ESSAR
OIL & GAS

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Ref No. EOGEPL/CBM-RG (E)/MoEF&CC/2020/3005

Date: 27th May, 2020

To
The Director
Ministry of Environment, Forests and Climate Change
Eastern Regional Office
A/3 Chandrasekharpur
Bhubaneswar-751 023
Orissa

Sub: Submission Half-yearly Compliance Report of the Environmental Clearance (Phase-III) by Essar Oil Gas Exploration and Production Limited reg.

Ref: Environmental Clearance of Phase-III granted by MoEF vide letter no.J-11011/491/2011-IA II(I) dated 26th February, 2013; Transfer of EC from EOL to EOGEPL dated 27.11.2017

Dear Sir

We are enclosing herewith the half-yearly compliance report in respect of the stipulated prior environmental clearance terms and conditions for the Production and Development Phase (Phase-III) of CBM project activities for the period of October, 2019 to March, 2020.

Thanking you for your continued support,

With Best Regards,

For Essar Oil and Gas Exploration and Production Limited

Kannan Rajendran
Chief Operating Officer
Raniganj East, CBM Project Durgapur

Enclosed: Phase-III Compliance Report

Copy to:

1. Member Secretary (Industry), MoEF&CC, CGO Complex, Paryavan Bhavan, New Delhi-110003
2. The Environmental Engineer, Durgapur Regional Office, WBPCB, Durgapur-713216

Essar Oil and Gas Exploration and Production Limited

RG (East)-CBM-2001/1 (Phase-III) Half Yearly Environment Clearance Compliance Report

(October' 19 to March' 20)

Essar Oil and Gas Exploration and Production Limited

RG (East)-CBM-2001/1 (Phase-III) Half Yearly Environment Clearance Compliance Report (October' 19 to March' 20)

Ref: Environmental Clearance F.No.J-11011/491/2011-IA II (I), dated 26th February, 2013

S. No	Condition	Compliance Status
A	**Specific Conditions**	
i.	Compliance to all the environmental conditions stipulated in the environmental clearance letter nos.J-11011/660/2007-IA-II(I) dated 6th May, 2008, J-11011/351/2009-IA-II(I) dated 23.09.2011 and its subsequent amendment shall be satisfactorily implemented.	Compliance to the environmental conditions of Phase-II & II(A) are being satisfactorily implemented and the compliance reports are regularly submitted to the Regional office of the MoEF.
ii.	Compensation for the land acquisition to the land oustees, if any, and also for standing crop shall be paid as per the National Resettlement and Rehabilitation Policy (NRRP) 2007 or State Government norms. It may be ensured that compensation provided shall not be less than the norms of the NRRP, 2007	Land acquisition is being directly done with the land owners and the compensation is paid as per the prevailing market rate. There is no involvement of Rehabilitation and Resettlement.
iii.	Prior permission from the Ministry of Defence shall be obtained regarding impact of proposed plant on Panagarh, if any.	Total four (4) nos. of GGS and One (1) no. of MCS are constructed as per the NOC obtained from the MoD.
iv.	As proposed, no forest land shall be used for the proposed facilities	Forest land is not being used for construction of well pads or and surface facilities of the project.
v.	Ambient Air Quality shall be monitored near the closest human settlements as per the National Ambient Air Quality Emission Standards (NAAQES) issued by the Ministry vide G.S.R No. 826(E) dated 16th November, 2009 for PM10, PM2.5, SO2, NOx, CO, CH4, VOCs, HC, Non-Methane HC etc. Efforts shall be made to improve the ambient air quality of the area.	Ambient Air Quality Monitoring has been carried out at facilities & well pads near to the closest human settlements as per the Ambient Air Quality Emission Standards (NAAQES) issued by the Ministry vide G.S.R No. 826(E) dated 16th November, 2009. Periodic & Preventive maintenance is carried out for all the equipment. However CBM gas production does not generate significant air pollution.

S. No	Condition	Compliance Status
		Monitoring activity has been carried out from Oct'19 to Mar'20 through a recognized laboratory based in Kolkata. However, due to ongoing COVID-19 pandemic, the laboratory was closed and the Mar' 20 reports are pending. Please find the ambient air quality monitoring results from Oct'19 to Feb' 20 attached with this report as **Annexure I.** We will submit the Mar'20 monitoring report as soon as we receive it.
vi.	Mercury shall also be analysed in air, water and drill cuttings twice during drilling period	The Drilling has been temporarily suspended from April' 17 till date.
vii.	The flare system shall be designed as per good oil field practices and Oil Industry Safety Directorate (OISD) guidelines. The company shall take necessary measures to prevent fire hazards and soil remediation as needed. At the place of ground flaring, the flare pit shall be lined with refractory bricks and efficient burning system. In case of overhead flare stacks, the stack height shall be provided as per the regulatory requirements and emission from stacks shall meet the MoEF/CPCB guidelines.	Elevated flare system is designed as per OISD guidelines. Measures delineated in the EIA/EMP have been taken to prevent fire hazards. The overhead flaring is installed at a height of 30 m. The following measures have been implemented to prevent fire hazard: ▪ Installation of electrical equipment as per approved hazardous zone classification as communicated to DGMS ▪ Dry chemical fire extinguishers are available at all well-sites & facilities. ▪ Portable methane gas analyzers (CH4) are available. ▪ Flame proof type lighting fixtures, push buttons and switches in the drill site facilities are used.
viii.	The company shall make the arrangement for control of noise from the drilling activity, compressor station and DG sets by providing necessary mitigation measures such as proper acoustic enclosures to DG sets and meet the norms notified by the MoEF. Height of all the stacks/vents shall be as per the CPCB guidelines.	Only CPCB approved models of silent generator sets have been installed with acoustic enclosures. Once the gas production starts at the well site, the Diesel Generator (DG) sets are replaced with Gas Generator (GG) sets. In operational wells gas generator sets are operational. Noise monitoring has been carried out in the surrounding habitats and major activity area. Please find the noise monitoring reports attached with report as **Annexure II**.

S. No	Condition	Compliance Status
ix.	The company shall comply with the guidelines for disposal of solid waste, drill cutting and drilling fluids for onshore drilling operation notified vide GSR.546€ dated 30th August, 2005.	The drilling is temporarily suspended from April, 2017 till date.
x.	Total fresh water requirement should not exceed 125m3 for each well during drilling phase 1 m3/day for GGS/MCS. Prior permission shall be obtained from the Competent Authority and a copy submitted to the Ministry's Regional Office at Bhubaneswar	The drilling was temporarily suspended from April 2007 to till date.
xi.	During well drilling, wastewater should be segregated into waste drilling fluid and drill cuttings. Drill cutting should be stored onsite impervious HDPE lined pit for solar evaporation and drying. Effluent should be properly treated and treated effluent should conform to CPCB standards. As proposed, produced water should be treated by reverse osmosis and reuse in drilling of new wells, fire hydrant system and other beneficial purposes. Domestic effluent should be disposed-off through septic tank followed by soak pit.	The drilling is temporarily suspended from April' 2017 till date. Produced water is treated through Reverse Osmosis (RO) system. The treated produced water is reused in other operations. Please find the RO water analysis results attached with this report as **Annexure III.** Monitoring activity has been carried out from Oct'19 to Mar'20 through a recognized laboratory based in Kolkata. However, due to ongoing COVID-19 pandemic, the laboratory was closed and the Mar' 20 reports are pending. Reports from Oct' 19 to Feb' 20 are attached. We will submit the Mar' 20 analysis results as soon as we receive it. Domestic effluent is disposed of through septic tank to soak pit.
xii.	Ground water quality monitoring should be done to assess if produced water storage or disposal has any effect.	Ground water quality monitoring is conducted and please find the analysis results attached with this report as **Annexure IV**.
xiii.	Drilling wastewater including drill cuttings, wash water shall be collected in disposal pit lined with HDPE lining, evaporated or treated and shall comply with the notified standards for on-shore disposal on land. Proper toxicological analysis shall be done	Drilling is temporarily suspended from April' 2017 till date.

