



इंडियन ऑयल कॉर्पोरेशन लिमिटेड  
एओडि - डिगबोई रिफाइनरी १२३  
पी.ओ. डिगबोई, पिन-786171, असम  
**Indian Oil Corporation Limited**  
**AOD - Digboi Refinery**  
P.O. Digboi - 786171 (Assam)  
Tel : 03751-262000  
Fax : 03751-269015  
Website : www.iocl.com  
E-mail : aoddigboi@indianoil.com



असम ऑयल डिवीजन  
**Assam Oil Division**

**Ref. No:HSE :355 -714/18**

**Date:-11-06-2018**

To  
**The Joint Director (S)**  
Ministry of Environment & Forests,  
North East Regional Office,  
Lumbatngen, Law-U-Sib,  
Shillong - 793021

**Sub.: Submission of the Half-Yearly Compliance Report on Environmental Stipulations**  
**pertaining to Projects at Digboi Refinery including Digboi Marketing Terminal Project**

**Ref :** Environmental Clearance No. J-11011/12/87-1A, dated – 19-10-1987  
Environmental Clearance No. J-13011/3/1987-1A dated -18-06-1987  
Environmental Clearance No. J-11011/8/89-1A dated 26-07-1989  
Environmental Clearance No. J-11011/41/97-1All(I) dated -05-3-1998  
Environmental Clearance No. J-11013/71/99-1A(II) dated -13-05-1999  
Environmental Clearance No. J-11011/482/2007-IA II (I), dated – 18-03-2008

Dear Sir .

Please find herewith the compliance status on Environmental Clearance Stipulations of the Environmental Clearance letters referred to above as on **1<sup>st</sup> June, 2018**.

Thanking you.

Yours sincerely,

(A. Mojumdar)  
Deputy General Manager (HS&E)  
Indian Oil Corporation (AOD)  
For Chief General Manager (AOD)

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

**ENVIRONMENTAL CLEARANCE (J-11011/12/87-1A, dated – 19-10-1987) FOR DIGBOI  
REFINERY MODERNISATION PROJECT  
(STATUS AS ON 1<sup>st</sup> JUNE, 2018)**

SL. NO	STIPULATIONS	STATUS
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.	<p>The concentration levels of all the parameters of effluent after treatment at ETP meets MINAS specification. Digboi Refinery had also carried out a study by a competent consultant for further Upgradation of ETP. Based on this study the following new facilities have been added in Phase-I:</p> <ul style="list-style-type: none"> <li>• TPI separator installed and commissioned in Feb, 2005.</li> <li>• Six nos. Dual Media Filters installed &amp; commissioned in October'2005.</li> <li>• Dissolved Air Floatation system installed and commissioned on 30-05-09.</li> </ul> <p>As per revised CPCB guideline, Digboi Refinery meets the stipulations for all 21 parameters of effluent. Six monthly compliance Report on Quantum Limit in Kg/1000 MT Crude processed is attached in Annexure-1</p> <p>Study on up gradation of ETP Operation of Digboi Refinery has been carried out by M/s National Environmental Engineering Research Institute, Nagpur from January 2014-October 2014. Implementation of the Recommendations of NEERI are being completed in phase wise. Online effluent monitoring &amp; connectivity to CPCB server was commissioned on 28<sup>th</sup> December 2015.</p> <p>Web Site <a href="http://dnpcpcb.glenserver.com">http://dnpcpcb.glenserver.com</a></p>
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 Pollution Control Board, Assam. Monitoring of receiving water bodies is also carried out every month, report submitted to Pollution Control Board, Assam. Reports are also submitted to MoEF once in Six month.( Annexure-2)
3.0	The sludge drains must be properly covered to avoid land and water pollution during incessant rains.	All OWS systems at DRMP are completely 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.	<p>All accumulated acid sludge recovered, treated through bioremediation. This exercise has been completed in July '08. Generation of fresh acid sludge stopped since 2002. Recovered area is being developed as a green belt. One HDPE lining concrete oily sludge storage tank of 400m<sup>3</sup> capacity was constructed in 2014 to prevent leaching and seepage of oil to ground water.</p> <p>Oily sludge is being treated at oily sludge treatment facility to recover oil and the residual sludge are bio-remediated. About 10000 m<sup>3</sup> treated in 2006-07, 14000 m<sup>3</sup> in 2007-08 &amp;</p>

