



इंडियन ऑयल कॉर्पोरेशन लिमिटेड

बॉंगागाँव रिफाइनरी

डाकघर : धालीगाँव - 783 385

जिला : चिरांग (असम)

Indian Oil Corporation Limited

Bongaigaon Refinery

P.O. : Dhaligaon - 783 385

Dist. : Chirang (Assam)

रिफाइनरीज प्रभाग

Refineries Division

IOC/BGR/ENV/REP/MoEF/2012-13/02

Date: 17.05.2013

To

**The Chief Conservator of Forests**

Regional Office, North East Region

Ministry of Environment & Forests

Law-U-SIB, Lumbatngen, Near M.T.C. Workshop,

**Shillong – 793021**

**Subject: Half yearly Report for the period of 1<sup>st</sup> October, 2012 to 31<sup>st</sup> March, 2013  
for "Refinery Expansion" Project**

Dear Sir,

With reference to above, we are enclosing the Six Monthly Report for the period of **1<sup>st</sup> October, 2012 to 31<sup>st</sup> March, 2013** for your kind perusal. The reports are being sent as per EIA Rules'2006 for the "Environmental Clearances" issued by MoEF to Bongaigaon Refinery, (BGR) for "Refinery Expansion" project.

Thanking you,

Yours faithfully,

(A.K. Agarwal)

Chief Manager (HSE)

Copy to:

1. Member Secretary, Pollution Control Board, Assam  
Bamunimaidam, Guwahati - 781 021
2. Zonal Officer, Central Pollution Control Board  
Eastern Zonal Office, 'TUM-SIR', Lower Motinagar,  
Near Fire Brigade H.Q., Shillong – 793014

**Half yearly Report for the period of 1<sup>st</sup> October, 2012 to 31<sup>st</sup> March, 2013  
for “Refinery Expansion” project**

**Environmental Clearance for Refinery Expansion, De-bottlenecking of Reformer and LPG facility vide MoEF’s letter No. J.11011/24/90-IA-II dated 03/06/1991:**

**Plant Commissioning dates:**

- 1. Crude Distillation Unit - II: 09.05.95**
- 2. Delayed Coker Unit - II: 06.03.96**

<b>Sl. No</b>	<b>Clearance Conditions</b>	<b>Status</b>
1.	Six monthly Effluent Quality (Point No. VIII)	Furnished in Appendix-A1
2.	Six monthly Ambient Air Quality/ Stack Monitoring Data	Furnished in Appendix-A2
3.	Tree Plantation Data	Furnished in Appendix-A3
4.	Special Information	Furnished in Appendix-A4

## **APPENDIX –A1**

### **Effluent Discharged (Figure in M<sup>3</sup>/Hr)**

(1<sup>st</sup> October 2012 to 31<sup>st</sup> March 2013)

A	Industrial Effluent M <sup>3</sup> /Hr	<b>178.4</b>
B	Domestic Effluent from BGR Township M <sup>3</sup> /Hr	<b>81.4</b>
C	Total Effluent Treated (A + B) M <sup>3</sup> /Hr	<b>259.8</b>
D	Treated Effluent Reused M <sup>3</sup> /Hr	<b>246.7</b>
E	Effluent Discharged M <sup>3</sup> /Hr	<b>13.2</b>
F	M <sup>3</sup> of Effluent discharged for 1000 tones of Crude processed	<b>48.4</b> <b>(Std. 400)</b>

## **EFFLUENT QUALITY**

### **A. Treated Effluent Quality**

(1<sup>st</sup> October 2012 to 31<sup>st</sup> March 2013)