S. No	Condition	Compliance Status
	to ensure there is no hazardous material. Copy of toxicological analysis shall be submitted to Ministry's Regional Office at Bhubaneswar.	
xiv.	Water base drilling mud or synthetic based mud shall be used	Water based mud was used in the drilling.
xv.	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 operation.	All the precautionary measures is implemented to prevent fire hazards & Oil Spills. Elevated flaring is carried out. No ground flaring is done.
xvi.	The company shall take necessary measures to prevent fire hazards and soil remediation as needed. The stacks of adequate height shall be provided to flare the gas, if required, to minimize gaseous emissions and heat load during flaring	Gas detectors & sensors available to prevent the fire hazards. Flare stack height of 30m is maintained at Gas Gathering Stations and 50 m at Main Compressor Stations.
xvii.	To prevent underground coal fire, preventive measures shall be taken for ingress of ambient air during withdrawal inside the coal seams by adopting technologies including vacuum suction. Gas detectors for the detection of CH4 and H2S shall be provided.	Gas detectors for Methane, H2S and other gases are provided at the Gas Gathering Station and production sites. There is not any ingress of ambient air since the well is arrested at the head with drive head and progressive cavity pump.
xviii.	The design, material of construction, assembly, inspection, testing and safety aspects of operations and maintenance of pipeline and transporting the natural gas/oil shall be governed by ASME/ANSI B 31.8/B31.4 and OISD standard 141. Pipeline wall thickness and minimum depth of burial at river crossing and casings at rails, major road crossings should be in conformity with ANSI/ASME requirements.	All the surface facilities are installed as per the applicable practise and standards.

S. No	Condition	Compliance Status
xix.	The company shall develop a contingency plan for H2S release including all necessary aspects from evacuation to resumption of normal operations. The workers shall be provided with personal H2S detectors in locations of high risk of exposure along with self-containing breathing apparatus.	H_2S is not present as per the analysis of gas tapped from the test wells & pilot wells. However all the necessary safety measures are taken as per the Emergency Response Plan. Gas detectors are kept at the Gas Gathering Station and production sites to check any presence of gases which are beyond threshold values. All workers are provided with standard PPEs according to job requirement.
xx.	Adequate well protection system shall be provided like Blow Out Preventor (BOP) or diverter systems as required based on the geological formation of the blocks.	CBM well hydrostatic pressures are found to be less than 2psi. However considering the hydrostatic pressures and sensitivity of well, Blow Out Preventers or diverter systems are provided at the well head during drilling along with other well control measures such as proper pre-well planning and drilling fluid logging to maintain the hydrostatic pressure.
xxi.	The top soil removed shall be stacked separately for reuse during restoration process.	The top soil being spread out in designated area for green belt development at project area..
xxii.	Emergency Response Plan shall be based on the guidelines prepared by OISD, DGMS and Govt. of India. Recommendations mentioned in the Risk Assessment & Consequence Analysis and Disaster Management Plan shall be strictly followed.	Emergency Response plan has been prepared as per the OISD & DGMS guidelines and sent for the DGMS approval and has been certified. The certificate has already attached with previous compliance report.
xxiii.	Project proponent shall comply with the environment protection measures and safeguards recommended in the EIA/EMP/risk analysis report/disaster management plan	Environmental protection measures and safeguards recommended in EMP/risk analysis report/disaster management plan are implemented.
xxiv.	The company shall take measures after completion of drilling process by well plugging and secured enclosures, decommissioning of rig upon abandonment of the well and drilling site shall be restored	Wells will be abandoned and restored to natural position if found not suitable for hydrocarbon extraction.

S. No	Condition	Compliance Status
	in original condition. In the event that no economic quantity of hydrocarbon is found a full abandonment shall be implemented for the drilling site in accordance with the applicable Indian Petroleum Regulations.	Wells will be fully abandoned in compliance with Indian Petroleum Regulations in the event of no economic quality of hydrocarbon is found.
xxv.	Occupational health surveillance of the workers shall be carried out as per the prevailing Acts and Rules.	Occupational health surveillance of the workers has been carried out as per the Mines Act 1952. Periodical Occupational Health Surveillance records are being maintained.
xxvi.	Company shall adopt Corporate Environment Policy as per the Ministry's O.M.No.J-11013/41/2006-IA.II(I) dated 26th April, 2011 and implemented.	Company has framed Corporate Environment Policy which is duly implemented.
xxvii.	All the commitments made to the public during the Public Hearing/Public Consultation meeting held on 24th May, 2012 shall be satisfactorily implemented and a separate budget for implementing the same shall be allocated and information submitted to the Ministry's Regional Office at Bhubaneswar.	Commitments given in the public hearing are strictly implemented. A separate budget has already been provided for the FY 2019-2020 as part of pervious phases of the project for the welfare of surrounding villages in thrust areas like Health, Education & Empowerment etc. under CSR budget.
xxviii.	At least 5% of the total cost of the project should be earmarked towards the enterprise social commitment and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office at Bhubaneswar. Implementation of such program shall be ensured after the completion of the project.	The budget for enterprise social commitment has been allocated for the CBM Project as a whole (Ph-I, II, IIA, III). The expenditure towards enterprise social commitment activities for the period October' 19 to March' 20 is INR 18.52 Lacs. The details of activities done in various areas like health, education and empowerment, community infrastructure development and its beneficiaries are attached with this report as **Annexure V.** The budgetary allocation has been made for the FY 2019-20 for the CBM Project which is about INR 37.5 Lacs. The fund is being utilized judicially for the development of villages and people in the vicinity of the project area.
B	**General Conditions**	

S. No	Condition	Compliance Status
i.	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board (SPCB), State Government and any other statutory authority.	We comply with the stipulations made by the State Pollution Control Board (SPCB), State Government and all other statutory bodies.
ii.	No further expansion or modification in the project shall be carried out without prior approval of the Ministry of Environment & Forests. 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 to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	We restrict to the project configuration that is described in the Environmental Clearance. For any further expansion and modification in project configuration, we would approach MoEF for the prior Environmental Clearance.
iii.	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained, wherever applicable.	We comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior approvals will be obtained from appropriate authority.
iv.	The project authorities must strictly comply with the rules and regulation with regarding to handling and disposal of Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/ disposal of hazardous wastes.	We comply with the rules and regulations with regard to handling and disposal of Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008. Authorization from the West Bengal Pollution Control Board has been obtained with regard to storage, treatment and disposal of hazardous waste, valid till 31st October, 2023.
v.	The overall noise levels in and around the plant area shall be kept within the	Acoustic hoods, silencers, enclosures are provided to high noise generating equipment. Noise levels will be

S. No	Condition	Compliance Status
	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 EPA Rules, 1989 viz. 75dBA (daytime) and 70 dBA (night time)	restricted to the standards prescribed under EPA Rules, 1989. Personal Protective Equipment (earmuffs and plugs) have been provided to the working personnel.
vi.	A separate Environmental Management Cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	A dedicated environment management cell is currently in operation and functioning for implementation of environment management plan at large. The sampling and analysis of environmental parameters is been carried out by Scientific Research Laboratory (MoEF recognized).
vii.	As proposed, Rs.2.80 Crore earmarked for environment pollution control measures shall be used to implement the conditions	Rs.2.80 Crore earmarked for environment pollution control measures has been judicially utilised. The former expenditure towards environmental protection has been submitted with previous compliance reports of EC Phase II (Environment Clearance no. F. No. J-11011/351/2009- IA II (I) dated 23.09.2011) & EC Phase III (F.No.J-11011/491/2011-IA II (I), dated 26th February, 2013) The environmental protection expenditure from October' 19 to March' 20 is attached with this report as **Annexure VI**.
viii.	The Regional Office of this Ministry/Central Pollution Control Board/State Pollution Control Board will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	Support is being extended to the Regional office of this Ministry/Central Pollution Control Board/State Pollution Control Board for monitoring the stipulated conditions. Six Monthly Compliance Reports will be regularly be submitted to MoEF Regional Office.
ix.	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/	A copy of Clearance letter has been uploaded on the company's website. The notice of obtaining environmental clearance has been published two new papers. Also a copy of clearance has been circulated to major administrative offices.

S. No	Condition	Compliance Status
	representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.	
x.	The project proponent shall upload the status of compliance for the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MoEF, the respective Zonal Office of CPCB and the WBPCB. The criteria pollutant levels namely; PM10, PM2.5, SO2, NOx, HC (Methane & Non-methane), VOCs (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.	Compliance reports have been uploaded on company's website & sent to Regional Office of the MOEF, the respective Zonal Office of CPCB and the WBPCB. The Ambient air quality monitoring is already being carried out in the nearest settlements as per revised NAAQM criteria. The criteria pollutant levels namely; SPM, RSPM, S02, NOx, HC (Methane & Non-methane), VOCs are being monitored periodically and displayed at the main entrance of the existing Gas Gathering Stations.
xi.	The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MoEF, the respective Zonal Office of CPCB and the WBPCB. The Regional Office of this Ministry/CPCB/WBPCB shall monitor the stipulated conditions.	We are submitting the six monthly compliance reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the WBPCB.
xii.	The environmental statement for each financial year ending 31st March in Form-V as is mandated to be submitted by the project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also	The environmental statement for each financial year ending 31st March in Form-V as is being regularly submitted to West Bengal Pollution Control Board and the same is been uploaded on the company's website along with the status of compliance report.

