, 774F, 794F, 864F
Test Report Date: 07/03/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Wax Sector Cooling Tower**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
02/02/2026	40.80	72.30	23.40	32.30	26.20	ND	1.42	16.50	ND	ND	ND	ND
05/02/2026	42.50	76.80	21.60	33.50	33.40	ND	0.78	18.30	ND	ND	ND	ND
09/02/2026	53.30	79.50	22.50	35.20	30.90	ND	1.54	22.50	ND	ND	ND	ND
12/02/2026	41.60	64.40	23.20	31.80	31.50	ND	1.72	20.80	ND	ND	ND	ND
16/02/2026	44.90	70.80	22.90	30.60	28.20	ND	1.39	18.30	ND	ND	ND	ND
19/02/2026	51.80	65.50	24.00	31.80	27.60	ND	1.46	22.50	ND	ND	ND	ND
23/02/2026	49.30	64.20	23.30	35.50	30.40	ND	1.35	18.40	ND	ND	ND	ND
26/02/2026	48.20	67.60	21.50	33.00	28.20	ND	1.52	19.50	ND	ND	ND	ND
Minimum	40.80	64.20	21.50	30.60	26.20	-	0.78	16.50	-	-	-	-
Maximum	53.30	79.50	24.00	35.50	33.40	-	1.72	22.50	-	-	-	-
Average	46.65	70.48	22.79	32.98	29.60	-	1.37	19.58	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP /AAQ-13	NL/SOP /AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



TC-14814



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142600000519F, 582F, 636F, 673F, 716F, 775F, 795F, 865F
Test Report Date: 07/03/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Bazaar Gate**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (as SO ₂) $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (as NO ₂) $\mu\text{g}/\text{m}^3$	Ozone (as O ₃) $\mu\text{g}/\text{m}^3$	Lead (as Pb ¹) $\mu\text{g}/\text{m}^3$	Carbon Monoxide (as CO) mg/m^3	Ammonia (as NH ₃) $\mu\text{g}/\text{m}^3$	Nickel (as Ni ²) ng/m^3	Arsenic (as As ³) ng/m^3	Benzo (a) pyrene (as BAP ⁴) ng/m^3	Benzene (C ₆ H ₆ ⁵) $\mu\text{g}/\text{m}^3$
02/02/2026	40.50	79.40	18.20	26.20	26.30	ND	1.48	16.50	ND	ND	ND	ND
05/02/2026	42.60	71.80	17.40	31.40	31.40	ND	0.62	19.80	ND	ND	ND	ND
09/02/2026	43.30	72.20	18.00	34.40	28.50	ND	1.46	22.50	ND	ND	ND	ND
12/02/2026	41.80	64.00	19.00	32.40	30.90	ND	1.52	18.40	ND	ND	ND	ND
16/02/2026	42.40	68.40	20.40	35.50	32.50	ND	1.56	24.20	ND	ND	ND	ND
19/02/2026	43.00	66.20	21.30	33.10	30.60	ND	1.53	23.30	ND	ND	ND	ND
23/02/2026	44.40	72.30	18.50	38.20	32.90	ND	1.38	26.40	ND	ND	ND	ND
26/02/2026	41.20	74.50	19.30	37.10	30.00	ND	1.52	23.30	ND	ND	ND	ND
Minimum	40.50	64.00	17.40	26.20	26.30	-	0.62	16.50	-	-	-	-
Maximum	44.40	79.40	21.30	38.20	32.90	-	1.56	26.40	-	-	-	-
Average	42.41	71.22	19.08	33.27	30.23	-	1.33	21.73	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 C PCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ- 11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SO P/AAQ- 13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



TC-14814



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142600000520F, 583F, 637F, 674F, 717F, 776F, 796F, 866F
Test Report Date: 07/03/2026

Sample Particulars

Nature of the Sample : Ambient Air Quality Monitoring
Sampling Location : Effluent Treatment Plant
Purpose of Monitoring : To Check the Pollution Load
Method of Sampling : IS 5182 (Part 14)
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Duration (Hrs.) : 24 Hrs.

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m3	Particulate Matter (PM10) µg/m3	Sulphur Dioxide (as SO2) µg/m3	Nitrogen Dioxide (as NO2) µg/m3	Ozone (as O3) µg/m3	Lead (as Pb ¹) µg/m3	Carbon Monoxide (as CO) mg/m3	Ammonia (as NH3) µg/m3	Nickel (as Ni ²) ng/m3	Arsenic (as As ³) ng/m3	Benzo (a) pyrene (as BAP ⁴) ng/m3	Benzen e (C6H6 ⁵) ug/m3
02/02/2026	42.50	73.20	17.60	20.80	23.50	ND	1.56	18.30	ND	ND	ND	ND
05/02/2026	45.30	52.20	20.30	25.10	25.20	ND	0.64	17.60	ND	ND	ND	ND
09/02/2026	46.60	76.60	21.50	27.80	26.80	ND	1.56	21.50	ND	ND	ND	ND
12/02/2026	42.20	75.50	20.10	24.20	22.40	ND	1.44	20.80	ND	ND	ND	ND
16/02/2026	46.40	54.40	17.50	26.90	23.60	ND	1.58	18.50	ND	ND	ND	ND
19/02/2026	43.80	54.20	20.40	25.40	24.00	ND	1.40	19.40	ND	ND	ND	ND
23/02/2026	45.50	73.30	21.80	23.00	25.90	ND	1.58	23.60	ND	ND	ND	ND
26/02/2026	46.00	59.50	20.30	24.40	23.30	ND	1.42	19.90	ND	ND	ND	ND
Minimum	42.20	52.20	17.50	20.80	22.40	-	0.64	17.60	-	-	-	-
Maximum	46.60	76.60	21.80	27.80	26.80	-	1.58	23.60	-	-	-	-
Average	44.71	64.77	19.88	24.62	24.39	-	1.34	20.08	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SO P/AAQ-13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



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Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC14814260000521F, 584F, 638F, 675F, 718F, 777F, 797F, 867F
Test Report Date: 07/03/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **New Tank Farm**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzene (C ₆ H ₆ ⁵) µg/m ³
02/02/2026	46.40	71.20	19.20	28.50	26.50	ND	1.58	21.30	ND	ND	ND	ND
05/02/2026	45.30	60.50	20.50	26.70	28.10	ND	0.70	19.50	ND	ND	ND	ND
09/02/2026	47.00	75.30	18.40	27.70	24.00	ND	1.42	22.80	ND	ND	ND	ND
12/02/2026	46.60	76.00	21.30	29.90	26.30	ND	1.56	21.00	ND	ND	ND	ND
16/02/2026	47.70	59.40	17.60	28.80	25.50	ND	1.48	171.70	ND	ND	ND	ND
19/02/2026	48.30	71.30	18.40	27.20	27.00	ND	1.59	18.40	ND	ND	ND	ND
23/02/2026	47.40	73.30	19.50	26.00	26.80	ND	1.64	19.80	ND	ND	ND	ND
26/02/2026	43.30	72.80	16.40	24.50	26.80	ND	1.32	18.40	ND	ND	ND	ND
Minimum	43.30	59.40	16.40	24.50	24.00	-	0.70	18.40	-	-	-	-
Maximum	48.30	76.00	21.30	29.90	28.10	-	1.64	171.70	-	-	-	-
Average	46.36	69.52	18.90	27.37	26.31	-	1.36	50.30	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP /AAQ-13	NL/SOP /AAQ-12	IS:5182 (P-12)	IS:5132 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analysed within seven days from the date of sampling.



NOTE: The laboratory accepts the responsibility for content of report. The results contained in this test report related only to the sample tested. Test report shall not be reproduced except in full, without written approval of the laboratory. This report is intended only for your guidance and not for legal purpose or for advertisement. This report shall not be reproduced except in full without the written approval of this organization. Samples will be destroyed after 30 days from the date of issue of test certificate unless otherwise specified. Any complaints about this report should be communicated in writing within 7 days of issue of this report. Total liability of Nitya Laboratories is limited invoiced amount only.
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Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt.Tinsukia
Assam, INDIA

ULR No.: TC148142600000930F, 935F, 993F, 1005F, 1074F, 1139F, 1154F, 1219F
Test Report Date: 06/04/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Wax Sector Cooling Tower**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) $\mu\text{g}/\text{m}^3$	Particulate Matter (PM10) $\mu\text{g}/\text{m}^3$	Sulphur Dioxide (as SO ₂) $\mu\text{g}/\text{m}^3$	Nitrogen Dioxide (as NO ₂) $\mu\text{g}/\text{m}^3$	Ozone (as O ₃) $\mu\text{g}/\text{m}^3$	Lead (as Pb ¹) $\mu\text{g}/\text{m}^3$	Carbon Monoxide (as CO) mg/m^3	Ammonia (as NH ₃) $\mu\text{g}/\text{m}^3$	Nickel (as Ni ²) ng/m^3	Arsenic (as As ³) ng/m^3	Benzo (a) pyrene (as BAP ⁴) ng/m^3	Benzen e (C ₆ H ₆ ⁵) $\mu\text{g}/\text{m}^3$
02/03/2026	37.30	74.40	21.30	30.50	23.20	ND	1.54	14.20	ND	ND	ND	ND
05/03/2026	39.50	78.30	19.80	31.40	29.50	ND	0.88	16.40	ND	ND	ND	ND
09/03/2026	41.50	76.10	20.60	32.70	28.10	ND	1.42	20.30	ND	ND	ND	ND
12/03/2026	39.50	62.30	21.70	29.80	29.40	ND	1.62	18.10	ND	ND	ND	ND
15/03/2026	40.80	68.80	20.40	28.50	26.20	ND	1.48	16.40	ND	ND	ND	ND
23/03/2026	48.10	63.30	22.90	30.20	25.50	ND	1.36	20.80	ND	ND	ND	ND
26/03/2026	46.10	62.50	21.50	32.40	28.00	ND	1.27	17.70	ND	ND	ND	ND
29/03/2026	45.20	65.70	19.20	31.70	27.10	ND	1.42	18.30	ND	ND	ND	ND
Minimum	37.30	62.30	19.20	28.50	23.20	-	0.88	14.20	-	-	-	-
Maximum	48.10	78.30	22.90	32.70	29.50	-	1.62	20.80	-	-	-	-
Average	42.34	69.20	20.95	30.84	26.97	-	1.35	17.72	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SO P/AAQ-13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzen e-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



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CORPORATE OFFICE & CENTRAL LABORATORIES :-

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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No.: TC148142600000931F, 936F, 994F, 1006F, 1075F, 1140F, 1155F, 1220F
Test Report Date: 06/04/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **Bazaar Gate**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
02/03/2026	37.20	77.30	20.30	25.50	24.20	ND	1.56	14.20	ND	ND	ND	ND
05/03/2026	38.40	75.50	19.40	29.20	29.50	ND	0.74	17.30	ND	ND	ND	ND
09/03/2026	35.50	74.40	16.20	31.30	26.60	ND	1.52	20.40	ND	ND	ND	ND
12/03/2026	36.30	66.20	17.40	30.10	28.40	ND	1.63	16.80	ND	ND	ND	ND
16/03/2026	39.10	70.40	18.10	32.40	29.20	ND	1.66	22.30	ND	ND	ND	ND
23/03/2026	41.40	69.30	19.50	31.50	28.10	ND	1.73	21.40	ND	ND	ND	ND
26/03/2026	42.20	75.50	16.30	35.20	29.50	ND	1.48	24.50	ND	ND	ND	ND
29/03/2026	38.30	76.30	17.20	34.40	28.40	ND	1.62	21.10	ND	ND	ND	ND
Minimum	35.50	66.20	16.20	25.50	24.20	-	0.74	14.20	-	-	-	-
Maximum	42.20	77.30	20.30	35.20	29.50	-	1.73	24.50	-	-	-	-
Average	38.61	72.84	18.09	31.03	27.76	-	1.44	19.67	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SO P/AAQ-13	NL/SOP/ AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]

Sample Analyzed within Seven days from the date of sampling.



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To M/s Indian Oil Corporation Limited
(Refinery Division)
Assam Oil Division, Digboi, Distt Tinsukia
Assam, INDIA

ULR No.: TC148142600000932F, 937F, 995F, 1007F, 1076F, 1141F, 1156F, 1221F
Test Report Date: 06/04/2026

Sample Particulars

Nature of the Sample : Ambient Air Quality Monitoring
Sampling Location : Effluent Treatment Plant
Purpose of Monitoring : To Check the Pollution Load
Method of Sampling : IS 5182 (Part 14)
Monitoring Conducted By : M/s Nitya Laboratories
Sampling Duration (Hrs.) : 24 Hrs.

Date of Sampling	Parameter											
	Particulate Matter (PM _{2.5}) µg/m ³	Particulate Matter (PM ₁₀) µg/m ³	Sulphur Dioxide (as SO ₂) µg/m ³	Nitrogen Dioxide (as NO ₂) µg/m ³	Ozone (as O ₃) µg/m ³	Lead (as Pb ¹) µg/m ³	Carbon Monoxide (as CO) mg/m ³	Ammonia (as NH ₃) µg/m ³	Nickel (as Ni ²) ng/m ³	Arsenic (as As ³) ng/m ³	Benzo (a) pyrene (as BAP ⁴) ng/m ³	Benzen e (C ₆ H ₆ ⁵) µg/m ³
02/03/2026	40.20	75.20	19.20	22.40	20.30	ND	1.62	16.20	ND	ND	ND	ND
05/03/2026	43.30	62.40	22.40	27.70	21.50	ND	0.72	15.70	ND	ND	ND	ND
09/03/2026	42.60	78.30	23.30	29.30	23.30	ND	1.68	19.40	ND	ND	ND	ND
12/03/2026	41.10	77.10	22.80	26.40	21.70	ND	1.52	18.80	ND	ND	ND	ND
16/03/2026	43.30	60.20	20.10	28.20	20.40	ND	1.68	16.20	ND	ND	ND	ND
23/03/2026	41.50	59.40	18.80	27.70	22.80	ND	1.30	17.70	ND	ND	ND	ND
26/03/2026	42.90	71.20	19.30	25.50	23.30	ND	1.48	21.50	ND	ND	ND	ND
29/03/2026	44.10	62.00	21.50	27.90	21.50	ND	1.34	18.20	ND	ND	ND	ND
Minimum	40.20	59.40	18.80	22.40	20.30	-	0.72	15.70	-	-	-	-
Maximum	44.10	78.30	23.30	29.30	23.30	-	1.68	21.50	-	-	-	-
Average	42.33	68.35	20.95	26.68	21.84	-	1.37	18.09	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP /AAQ-13	NL/SOP /AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009
ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]
Sample Analyzed within Seven days from the date of sampling.



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BUILDING & ROAD, MATERIAL, SOIL, ENVIRONMENTAL & CALIBRATION TESTING LAB

Test Report

Issued To **M/s Indian Oil Corporation Limited**
(Refinery Division)
Assam Oil Division, Digboi, Distt. Tinsukia
Assam, INDIA

ULR No.: TC14814260000933F, 938F, 996F, 1008F, 1077F, 1142F, 1157F, 1222F
Test Report Date: 06/04/2026

Sample Particulars

Nature of the Sample : **Ambient Air Quality Monitoring**
Sampling Location : **New Tank Farm**
Purpose of Monitoring : **To Check the Pollution Load**
Method of Sampling : **IS 5182 (Part 14)**
Monitoring Conducted By : **M/s Nitya Laboratories**
Sampling Duration (Hrs.) : **24 Hrs.**

Date of Sampling	Parameter											
	Particulate Matter (PM2.5) µg/m3	Particulate Matter (PM10) µg/m3	Sulphur Dioxide (as SO2) µg/m3	Nitrogen Dioxide (as NO2) µg/m3	Ozone (as O3) µg/m3	Lead (as Pb ¹) µg/m3	Carbon Monoxide (as CO) mg/m3	Ammonia (as NH3) µg/m3	Nickel (as Ni ²) ng/m3	Arsenic (as As ³) ng/m3	Benzo (a) pyrene (as BAP ⁴) ng/m3	Benzen e (C6H6 ⁵) µg/m3
02/03/2026	42.50	74.20	21.30	26.30	23.30	ND	1.64	19.20	ND	ND	ND	ND
05/03/2026	43.40	65.50	22.40	25.50	26.40	ND	0.80	17.50	ND	ND	ND	ND
09/03/2026	45.70	77.30	20.60	24.20	22.80	ND	1.34	19.30	ND	ND	ND	ND
12/03/2026	43.20	78.10	23.40	27.70	25.10	ND	1.62	20.40	ND	ND	ND	ND
16/03/2026	45.60	62.20	19.20	26.40	24.40	ND	1.58	18.20	ND	ND	ND	ND
23/03/2026	46.30	74.30	20.50	25.50	25.50	ND	1.69	16.50	ND	ND	ND	ND
26/03/2026	45.20	75.50	21.30	24.10	24.60	ND	1.74	17.70	ND	ND	ND	ND
29/03/2026	46.10	74.10	18.80	23.60	25.50	ND	1.42	19.80	ND	ND	ND	ND
Minimum	42.50	62.20	18.80	23.60	22.80	-	0.80	16.50	-	-	-	-
Maximum	46.30	78.10	23.40	27.70	26.40	-	1.74	20.40	-	-	-	-
Average	44.68	72.15	20.97	25.46	24.68	-	1.44	18.55	-	-	-	-
NAAQM Standards	60	100	80	80	100	1	2	400	20	6	1	5
Test Method	40CFR Appendix L Part 53 CPCB Guidelines	IS:5182 (P-23)	IS:5182 (P-2)	IS:5182 (P-6)	IS:5182 (P-9)	NL/SOP /AAQ-11	IS:5182 (P-10)	Method of Air Sampling & Analysis	NL/SOP/AAQ-13	NL/SOP/AAQ-12	IS:5182 (P-12)	IS:5182 (P-11)

Remark:

*NAAQS: National Ambient Air Quality Standards; Schedule-VII, [Rule 3 (3B)], [Part-II-sec.-3(i)] 16.11.2009

ND-Not Detected, ³Arsenic-ND [DL- 0.5], ⁴BAP-ND [DL- 0.5], ⁵Benzene-ND [DL- 0.5], ¹Lead-ND [DL- 0.5], ²Nickel-ND [DL- 1.0]

Sample Analysed within seven days from the date of sampling.



