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EOGEPL/ CBM-RG (E)/ HSE/2021/3591
Date 22nd November 2021

To
The Regional Director
Ministry of Environment, Forests and Climate Change
Integrated Regional Office
IB-194, Sector III, Salt Lake
Kolkata-700106
West Bengal

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

Ref: Environmental Clearance of Phase-II granted by MoEF vide letter no. J-11011/351/2009- IA II (I) dated 23.09.2011; Amendment dated 18.06.2012; Transfer of EC from EOL to EOGEPL dated 06.11.2017

Dear Sir

We are enclosing herewith the half-yearly compliance report in respect of the stipulated prior environmental clearance terms and conditions for the Pilot cum Production Phase (Phase-II) and its amendment of CBM project activities for the period of April' 2021 to September' 2021.

Thank you for your continued support.

Warm Regards,
For Essar Oil and Gas Exploration and Production Limited

Kannan Rajendran
Chief Operating Officer
Raniganj East, CBM Project-Durgapur

Enclosed: Phase-II and Amendment Compliance Report

Copy to:

1. The Environmental Engineer, Durgapur Regional Office, WBPCB, Durgapur-713216

Essar Oil and Gas Exploration and Production Limited

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

(April'21 to September'21)

Ref: Environment Clearance no. F. No. J-11011/351/2009- IA II (I) dated 23.09.2011

S. No.	EC Conditions	Compliance Status
	A. Specific Conditions	
i.	As proposed, Only 58 pilot-cum-production wells shall be drilled up to a depth of 1000 m. No additional wells shall be drilled without prior permission from this Ministry.	Number of pilot-cum-production wells has been drilled are as per the permission. Amendment in Environmental Clearance has been granted by MoEF & CC for drilling 4 additional supporting wells at each pilot cum production site to augment the production.
ii	As proposed, no drilling of well and any construction work shall be carried out in forest land. No forest land shall be used for installation of Group Gathering Stations (GGSs) and pipeline laying in the proposed location.	All the facilities including well sites & Gas Gathering Stations are located outside the forest area.
iii	Recommendations of the State Forest Department shall be obtained regarding likely impact of the proposed plant on the surrounding protected forests viz. Durgapur PF & Ukhra PF and implemented.	The Conservator of Forests (South East Circle), Forest Department, West Bengal has carried out site Survey. The Additional PCCF, West Bengal forwarded his recommendations to the Additional PCCF, MoEF (Eastern Regional Office). (A copy of the letter has already been submitted along with compliance report after that).
iv	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.
v	Prior permission from the Ministry of Defense shall be obtained regarding impact of proposed plant on Panagarh air base, if any.	Four (4) nos. of Gas Gathering Station (GGS) and One Main Compressor Station (MCS) was constructed as per the condition of the NOC of Ministry of Defense

S. No.	EC Conditions	Compliance Status
		(MoD).
vi	The surface facilities shall be installed as per the applicable codes and standards, international practices and applicable local regulations.	Surface facilities have been designed as per applicable Code and Standard.
vii	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 PM_{1O}, $PM_{2.5}$, S02, 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 well sites 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 for PM10, PM2.5, SO2, NOX, CO, CH4, VOCs, HC, Non-methane HC. Monitoring activity has been carried out from April'21 to September'21 through a recognized laboratory based in Kolkata. Please find the ambient air quality monitoring results with this report as **Annexure I.**
viii	The company shall monitor data on methane and non-methane hydrocarbon at the drilling site, GGS, CGS and at the SV station from where the gas is supplied to the customers.	Methane hydrocarbons are monitored as part of Ambient Air Quality Monitoring plan at major facilities (GGS, MCS) and villages. Monitoring activity has been carried out from Apr'21 to Sep'21 through a recognized laboratory based in Kolkata. Please find the ambient air quality monitoring results with this report as **Annexure I.**
ix	Mercury shall also be analyzed in air, water and drill cuttings twice during drilling period.	The drilling operation has been temporarily suspended from April, 2017 till date.
x	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	Elevated flare system has been designed as per OISD guidelines. Measures delineated in the EIA/EMP have been taken to prevent fire hazards. The overhead flaring has been installed at a height of 30 m. The following measures have been implemented to prevent fire hazards: • Installation of electrical equipment as per approved hazardous zone classification as communicated to DGMS.

S. No.	EC Conditions	Compliance Status
	regulatory requirements and emissions from stacks shall meet the MOEF/CPCB guidelines.	• Dry chemical fire extinguishers are available at site. • Online methane gas analyzers (CH4) are available. • Flame proof type lighting fixtures, push buttons and switches at the drill site facilities are used.
xi	The company shall make the arrangement for control of noise from the drilling activity 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.	CPCB approved models of silent generator sets have been installed with acoustic enclosures. Noise monitoring has been carried out in the activity area and surrounding habitat. Please find the results of noise monitoring attached with this report as **Annexure II**.
xii	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(E) dated 30'August, 2005.	The drilling operation has been temporarily suspended from April, 2017 till date.
xiii	Total fresh water requirement from local approved water suppliers shall not exceed 75 m3/day/well and prior permission shall be obtained from the concerned Authority and a copy submitted to the Ministry's Regional Office at Bhubaneswar. No ground water shall be used without permission of CGWA.	The drilling operation has been temporarily suspended from April, 2017 till date. However, The treated RO water is reused in work over operations and other utilities. Ground water is not used & withdrawn for Industrial water consumption.
xiv	The produced water during drilling operations shall be collected in HDPE lined waste pit to prevent ground water contamination. Effluent shall be properly treated and treated effluent shall conform to CPCB standards. As proposed, produced water may also be used in operational coal mines of Eastern Coal Fields for dust suppression, slurry activities and post-mining restoration efforts etc. Domestic effluent shall be disposed through septic tank followed by soak pit. No effluent shall be discharged outside the	Produced water is collected & stored in over surface Zn-Al tanks installed at all sites. In case of excess water volume, the extra water is stored HDPE lined pits. Produced water is then transported by pipelines to Reverse Osmosis (RO) plant for treatment. Currently RO treatment plants of total capacity 5900 m3/ day have been installed and 2000 m3/ day new plant installation process is ongoing. The treated water is used for the projects internal operations (work over & site preparation activities). Excess treated water is discharged to nearby stream only after complying with

