



o/c

इंडियन ऑयल कॉर्पोरेशन लिमिटेड

रिफाइनरी प्रभाग : गुवाहाटी रिफाइनरी

नूनमाटी, गुवाहाटी-७८१०२० (असम)

**Indian Oil Corporation Limited**

Refineries Division : Guwahati Refinery

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Guwahati Refinery

Ref.No.:GR/HSE/303/2017-18/INDADEPT<sup>G</sup>/1

Date: 03.07.2017

To,

Dr H Tynsong  
Scientist "C"  
Ministry of Environment & Forest,  
North Eastern Regional Office,  
Lumbatngen (LAW-U-SIB),  
Shillong-793 021

**Subject : Submission of half-yearly compliance report on Environment Stipulations.**

**Reference :**

(a) MOEF LETTER NO : J-11011/71/2012-1A-II(I) dt. 22/01/2015 for INDADEPT<sup>G</sup> project

Sir,

With reference to above please find enclosed herewith the six monthly compliance reports of environmental stipulations for INDADEPT<sup>G</sup> project of IOCL, Guwahati Refinery for the period Dec'16 to May'17.

With warm Regards,

Yours Sincerely

For and on behalf of IOCL Guwahati Refinery,

*Monika Das*  
(Monika Das) 31/7/17

Deputy General Manager (HSE)

Enclosure : As above

- Copy to : 1) The Director,  
Ministry of Environment, Forests & Climate Change  
Indira Paryavaran Bhawan,  
Jorbagh Road,  
New Delhi-110 003  
2) Member Secretary (i/c), Pollution Control Board, Assam, Bamunimaidam, Ghy-21

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Pollution Control Board Assam  
Bamunimaidam, Guwahati-21

पंजीकृत कार्यालय : जी- ९, अली यावर जंग मार्ग, बान्द्रा (पूर्व), मुम्बई- ४०० ०५१

Regd. Office : G-9 Ali Yavar Jung Marg, Bandra (East), Mumbai-400051 (India)

**ATR ON EC CONDITIONS OF SIX MONTHLY COMPLIANCE STATUS OF INDAdept<sup>G</sup>**  
**PROJECT**

**REF: J-11011/71/2012-1A-II (I) dated 22<sup>nd</sup> January, 2015**

SN	SPECIFIC CONDITIONS	STATUS on 1 <sup>st</sup> June 2017
1.	Permission to be obtained from the Standing Committee of NBWL in respect of Amchang Wildlife Sanctuary	<ul style="list-style-type: none"> <li>• Application submitted to Divisional Forest Office, Guwahati (DFO) on 25.09.2014 for permission of NBWL.</li> <li>• State Board of Wildlife (SBWL) accorded clearance vides MOM of 8<sup>th</sup> SBWL meeting held on 19.09.2015.</li> <li>• The letter Ref No FRW.18/2015/67 dated 6<sup>th</sup> June, 2016 has been dispatched from State Board of Wildlife to MoEFCC, GOI, New Delhi.</li> <li>• The file is returned back to MoEF, GOA to resubmit in prescribed format and submit online application</li> <li>• Online application submitted to DFO on 31.08.2016</li> <li>• The same was cleared online in February' 2017 by DFO, Guwahati Wildlife Division and office of PCCF, Wildlife &amp; Chief Wildlife Warden, Assam in March'2017 for further action of Department of Environment &amp; Forest, GOA.</li> </ul>
2.	Compliance to all the environmental conditions stipulated in the environmental clearance letter no. J-11011/1/2000-IA II(I) dated 24 <sup>th</sup> April, 2000 and J-11011/215/2007-1A II (I) dated 7 <sup>th</sup> February, 2008 shall be satisfactorily implemented and compliance reports submitted to the Ministry's Regional Office at Shillong	Compliance to all the environmental conditions stipulated in the environmental clearance letter no. J-11011/1/2000-IA II (I) dated 24 <sup>th</sup> April, 2000 and J-11011/215/2007-1A II (I) dated 7 <sup>th</sup> February, 2008 is satisfactorily implemented and compliance reports submitted to the Ministry's Regional Office at Shillong. <b>Complied.</b>
3.	M/s IOCL shall comply with new standards/norms for Oil Refinery Industry notified under the Environment (Protection) Rules, 1986 vide G.S.R 186(E) dated 18 <sup>th</sup> March, 2008	Guwahati Refinery complies with all the standards/norms under the Environment (Protection) Rules, 1986 vide G.S.R 186(E) dated 18 <sup>th</sup> March, 2008 and compliance status during the period Dec'16 to May '17 is attached as Annexure-1.  <b>Complied</b>