Sl. No	Parameter	MINAS,2008	Min	Avg.	Max
1	p <sup>H</sup> value	6.0 - 8.5	6.5	7.2	8.5
2	Oil and Grease, mg/l	5.0	0.6	1.5	4.0
3	Bio-Chemical Oxygen Demand (3 Day at 27°C), mg/l	15.0	2.0	3.8	11.0
4	Chemical Oxygen Demand (COD), mg/l	125.0	19.0	33.2	80.0
5	Suspended solids, mg/l	20.0	2.0	4.9	13.0
6	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH), mg/l	0.35	BDL	BDL	BDL
7	Sulphide (as S), mg/l	0.50	BDL	BDL	BDL
8	CN mg/l	0.20	BDL	BDL	BDL
9	Ammonia as N, mg/l	15.0	0.10	0.53	1.36
10	TKN, mg/l	40.0	0.70	1.06	1.57
11	P, mg/l	3.0	0.12	0.47	1.20
12	Cr (Hexavalent), mg/l	0.10	BDL	BDL	BDL
13	Cr (Total), mg/l	2.0	BDL	BDL	BDL
14	Pb, mg/l	0.10	BDL	BDL	BDL
15	Hg, mg/l	0.01	BDL	BDL	BDL
16	Zn, mg/l	5.0	BDL	BDL	BDL
17	Ni, mg/l	1.0	BDL	BDL	BDL
18	Cu, mg/l	1.0	BDL	BDL	BDL
19	V, mg/l	0.20	BDL	BDL	BDL
20	Benzene, mg/l	0.10	BDL	BDL	BDL
21	Benzo (a) pyrene, mg/l	0.20	BDL	BDL	BDL

# EFFLUENT QUALITY

## B. Final Outlet (From the Complex) Effluent Quality

(1<sup>st</sup> October 2012 to 31<sup>st</sup> March 2013)

Sl. No.	Parameter	MINAS	Min	Avg.	Max
1	p <sup>H</sup> value	6.0 - 8.5	6.5	7.6	8.5
2	Oil and Grease, mg/l	5.0	1.00	1.87	5.00
3	Bio-Chemical Oxygen Demand (3 Days at 27° C), mg/l	15.0	2.0	4.6	12.0
4	Chemical Oxygen Demand (COD), mg/l	125.0	19.0	36.6	120.0
5	Suspended Solids, mg/l	20.0	2.0	5.5	20.0
6	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH), mg/l	0.35	0.02	0.03	0.08
7	Sulphide (as S), mg/l	0.50	0.02	0.15	0.50
8	CN, mg/l	0.20	BDL	BDL	BDL
9	Ammonia as N , mg/l	15.0	0.10	0.43	0.68
10	TKN, mg/l	40.0	0.68	0.92	1.15
11	P, mg/l	3.0	0.35	0.83	1.30
12	Cr (Hexavalent), mg/l	0.10	BDL	BDL	BDL
13	Cr (Total), mg/l	2.0	BDL	BDL	BDL
14	Pb, mg/l	0.10	BDL	BDL	BDL
15	Hg, mg/l	0.01	BDL	BDL	BDL
16	Zn, mg/l	5.0	BDL	BDL	BDL
17	Ni, mg/l	1.0	BDL	BDL	BDL
18	Cu, mg/l	1.0	BDL	BDL	BDL
19	V, mg/l	0.20	BDL	BDL	BDL
20	Benzene, mg/l	0.10	BDL	BDL	BDL
21	Benzo (a) pyrene, mg/l	0.20	BDL	BDL	BDL

## STACK MONITORING DATA

(1<sup>st</sup> October 2012 to 31<sup>st</sup> March 2013)

### A. SO<sub>2</sub> Emission (mg/Nm<sup>3</sup>):

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 1700 For F.G. = 50	92	377	649
CDU-II		65	368	998
DCU-I		91	419	655
DCU-II		23	416	996
CPP		29	323	998
Reformer		5	31	361
HO-1		14	142	444
Isomerisation		1	15	212

### B. NO<sub>x</sub> Emission (mg/Nm<sup>3</sup>):

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 450 For F.G. = 350	63	112	409
CDU-II		23	104	333
DCU-I		50	96	221
DCU-II		44	88	212
CPP		101	237	429
Reformer		20	136	276
HO-1		10	87	212
Isomerisation		2	28	63

### C: PM Emission (mg/Nm<sup>3</sup>)

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 100 For F.G. = 10	9.0	12.5	16.5
CDU-II		6.0	16.6	30.8
DCU-I		4.0	15.2	34.5
DCU-II		6.0	6.0	6.0
CPP		14.0	18.0	25.1
Reformer		4.7	6.6	8.0
HO-1/2		9.0	13.3	19.0
Isomerisation		4.0	5.7	8.0