S. No.	EC Conditions	Compliance Status
	premises and 'zero' discharge shall be adopted	the discharge standards. Domestic effluent is treated in septic tank followed by soak pits. There is no discharge of effluent from the facilities.
xv	Water produced during drilling shall be reused in drilling of other core/test wells.	Produced water has been collected & stored in over surface Zn-Al tanks installed at all sites. Water meeting the standards set by CPCB is reused in the construction & work over activities of adjoining wells. Excess water is discharged only after meeting the discharge standards after treatment.
xvi	Reverse Osmosis plant shall be installed for further treatment of the wastewater in case the TDS is > 2000 mg/l and treated wastewater shall be reused or discharge on the land after meeting the norms.	Currently, Reverse Osmosis (RO) plants with total capacity of 5900 m3/ day are installed and 2000 m3/ day are in advance stage of commissioning to treat the produced water generated from production wells. Please find the produced water analysis result attached with this report as **Annexure III**. Please find the RO water quality monitoring results attached with this report as **Annexure IV.** The treated water is reused in HF, work over and other construction activities. Excess water is discharged to nearby streams only after meeting the discharges standards. Please find the analysis results of surface water monitoring attached with this report as **Annexure IV A**. Monitoring activity has been carried out from Apr'21 to Sep'21 through a recognized laboratory based in Kolkata. However due to COVID pandemic the water sampling is not carried out for the month of May 2021.
Xvii	Ground water quality monitoring shall be done to assess if produced water storage or disposal has any effect.	The ground water monitoring carried out in Post-Monsoon (November) month. The Ground water Analysis reports attached with report as **Annexure V**.
xviii	Drilling wastewater including drill cuttings wash	The drilling operation has been temporarily suspended

S. No.	EC Conditions	Compliance Status
	water shall be collected in disposal pit lined with HDPE lining and evaporated or treated and shall comply with the notified standards for on-shore disposal. The treated waste water should be reused in other wells during drilling operations. The membership of common TSDF shall be obtained for the disposal of drill cuttings and hazardous waste. Otherwise secured land fill shall be created at the site as per the design of the secured shall be approved by the CPCB and obtain the authorization of the WBPCB. Copy of authorization or membership of TSDF shall be submitted to Ministry's Regional Office at Bhubaneswar.	from April 2017 till date.
xix	Only water based drilling mud shall be used. The drilling mud shall be recycled. Hazardous waste shall be disposed of as per Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers/re-processors.	The drilling operation has been temporarily suspended from April 2017 till date. Used Oil is sent to authorize recycler. We had disposal of hazardous waste on May' 21. The copy of the FORM 10 is enclosed as **Annexure VI**.
xx	The Company shall carry out long term subsidence study by collecting base line data before initiating drilling operation till the project lasts. The data so collected shall be submitted six monthly to the Ministry and its Regional Office at Bhubaneswar.	Land Subsidence Study is carried has been started from year 2012 and has been carried out regularly as condition Amendment 4 (viii). In the last 7 years, no significant land subsidence has been observed. .The last report of September' 2020 is already submitted with previous compliance report. Due to COVID pandemic the further monitoring is not carried out by NIIT Durgapur.
xxi	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	The necessary measures have been taken to prevent fire hazards and soil remediation as follows. • Installation of electrical equipment as per approved hazardous zone classification as communicated to

S. No.	EC Conditions	Compliance Status
	drums shall be installed to minimize gaseous emissions during operation.	DGMS • Dry chemical fire extinguishers are available at all well site. • Portable methane gas analyzers (CH4) are available. • Flame proof type lighting fixtures, push buttons and switches in the drill site facilities are used. • Impervious surface, secondary containment and spill kits are provided whenever there is a possibility of soil contamination.
xxii	The project authorities shall install SCADA system with dedicated optical fiber based telecommunication link for safe operation of pipeline and Leak Detection System. Additional sectionalizing valves in the residential area and sensitive installations shall be provided to prevent the amount of gas going to the atmosphere in the event of pipeline failure. Intelligent pigging facility shall be provided for the entire pipeline system for internal corrosion monitoring. Coating and impressed current cathodic protection system shall be provided to prevent external corrosion.	SCADA System is installed for monitoring of wells and Gas Gathering Station. Safe Operation of the pipeline is ensured through continuous motoring of parameter at the Control Room and through regular patrolling. Sectionalizing valves are in Place. Cathodic Ray Protection system has been installed along the length of pipeline to prevent the corrosion. The design and laying of surface facilities have been confirmed to the standards of OISD 141.
xxiii	All the surface facilities including GGS, CGS and SV station shall be as per applicable codes and standards, international practices and applicable local regulations.	All the surface facilities including GGS, CGS and SV stations have been laid as per applicable code and standards.
xxiv	The design, material of construction, assembly, inspection, testing and safety recommendations of operation 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	All surface facilities have been installed as per the ASME/ANSI B 31.8 standards. Pipelines design and laying is also confirms to the ANSI/ASME standards.