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SL. NO	STIPULATIONS	STATUS
		<p>2008-09 and 10000 m<sup>3</sup> in 2011-12. Treatment of another 10,000m<sup>3</sup> of oily sludge started under Phase-IV from July, 2013 and 7362 m<sup>3</sup> is treated till October 2014. Approximate 1,000m<sup>3</sup> of Residual Oily sludge and 1500 m<sup>3</sup> of Acidic Sludge have been Bio-remediated by M/S TERI. Another 500m<sup>3</sup> of oily sludge bio-remediated at ETP and 1700 m<sup>3</sup> of residual sludge bio-remediated inside Refinery Campus during 2015-16. Bio remediation of another 600 MT of Oily Sludge is completed in 2017-18 at Secured Land Fill at ETP.</p> <p>Secured land fill (SLF) at ETP was commissioned in March 2007 for Bio remediation of Oily Sludge/ Residual Sludge</p>
5.0	The ambient air around Refinery should be monitored at least at four monitoring stations for SPM, SOx, NOx, Hydrocarbons and H <sub>2</sub> S.	<p>Four nos. of Ambient Air quality monitoring stations have been installed around Digboi Refinery. Ambient air quality monitoring is being carried out on regular basis and reports submitted to Pollution Control Board, Assam.</p> <p>One no. of Continuous Ambient Air Quality Monitoring Station installed and commissioned in September 2012 and is in service. In addition to these a CPCB approved agency has been working on measuring Ambient Air quality around Refinery. Six monthly report attached herewith as Annexure-3</p>
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.	<p>Monitoring of stack emissions is carried out with the help of portable monitoring kit. Fixed on-line monitors are also installed in AVU, DCU, CPP, CRU,SDU, HDT, HGU and MSQU. Installation of Sixteen online Stack analyzers and connectivity to CPCB Server is commissioned on 30<sup>th</sup> March, 2016. Apart from own monitoring, external agencies are also employed to conduct stack emission analysis on regular basis. Annexure-4</p>
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.	<p>Regular monitoring of Hydrocarbons is done with GMI Gas surveyor and as well as with VOC detector in plant &amp; offsite areas by an external CPCB approved agency.</p>
8.0	Land filling, if any, must be done with fill material only from within battery limits of the Refinery.	Complied with.
9.0	The Assam Oil Division must take up development of green belt as proposed.	<p>Digboi Refinery is surrounded by the Upper Dehing Reserve Forest on south and south west side, which acts as a natural Green Belt.</p> <p>Green belt developed with regular tree plantation around Refinery premises and township area.</p> <p>A garden of medicinal plants "Pathyabon" was also developed in the township. Till June, 2010 around 52000 tree were planted in and around Digboi Refinery.</p> <p>'Arboretum' a botanical garden developed at Shillong road area of Digboi. This garden was inaugurated by the Conservator of Forest, Eastern Zone, Assam on 13-05-11. Similarly a fruits garden has been developed on 5<sup>th</sup> June, 2011 at Shillong Road area of Digboi.</p>

		<p>Further, reclaimed area at tar pit in the Refinery is being developed as green belt area. Tree plantation is carried out from 1<sup>st</sup> June to 31<sup>st</sup> July every year as a part of WED program. As per this program, 60416 tree saplings have planted in Digboi Township &amp; Shillong Road area from 2002 to March 2018. During this FY 2018-19 already 1500 saplings have planted.</p>
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**ENVIRONMENTAL CLEARANCE (J-13011/3/1987-1A dated -18-06-1987) FOR  
CAPTIVE POWER PLANT**

**(STATUS AS ON 1<sup>st</sup> JUNE, 2018)**

SL. NO	STIPULATIONS	STATUS
1.0	Only sweet natural gas will be used as feed stock.	Complied with.
2.0	Under the envisaged modernization programme for the refinery, Sulphur recovery units to be provided to reduce emission of SO <sub>2</sub> . Efforts should also be made to reduce the emissions of NO <sub>x</sub> . The existing sulphuric acid plant should be scrapped.	Digboi Refinery processes only sweet crude having average sulphur content of 0.2%. 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, formation of NO <sub>x</sub> is very low and always remains within the prescribed limit. Further, low NO <sub>x</sub> burners are also fitted in all the new units viz. Solvent Dewaxing Unit, Hydro treater, 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.	Complied.
6.0	Adequate precautionary measures for preventing and controlling fire and explosion hazards should be taken up specially 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.