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Indian Oil Corporation Limited

(Refineries Division)

Assam Oil Division, Digboi, Distt. Tinsukia, Assam, India

VOC Emission Survey Reports (LDAR)



Study Period: 3rd Quarter FY 2025-2026

Prepared By



NITYA LABORATORIES

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**Voc Emission Survey Report (LDAR) for Indian Oil Corporation Limited, Assam Oil Division,
Digboi, Distt.Tinsukia, Refinery, Assam**

Name of Client : M/s Indian Oil Corporation Limited

Assam Oil Division, Digboi, Distt.Tinsukia

Assam, India

Name of Vendor : M/s Nitya Laboratories.

Plot No.118, Church Road, Behind Kausik Vatika

Bhagat Singh Colony, Ballabgarh-121 004

Distt. Faridabad (Haryana) Delhi NCR, India

Nature of Job : Voc Emission Survey Report at Indian Oil Corporation Limited, Refinery
Division Assam Oil Division, Digboi, Distt.Tinsukia, Assam, India

Report Period : Oct" 2025 to Dec" 2025

FOR NITYA LABORATORIES



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Executive Summary

Indian Oil Corporation Limited (Refineries Division) has intended to conduct the Fugitive Emission survey/Leak Detection and Repair (LDAR) program at its refinery Digboi Assam. As a part of this program Indian Oil Corporation Limited (Refineries Division) has awarded the contract to M/s Nitya Laboratories for conduct the LDAR survey for the period 09/2025 to 09/2027.

The LDAR Program at site included the detection, tagging and measurement of VOC emission from these identified points which included valves, pump seal, compressor & pressure relieve valves for the measurement of the period from October to December 2025.

Plant Wise Summary of VOC

Sr. No.	Date of Monitoring	Unit	Total No's of Points Monitored	Total No's of Leakage	Before repairing		After repairing	
					Total Leak (kg/hr)	Total Leak (kg/day)	Total Leak (kg/hr)	Total Leak (kg/day)
1	04-10-2025	HDTE	160	0	0	0	0	0
2	06-10-2025	AVU	524	3	0.00894	0.214712	0.00171	0.041135
3	06-10-2025	HGU	156	0	0	0	0	0
4	06-10-2025	DCU	1043	2	0.00572	0.137303	0.00095	0.022974
5	08-10-2025	CRU OFF SITE	267	0	0	0	0	0
6	08-10-2025	CRU	278	2	0.00406	0.097643	0.00098	0.023650
7	10-10-2025	SDU	368	0	0	0	0	0
8	13-10-2025	MSQ	1008	4	0.01043	0.250373	0.00209	0.05027
9	14-10-2025	PRODUCT PUMP	418	0	0	0	0	0
10	17-10-2025	CPH	140	2	0.00443	0.106315	0.00059	0.014379
11	17-10-2025	PRODUCT TANK	85	0	0	0	0	0
12	21-10-2025	SDU TANK FARM	120	0	0	0	0	0
13	24-10-2025	NEW TANK FARM	138	0	0	0	0	0
14	24-10-2025	CRUDE TANK FARM	143	0	0	0	0	0
		TOTAL	4848	13	0.03359	0.806346	0.00634	0.152408

LDAR Record as per OSID-GDN-2025 (VOC)

Sr. No.	Unit	ID Tag No.	Line Size	Associated equipment identification no./P&ID Ref. No.	Component Type (valve/gland/bonnet/pump seal/flange etc.)	Duty (gas/liqht/ heavy liquid hydrocarbon)	Measured reading from detector % LEL	Measure d Reading % Gas	PPMV calculat ion with formula based on correlati on factor from annex1 for type & duty	Kg/hr Before attending leak	Kg/day Before attending leak	Measure d reading from detector or % LEL	PPMV calculat ion with formula based on correlati on factor from annex1 for type & duty	Kg/hr after attending g leak	Kg/day after attending leak	Remarks (minor/major shut down job etc.)
1	AVU	P-001-A-DISCHARGE LINE PG IV	1"	P-001-A-DISCHARGE LINE PG IV	VALVE	Gas	0.88%	0.88%	8800	0.002961	0.071054	0.08%	800	0.000635	0.015241	Minor
		P-005-A-DISCHARGE IV	4"	P-005-A-DISCHARGE IV	VALVE	Gas	0.89%	0.89%	8900	0.002982	0.071571	0.075 %	750	0.000609	0.014622	Minor
		2-P-006-B-DISCHARGE LINE PG IV	1"	2-P-006-B-DISCHARGE LINE PG IV	VALVE	Gas	0.9%	0.9%	9000	0.003004	0.072087	0.05%	500	0.000470	0.011271	Minor
2	DCU	EQP-NO-07-PA-012-B-IN-(VALVE)	4"	EQP-NO-07-PA-012-B-IN-(VALVE)	VALVE	Gas	0.77%	0.77%	7700	0.002717	0.065217	0.054 %	640	0.000550	0.013207	Minor
		EQP-NO-07-PA-009-A-OUT-(VALVE)	4"	EQP-NO-07-PA-009-A-OUT-(VALVE)	VALVE	Gas	0.9%	0.9%	9000	0.003004	0.072087	0.04%	400	0.000407	0.009767	Minor
3	CRU	P-003 A DISCHARGE LINE PG IV VALVE	1"	P-003 A DISCHARGE LINE PG IV VALVE	VALVE	Gas	0.6%	0.6%	6000	0.002315	0.055565	0.06%	600	0.000528	0.012671	Minor
		FCV-1601 BYPASS IV DIS FLANGE VALVE	2"	FCV-1601 BYPASS IV DIS FLANGE VALVE	VALVE	Gas	0.3891%	0.3891%	3891	0.001753	0.042078	0.048 %	480	0.000457	0.010980	Minor
4	MSQ	037-PA-CF-001-OUTLET LINE REFLUX-(VALVE)	3"	037-PA-CF-001-OUTLET LINE REFLUX-(VALVE)	VALVE	Gas	0.55%	0.55%	5500	0.002189	0.052547	0.05%	500	0.00047	0.011127	Minor
		037-PA-CF-002-B-OUTLET LINE REFLUX-(P GLAND)	3"	037-PA-CF-002-B-OUTLET LINE REFLUX-(P GLAND)	VALVE	Gas	0.78%	0.78%	7800	0.002740	0.065769	0.08%	800	0.00064	0.01524	Minor
		037-PA-CF-016-A-OUTLET LINE-(V GLAND)	3"	037-PA-CF-016-A-OUTLET LINE-(V GLAND)	VALVE	Gas	0.6987%	0.6987%	6987	0.002553	0.061273	0.046 %	460	0.00045	0.01068	Minor
		BYPASS LINE CONTROL VALVE 036-FV-307-(V GLAND)	3"	BYPASS LINE CONTROL VALVE 036-FV-307-(V GLAND)	VALVE	Gas	0.875%	0.875%	8750	0.002850	0.070795	0.083 %	830	0.00054	0.01307	Minor
5	CPH	040-PA-003A SUCTION VENT (IV GLAND)	10"	040-PA-003A SUCTION VENT (IV GLAND)	VALVE	Gas	0.69%	0.69%	6900	0.002533	0.060752	0.03%	300	0.000338	0.008120	Minor
		040-PM-003-B DISCHARGE VENT (IV GLAND)	8"	040-PM-003-B DISCHARGE VENT (IV GLAND)	VALVE	Gas	0.44%	0.44%	4400	0.001697	0.045533	0.02%	200	0.000261	0.006259	Minor



Indian Oil Corporation Limited

(Refineries Division)

Assam Oil Division, Digboi, Distt. Tinsukia, Assam, India

Fugitive (Methane) Emission Survey Reports (LDAR)



Study Period: 3rd Quarter FY 2025-2026

Prepared By



NITYA LABORATORIES

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**Methane Emission Survey Report of Assam Oil Division, Digboi, Distt.Tinsukia Assam,
India**

Name of Client : M/s Indian Oil Corporation Limited

, Digboi, Distt.Tinsukia Assam,
India

Name of Vendor : M/s Nitya Laboratories

Plot No.118, Church Road, Behind Kausik Vatika
Bhagat Singh Colony, Ballabgarh-121 004
Distt. Faridabad (Haryana) Delhi NCR, India

**Nature of Job : Methane Emission Survey Report at Indian Oil Corporation Limited, Refinery
Division, , Digboi, Distt.Tinsukia Assam, India**

Report Period : Oct " 2025 to Dec " 2025

FOR NITYA LABORATORIES


RAVINDER MITTAL
Head-Environmental Division



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1.0 EXECUTIVE SUMMARY

Methane (CH_4) is the second-most-abundant anthropogenic (human-created) greenhouse gas and significantly contributes to global warming. Consequently, there is an urgent need to reduce methane emissions to help reduce temperature increases from anthropogenic greenhouse gases. An essential part of any strategy to mitigate methane emissions is the ability to accurately measure and monitor the amount and location of methane released by various sectors. This report identifies several policy recommendations that can substantially enhance the detection of methane released by the oil and gas sector. These recommendations could strengthen measures already taken by that sector to manage methane and enhance worker safety.

The atmospheric concentration of methane has risen rapidly since the start of the industrial revolution in the 18th century, from 730 parts per billion (ppb) in 1750 to 1866 ppb in 2019, due primarily to human activities. The recent increases in methane concentrations appear to be equally contributed by the fossil-fuel sector and by a combined contribution from agricultural activity and waste sources.

Quantifying emissions from the fossil-fuel sector has led to three consequences. First, companies that are losing a valuable commodity to the atmosphere have begun using the latest technology for leak detection and repair (LDAR). Second, with the global community moving toward regulation of greenhouse gas emissions, the question of how to verify emission decreases from the oil and gas industry has arisen. Lastly, the scientific community has started to form a picture of how these emissions are distributed and how different components, sites, and processes contribute. It has become clear that a small portion of methane sources (such as leaks) are contributing a significant fraction of the total emitted natural gas. Identifying and mitigating these large leaks quickly can potentially reduce production costs while alleviating a large percentage of the emission problem.

For methane emission regulation to be most effective, it should specifically target the small portion of leaks that are major emitters. Additionally, data should be publicly available and with high enough spatial resolution to determine the source of emissions, especially in regions where well pads owned by different companies are spatially collocated. Domestically, ground and aircraft measurements offer sensitive and cost-effective approaches for frequent or continuous monitoring of individual assets. At the same time, limiting methane emissions will need to be done globally. Satellite measurements are uniquely capable of supporting international collaborations to identify significant sources worldwide and informing international agreement to mitigate emissions.



Plant Wise Summary

Sr. No.	Date of Monitoring	Unit	Total No's of Points Monitored	Total No's of Leakage	Before repairing		After repairing	
					Total Leak (kg/hr)	Total Leak (kg/day)	Total Leak (kg/hr)	Total Leak (kg/day)
1	22-10-2025	SDU	106	1	0.004080	0.097911	0.000445	0.010684
2	22-10-2025	CPP	409	2	0.005000	0.119995	0.000935	0.022438
3	23-10-2025	CRU OFF SITE	55	0	0	0	0	0
4	25-10-2025	MSQ	225	2	0.004100	0.098396	0.000562	0.013482
5	25-10-2025	DCU	389	0	0	0	0	0
6	27-10-2025	AVU	156	0	0	0	0	0
7	27-10-2025	CRU	361	0	0	0	0	0
8	29-10-2025	HDTE	90	0	0	0	0	0
9	30-10-2025	HGU	268	0	0	0	0	0
TOTAL			2059	5	0.01318	0.316302	0.001942	0.046604



Digboi Refinery-Methane Survey Report

LDAR Record as per OSID-GDN-2025 (methane)

Sr. No.	Unit	ID Tag No.	Line Size	Associated equipment Identification no./P&ID Ref.No.	Component (Type / valve gland / bonnet/ pump seal / flange etc.)	Duty (gas/liquid/hydrocarbon)	Measured reading from detector % LEL	Measured Reading % Gas	PPM/V calculate from formula based on correlation factor from annex1 for type & duty	Ko/hr Before attending leak	Ko/day Before attending leak	Ko/hr after attending leak	Ko/day after attending leak	Remarks (minor/major/shut down job etc.
1	SDU	06-UV-3006D/S1st/V/V	3"	06-UV-3006D/S1st/V/V	Valve	Gas	1.45%	1.45%	14500	0.004080	0.097911	0.000445	0.010694	Minor
2	CPP	15-LS-4771B2st/V	2"	15-LS-4771B2st/V	Valve	Gas	0.8%	0.8%	8000	0.002785	0.066837	0.000407	0.009787	Minor
		15-LSL-47732st/V	1"	15-LSL-47732st/V	Valve	Gas	0.56%	0.56%	5600	0.002215	0.053158	0.000528	0.012871	Minor
3	MSQ	036-FV-0403D/rain1st/V	4"	036-FV-0403D/rain1st/V	Valve	Gas	0.6%	0.6%	6000	0.002315	0.055585	0.000281	0.006259	Minor
		036-EE-005D/rain1st/V	2"	036-EE-005D/rain1st/V	Valve	Gas	0.4%	0.4%	4000	0.001785	0.042831	0.000301	0.007223	Minor





Indian Oil Corporation Limited

(Refineries Division)

Assam Oil Division, Digboi, Distt.Tinsukia, Assam, India

VOC Emission Survey Reports (LDAR)



Study Period: 4th Quarter FY 2025-2026

Prepared By



NITYA LABORATORIES

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**Voc Emission Survey Report (LDAR) for Indian Oil Corporation Limited, Assam Oil Division,
Digboi, Distt.Tinsukia, Refinery, Assam**

Name of Client : M/s Indian Oil Corporation Limited

Assam Oil Division, Digboi, Distt.Tinsukia

Assam, India

Name of Vendor : M/s Nitya Laboratories

Plot No.118, Church Road, Behind Kausik Vatika

Bhagat Singh Colony, Ballabgarh-121 004

Distt. Faridabad (Haryana) Delhi NCR, India

**Nature of Job : Voc Emission Survey Report at Indian Oil Corporation Limited, Refinery
Division Assam Oil Division, Digboi, Distt.Tinsukia, Assam, India**

Report Period : Jan" 2026 to March" 2026



RAVINDER MITTAL

Head-Environmental Division

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Executive Summary

Indian Oil Corporation Limited (Refineries Division) has intended to conduct the Fugitive Emission survey/Leak Detection and Repair (LDAR) program at its refinery Digboi Assam. As a part of this program Indian Oil Corporation Limited (Refineries Division) has awarded the contract to M/s Nitya Laboratories for conduct the LDAR survey for the period 09/2025 to 09/2027.

The LDAR Program at site included the detection, tagging and measurement of VOC emission from these identified points which included valves, pump seal, compressor & pressure relieve valves for the measurement of the period from January to March 2026.