**STACK MONITORING DATA**  
(1<sup>st</sup> October 2012 to 31<sup>st</sup> March 2013)

**D. CO Emission (mg/Nm<sup>3</sup>)**

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 200 For F.G. = 150	29.0	33.0	41.0
CDU-II		43.0	51.0	61.0
DCU-I		33.0	37.7	43.0
DCU-II		47.0	47.0	47.0
CPP		39.0	48.3	63.0
Reformer		7.0	9.7	11.0
HO-1/2		6.0	8.3	10.0
ISMERISATION		4.0	13.3	19.0

**E. Ni + V Emission (mg/Nm<sup>3</sup>) :**

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 5	<1.0	<1.0	<1.0
CDU-II		<1.0	<1.0	<1.0
DCU-I		<1.0	<1.0	<1.0
DCU-II		<1.0	<1.0	<1.0
CPP		<1.0	<1.0	<1.0
Reformer		<1.0	<1.0	<1.0
HO-1/2		<1.0	<1.0	<1.0
ISMERISATION		<1.0	<1.0	<1.0

## APPENDIX – A2

### AMBIENT AIR QUALITY AROUND BGR COMPLEX (Average of monthly sample Schedule – VII) (1<sup>st</sup> October 2012 to 31<sup>st</sup> March 2013)

	Station	Continuous Monitoring Station	Near Tube Well No.14	Near LPG Bottling plant	Rural Health Centre	Bartala Rail Gate	Near TW No.7 in Township
<b>1</b>	<b>SO<sub>2</sub> (Std.: 50/80 µg/m<sup>3</sup>)</b>						
	Min	1.9	BDL	BDL	BDL	BDL	BDL
	Average	14.9	BDL	BDL	BDL	BDL	BDL
	Max	52.3	BDL	BDL	BDL	BDL	BDL
	No of observation	Continuous	48	48	48	48	48
<b>2</b>	<b>NO<sub>2</sub> (Std. 40/80 µg/m<sup>3</sup>)</b>						
	Min	3.3	5.0	5.0	5.0	5.0	5.0
	Average	6.9	8.0	7.8	8.6	8.6	8.3
	Max	13.6	10.0	10.0	13.0	12.0	12.0
	No of observation	Continuous	48	48	48	48	48
<b>3</b>	<b>PM-10 (Std. 60/100 µg/m<sup>3</sup>)</b>						
	Min	2.8	32.0	52.0	50.0	21.0	34.0
	Average	32.2	76.0	72.1	84.9	79.1	74.9
	Max	92.1	98.0	94.0	98.0	98.0	93.0
	No of observation	Continuous	48	48	48	48	48
<b>4</b>	<b>PM-2.5 (Std. 40/60 µg/m<sup>3</sup>)</b>						
	Min	2.3	16.0	25.0	26.0	11.0	13.0
	Average	21.6	45.6	44.2	49.9	47.5	43.8
	Max	52.3	58.0	58.0	60.0	60.0	56.0
	No of observation	Continuous	48	48	48	48	48
<b>5</b>	<b>Ammonia (Std. 100/400 µg/m<sup>3</sup>)</b>						
	Min	2.3	BDL	BDL	BDL	BDL	BDL
	Average	2.9	BDL	BDL	BDL	BDL	BDL
	Max	3.6	BDL	BDL	BDL	BDL	BDL
	No of observation	Continuous	48	48	48	48	48
<b>6</b>	<b>Pb (Std. -0.5/1.0 µg/m<sup>3</sup>)</b>						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL
	No of observation		48	48	48	48	48