*P. Indira*



4.	Continuous on-line stack monitoring for SO <sub>2</sub> , NO <sub>x</sub> and CO of all the stacks shall be carried out.	<p>Facilities for On-line stack Monitoring for SO<sub>x</sub> &amp; NO<sub>x</sub> with connectivity to CPCB/APCB are available in all the stack of Guwahati Refinery. Installation of on-line PM &amp; CO analyzers in all the stacks has been done on 30<sup>th</sup> June, 2016 with connectivity to CPCB/APCB.</p> <p>There will no SO<sub>2</sub>, NO<sub>x</sub> and CO emission from INDAdaptG unit as it does not have furnace.</p>
5.	Scrubber shall be provided to control SO <sub>x</sub> emission from installation of INDAdaptG unit	Caustic Scrubber system is a part of the proposed INDAdapt <sup>G</sup> Unit. Combustion gases containing SO <sub>x</sub> are treated in the scrubber column with Caustic solution and treated gas is recycled back to the reactor.
6.	Leak Detection and Repair programme shall be prepared and implemented to control HC/VOC emissions. Focus shall be given to prevent fugitive emissions for which preventive maintenance of pumps, valves, pipelines are required. Proper maintenance of mechanical seals of pumps and valves shall be given. A preventive maintenance schedule for each Unit shall be prepared and adhered to. Fugitive emissions of HC from product storage tank yards etc. must be regularly monitored. Sensors for detecting HC leakage shall be provided at strategic locations	<p>Leak Detection and Repair programme (LDAR) carried quarterly through external agency for all process units and tank farm area.</p> <p>Preventive maintenance schedule for each Unit exists and strictly adhered to.</p> <p>No new storage tanks are coming up for proposed INDAdapt<sup>G</sup> unit</p> <p>HC detectors at strategic locations has been considered in the design package of INDAdapt<sup>G</sup> unit</p> <p>Fugitive Emission data is attached as Annexure III.</p> <p><b>Complied.</b></p>
7.	SO <sub>2</sub> emissions after expansion from the plant shall not exceed 5.14 TPD	<p>There will not be any SO<sub>2</sub> emissions from the INDAdaptG unit as it does not have any furnace. Increase in SO<sub>2</sub> emissions will be from TPS due to additional fuel burning to generate power (1.5 MW) required for INDAdaptG unit.</p> <p>Total SO<sub>2</sub> emission from the refinery is estimated to be 5.14 TPD after commissioning of INDAdaptG unit. SO<sub>2</sub> emission for the month of Feb'17 to May'17 is 2.52 TPD.</p> <p>SO<sub>2</sub> emission for each month after commissioning of Indadapt<sup>G</sup> is attached as Annexure VII.</p> <p><b>Complied .</b></p>

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8.	As proposed, record of Sulfur balance shall be maintained at the Refinery as part of the environmental data on regular basis. The basic component of sulphur balance include sulphur input through feed (sulphur content in crude oil), sulphur output from Refinery through products, by-product (elemental sulphur), atmospheric emissions etc.	Sulphur balancing is a regular practice of Guwahati Refinery and it is complied with after commissioning of the unit also.  <b>Complied &amp; Noted.</b>
9.	Ambient air quality monitoring stations (PM10,PM2.5,SO <sub>2</sub> ,NO <sub>x</sub> ,H <sub>2</sub> S , Mercaptan , non methane HC and benzene) shall be set up in the complex in consultation with Maharashtra Pollution Control Board , based on occurrence of maximum ground level concentration and down wind direction of wind .The monitoring network must be decided based on modeling exercise to represent short term GLCs.	Guwahati Refinery is located in Noonmati, District: Kamrup (Metro), Assam and under jurisdiction of Pollution Control Board, Assam.  Four nos of Ambient Air Monitoring stations based on downwind GLC contour and discussions with APCB are in regular operation and monitoring done through external agency as per NAAQS notified by Ministry on 16 <sup>th</sup> November 2009.  One Continuous Ambient Air Quality Monitoring (CAAQM) station is installed with connectivity to CPCB/APCB for continuous Ambient Air Quality monitoring (SO <sub>x</sub> , NO <sub>x</sub> , CO, O <sub>3</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , NH <sub>3</sub> ) .  <b>Complied</b>
10.	Ambient air quality data shall be collected as per NAAQS standards notified by the ministry on 16th November 2009 and trend analysis w.r.t past monitoring results shall also be carried out. Adequate measures based on trend analyses shall be taken to improve the ambient air quality in the project area.	Ambient air quality data is regularly collected as per NAAQS standards notified by the ministry on 16th November 2009 which are well within limit and the compliance status during the period Dec'16 to May'17 is attached as Annexure-II  <b>Complied.</b>
11.	The gaseous emission from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Besides acoustic enclosure /silencer shall be installed wherever noise levels exceed the limit.	GR does not have a DG set
12.	Total raw water requirement from Brahmaputra River shall not exceed 331 m <sup>3</sup> /hr. Industrial effluent (183 m <sup>3</sup> /hr) shall be treated in the effluent treatment plant. Treated effluent shall be recycled/reused as make up	a) Total raw water requirement will be monitored for not exceeding 331 m <sup>3</sup> /hr. For the year 2016-17, raw water consumption was 243 m <sup>3</sup> /hr.