Plant Wise Summary of VOC

Sr. No.	Date of Monitoring	Unit	Total No's of Points Monitored	Total No's of Leakage	Before repairing		After repairing	
					Total Leak (kg/hr)	Total Leak (kg/day)	Total Leak (kg/hr)	Total Leak (kg/day)
1	13-02-2026	HGU	156	0	0	0	0	0
2	14-02-2026	HDTE	160	0	0	0	0	0
3	14-02-2026	CRU	278	7	0.017888	0.429303	0.00340	0.08170
4	16-02-2026	AVU	524	1	0.000951	0.0228182	0.000545	0.0130740
5	16-02-2026	DCU	1043	0	0	0	0	0
6	17-02-2026	MSQ	1008	3	0.005496	0.131895	0.001580	0.037931
7	17-02-2026	CRU OFF SITE	267	0	0	0		
8	18-02-2026	SDU	368	2	0.008158	0.195794	0.000909	0.021805
9	19-02-2026	SDU OFF SITE PH	120	0	0	0	0	0
10	19-02-2026	CPH	140	0	0	0	0	0
11	19-02-2026	PPH	418	0	0	0	0	0
12	20-02-2026	PRODUCT TANK	85	0	0	0	0	0
13	20-02-2026	CRUDE TANK FARM	143	9	0.005134	0.12320617	0.002474	0.05938741
14	21-02-2026	NEW TANK FROM	138	0	0	0	0	0
		TOTAL	4848	22	0.037627	0.90301637	0.008908	0.21389741



LDAR Record as per OSID-GDN-2026 (VOC)

Sr. No.	Unit	ID Tag No.	Line Size	Associated equipment identification no./P&ID Ref.No.	Component Type (valve/gland/bonnet/pump seal/flange etc.)	Duty (gas/liquid/hydrocarbon)	Measured reading from detector % LEL	Reading % Gas	PPMV calculated with formula based on correlation factor from annex-1 for type & duty	Kg/hr before attending leak	Kg/day before attending leak	Measure and read from detector or % LEL	PPMV calculated with formula based on correlation factor from annex-1 for type & duty	Kg/hr after attending leak	Kg/day after attending leak	Remarks (minor/major shut down job etc.)
1	CRU	05-PA-301 B PUMP C&D DRAIN LINE IV VALVE	4"	05-PA-301 B PUMP C&D DRAIN LINE IV VALVE	VALVE	Gas	0.000004%	4%	50.04	0.000107	0.003572	0.0010%	16.1	0.00038	0.00020	Minor
		04-FCV-1505-BYPASS IV GLAND	3"	04-FCV-1505-BYPASS IV GLAND	VALVE	Gas	0.67%	0.67%	6700	0.002465	0.058645	0.06%	600	0.000518	0.01371	Minor
		05-FCV-1101-D3 IV GLAND	3"	05-FCV-1101-D3 IV GLAND	VALVE	Gas	0.9087%	0.9087%	9087	0.003022	0.072533	0.04%	400	0.000437	0.009167	Minor
		04-FCV-1101-US IV GLAND	3"	04-FCV-1101-US IV GLAND	VALVE	Gas	0.15%	0.15%	15000	0.004169	0.100055	0.09%	900	0.000635	0.016138	Minor
		04-FCV-1101-D5 IV GLAND	3"	04-FCV-1101-D5 IV GLAND	VALVE	Gas	0.9%	0.9%	9000	0.003004	0.072067	0.06%	800	0.000615	0.015141	Minor
2	AVU	REATOR FEED LINE 1ST IV GLAND	3"	REATOR FEED LINE 1ST IV GLAND	VALVE	Gas	0.6%	0.6%	6000	0.002315	0.055505	0.06%	600	0.000518	0.01371	Minor
		REATOR FEED LINE 2ND IV GLAND	3"	REATOR FEED LINE 2ND IV GLAND	VALVE	Gas	0.8%	0.8%	8000	0.002785	0.068837	0.07%	700	0.000533	0.01389	Minor
		P-204A-DISCHARGE LINE PG IV	1"	P-204A-DISCHARGE LINE PG IV	VALVE	Gas	0.15%	0.15%	1500	0.000951	0.0223162	0.063%	630	0.000545	0.013740	Minor
		34-FT-0111-US GLAND	3"	34-FT-0111-US GLAND	VALVE	Gas	0.6%	0.6%	6000	0.002315	0.055505	0.05%	500	0.000470	0.011171	Minor
		034-FV-0105-CV GLAND	3"	034-FV-0105-CV GLAND	VALVE	Gas	0.55%	0.55%	5500	0.002189	0.052547	0.06%	600	0.000518	0.01371	Minor
3	MSQ	034-PA-CF-001-A-SUCTION IV GLAND	3"	034-PA-CF-001-A-SUCTION IV GLAND	VALVE	Gas	0.10%	0.10%	1600	0.000991	0.022764	0.07%	700	0.000533	0.01389	Minor
		INTERCONNECTION FROM KA-SC-101-A-DISCHARGE 2ND IV GLAND	2"	INTERCONNECTION FROM KA-SC-101-A-DISCHARGE 2ND IV GLAND	VALVE	Gas	0.15%	0.15%	15000	0.004169	0.1000849	0.05%	500	0.000470	0.0112712	Minor
		08-FV-3501-CV GLAND	2"	08-FV-3501-CV GLAND	VALVE	Gas	0.14%	0.14%	14000	0.003469	0.0667264	0.045%	450	0.000419	0.010540	Minor
		ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 45	-	ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 45	-	Gas	0.0031%	0.0031%	31	0.000079	0.0018910	0.0021%	21	0.000061	0.0014726	Minor
		ROUND THE CLOCK 12-TO 3 RIM SEAL AREA METER 03	-	ROUND THE CLOCK 12-TO 3 RIM SEAL AREA METER 03	-	Gas	0.02502%	0.02502%	250.2	0.000501	0.0072266	0.015%	150	0.000217	0.0051033	Minor
4	SDU	ROUND THE CLOCK 3-TO 6 RIM SEAL AREA METER 03	-	ROUND THE CLOCK 3-TO 6 RIM SEAL AREA METER 03	-	Gas	0.1242%	0.1242%	1242	0.000642	0.0207142	0.0136%	139	0.000206	0.0049550	Minor
		ROUND THE CLOCK 3-TO 6 RIM SEAL AREA METER 11	-	ROUND THE CLOCK 3-TO 6 RIM SEAL AREA METER 11	-	Gas	0.1442%	0.1442%	1442	0.000627	0.0222478	0.077%	700	0.000533	0.013889	Minor
		ROUND THE CLOCK 6-TO 9 RIM SEAL AREA METER 17	-	ROUND THE CLOCK 6-TO 9 RIM SEAL AREA METER 17	-	Gas	0.0986%	0.0986%	986	0.000726	0.0174301	0.04%	400	0.000407	0.0091668	Minor
		ROUND THE CLOCK 6-TO 9 RIM SEAL AREA METER 23	-	ROUND THE CLOCK 6-TO 9 RIM SEAL AREA METER 23	-	Gas	0.11%	0.11%	1100	0.000779	0.01969843	0.0106%	198	0.000229	0.0051856	Minor
		ROUND THE CLOCK 6-TO 9 RIM SEAL AREA METER 25	-	ROUND THE CLOCK 6-TO 9 RIM SEAL AREA METER 25	-	Gas	0.107%	0.107%	1670	0.001019	0.02444640	0.048%	489	0.000463	0.0111136	Minor
5	CRUDE TANK FARM	ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 31	-	ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 31	-	Gas	0.0031%	0.0031%	31	0.000079	0.00189097	0.0015%	15	0.000049	0.0011854	Minor
		ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 30	-	ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 30	-	Gas	0.036201%	0.036201%	362.01	0.000382	0.0091607	0.01628%	362.8	0.000229	0.0051842	Minor
		ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 34	-	ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 34	-	Gas	0.036201%	0.036201%	362.01	0.000382	0.0091607	0.01628%	362.8	0.000229	0.0051842	Minor
		ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 36	-	ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 36	-	Gas	0.036201%	0.036201%	362.01	0.000382	0.0091607	0.01628%	362.8	0.000229	0.0051842	Minor
		ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 38	-	ROUND THE CLOCK 9-TO 12 RIM SEAL AREA METER 38	-	Gas	0.036201%	0.036201%	362.01	0.000382	0.0091607	0.01628%	362.8	0.000229	0.0051842	Minor





Indian Oil Corporation Limited
(Refineries Division)
Assam Oil Division, Digboi, Distt. Tinsukia, Assam, India
Fugitive (Methane) Emission Survey Reports (LDAR)



Study Period: 4th Quarter FY 2025-2026

Prepared By



NITYA LABORATORIES

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**Methane Emission Survey Report of Assam Oil Division, Digboi, Distt.Tinsukia Assam,
India**

Name of Client : M/s Indian Oil Corporation Limited

, Digboi, Distt.Tinsukia Assam,
India

Name of Vendor : M/s Nitya Laboratories

Plot No.118, Church Road, Behind Kausik Vatika
Bhagat Singh Colony, Ballabgarh-121 004
Distt. Faridabad (Haryana) Delhi NCR, India

**Nature of Job : Methane Emission Survey Report at Indian Oil Corporation Limited, Refinery
Division, , Digboi, Distt.Tinsukia Assam, India**

Report Period : Jan" 2026 to March" 2026



RAVINDER MITTAL

Head-Environmental Division



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1.0 EXECUTIVE SUMMARY

Methane (CH_4) is the second-most-abundant anthropogenic (human-created) greenhouse gas and significantly contributes to global warming. Consequently, there is an urgent need to reduce methane emissions to help reduce temperature increases from anthropogenic greenhouse gases. An essential part of any strategy to mitigate methane emissions is the ability to accurately measure and monitor the amount and location of methane released by various sectors. This report identifies several policy recommendations that can substantially enhance the detection of methane released by the oil and gas sector. These recommendations could strengthen measures already taken by that sector to manage methane and enhance worker safety.

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For methane emission regulation to be most effective, it should specifically target the small portion of leaks that are major emitters. Additionally, data should be publicly available and with high enough spatial resolution to determine the source of emissions, especially in regions where well pads owned by different companies are spatially collocated. Domestically, ground and aircraft measurements offer sensitive and cost-effective approaches for frequent or continuous monitoring of individual assets. At the same time, limiting methane emissions will need to be done globally. Satellite measurements are uniquely capable of supporting international collaborations to identify significant sources worldwide and informing international agreement to mitigate emissions.



Plant Wise Summary

Sr. No.	Date of Monitoring	Unit	Total No's of Points Monitored	Total No's of Leakage	Before repairing		After repairing	
					Total Leak (kg/hr)	Total Leak (kg/day)	Total Leak (kg/hr)	Total Leak (kg/day)
1	13-02-2026	HGU	268	0	0	0	0	0
2	14-02-2026	HDTE	90	0	0	0	0	0
3	14-02-2026	CRU	361	0	0	0	0	0
4	16-02-2026	AVU	156	0	0	0	0	0
5	16-02-2026	DCU	389	4	0.011739	0.281743	0.001597	0.038321
6	17-02-2026	MSQ	255	0	0	0	0	0
7	17-02-2026	CRU OFF	55	6	0.018153	0.435662	0.002543	0.061029
8	18-02-2026	CPP	409	0	0	0	0	0
9	18-02-2026	SDU	106	0	0	0	0	0
TOTAL			2089	10	0.029892	0.717405	0.00414	0.09935



Digboi Refinery-Methane Survey Report

LDAR Record as per OSID-GDN-2026 (methane)

Sr. No.	Unit	ID Tag No.	Line Size	Associated equipment identification m, p, & D Ref. No.	Component type (valve, gland, bonnet, pump seal, flange etc.)	Duty (gas, oil, heavy liquid, hydrocarbon)	Measured reading from detector % LEL	Measure of Reading % Gas	ppmv calculated from formula based on correlation factor from annex 1 for type & duty	Kg/hr before attending leak	Kg/day before attending leak	ppmv calculated from formula based on correlation factor from annex 1 for type & duty	Kg/hr after attending leak	Kg/day after attending leak	Remarks (minor, major, shut down job etc.)
1	OCU	07-PI-1232-US IV GLAND	2"	07-PI-1202-US IV GLAND	Valve	Gas	1%	1%	10000	0.003214	0.077131	500	0.000470	0.011271	Minor
		07-PI-1232-CV GLAND	2"	07-PI-1202-CV GLAND	Valve	Gas	0.58%	0.58%	5900	0.002265	0.051365	200	0.000261	0.006259	Minor
		07-PI-1232-BYPASS IV GLAND	2"	07-PI-1202-BYPASS IV GLAND	Valve	Gas	0.92%	0.92%	9200	0.003046	0.073111	300	0.000338	0.008120	Minor
		FG-LINE DIS IV GLAND	2"	FG-LINE DIS IV GLAND	Valve	Gas	1%	1%	10000	0.003214	0.077131	600	0.000528	0.012071	Minor
2	CRD OFF SITE	38-PSV-1501-N (IV GLAND)	31	38-PSV-1501-N (IV GLAND)	VALVE	Gas	1%	1%	10000	0.003214	0.077131	500	0.00047	0.01127	Minor
		38-PSV-1501-N-BYPASS-GLAND VALVE IV GLAND	34	38-PSV-1501-N-BYPASS-GLAND VALVE IV GLAND	VALVE	Gas	1%	1%	10000	0.003214	0.077131	500	0.00047	0.01127	Minor
		38-PSV-PSV-1503-N (ND IV GLAND)	41	38-PSV-PSV-1503-N (ND IV GLAND)	VALVE	Gas	1%	1%	10000	0.003214	0.077131	500	0.00047	0.01127	Minor
		38-FI-1501-V (VENT IV GLAND)	44	38-FI-1501-V (VENT IV GLAND)	VALVE	Gas	0.6%	0.6%	6000	0.002315	0.055565	100	0.00017	0.00401	Minor
		H2-LINE TO FROM PLANT-(2ND IV GLAND)	49	H2-LINE TO FROM PLANT-(2ND IV GLAND)	VALVE	Gas	1%	1%	10000	0.003214	0.077131	600	0.00053	0.01267	Minor
		BULLET B LINE-(1ST IV GLAND)	52	BULLET B LINE-(1ST IV GLAND)	VALVE	Gas	0.89%	0.89%	8900	0.002982	0.071571	450	0.00044	0.01053	Minor



CREP - Present Status of Digboi Refinery

Sl No	Action Point	Present Status of Digboi Refinery
1.	Member Secretary, CPCB expressed serious concern on most of the Refineries not Monitoring all the New parameters (as per March, 2008 notification) in effluent and desired Refineries should develop capabilities to start monitoring each parameter and report the detail data to CPCB regularly. Further effluents discharged from the ETP outlet were found having high values of BOD and oil and grease indicating that effluent treatment facilities are not meeting standards and may require up-gradation. The effluent data to be sent CPCB on daily basis through the CPCB online air quality monitoring server	For Effluent, out of 21 parameters, 9 Parameters i.e. pH, oil and grease, BOD, COD, TSS, MLSS, Phenol, Sulphide & Cyanide are tested in Digboi Refinery on daily basis. Reports of these tests are submitted to PCB, Assam regularly. Remaining tests are done by the Third-Party M/s Nitya Laboratories 43, sector -A1 Ext. Bhalla Enclave, Channi Himmat, Jammu-180015, J&K (UT), India Detailed up gradation study of ETP through M/s NEERI, Nagpur, was done in October 2014. Treated effluent from ETP is recycled to refinery as Fire water tank make up, cleaning and gardening purposes at ETP. Treated effluent is reused as make up for Coke Cutting water at delayed coking unit, Wax Sector Cooling Tower & Fire Water Network. During October'25 - March'26, 100% of treated effluent was reused.
2.	2.1 The PM Emission from furnace, boilers and captive power plant is not compiled in some of the units and the reason stated are (10 & 100 mg/Nm ³ for FG and NG Respectively) too stringent and retrofitting like ESP or installation of filters for fuel is not feasible.	Emission of PM from furnace, boilers & Captive Power Plant is well within the prescribed limit. Due to the use of natural gas with very low Sulphur content and sweetened refinery fuel gas as fuel.
	2.2 Installation of low Nox burner is yet to be completed. Refineries shall give the status and time target for the same and if installation is not possible, reason to be given, so that decision could be arrived.	As natural gas is the primary fuel used at Digboi Refinery, emissions of NO_x from process units and Captive Power Plant is below the limit. Since the refinery is using natural gas, formation of NO_x is very low and always remains within the prescribed limit. Further, low NO_x burners are also fitted in all the new units viz. Solvent De-waxing Unit, Hydro-treater Unit, Delayed Coking Unit and MSQ Unit
	2.3 IOC Refineries expressed inability to meet PM stipulations on neat fuel gas firing in furnaces. Member Secretary advised to generated data for both cases i.e. neat fuel gas firing and mixed (oil and gas) firing to look into the issue of PM standards compliance. All the Refineries are advised to submit in detail fuel gas & Oil analysis and emission data every month to HSE, RHQ for taking up with MoEF & CC.	- For firing, only gaseous fuel (Internal generated Fuel Gas with make-up of Natural Gas) is used, and no liquid fuel is in use. - Emission of PM from stacks at Digboi refinery is within specified norms.