*J. SINGH  
AM/PS*

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

**(STATUS AS ON 1<sup>st</sup> JUNE, 2018)**

SL. NO	STIPULATIONS	STATUS
1.0	The project authority must strictly adhere to the stipulations made by State govt. and the State Pollution Control Board.	<p>The stipulations made by the State Govt. and the State Pollution Control Board are strictly followed with regard to effluent and emission norms.</p> <p>Dissolved Air Flotation system at ETP installed and commissioned on 30-05-09.</p> <p>As per revised CPCB guideline, Digboi Refinery meets all parameters of effluent.</p>
2.0	The project authority will not increase the throughput capacity of the refinery from the existing level.	Complied.
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 <sub>2</sub> , Hydrocarbons and oxides of Nitrogen should not exceed the prescribed standard stipulated by Central/State Pollution Control Board. At no time the emission level should 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.
5.0	The project authority must explore the possibility of maximum recycling of effluent either as a process water or for afforestation.	Treated effluent from ETP is recycled to refinery as Fire water tank make up, cleaning and gardening purposes at ETP. Treated effluent is re used as make up for coke cutting water at delayed coking unit since August'11. Scheme for re use of Treated Effluent for its further increase through use as Make up at Wax Sector Cooling Tower is commissioned on 28-03-2014. Efforts are on for further increase of re use of Treated Effluent from ETP through implementation of different schemes..

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AM/PS*

SL. NO	STIPULATIONS	STATUS
6.0	The entire quantity of liquid effluent coming out of the complex should strictly conform 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 specification both in quality and quantity. The process plant effluent is discharged through pipeline/closed OWS channels.  Six monthly compliance Report on Quantum Limit in Kg/1000MT of Crude Processed is attached in Annexure-2
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.	Four nos. of air quality monitoring stations have been installed around Digboi Refinery. Ambient air quality monitoring is being carried out on regular basis and reports submitted to Pollution Control Board, Assam.  One no. of Continuous Ambient Air Quality Monitoring Station, installed and commissioned in September 2012.  Monitoring of stack emissions is carried out with the help of portable monitoring kit. Fixed on-line monitors are also installed in AVU, DCU, CPP, CRU and in the new units SDU, HDT and MSQU. Sixteen online Stack analyzers and connectivity to CPCB Server is commissioned on 30 <sup>th</sup> March, 2016. Apart from own monitoring, external agencies are also employed to conduct stack emission analysis on regular basis. <a href="http://www.envsaindia.com/cpcb/login.php">Website http://www.envsaindia.com/cpcb/login.php</a>
8.0	The liquid effluent quality must be ensured on 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.	Liquid effluent quality from ETP outlet is monitored regularly on daily basis. Quality of Treated Effluent is also regular tested by CPCB approved 'outside agency'. In addition to this, test of sample from receiving water bodies has been carrying out regularly.
9.0	The project authority must monitor the aquatic life(like fish, tortoise etc.) and report should be submitted to the Ministry once in six months.	Study on aquatic life was covered in the EIA. Apart from this monitoring of aquatic life in receiving water bodies were also carried out through Guwahati University and report submitted to CPCB & MOEF. Study on aquatic life has been carried out in 2007 by M/s KLG-ESS.
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.

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SL. NO	STIPULATIONS	STATUS
11.	The project authority must provide oil separator in the nullah and the effluents should be discharged through covered drains.	Complied.
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 approved by DC, Tinsukia. Copy of the plan submitted to CIF, Guwahati. Offsite drills are carried out regularly, once in 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 DMI, Bhopal. Last Offsite drill was carried out on 23 <sup>rd</sup> November, 2016
14.	The Project authority must ensure that the effluent plant fully operational within the next 3 months.	ETP is 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.	Already exists.
16.	The project authority must provide necessary infrastructural facilities to the construction workers during construction.	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.	Complied.
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.	Complied.
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.	Environmental cell headed by General Manager (Health, Safety & Environment) with DGM (HS&E), CM(HSE),M,HSE and AM,HSE qualified officers already exists and is functioning.
20.	Adequate fund provision (capital and recurring expenditure) so provided for environmental control measure should not be diverted to any other purpose. The implementation schedule for environmental measure must be strictly adhered to.	Complied.