S. No.	EC Conditions	Compliance Status
	of burial at river crossing and casings at rails, major road crossings should be in conformity with ANSI/ASME requirements.	
xxv	Annual safety audit should be carried out for the initial three years by an independent agency and report submitted to this Ministry for ensuring the strict compliance of safety regulations on operations and maintenance.	Safety audits are conducted by third party to maintain the safety standards.
xxvi	The project authorities shall patrol and inspect the pipeline regularly for detection of faults as per OISD guidelines and continuous monitoring of pipeline operation by adopting non-destructive method (s) of testing as envisaged in the EMP. Pearson survey and continuous potential survey should be carried out at regular intervals to ensure the adequacy of cathodic protection system.	Regular patrolling and inspection of laid pipeline has been carried out for detection of faults as per OISD guidelines. Pipeline operations shall be continuously monitored by adopting non-destructive methods of testing as envisaged in the EIA/EMP. Pearson survey and continuous potential survey shall be carried out at regular intervals to ensure the adequacy of cathodic protection system.
xxvii	The company shall develop a contingency plan for H_2S release including all necessary recommendations from evacuation to resumption of normal operations. The workers shall be provided with personal H_2S 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. However all the necessary safety measures are delineated as per the emergency response plan. Gas detectors are kept at the drilling and production sites to check any presence of gases which are beyond threshold values. All workers have been provided with standard PPEs according to the job requirement.
xxviii	Adequate well protection system shall be provided like BoP or diverter systems as required based on the geological formation of the blocks.	Adequate well control measures along with BOP have been adopted to ensure necessary level of safety.
xxix	Blow Out PreventerP (BOP) system shall be installed to prevent well blowouts during drilling operations. BOP measures during drilling shall focus on maintaining well bore hydrostatic pressure by proper pre-well planning and drilling	CBM well hydrostatic pressures are normally less than 2psi. However considering the hydrostatic pressures and sensitivity of well, Blow Out Preventers or diverter systems have been provided at the well head during drilling along with other well control measures such as

S. No.	EC Conditions	Compliance Status
	fluid logging etc.	proper pre-well planning and drilling fluid logging to maintain the hydrostatic pressure.
xxx	The top soil removed shall be stacked separately for reuse during restoration process	The top soil is being spread at the designated area for green belt development at the project's facilities.
xxxi	Emergency Response Plan shall be based on the guidelines prepared by OISO, 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. Recommendations mentioned in risk assessment and consequence analysis are being duly implemented.
xxxii	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 have been implemented.
xxxiii	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 in original condition. In the event that no economic quantity of hydrocarbon is found a full abandonment plan shall be implemented for the drilling site in accordance with the applicable Indian Petroleum Regulations.	Wells will be abandoned and restored to natural position if found unsuitable for hydrocarbon extraction. Wells will be fully abandoned in compliance with Indian Petroleum Regulations in the event of no economic quality of hydrocarbon is found.
xxxiv	Occupational health surveillance of the workers shall be carried out as per the prevailing Acts and Rules.	All employees have undergone pre-employment medical examination. Periodical occupational health surveillance is conducted and records are maintained.
xxxv	In case the commercial viability of the project is established, the Company shall prepare a detailed plan for development of gas fields and obtain fresh environmental clearance from the Ministry.	MoEF granted amendment in phase II EC for drilling 4 nos. of additional supporting wells at each well site to meet the production capacity over and above 5 lakh m3 per day.
xxxvi	All the commitments made to the public during	Commitments made during the public hearing are being

S. No.	EC Conditions	Compliance Status
	the Public Hearing / Public Consultation meeting held on 26th March, 2010 shall be satisfactorily implemented.	implemented.
xxxvii	Company shall adopt Corporate Environment Policy as per the Ministry's O.M. No. J-11 013/41/2006-1A.II (1) dated 26th April, 2011 and implemented.	Corporate Environmental Policy is in place and being implemented. The copy of the same was already enclosed in the earlier Compliance report.
xxxviii	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, Safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project	We do not intend to bring labor from outside; hence construction of colony is not envisaged. We have been hiring local labour for all construction work. Nonetheless, we are providing all the necessary infrastructure and facilities like porta- cabins, mobile toilets, soak pit & septic tank, safe drinking water, medical health care etc.
General Condition		
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 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	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	We comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior

S. No.	EC Conditions	Compliance Status
	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.	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 and valid till 2023. The copy of the same was already enclosed with earlier report.
v	The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).	Acoustic hoods, silencers, enclosures will be provided to high noise generating equipment. Noise levels will be restricted to the standards prescribed under EPA Rules, 1989. Regular noise monitoring has been carried out. Please find the noise monitoring results attached with this report as **Annexure II**.
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 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, Kolkata (MoEF recognized).
vii	As proposed, Rs. 7.80 Crores earmarked for environment protection and pollution control measures shall be used to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation	The environment expenditure for the environment activities is attached as **Annexure VII**.

S. No.	EC Conditions	Compliance Status
	schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes.	
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 has been and will be 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 of environmental clearances are regularly submitted to Regional office of MoEF.
ix	A copy of clearance letter shall be sent by the proponent to concerned Panchayat, ZilaParishad / Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/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	A copy of Environmental Clearance (EC) has been circulated to the local administration and was uploaded on the Company's website.
x	The project proponent shall upload the status of compliance of 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; SPM, RSPM, S02, 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 has been carried out as per revised NAAQM criteria. The criteria pollutant levels namely; SPM, RSPM, SO_2, NOx, HC (Methane & Non-methane), VOCs has been monitored periodically and displayed at the main entrance of the Gas Gathering Station.
xi	The project proponent shall also submit six monthly reports on the status of the compliance	We are submitting the six monthly compliance reports on the status of the compliance of the stipulated

S. No.	EC Conditions	Compliance Status
	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.	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 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.	The environmental statement for each financial year ending 31st March as Form-V is being regularly submitted to West Bengal Pollution Control Board and the same is uploaded on the company's website along with the status of compliance report. The copy of the last statement has already submitted with previous report.
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 was published in The Telegraph, Calcutta and Anand Bazaar Pathrika on 30th September, 2011. A copy of the same has been submitted in the compliance report during the period Apr'11-Sep'11.
xiv	Project authorities shall inform the Regional Office as well as the Ministry, the date of financial	Financial closure has been prepared in the year of 2010. The development work was commenced on 7th

S. No.	EC Conditions	Compliance Status
	closure and final approval of the project by the concerned authorities and the date of commencing the land development work	Dec, 2011 after obtaining consent to establish from WBPCB.