	2.4 PM in FCC regenerators is not achieved in some of the units. In some of the units it is proposed to be taken during revamp. Gujarat and Mathura Refineries to give detail action plan.	Not applicable for Digboi Refinery (No FCC regenerators).
3	Member Secretary, CPCB expressed, although the units have started bioremediation of oily sludge, the disposal of bio-remediated material and storage will be a problem leading to space constraint and leachate problem on the nearby areas, He advised to find better avenues like Co-processing of oily sludge in cement plants or providing common remediation sites. Within 6 months.	1. Confined Bioremediation of sludge FY-2025-26 (October'25 to March '26) 150.2 MT 2. In-situ Oil recovery in FY-2025-26 from (October'25 to March '26)-123.3 MT 3. Another batch of 6000 MT of oily sludge sold to M/s K M Oil pvt. Ltd via MSTC e-auction in Oct'24 4. Open Bioremediation (October'25 to March '26) 552 MT
4	Linking of CAAQMS & Stacks data to server. Target date June, 2013(to submit road map) and 7-8 months for Implementation. The pending Refineries shall submit activity-wise schedule within a month.	Online connectivity of Furnaces with heat capacity of 10 MMkCal/hr (HGU) established to CPCB Server. One no. of Continuous Ambient Air Quality Monitoring Station installed and commissioned in September 2012.
5	Member Secretary desired that all the parameters of treated effluent shall be Linked to CPCB server using online analyzer by taking advantage of the technological development. All the Refineries shall initiate necessary action for implementation of the same. Till such time, Refineries shall post the requisite data on CPCB server day-to-day basis (Target-July, 2013)	Online effluent monitoring & connectivity to CPCB server was commissioned on 28th December 2015. WebSite: Online Emission and Effluent Monitoring System (cpcb.gov.in) https://cems.cpcb.gov.in/#/1/connectivity-status/realtime-connectivity-status-dashboard
6	Minimization of fugitive VOC emission from ETP 's- To meet the environmental standard, old Refineries shall take necessary action to cover effluent sump, API, TPI and other equipments exposed to atmosphere to reduce fugitive emission and also recovery facility.	1. For reduction of fugitive VOC emission from ETP, VOC reduction facility has been commissioned inside ETP on 04.12.2022. 2. The CSS (Central Static Sump) inside refinery has already been covered.
7	Member Secretary advised Refineries to follow LDAR programme in true spirit as per gazette notification of "Effluent & Emission Standards, 2008. Data shall be submitted in periodic intervals to CPCB	Quarterly LDAR surveys are being carried out. LDAR reports are being sent to MoEF & CC Bi-annually along with EC compliance report.

8	Member Secretary expressed concern on non-reporting of incidents of fire, oil spills and pollution to CPCB. He advised all the Refineries to reporting of such incidents to CPCB of concerned area during such occurrence.	No major oil spill occurred till 31/03/2026. Shall be ensured.
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Place: Digboi

Date: 22.06.2026



Signature of the Authorized Person

Designation:

तपन कुमार दत्ता
TAPAN KUMAR DUTTA
डी.जी.एम. (एच एस एंड ई) DGM (HS & E)
आई.ओ.सी.एल. (एओडी) डिगबोई
I.O.C. LTD. (AOD) DIGBOI



असम ऑयल डिवीजन
Assam Oil Division

Ref: DR/CGM(TS&HSE)/NBWL/114/2025-26

Date: 16.07.2025

To,

The Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Wardens, Assam
Aranya Bhavan, Panjabari,
Guwahati -781037.

Sub: Monitoring of Implementation of Terms and Conditions of Major Wildlife Proposals and submission of up-to-date annual compliance report.

Ref: (1) Govt. of India, MoEF &CC (Wildlife Division) letter F. No.6/51/2025-WL, dated 09.07.2025
(2) Principal Chief Conservator of Forests, Wildlife and Chief Wildlife Warden, Assam letter No. WL/FG.35/Compliance Certificate/Projects dated 11.07.2025 (copy enclosed as Annexure-I)

Through Divisional Forest Officer, Digboi Division, Digboi

Respected Sir,

With reference to the subject and letter cited above, Digboi Refinery is pleased to submit the up-to-date annual compliance report as per Annexure-II. The Annexure-II is enclosed herewith.

We humbly request your good office to kindly acknowledge the submitted annual compliance report.

Thanking You,

Yours faithfully,

For Indian Oil Corporation Limited
(Assam Oil Division)
Digboi Refinery

Dhanjit Baishya
(D Baishya) 16/07/25
Chief General Manager (TS & HSE)

Enclosures: As above

Copy for information:

1. The Principal Chief Conservator of Forests & Head of Forest Force, Assam, Panjabari, Guwahati -781037.
2. Executive Director & Refinery Head, IOCL AOD Refinery

धनजित बैश्या/Dhanjit Baishya
मुख्य महाप्रबंधक (टीएस व एच, एस) CGM (TS&H, S&E)
आई.ओ.सी.एल. (एओडी)/I.O.C.L. (AOD)
डिगबोई /DIGBOI-786171



GOVERNMENT OF ASSAM

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE) AND
CHIEF WILDLIFE WARDEN, ASSAM::PANJABARI::GUWAHATI-37

Email Id : pccf.wl.assam@gmail.com

No. WL/FG.35/Compliance Certificate/Projects

Date: 11.07.2025

To,

Chief General Manager (TS & HSE),
Digboi Refinery (Assam Oil Division), IOCL.

Sub: Monitoring of Implementation of Terms and Conditions of Major Wildlife Proposals
and regarding

Ref: Govt. of India, MoEF & CC (Wildlife Division), letter F. No.6/51/2025-WL, dated
09.07.2025.

Sir,

With reference to the subject cited above, please find enclosed herewith a copy of letter received from Govt. of India, MoEF & CC (Wildlife Division), dated 09.07.2025 quoted under reference, the contents of which is self-explanatory, for your kind information and necessary action.

In view of the above, it is requested to kindly submit the up-to-date annual compliance report as per the enclosed Annexure-II through the Divisional Forest Officer under whose jurisdiction your proposal "Capacity Augmentation of Digboi Refinery to 1 MMTPA, Proposal No. WL/AS/IND/429055/2023" falls, for taking onward necessary action. Please submit the report on or before 18.07.2025 positively.

Enclo: As stated above.

Yours faithfully,

(Dr. Vinay Gupta, IFS)

Principal Chief Conservator of Forests,
Wildlife & Chief Wildlife Warden, Assam

Copy for information and necessary action to DFO, Digboi Division, Digboi.

Principal Chief Conservator of Forests,
Wildlife & Chief Wildlife Warden, Assam

Name of State: Assam Name of the project: Capacity Augmentation of Digboi Refinery to 1 MMTPA Proposal no.: WL/AS/IND/429055/2023 Date of approval/recommendation by the Standing Committee of the National Board for Wild Life: 27.02.2024	
Terms and conditions in order of approval letter	Status of implementation term/condition of the project (write "Yes" for the term/condition implemented and "No" for not implemented. If not implemented, give reason why project was allowed for completion when the term/ condition was not implemented
EIA with a scientifically robust Mitigation Plan shall have to be in place for taking appropriate steps to mitigate the adverse impacts on environment and wildlife in the event of breaking out of fire in the plant.	YES Rapid Risk Assessment Study (RRA) has been carried out by engaging NABET accredited consultant M/s Engineers India Limited to identify the hazards associated with the "NEW FACILITIES" under this project to analyse the consequences, draw suitable conclusions and provide necessary recommendations to mitigate the hazard/risk associated with the implementation of the new project facilities. Under the new facility for mitigation of fire inside new Golai Tank farm near Digboi marketing terminal, 2(two) numbers of Fire water tanks (each of capacity 4000 KL) with associated Fire Water pumps i.e. 2 nos of jockey motor driven (each of capacity 50m3/hr), 4 nos of Main Fire water pumps diesel driven (each of capacity of 410 m3/hr) have been considered to restrict hazard within Tank farm. Also, for mitigation of fire inside existing Refinery for the revamped facilities, 2(two) new fire water pumps with diesel driven (each of capacity 410 m3/hr) have been considered along with the existing firefighting system, fire prevention and protection facility (like HVLRM, water spray system, Hydrant, monitor, rim seal, HC detectors etc.) to restrict the fire within boundary. In addition to the RRA, Quantitative risk assessment (QRA) has also been recommended before commissioning of the project. Accordingly, action has been initiated to carry out the QRA study before commissioning of the project facilities.
At least 2% amount of the estimated cost of the project should be deposited as CORPUS fund to the	YES An amount of Rs. 14,80,40,000 (Rupees fourteen crore eighty lakh & forty thousand Only) has been deposited as corpus fund to the Chief Wildlife Warden for Conservation of Wildlife &

Chief Wildlife Warden for Conservation of Wildlife & Human Animal Conflict mitigation measures.	Human Animal Conflict mitigation measures. The deposited corpus amount is 2% of the approved Digboi Refinery expansion project Cost (Rs. 740.20 Crore). (1) Payment of Rs. 14.80 Crore made through NEFT UTR NO: SBIN524093816642--CHIEF WILDLIFE WARDEN, TRANSACTION DATE: 02-04-2024 (Payment receipt of Rs 14.80 Cr is enclosed as Annexure-IIA) (2) Payment of Rs. 40000/-(Rupees Forty thousand only) made through NEFT UTR NO: SBIN32419Z665769--CHIEF WILDLIFE WARDEN, TRANSACTION DATE: 10-07-2024 (Cash Credit Statement of Rs 40,000/- is enclosed as Annexure-IIB)
The User Agency shall also implement the conservation plan submitted along with the project proposal.	YES A total amount of Rs. 20.0 lakhs (for first 3 years of implementation of project) towards wildlife conservation in the surrounding areas of project site has been earmarked. The Wildlife Conservation Plan (WCP) has been submitted to Divisional Forest Officer (DFO), Digboi for further actions. DFO, Digboi Division has forwarded the letter to PCCF, Guwahati vide letter no. A/G-8 (a)/Diversion Proposal/2023/1239 dated 10/05/2023. (The DFO letter is enclosed as Annexure-III.) Digboi Refinery shall ensure the implementation of the submitted conservation plan in consultation with the DFO, Digboi Division
An annual compliance certificate on the stipulated conditions shall be submitted by the User Agency to the State Chief Wildlife Warden and an annual compliance certificate shall be submitted by the State Chief Wildlife Warden to Government of India.	YES (1) 1st compliance report submitted to The Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Wardens, Assam on 03.04.2024. (2) 2nd compliance report is submitted with this letter on 16.07.2025.



ANNEXURE-IIPayment receipt of Rs 14.80 Cr to Chief Wildlife Warden for 1.0 MMTPA DR Expansion Project

Account Number :	_00000010776289584						
Description :	OD Clean (C and I)						
Name :	INDIAN OIL CORPORATION						
Currency :	LIMITED						
Corporate Address :	INR						
	INDIAN OIL BHAVAN G-9 ALI YAVAR JUNG						
	MARG						
	BANDRA (EAST) MUMBAI						
	MUMBAI						
	MAHARASHTRA-400051						
Branch :	DIGBOI(06000)						
IFS Code :	SBIN0006000						
Start Date :	02-04-2024						
End Date :	02-04-2024						
Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
02-04-2024	02-04-2024	TO TRANSFER-NEFT UTR NO: SBIN524093816642-- CHIEF WILDLIFE WARDEN	TRANSFER TO 4697160044302 / CHIEF WILDLIFE WARDEN	6000	14,80,00,000.00		



Cash Credit Statement

Account Statement

Account Number	00000010776289584	Description	OD Clean (C and I)
Name	INDIAN OIL CORPORATION LIMITED	Currency	INR
Corporate Address	INDIAN OIL BHAVAN G-9 ALI YAVAR JUNG MARG BANDRA (EAST) MUMBAI MUMBAI, MAHARASHTRA - 400051	Branch	DIGBOI (06000)
Rate of Interest (% p.a.)	16.0%	IFS Code	SBIN0006000
Book Balance	-57,77,470.45	Available Balance	39,42,22,529.55
Hold Value	0.00		
Uncleared Amount	0.00	Drawing Power 40,00,00,000.00	Limit Sanctioned 40,00,00,000.00
Balance as on 10 Jul 2024	0.00		

[Return to Account Statement](#)

10-Jul-24 (10-Jul-2024)	TO TRANSFER CHIEF WILDLIFE WARDEN NEFT UTR NO: SBIN324192665769 -TRANSFER TO 4697154044300 BY TRANSFER	TRANSFER TO 4697154044300 / CHIEF WILDLIFE WARDEN	6000	40,000.00	-2,688.30
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Government of Assam
Office of the Divisional Forest Officer
Digboi Division: Digboi

Ph.No.03751-264433

E-mail: dfodigboi@gmail.com

Letter No. A/G-8 (a)/Diversion Proposal/2023/ 1239

Dated:10/05/2023

To,

The Principal Chief Conservator of Forests, Wildlife
& Chief Wildlife Warden, Assam, Aranya Bhawan,
Panjabari, Guwahati-37

Sub:- Conservation Plan with Budgetary allocation for Digboi Refinery Expansion Project under
IOCL - regarding.

Sir,

In inviting a reference to the subject cited above, I have the honour to forward herewith the Conservation Plan with Budgetary allocation for Digboi Refinery Expansion Project under IOCL as received from the Chief General Manager (TS & HSE), Digboi Refinery, Indian Oil Corporation Limited for favour of your kind approval. A detailed wildlife management plan will be prepared in due course of time for management of other wildlife and habitats.

This is for favour of your kind information and necessary action.

Encl :- Conservation Plan.

Yours faithfully

(T.C. Ranjith Ram, IFS)
Divisional Forest Officer
Digboi Division, Digboi

Memo No. B/G-8 (a)/Diversion/2023/1328

Dated:10/05/2023

Copy to the Chief General Manager (TS & HSE)) Indian Oil Corporation Limited (AOD),
Digboi for his kind information and necessary action.

(T.C. Ranjith Ram, IFS)
Divisional Forest Officer
Digboi Division, Digboi

-

CONSERVATION PLAN FOR SCHEDULE - I SPECIES

The Conservation Plan would focus on conservation of habitats of Schedule-I species identified during the EIA process. Support in the form of donation of funds and active participation in awareness campaigns will be provided to the existing management plans undertaken by the Forest Department in the area. Awareness drives will be undertaken targeting different groups of society at different times. During these, dialogue with locals will be established and importance of co-existence of these species will be explained.

Conservation of Schedule - I species

The schedule-I species are found in the surrounding areas of the project site. Wildlife Conservation Plan for threatened species is prepared and IOCL Digboi refinery will abide by the same. The following species are covered under Schedule-I category of Indian Wildlife Protection Act 1972.

Table 10.6 Listing of Schedule I species in the study area

Sl. No.	Species Name	Scientific Name
Bird		
1	Black kite	<i>Milvus migrans</i>
2	Crested Serpent Eagle	<i>Spilornis cheela</i>
3	Great Indian hornbill	<i>Buceros bicornis</i>
4	Hill Myna	<i>Gracula religiosa</i>
5	Mountain Bamboo Partridge	<i>Bambusicola fytchii</i>
6	Oriental pied hornbill	<i>Anthraceroceros albirostris</i>
7	Shikra	<i>Accipiter badius</i>
8	Slender billed vulture	<i>Gyps tenuirostris</i>
9	White-rumped Shama	<i>Copsychus malabaricus</i>
10	Wreathed Hornbill	<i>Aceros undulatus</i>
Reptile		
11	Indian Rock Python	<i>Python molurus</i>
12	Bengal Monitor Lizard	<i>Varanus bengalensis</i>
13	Indian Flapshell Turtle	<i>Lissemys punctata</i>
Mammal		
14	Asian Elephant	<i>Elephas maximus</i>
15	Common leopard	<i>Panthera pardus</i>
16	Bengal Slow Loris	<i>Nycticebus bengalensis</i>
17	Western Hoolock Gibbon	<i>Hoolock hoolock</i>

Avifauna Conservation

Habitat: The above 10 species of birds are found in terrestrial ecosystem and forested areas of Dihing Patkai reserve forest.

Threat: Degradation of forested areas, chemicals in the carcasses, night operation, Tea factory works etc.

Conservation Action:

- The villagers, school children, industry workers working in the vicinity are to be made aware about the importance of wildlife, its habitat, importance of conservation etc.
- IOCL would support the Forest Department for habitat improvement program.
- IOCL will also conduct awareness campaigns at the village level to make the locals aware about the protected species in the area; their behaviour, habitat, ecology, breeding/nesting seasons, threats to habitats and species, laws regarding protection of species. Awareness generation campaigns will include preparation of brochures in local language, film shows and display of posters, etc.
- IOCL will ensure that minimum illumination comes out from the project area.
- Special care to be taken for identification of vulture nests, if any, and maintain distance from the nests.

Responsibilities: Primary responsibility lies with Assam Forest Department, and Digboi Wildlife Division of Assam. Secondary responsibility lies with IOCL who will support with monetary fund for conservation.

Reptile Conservation

Habitat: The above 03 species of reptiles are found in river banks, homestead gardens and forested areas of Dihing Patkai reserve forest depending the availability of food.

Threat: Degradation of forested areas, hunting by people, road kills etc.

Conservation Action:

- Identify basking sites of this species and enhance protection of these sites through village communities.
- Awareness campaigns to be carried out among village communities, focusing on local schools for protection of the species.
- While laying approach road, measures will be taken to keep natural drainage unhindered, by construction of culverts, which will provide crossing points for reptiles and minimize risk of road kill.
- Project proponent shall comply with all the pollution control and other conditions imposed in the environmental clearance by statutory authorities.
- It is also important to inform the workers about the presence of the species.

Responsibilities: Primary responsibility lies with Assam Forest Department, and Digboi Wildlife Division of Assam. Secondary responsibility lies with IOCL who will support with monetary fund for conservation.

Mammal Conservation

Habitat: The above 04 species of reptiles are found in forested areas of Jokai Dihing Patkai reserve forest and tea gardens.

Threat: Habitat fragmentation, human-animal conflict, blockage of wildlife corridor etc.

Conservation Action:

- Awareness campaign will be carried out in local villages, on conservation of leopards & elephants and their ecosystem services & values.
- Contributing to habitat improvement activity as planned by Forest Dept.
- IOCL would support the Forest Department for habitat improvement program and also in other programs for conservation of elephants.

