Indian Oil

इंडियन ऑयल कॉर्पोरेशन लिमिटेड
बोंगाइगाँव 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/2013-14/01 **Date: 19.11. 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 1st April, 2013 to 30th September 2013 for "Refinery Expansion Project"

Dear Sir,

With reference to above, we are enclosing the Six Monthly Report for the period of **1st April, 2013 to 30th September, 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 1st April, 2013 to 30th September, 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**

Sl. No	Clearance Conditions	Status
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^3/Hr)

(1st April, 2013 to 30th September, 2013)

A	Industrial Effluent M^3/Hr	**186.0**
B	Domestic Effluent from BGR Township M^3/Hr	**69.6**
C	Total Effluent Treated (A + B) M^3/Hr	**255.6**
D	Treated Effluent Reused M^3/Hr	**237.9**
E	Effluent Discharged M^3/Hr	**17.7**
F	M^3 of Effluent discharged for 1000 tones of Crude processed	**69.7 (Std. 400)**

EFFLUENT QUALITY

A. Treated Effluent Quality

(**1st April, 2013 to 30th September, 2013**)

Sl. No	Parameter	MINAS,2008	Min	Avg.	Max
1	**p^H value**	**6.0 - 8.5**	**6.0**	**7.1**	**8.5**
2	**Oil and Grease, mg/l**	**5.0**	**1.0**	**1.1**	**1.4**
3	**Bio-Chemical Oxygen Demand (3 Day at 27°C), mg/l**	**15.0**	**2.0**	**3.9**	**8.8**
4	**Chemical Oxygen Demand (COD), mg/l**	**125.0**	**20.0**	**27.4**	**59.0**
5	**Suspended Solids, mg/l**	**20.0**	**3.0**	**4.0**	**5.0**
6	**Phenolic compounds (as C6H5OH), mg/l**	**0.35**	**0.02**	**0.04**	**0.08**
7	**Sulphide (as S), mg/l**	**0.50**	**0.02**	**0.09**	**0.31**
8	**CN mg/l**	**0.20**	**BDL**	**BDL**	**BDL**
9	**Ammonia as N, mg/l**	**15.0**		**0.98**	
10	**TKN, mg/l**	**40.0**		**1.19**	
11	**P, mg/l**	**3.0**		**0.63**	
12	**Cr (Hexavalent), mg/l**	**0.10**		**BDL**	
13	**Cr (Total), mg/l**	**2.0**		**BDL**	
14	**Pb, mg/l**	**0.10**		**BDL**	
15	**Hg, mg/l**	**0.01**		**BDL**	
16	**Zn, mg/l**	**5.0**		**BDL**	
17	**Ni, mg/l**	**1.0**		**BDL**	
18	**Cu, mg/l**	**1.0**		**BDL**	
19	**V, mg/l**	**0.20**		**BDL**	
20	**Benzene, mg/l**	**0.10**		**BDL**	
21	**Benzo (a) pyrene, mg/l**	**0.20**		**BDL**	

EFFLUENT QUALITY

B. Final Outlet (From the Complex) Effluent Quality

(1st April, 2013 to 30th September, 2013)

Sl. No	Parameter	MINAS	Min	Avg.	Max
1	p^H value	6.0 - 8.5	6.5	7.7	8.5
2	Oil and Grease, mg/l	5.0	1.0	1.2	1.4
3	Bio-Chemical Oxygen Demand (3 Days at 27° C), mg/l	15.0	2.4	4.8	9.0
4	Chemical Oxygen Demand (COD), mg/l	125.0	20.0	32.7	78.0
5	Suspended Solids, mg/l	20.0	3.0	4.5	6.0
6	Phenolic compounds (as C6H5OH), mg/l	0.35	0.01	0.05	0.12
7	Sulphide (as S), mg/l	0.50	0.02	0.11	0.38
8	CN, mg/l	0.20	BDL	BDL	BDL
9	Ammonia as N , mg/l	15.0		0.05	
10	TKN, mg/l	40.0		0.07	
11	P, mg/l	3.0		0.08	
12	Cr (Hexavalent), mg/l	0.10		BDL	
13	Cr (Total), mg/l	2.0		BDL	
14	Pb, mg/l	0.10		BDL	
15	Hg, mg/l	0.01		BDL	
16	Zn, mg/l	5.0		BDL	
17	Ni, mg/l	1.0		BDL	
18	Cu, mg/l	1.0		BDL	
19	V, mg/l	0.20		BDL	
20	Benzene, mg/l	0.10		BDL	
21	Benzo (a) pyrene, mg/l	0.20		BDL	