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	<p>for the raw water cooling tower and coke cutting water. Treated Effluent (65 m<sup>3</sup>/hr) will be discharged into surface water body i.e River Brahmaputra after achieving standards prescribed.</p> <p>Domestic sewage shall be treated in sewage treatment plant (STP)</p>	<p>b) Industrial effluent is treated in Effluent Treatment Plant. About 95% of the treated effluent is reused as make up water for fire water/cooling towers /coke cutting water &amp; gardening &amp; balance is discharged to river Brahmaputra after achieving MINAS standards.</p> <p>Data attached as Annexure-IV.</p> <p>c) Domestic sewage is treated in Effluent Treatment Plant.</p> <p><b>Complied &amp; Noted.</b></p>
13.	Oil catchers/oil traps shall be provided at all possible locations in rain/storm water drainage system inside the factory premises	<p>Oil catchers /Hay filters provided at all required locations in rain/storm water drainage system inside refinery.</p> <p><b>Complied.</b></p>
14.	<p>a) Treated effluent shall be passed through guard pond.</p> <p>b) Online continuous pH meter, TOC analyzer and flow meter shall be installed to monitor the treated water quality.</p>	<p>a) The treated effluent is passed through two nos of guard ponds at effluent treatment plant having capacity more than 6000m<sup>3</sup></p> <p>b) Installation of online analyzers for monitoring treated effluent quality (pH, TSS, COD and BOD) has been completed in Dec 15 with connectivity to CPCB/APCB.</p> <p>Flow meter is available for daily monitoring the treated effluent quantity at ETP.</p> <p><b>Complied.</b></p>
15.	Oily sludge shall be treated via bioremediation process. Annual oily sludge generation and disposal data shall be submitted to the ministry's Regional office and CPCB	<p>Oily sludge generation is regularly treated via Bioremediation and also reprocessed in DCU. Oily sludge generation and disposal data submitted to APCB annually. Data of oily sludge from Dec'16 to May'17 is attached as Annexure-VI.</p>
16.	The company should strictly comply with the rules and regulations under Manufacture storage and import of hazardous chemicals rules 1989 as amended in October, 1994 and January 2000. Hazardous waste should be disposed of as per Hazardous waste (management handling and trans-boundary rules 2008 and amended time to time.	<p>Guwahati Refinery is strictly complying with the rules and regulations under Manufacture Storage and Import of hazardous chemicals rules 1989 and amendments thereafter. The refinery has authorization from Pollution Control Board, Assam under Hazardous Waste (Management and Handling) Rules 2008 with validity up to 27.01.2020 and strictly adheres to the terms and conditions of the authorization.</p>

*Refinery*



		<b>Complied.</b>
17	<p>The membership of common TSDF shall be obtained for disposal of hazardous waste. Copy of authorization or membership of TSDF shall be submitted to Ministry's Regional Office at Bhopal. Chemical /inorganic sludge shall be sent to treatment storage disposal facility (TSDF) for hazardous waste.</p> <p>Spent catalyst shall be sent to authorize recyclers/re-processors.</p>	<p>The common TSDF is at present not available in Assam.</p> <p>Hazardous oily sludge is bio-remediated through M/s The Energy &amp; Resources Institute (TERI) &amp; e-waste disposed to authorized vendor by auction through MSTC. Guwahati Refinery has received authorization from State Pollution Control Board for handling of hazardous waste under Hazardous Waste (Management and Handling) Rules 2008.</p> <p>Spent catalyst is disposed to authorized recyclers by auction through MSTC.</p>
18	Proper oil spillage prevention management plan shall be prepared to avoid spillage /leakage of oil/petroleum products and ensure regular monitoring	<p>This already exists and same has been extended to INDAdaptG unit. Regular monitoring is done for prevention of oil spillage.</p> <p><b>Complied &amp; Noted</b></p>
19	The company shall strictly follow all the recommendations mentioned in the charter on corporate responsibility for environment protection(CREP)	All the recommendations and guidelines from statutory bodies for Environment Protection are complied with.
20	To prevent fire and explosion at oil and gas facility , potential ignition sources shall be kept to a minimum and adequate separation distance between potential ignition sources and flammable materials shall be in place	<p>This is adhered to by meeting OISD norms. The layout of INDAdaptG plant meets OISD STD 118</p> <p><b>Complied</b></p>
21	Green belt shall be developed at least in 33% of the plot area in and around the plant premises to mitigate the effects of fugitive emissions all around the plant as per the CPCB guidelines in consultation with DFO. Thick greenbelt with suitable plant species shall be developed around unit. Selection of plant species shall be as per the CPCB guidelines.	<p>Because of space constraint green belt cannot be expanded inside refinery. However the tree plantation is taken up in and around refinery area.</p> <p>In the year 2014-15 tree plantation carried out by adopting Japanese Akira Miyawaki Model of Environment Forest Plantation under guidance of CPCB, Shillong. Total 2500 tree sampling planted in township areas in 2014-15 and 1000 tree in 2015-16.</p> <p>Plantation of total 5000 nos of trees within a stretch of 6 KM in NH 31, Amingaon, Ghy was carried out in partnership with NHAI and completed in May'2017.</p> <p>Under Sustainability programme Guwahati Refinery shall continuously keep on planting more and more trees in future.</p> <p><b>Complied.</b></p>