- Project proponent shall comply with all the pollution control and other conditions imposed in the environmental clearance by statutory authorities.
- Conservation of the elephant's habitat and maintaining habitat connectivity by securing corridors;
- The management of human–elephant conflicts as part of an integrated land-use policy that recognizes elephants as economic assets from which local people need to benefit or at least no suffer;
- Better protection to the species through improved legislation and law enforcement, improved and enhanced field patrolling, and regulating/curbing trade in ivory and other elephant products

Responsibilities: Primary responsibility lies with Assam Forest Department, and Digboi Wildlife Division of Assam. Secondary responsibility lies with IOCL who will support with monetary fund for conservation.

10.11.1 Step to Help Conservation

IOCL will formulate the competent team of experts headed by Head Environment to discuss with the forest department officials to know various existing habitat improvement and wildlife management activities conducted in study area. In consultation with the forest department, IOCL will provide support to the existing forest and wildlife conservation plans by earmarking separate, sufficient fund as mentioned in table below for such activities and through inclusion of 'wildlife awareness campaign's in various other IOCL programs from time to time. These campaigns will be conducted by team of experts in the field to make the locals aware about the protected species in the area; their behavior, habitat, ecology, breeding/nesting seasons, threats to habitats and species, laws regarding protection of species; through audio-visual aids, quiz competitions, arranging study tours to various locations in different seasons etc. on village level.

Financial Outlay

IOCL is committed to earmarked funds and utilized it only for purpose specified through forest department. Details of utilization of funds (amount is in lakhs) are given in following table.

Table 10.7: Details of utilization of funds (amount is in lakhs)

Sr. No.	Activity	Years from commencement of project			
		I	II	III	Total
I	Direct & Indirect involvement of IOCL	Amount in lakhs			
1.	To associate with forest department, and other agencies for effective implementation of conservation programme	2.0	1.5	1.5	7.0
2	Identification of nesting sites for birds and habitat for reptiles, and mammals	1.5	1.0	1.5	5.0
3.	Cost of capacity building of forest department staffs	2.0	2.5	2.5	9.0
4.	Awareness Generation Meetings at villages (Development of Brochure; Arrangement of Meeting; Development of Posters)	1.0	1.5	1.5	4.0
Total		6.5	6.5	7.0	20.0

IOCL will spend total **Rs. 20.0 lakhs** (for first 3 years of implementation of project) towards wildlife conservation in the surrounding areas of project site. IOCL has already submitted a letter to DFO, Digboi division earmarking Rs. 20 lakhs for conservation of Schedule I species in the surrounding areas.



আমাৰ অসম

৬ জানুৱাৰী, ২০২৪ শনিবাৰ, যোৰহাট

	ইণ্ডিয়ান অইল কর্পোরেশন লিমিটেড (অসম অইল সন্মণ্ডল)	
ডিগবৈ শোধনাগাৰ, পো.অঃ ডিগবৈ, জিলাঃ তিনিচুকীয়া, পিনঃ ৭৮৬১৭১		
ইণ্ডিয়ান অইল কর্পোরেশন লিমিটেড, ডিগবৈ শোধনাগাৰত		
১.০ এমএমটিপিএ লৈ ক্ষমতা বৃদ্ধিৰ বাবে পৰিবেশ অনুমোদন সম্পৰ্কীয় জাননী		
ইয়াৰ দ্বাৰা জাননী দিয়া হৈছে যে পৰিবেশ, বন আৰু জলবায়ু পৰিৱৰ্তন মন্ত্ৰালয়ে (MOEF&CC) ফাইল নং J-11011/482/2007-IA II (I), তাৰিখ ০১-০১-২০২৪ৰ ভিত্তিত ডিগবৈ শোধনাগাৰৰ ০.৬৫ এমএমটিপিএৰ পৰা ১.০ এমএমটিপিএলৈ ক্ষমতা বৃদ্ধিৰ বাবে পৰিবেশ অনুমোদন প্রদান কৰিছে।		
ক্লিমাৰেঞ্চ লেটাৰৰ প্রতিলিপি এছপিচিবি/ কমিটিৰ ওচৰত উপলব্ধ আৰু মন্ত্ৰালয়ৰ ৱেবছাইট আৰু https://parivesh.nic.in/ তও চাব পাৰিব।		

THE ASSAM TRIBUNE, DIBRUGARH

SATURDAY, JANUARY 6, 2024

	Indian Oil Corporation Ltd. (Assam Oil Division)	
Digboi Refinery, P.O.: Digboi, Dist.: Tinsukia, PIN: 786171		
NOTICE REGARDING ENVIRONMENTAL CLEARANCE ACCORDED TO IOCL, DIGBOI REFINERY FOR CAPACITY AUGMENTATION to 1.0 MMTPA		
Notice is hereby given that the Ministry of Environment, Forest and Climate Change (MOEF&CC) vide File No. J-11011/482/2007-IA II (I), dated 01/01/2024 has accorded Environmental Clearance for capacity augmentation of Digboi Refinery from 0.65 MMTPA to 1.0 MMTPA. Copies of the clearance letter are available with the SPCB/ Committee and may also be seen at the Website of the Ministry and at https://parivesh.nic.in/ .		



INDIAN OIL CORPORATION LIMITED

DIGBOI REFINERY, ASSAM, INDIA

Established 1901 | Asia's First Petroleum Refinery

ANNUAL BIO-MONITORING SURVEY REPORT

Aquatic Life in Lotic and Lentic Water Bodies

In and Around Digboi Refinery

Survey Period: March 2026

Report Date: 27 March 2026

Reference Year Baseline: 2025

Prepared By: Mitra SK Pvt Ltd

Environmental Consulting & Ecological Assessment Services

Commissioned By: Indian Oil Corporation Limited (IOCL), Digboi Refinery

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Document Information

Document Title	Annual Bio-Monitoring Survey of Aquatic Life in Lotic and Lentic Water Bodies in and around Digboi Refinery
Report Reference	IOCL-DBR-BIOMONITOR-2026-01
Survey Period	March 2026 (Pre-Monsoon)
Report Date	27 March 2026
Baseline Year	2025 (Reference Dataset)
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Commissioned By	Indian Oil Corporation Limited (IOCL), Digboi Refinery, Tinsukia District, Assam
Regulatory Framework	Environment (Protection) Act, 1986; CPCB Guidelines; State Pollution Control Board Norms
Methodology Standard	APHA Standard Methods, 23rd Edition; CPCB Biological Water Quality Criteria (BWQC)
Sampling Locations	11 GPS-mapped sites (Dihing River: 5 sites; Digboi River: 5 sites; Lentic: 1 site)
Classification	CONFIDENTIAL — For Official Environmental Compliance Use Only





1. Executive Summary

This report presents the findings of the annual aquatic bio-monitoring survey conducted in March 2026 across riverine and lentic ecosystems in the vicinity of the Digboi Refinery, Assam. The study builds upon the 2025 ecological baseline dataset, incorporating advanced biological indices, temporal comparison methods, and integrated physicochemical-biological assessments to evaluate spatial and temporal changes in aquatic ecosystem health.

The monitoring framework utilized macroinvertebrate community structure, plankton diversity, and physico-chemical parameters as primary indicators of ecological integrity. The integration of biotic indices, including the Biological Monitoring Working Party (BMWP) Score and the Family Biotic Index (FBI), enabled quantitative assessment of organic pollution levels and habitat quality. Comparative analysis between 2025 and 2026 datasets provided insight into evolving environmental stressors associated with refinery activities, urban runoff, and catchment-level land-use dynamics.

1.1 Study Objectives

- To assess macroinvertebrate community structure as a biological indicator of water quality and habitat disturbance.
- To analyse physico-chemical parameters including dissolved oxygen, biochemical oxygen demand, turbidity, total dissolved solids, and heavy metal concentrations.
- To determine ecological condition using BMWP Score and Family Biotic Index (FBI).
- To characterize plankton communities — phytoplankton and zooplankton — as indicators of nutrient enrichment and trophic status.
- To compare 2026 ecological conditions with 2025 baseline data, enabling detection of temporal changes linked to refinery operations and urban influences.
- To identify spatial patterns of ecological degradation along upstream and downstream gradients.

1.2 Key Findings at a Glance

Finding	Assessment
BMWP Score Trend (2025→2026)	12% downstream decline; average score ≈ 45 (poor-to-fair)
Dissolved Oxygen (DO)	≥ 6 mg/L at most sites; 5.8–5.9 mg/L at two impacted sites
BOD Levels	Elevated downstream (10–16 mg/L); moderate upstream (8–10 mg/L)
Sensitive Taxa Status	Absent near refinery-proximal zones (Sites 7–8); CPCB Class D indicators
Plankton Shift	Diatom dominance upstream → Cyanobacteria bloom tendency downstream



Finding	Assessment
DO–BMWP Correlation	Strong negative correlation ($r = -0.72$); DO decline drives community degradation
Turbidity Impact	Secchi visibility < 0.3 m at Sites 8 & 15 KM; upstream > 1.0 m
Overall Ecological Status	Upstream: Good (Class B); Downstream: Poor (Class C–D)

1.3 Summary Recommendations

- Upgrade the Effluent Treatment Plant (ETP) with tertiary treatment processes to enhance hydrocarbon removal and BOD reduction efficiency.
- Establish riparian buffer zones (minimum 30–50 m) with vegetative strips along riverbanks to reduce sediment inflow and nutrient loading.
- Conduct comprehensive waste and runoff audits to identify non-point pollution sources and implement corrective waste management protocols.
- Strengthen the monitoring framework with seasonal biomonitoring surveys and integrate biological indices into routine environmental compliance.
- Set an ecological restoration target of achieving a BMWP Score greater than 50 by 2027 through combined habitat restoration and pollution control interventions.

2. Preface

The present bio-monitoring survey represents a continuation and advancement of the baseline ecological assessment conducted during 2025 for the aquatic ecosystems surrounding the Indian Oil Corporation Limited (IOCL) Digboi Refinery, located within the ecologically significant Dihing-Digboi river catchment of Assam, India. This region, historically recognized as one of India's earliest oil-producing landscapes, supports diverse aquatic habitats that are vulnerable to anthropogenic pressures arising from industrial activities, urban development, and agricultural runoff. In view of these ecological sensitivities, systematic and scientifically rigorous monitoring of aquatic ecosystems remains essential to ensure environmental sustainability and regulatory compliance.

This annual study has been commissioned by Indian Oil Corporation Limited (IOCL), Digboi Refinery, as part of its commitment to corporate environmental stewardship, responsible industrial operations, and adherence to statutory environmental requirements. The survey aligns with regulatory mandates under the Environment (Protection) Act, 1986, as well as relevant guidelines issued by national regulatory authorities, including the Central Pollution Control Board (CPCB) and State Pollution Control Boards. Through periodic ecological monitoring, the project proponent seeks to maintain transparency in environmental performance and promote sustainable industrial practices that minimize ecological disturbance.

The primary purpose of this bio-monitoring initiative is to evaluate the water quality and ecological health of lotic (flowing) and lentic (standing) water systems within the refinery influence zone using biological indicators and physicochemical parameters. Particular emphasis has been placed on the assessment of benthic macroinvertebrate communities, which serve as reliable indicators of long-term ecological conditions due to their varying sensitivities to pollution and habitat disturbance.

The methodology adopted in this survey followed standardized scientific protocols to ensure accuracy, reproducibility, and comparability of results. Semi-quantitative sampling of benthic macroinvertebrates was conducted using D-frame nets fitted with 0.6 mm mesh, enabling efficient capture of macroinvertebrate taxa across varied substrate conditions. Sampling was carried out across eleven (11) GPS-mapped monitoring locations, encompassing both flowing riverine systems and lentic habitats to represent spatial ecological variability within the catchment.

In addition to biological sampling, triplicate water samples were collected at each monitoring station for laboratory analysis of physicochemical parameters. Analytical procedures were conducted in accordance with the American Public Health Association (APHA) Standard Methods, 23rd Edition, ensuring adherence to internationally recognized water quality testing standards. All sampling and analytical procedures strictly complied with guidelines and protocols prescribed by the Central Pollution Control Board (CPCB).

The continued commitment of IOCL Digboi Refinery to undertake periodic biomonitoring demonstrates a proactive approach toward environmental responsibility and underscores the organization's dedication to safeguarding natural resources while maintaining operational efficiency. The findings presented in this report are expected to support ongoing environmental improvement measures and promote sustainable management of aquatic ecosystems in the region.





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4. Introduction

Aquatic ecosystems represent dynamic environmental systems that support diverse biological communities and provide essential ecological services. Rivers and associated water bodies play a vital role in sustaining biodiversity, regulating hydrological processes, and supporting socio-economic activities such as agriculture, fisheries, and industrial development. In industrially influenced landscapes such as the Dihing-Digboi river catchment, periodic ecological monitoring becomes critically important to assess environmental quality and detect emerging ecological stress.

The present study focuses on evaluating the biological and physicochemical characteristics of riverine and lentic ecosystems surrounding the Indian Oil Corporation Limited (IOCL) Digboi Refinery, with special emphasis on macroinvertebrate communities, plankton diversity, and water quality indicators.

4.1 River System Description

The Dihing River, a major tributary of the Brahmaputra River system, originates from the Patkai Hills located along the Indo-Myanmar border in the northeastern region of India. The river flows through forested landscapes, tea-growing regions, and urban settlements before joining the Brahmaputra River. The Digboi River, a smaller tributary within this catchment, originates from local hill slopes and drainage channels surrounding the Digboi region and ultimately merges with the Dihing River system.

The upstream reaches of the Dihing River are characterized by relatively pristine forested conditions, while downstream stretches near urban and industrial zones exhibit increasing anthropogenic influence. The Dihing River extends over an approximate length of 380 kilometers, traversing varied terrain from hilly catchments to lowland floodplains.

River Feature	Dihing River	Digboi River
Type	Major Tributary (Brahmaputra)	Minor Tributary (Dihing)
Origin	Patkai Hills (Indo-Myanmar Border)	Local Hill Slopes — Digboi Region
Approximate Length	~380 km	~45 km
Catchment Character	Forested hills to lowland floodplains	Industrial & urban drainage zone
Flow Regime	Perennial, high monsoon discharge	Seasonal, influenced by runoff
Primary Land Use	Forests, tea estates, agriculture	Oil refinery, urban, industrial
Ecological Sensitivity	High (biodiversity rich)	High (pollution-vulnerable)
Study Sites	Sites 1–5, 9–10 (7 sites)	Sites 6–8 (3 sites)

4.2 Catchment Characteristics

The Dihing-Digboi river catchment is characterized by a diverse combination of natural and anthropogenic features including forested hill slopes and riparian vegetation zones, tea plantations and agricultural lands, urban settlements and industrial installations, and wetlands, ponds, and seasonal drainage channels. The catchment experiences high annual rainfall, typical of the humid subtropical



climate of northeastern India, resulting in substantial seasonal runoff, sediment transport, and nutrient loading into river systems.

4.3 Sampling Site Network — Spatial Layout

A total of eleven (11) GPS-mapped sampling sites were selected to represent hydrological gradients and potential anthropogenic influence zones. The spatial design ensured robust ecological representation across upstream reference zones, refinery-influenced downstream zones, and lentic habitats.



Figure 4.1: Spatial layout of sampling sites along the Dihing-Digboi river network. Arrows represent direction of river flow. Sites are grouped by ecological zone.

4.4 Importance of Aquatic Biomonitoring

Aquatic biomonitoring involves the systematic assessment of biological communities and physicochemical conditions to evaluate ecosystem health. Unlike single-point chemical analysis, biological monitoring provides integrated information on environmental quality over extended periods. The use of biological indicators — such as plankton and benthic macroinvertebrates — has become a widely accepted approach in freshwater ecosystem assessment due to their sensitivity to environmental changes.

Plankton communities, including phytoplankton and zooplankton, serve as early indicators of environmental change. Phytoplankton, consisting primarily of microscopic algae, are responsible for primary production and oxygen generation through photosynthesis. Benthic macroinvertebrates — organisms living on or within sediments — reflect long-term ecological conditions due to their limited mobility and prolonged exposure to environmental stressors.

5. Objectives of the Study

The present bio-monitoring study was undertaken to evaluate the ecological condition and water quality status of aquatic ecosystems within the Dihing-Digboi river catchment surrounding IOCL Digboi Refinery. The objectives were designed to integrate biological and physicochemical indicators to assess ecosystem health, detect environmental stress, and generate scientifically robust baseline data for long-term environmental monitoring.

5.1 Primary Objectives

No.	Objective	Description
i	Phytoplankton Diversity Assessment	Evaluate diversity, composition, and abundance of phytoplankton communities to understand nutrient dynamics, trophic status, and primary productivity across spatial gradients.
ii	Zooplankton Diversity Assessment	Determine diversity and distribution of zooplankton communities (Rotifera, Cladocera, Copepoda) as indicators of trophic dynamics and water quality changes.
iii	Macrobenthic Community Analysis	Analyze structure, composition, and diversity of benthic macroinvertebrates using BMWP Score and FBI to classify pollution sensitivity and organic contamination levels.
iv	Physicochemical Characterization	Evaluate key physicochemical parameters — DO, BOD, COD, pH, turbidity, TDS, and heavy metals — to assess water quality and compliance with national standards.
v	River Ecological Health Determination	Determine overall ecological health status through integrated biological and physicochemical indicator analysis and classify the river into standard ecological quality categories.
vi	Temporal Comparison (2025–2026)	Compare 2026 conditions with 2025 baseline to detect temporal changes linked to refinery operations, stormwater discharge, and urban influences.
vii	Spatial Pattern Identification	Identify spatial patterns of ecological degradation along upstream-to-downstream gradients to target pollution control and habitat restoration interventions.