S. No	Condition	Compliance Status
	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 Offices of the MoEF by e-mail	
xiii.	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 WBPCB and may also be seen at Website of the Ministry of Environment and Forests at http:/envfor.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 Regional Office.	The advertisement regarding the grant of environmental clearance has been published in two newspapers viz The Statesman (English) and Anand Bazaar Pathrika (Bengali/Vernacular) on 28th February, 2013. A copy of the advertisement is already submitted with Half yearly compliance of Oct 12 – Mar 13 period
xiv.	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.	We are currently working with financial institutions regarding funding for the phase-III project activities. The date of financial closure will be informed to the MoEF (Eastern Regional Office) as and when achieved. The approval from concerned authorities and the commencement of the activities will also be informed to your kind office.

Annexure I: Ambient Air Quality Analysis Report

(October’ 19 to February’ 20)

Ambient Air Analysis Report of CBM Raniganj Project of Essar Oil Gas Exploration 1roduction Liited

(Compliance Period: Oct' 19 - Feb'20)

ANNEXURE I

Name of Location			MCS					GGS- 01					GGS- 02	
Date			Oct' 19	Nov' 19	Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19
Parameter	UoM	NAAQS LIMIT												
PM 2.5	$\mu g/m^3$	60	33.76	38.54	46.87	39.83	34.62	36.02	40.25	42.27	38.44	46.87	34.12	42.31
PM 10	$\mu g/m^3$	100	69.37	74.30	85.46	72.46	85.94	70.34	73.96	74.20	70.86	82.51	73.88	71.65
Nitrogen Dioxide	$\mu g/m^3$	80	36.99	40.92	39.13	41.59	40.17	38.29	39.70	38.08	38.77	40.91	39.05	39.44
Sulphur Dioxide	$\mu g/m^3$	80	4.85	6.12	6.53	6.07	7.14	5.12	5.86	6.27	6.33	7.36	4.77	6.20
Carbon Monoxide	mg/m^3	2	0.408	0.426	0.470	0.406	0.438	0.408	0.452	0.472	0.442	0.438	0.388	0.438
Hydrocarbon	mg/m^3	NIL	1.62	1.62	1.98	1.64	1.88	1.68	1.80	1.82	1.80	1.88	1.72	1.80
Mercury	mg/m^3		---	---	< 0.002	---	---	---	---	< 0.002	---	---	---	---
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	$\mu g/m^3$		---	---	3.29	---	---	---	---	2.93	---	---	---	---
Benzo(a)Pyrene	ng/m^3	1	---	---	0.61	---	---	---	---	0.47	---	---	---	---
Ammonia	$\mu g/m^3$	400	---	---	29.07	---	---	---	---	25.83	---	---	---	---
Ozone	$\mu g/m^3$	180	---	---	43.57	---	---	---	---	38.29	---	---	---	---
Lead	$\mu g/m^3$	1	---	---	0.22	---	---	---	---	0.18	---	---	---	---
Nickel	ng/m^3	20	---	---	17.04	---	---	---	---	14.96	---	---	---	---
Arsenic	ng/m^3	6	---	---	1.99	---	---	---	---	1.75	---	---	---	---
Benzene	$\mu g/m^3$	5	---	---	1.98	---	---	---	---	1.71	---	---	---	---

Ambient Air Analysis Report of CBM Raniganj Project of Essar Oil Gas Exploration 2roduction Liited

(Compliance Period: Oct' 19 - Feb'20)

ANNEXURE I

Name of Location			GGS- 02			Gopalpur Warehouse					PARULIA			
Date			Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19	Jan' 20
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	42.24	50.83	50.40	34.26	34.12	42.57	34.42	39.48	32.55	41.11	49.58	41.49
PM 10	µg/m^3	100	79.66	93.48	90.58	71.49	72.76	79.09	82.98	72.80	60.69	61.95	83.85	76.49
Nitrogen Dioxide	µg/m^3	80	40.67	40.64	40.30	39.27	39.75	39.49	40.57	41.24	41.31	40.90	39.62	40.08
Sulphur Dioxide	µg/m^3	80	6.32	6.24	6.72	4.87	6.03	6.21	6.38	6.02	5.31	6.19	6.78	6.42
Carbon Monoxide	mg/m^3	2	0.448	0.412	0.438	0.402	0.430	0.465	0.438	0.442	0.398	0.442	0.474	0.419
Hydrocarbon	mg/m^3	NIL	1.89	1.92	1.95	1.88	1.78	1.86	1.76	1.72	1.78	1.68	1.92	1.78
Mercury	mg/m^3		< 0.002	---	---	---	---	< 0.002	---	---	---	---	< 0.002	---
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3		2.87	---	---	---	---	3.16	---	---	---	---	3.27	---
Benzo(a)Pyrene	ng/m^3	1	0.48	---	---	---	---	0.52	---	---	---	---	0.58	---
Ammonia	µg/m^3	400	27.05	---	---	---	---	28.53	---	---	---	---	28.92	---
Ozone	µg/m^3	180	39.77	---	---	---	---	42.91	---	---	---	---	42.37	---
Lead	µg/m^3	1	0.19	---	---	---	---	0.20	---	---	---	---	0.18	---
Nickel	ng/m^3	20	15.73	---	---	---	---	16.88	---	---	---	---	15.21	---
Arsenic	ng/m^3	6	1.85	---	---	---	---	1.95	---	---	---	---	1.84	---
Benzene	µg/m^3	5	1.81	---	---	---	---	1.85	---	---	---	---	1.89	---

Ambient Air Analysis Report of CBM Raniganj Project of Essar Oil Gas Exploration 3roduction Liited

(Compliance Period: Oct' 19 - Feb'20)

ANNEXURE I

Name of Location			PARULIA	SARENGA					SARASWATIGUNJ					NACHAN
Date			Feb' 20	Oct' 19	Nov' 19	Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19	Jan' 20	Feb' 20	Oct' 19
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	45.93	35.42	44.06	43.96	44.42	44.93	33.86	41.16	36.27	48.55	44.90	34.04
PM 10	µg/m^3	100	87.02	73.55	76.85	83.07	72.85	76.36	65.77	71.07	72.86	82.25	87.17	69.81
Nitrogen Dioxide	µg/m^3	80	41.80	40.37	38.79	39.70	41.82	40.05	39.94	38.75	37.95	38.43	41.15	39.85
Sulphur Dioxide	µg/m^3	80	7.57	4.12	5.33	6.45	6.52	6.22	5.09	6.09	6.44	6.24	7.03	5.01
Carbon Monoxide	mg/m^3	2	0.452	0.384	0.415	0.438	0.422	0.436	0.398	0.432	0.468	0.412	0.432	0.396
Hydrocarbon	mg/m^3	NIL	1.78	1.68	1.78	1.95	1.74	1.76	1.84	1.76	1.79	1.78	1.86	1.50
Mercury	mg/m^3		---	---	---	< 0.002	---	---	---	---	< 0.002	---	---	---
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3		---	---	---	3.57	---	---	---	---	2.99	---	---	---
Benzo(a)Pyrene	ng/m^3	1	---	---	---	0.69	---	---	---	---	0.37	---	---	---
Ammonia	µg/m^3	400	---	---	---	30.18	---	---	---	---	25.06	---	---	---
Ozone	µg/m^3	180	---	---	---	44.67	---	---	---	---	39.18	---	---	---
Lead	µg/m^3	1	---	---	---	0.24	---	---	---	---	0.15	---	---	---
Nickel	ng/m^3	20	---	---	---	18.51	---	---	---	---	14.23	---	---	---
Arsenic	ng/m^3	6	---	---	---	2.13	---	---	---	---	1.81	---	---	---
Benzene	µg/m^3	5	---	---	---	2.05	---	---	---	---	1.68	---	---	---

Ambient Air Analysis Report of CBM Raniganj Project of Essar Oil Gas Exploration 4roduction Liited

(Compliance Period: Oct' 19 - Feb'20)