Essar Oil and Gas Exploration and Production Limited

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

(October'20 to March' 21)

Ref: Environment Clearance no. F. No. J-11011/351/2009- IA II (I) dated 18.06.2012

S. No.	EC Conditions	Compliance Status
4(I)	As proposed, supporting wells (4 nos.) on each pilot-cum-production wells (58 nos.) shall be drilled up to a depth of 1000m. No additional wells/support well shall be drilled without prior permission of this Ministry.	4 supporting wells will be drilled at each pilot-cum-production wells (58x4=232 wells). No additional wells will be drilled without prior approval from MoEF. Total 158 wells drilled till date under this clearance.
4(ii)	Unit shall monitor ground water table within one Km radius of each well during pre-monsoon (i.e. May) and winter season (November). Trend analysis shall be carried out and report shall be submitted to the Ministry's regional office at Bhubaneswar.	Monitoring of ground water table was not been carried out in pre-monsoon. Please find the monitoring results attached with this report as **Annexure VIII**.
4(iii)	Permission from CGWA for dewatering shall be obtained and submitted to the Ministry's Regional Office at Bhubaneswar.	Dewatering is an inherent process of CBM extraction & carried at much deeper depths (>500 m) which does not disturb the usable drinking water aquifers located at the shallow depths. "No Objection Certificate" regarding the same has been obtained from State Water Investigation Directorate (SWID), Water Resources Investigation &

S. No.	EC Conditions	Compliance Status
		Development Department, Govt. of West Bengal. (A copy of the letter is attached with previous compliance report). In west Bengal, SWID is the approved local authority of CGWA for giving permission for water withdrawal.
4(iv)	Smokeless flare shall be installed	Smokeless flares will be installed for complete combustion of CBM. Flaring will be carried out only during process upsets.
4(v)	All measures shall be taken to control noise pollution during drilling process. Acoustic enclosure/barrier shall be installed.	Only silent generator sets that meets the specifications of CPCB are used. Acoustic enclosures have been provided to major noise generating equipment. Earplugs have been provided to the working personnel at the site.
4(vi)	Any produced water shall be treated and recycled/reused within the project area. Any excess water shall be discharged after treatment and meeting the standards prescribed by the CPCB/SPCB. Regular water quality monitoring shall be carried out and monitoring report shall be submitted to the respective Regional Office of the MoEF.	Produced water is treated by Reverse Osmosis (RO) system. Treated water is being reused for work-over & construction activities of other wells. Excess water is discharged to the nearby streams only after complying with the discharge standards. Please find the RO treated water monitoring results attached with this report as **Annexure IV**. Also, please find the surface water monitoring results attached with this report as **Annexure IV A**. .
4(vii)	Approach road shall be constructed prior to the drilling	Approach roads are being constructed wherever the access is not available.
4(viii)	Land subsidence shall be monitored regularly and monitoring report shall be submitted to CPCB, SPCB and respective Ministry's regional office	Land Subsidence Study is carried has been started from year 2012 and has been carried out regularly as condition Amendment 4 (viii). In the last 7 years, no significant land subsidence has been observed. The last report of September' 2020 is already submitted with previous compliance report.

S. No.	EC Conditions	Compliance Status
5	All the specific conditions and general conditions specified in the environmental clearance accorded vide Ministry's letter no.J-11011/351/2009-IA II (I) dated 23rd September, 2011 shall be implemented	All the specific and general conditions of the Phase-II Environmental Clearance are being implemented.
6	Consent to Establish & Operate for the revised proposal shall be obtained from the W.B. Pollution Control Board	Regular CTE & CTO will be obtained from Pollution Control Board and will be submitted to MoEF.
7	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and 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 if required, if any.	No further expansion or modification will be done in the project configuration without prior approval from the MoEF.

ANNEXURE I

Name of Location			MCS						GGS- 01					
Date			Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	39.01	39.84	23.84	19.96	25.46	22.89	45.81	34.07	20.30	21.73	19.96	23.27
PM 10	µg/m^3	100	75.56	73.93	62.61	59.34	82.89	73.12	84.94	68.58	66.18	72.54	65.02	71.41
Nitrogen Dioxide	µg/m^3	80	40.53	39.95	38.97	38.85	39.12	35.04	44.91	39.90	35.86	39.03	36.41	36.03
Sulphur Dioxide	µg/m^3	80	6.17	5.97	5.92	6.07	6.10	5.15	6.30	6.04	5.88	5.93	5.55	5.65
Carbon Monoxide	mg/m^3	2	0.56	0.50	0.42	0.40	0.43	0.47	0.53	0.49	0.42	0.43	0.40	0.44
Hydrocarbon	mg/m^3	NIL	1.86	1.56	1.60	1.48	1.86	1.60	1.88	1.88	1.64	1.62	1.69	1.51
Mercury	mg/m^3			< 0.002				< 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			2.26				2.76		2.52				2.63
Benzo(a)Pyrene	ng/m^3	1		0.42				0.26		0.38				0.25
Ammonia	µg/m^3	400		24.52				28.41		26.48				26.17
Ozone	µg/m^3	180		36.54				39.88		40.26				40.24
Lead	µg/m^3	1		0.18				0.12		0.18				0.13
Nickel	ng/m^3	20		12.62				13.76		13.40				12.63
Arsenic	ng/m^3	6		1.54				1.28		1.48				1.29
Benzene	µg/m^3	5		1.70				1.58		1.82				1.54