*Signature*



22	All the recommendations mentioned in the rapid risk assessment report, disaster management plan and safety guidelines shall be implemented.	All the recommendations of rapid risk assessment report, disaster management plan and safety guidelines were implemented during installation of IndadeptG plant. <b>Complied</b>
23	All the commitment made regarding issues raised during public hearing /consultation meeting held on 9 <sup>th</sup> April 2013 shall be satisfactorily implemented	During public hearing/consultation meeting held on 9 <sup>th</sup> April, 2013 no issues were raised.
24	Provision shall be made for the housing of construction labour within the site with all the necessary infrastructure and facilities such as fuel for cooking, mobile toilets. Safe drinking water, medical healthcare crèche etc .The housing may be in the form of temporary structures to be removed after the completion of the project.	Project is completed and the point is complied with.
<b>B</b>	<b>GENERAL CONDITIONS</b>	
1.	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board (SPCB), State government and any other statutory authority.	Stipulations of SPCB, State Government and any other statutory authority are adhered to.
2.	No further expansion or modification in the project shall be carried out without prior approval of the Ministry of Environment And Forest .In case of deviation or alterations in the project proposal from those submitted in the Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required if any.	Expansion/modification of INDAddeptG unit shall not be done without approval of Ministry.
3.	The project authorities must strictly comply with the rules and regulations under MSIHC rules 2000 as amended subsequently. Prior approvals from Chief Inspector Of Factories, Chief Controller Of Explosives, Fire & Safety Inspectorate etc must be obtained wherever applicable.	Prior approval from Chief Inspector Of Factories obtained vide letter Ref No KM/69/11553 dated 17.10.2015 followed by Stability certificate dated 23.09.2016  Prior approval from Chief Controller Of Explosives (CCOE), Nagpur obtained vide letter Ref No P/HQ/AS/15/845(P221799)/P-5(2)227/Refinery dated 03.02.2015  <b>Complied.</b>
4.	The overall noise levels in and around the plant area shall be well kept 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	Quarterly monitoring is done and results are well within the prescribed limits.  Compliance status is attached as Annexure-V

*P. Anand*



	conform to the standards prescribed under EPA rules ,1989 viz 75 dba(daytime) and 70 dba (nightime)	<b>Complied.</b>
5.	A separate Environment Management cell equipped with full fledged laboratory facilities must be set up to carry out the environment management and monitoring functions.	Separate environment management cell headed by GM exists. Laboratory facility is available in the refinery. <b>Complied.</b>
6.	Adequate funds shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures and shall be used to implement the conditions stipulated by MOEF as well as state govt. along with the implementation schedule for all the condition stipulated herein. The funds so provided shall not be diverted for any other purposes.	Following funds is being earmarked during the year 2016-17  BIOREMEDIATION : Rs 43.17 lakhs TREE PLANTATION. Rs. 79.36 lacs  ENVIRONMENT MONITORING :Rs 14.46 LAKHS  No funds diverted.  <b>Complied.</b>
7.	The Regional office of this Ministry/ CPCB/ SPCB will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	<b>Noted for compliance.</b> Monitored data has been attached as Annexure-VII
8.	A copy of clearance letter shall be sent by the proponent to concerned panchayat, Zila Parishad /municipal corporation, urban local body and the local NGO, if any from whom suggestions, representations, if any were received while processing the proposal.	News paper notification was published/ given regarding Environmental Clearance letter on 01.03.2016 in local dailies (One in English and one in vernacular language) <b>No suggestions, representations received.</b> <b>Complied</b>
9.	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of the monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of MOEF, the respective zonal office of CPCB and SPCB. The criteria pollutant levels namely PM 10,PM 2.5, SOX.NOX,HC (Methane and non methane),VOCs (ambient level) as well as stack emissions or critical sectoral parameters, indicated for the projects shall be monitored and displayed at convenient location near the main gate of the company in the public domain.	Compliance of Stipulated Environmental Clearance conditions, including monitoring data are submitted to MoEF Regional Office as per schedule. <b>Six monthly compliance report being uploaded in the IOCL website.</b>  Display of the environmental data at GR gate is available.  <b>Complied</b>

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10.	The project proponent shall also submit six monthly report on the status of the compliance of the stipulated environmental condition including results of the monitored data (both in hard copy as well as by e-mail to the Regional office of MOEF ,the respective zonal office of CPCB	The plant IndadeptG commissioned on 31 <sup>st</sup> January'2017. Results and Monitored Environmental data is attached as Annexure-A
11.	The environmental statement for each financial year ending 31 <sup>st</sup> march in form V as is mandated to be submitted by the project proponent to the concerned SPCB as prescribed under Environment (Protection Rules) 1986 as amended subsequently shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective regional office of the MOEF by e-mail.	Environment Statement is submitted annually to SPCB as per Environment (Protection Rules) 1986. Compliance status of Environmental Conditions is being uploaded at IOCL website; <a href="http://www.indianoil.in">www.indianoil.in</a>  <b>Complied.</b>
12.	The project proponent shall inform the public that the project has been accorded environment clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at the website of MOEF at <a href="http://envfor.nic.in">http://envfor.nic.in</a> . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the regional office	Copy of Environment Clearance is available with SPCB and may be seen at the website of MoEF at <a href="http://envfor.nic.in">http://envfor.nic.in</a> .  News paper notification was published/ given regarding Environmental Clearance letter on 01.03.2016 in local dailies (One in English and one in vernacular language). Copies attached as Annexure-B  <b>Complied</b>
13.	Project authorities shall inform the regional office as well as the Ministry the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	Approval by IOCL Board on 13 <sup>th</sup> February 2014 for IndadeptG Financial Closure is in process. The date of start of land development work is not applicable as the Project works started within the existing refinery land <b>Complied.</b>