ANNEXURE I

Name of Location			NACHAN				PRATPPUR					BANSIA		
Date			Nov' 19	Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	43.83	48.63	44.76	42.30	30.97	44.25	43.42	35.94	42.86	30.84	39.40	43.86
PM 10	µg/m^3	100	73.48	87.91	82.91	71.57	64.46	88.43	81.69	73.05	82.61	63.79	64.65	75.54
Nitrogen Dioxide	µg/m^3	80	42.25	39.17	40.70	39.32	43.50	40.93	40.43	41.63	39.69	40.11	39.76	39.58
Sulphur Dioxide	µg/m^3	80	6.58	6.24	6.54	6.32	5.23	5.99	6.50	6.59	7.10	5.18	5.95	6.42
Carbon Monoxide	mg/m^3	2	0.444	0.464	0.424	0.436	0.384	0.428	0.474	0.422	0.422	0.402	0.426	0.468
Hydrocarbon	mg/m^3	NIL	1.74	1.97	1.72	1.73	1.66	1.72	1.88	1.70	1.84	1.64	1.82	1.76
Mercury	mg/m^3		---	< 0.002	---	---	---	---	< 0.002	---	---	---	---	< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3		---	3.23	---	---	---	---	3.15	---	---	---	---	2.83
Benzo(a)Pyrene	ng/m^3	1	---	0.59	---	---	---	---	0.50	---	---	---	---	0.45
Ammonia	µg/m^3	400	---	30.14	---	---	---	---	27.44	---	---	---	---	25.58
Ozone	µg/m^3	180	---	42.19	---	---	---	---	41.49	---	---	---	---	40.53
Lead	µg/m^3	1	---	0.21	---	---	---	---	0.17	---	---	---	---	0.15
Nickel	ng/m^3	20	---	17.28	---	---	---	---	15.02	---	---	---	---	14.74
Arsenic	ng/m^3	6	---	1.85	---	---	---	---	1.63	---	---	---	---	1.72
Benzene	µg/m^3	5	---	1.93	---	---	---	---	1.83	---	---	---	---	1.69

Ambient Air Analysis Report of CBM Raniganj Project of Essar Oil Gas Exploration 5roduction Liited

(Compliance Period: Oct' 19 - Feb'20)

ANNEXURE I

Name of Location			BANSIA		GGS-04					KANTABERIA		
Date			Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19
Parameter	UoM	NAAQS LIMIT										
PM 2.5	$\mu g/m^3$	60	40.27	42.86	31.06	42.55	49.81	45.59	43.11	34.16	43.89	42.77
PM 10	$\mu g/m^3$	100	75.40	78.48	67.24	76.05	80.38	73.56	73.13	72.61	77.50	79.25
Nitrogen Dioxide	$\mu g/m^3$	80	41.68	40.90	40.96	42.65	40.76	39.70	40.85	39.83	41.26	40.25
Sulphur Dioxide	$\mu g/m^3$	80	6.78	6.55	5.22	6.01	6.06	6.12	6.37	4.74	5.61	6.57
Carbon Monoxide	mg/m^3	2	0.408	0.447	0.398	0.432	0.452	0.402	0.442	0.388	0.448	0.452
Hydrocarbon	mg/m^3	NIL	1.72	1.80	1.52	1.64	1.90	1.70	1.75	1.66	1.74	1.88
Mercury	mg/m^3		---	---	---	---	< 0.002	---	---	---	---	< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	$\mu g/m^3$		---	---	---	---	3.34	---	---	---	---	3.02
Benzo(a)Pyrene	ng/m^3	1	---	---	---	---	0.66	---	---	---	---	0.44
Ammonia	$\mu g/m^3$	400	---	---	---	---	29.55	---	---	---	---	26.17
Ozone	$\mu g/m^3$	180	---	---	---	---	44.09	---	---	---	---	39.76
Lead	$\mu g/m^3$	1	---	---	---	---	0.23	---	---	---	---	0.16
Nickel	ng/m^3	20	---	---	---	---	17.49	---	---	---	---	15.18
Arsenic	ng/m^3	6	---	---	---	---	2.06	---	---	---	---	1.67
Benzene	$\mu g/m^3$	5	---	---	---	---	1.95	---	---	---	---	1.78

Ambient Air Analysis Report of CBM Raniganj Project of Essar Oil Gas Exploration 6roduction Liited

(Compliance Period: Oct' 19 - Feb'20)

ANNEXURE I

Name of Location			KANTABERIA		JAMGORA					JATGORIA	
Date			Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19
Parameter	UoM	NAAQS LIMIT									
PM 2.5	$\mu g/m^3$	60	47.68	48.19	31.11	43.56	41.83	46.46	40.48	32.54	42.63
PM 10	$\mu g/m^3$	100	84.17	74.05	68.82	82.83	75.84	82.86	77.95	69.27	77.45
Nitrogen Dioxide	$\mu g/m^3$	80	39.41	39.88	40.44	39.05	39.22	41.13	40.22	37.47	39.37
Sulphur Dioxide	$\mu g/m^3$	80	6.57	6.47	5.09	6.00	6.18	6.69	6.34	4.77	6.41
Carbon Monoxide	mg/m^3	2	0.432	0.460	0.392	0.438	0.458	0.408	0.452	0.408	0.428
Hydrocarbon	mg/m^3	NIL	1.74	1.76	1.59	1.72	1.85	1.74	1.82	1.72	1.82
Mercury	mg/m^3		---	---	---	---	< 0.002	---	---	---	---
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	$\mu g/m^3$		---	---	---	---	2.97	---	---	---	---
Benzo(a)Pyrene	ng/m^3	1	---	---	---	---	0.51	---	---	---	---
Ammonia	$\mu g/m^3$	400	---	---	---	---	26.29	---	---	---	---
Ozone	$\mu g/m^3$	180	---	---	---	---	39.33	---	---	---	---
Lead	$\mu g/m^3$	1	---	---	---	---	0.17	---	---	---	---
Nickel	ng/m^3	20	---	---	---	---	15.05	---	---	---	---
Arsenic	ng/m^3	6	---	---	---	---	1.69	---	---	---	---
Benzene	$\mu g/m^3$	5	---	---	---	---	1.75	---	---	---	---

Ambient Air Analysis Report of CBM Raniganj Project of Essar Oil Gas Exploration 7roduction Liited

(Compliance Period: Oct' 19 - Feb'20)

ANNEXURE I

Name of Location			JATGORIA			KULDIHA				
Date			Dec' 19	Jan' 20	Feb' 20	Oct' 19	Nov' 19	Dec' 19	Jan' 20	Feb' 20
Parameter	UoM	NAAQS LIMIT								
PM 2.5	µg/m^3	60	43.29	52.49	47.48	36.99	49.89	38.48	35.82	47.08
PM 10	µg/m^3	100	85.33	89.31	84.56	77.78	80.37	74.77	76.67	83.17
Nitrogen Dioxide	µg/m^3	80	39.12	40.19	39.27	38.38	39.72	36.78	40.26	38.77
Sulphur Dioxide	µg/m^3	80	6.61	6.74	7.16	4.82	5.63	6.06	6.35	7.29
Carbon Monoxide	mg/m^3	2	0.438	0.452	0.448	0.384	0.426	0.475	0.418	0.425
Hydrocarbon	mg/m^3	NIL	1.94	1.82	1.84	1.64	1.74	1.86	1.68	1.72
Mercury	mg/m^3		< 0.002	---	---	---	---	< 0.002	---	---
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3		3.12	---	---	---	---	2.95	---	---
Benzo(a)Pyrene	ng/m^3	1	0.56	---	---	---	---	0.40	---	---
Ammonia	µg/m^3	400	29.73	---	---	---	---	24.47	---	---
Ozone	µg/m^3	180	40.24	---	---	---	---	38.15	---	---
Lead	µg/m^3	1	0.19	---	---	---	---	0.14	---	---
Nickel	ng/m^3	20	16.17	---	---	---	---	14.06	---	---
Arsenic	ng/m^3	6	1.73	---	---	---	---	1.53	---	---
Benzene	µg/m^3	5	1.87	---	---	---	---	1.66	---	---

Annexure II: Noise Monitoring Analysis Report

(October’ 19 to March’ 20)

Noise in Surrounding Villages (Leq dB (A))					
Date of sampling	LOCATION	DAY TIME		NIGHT TIME	
		Permissible Limit as per CPCB dB(A)	Noise Level dB(A)	Permissible Limit as per CPCB dB(A)	Noise Level dB(A)
09.01.2020 to 10.01.2020	Jatgoria (EDD 005)	75	55.74	70	50.45
09.01.2020 to 10.01.2020	Saraswatigunj (EDI 039)	75	52.7	70	43.84
10.01.2020 to 11.01.2020	Kantaberia EDD 012	75	62.85	55	60.43
10.01.2020 to 11.01.2020	Khatgoria (GGS 001)	75	70.81	70	61.3
10.01.2020 to 11.01.2020	Jamgora (EDD 429)	75	60.48	70	55.37
11.01.2020 to 12.01.2020	Kuldiha (EDN 099)	75	61.05	70	51.8
13.01.2020 to 14.01.2020	Pratappur (EDD 049)	75	58.11	70	53.82
13.01.2020 to 14.01.2020	Bansia (EDD 411)	75	58.67	70	54.52
15.01.2020 to 16.01.2020	Parulia (EDC 413)	75	54.65	70	46.69
15.01.2020 to 16.01.2020	Nachan (EDD 053)	75	59.8	70	52.47
18.01.2020 to 19.01.2020	Akandara	75	64.76	70	63.58
20.01.2020 to 21.01.2020	Gopalpur Warehouse	75	58.82	70	56.86
20.01.2020 to 21.01.2020	Malandighi	75	59.51	70	56.7
22.01.2020 to 23.01.2020	Gopalpur (GGS 004)	75	65.44	70	51.64