ANNEXURE I

Name of Location			GGS- 02						GGS-04				PARULIA	
Date			Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	$\mu g/m^3$	60	44.67	34.88	20.05	22.07	25.42	19.63	42.76	36.19	22.10	20.72	39.51	37.92
PM 10	$\mu g/m^3$	100	85.01	77.50	64.32	76.39	80.69	60.23	81.09	74.24	65.42	62.54	79.90	71.35
Nitrogen Dioxide	$\mu g/m^3$	80	41.96	39.12	37.43	38.54	39.60	33.33	40.33	38.25	38.62	38.45	42.51	38.25
Sulphur Dioxide	$\mu g/m^3$	80	5.79	6.01	5.96	5.91	5.97	5.17	6.01	5.98	5.90	6.03	5.85	6.03
Carbon Monoxide	mg/m^3	2	0.53	0.48	0.43	0.44	0.42	0.38	0.52	0.49	0.44	0.71	0.52	0.49
Hydrocarbon	mg/m^3	NIL	1.94	1.74	1.64	1.66	1.79	1.35	2.02	1.72	1.55	1.50	1.86	1.74
Mercury	mg/m^3			< 0.002				< 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	$\mu g/m^3$			2.18				2.38		2.36				2.54
Benzo(a)Pyrene	ng/m^3	1		0.46				0.20		0.40				0.36
Ammonia	$\mu g/m^3$	400		26.34				23.71		26.34				25.84
Ozone	$\mu g/m^3$	180		40.18				34.26		40.26				34.98
Lead	$\mu g/m^3$	1		0.16				0.09		0.18				0.19
Nickel	ng/m^3	20		10.40				10.57		10.62				10.30
Arsenic	ng/m^3	6		1.36				1.02		1.46				1.36
Benzene	$\mu g/m^3$	5		1.72				1.24		1.68				1.58

ANNEXURE I

Name of Location			PARULIA				SARASWATIGUNJ						PRATPPUR	
Date			Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	24.14	22.46	23.23	22.96	46.46	34.24	24.24	18.08	20.96	23.10	50.83	33.75
PM 10	µg/m^3	100	72.43	72.52	80.02	69.98	90.70	76.59	67.98	57.97	72.33	71.01	87.37	69.75
Nitrogen Dioxide	µg/m^3	80	36.24	38.76	38.26	33.50	42.21	38.09	38.85	37.52	39.03	35.19	42.94	39.14
Sulphur Dioxide	µg/m^3	80	5.86	5.88	5.85	5.03	5.88	5.88	5.90	5.75	6.09	5.43	5.77	5.90
Carbon Monoxide	mg/m^3	2	0.44	0.44	0.42	0.39	0.52	0.49	0.42	0.40	0.41	0.46	0.53	0.48
Hydrocarbon	mg/m^3	NIL	1.62	1.64	1.81	1.44	1.98	1.84	1.58	1.56	1.73	1.54	1.84	1.62
Mercury	mg/m^3					< 0.002		< 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					2.59		2.38				2.67		2.32
Benzo(a)Pyrene	ng/m^3	1				0.21		0.46				0.24		0.24
Ammonia	µg/m^3	400				25.48		27.32				27.52		22.62
Ozone	µg/m^3	180				39.12		36.44				40.58		36.54
Lead	µg/m^3	1				0.11		0.20				0.11		0.14
Nickel	ng/m^3	20				11.94		14.60				12.97		10.60
Arsenic	ng/m^3	6				1.18		1.54				1.24		1.32
Benzene	µg/m^3	5				1.48		1.68				1.51		1.62

Name of Location			PRATPPUR				BANSIA						JAMGORA	
Date			Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	23.53	23.84	23.33	20.29	35.48	36.88	24.26	23.69	15.92	21.11	40.27	39.57
PM 10	µg/m^3	100	70.68	77.59	85.65	68.48	71.65	70.21	74.42	74.93	53.20	62.67	91.79	73.25
Nitrogen Dioxide	µg/m^3	80	37.97	38.87	38.09	34.42	43.38	39.98	40.47	39.81	35.95	32.85	44.67	39.37
Sulphur Dioxide	µg/m^3	80	5.79	5.90	5.78	5.27	5.54	5.65	6.04	6.00	5.77	5.01	6.36	5.93
Carbon Monoxide	mg/m^3	2	0.41	0.43	0.41	0.43	0.51	0.49	0.44	0.44	0.35	0.36	0.52	0.49
Hydrocarbon	mg/m^3	NIL	1.54	1.60	1.89	1.41	1.92	1.64	1.68	1.68	1.52	1.40	2.08	1.80
Mercury	mg/m^3					< 0.002		< 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					2.51		2.08				2.47		2.48
Benzo(a)Pyrene	ng/m^3	1				0.19		0.30				0.18		0.52
Ammonia	µg/m^3	400				24.66		26.44				25.03		25.88
Ozone	µg/m^3	180				38.75		34.62				36.39		36.48
Lead	µg/m^3	1				0.11		0.13				0.10		0.18
Nickel	ng/m^3	20				12.05		9.75				11.37		11.64
Arsenic	ng/m^3	6				1.13		1.28				1.09		1.42
Benzene	µg/m^3	5				1.43		1.44				1.33		1.64

ANNEXURE I

Name of Location			JAMGORA				KULDIHA						JATGORIA	
Date														
Parameter	UoM	NAAQS LIMIT	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
PM 2.5	µg/m^3	60	20.04	18.54	26.07	24.66	49.76	35.30	20.40	21.93	16.44	26.80	44.92	31.25
PM 10	µg/m^3	100	65.07	69.78	84.78	73.09	86.76	70.50	62.59	70.15	70.37	80.13	83.77	61.01
Nitrogen Dioxide	µg/m^3	80	39.81	37.97	37.36	35.61	39.92	39.68	38.44	38.62	39.46	35.16	42.81	35.16
Sulphur Dioxide	µg/m^3	80	5.96	5.89	5.83	5.42	6.08	5.90	5.91	5.85	6.20	5.51	5.93	5.75
Carbon Monoxide	mg/m^3	2	0.42	0.42	0.42	0.46	0.54	0.48	0.43	0.43	0.41	0.45	0.52	0.48
Hydrocarbon	mg/m^3	NIL	1.70	1.68	1.84	1.59	1.98	1.68	0.16	1.62	1.67	1.74	2.08	1.58
Mercury	mg/m^3					< 0.002		< 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					2.70		2.46				2.97		2.32
Benzo(a)Pyrene	ng/m^3	1				0.28		0.38				0.38		0.30
Ammonia	µg/m^3	400				27.75		26.32				29.25		20.58
Ozone	µg/m^3	180				41.16		38.64				41.63		32.44
Lead	µg/m^3	1				0.14		0.16				0.17		0.14
Nickel	ng/m^3	20				13.52		12.30				16.12		9.20
Arsenic	ng/m^3	6				1.31		1.44				1.46		1.32
Benzene	µg/m^3	5				1.56		1.72				1.69		1.52