*P. Infante*

**Annexure-I**

**Data on Stack Emission Monitoring at Guwahati Refinery**

(Dec'16-May'17)

Stack	Month	Fuel burnt (type with %)	Concentration in mg / Nm3 unless stated					
			SO2		NOX		PM	
			Limit	Actual	Limit	Actual	Limit	Actual
CDU	Dec-16	FO/FG	1360	345	429	185	81	26
	Jan-17	FO/FG	1024	390	409	219	63	38
	Feb-17	FO/FG	1042	413	410	230	64	43
	Mar-17	FO/FG	1332	458	428	263	79	29
	Apr-17	FO/FG	1526	558	439	226	91	52
	May-17	FO/FG	1295	235	425	164	78	60
DCU	Dec-16	FO/FG	371	226	369	131	45	30
	Jan-17	FO/FG	443	195	374	159	34	30
	Feb-17	FO/FG	404	233	371	174	36	28
	Mar-17	FO/FG	401	208	371	144	35	29
	Apr-17	FO/FG	439	213	374	171	31	29
	May-17	FO/FG	345	277	368	143	26	24
HDT	Dec-16	FG	50	11	350	78	10	8
	Jan-17	FG	50	9	350	82	10	9
	Feb-17	FG	50	14	350	85	10	8
	Mar-17	FG	50	10	350	57	10	8
	Apr-17	FG	50	24	350	85	10	9

*P. Infanta*



	<b>May-17</b>	FG	<b>50</b>	12	<b>350</b>	129	<b>10</b>	8
<b>HGU</b>	<b>Dec-16</b>	Napht ha/FG	<b>1400</b>	19	<b>432</b>	57	<b>84</b>	11
	<b>Jan-17</b>	Napht ha	<b>1700</b>	23	<b>450</b>	88	<b>100</b>	14
	<b>Feb-17</b>	Napht ha	<b>1700</b>	17	<b>450</b>	83	<b>100</b>	17
	<b>Mar-17</b>	Napht ha	<b>1700</b>	35	<b>450</b>	58	<b>100</b>	22
	<b>Apr-17</b>	Napht ha	<b>1700</b>	53	<b>450</b>	99	<b>100</b>	19
	<b>May-17</b>	Napht ha	<b>1700</b>	28	<b>450</b>	46	<b>100</b>	21
	<b>ISOM</b>	<b>Dec-16</b>	FG	<b>50</b>	10	<b>350</b>	33	<b>10</b>
<b>Jan-17</b>		FG	<b>50</b>	10	<b>350</b>	33	<b>10</b>	8
<b>Feb-17</b>		FG	<b>50</b>	12	<b>350</b>	40	<b>10</b>	8
<b>Mar-17</b>		FG	<b>50</b>	13	<b>350</b>	42	<b>10</b>	7
<b>Apr-17</b>		FG	<b>50</b>	13	<b>350</b>	35	<b>10</b>	8
<b>May-17</b>		FG	<b>50</b>	11	<b>350</b>	26	<b>10</b>	5
<b>INDM AX</b>	<b>Dec-16</b>	FO	<b>1700</b>	93	<b>450</b>	75	<b>100</b>	62
	<b>Jan-17</b>	FO	<b>1700</b>	108	<b>450</b>	97	<b>100</b>	74
	<b>Feb-17</b>	FO	<b>1700</b>	60	<b>450</b>	104	<b>100</b>	73
	<b>Mar-17</b>	FO	Shutdown					
	<b>Apr-17</b>	FO	<b>1700</b>	45	<b>450</b>	116	<b>100</b>	57
	<b>May-17</b>	FO	<b>1700</b>	20	<b>450</b>	46	<b>100</b>	48

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Blr-6&7	Dec-16	FO/FG	1219	474	421	193	74	71	
	Jan-17	FO/FG	1394	413	431	180	83	65	
	Feb-17	FO/FG	1168	421	430	215	71	68.9	
	Mar-17	FO/FG	1276	512	424	142	77	58	
	Apr-17	FO/FG	998	467	407	218	62	60	
	May-17	FO/FG	1134	272	416	127	69	58	
Blr-5	Dec-16	FO/FG	1700	279	450	141	100	42	
	Feb-17	FO/FG	1091	375	413	195	67	57	
	Mar-17	FO/FG	Shutdown						
	Apr-17	FO/FG	596	384	383	199	40	37	
	May-17	FO/FG	1366	229	430	140	82	37	

Stack	Month	Fuel burnt (type with %)	Concentration in mg / Nm3 unless stated					
			CO (ppm)		Ni+V		S in Liq. Fuel, % wt	
			Limit	Actual	Limit	Actual	Limit	Actual
CDU	Dec-16	FO/FG	190	16	5	0.0271/BDL	1	0.44
	Jan-17	FO/FG	180	14	5	0.0366/BDL	1	0.43
	Feb-17	FO/FG	180	12	5	0.0477/BDL	1	0.43
	Mar-17	FO/FG	189	20	5	0.0266/BDL	1	0.50
	Apr-17	FO/FG	195	19	5	0.0471/BDL	1	0.45
	May-17	FO/FG	188	19	5	BDL/BDL	1	0.43
DCU	Dec-16	FO/FG	160	6	5	0.0124/BDL	1	0.44