Annexure III: RO Water Analysis Report

(October’ 19 to February’ 20)

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					October' 19						
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	GGS 01			EDD 050			EDH 044
					Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet
1	pH		5.5 to 9.0	5.5-9.0	7.70	8.11	7.88	8.15	7.35	8.10	7.55
2	Temperature	deg C			34.2°C	34.9°C	25.3°C	32.3°C	35.7°C	33.6°C	32.4°C
3	Total Suspended Solids	mg/l	100	100	2	<2	2	4	<2	5	<2
4	Total Dissolved Solids	mg/l	---	2100	2712	976	3468	2892	880	3416	5750
5	Chlorides	mg/l	---	600	1025	335	1380	975	295	1024	2510
6	Total Hardness	mg/l	---	---	39.60	27.70	43.50	39.60	19.80	47.50	166.30
7	Sulphates	mg/l	---	1000	3.9	<2.5	4.5	3.0	<2.5	4.5	5.0
8	Calcium	mg/l			9.5	6.3	11.1	9.5	4.7	11.1	42.8
9	Magnesium	mg/l	---	---	3.8	2.90	3.8	3.8	1.9	4.8	14.4
10	Dissolved Oxygen	mg/l									
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	1.65	0.85	1.9	2.15	0.98	2.65	3.8
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.015	<0.01	0.016	0.022	0.013	0.027	0.029
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Sodium Absorption Ratio		---	---	84.3	35.3	96.6	76.9	31.1	77.6	92.3
24	Aluminum	mg/l	---	---	---	---	---	---	---	---	---
25	Lithium	mg/l			---	---	---	---	---	---	---
26	Molybednum	mg/l	---	---	---	---	---	---	---	---	---
27	Palladium	mg/l	---	---	---	---	---	---	---	---	---
28	Selenium	mg/l			---	---	---	---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					October' 19						
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	GGS 01			EDD 050			EDH 044
					Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet
29	Vanadium	mg/l	---	---	---	---	---	---	---	---	---
30	Cadmium	mg/l			---	---	---	---	---	---	---
31	Cobalt	mg/l			---	---	---	---	---	---	---
32	Bicarbonate	mg/l			---	---	---	---	---	---	---
33	Sodium	mg/l	---	---	1220.0	425.0	1465.0	1110.0	320.0	1230.0	2740.0
34	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
36	% Sodium				---	---	---	---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					October' 19		October' 19			November' 19	
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH 044		EDN 099			GGS 01	
					Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet
1	pH		5.5 to 9.0	5.5-9.0	7.62	7.49	6.95	7.25	7.10	7.80	8.08
2	Temperature	deg C			32.5°C	32.2°C	33.9°C	30.5°C	35.4°C	32.8°C	32.2°C
3	Total Suspended Solids	mg/l	100	100	<2	<2	3	<2	3	<2	<2
4	Total Dissolved Solids	mg/l	---	2100	1330	6290	3622	702	4814	2888	894
5	Chlorides	mg/l	---	600	425	2720	915	265	1130	1204	307
6	Total Hardness	mg/l	---	---	39.60	150.50	447.50	67.30	609.80	39.60	27.70
7	Sulphates	mg/l	---	1000	3.8	5.9	4.5	<2.5	5.0	5.2	4.5
8	Calcium	mg/l			9.5	36.5	117.4	18.9	161.9	9.5	6.3
9	Magnesium	mg/l	---	---	3.8	14.5	37.5	6.7	50.00	3.8	2.90
10	Dissolved Oxygen	mg/l									
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	1.05	4.1	2.4	0.85	3.15	1.1	0.47
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.014	0.028	0.019	<0.01	0.022	0.020	0.018
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Sodium Absorption Ratio		---	---	30.4	107	23	14.8	22	69.8	17.5
24	Aluminum	mg/l	---	---	---	---	---	---	---	---	---
25	Lithium	mg/l			---	---	---	---	---	---	---
26	Molybednum	mg/l	---	---	---	---	---	---	---	---	---
27	Palladium	mg/l	---	---	---	---	---	---	---	---	---
28	Selenium	mg/l			---	---	---	---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					October' 19		October' 19			November' 19	
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH 044		EDN 099			GGS 01	
					Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet
29	Vanadium	mg/l	---	---	---	---	---	---	---	---	---
30	Cadmium	mg/l			---	---	---	---	---	---	---
31	Cobalt	mg/l			---	---	---	---	---	---	---
32	Bicarbonate	mg/l			---	---	---	---	---	---	---
33	Sodium	mg/l	---	---	440.0	3020.0	1120.0	280.0	1250.0	1010.0	212.0
34	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
36	% Sodium				---	---	---	---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					November' 19						
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	GGS 01	EDD 050			EDH 044		
					Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject
1	pH		5.5 to 9.0	5.5-9.0	7.80	8.29	7.83	8.15	7.50	7.18	7.71
2	Temperature	deg C			32.0°C	29.6°C	33.7°C	30.0°C	28.0°C	28.1°C	28.1°C
3	Total Suspended Solids	mg/l	100	100	<2	<2	<2	2	<2	<2	<2
4	Total Dissolved Solids	mg/l	---	2100	3416	2886	818	2910	2782	426	3280
5	Chlorides	mg/l	---	600	1520	1470	245	1510	1135	184	1230
6	Total Hardness	mg/l	---	---	43.50	51.50	23.70	51.50	87.10	27.70	83.20
7	Sulphates	mg/l	---	1000	6.8	4.9	3.0	5.6	6.9	3.5	7.5
8	Calcium	mg/l			9.5	12.7	4.7	12.7	22.2	6.3	19
9	Magnesium	mg/l	---	---	4.8	4.8	2.9	4.8	7.7	2.9	8.6
10	Dissolved Oxygen	mg/l									
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	1.35	1.65	0.8	1.92	1.75	0.56	2.05
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.240	0.021	0.015	0.027	0.024	0.012	0.029
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Sodium Absorption Ratio		---	---	77.2	72	16.1	73.9	39.1	10.3	42.5
24	Aluminum	mg/l	---	---	---	---	---	---	---	---	---
25	Lithium	mg/l			---	---	---	---	---	---	---
26	Molybednum	mg/l	---	---	---	---	---	---	---	---	---
27	Palladium	mg/l	---	---	---	---	---	---	---	---	---
28	Selenium	mg/l			---	---	---	---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					November' 19						
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	GGS 01	EDD 050			EDH 044		
					Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject
29	Vanadium	mg/l	---	---	---	---	---	---	---	---	---
30	Cadmium	mg/l			---	---	---	---	---	---	---
31	Cobalt	mg/l			---	---	---	---	---	---	---
32	Bicarbonate	mg/l			---	---	---	---	---	---	---
33	Sodium	mg/l	---	---	1170.0	1190.0	180.0	1220.0	840.0	125.0	890.0
34	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
36	% Sodium				---	---	---	---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					November' 19			December' 19			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN 099			GGS 01			EDD 050
					Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet
1	pH		5.5 to 9.0	5.5-9.0	6.87	6.40	5.80	7.70	7.82	7.91	8.06
2	Temperature	deg C			31.4°C	27.8°C	29.4°C	29.9°C	29.3°C	29.7°C	28.7°C
3	Total Suspended Solids	mg/l	100	100	22	<2	<2	4	<2	2	4
4	Total Dissolved Solids	mg/l	---	2100	5112	1080	6192	2180	882	2896	2270
5	Chlorides	mg/l	---	600	2018	390	1925	745	236	885	825
6	Total Hardness	mg/l	---	---	491.00	182.20	518.80	43.5	15.8	47.5	47.5
7	Sulphates	mg/l	---	1000	7.5	4.7	8.5	5.7	<2.5	6.1	4.8
8	Calcium	mg/l			125.4	46	134.9	11.1	3.2	11.1	11.1
9	Magnesium	mg/l	---	---	43.3	16.30	44.00	3.8	1.90	4.8	4.8
10	Dissolved Oxygen	mg/l						4.8	5.90	5.0	5.0
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	2.6	0.7	2.5	1.95	0.45	2.1	2.25
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.033	0.019	0.030	0.015	<0.01	0.017	0.024
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Sodium Absorption Ratio		---	---	35.7	10.2	32.7	60.3	34.3	71.2	51
24	Aluminum	mg/l	---	---	---	---	---	<0.01	<0.01	<0.01	<0.01
25	Lithium	mg/l			---	---	---	<0.5	<0.5	<0.5	<0.5
26	Molybednum	mg/l	---	---	---	---	---	<0.5	<0.5	<0.5	<0.5
27	Palladium	mg/l	---	---	---	---	---	<0.5	<0.5	<0.5	<0.5
28	Selenium	mg/l			---	---	---	<0.005	<0.005	<0.005	<0.005