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

**(STATUS AS ON 1<sup>st</sup> JUNE, 2018)**

SL. NO	STIPULATIONS	STATUS
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. Another Quantitative Risk Analysis study for all the units, including MSQU, completed in March, 2012 and various recommendations for further risk reduction are under study for implementation. A fresh Quantitative Risk Assessment for Wax Palletisation Unit completed on August 2013 by ZEEPINE SYSTEM INDIA Pvt. Ltd

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

**(STATUS AS ON 1<sup>st</sup> JUNE, 2018)**

SL. NO	STIPULATIONS	STATUS
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 already implemented. Another Quantitative Risk Analysis study for all the units, including MSQU, completed in March, 2012 and various recommendations for further risk reduction are under study for implementation.

*J. S. G. D. S.*  
*AM (PS)*

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

**(STATUS AS ON 1<sup>st</sup> JUNE, 2018)**

SN	Stipulations	Status
1	The company shall comply with new standards/norms that are being proposed by the CPCB for petrochemical plants and refineries.	Being complied.
2	The process emissions (SO <sub>2</sub> , NO <sub>x</sub> , 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.	Emission standards meets the norms as prescribed by PCBA and the readings are communicated to Assam State Pollution Control Board on monthly basis. The emission standards are within prescribed limit.
3	Ambient air quality monitoring stations. [SPM, SO <sub>2</sub> , NO <sub>x</sub> 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 <sub>2</sub> and NO <sub>x</sub> .	<p>4 nos of Ambient Air Quality monitoring stations are already in operation in the Refinery premises as per direction of Pollution Control Board, Assam.</p> <p>Continuous Ambient Air Quality Monitoring Station procured, installed and commissioned on 01.09.2012 and is in operation.</p> <p>On line stack monitoring equipment already installed in AVU, CRU, DCU, HDT, HGU, SDU and also at the stacks of the Captive Power Plant (CPP) of Digboi Refinery for monitoring stack emissions. Installation of Sixteen online Stack analyzers and connectivity to CPCB Server is commissioned on 30<sup>th</sup> March, 2016. (CDU-2, VDU-2, HGU-4 &amp; CPP-8 Total-16)</p>
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 hydro carbon will be routed to the flare system and the flare system shall be designed for smoke less burning.	<p>Quarterly monitoring of fugitive emission is being carried out regularly. Report are submitted regularly MoEF &amp;CC with six monthly compliance report. (Annexure-5)</p> <p>Complied</p>

*MSQ  
AM/PS*

SN	Stipulations	Status
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 S02 emission.	<p>Quarterly monitoring of fugitive emission is being carried regularly.</p> <p>HC detectors are already provided at the strategic locations at plants and tank farm areas. HC detectors are maintained by the vendors on quarterly basis. HC detector also provided at MS Quality up gradation unit.</p> <p>Digboi Refinery is using sweet natural gas which contains sulphur level below 2 ppm.</p>
6	The company shall strictly follow all the recommendation mentioned in the charter on corporate responsibility for environmental protection (CREP).	Being followed strictly.
7	The Company shall take necessary measures to prevent fire hazards, containing oil spill 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.	<p>Modern fire fighting system and hydrant network system has been provided and it meets OISD – 116 standard. Fire fighting facility at MSQ project is as per OISD-116. Remote HVLR 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 &amp; 452.</p> <p>At Digboi Refinery, flaring is done at the height of 108 mtrs through flare stack. Knockout drums are provided in the flare system.</p>
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.	Already 60416 nos. of tree saplings have been planted in and around Digboi from 2002 to March 2018. This FY- 2018-19 already 1500 saplings have planted.