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	Jan-17	FO/FG	162	6	5	0.0189/BDL	1	0.43
	Feb-17	FO/FG	161	8	5	0.027/BDL	1	0.43
	Mar-17	FO/FG	161	9	5	0.0285/BDL	1	0.50
	Apr-17	FO/FG	162	8	5	0.0202/BDL	1	0.45
	May-17	FO/FG	159	8	5	0.0242/BDL	1	0.43
HDT	Dec-16	FG	150	2	5	BDL/BDL	1	0.44
	Jan-17	FG	150	3	5	BDL/BDL	1	0.43
	Feb-17	FG	150	4	5	BDL/BDL	1	0.43
	Mar-17	FG	150	4	5	BDL/BDL	1	0.50
	Apr-17	FG	150	2	5	BDL/BDL	1	0.45
	May-17	FG	150	7	5	BDL/BDL	1	0.43
HGU	Dec-16	Napht ha/FG	191	4	5	BDL/BDL	1	0.44
	Jan-17	Napht ha	200	3	5	BDL/BDL	1	0.43
	Feb-17	Napht ha	200	3	5	BDL/BDL	1	0.43
	Mar-17	Napht ha	200	5	5	BDL/BDL	1	0.50
	Apr-17	Napht ha	200	4	5	BDL/BDL	1	0.45
	May-17	Napht ha	200	3	5	BDL/BDL	1	0.43
ISOM	Dec-16	FG	150	5	5	BDL/BDL	1	0.44
	Jan-17	FG	150	4	5	BDL/BDL	1	0.43

*P. Infante*

	Feb-17	FG	150	4	5	BDL/BDL	1	0.43
	Mar-17	FG	150	6	5	BDL/BDL	1	0.50
	Apr-17	FG	150	4	5	BDL/BDL	1	0.45
	May-17	FG	150	5	5	BDL/BDL	1	0.43
INDM AX	Dec-16	FO	400	5	5	0.023/BDL	1	0.44
	Jan-17	FO	400	4	5	0.027/BDL	1	0.43
	Feb-17	FO	400	7	5	0.021/BDL	1	0.43
	Mar-17	FO	Shutdown					
	Apr-17	FO	400	8	5	0.0295/BDL	1	0.45
	May-17	FO	400	8	5	0.0175/BDL	1	0.43
Blr- 6&7	Dec-16	FO/FG	185	7	5	0.0266/BDL	1	0.44
	Jan-17	FO/FG	191	7	5	0.0332/BDL	1	0.43
	Feb-17	FO/FG	184	8	5	0.0417/BDL	1	0.43
	Mar-17	FO/FG	187	10	5	0.0255/BDL	1	0.50
	Apr-17	FO/FG	179	6	5	0.0375/BDL	1	0.45
	May-17	FO/FG	183	10	5	0.0122/BDL	1	0.43
Blr-5	Dec-16	FO/FG	200	5	5	0.0132/BDL	1	0.44
	Feb-17	FO/FG	182	6	5	0.0282/BDL	1	0.43
	Mar-17	Shutdown						
	Apr-17	FO/FG	167	5	5	0.0214/BDL	1	0.45
	May-17	FO/FG	190	12	5	0.0185/BDL	1	0.43

- H2S in fuel gas is present in traces
- Opacity of INDMAX unit is 29% (limit 30%)

*Indmax*



SRUData:

Parameters	Limit for Existing SRU	Actual Values
Sulfur Recovery %	94	94.1
NOx, mg/Nm <sup>3</sup>	350	134.2
CO, ppm	150	7.7

\*BDL- Below Detectable Limit

\*FO- Fuel Oil

\*FG- Fuel Gas

*Surfdata*

**Annexure-II**

**Data on Ambient Air Monitoring at Guwahati Refinery**

AMBIENT AIR MONITORING REPORT						Dec'16-May-17						
AMBIENT AIR QUALITY MONITORING REPORT												
	SO2	NO2	PM 10	PM 2.5	Ozone (O3)	Lead (Pb)	CO	Ammonia (NH3)	Benzene (C6H6)	Benzo(O) Pyrene	Arsenic (As)	Nickel (Ni)
Concentration of Pollutants												
	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	mg/m3	µg/m3	µg/m3	ng/m3	ng/m3	ng/m3
Limit	80	80	100	60	100	1	2	400	5	1	6	20
<b>Location : Adm Building</b>												
Max	16.3	48.6	98.0	58.0	42.6	0.09	0.96	26.00	3.95	0.98	1.96	13.66
Min	5.8	21.2	61.0	28.0	<10.0	<0.02	0.45	<10.0	<2.08	<0.4	<1.0	<4.0
Avg.	9.9	35.2	85.0	45.3	26.6	0.04	0.72	17.56	2.64	0.64	1.34	8.33
<b>Location : Guest House</b>												
Max	14.7	47.3	97.0	57.0	37.4	0.08	0.96	23.40	3.96	0.98	2.03	12.87
Min	4.9	20.2	46.0	17.0	<10.0	<0.02	0.44	<10.0	<2.08	<0.4	<1.0	<4.0
Avg.	8.6	34.5	82.7	44.3	24.6	0.04	0.71	15.49	2.53	0.58	1.31	7.55
<b>Location : Sector II</b>												
Max	16.5	52.6	97.0	59.0	35.5	0.09	0.95	31.2	3.96	0.97	2.36	13.4
Min	4.2	18.5	48.0	21.0	<10.0	<0.02	0.32	<10.0	<2.08	<0.4	<1.0	<4.0
Avg.	8.5	34.7	83.7	43.8	24.2	0.04	0.68	15.6	2.62	0.66	1.36	7.4