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					November' 19			December' 19			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN 099			GGS 01			EDD 050
					Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet
29	Vanadium	mg/l	---	---	---	---	---	<0.2	<0.2	<0.2	<0.2
30	Cadmium	mg/l			---	---	---	<0.02	<0.02	<0.02	<0.02
31	Cobalt	mg/l			---	---	---	<0.1	<0.1	<0.1	<0.1
32	Bicarbonate	mg/l			---	---	---	425.0	220.0	550.0	385.0
33	Sodium	mg/l	---	---	1820.0	315.0	1715.0	915.0	315.0	1130.0	795.0
34	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
36	% Sodium				---	---	---	97.9	97.7	98.1	97.3

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					December' 19					December' 19	
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDD 050		EDH 044			EDN 099	
					Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet
1	pH		5.5 to 9.0	5.5-9.0	7.61	8.20	7.51	7.69	7.40	7.53	6.63
2	Temperature	deg C			29.9°C	23.1°C	22.9°C	23.1°C	23.2°C	25.8°C	26.9°C
3	Total Suspended Solids	mg/l	100	100	<2	3	10	<2	5	9	<2
4	Total Dissolved Solids	mg/l	---	2100	856	2766	3522	704	3856	2310	466
5	Chlorides	mg/l	---	600	310	940	1170	198	1370	845	135
6	Total Hardness	mg/l	---	---	23.7	59.4	106.9	31.7	95.0	142.5	39.6
7	Sulphates	mg/l	---	1000	<2.5	5.9	6.0	3.5	7.2	5.0	<2.5
8	Calcium	mg/l			4.8	14.3	26.9	7.9	23.8	36.5	9.5
9	Magnesium	mg/l	---	---	2.9	5.8	9.6	2.9	8.7	12.5	3.8
10	Dissolved Oxygen	mg/l			5.7	5.2	4.7	5.8	4.9	5.0	6.1
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	0.70	2.35	1.9	0.83	2.15	0.9	0.26
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	<0.01	0.022	0.024	0.011	0.027	<0.01	<0.01
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Sodium Absorption Ratio		---	---	26.4	57.8	45.8	23.7	63.5	33.7	11.1
24	Aluminum	mg/l	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Lithium	mg/l			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
26	Molybednum	mg/l	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
27	Palladium	mg/l	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
28	Selenium	mg/l			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					December' 19					December' 19	
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDD 050		EDH 044			EDN 099	
					Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet
29	Vanadium	mg/l	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
30	Cadmium	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
31	Cobalt	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
32	Bicarbonate	mg/l			157.0	435.0	695.0	169.0	720.0	518.0	122.0
33	Sodium	mg/l	---	---	295.0	1025.0	1090.0	305.0	1430.0	920.0	160.0
34	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
36	% Sodium				96.5	97.4	95.7	95.5	97	93.4	89.9

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					December ' 19	January' 20					
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN 099	GGS 01			EDD 050		
					Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject
1	pH		5.5 to 9.0	5.5-9.0	7.16	8.15	8.11	7.90	7.78	7.51	7.90
2	Temperature	deg C			27.2°C	28.5°C	28.4°C	28.8°C	29.9°C	29.9°C	24.3°C
3	Total Suspended Solids	mg/l	100	100	<2	4	<2	6	3	<2	4
4	Total Dissolved Solids	mg/l	---	2100	2884	2248	1254	3128	2790	950	3452
5	Chlorides	mg/l	---	600	1085	705	530	1095	1185	385	1510
6	Total Hardness	mg/l	---	---	186.1	24.0	12.0	39.0	39.0	31.0	43.0
7	Sulphates	mg/l	---	1000	6.1	5.1	<2.5	6.2	3.9	<2.5	4.4
8	Calcium	mg/l			46.0	6.3	3.2	7.9	9.5	6.3	11.1
9	Magnesium	mg/l	---	---	17.3	2.0	<2	4.8	3.80	3.8	3.8
10	Dissolved Oxygen	mg/l			5.5	4.5	6.0	3.7	6.00	6.4	6.4
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	1.30	1.45	0.75	1.8	1.5	0.96	1.89
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	<0.01	0.023	0.011	0.026	0.014	<0.01	0.017
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Sodium Absorption Ratio		---	---	37.3	72.9	62.1	87.8	70.9	31.1	94.9
24	Aluminum	mg/l	---	---	<0.01	---	---	---	---	---	---
25	Lithium	mg/l			<0.5	---	---	---	---	---	---
26	Molybednum	mg/l	---	---	<0.5	---	---	---	---	---	---
27	Palladium	mg/l	---	---	<0.5	---	---	---	---	---	---
28	Selenium	mg/l			<0.005	---	---	---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					December ' 19	January' 20					
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN 099	GGS 01			EDD 050		
					Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject
29	Vanadium	mg/l	---	---	<0.2	---	---	---	---	---	---
30	Cadmium	mg/l			<0.02	---	---	---	---	---	---
31	Cobalt	mg/l			<0.1	---	---	---	---	---	---
32	Bicarbonate	mg/l			671.0	1165.0	425.0	1470.0	20.0	305.0	940.0
33	Sodium	mg/l	---	---	1170.0	820.0	495.0	1260.0	1020.0	405.0	1430.0
34	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
36	% Sodium				93.2	98.7	98.9	98.6	98.3	96.5	98.6

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					January' 20						February' 20
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH 044			EDN 099			GGS 01
					Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet
1	pH		5.5 to 9.0	5.5-9.0	7.39	7.52	7.72	7.15	6.95	6.81	7.82
2	Temperature	deg C			26.3°C	26.3°C	26.1°C	27.2°C	28.5°C	27.8°C	27.5°C
3	Total Suspended Solids	mg/l	100	100	8	<2	7	<2	<2	<2	3
4	Total Dissolved Solids	mg/l	---	2100	3382	692	4188	4236	656	5280	2216
5	Chlorides	mg/l	---	600	1320	245	1710	2110	286	2340	830
6	Total Hardness	mg/l	---	---	115.0	16.0	79.0	436.0	36.0	594.0	47.0
7	Sulphates	mg/l	---	1000	8.0	<2.5	10.0	5.3	<2.5	6.2	<2.5
8	Calcium	mg/l			25.4	3.2	19	112.7	7.9	161.9	11.1
9	Magnesium	mg/l	---	---	12.5	2.0	7.7	37.5	3.8	46.2	4.8
10	Dissolved Oxygen	mg/l			4.7	6.1	4.3	5.0	5.9	3.5	2.0
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	2.9	0.61	1.75	1.85	0.81	2.30	1.4
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.019	<0.01	0.021	0.015	<0.01	0.022	0.017
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Sodium Absorption Ratio		---	---	57.2	31.5	89.6	36.3	22.5	34.3	55.4
24	Aluminum	mg/l	---	---	---	---	---	---	---	---	---
25	Lithium	mg/l			---	---	---	---	---	---	---
26	Molybednum	mg/l	---	---	---	---	---	---	---	---	---
27	Palladium	mg/l	---	---	---	---	---	---	---	---	---
28	Selenium	mg/l			---	---	---	---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					January' 20						February' 20
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH 044			EDN 099			GGS 01
					Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet
29	Vanadium	mg/l	---	---	---	---	---	---	---	---	---
30	Cadmium	mg/l			---	---	---	---	---	---	---
31	Cobalt	mg/l			---	---	---	---	---	---	---
32	Bicarbonate	mg/l			815.0	280.0	1240.0	460.0	60.0	595.0	512.0
33	Sodium	mg/l	---	---	1410.0	290.0	1830.0	1740.0	310.0	1920.0	875.0
34	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
36	% Sodium				96.4	97.5	98.1	89.7	95	87.6	97.6