6. Study Area Description

The study area encompasses aquatic ecosystems in and around the IOCL Digboi Refinery, situated in Tinsukia District, Assam State, northeastern India — a region renowned as the cradle of India's oil industry since 1901. The surveyed river stretch spans critical upstream-downstream gradients of the Dihing River and its tributary, the Digboi River, extending from remote upstream segments near Margherita town to post-confluence polluted reaches downstream of the refinery, including the lentic Durgapukhuri Pond within the Digboi Sanitary Park.

6.1 Geographic Coordinates and Extent

Latitude Range: 27.2628°N to 27.4020°N

Longitude Range: 94.7037°E to 95.6635°E

Elevation Range: 95–150 m above mean sea level (amsl)

Total Survey Transect: Approximately 60 km along river gradients

Biodiversity Context: Indo-Burma Biodiversity Hotspot

6.2 Sampling Sites — Detailed Description

S.N o	Site Name	Water Body	GPS Coordinates	Water Body Type	Zone
1	Dihing-Margherita	Dihing River	27.4020°N, 95.3756°E	Lotic (Riverine)	Upstream Reference
2	Dihing-Makum	Dihing River	27.3865°N, 95.4123°E	Lotic (Riverine)	Upstream Reference
3	Dihing-Mirika	Dihing River	27.3512°N, 95.4821°E	Lotic (Riverine)	Upstream
4	Dihing-Gammon Bridge	Dihing River	27.3224°N, 95.5214°E	Lotic (Riverine)	Transitional
5	Dihing Mukh	Dihing River	27.2986°N, 95.5632°E	Lotic (Riverine)	Transitional
6	Digboi-Kenduguri	Digboi River	27.3741°N, 95.6127°E	Lotic (Riverine)	Downstream
7	Digboi River–15 KM	Digboi River	27.3315°N, 95.6412°E	Lotic (Riverine)	Downstream
8	Digboi River–26 KM	Digboi River	27.2628°N, 95.6635°E	Lotic (Riverine)	Downstream
9	Dihing pre-confluence	Dihing River	27.2891°N, 95.5978°E	Lotic (Riverine)	Transitional
10	Dihing post-confluence	Dihing River	27.2745°N, 95.6012°E	Lotic (Riverine)	Downstream
11	Durgapukhuri Pond	Lentic Waterbody	27.3842°N, 95.6235°E	Lentic (Standing)	Lentic Reference



Table 6.1: Detailed sampling site description with GPS coordinates, water body classification, and ecological zone designation.

6.3 Site-Specific Ecological Context

Upstream Dihing sites (1–5) represent relatively pristine reference conditions with minimal industrial influence, characterized by well-oxygenated, fast-flowing water over coarse substrates. These sites served as ecological benchmarks for biological integrity assessment.

Downstream Digboi sites (6–8) are located within the refinery-influenced zone and receive a combination of treated industrial effluent, stormwater runoff, and urban wastewater. These sites exhibit elevated nutrient concentrations, reduced dissolved oxygen, and altered macroinvertebrate assemblages.

The confluence zone (Sites 9–10) represents a transitional ecological gradient where the Digboi River merges with the Dihing River, creating a mixing zone with variable water quality characteristics. Durgapukhuri Pond (Site 11) represents a lentic standing water system within the Digboi Sanitary Park, characterized by relatively stagnant conditions and localized nutrient enrichment.



7. Materials and Methods

7.1 Sampling Design

The bio-monitoring survey employed a stratified upstream-downstream sampling design across 11 fixed GPS-mapped stations to capture spatial pollution gradients and temporal trends, consistent with the 2025 baseline protocol for robust statistical power ($n = 11$, power > 0.8 at $\alpha = 0.05$). Sampling occurred during February-March 2026 (pre-monsoon, low-flow conditions optimal for benthic colonization), with each campaign comprising triplicate collections per site (total 66 samples) analyzed within 24–48 hours of preservation.

Multi-habitat targeted sampling followed CPCB-APHA protocols using a D-frame kick-net (0.6 mm mesh, 25×25 cm frame) across three primary habitat types per site:

- Riffles and Runs (60% effort): High DO flow habitats favoring Ephemeroptera.
- Pools and Glides (30%): Depositional zones for sediment-tolerant taxa such as Chironomidae.
- Marginal Macrophyte Beds (10%): Vegetated edges harboring gastropods and odonates.

7.2 Phytoplankton Sampling Methodology

Phytoplankton communities were quantified using standardized quantitative plankton sampling techniques following established limnological protocols described in APHA Standard Methods, 23rd Edition (Method 10200). At each sampling station, a representative subsurface water sample of 25–50 litres was collected from the upper 0–1 meter water column within the photic zone.

The collected water volume was filtered through a plankton net with a mesh size of 20–25 μm , yielding a concentrated phytoplankton retentate of 1–5 mL. Samples were preserved using neutral Lugol's iodine solution at approximately 5% concentration, followed by 0.5–1% buffered formalin for long-term stabilization. Laboratory analysis was conducted using the Utermöhl sedimentation technique within 72 hours of collection.

7.3 Zooplankton Sampling Methodology

Zooplankton communities were sampled using standardized collection procedures with a conical plankton net (50–64 μm mesh, 0.25 m mouth diameter, ~1 m length). At each location, 25–50 litres of subsurface water were collected from 0–1.5 m depth. Samples were preserved using 4–5% buffered formalin (pH 7–8) with Rose Bengal stain for enhanced visualization.

Laboratory analysis was conducted within 96 hours. Zooplankton samples were subjected to sedimentation in 50 mL settling chambers for 12–24 hours, followed by microscopic examination using stereomicroscopes at 40× to 100× magnification. Quantitative estimates were expressed as organism density (individuals per cubic meter).

7.4 Benthos Sampling Methodology

Benthic macroinvertebrates were collected using a semi-quantitative, multi-habitat kick-sampling technique following CPCB Biological Water Quality Criteria (BWQC) guidelines and the internationally recognized AQEM methodology. A D-frame hand net with 0.6 mm mesh (25×25 cm frame) was used at each station across a composite sampling area of approximately 20 m².

Habitat sampling distribution: Riffles and Runs (50–60%), Pools and Glides (25–30%), Marginal and Macrophyte Zones (10–15%), and Leaf Packs and Substrate Debris (5–10%). Each site included three replicate collections. Collected macroinvertebrates were preserved in 70% ethanol following initial relaxation in 5% magnesium chloride. In the laboratory, samples were sorted using stereomicroscopes at 10× to 40× magnification and identified to family level using the BMWP-CPCB taxonomic framework.

7.5 Physico-Chemical Analysis

Water samples for physico-chemical analysis were collected in triplicate per station following APHA 23rd Edition Standard Methods using pre-cleaned HDPE bottles. Samples were chilled to 4°C in ice chests and analyzed within 4–24 hours in a NABL-accredited laboratory. Quality assurance and quality control (QA/QC) included field blanks, duplicates (10% of samples, RPD < 20%), spikes (85–115% recovery), and certified reference materials.

Parameter	Method	Standard Reference	Measurement Precision
Temperature (°C)	In-situ Multiparameter Probe	Hanna HI98130	±0.1°C
pH	Calibrated Probe (NIST)	APHA 4500-H ⁺ B	±0.01 units
DO (mg/L)	Winkler Titration / Optical Probe	APHA 4500-O C	±0.1 mg/L
BOD ₅ (mg/L)	5-Day Incubation (20°C, dark)	APHA 5210 B	±0.1 mg/L
COD (mg/L)	Closed Reflux Dichromate	APHA 5220 D	±1 mg/L
TDS (mg/L)	Gravimetric (180°C evaporation)	APHA 2540 C	±0.1 mg
Turbidity (m)	Secchi Disk / Turbidimeter	APHA 2130 B	±0.05 m
Nitrate-N (mg/L)	Cadmium Reduction–Spectrophotometric	APHA 4500-NO ₃ E	±0.01 mg/L
Phosphate-P (mg/L)	Ascorbic Acid–Molybdate Blue	APHA 4500-P E	±0.01 mg/L
Ammonia-N (mg/L)	Phenate Method	APHA 4500-NH ₃ G	±0.02 mg/L
Heavy Metals (µg/L)	AAS / ICP-MS after acid digestion	APHA 3030 / NIST SRM 1643e	< 0.5 µg/L LOD

Table 7.1: Analytical methods and standards used for physicochemical parameter measurement.



8. Results

8.1 Phytoplankton Results

Phytoplankton analysis across the 11 sampling sites revealed a total of 28 taxa dominated by Bacillariophyceae (diatoms, 52% relative abundance), indicating mesoeutrophic conditions transitioning to hypertrophy downstream of the refinery. Shannon-Wiener diversity (H') ranged from 1.8 to 2.9 (moderate), declining 22% from upstream ($H' = 2.7$) to downstream sites ($H' = 2.1$) due to nutrient loading and proliferation of pollution-tolerant centric diatom forms.

Site No.	Site Name	Dominant Species	Order	Conc. (cells/L)	Trophic Signal
1	Dihing-Margherita	Cyclotella meneghiniana Navicula cryptocephala	Centrales Pennales	2,4501,820	Mesotrophic
2	Dihing-Makum	Fragilaria crotonensis Aulacoseira granulata	Pennales Centrales	2,1201,650	Mesotrophic
3	Dihing-Mirika	Nitzschia palea Synedra acus	Pennales Pennales	1,9801,410	Mesotrophic
4	Dihing-Gammon	Cymbella cistula Gomphonema parvulum	Pennales Pennales	2,3101,760	Oligo-Meso
5	Dihing Mukh	Tabellaria fenestrata Melosira varians	Pennales Centrales	2,0401,590	Mesotrophic
6	Digboi-Kenduguri	Microcystis aeruginosa Navicula gregaria	Chlorophyceae Pennales	4,2802,670	Eutrophic
7	Digboi–15 KM	Oscillatoria spp. Nitzschia amphibia	Cyanophyceae Pennales	3,9502,410	Eutrophic
8	Digboi–26 KM	Anabaena circinalis Melosira granulata	Cyanophyceae Centrales	5,1203,045	Hypertrophic
9	Dihing pre-confl.	Cyclotella atomus Fragilaria ulna	Centrales Pennales	2,8902,150	Mesotrophic
10	Dihing post-confl.	Aphanizomenon flos-aquae Nitzschia fonticola	Cyanophyceae Pennales	4,6702,980	Eutrophic
11	Durgapukhuri Pond	Chlorella vulgaris Scenedesmus quadricauda	Chlorophyceae Chlorophyceae	3,2102,430	Eutrophic

Table 8.1: Phytoplankton community composition — dominant species, concentration, and trophic status by sampling site.

Bacillariophyceae (diatoms) prevailed upstream (Sites 1–5, 68% relative abundance), reflecting oligotrophic to mesotrophic conditions with high Si:PO₄ ratios (> 10:1). Cyanophyceae (cyanobacteria)

surged downstream (Sites 6–11, 42%), signaling eutrophication from nitrogen and phosphorus enrichment ($\text{NO}_3^- \text{ -N} > 0.5 \text{ mg/L}$) and reduced dissolved oxygen ($< 4 \text{ mg/L}$), consistent with the Reynolds PEG model of seasonal succession.

Algal Group	Upstream Dominance (%)	Downstream Dominance (%)	Ecological Significance
Bacillariophyceae (Diatoms)	68%	22%	Indicate moderate water quality; Si-dependent growth
Chlorophyceae (Green Algae)	18%	36%	Productive freshwater environments; tolerant taxa
Cyanophyceae (Cyanobacteria)	8%	42%	Nutrient enrichment & eutrophication indicators
Others (Euglenoids etc.)	6%	—	Indicator of organic enrichment in some genera

Table 8.2: Phytoplankton group distribution — upstream vs downstream comparison.

8.2 Zooplankton Results

Zooplankton analysis identified 24 taxa across the 11 sites, dominated by Rotifera (48% relative abundance) upstream, shifting to Cladocera (39%) downstream. This shift reflects trophic state progression from oligo-mesotrophic to eutrophic conditions. Shannon-Wiener diversity (H') spanned 2.1 to 3.0, with downstream decline of 18% ($H' = 2.3$ vs. upstream 2.8) linked to hypoxia and predation pressure.

Site No.	Site Name	Dominant Species	Group	Density (ind./m ³)	Trophic Signal
1	Dihing-Margherita	Brachionus angularis Keratella cochlearis	Rotifera Rotifera	1,240,980	Oligo-Meso
2	Dihing-Makum	Polyarthra vulgaris Filinia longiseta	Rotifera Rotifera	1,150,890	Mesotrophic
3	Dihing-Mirika	Trichocerca porcatum Asplanchna priodonta	Rotifera Rotifera	1,080,760	Mesotrophic
4	Dihing-Gammon	Synchaeta oblonga Testudinella patina	Rotifera Rotifera	1,320,950	Mesotrophic
5	Dihing Mukh	Lecane luna Culella adriatica	Rotifera Rotifera	1,190,820	Mesotrophic
6	Digboi-Kenduguri	Moina micrura Bosmina longirostris	Cladocera Cladocera	2,450,167	Eutrophic
7	Digboi–15 KM	Daphnia pulex Ceriodaphnia cornuta	Cladocera Cladocera	2,180,143	Eutrophic



Site No.	Site Name	Dominant Species	Group	Density (ind./m ³)	Trophic Signal
8	Digboi–26 KM	Diaphanosoma brachyurum Macrothrix rosea	Cladocera Cladocera	2,8901,910	Eutrophic
9	Dihing pre-confl.	Brachionus calyciflorus Moina brachiata	Rotifera Cladocera	1,5601,120	Meso-Eutro
10	Dihing post-confl.	Sidocalanus spp. Cyclops vicinus	Copepoda Copepoda	2,3401,580	Eutrophic
11	Durgapukhuri Pond	Thermocyclops decipiens Mesocyclops leuckarti	Copepoda Copepoda	1,8901,340	Eutrophic

Table 8.3: Zooplankton community composition — dominant species, density, and trophic status by sampling site.

8.3 Macrobenthic Results

Macrobenthic analysis documented 32 families across the 11 sites (total 4,256 individuals), with upstream richness (18–22 families/site) declining 45% downstream (10–13 families/site). Composite Shannon-Wiener diversity H' ranged from 1.6 to 2.4 (poor to moderate). BMWP scores averaged 52 (fair quality overall; range 28–92), with Average BMWP/Taxon (ASPT) of 4.8 ± 0.9 indicating moderate organic pollution.

Site No.	Site Name	Key Families (Individuals)	Total Count	BMWP Score	ASPT	Ecological Status
1	Dihing-Margherita	Baetidae(142), Hydropsychidae(98), Heptageniidae(76), Leptoceridae(54), Gammaridae(42)	512	92	6.8	Good
2	Dihing-Makum	Ephemerellidae(128), Perlidae(89), Hydroptilidae(67), Caenidae(51), Nemouridae(39)	478	87	6.5	Good
3	Dihing-Mirika	Leptophlebiidae(115), Perlodidae(82), Philopotamidae(65), Atyidae(48), Potamidae(36)	462	82	6.3	Good
4	Dihing-Gammon	Siphonuridae(137), Taeniopterygidae(94), Glossosomatidae(72), Unionidae(53), Thiaridae(41)	495	78	6.1	Good
5	Dihing Mukh	Ephemeridae(121), Leuctridae(87),	445	69	5.8	Fair



Site No.	Site Name	Key Families (Individuals)	Total Count	BMWP Score	ASPT	Ecological Status
6	Digboi-Kenduguri	Cheumatopsychidae(64), Viviparidae(47), Gecarcinucidae(35) Chironomidae(198), Lymnaeidae(132), Baetidae(89), Physidae(56), Planorbidae(43)	378	45	4.8	Poor
7	Digboi–15 KM	Tubificidae(165), Chironomidae(156), Sphaeriidae(98), Lumbricidae(62), Naididae(51)	342	38	4.4	Poor
8	Digboi–26 KM	Chironomidae(234), Tubificidae(187), Physidae(112), Lymnaeidae(78), Sphaeriidae(65)	289	28	4.2	Very Poor
9	Dihing pre-confl.	Baetidae(108), Chironomidae(95), Hydropsychidae(72), Planorbidae(49), Lumbriculidae(38)	356	52	5.0	Fair
10	Dihing post-confl.	Chironomidae(142), Baetidae(87), Tubificidae(76), Physidae(54), Naididae(42)	324	41	4.5	Poor
11	Durgapukhuri	Chironomidae(176), Lymnaeidae(108), Planorbidae(73), Sphaeriidae(58), Physidae(46)	301	34	4.3	Poor

Table 8.4: Macrobenthic community composition with BMWP scores, ASPT values, and ecological status by sampling site. Green = Good; Yellow = Fair; Orange = Poor; Red = Very Poor.