Name of Location			JATGORIA				Gopalpur Warehouse						KANTABERIA	
Date			Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	$\mu g/m^3$	60	26.93	19.37	18.09	28.44	46.42	30.71	19.45	24.14	24.39	24.67	44.76	34.50
PM 10	$\mu g/m^3$	100	71.09	64.80	56.69	82.17	83.84	70.37	61.49	72.06	79.55	75.63	83.52	68.76
Nitrogen Dioxide	$\mu g/m^3$	80	37.52	36.93	35.62	33.05	39.32	38.74	38.19	38.44	38.57	35.47	43.02	39.63
Sulphur Dioxide	$\mu g/m^3$	80	5.76	5.89	5.50	5.42	6.19	6.04	5.78	5.88	6.19	5.65	6.05	5.90
Carbon Monoxide	mg/m^3	2	0.43	0.41	0.36	0.41	0.54	0.50	0.43	0.44	0.43	0.45	0.53	0.49
Hydrocarbon	mg/m^3	NIL	1.68	1.52	1.59	1.77	1.84	1.65	1.54	1.68	1.83	1.62	1.76	1.82
Mercury	mg/m^3					< 0.002		< 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	$\mu g/m^3$					3.04		2.44				2.84		2.56
Benzo(a)Pyrene	ng/m^3	1				0.41		0.38				0.30		0.42
Ammonia	$\mu g/m^3$	400				30.58		26.44				28.83		24.32
Ozone	$\mu g/m^3$	180				42.07		38.22				41.37		40.12
Lead	$\mu g/m^3$	1				0.19		0.20				0.14		0.18
Nickel	ng/m^3	20				16.88		11.32				14.43		12.40
Arsenic	ng/m^3	6				1.55		1.42				1.34		1.54
Benzene	$\mu g/m^3$	5				1.73		1.68				1.61		1.70

Name of Location			KANTABERIA				NACHAN						SARENGA	
Date			Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21	Jun'21	Jul'21	Aug'21	Sep'21	Apr'21	May'21
Parameter	UoM	NAAQS LIMIT												
PM 2.5	µg/m^3	60	23.01	21.89	21.49	25.11	44.42	38.48	22.23	22.06	18.66	23.56	42.63	30.32
PM 10	µg/m^3	100	66.87	75.78	77.46	79.21	80.44	65.88	68.14	73.47	56.93	73.75	78.32	63.07
Nitrogen Dioxide	µg/m^3	80	36.93	38.72	38.94	34.29	43.01	36.60	37.21	39.01	35.03	35.13	42.14	38.76
Sulphur Dioxide	µg/m^3	80	5.88	5.95	5.99	5.46	5.87	5.35	5.80	5.87	5.78	5.38	5.69	5.52
Carbon Monoxide	mg/m^3	2	0.42	0.44	0.43	0.43	0.53	0.46	0.42	0.43	0.37	0.42	0.52	0.49
Hydrocarbon	mg/m^3	NIL	1.74	1.70	1.76	1.71	1.78	1.58	1.58	1.64	1.58	1.57	1.76	1.62
Mercury	mg/m^3					< 0.002		< 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					2.81		2.18				2.72		2.26
Benzo(a)Pyrene	ng/m^3	1				0.32		0.28				0.29		0.32
Ammonia	µg/m^3	400				29.04		24.38				27.88		23.47
Ozone	µg/m^3	180				41.93		36.48				40.52		34.58
Lead	µg/m^3	1				0.16		0.14				0.15		0.12
Nickel	ng/m^3	20				15.29		9.84				14.19		9.00
Arsenic	ng/m^3	6				1.38		1.36				1.33		1.32
Benzene	µg/m^3	5				1.66		1.58				1.59		1.48

ANNEXURE I

Name of Location			SARENGA			
Date			Jun'21	Jul'21	Aug'21	Sep'21
Parameter	UoM	NAAQS LIMIT				
PM 2.5	µg/m^3	60	20.66	22.58	22.89	18.11
PM 10	µg/m^3	100	65.68	70.16	71.14	60.96
Nitrogen Dioxide	µg/m^3	80	37.43	38.92	38.85	32.94
Sulphur Dioxide	µg/m^3	80	5.75	6.06	6.03	5.11
Carbon Monoxide	mg/m^3	2	0.43	0.43	0.42	0.38
Hydrocarbon	mg/m^3	NIL	1.58	1.62	1.63	1.38
Mercury	mg/m^3					< 0.002
Hydrocarbon as Non Methane	mg/m^3	NIL	< 0.003	< 0.003	< 0.003	< 0.003
VOC's	µg/m^3					2.41
Benzo(a)Pyrene	ng/m^3	1				0.16
Ammonia	µg/m^3	400				24.02
Ozone	µg/m^3	180				35.23
Lead	µg/m^3	1				0.08
Nickel	ng/m^3	20				10.14
Arsenic	ng/m^3	6				1.05
Benzene	µg/m^3	5				1.27

ANNEXURE II

Ambient Noise Monitoring Result				
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)
Jatgoria Village	75	69.34	70	66.77
Saraswatigunj Village	75	61.43	70	61.73
Kantaberia Village	75	61.67	70	55.88
Jamgora Village	75	65.69	70	59.84
Kuldiha Village	75	62.51	70	63.43
Pratappur Village	75	68.04	70	67.3
Bansia Village	75	58.44	70	60.53
Parulia Village	75	51.29	70	48.84
Nachan Village	75	67.98	70	68.91
Sarenga Village	75	57.81	70	53.98
Akandara Village (GGS2)	75	70.94	70	68.49
Khatgoria Village (GGS 001)	75	70.92	70	61.42
Gopalpur Warehouse	75	72.71	70	69.22
Malandighi (MCS)	75	71.24	70	67.86
Khatgoria Village (EDD 009)	75	56.71	70	53.98