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					February' 20						
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	GGS 01		EDD 050			EDH 044	
					Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet
1	pH		5.5 to 9.0	5.5-9.0	7.88	7.95	7.70	7.65	7.85	7.90	7.43
2	Temperature	deg C			27.4°C	30.2°C	30.9°C	31.2°C	24.7°C	35.7°C	26.2°C
3	Total Suspended Solids	mg/l	100	100	<2	4	4	<2	3	<2	<2
4	Total Dissolved Solids	mg/l	---	2100	702	3512	3102	912	3230	3214	656
5	Chlorides	mg/l	---	600	225	1140	1470	310	1510	1225	245
6	Total Hardness	mg/l	---	---	51.0	47.0	47.0	20.0	51.0	51.0	63.0
7	Sulphates	mg/l	---	1000	<2.5	<2.5	3.9	<2.5	4.2	<2.5	<2.5
8	Calcium	mg/l			11.1	9.5	11.1	4.8	12.7	12.7	14.3
9	Magnesium	mg/l	---	---	5.80	5.8	4.8	1.9	4.8	4.8	6.7
10	Dissolved Oxygen	mg/l			3.20	1.8	1.7	4.1	<1	2.8	5.0
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	0.65	1.85	2.1	0.69	2.25	1.65	0.71
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	<0.01	0.022	0.014	<0.01	0.018	0.022	0.011
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Sodium Absorption Ratio		---	---	18.6	81.2	84	25.7	85.7	89.5	15.9
24	Aluminum	mg/l	---	---	---	---	---	---	---	---	---
25	Lithium	mg/l			---	---	---	---	---	---	---
26	Molybednum	mg/l	---	---	---	---	---	---	---	---	---
27	Palladium	mg/l	---	---	---	---	---	---	---	---	---
28	Selenium	mg/l			---	---	---	---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					February' 20						
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	GGS 01		EDD 050			EDH 044	
					Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet
29	Vanadium	mg/l	---	---	---	---	---	---	---	---	---
30	Cadmium	mg/l			---	---	---	---	---	---	---
31	Cobalt	mg/l			---	---	---	---	---	---	---
32	Bicarbonate	mg/l			293.0	1002.0	525.0	220.0	586.0	866.0	185.0
33	Sodium	mg/l	---	---	306.0	1280.0	1325.0	265.0	1408.0	1470.0	290.0
34	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
36	% Sodium				92.9	98.3	98.4	96.7	98.4	98.4	91

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					February' 20			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH 044	EDN 099		
					Reject	Inlet	Outlet	Reject
1	pH		5.5 to 9.0	5.5-9.0	7.50	7.53	7.28	7.40
2	Temperature	deg C			25.8°C	26.6°C	27.9°C	27.6°C
3	Total Suspended Solids	mg/l	100	100	<2	8	<2	10
4	Total Dissolved Solids	mg/l	---	2100	3564	3458	768	4344
5	Chlorides	mg/l	---	600	1415	1445	260	1590
6	Total Hardness	mg/l	---	---	126.0	380.0	59.0	459.0
7	Sulphates	mg/l	---	1000	<2.5	5.6	3.0	6.4
8	Calcium	mg/l			31.7	95.2	12.7	111.1
9	Magnesium	mg/l	---	---	11.6	34.6	6.7	44.2
10	Dissolved Oxygen	mg/l			2.1	2.2	4.8	2.0
11	BOD	mg/l	30	30	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0
14	Phenolic Compounds	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	1.9	3.15	0.48	2.80
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.027	0.020	<0.01	0.021
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<0.1	<0.1	<0.1	<0.1
22	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001
23	Sodium Absorption Ratio		---	---	62.7	29.1	17.3	35
24	Aluminum	mg/l	---	---	---	---	---	---
25	Lithium	mg/l			---	---	---	---
26	Molybednum	mg/l	---	---	---	---	---	---
27	Palladium	mg/l	---	---	---	---	---	---
28	Selenium	mg/l			---	---	---	---

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Oct'19 to Feb'20)

ANNEXURE III

Date					February' 20			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH 044	EDN 099		
					Reject	Inlet	Outlet	Reject
29	Vanadium	mg/l	---	---	---	---	---	---
30	Cadmium	mg/l			---	---	---	---
31	Cobalt	mg/l			---	---	---	---
32	Bicarbonate	mg/l			952.0	1078.0	207.0	1214.0
33	Sodium	mg/l	---	---	1620.0	1305.0	305.0	1725.0
34	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01
35	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02
36	% Sodium				96.6	88.2	91.9	89.1

Annexure IV: Ground Water Analysis Report

(October’ 19 to March’ 20)

Ground water analysis of surrounding areas of CBM Raniganj Project by Essar Oil Gas Exploration Production Ltd

Compliance Period: Oct'19 to Mar'20

ANNEXURE IV

S. No.	Parameter	Unit	Limits of IS:10500 -1991 Reaffirmed 2009		Akandara	Dhabani	Bansia	Nachan	Kalikapur
			Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)					
1	pH at 27°C		6.5 to 8.5	No Relaxation	6.35	6.2	6.91	6.81	7.12
2	Colour in Hazen unit		5	15	<5	<5	<5	<5	<5
3	Odour		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Total Suspended Solids	mg/l	---	---	<2	15	<2	12	<2
5	Total Dissolved Solids	mg/l	500	2000	54	12	322	352	298
6	Nitrate	mg/l	45	No Relaxation	<0.5	<0.5	<0.5	<0.5	<0.5
7	Total Alkalinity (as $CaCO_3$)	mg/l	200	600	32.8	92	194	220	161
8	Chloride	mg/l	250	1000	14	25	35	86	64
9	Total Hardness (as $CaCO_3$)	mg/l	200	600	31.7	83.2	182.2	217.8	158.4
10	Sulphate	mg/l	200	400	<2.5	4	6.7	6.5	5
11	Calcium	mg/l	75	200	7.9	20.6	47.6	60.3	38.1
12	Magnesium	mg/l	30	100	2.9	7.7	15.4	16.4	15.4
13	Anionic Detergents (as MBAS)	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1
14	Mineral Oil	mg/l	0.5	No Relaxation	<1	<1	<1	<1	<1
15	Phenolic Compounds (as C_6H_5OH)	mg/l	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
16	Fluoride	mg/l	1	1.5	0.37	0.45	0.61	0.41	0.33
17	Residual Free Chlorine	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron	mg/l	0.3	No Relaxation	<0.1	1.75	<0.1	1.8	<0.1
19	Sodium	mg/l	---	---	7	12	25	42	32
20	Total Chromium	mg/l	0.05	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05
21	Zinc	mg/l	5	15	<0.01	<0.01	<0.01	<0.01	<0.01
22	Copper	mg/l	0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05
23	Nickel	mg/l	0.02	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05
24	Arsenic	mg/l	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
25	Lead	mg/l	0.01	No Relaxation	<0.1	<0.1	<0.1	<0.1	<0.1
26	Mercury	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001

Ground water analysis of surrounding areas of CBM Raniganj Project by Essar Oil Gas Exploration Production Ltd

Compliance Period: Oct'19 to Mar'20

ANNEXURE IV

S. No.	Parameter	Unit	Limits of IS:10500 -1991 Reaffirmed 2009		Akandara	Dhabani	Bansia	Nachan	Kalikapur
			Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)					
27	Boron	mg/l	0.5	1	<1	<1	<1	<1	<1
28	Phosphorus	mg/l	---	---	<0.01	<0.01	<0.01	<0.01	<0.01
29	Potassium	mg/l	---	---	<1	2	3	2	2
30	Aluminium	mg/l	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01
31	Manganese	mg/l	0.1	0.3	<0.05	<0.05	<0.05	<0.05	<0.05
32	Selenium	mg/l	0.01	No Relaxation	<0.005	<0.005	<0.005	<0.005	<0.005
33	Cadmium	mg/l	0.003	No Relaxation	<0.02	<0.02	<0.02	<0.02	<0.02
34	Cyanide	mg/l	0.05	No Relaxation	<0.02	<0.02	<0.02	<0.02	<0.02
35	Electrical Conductivity at 25° C	us/cm	---	---	82	196	525	540	430
36	Hexavalent Chromium	mg/l	---	---	<0.01	<0.01	<0.01	<0.01	<0.01
37	Total Coliform	MPN/100ml	---	---	2	4	<1	4	<1

Ground water analysis of surrounding areas of CBM Raniganj Project by Essar Oil Gas Exploration Production Ltd
Compliance Period: Oct'19 to Mar'20