STACK MONITORING DATA

(1st April 2013 to 30th September, 2013)

A. SO_2 Emission (mg/Nm^3):

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 1700 For F.G. = 50	45	524	972
CDU-II		42	354	997
DCU-I		61	506	974
DCU-II		33	314	967
CPP		83	495	999
Reformer		4	70	496
HO-1		25	220	496
Isomerisation		5	57	461
DHDT		11	65	259
HGU		68	102	150

B. NO_X Emission (mg/Nm^3):

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 450 For F.G. = 350	26	95	196
CDU-II		43	148	361
DCU-I		32	78	193
DCU-II		40	132	248
CPP		57	169	348
Reformer		19	69	147
HO-1		10	79	137
Isomerisation		12	34	59
DHDT		10	63	248
HGU		26	65	149

C: PM Emission (mg/Nm^3)

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 100 For F.G. = 10	14	15	17
CDU-II		19	24	30
DCU-I		17	25	38
DCU-II		7	24	36
CPP		22	24	25
Reformer		8	11	17
HO-1/2		6	11	16
Isomerisation		14	15	17
DHDT		19	24	30
HGU		17	25	38

STACK MONITORING DATA
(1st April 2013 to 30th September, 2013)

D. CO Emission (mg/Nm^3)

Stacks	Emission Std.	Observed value		
		Min	Avg.	Max
CDU-I	For F.O. = 200 For F.G. = 150	34	38.5	43
CDU-II		63	66	69
DCU-I		37	44	51
DCU-II		31	49	67
CPP		46	58.5	71
Reformer		10	10.5	11
HO-1/2		8	10.5	13
Isomerisation		15	15	15
DHDT		13	26	39
HGU		12	34.5	57

E. Ni + V Emission (mg/Nm^3):

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
DHDT		< 1.0	< 1.0	< 1.0
HGU		< 1.0	< 1.0	< 1.0

APPENDIX – A2

AMBIENT AIR QUALITY AROUND BGR COMPLEX
(Average of monthly sample Schedule – VII)
(1st April, 2013 to 30th September, 2013)

	Station	Continuous Monitoring Station	Near Tube Well No.14	Near LPG Bottling Plant	Rural Health Centre	Bartala Rail Gate	Near TW No.7 (Township)
1	SO2 (Std.: 50/80 µg/m^3)						
	Min	0.17	BDL	BDL	BDL	BDL	BDL
	Average	6.46	BDL	BDL	BDL	BDL	BDL
	Max	37.7	BDL	BDL	BDL	BDL	BDL
	No of observation	Continuous	50	50	50	50	50
2	NO2 (Std.: 40/80 µg/m^3)						
	Min	0.4	8.5	8.9	8.0	8.0	8.0
	Average	6.7	9.6	9.8	9.5	9.7	9.4
	Max	8.7	11.0	11.0	12.0	12.0	13.0
	No of observation	Continuous	50	50	50	50	50
3	PM-10 (Std.: 60/100 µg/m^3)						
	Min	8.3	17.0	17.0	20.0	17.0	24.0
	Average	19.5	41.5	36.5	41.6	42.1	49.7
	Max	76.4	92.0	96.0	97.0	94.0	96.0
	No of observation	Continuous	50	50	50	50	50
4	PM-2.5 (Std.: 40/60 µg/m^3)						
	Min	1.4	9.0	8.0	9.0	10.0	14.0
	Average	6.6	23.5	21.5	23.3	25.0	29.4
	Max	59.9	56.0	58.0	58.0	58.0	56.0
	No of observation	Continuous	50	50	50	50	50
5	Ammonia (Std.: 100/400 µg/m^3)						
	Min	3.68	BDL	BDL	BDL	BDL	BDL
	Average	4.67	BDL	BDL	BDL	BDL	BDL
	Max	4.88	BDL	BDL	BDL	BDL	BDL
	No of observation	Continuous	50	50	50	50	50
6	Lead (Pb) (Std.: 0.5/1.0 µg/m^3)						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL
	No of observation		50	50	50	50	50