7	Arsenic (As) (Std.- 6 ng/m3)						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL
	No of observation		48	48	48	48	48
8	Ni (Std.- 20 ng/m3)						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL
	No of observation		48	48	48	48	48
9	CO (Std.- 2/4 mg/m3)						
	Min	0.01					
	Average	0.15					
	Max	0.93					
	No of observation	Continuous					
10	Ozone (Std. -100/180 µg/m <sup>3</sup> for 8hrs./1 hr.)						
	Min	5.7	BDL	BDL	BDL	BDL	BDL
	Average	19.9	BDL	BDL	BDL	BDL	BDL
	Max	42.0	BDL	BDL	BDL	BDL	BDL
	No of observation	Continuous	48	48	48	48	48
11	Benzene(Std. : 5 µg/m <sup>3</sup> )						
	Min	0.01	BDL	BDL	BDL	BDL	BDL
	Average	0.27	BDL	BDL	BDL	BDL	BDL
	Max	2.39	BDL	BDL	BDL	BDL	BDL
	No of observation	Continuous	48	48	48	48	48
12	Benzo(a)Pyrene_(Std. : 1 ng/m <sup>3</sup> )						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL
	No of observation		48	48	48	48	48

Average of Six Stations												
PARAMETER	SO <sub>2</sub>	NO <sub>2</sub>	PM-10	PM-2.5	NH <sub>3</sub>	Pb	As	Ni	Benz o(a) Pyre ne	CO	C <sub>6</sub> H <sub>6</sub>	O <sub>3</sub>
Unit	µg/m <sup>3</sup>					ng/m <sup>3</sup>				mg/m <sup>3</sup>	µg/m <sup>3</sup>	
NAAQ Std. 2009	50/80	40/80	60/100	40/60	100/400	0.5/1.0	Max. 6	Max. 20	Max 1	2/4	Max 5	100/180
Min	1.9	3.3	2.8	2.3	1.1	BDL	BDL	BDL	BDL	0.01	0.01	5.7
Average	14.9	8.0	69.9	42.1	3.1	BDL	BDL	BDL	BDL	0.15	0.27	19.9
Max	52.3	13.6	98.0	60.0	3.8	BDL	BDL	BDL	BDL	0.93	2.39	42.0



## **APPENDIX – A3**

### **Tree Plantation (1<sup>st</sup> October, 2012 to 31<sup>st</sup> March, 2013)**

The entire area inside BGR covers with Greenery through massive plantation activities. Through massive plantation work and by giving protection to natural forest growth inside BGR premises, the entire area has become green. The entire plant area where processing plant facilities do not exist has a green cover. This helps in reduction of noise and air pollution level in one hand while on the other hand provides protection to ecological features of the area. The refinery has an excellent quality environment around its complex. Natural greenery can be seen all around the complex and in all seasons of the year.

Total number of trees planted inside plant area & township are around 60,000

However tree plantation is a continuous process in Bongaigaon Refinery to compensate the loss due to tree felling and maintain the green balance.

## **APPENDIX – A 4**

### **Additional Information (1<sup>st</sup> October, 2012 to 31<sup>st</sup> March, 2013)**

Effluent reused during the period (1<sup>st</sup> October, 2012 to 31<sup>st</sup> March, 2013) was around 95.0% of the total effluent treated which includes plant effluents as well as Township sewer.

Under the Leak Detection and Repair programme (LDAR), BGR is conducting quarterly Fugitive Emission Survey. During the period from 1<sup>st</sup> October, 2012 to 31<sup>st</sup> March, 2013, 22706 potential leaky points were checked and 258 leaky points were detected and rectified. By following LDAR programme in true spirit, the company could not only avoid potential loss of 0.40 MTA (approx.) of light Hydrocarbon to the atmosphere through fugitive sources but also able to keep healthy work environment in the plant complex.

To ensure work area quality and health of equipments, quarterly noise survey was conducted covering all the operating plants, control rooms and ambient surrounding the BGR complex. Noise Survey for all four quarters of 2012-13 has been completed, and no abnormality was reported.

As a measure of Hazardous Waste Management, M/s Balmer Lowrie & Co. Limited was awarded the contract of Oily Sludge processing along with bio-remediation of solids. The party is carrying out the processing of oily sludge from sludge lagoons. About **4093 KL** of oily sludge has been processed during the period from **1<sup>st</sup> October, 2012 to 31<sup>st</sup> March, 2013**.

Further two no. Rain Water Harvesting (ground water recharging) schemes inside BGR complex has been implemented in the year.