ANNEXURE IV

S. No.	Parameter	Unit	Limits of IS:10500 -1991 Reaffirmed 2009		Bargoria	Kantaberia	Jatgoria	Saraswatiganj	Gopalpur
			Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)					
1	pH at 27°C		6.5 to 8.5	No Relaxation	6.3	6.71	7.12	6.45	6.28
2	Colour in Hazen unit		5	15	<5	<5	<5	<5	<5
3	Odour		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Total Suspended Solids	mg/l	---	---	4	212	2	35	<2
5	Total Dissolved Solids	mg/l	500	2000	48	120	104	98	228
6	Nitrate	mg/l	45	No Relaxation	<0.5	<0.5	<0.5	<0.5	<0.5
7	Total Alkalinity (as $CaCO_3$)	mg/l	200	600	31	43	54	50	14.8
8	Chloride	mg/l	250	1000	10	24	22	28	82.6
9	Total Hardness (as $CaCO_3$)	mg/l	200	600	43.5	23.8	51.5	47.5	83.1
10	Sulphate	mg/l	200	400	<2.5	5	6.2	4.7	8
11	Calcium	mg/l	75	200	9.5	6.3	12.7	11.1	33.3
12	Magnesium	mg/l	30	100	4.8	1.9	4.8	4.8	7.7
13	Anionic Detergents (as MBAS)	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1
14	Mineral Oil	mg/l	0.5	No Relaxation	<1	<1	<1	<1	<1
15	Phenolic Compounds (as C_6H_5OH)	mg/l	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
16	Fluoride	mg/l	1	1.5	0.2	0.19	0.1	0.12	0.26
17	Residual Free Chlorine	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron	mg/l	0.3	No Relaxation	0.52	55.5	0.8	9	0.33
19	Sodium	mg/l	---	---	4	11	14	12	64
20	Total Chromium	mg/l	0.05	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05
21	Zinc	mg/l	5	15	<0.01	<0.01	<0.01	<0.01	<0.01
22	Copper	mg/l	0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05
23	Nickel	mg/l	0.02	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05
24	Arsenic	mg/l	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
25	Lead	mg/l	0.01	No Relaxation	<0.1	<0.1	<0.1	<0.1	<0.1
26	Mercury	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001

Ground water analysis of surrounding areas of CBM Raniganj Project by Essar Oil Gas Exploration Production Ltd

Compliance Period: Oct'19 to Mar'20

ANNEXURE IV

S. No.	Parameter	Unit	Limits of IS:10500 -1991 Reaffirmed 2009		Bargoria	Kantaberia	Jatgoria	Saraswatiganj	Gopalpur
			Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)					
27	Boron	mg/l	0.5	1	<1	<1	<1	<1	<1
28	Phosphorus	mg/l	---	---	<0.01	<0.01	<0.01	<0.01	<0.01
29	Potassium	mg/l	---	---	<1	<1	<1	<1	3
30	Aluminium	mg/l	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01
31	Manganese	mg/l	0.1	0.3	<0.05	0.186	<0.05	0.075	<0.05
32	Selenium	mg/l	0.01	No Relaxation	<0.005	<0.005	<0.005	<0.005	<0.005
33	Cadmium	mg/l	0.003	No Relaxation	<0.02	<0.02	<0.02	<0.02	<0.02
34	Cyanide	mg/l	0.05	No Relaxation	<0.02	<0.02	<0.02	<0.02	<0.02
35	Electrical Conductivity at 25° C	us/cm	---	---	60	175	148	135	350
36	Hexavalent Chromium	mg/l	---	---	<0.01	<0.01	<0.01	<0.01	<0.01
37	Total Coliform	MPN/100ml	---	---	2	4	<1	2	<1

Ground water analysis of surrounding areas of CBM Raniganj Project by Essar Oil Gas Exploration Production Ltd

ANNEXURE IV

Compliance Period: Oct'19 to Mar'20

S. No.	Parameter	Unit	Limits of IS:10500 -1991 Reaffirmed 2009		Sarenga	Ghatakdanga
			Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)		
1	pH at 27^{o}C		6.5 to 8.5	No Relaxation	6.35	6.1
2	Colour in Hazen unit		5	15	<5	<5
3	Odour		Agreeable	Agreeable	Agreeable	Agreeable
4	Total Suspended Solids	mg/l	---	---	2	4
5	Total Dissolved Solids	mg/l	500	2000	316	48
6	Nitrate	mg/l	45	No Relaxation	<0.5	<0.5
7	Total Alkalinity (as $CaCO_3$)	mg/l	200	600	96.1	11.1
8	Chloride	mg/l	250	1000	38.3	12.1
9	Total Hardness (as $CaCO_3$)	mg/l	200	600	71.3	39.6
10	Sulphate	mg/l	200	400	7.1	<2.5
11	Calcium	mg/l	75	200	17.5	15.8
12	Magnesium	mg/l	30	100	6.7	3.8
13	Anionic Detergents (as MBAS)	mg/l	0.2	1	<0.1	<0.1
14	Mineral Oil	mg/l	0.5	No Relaxation	<1	<1
15	Phenolic Compounds (as C_6H_5OH)	mg/l	0.001	0.002	<0.002	<0.002
16	Fluoride	mg/l	1	1.5	0.2	<0.05
17	Residual Free Chlorine	mg/l	0.2	1	<0.1	<0.1
18	Iron	mg/l	0.3	No Relaxation	0.41	0.68
19	Sodium	mg/l	---	---	25	7
20	Total Chromium	mg/l	0.05	No Relaxation	<0.05	<0.05
21	Zinc	mg/l	5	15	<0.01	<0.01
22	Copper	mg/l	0.05	1.5	<0.05	<0.05
23	Nickel	mg/l	0.02	No Relaxation	<0.05	<0.05
24	Arsenic	mg/l	0.01	0.05	<0.01	<0.01
25	Lead	mg/l	0.01	No Relaxation	<0.1	<0.1
26	Mercury	mg/l	0.001	No Relaxation	<0.001	<0.001

Ground water analysis of surrounding areas of CBM Raniganj Project by Essar Oil Gas Exploration Production Ltd

ANNEXURE IV

Compliance Period: Oct'19 to Mar'20

S. No.	Parameter	Unit	Limits of IS:10500 -1991 Reaffirmed 2009		Sarenga	Ghatakdanga
			Desirable limit (Max.)	Permissible limit in the Absence of Alternate Source (Max.)		
27	Boron	mg/l	0.5	1	<1	<1
28	Phosphorus	mg/l	---	---	<0.01	<0.01
29	Potassium	mg/l	---	---	3	<1
30	Aluminium	mg/l	0.03	0.2	<0.01	<0.01
31	Manganese	mg/l	0.1	0.3	<0.05	<0.05
32	Selenium	mg/l	0.01	No Relaxation	<0.005	<0.005
33	Cadmium	mg/l	0.003	No Relaxation	<0.02	<0.02
34	Cyanide	mg/l	0.05	No Relaxation	<0.02	<0.02
35	Electrical Conductivity at 25° C	us/cm	---	---	320	85
36	Hexavalent Chromium	mg/l	---	---	<0.01	<0.01
37	Total Coliform	MPN/100ml	---	---	<1	2

Annexure V: Corporate Social Responsibility Expenditure

(October’ 19 to March’ 20)

ANNEXURE V

Corporate Social Responsibility Expenditure from October' 19 to March' 20			
Thematic Area	**Projects**	**Beneficiaries (No.)**	**Expenditure (INR)**
HEALTH	Community Health Care Services through Mobile Medical Van	11287	Rs. 15,32,470.00
EDUCATION	Support to inter-school events and anganwadis	2995	Rs. 1,87,664.00
SPORTS AND CULTURAL EVENT	Support to sports	1797	Rs. 62,655.00
COMMUNITY INFRASTRUCTURE DEVELOPMENT	Support to community for COVID-19	308	Rs. 69,382.00
TOTAL		**16387**	**Rs. 18,52,171.00**

Annexure VI: Expenditure towards Environmental Protection

(October’ 19 to March’ 20)

ANNEXURE VI

Expenditure towards Environmental Protection Measures at EOGEPL CBM Project, Raniganj (October'19 to March' 20)		
S. No.	**Particular**	**Expenses (INR)**
1	Installation of Reverse Osmosis Treatment System for Produced Water Treatment (Capital & Recurring)	Rs. 95,29,987.00
2	Environmental Monitoring Activities (Recurring)	Rs. 7,65,016.00
3	HDPE liners for produced water storage at site when needed (Capital)	Rs. 51,430.00
4	Non Hazardous Waste Disposal (Recurring)	Rs. 81,153.00
5	Green Belt Development (Recurring)	Rs. 35,352.00
6	Land Subsidence Study (Recurring)	Rs. 4,46,000.00
TOTAL		**Rs. 1,09,08,938.00**