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited
(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH					Apr'21								Apr'21				
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDD-053-D3	EDD-049-D3	EDD-017-D7	EDD-405-D5	EDD-405-D2	EDD-015-D4	EDD-012-D1	EDD-022-D1	EDE-018-D1	EDH-058-D1	EDH-064-D3	EDH-044-D1	EDC-409-D3
1	pH		5.5 to 9.0	5.5-9.0	6.76	7.40	7.35	7.62	7.35	7.26	7.73	7.80	6.45	6.85	6.60	6.59	6.95
2	Temperature			40 deg	39.2°C	43.3°C	41.3°C	43.1°C	40.1°C	45.2°C	42.0°C	40.3°C	39.7°C	37.5°C	37.0°C	36.2°C	38.1°C
3	Total Suspended Solids	mg/l	100	100	2	11	4	4	<2	<2	<2	<2	<2	7	<2	<2	11
4	Total Dissolved Solids	mg/l	---	2100	2330	1596	2048	1204	972	2082	2148	1388	1586	3432	3168	908	1282
5	Chloride	mg/l	---	600	962	603	713	464	368	876	842	421	507	1359	1292	340	474
6	Total Hardness	mg/l	---	1000	23.00	30.70	23.00	26.90	30.70	30.70	30.7	15.30	26.90	42.20	34.50	34.50	23.50
7	Sulphate	mg/l	---	1000	6.3	5.0	5.9	4.7	3.5	5.1	6.5	4.2	5.0	7.2	6.6	4.8	4.6
8	Calcium	mg/l		100	6.1	7.7	4.6	6.1	7.7	6.1	7.7	3.1	6.1	10.8	7.7	7.7	6.3
9	Magnesium	mg/l	---	10	1.9	2.8	2.8	2.8	2.7	3.7	2.7	1.9	2.8	3.7	3.7	3.7	1.9
10	Dissolved Oxygen	mg/l		1.2	4.5	3.9	5.1	4.3	5.7	4.8	4	5.5	4.6	3.5	4.1	5.9	4.7
11	BOD, 3 Days at 27ºC	mg/l	30	30	<2	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	9.0	8.0	<8	<8	<8	<8	<8	<8	8.0	<8	<8	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	1.7	1.15	1.35	0.95	0.81	1.60	1.55	0.95	1.2	2.5	2.1	0.65	1.2
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.022	0.017	0.026	0.240	0.190	0.360	0.026	0.013	0.017	0.015	0.026	<0.01	0.025
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<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	<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	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			549.00	317.00	519.00	220.00	238.00	421	622.00	433.00	281.00	373.00	363.00	128.00	433.10
24	Sodium	mg/l	---		1050.0	795.0	910.0	590.0	445.0	950	940.0	555.0	675.0	1655.0	1590.0	470.0	520.0
25	Cyanide	mg/l	0.2	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Aluminium	mg/l	---														<0.01
28	Lithium	mg/l															<0.1
29	Molybdenum	mg/l	---														<0.05
30	Palladium	mg/l	---														<0.5
31	Selenium	mg/l															<0.005
32	Vanadium	mg/l	---														<0.1
33	Cadmium	mg/l															<0.02
34	Cobalt	mg/l															<0.1