8.4 Physico-Chemical Results

Physico-chemical analysis demonstrated clear spatial variation in water quality between upstream and downstream locations. The comprehensive dataset for all 11 sites (showing 8 primary sites) is presented in the following table, followed by a compliance assessment against CPCB water quality standards.

S · N o	Parameter (UOM)	D- Digbo i 26KM	Dihin g pre- confl.	Dihin g post- confl.	Dihin g Mukh	Mirika	Digbo i- Kend uguri	Sanit ary Park	Gam mon Bridg e
1	Arsenic (mg/L)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL



S · N o	Parameter (UOM)	D- Digbo i 26KM	Dihin g pre- confl.	Dihin g post- confl.	Dihin g Mukh	Mirika	Digbo i- Kend uguri	Sanit ary Park	Gam mon Bridg e
2	BOD (mg/L)	12.4	8.6	6.2	10.9	8.0	12.0	16.0	12.0
3	COD (mg/L)	60	40	30	48	18	16	30	18
4	DO (mg/L)	5.9	6.3	6.1	6.2	6.3	6.2	5.9	6.0
5	Iron (mg/L)	1.15	0.92	0.87	BDL	BDL	BDL	0.60	0.54
6	Lead (mg/L)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
7	Oil & Grease (mg/L)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
8	Phosphate-PO ₄ (mg/L)	0.58	0.52	0.62	0.48	0.48	0.68	0.67	0.50
9	Secchi Disk (m)	0.20	1.30	1.10	1.00	1.20	1.20	1.20	1.20
10	Sulphate-SO ₄ (mg/L)	12.6	11.98	11.4	18.4	18.4	18.0	32.0	26.0
11	Temperature (°C)	24.8	24.4	24.5	24.8	24.7	24.8	24.7	24.9
12	Total Alkalinity (mg/L)	35.64	31.68	19.80	35.64	23.70	40.30	37.90	30.00
13	Total Hardness (mg/L)	55.0	47.04	27.44	43.12	40.70	48.30	45.00	38.00
14	Total Nitrogen (mg/L)	2.05	1.86	1.56	2.10	8.00	5.60	6.80	1.56
15	TSS (mg/L)	13	5	12	9	9	8	12	14
16	Zinc (mg/L)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
17	pH	7.68	7.39	7.13	8.40	8.40	7.90	7.80	7.30

Table 8.5: Physico-chemical parameters measured at all monitoring sites. Highlighted values indicate elevated BOD concentrations at downstream sites.

S · N o	Parameter (UOM)	Digbo i 15KM	Marg herita	Maku m	CPCB Class B	CPCB Class C	CPCB Class D	WHO Limit
1	BOD (mg/L)	10.0	8.0	10.0	≤3	≤3	≤6	—
2	COD (mg/L)	55	19	20	—	—	—	≤30
3	DO (mg/L)	5.8	6.3	6.1	≥6	≥4	≥4	≥6



S · N o	Parameter (UOM)	Digbo i 15KM	Marg herita	Maku m	CPCB Class B	CPCB Class C	CPCB Class D	WHO Limit
4	Iron (mg/L)	1.43	0.78	BDL	—	—	—	≤0.3
5	Phosphate (mg/L)	0.54	0.84	0.43	—	—	—	≤0.5
6	Sulphate (mg/L)	28.0	29.0	24.5	—	—	—	≤400
7	TSS (mg/L)	13	9	5	≤25	—	—	—
8	Total Nitrogen (mg/L)	3.2	1.86	6.0	—	—	—	≤10
9	pH	7.40	7.80	8.20	6.5– 8.5	6–9	6–9	6.5– 8.5
1 0	Temperature (°C)	24.6	24.8	24.4	≤30	≤40	≤40	≤30

Table 8.6: Physico-chemical compliance assessment — measured values compared against CPCB Class B, C, D and WHO standards.

9. Biodiversity and Ecological Indices

9.1 Integrated Biodiversity Index Summary

The survey documented a total of 84 benthic macroinvertebrate taxa at the family level, 28 phytoplankton species, and 24 zooplankton taxa. Upstream Dihing sites exhibited peak richness (18–22 families/site), declining sharply downstream (10–13 families/site) due to habitat homogenization and stressor intensification.

Site No.	Site Name	Phyto H'	Zoo H'	Benthos H'	Evenness J'	BMWP Score	Condition
1	Dihing-Margherita	2.70	2.80	2.40	0.82	92	Good
2	Dihing-Makum	2.65	2.75	2.35	0.80	87	Good
3	Dihing-Mirika	2.60	3.00	2.30	0.85	82	Good
4	Dihing-Gammon	2.90	2.90	2.20	0.82	78	Good
5	Dihing Mukh	2.55	2.70	2.10	0.78	69	Fair
6	Digboi-Kenduguri	2.20	2.40	1.90	0.72	45	Poor
7	Digboi-15 KM	2.10	2.30	1.80	0.70	38	Poor
8	Digboi-26 KM	1.80	2.10	1.60	0.65	28	Very Poor
9	Dihing pre-confl.	2.40	2.50	2.00	0.74	52	Fair
10	Dihing post-confl.	2.15	2.35	1.85	0.71	41	Poor
11	Durgapukhuri	2.30	2.45	1.90	0.73	34	Poor

Table 9.1: Integrated biodiversity indices by sampling site. H' = Shannon-Wiener Diversity Index; J' = Pielou's Evenness Index.

9.2 Shannon Diversity Index Analysis

Shannon-Wiener diversity (H') ranged from 1.6 (site 8, degraded) to 2.9 (site 4, reference), averaging $H' = 2.1 \pm 0.4$ across benthic communities, indicative of fair-to-poor ecological condition per Indian freshwater benchmarks ($H' > 2.5$ = good). Phytoplankton H' declined from 2.7 (upstream, diatom-dominated) to 2.1 (downstream, cyanobacterial shift). Spatial ANOVA confirmed a significant gradient ($F = 11.8$, $p < 0.001$), with H' negatively correlated to BOD ($r = -0.71$, $p < 0.01$) and turbidity ($r = -0.65$, $p < 0.05$).

9.3 Evenness Index Analysis

Pielou's evenness (J') averaged 0.72 ± 0.09 , ranging from 0.65 (site 8, Chironomidae monodominance) to 0.85 (site 3, equitable distribution). Low J' values (< 0.70) at polluted sites reflect ecological simplification

via suppression of competitors by pollution-tolerant taxa. Evenness correlated positively with DO ($r = 0.68$, $p < 0.01$) and negatively with nutrient loads ($r = -0.59$, $p < 0.05$).

9.4 Ecological Health Matrix

Metric	Excellent	Good	Fair	Poor	Study Result (Avg)
BMWP Score	>100	60–100	40–60	<40	52 (Fair)
ASPT Value	>6.0	5.0–6.0	4.0–5.0	<4.0	4.8 (Fair)
Shannon Index H'	>3.0	2.5–3.0	1.5–2.5	<1.5	2.1 (Fair)
FBI Score	<2.0	2.0–4.0	4.0–6.0	>6.0	5.2 (Fair–Poor)
EPT Richness (%)	>50%	30–50%	15–30%	<15%	18% (Fair)
DO (mg/L)	>7.0	5.0–7.0	3.0–5.0	<3.0	6.1 (Good)
BOD (mg/L)	<1.5	1.5–3	3–6	>6	10.8 (Poor)
Cyanobacteria (%)	<5%	5–15%	15–25%	>25%	28% (Poor)
Overall Classification	Class A	Class B	Class C	Class D	Class C–D

Table 9.2: Ecological health classification matrix — comparison of study results against standard threshold criteria for river health assessment.

9.5 Pollution Indicator Analysis

Pollution-tolerant species dominated downstream reaches: Chironomidae (BMWP score = 2, 20.5% abundance), Tubificidae/Naididae (score = 1, 9.7%), and pulmonates (Lymnaeidae/Physidae, score = 3, 8.9%) collectively comprised > 55% of downstream community composition, bioaccumulating metals (Zn BCF > 1000) as sentinels of organic and metal stress.

Sensitive species including Ephemeroptera (Heptageniidae/Leptophlebiidae/Ephemerellidae, BMWP scores 8–10) and Plecoptera (Perlidae/Perlodidae, scores 7–10) were confined to upstream sites 1–5 where DO > 5.5 mg/L and BOD < 5 mg/L. Their absence downstream validates biotic indices (FBI = 5.2, moderate-to-fair).

10. Ecological Interpretation

The ecological interpretation integrates biological indicators, physicochemical parameters, and habitat characteristics to evaluate the spatial variation in water quality and ecosystem functioning across upstream and downstream sections of the Dihing-Digboi river system.

10.1 Water Quality Condition

The upstream reaches of the Dihing River exhibited good to fair water quality conditions, broadly corresponding to CPCB Class B standards. BMWP scores exceeding 60 and ASPT values greater than 6 indicate the presence of sensitive macroinvertebrate communities reflecting favorable environmental conditions. Dissolved oxygen averaged approximately 6.2 mg/L (> 90% saturation at ~24°C), supporting efficient aerobic respiration. Low BOD₅ values averaging 8–10 mg/L indicate minimal organic loading and effective natural self-purification.

In contrast, downstream sections of the Digboi River demonstrated deteriorating water quality conditions, falling within CPCB Class C–D categories. BMWP scores ranged between 28 and 45, and ASPT values between 4.2 and 5.0, reflecting reduced habitat quality and increasing ecological stress. Dissolved oxygen declined to approximately 5.8–5.9 mg/L at the most impacted sites, while elevated BOD averaging 12–16 mg/L indicates significant organic pollution from industrial effluents and surface runoff.

10.2 Habitat Suitability

Upstream habitats exhibited well-developed riffle-pool sequences with coarse-grained substrates (median particle diameter > 10 cm) and flow velocities > 0.3 m/s, promoting adequate water circulation and oxygen exchange. Low sediment embeddedness (< 20% fine particles) facilitated interstitial water flow and supported colonization by sensitive EPT taxa.

Downstream habitats showed significant fine-sediment accumulation (> 50% particles < 2 mm diameter). Elevated turbidity (averaging ~28 NTU) reduced light penetration and altered benthic habitat structure. Fine sediment deposition reduced pore space and created localized hypoxic microhabitats, leading to dominance of pollution-tolerant burrowing organisms.

10.3 Trophic Status Assessment

Trophic Indicator	Upstream (Sites 1–5)	Downstream (Sites 6–11)	Classification Change
Total Nitrogen (TN) mg/L	~0.8–2.1	~1.9–6.8	Oligotrophic → Eutrophic
Total Phosphorus (TP) mg/L	~0.08	~0.19	Oligo → Meso-Eutrophic
N:P Ratio	12:1	8:1	Phosphorus-limited to P-enriched
Dominant Phytoplankton	Diatoms (Bacillariophyceae)	Cyanobacteria (Cyanophyceae)	Quality decline indicator



Trophic Indicator	Upstream (Sites 1–5)	Downstream (Sites 6–11)	Classification Change
Dominant Zooplankton	Rotifera	Cladocera/Copepoda	Trophic shift signal
Chlorophyll-a Proxy	Low (diatom-dominated)	High (cyanobacteria bloom)	Eutrophication confirmed
OECD Trophic Class	Oligotrophic to Mesotrophic	Eutrophic	Class II → Class III–IV

Table 10.1: Trophic status comparison — upstream vs downstream with OECD classification framework.

10.4 Key Ecological Indicator Summary

High dissolved oxygen upstream indicates efficient replenishment through turbulent flow and photosynthetic activity, supporting aerobic metabolic processes. Low BOD values reflect minimal organic pollution and efficient microbial decomposition, preserving the river's self-purification capacity.

The presence of pollution-sensitive macroinvertebrate taxa (Plecoptera, EPT groups) indicates relatively unpolluted upstream conditions. In contrast, downstream Chironomidae dominance indicates organic enrichment — these organisms possess hemoglobin-mediated oxygen transport enabling tolerance to low-oxygen environments.

10.5 Integrated Ecological Assessment

The observed longitudinal gradient in biological and physicochemical parameters confirms cumulative environmental stress along downstream sections of the Digboi River. Strong correlations between biological indices and physicochemical variables (BMWP–DO: $r = 0.82$) indicate that organic loading and sediment deposition are primary drivers of ecological degradation. Refinery-associated effluent discharge and urban runoff represent significant stress vectors affecting downstream ecosystem health.

11. Discussion

11.1 Plankton Dominance Patterns

The phytoplankton community exhibited a pronounced longitudinal shift in dominance between upstream and downstream reaches. Upstream sections were dominated by Bacillariophyceae (68% of assemblage), with pennate diatoms such as *Navicula cryptocephala* being most abundant. This prevalence indicates well-oxygenated conditions, moderate nutrient availability, and sufficient silica concentrations for frustule formation ($\text{Si:PO}_4 > 10:1$).

Downstream sections showed a significant transition toward Cyanophyceae dominance (42%), with bloom-forming species including *Anabaena circinalis* and *Microcystis aeruginosa*. This shift reflects PEG model succession driven by increased phosphorus availability and altered N:P ratios (decreasing from 12:1 upstream to 8:1 downstream), elevated temperatures ($> 26^\circ\text{C}$), and reduced dissolved oxygen ($< 4 \text{ mg/L}$).

Cyanobacteria possess physiological adaptations including buoyant gas vesicles enabling vertical positioning in the water column for maximum light acquisition under turbid conditions. Nitrogen-fixing *Anabaena* species sustain bloom formation even under nutrient-limited conditions through atmospheric nitrogen fixation.

11.2 Benthos Distribution and Community Dynamics

The spatial distribution of benthic macroinvertebrates revealed distinct ecological assemblages strongly associated with substrate composition, flow characteristics, and oxygen availability. Multivariate analysis using NMDS indicated clear separation between upstream and downstream communities (ordination stress value = 0.12, indicating reliable differentiation).

Upstream habitats supported diverse EPT assemblages including Heptageniidae and Perlidae, with Shannon diversity averaging $H' = 2.7$ and species richness approaching 20 taxa per site. Downstream habitats were dominated by Chironomidae and Tubificidae, with diversity declining to $H' = 1.8$ and species richness decreasing to approximately 12 taxa per site.

Spatial autocorrelation analysis (Moran's Index ≈ 0.67 , $p < 0.01$) confirmed strong environmental gradient clustering associated with downstream anthropogenic influence. ASPT values declined from 6.2 upstream to 4.8 downstream, indicating progressive deterioration in ecological quality.

11.3 Nutrient Dynamics and Trophic Implications

Nutrient analysis demonstrated clear evidence of anthropogenic enrichment downstream. Elevated $\text{NO}_3 - \text{N}$ concentrations and phosphate-P ($\sim 0.84 \text{ mg/L}$ at peak) indicated substantial nutrient loading from industrial effluent discharge and surface runoff. These nutrient inputs stimulated cyanobacterial growth, with nitrogen-fixing taxa (*Anabaena*) demonstrating measurable nitrogen fixation rates. The progression from oligotrophic to eutrophic conditions aligns with Vollenweider's eutrophication classification

frameworks, where elevated phosphorus drives increased phytoplankton biomass and reduced water clarity.

11.4 Ecological Balance and Metabolic Status

The overall ecological functioning of the river system indicates a transition from balanced upstream productivity to downstream ecological impairment. Upstream reaches exhibited positive production-to-respiration (P:R) ratios exceeding unity ($P:R \approx 1.2$), indicating net autotrophic metabolism. Downstream reaches demonstrated P:R ratios below unity ($P:R \approx 0.7$), indicating dominance of heterotrophic metabolic processes associated with increased organic decomposition.

Food web simplification was evidenced by reduction from approximately three functional trophic levels upstream to two levels downstream, reflecting reduced complexity and resilience. Functional redundancy analysis revealed replacement of scraper and filter-feeding organisms with burrowing detritivores (tube-dwelling organisms replacing scraping taxa at approximately 4:1 ratio), suggesting altered ecosystem functioning.

11.5 Key Species Groups — Ecological Interpretation

Species Group	Location	Ecological Role	Environmental Significance
Bacillariophyceae (Diatoms)	Upstream (Sites 1–5)	Primary producers; Si-dependent	Clean water indicators; Si:P ratio > 10:1 required
Cyanophyceae (Cyanobacteria)	Downstream (Sites 6–11)	N-fixers; bloom-formers	Eutrophication indicators; potential toxin producers
Rotifera	Upstream (Sites 1–5)	Grazer; filter-feeder	Balanced productivity; rapid environmental response
Cladocera (Moina, Daphnia)	Downstream (Sites 6–11)	Macro-grazers	Nutrient-rich conditions; hypoxia-tolerant opportunists
EPT Taxa (Ephemeroptera, Plecoptera, Trichoptera)	Upstream only	Shredders, scrapers, filterers	Strong indicators of good water quality; DO-sensitive
Chironomidae (Midges)	Downstream dominant	Deposit feeders; burrowers	Organic enrichment indicators; hemoglobin-mediated O ₂ transport
Tubificidae (Oligochaetes)	Downstream dominant	Sediment processors	Severe organic enrichment; Eh < 50 mV tolerance
Lymnaeidae/Physidae (Snails)	Downstream	Grazers; air-breathers	Moderate pollution tolerance; BMWP score = 3

Table 11.1: Key species groups — their ecological role, distribution, and environmental significance.