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AM (PS)

Effluent Parameters Test Report											
From October 2017 to March 2018											
Parameters	Limits	October	November	December	January	February	March	Average			
pH	6.0 - 8.5	7.42	7.07	7.06	7.15	7.2	7.19	7.182			
Oil & Grease	5.0	4.27	4.26	4.27	4.57	4.47	4.67	4.418			
BOD	15.0	10.00	9.98	10.26	10.19	9.75	9.7	9.980			
COD	125.0	100.33	91.57	99.29	103.81	101.93	98.77	99.283			
TSS	20.0	17.15	17.07	16.83	17.47	17.46	17.56	17.257			
Phenols	0.35	0.28	0.271	0.276	0.297	0.296	0.292	0.286			
Sulphides	0.5	0.044	0.035	0.035	0.048	0.042	0.035	0.040			
CN	0.20	0.019	0.012	0.015	0.015	0.019	0.014	0.016			
Ammonia as N	15.0	2.55	ND	ND	ND	ND	ND	2.550			
TKN	40.0	23.50	ND	ND	ND	ND	ND	23.500			
P	3.0	0.07	ND	ND	ND	ND	ND	0.070			
Cr (Hexavalent)	0.1	BDL	ND	ND	ND	ND	ND	BDL			
Cr (Total)	2.0	BDL	ND	ND	ND	ND	ND	BDL			
Pb	0.1	BDL	ND	ND	ND	ND	ND	BDL			
Hg	0.01	BDL	ND	ND	ND	ND	ND	BDL			
Zn	5.0	BDL	ND	ND	ND	ND	ND	BDL			
Ni	1.0	BDL	ND	ND	ND	ND	ND	BDL			
Cu	1.0	BDL	ND	ND	ND	ND	ND	BDL			
V	0.2	BDL	ND	ND	ND	ND	ND	BDL			
Benzene	0.1	ND	ND	ND	ND	ND	ND	BDL			
Benzo (a) -Pyrene	0.2	BDL	ND	ND	ND	ND	ND	BDL			
TDS		427.5	456.6	439.8	464.7	449.3	449.3	447.9			

JSK  
AM (PS)

ANNEXURE-2

**COMPLIANCE OF EFFLUENT STANDARDS (Quantum based)**

(Figs. in Kg/1000 Ton Crude processed)  
(October'17 -March18)

PARAMETER	LIMIT	October	November	December	January	February	March	AVERAGE
pH	--							
Oil & Grease	2.0	0.255	0.176	0.205	0.293	0.312	0.395	0.273
BOD	6.0	0.598	0.413	0.491	0.653	0.680	0.821	0.609
COD	50	5.995	3.789	4.755	6.651	7.114	8.354	6.110
TSS	8.0	1.024	0.706	0.806	1.119	1.219	1.485	1.060
Phenols	0.14	0.017	0.011	0.013	0.019	0.021	0.025	0.018
Sulphides	0.2	0.003	0.001	0.002	0.003	0.003	0.003	0.003
CN	0.08	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Ammonia as N	6.0	0.152	ND	ND	ND	ND	ND	0.152
TKN	16	1.400	ND	ND	ND	ND	ND	1.400
P	1.2	0.004	ND	ND	ND	ND	ND	0.004
Cr (Hexavalent)	0.04	0.000	ND	ND	ND	ND	ND	0.000
Cr (Total)	0.8	0.000	ND	ND	ND	ND	ND	0.000
Pb	0.04	0.000	ND	ND	ND	ND	ND	0.000
Hg	0.004	0.000	ND	ND	ND	ND	ND	0.000
Zn	2.0	0.000	ND	ND	ND	ND	ND	0.000
Ni	0.4	0.000	ND	ND	ND	ND	ND	0.000
Cu	0.4	0.000	ND	ND	ND	ND	ND	0.000
V	0.8	0.000	ND	ND	ND	ND	ND	0.000
Benzene	0.04	0.000	ND	ND	ND	ND	ND	0.000
Benzo (a) -Pyrene	0.08	0.000	ND	ND	ND	ND	ND	0.000