*[Handwritten signature]*



Location : WTP												
<b>Max</b>	17.3	46.5	97.0	58.0	34.2	0.04	0.86	18.6	2.38	0.99	1.7	10.4
<b>Min</b>	4.2	12.2	30.0	12.0	<10.0	<0.02	0.25	<10.0	<2.08	<0.4	<1.0	<4.0
<b>Avg.</b>	5.8	25.0	63.2	34.3	17.1	0.02	0.45	11.7	2.09	0.4	1.0	5.4
<b>Note :</b>	BDL= Below Detections Limit											

*Signature*

Annexure-III

Fugitive Emissions

Fugitive Emission (Dec'16-May'17)						
		In between H2U & HDT	Near Indmax	Near CDU	Near Unit No. 6 & 7	Near DCU
Dec-16	Total HC(ppm)/Benz ene(MG/NM3)	11.77/0.272	9.77/0.251	10.45/0.233	12.57/0.364	12.5/0.371
Jan-17	Total HC(ppm)/Benz ene(MG/NM3)	12.35/0.321	9.91/0.249	10.45/0.249	12.57/0.467	12.50/0.323
Feb-17	Total HC(ppm)/Benz ene(MG/NM3)	11.95/0.286	11.57/0.363	14.75/0.410	11.94/0.312	12.24/0.319
Mar-17	Total HC(ppm)/Benz ene(MG/NM3)	17.06/0.355	16.38/0.364	15.69/0.505	13.06/0.292	14.52/0.324
Apr-17	Total HC(ppm)/Benz ene(MG/NM3)	16.00/0.379	13.94/0.385	14.76/0.329	14.28/0.407	11.89/0.314
May-17	Total HC(ppm)/Benz ene(MG/NM3)	10.70/0.233	11.42/0.312	17.75/0.475	14.16/0.370	10.0/0.306

*Signature*



Annexure-IV

Data on Discharged Effluent Analysis at Guwahati Refinery

Dec'16-May'17

<u>PARAMETER</u>	<u>LIMIT (mg/m3 except PH)</u>	<u>AVERAGE</u>
pH	6.0 - 8.5	7.2
Oil & Grease	5.0	3.4
BOD	15.0	9
COD	125.0	76
TSS	20.0	14
Phenols	0.35	0.28
Sulphides	0.5	0.02
CN	0.20	0.011
Ammonia as N	15.0	5.63
TKN	40.0	10.8
P	3.0	0.05
Cr (Hexavalent)	0.1	0.01
Cr (Total)	2.0	0.01
Pb	0.1	0.01
Hg	0.01	0.001
Zn	5.0	0.09
Ni	1.0	0.02
Cu	1.0	0.02
V	0.2	0.2

*Prof. S. K. Das*

Benzene	0.1	0.005
Benzo (a) -Pyrene	0.2	0.0001

*Prof. Adams*



Annexure – V

NOISE LEVEL MONITORING

BATTERY AREA

NOISE LEVEL MONITORING

BATTERY AREA

GUWAHATI REFINERY (Dec'16-May'17)

SL. NO.	AREA	LOCATION	AVERAGE EXPOSURE FOR AN EMPLOYEE PER SHIFT (HRS)	READING IN dBA
1	TPS	Boiler - 3	1.30 hrs	OFF
		Boiler - 4	1.30 hrs	85.0
		Boiler - 5	1.30 hrs	92.0
		Boiler - 6	1.30 hrs	91.0
		Boiler - 7	1.30 hrs	88.0
		Boiler Control Room	8.0 hrs	67.0
		TG - 3	1.30 hrs	OFF
		TG - 4	1.30 hrs	98.0
		TG - 5	1.30 hrs	92.0
		Turbine Control Room	8.0 hrs	65.0
		DM Plant Pump Area	1.30 hrs	94.0
		DM Plant Control Room	8.0 hrs	66.0

*P. Infada*

2	CDU	Model Pump House	1.30 hrs	95.0
		Cold Pump House	1.30 hrs	94.0
		Hot Pump House	1.30 hrs	95.0
		NSF Area	1.30 hrs	94.0
		CDU Field Control Room	8.0 hrs	66.0
3	DCU	Cold Pump House	1.30 hrs	94.0
		Hot Pump House	1.30 hrs	96.0
		Air Compressor Area	1.30 hrs	93.0
		DCU Field Control Room	8.0 hrs	67.0
4	NITROGEN	Air Compressor 013-K-01A	1.00 hr	97.0
		Air Compressor 013-K-01B	1.00 hr	98.0
		Air Compressor 013-K-01C	1.00 hr	98.0
5	INDMAX	Main Air Blower Area	1.00 hr	94.0