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		50	50	50	50	50
8	Ni (Std.: 20 µg/m3)						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL
	No of observation		50	50	50	50	50
9	Carbon Monoxide (CO) (Std.: 2/4 mg/m3)						
	Min	0.02					
	Average	0.40					
	Max	1.13					
	No of observation	Continuous					
10	Ozone (Std.:100/180 µg/m^3 (for 8hrs./1 hr.)						
	Min	8.68	BDL	BDL	BDL	BDL	BDL
	Average	17.6	BDL	BDL	BDL	BDL	BDL
	Max	56.76	BDL	BDL	BDL	BDL	BDL
	No of observation	Continuous	50	50	50	50	50
11	Benzene(Std. : 5 µg/m^3)						
	Min	0.01	BDL	BDL	BDL	BDL	BDL
	Average	0.01	BDL	BDL	BDL	BDL	BDL
	Max	0.16	BDL	BDL	BDL	BDL	BDL
	No of observation	Continuous					
12	Benzo(a)Pyrene (Std. : 1 ng/m^3)						
	Min		BDL	BDL	BDL	BDL	BDL
	Average		BDL	BDL	BDL	BDL	BDL
	Max		BDL	BDL	BDL	BDL	BDL

Average of Six Stations												
PARAMETER	SO_2	NO_2	PM-10	PM-2.5	NH_3	Pb	As	Ni	Benzo (a) Pyrene	CO	C_6H_6	O_3
Unit	µg/m^3						ng/m^3			mg/m^3	µg/m^3	
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	0.2	0.4	8.3	1.4	3.7	BDL	BDL	BDL	BDL	0.0	0.01	8.7
Average	6.5	9.1	38.4	21.6	4.7	BDL	BDL	BDL	BDL	0.4	0.01	17.6
Max	37.7	13.0	97.0	59.9	4.9	BDL	BDL	BDL	BDL	1.1	0.16	56.8

Tree Plantation
(1st April, 2013 to 30th September, 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 in side 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. During this period around 1500 tree planted inside plant area, Township and neighbouring area.

APPENDIX – A 4

Additional Information
(1st April, 2013 to 30th September, 2013)

Effluent reused during the period (1st April, 2013 to 30th September, 2013) was around 93.1% of the total effluent treated which includes plant effluent as well as BGR Township sewer.

Under the Leak Detection and Repair programme (LDAR), BGR is conducting quarterly Fugitive Emission Survey. During the period from 1st April, 2013 to 30th September, 2013, 22975 potential leaky points checked and 232 Leaky points detected and rectified. By following LDAR programme in true spirit, the company could not only avoid potential loss of 56.8 MTA (approx.) of light Hydrocarbon to the atmosphere through fugitive sources but also able to keep healthy work environment in the plants.

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. During 1st April, 2013 to 30th September, 2013 Noise Survey for two quarters of 2013 -14 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 has carried out the processing of oily sludge from sludge lagoons. About 1735 KL of oily sludge has been processed during the period from 1st April, 2013 to 30th September, 2013. Bio-remediation of residual solids is being continued.

Further two more Rain Water Harvesting (ground water recharging) schemes in BGR Township have been implemented during the period.

Further Bongaigaon Refinery has carried out a tree census inside BGR plant area as well as Township by engaging Forest Dept, Govt. of Assam. The final report is awaited.