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

*JSK*  
*AM/PS*

Month	Flue Gas Velocity N/M <sup>3</sup> /Hr	CDU		VDU		DCU		SDU		CRU-HDT		CRU-OBSC		HDT		HGU		Avg	Total
		Avg mg/NM <sup>3</sup>	Avg kg/hr	Avg mg/NM <sup>3</sup>	Avg kg/hr	Avg mg/NM <sup>3</sup>	Avg kg/hr	Avg mg/NM <sup>3</sup>	Avg kg/hr	Avg mg/NM <sup>3</sup>	Avg kg/hr	Avg mg/NM <sup>3</sup>	Avg kg/hr	Avg mg/NM <sup>3</sup>	Avg kg/hr	Avg mg/NM <sup>3</sup>	Avg kg/hr	Avg kg/hr	Avg kg/hr
April	11208	137.7	1.544	168.8	1.891	97.02	1.087	71.59	0.802	75.40	0.845	5.49	0.062	0.60	0.007	42.97	0.482	0.780	6.72
May	11821	84.92	1.004	152	1.796	66.47	0.786	59.46	0.703	56.40	0.667	5.89	0.070	0.350	0.004	31.64	0.374	0.629	5.40
June	12277	86.62	1.063	81.1	0.996	49.82	0.612	35.8	0.440	35.9	0.441	24.48	0.301	0.6	0.007	11.66	0.143	0.482	4.00
July	11773	72.03	0.848	103.1	1.213	48.04	0.566	43.36	0.510	43.36	0.510	13.11	0.154	0.56	0.007	22.89	0.269	0.476	4.08
Aug	13497	74.45	1.005	101.8	1.374	11.75	0.159	34.5	0.466	36.54	0.493	5.47	0.074	0.81	0.011	25.15	0.339	0.448	3.92
Sept	12847	72.74	0.934	105.2	1.352	10.25	0.132	41.72	0.536	39.6	0.509	11.02	0.142	0.71	0.009	23.14	0.297	0.452	3.91
Oct	12582	80.32	1.011	75.48	0.950	13.11	0.165	35.64	0.448	38.4	0.483	21.58	0.272	0.64	0.008	25.62	0.322	0.417	3.66
Nov	12692	62.17	0.789	69.7	0.885	5.31	0.067	35.64	0.452	38.4	0.487	7.77	0.099	0.28	0.004	41.66	0.529	0.348	3.31
Dec	11993	80.24	0.962	69.7	0.836	5.77	0.069	34.4	0.413	35.9	0.431	1.82	0.022	0.26	0.003	48.71	0.584	0.342	3.32
Jan	13290	53.44	0.710	89.31	1.187	24.47	0.325	35.64	0.474	39.94	0.531	21.97	0.292	0.22	0.003	28.18	0.375	0.440	3.90
Feb	12004	42.35	0.508	67.5	0.810	31.94	0.383	38.29	0.460	38.87	0.467	30.17	0.362	0.24	0.003	31.03	0.372	0.374	3.37
Mar	14916	61.46	0.917	69.77	1.041	35	0.522	36.55	0.545	36.49	0.544	27.24	0.406	0.33	0.005	20.2	0.301	0.498	4.28
Avg	12575	75.705	0.9413	96.11	1.1942	33.246	0.4061	41.88	0.5207	42.933	0.534	14.668	0.1878	0.4667	0.0059	29.404	0.3657	0.474	4.16

Avg Nox emission for Six months

Total Nox load = 36403 Kg/Yr  
 = 36.403 MT/Yr

SKGAS  
 AN (P/S)