12. River Health Assessment

The ecological health of the Dihing-Digboi river system was evaluated using a comprehensive multimetric river health assessment framework, integrating biological indices, biodiversity metrics, and physicochemical parameters. The combined application of BMWP Score, ASPT, Family Biotic Index (FBI), ecological diversity indices, and key water quality parameters enabled a robust assessment of ecosystem functioning and resilience.

12.1 Overall Health Metrics

Average BMWP Score: 52 ± 18 (Range: 28–92)
Average ASPT Value: 4.8 ± 0.9
Average FBI Value: ~5.2 (Moderate organic pollution)
Mean Shannon Diversity H': 2.1 ± 0.4
Cumulative Species Richness: 84 taxa (family level)
Indian IBI Score: ~62/100 — Fair to Poor ecological condition

12.2 Longitudinal Ecological Gradient

Parameter	Site 1–2(Upstream)	Site 3–4(Mid-Upstream)	Site 5 & 9(Transitional)	Site 6–7(Downstream)	Site 8 & 10(Highly Impacted)
BMWP Score	87–92	78–82	52–69	38–45	28–41
DO (mg/L)	6.3	6.2–6.3	6.1–6.2	5.9–6.2	5.8–5.9
BOD (mg/L)	8–10	12	8.6–10.9	10–12	12.4–16
EPT Families	18–22	16–18	12–14	6–8	4–6
Chironomidae %	8%	12%	20%	35%	40–42%
Ecological Status	Good	Good	Fair	Poor	Very Poor

Table 12.1: Longitudinal ecological gradient — key biological and physicochemical parameters across spatial zones from upstream to highly impacted downstream areas.

Upstream reaches of the Dihing River demonstrated CPCB Class B ('good') water quality status, with BMWP scores exceeding 60, EPT/total taxa ratios > 0.4 , and DO consistently exceeding 6 mg/L. These sections supported structurally complex trophic networks with P:R ratios averaging approximately 1.2 (net autotrophic).

Downstream Digboi River segments exhibited CPCB Class D ('poor') water quality status, with BMWP scores below 45, Chironomidae exceeding 40% relative abundance, and DO at two sites falling below 6 mg/L. P:R ratios declining to approximately 0.7 indicate dominance of heterotrophic processes. These

sections may be approaching natural self-purification capacity thresholds as described in classical Streeter-Phelps oxygen sag models.

12.3 Recovery Potential Assessment

Despite current ecological degradation, resilience indicators suggest the river system retains significant recovery potential. Functional redundancy within upstream communities, combined with moderate biodiversity reserves, indicates ecological restoration is feasible through targeted pollution reduction and habitat rehabilitation. Predictive ecological modeling suggests that improvements in water quality and reduction of organic loading could enable recovery trajectories achieving:

- BMWP scores exceeding 70 (Good ecological status)
- Increased diversity indices ($H' > 2.5$)
- Restoration of sensitive EPT taxa populations
- Recovery timeline: estimated 2–3 years with sustained interventions

13. Comparative Study — 2025 vs 2026 Temporal Analysis

A temporal comparative analysis was conducted between the 2025 baseline dataset and the 2026 monitoring data to assess ecological trends, detect emerging environmental stressors, and evaluate the effectiveness of existing pollution control measures. The comparison reveals measurable shifts in biological community structure and physicochemical conditions across the 12-month monitoring period.

13.1 Upstream vs Downstream Ecological Comparison (2026)

Ecological Parameter	Upstream (Sites 1–5)	Transitional (Sites 9)	Downstream (Sites 6–8, 10)	Change (%)
BMWP Score (avg)	81.6	52.0	37.2	– 54.4%
ASPT Value	6.3	5.0	4.4	– 30.2%
Shannon Diversity H' (Benthic)	2.27	2.00	1.81	– 20.3%
Pielou Evenness J'	0.81	0.74	0.70	– 13.6%
EPT Taxa Richness	18–22 families	10–12 families	5–8 families	– 65%
Chironomidae Abundance (%)	8–12%	26%	35–42%	+250–350%
DO (mg/L)	6.20–6.30	6.10	5.80–5.90	– 6.4%
BOD (mg/L)	8.0–10.0	8.6	10.0–16.0	+60–100%
COD (mg/L)	18–20	40	30–60	+50–200%
Phytoplankton H'	2.68	2.40	2.07	– 22.8%
Cyanobacteria Dominance (%)	5–10%	20%	35–42%	+300–420%
Zooplankton:Phytoplankton Ratio	0.45	0.36	0.28	– 37.8%
Total Nitrogen (mg/L)	1.86–2.10	1.86	2.05–6.80	+50–265%
Phosphate (mg/L)	0.43–0.48	0.52	0.54–0.68	+13–41%

Table 13.1: Ecological parameter comparison — upstream vs. downstream in 2026 monitoring survey. Red values indicate deterioration/increase; Green values indicate improvement/decrease.

13.2 Temporal Trend — 2025 to 2026

Parameter	2025 Baseline	2026 Survey	Change	Trend Assessment
Avg BMWP (downstream)	~51	~45	– 12%	Deteriorating
DO Average (downstream)	6.2 mg/L	5.9–6.1 mg/L	Marginal decline	Stable/Watch
BOD Average (downstream)	9.5 mg/L	11.2 mg/L	+18%	Deteriorating
Phytoplankton H'	2.4	2.2	– 8%	Slight decline
Cyanobacteria %	22%	28%	+27%	Deteriorating
EPT Richness (downstream)	10 families	8 families	– 20%	Deteriorating
Chironomidae % (downstream)	32%	38%	+19%	Deteriorating
Shannon H' Benthic (all sites)	2.25	2.10	– 7%	Slight decline
COD (downstream peak)	52 mg/L	60 mg/L	+15%	Deteriorating
Species Richness (downstream)	14 families	11 families	– 21%	Deteriorating

Table 13.2: Temporal trend analysis — 2025 baseline vs 2026 monitoring data for key ecological and physicochemical parameters.

The temporal comparison between the 2026 monitoring period and 2025 baseline observations indicates a measurable decline in biological integrity of approximately 12%, despite relatively stable hydrological conditions and rainfall patterns. This suggests that observed ecological degradation is primarily associated with anthropogenic inputs rather than climatic variability.

13.3 Statistical Correlation Summary

Variable 1	Variable 2	Correlation (r)	p-Value	Interpretation
BMWP Score	Dissolved Oxygen (DO)	+0.82	< 0.001	Strong positive — DO drives BMWP
BMWP Score	BOD	– 0.79	< 0.001	Strong negative — BOD suppresses BMWP
Shannon H'	BOD	– 0.71	< 0.01	Negative — organic load reduces diversity

Variable 1	Variable 2	Correlation (r)	p-Value	Interpretation
Shannon H'	Turbidity	– 0.65	< 0.05	Moderate negative correlation
Cyanobacteria %	Phosphate-P	+0.74	< 0.01	Nutrient drives cyanobacterial bloom
Evenness J'	Dissolved Oxygen	+0.68	< 0.01	Higher DO supports equitable community
Chironomidae %	BOD	+0.76	< 0.01	Organic enrichment favors Chironomidae
EPT Richness	DO	+0.85	< 0.001	Very strong — DO essential for EPT taxa

Table 13.3: Statistical correlation matrix between key biological indices and physicochemical parameters. Strong correlations ($|r| > 0.7$) are highlighted.

14. Conclusion

The 2026 bio-monitoring survey of aquatic ecosystems in the Dihing-Digboi river catchment surrounding the IOCL Digboi Refinery provides a comprehensive and scientifically robust assessment of ecological health through integrated biological and physicochemical analysis.

Conclusion Theme	Key Finding
Overall Ecosystem Health	Fair to Poor (Indian IBI Score: ~62/100). Pristine upstream areas contrasting with significantly degraded downstream segments.
Biodiversity Status	Moderate regional richness (84 macroinvertebrate taxa, $H' = 2.1$) with severe downstream simplification — 45% taxon loss, EPT absence, Chironomidae dominance.
Pollution Levels	Moderate organic loading (BOD 10–16 mg/L, Class C–D) coupled with nutrient enrichment. Conditions exceeding CPCB thresholds for designated aquatic use at downstream sites.
Upstream Viability	Good to fair quality (BMWP > 60, diverse trophic web). Supports aquatic biodiversity and ecological services. Suitable for Class B designated uses.
Downstream Viability	Marginal suitability for aquatic life (BMWP < 45, hypoxia-intolerant taxa absent). Compromising fisheries and ecosystem services.
Temporal Trend	12% decline in downstream biological integrity compared to 2025 baseline. Trend linked to anthropogenic inputs rather than climatic variability.
Primary Stressors	Industrial effluent discharge, urban runoff, sediment loading, nutrient enrichment, and organic pollution from refinery operations.
Recovery Potential	River retains recovery capacity with targeted interventions. Modeled recovery trajectory: BMWP > 70 within 2–3 years of sustained pollution control measures.

The results of the 2026 bio-monitoring survey indicate that refinery effluent discharge and urban runoff are contributing to progressive ecological degradation in downstream aquatic habitats. While upstream locations remain relatively resilient, downstream environments exhibit reduced presence of pollution-sensitive macroinvertebrates, increased dominance of tolerant taxa, declining oxygen levels, and elevated organic pollution indicators. The observed temporal decline relative to 2025 baseline data suggests emerging environmental stress requiring immediate mitigation.

15. Recommendations

Based on the ecological findings of the 2026 bio-monitoring survey, the following targeted interventions are recommended to address environmental stress, restore ecological integrity, and achieve CPCB Class B water quality standards within the Dihing-Digboi river system.

15.1 Effluent Treatment Plant Upgrades

- Upgrade ETPs to achieve tertiary treatment standards compliant with discharge limits under the Environment (Protection) Rules, 1986, Schedule VI.
- Implement advanced oil-water separation, dissolved air flotation (DAF), biological treatment units, and advanced tertiary filtration systems.
- Ensure compliance with CPCB discharge criteria: BOD < 5–10 mg/L, COD < 30 mg/L, oil and grease within permissible limits.
- Introduce hydrocarbon removal efficiency upgrades, particularly for refractory organic compounds with low BOD/COD ratios.
- Target ecological restoration goal: BMWP Score > 50 by 2027.

15.2 Stormwater Management and Pollution Control

- Implement stormwater management and non-point source control strategies consistent with NEERI watershed management frameworks.
- Establish vegetative buffer zones (30–50 m minimum width) with regionally adapted native species along riverbanks.
- Install sediment retention structures and controlled runoff pathways from agricultural and urban areas.
- Establish Online Continuous Effluent Monitoring Systems (OCEMS) at industrial discharge points linked to SPCB servers.
- Conduct comprehensive waste and runoff audits to identify non-point pollution sources.

15.3 Habitat Protection and Restoration

- Undertake reach-scale ecological restoration following CPCB river rejuvenation and ecological flow maintenance frameworks.
- Focus on improving channel morphology, substrate heterogeneity, and riparian vegetation using bioengineering techniques.
- Remove or manage invasive species using integrated ecological control methods per national biodiversity management guidelines.
- Where flow barriers exist, incorporate fish passage structures to restore longitudinal connectivity and aquatic biodiversity.
- Maintain riparian buffer widths of 30–50 m minimum to reduce sediment and nutrient loading.

15.4 Enhanced Monitoring Program

- Establish a quarterly river biomonitoring program supplemented by biannual intensive surveys (pre- and post-monsoon) per CPCB NWMP protocols.
- Integrate biological indices (BMWP, ASPT, FBI, EPT richness, Shannon H') with physico-chemical parameters including DO, BOD, COD, nutrients, pH, EC, turbidity, and temperature.
- Deploy automated water quality sensors at critical locations linked to telemetry-based data acquisition systems.
- Maintain QA/QC protocols including field blanks, $\geq 10\%$ duplicate samples, and ISO/IEC 17025-accredited laboratory calibration.
- Conduct periodic IBI recalibration using regional reference conditions and non-parametric Mann-Kendall trend analysis.

15.5 Community Awareness and Stakeholder Engagement

- Implement structured stakeholder engagement programs per CPCB environmental awareness frameworks targeting industries, agricultural stakeholders, and local communities.
- Promote participatory water quality monitoring through community-based programs using simplified field kits calibrated against certified laboratory standards.
- Develop environmental communication systems per ISO 14063, including signage, awareness materials, and public reporting dashboards.
- Integrate river ecology education modules into local institutional outreach programs to strengthen environmental stewardship.

16. Compliance Matrix for River Health Management

The following compliance matrix summarizes the recommended interventions, corresponding regulatory guidelines, applicable ISO standards, monitoring frequency, responsible agencies, and key performance indicators (KPIs) for systematic implementation.

Component	Recommendation	CPCB Reference	ISO Standard	Frequency	Responsible Agency
Water Quality Monitoring	Quarterly biomonitoring at 11 fixed stations	CPCB NWMP Guidelines	ISO 5667	Quarterly	SPCB / Project Authority
Automated Monitoring	Real-time multiparameter sondes with telemetry	CPCB OCEMS Guidelines	ISO 15839, 24512	Continuous	Industry / SPCB
Laboratory QA/QC	Standardized QA/QC, duplicate sampling, calibration	CPCB Lab QA Guidelines	ISO/IEC 17025	Monthly / Quarterly	NABL Lab
Biological Monitoring	Macroinvertebrate and biodiversity assessments	CPCB Biological Monitoring	ISO 7828	Biannual	Research Institutions
Effluent Control	Upgrade ETPs to tertiary treatment standards	EPA 1986 Schedule VI	ISO 14001	Continuous	Industry / SPCB
Stormwater Management	Vegetative buffer zones and runoff control	CPCB Watershed Guidelines	ISO 14055	Seasonal Review	Local Authorities
Online Effluent Monitoring	Install OCEMS at discharge points	CPCB OCEMS Framework	ISO 24516	Continuous	Industry / SPCB
River Habitat Restoration	Riparian restoration and channel rehabilitation	CPCB River Rejuvenation	ISO 14055	Annual	River Authority
Invasive Species Control	Remove invasive plants, restore native vegetation	CPCB Wetland Guidelines	ISO 14001	Annual	Forest / Biodiversity
Community Monitoring	Citizen science water quality kits	CPCB Public Participation	ISO 14063	Monthly	NGOs / Institutions
Stakeholder Awareness	Structured environmental awareness programs	CPCB Awareness Guidelines	ISO 14063	Biannual	NGOs / Education
Data Management	Centralized data management and reporting	CPCB Data Reporting	ISO 24512	Quarterly	SPCB / Authority
Trend Analysis	Long-term statistical analysis for restoration	CPCB Water Quality Trend	ISO 5725	Annual	Research Institutions





Table 16.1: Compliance matrix for river health management — regulatory framework, standards, and implementation schedule.



17. References

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Appendix A: List of Abbreviations

Abbreviation	Full Form
APHA	American Public Health Association
ASPT	Average Score Per Taxon
BMWP	Biological Monitoring Working Party
BOD	Biochemical Oxygen Demand
BWQC	Biological Water Quality Criteria
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
DO	Dissolved Oxygen
EPT	Ephemeroptera, Plecoptera, Trichoptera
ETP	Effluent Treatment Plant
FBI	Family Biotic Index
GPS	Global Positioning System
H'	Shannon-Wiener Diversity Index
IBI	Index of Biotic Integrity
IOCL	Indian Oil Corporation Limited
J'	Pielou's Evenness Index
NABL	National Accreditation Board for Testing and Calibration Laboratories
NEERI	National Environmental Engineering Research Institute
NMDS	Non-Metric Multidimensional Scaling
OCEMS	Online Continuous Effluent Monitoring System
P:R Ratio	Production-to-Respiration Ratio
QA/QC	Quality Assurance / Quality Control
SPCB	State Pollution Control Board
TDS	Total Dissolved Solids
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids

Appendix B: Sampling Equipment List





Equipment	Specification	Purpose
D-Frame Kick Net	0.6 mm mesh, 25×25 cm frame	Benthic macroinvertebrate sampling
Plankton Net (Phytoplankton)	20–25 µm mesh, conical	Phytoplankton concentration and sampling
Plankton Net (Zooplankton)	50–64 µm mesh, 0.25 m mouth	Zooplankton capture
Multiparameter Probe	Hanna HI98130	In-situ DO, pH, Temperature measurement
Optical DO Probe	YSI ProODOX	High-precision dissolved oxygen measurement
Secchi Disk	Standard white/black disk	Water transparency/turbidity measurement
HDPE Sampling Bottles	1 L (general), 500 mL (metals)	Water sample collection and storage
Acid-washed Bottles	500 mL amber glass	Heavy metal and sensitive parameter collection
GPS Device	±3 m accuracy	Site location recording and mapping
Field Stereomicroscope	10×–40× magnification	Field sorting of macroinvertebrates
Inverted Microscope	100×–400×	Phytoplankton identification and enumeration
AAS/ICP-MS Analyzer	Varian AA240FS / Agilent 7800	Heavy metal analysis
Insulated Ice Chests	4°C maintenance	Sample preservation during transport

— End of Report —

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