*Signature*



		INDMAX Field Control Room	8.0 hrs	67.0
6	SRU	Main Air Blower 51A-K-01A	1.30 hrs	96.0
		Main Air Blower 51A-K-01B	1.30 hrs	OFF
		SRU Field Control Room	8.0 hrs	64.0
7	HDT	Pump Area	1.00 hr	90.0
		HDT/HGU Field Control Room	8.0 hrs	65.0
8	HGU	Pump Area	1.00 hr	93.0
		HDT/HGU Field Control Room	8.0 hrs	65.0
9	MSQU	Pump Area	1.00 hr	92.0
		MSQU Field Control Room	8.0 hrs	64.0
10	ETP	Air Blower Area	1.00 hr	97.0
		ETP Control Room	8.0 hrs	68.0

*Indmax*

**Permissible Noise Level For Continuous Exposure ( OISD-GDN-166, JULY 1997,)**

<b>DURATION PER DAY (HOURS)</b>	<b>SOUND LEVEL (dBA)</b>
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
1/2	110
1/4 or less	115

**\*Boiler-4 in TPS was put off from Dec'16-Mar'17**

**\*Boiler-5 in TPS was under maintenance in Dec'16 and was put off in Apr'17.**

**\*Air Compressor 013-K-01A in Nitrogen plant was running from Jan'17-Mar'17**

**\*Air Compressor 013-K-01B in Nitrogen plant is running from Apr'17**

**\*Air Compressor 013-K-01C in Nitrogen plant was put off from Jan'17**

*Ref. info.*



Annexure-VI

Oily Sludge Details (Dec'16-May'17)

Refinery	Oily Sludge						Treatment for Oil Recovery / Processing					Closing Stock as on 31.05.17 (MT)
	GR	Opening Stock as on 01.12.16 (MT)	Generation (MT)			Total Stock (MT)	Qty. (MT)			Methodology **		
			ETP sludge	Tank bottom sludge	Any others		ETP sludge	Tank bottom sludge	Processing in DCU	ETP sludge	Tank bottom sludge	
Guwahati	Dec'16 – May'17	8	630	380	0	1018	0	380	586	Bioremediation	Steaming and processed as slop in DCU after dewatering	52

Residual Oily Sludge						
Opening Stock as on 01.12.16 (MT)	Generation		Disposal		Closing Stock as on 31.05.17 (MT)	
	Qty. (MT)		Qty. (MT)	Methodology ***		% oil content in residual sludge
348	595		0	Bioremediation	<10	943

- Confine Bio-remediation was successfully completed with 123 m3 of oily sludge in April 2016. Second batch of confine bio-remediation with 220 m3 of oily sludge is in progress

*P. S. Das*

Annexure VII

SO<sub>2</sub> Emission In Guwahati Refinery

Unit	Stack	Feb'17
		SO <sub>2</sub> (kg/hr)
TPS	Unit No. 3&4	16.91
TPS	Unit No. 5	29.48
TPS	Unit No. 6	62.36
SRU	Stack	1.35
HDT	Furnace	0.19
CDU	Furnace	8.38
DCU	Furnace	25.33
H <sub>2</sub> U	Stack	0.61
MSQU	Furnace	0.06
INDMAX	Stack	3.48
<b>Total (kg/hr)</b>		<b>148.15</b>
<b>Total (TPD)</b>		<b>3.56</b>

- TPS Unit 3&4 have been put off since February,2017

Unit	Stack	March'17
		SO <sub>2</sub> (kg/hr)
TPS	Unit No. 6 &7	6.98
HDT	Furnace	0.13
CDU	Furnace	8.80
DCU	Furnace	21.76
H <sub>2</sub> U	Stack	1.28
MSQU	Furnace	0.06
SRU	Stack	1.64
<b>Total (kg/hr)</b>		<b>40.65</b>
<b>Total (TPD)</b>		<b>0.98</b>

- TPS Unit 5 and INDMAX were under shutdown in March, 2017.

*P. S. Saha*



Unit	Stack	April'17
		SO <sub>2</sub> (kg/hr)
TPS	Unit No. 5	31.71
TPS	Unit No. 6 &7	67.33
HDT	Furnace	0.32
CDU	Furnace	9.38
DCU	Furnace	22.05
H <sub>2</sub> U	Stack	1.72
MSQU	Furnace	0.06
SRU	Stack	1.26
INDMAX	Stack	1.28
<b>Total (kg/hr)</b>		<b>135.11</b>
<b>Total (TPD)</b>		<b>3.24</b>

Unit	Stack	May'17
		SO <sub>2</sub> (kg/hr)
TPS	Unit No. 5	18.08
TPS	Unit No. 6 &7	38.79
HDT	Furnace	0.16
CDU	Furnace	5.46
DCU	Furnace	30.87
H <sub>2</sub> U	Stack	0.97
MSQU	Furnace	0.05
SRU	Stack	0.52
INDMAX	Stack	0.65
<b>Total (kg/hr)</b>		<b>95.54</b>
<b>Total (TPD)</b>		<b>2.29</b>

*Indonesian*