Month	Flue Gas Velocity NMS/Hr	CDU		VDU		DCU		SDU		CRU-HDT		CRU-OBSG		HDT		HGU		Avg		Total
		Avg mg/ NMS	Avg kg/hr	Avg mg/ NMS	Avg kg/hr	Avg mg/ NMS	Avg kg/hr	Avg mg/ NMS	Avg kg/hr	Avg mg/ NMS	Avg kg/hr	Avg mg/ NMS	Avg kg/hr	Avg mg/ NMS	Avg kg/hr	Avg mg/ NMS	Avg kg/hr	Avg mg/ NMS	Avg kg/hr	
April	11208	16.95	0.19	36.41	0.41	49.50	0.55	49.63	0.56	48.78	0.55	42.16	0.47	21.18	0.24	48.00	0.54	0.37	3.50	
May	11821	14.34	0.17	49.06	0.58	49.80	0.59	23.78	0.28	12.00	0.14	31.24	0.37	1.18	0.01	49.16	0.58	0.27	2.73	
June	12277	27.55	0.34	25.38	0.31	49.82	0.61	16.97	0.21	0.40	0.00	29.65	0.36	1.17	0.01	17.45	0.21	0.23	2.07	
July	11773	6.72	0.08	25.63	0.30	25.24	0.30	34.60	0.41	20.29	0.24	36.14	0.43	1.16	0.01	2.85	0.03	0.22	1.80	
August	13497	20.78	0.28	20.47	0.28	9.52	0.13	21.51	0.29	37.92	0.51	34.64	0.47	1.10	0.01	3.81	0.05	0.25	2.02	
Sept	12847	6.485	0.08	5.785	0.07	12.83	0.16	29.73	0.38	46.93	0.60	28.42	0.37	0.90	0.01	3.42	0.04	0.21	1.73	
Oct	12582	23.15	0.29	26.11	0.33	6.41	0.08	29.48	0.37	48.03	0.60	28.90	0.36	0.71	0.01	11.89	0.15	0.26	2.20	
Nov	12692	20.24	0.26	32.89	0.42	5.02	0.06	29.23	0.37	54.54	0.69	28.77	0.37	0.70	0.01	10.82	0.14	0.27	2.31	
Dec	11993	18.30	0.22	40.15	0.48	1.82	0.02	26.02	0.31	46.62	0.56	33.59	0.40	0.66	0.01	13.01	0.16	0.25	2.16	
Jan	13290	25.98	0.35	47.09	0.63	42.11	0.56	26.56	0.35	46.28	0.62	35.74	0.47	0.69	0.01	13.64	0.18	0.37	3.16	
Feb	12004	12.35	0.15	26.72	0.32	28.21	0.34	17.05	0.20	28.78	0.35	43.17	0.52	0.71	0.01	7.10	0.09	0.24	1.97	
Mar	14916	8.21	0.12	17.97	0.27	32.50	0.48	17.18	0.26	14.09	0.21	35.82	0.53	0.77	0.01	8.95	0.13	0.24	2.02	
Avg	12575	16.753	0.2103	29.47	0.3662	26.065	0.3246	26.81	0.3328	33.722	0.4228	34.02	0.4269	2.5775	0.0301	15.842	0.1921	0.26	2.31	

Avg Sox emission (kg/hr) for Six months=

Total Sox Load = 20198 Kg/Yr  
 = 20.198 MT/Yr

*JSK*  
*AM (PS)*



**Six Monthly Monitoring Result of Ambient Air Quality**  
**Period: October 2017 to March 2018**  
**Digboi Refinery**

Sl. No.	Pollutants	Unit	Time Weighted Average	NAAQ Standards	Monthly Average Readings						
					October	November	December	January	February	March	Average
1	SO <sub>2</sub>	µg/m <sup>3</sup>	24 hrs	80	11.03	27.61	13.89	12.11	5.36	8.31	13.05
2	NO <sub>2</sub>	µg/m <sup>3</sup>	24 hrs	80	14.21	16.15	16.15	16.15	8.87	13.06	14.10
3	PM <sub>10</sub>	µg/m <sup>3</sup>	24 hrs	100	26.84	15.95	12.11	9.69	37.8	34.09	22.75
4	PM <sub>2.5</sub>	µg/m <sup>3</sup>	24 hrs	60	5.73	4.52	5.51	4.77	16.74	19.71	9.50
5	Ozone (O <sub>3</sub> )	µg/m <sup>3</sup>	8 hrs	100	50.54	47.61	57.08	43.88	23.32	26.65	41.51
6	Lead (Pb)	µg/m <sup>3</sup>	24 hrs	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL
7	CO	mg/m <sup>3</sup>	8 hrs	2	0.31	0.31	0.31	0.59	0.59	0.39	0.42
8	Ammonia (NH <sub>3</sub> )	µg/m <sup>3</sup>	24 hrs	400	5.6	4.73	5.54	5.92	7.56	7.23	1.47
9	Benzene (C <sub>6</sub> H <sub>6</sub> )	µg/m <sup>3</sup>	Annual	5	1.22	0.92	1.12	1.13	0.96	0.8	0.96
10	Benzo(a) Pyrene	ng/m <sup>3</sup>	Annual	1	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11	Arsenic (As)	ng/m <sup>3</sup>	Annual	6	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12	Nickel (Ni)	ng/m <sup>3</sup>	Annual	20	BDL	BDL	BDL	BDL	BDL	BDL	BDL

*ASR*  
*AM (PS)*

Annexure-5

**Fugitive Emission**  
Digboi Refinery

VOC Emission	3rd Quarter	4th Quarter	
LDAR Report Generated Date	Oct-Dec 2017	Jan-March 2018	
Total VOC Emission kg/day	452.000	470.000	

J. S. Das.  
AM (PS)