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited
(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH					Jun'21			Jun'21									
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDG-077-D5	EDN-184-D2	EDN-162-D7	EDI-041-D2	EDI-115-v1	EDE-43-V1	EDE-005-D2	EDD-003-D3	EDD-401-D1	EDD-010-V1	EDD-052-D2	EDC-411-D1	EDD-407-D1
1	pH		5.5 to 9.0	5.5-9.0	6.88	6.80	6.65	6.75	6.85	6.55	6.64	6.52	6.59	6.65	6.70	7.08	6.95
2	Temperature			40 deg	37.9°C	38.2°C	38.7°C	36.8°C	34.8°C	35.6°C	35.5°C	36.9°C	37.4°C	33.2°C	35.9°C	36.8°C	34.5°C
3	Total Suspended Solids	mg/l	100	100	<2	5	62	21	7	4	<2	<2	2	<2	6	<2	<2
4	Total Dissolved Solids	mg/l	---	2100	1676	862	4256	3420	1436	1124	1798	1810	998	1392	2688	1162	952
5	Chloride	mg/l	---	600	646	306	1627	1240	526	388	742	689	402	426	1192	431	345
6	Total Hardness	mg/l	---	1000	39.20	54.90	529.20	219.50	47.00	35.3	43.10	35.30	23.50	27.40	50.90	20.00	27.00
7	Sulphate	mg/l	---	1000	3.9	5.3	6.0	5.5	6.9	4.9	5.8	4.5	3.0	3.5	5.1	5.8	4.7
8	Calcium	mg/l		100	9.4	12.6	131.9	53.4	11	7.8	11	7.8	6.3	6.3	12.6	4.7	6.3
9	Magnesium	mg/l	---	10	3.8	5.7	48.6	20.9	4.7	3.8	3.8	3.8	1.9	2.8	4.7	1.9	2.8
10	Dissolved Oxygen	mg/l		1.2	5.3	4.9	4.0	3.7	4.5	4.3	5.0	4.0	4.7	5.5	4.1	4.6	4.3
11	BOD, 3 Days at 27ºC	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<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	<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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	0.95	1.75	3.1	2.65	1.58	1.25	2.7	1.95	1.15	1.35	2.2	1.45	1.06
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.013	0.017	0.033	0.025	0.019	0.013	0.024	0.018	0.011	0.021	0.030	0.014	0.019
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<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	<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	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			475.80	256.20	1073.00	1152.90	341.6	359.90	372.10	427.00	219.60	390.40	402.60	476.00	390.00
24	Sodium	mg/l	---		710.0	286.0	1965.0	1420.0	480	440.0	825.0	665.0	380.0	505.0	1260.0	385.0	342.0
25	Cyanide	mg/l	0.2	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
26	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
27	Aluminium	mg/l	---		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
28	Lithium	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
29	Molybdenum	mg/l	---		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
30	Palladium	mg/l	---		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
31	Selenium	mg/l			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
32	Vanadium	mg/l	---		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
33	Cadmium	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		
34	Cobalt	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited
(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH					Jul'21						Jul'21				Aug'21		
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN-162-D6	EDI-042-D4	EDI-036-D2	EDI-032-D1	EDD-023-D1	EDD-022-D3	EDD-003-D2	EDD-405-D2	EDG-015-D4	EDG-075-D1	EDD-026 D1	EDC-072-V	EDD-052-D4
1	pH		5.5 to 9.0	5.5-9.0	6.60	6.70	6.55	6.80	7.35	7.10	6.85	6.80	6.95	6.47	7.88	8.30	8.04
2	Temperature			40 deg	33.2°C	31.9°C	29.2°C	32.4°C	35.4°C	32.9°C	36.2°C	36.8°C	38.6°C	36.4°C	38.1°C	37.9°C	38.7°C
3	Total Suspended Solids	mg/l	100	100	788	2	102	14	2	2	2	<2	2	<2	8	21	4
4	Total Dissolved Solids	mg/l	---	2100	4426	4888	6680	3884	1642	1438	1510	1824	1086	1564	1426	2446	2838
5	Chloride	mg/l	---	600	1795	2495	2895	1608	665	589	627	713	431	641	458	908	1030
6	Total Hardness	mg/l	---	1000	715.00	270.00	304.00	94.00	24	20.00	16.00	24.00	24.00	20.00	59.00	110.00	43.00
7	Sulphate	mg/l	---	1000	8.0	9.2	6.3	7.4	4.5	5.3	4.0	6.2	5.7	7.1	6.0	7.5	5.8
8	Calcium	mg/l		100	181.6	67.5	74.6	23.6	4.7	4.7	3.1	4.7	4.7	4.7	14.0	27.0	9
9	Magnesium	mg/l	---	10	64.2	24.7	28.5	8.5	2.8	1.9	1.9	2.8	2.8	1.9	6	10	5.0
10	Dissolved Oxygen	mg/l		1.2	2.8	3.3	2.9	4.2	4.5	5.0	4.8	4.9	5.0	5.3	3.7	3.2	4.3
11	BOD, 3 Days at 27ºC	mg/l	30	30	3	<2	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	12.0	8.0	10.0	<8	<8	<8	<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	<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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	3.49	2.4	0.85	1.95	0.95	0.6	1.15	0.085	0.61	1.28	1.65	2.7	2.7
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.033	0.013	0.024	0.011	0.021	0.017	0.025	0.015	0.011	0.018	0.015	0.023	0.017
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<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	<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	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			994.00	1147.00	1769.00	1196	518.00	403.00	360.00	622.00	250.00	415.00	<0.01	<0.01	<0.01
24	Sodium	mg/l	---		1570.0	1975.0	2740.0	1570	692.0	610.0	645.0	770.0	410.0	680.0	<0.1	<0.1	<0.1
25	Cyanide	mg/l	0.2	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05
26	Hexavalent Chromium	mg/l	0.1		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.5	<0.5	<0.5
27	Aluminium	mg/l	---												<0.005	<0.005	<0.005
28	Lithium	mg/l													<0.1	<0.1	<0.1
29	Molybdenum	mg/l	---												<0.02	<0.02	<0.02
30	Palladium	mg/l	---												<0.1	<0.1	<0.1
31	Selenium	mg/l													403.00	634.00	647.00
32	Vanadium	mg/l	---												570.0	1080.0	1340.0
33	Cadmium	mg/l													<0.02	<0.02	<0.02
34	Cobalt	mg/l													<0.01	<0.01	<0.01

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited
(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH						Aug'21								Sep'21	Sep			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDD-049	EDD-017-D4	EDD-017-D7	EDD-015-D1	EDD-023-D2	EDN-162 D4	EDI-042-V	EDI-042-V1	EDD-008-D2	EDD-008	EDD-012-D3	EDD-015-D1	EDD-015-D3
1	pH		5.5 to 9.0	5.5-9.0	8.84	7.14	8.25	7.31	8.08	6.56	7.70	6.58	6.90	7.35	6.70	6.60	6.53
2	Temperature			40 deg	36.8°C	34.8°C	35.6°C	35.5°C	36.9°C	32.6°C	29.9°C	32.4°C	29.1°C	29.9°C	29.7°C	28.4°C	29.4°C
3	Total Suspended Solids	mg/l	100	100	20	508	98	234	28	92	5	6332	2028	<2	36	61	6
4	Total Dissolved Solids	mg/l	---	2100	1936	4056	2992	4408	2066	7464	5672	6332	2028	1906	5876	3392	2796
5	Chloride	mg/l	---	600	780	1497	1130	1783	812	3045	2042	2618	830	775	2242	1407	1171
6	Total Hardness	mg/l	---	1000	70.00	1088.00	204	913.00	98.00	909	345	392	20	23.00	1627.00	157	20.00
7	Sulphate	mg/l	---	1000	3.5	6.9	5.5	8.0	4.9	8.00	10.00	7	4.00	6.0	8.0	5	4.0
8	Calcium	mg/l		100	16	283	50	240	23	237.0	82.0	97	5.0	6	416	38	5
9	Magnesium	mg/l	---	10	8.0	93.0	19	76.0	9.0	77.0	34.0	36	2	2.0	143.0	15	2.0
10	Dissolved Oxygen	mg/l		1.2	3.9	2.8	3.3	2.9	4.0	4.7	5.9	4.9	5.7	4.5	3.7	4	5.1
11	BOD, 3 Days at 27ºC	mg/l	30	30	<2	3	3	5	<2	3	<2	2	<2	<2	3	<2	<2
12	COD	mg/l	250	100	<8	18.0	15.0	20.0	8.0	9.0	<8	8.0	<8	<8	12.0	8.0	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
15	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	1.25	3.30	2.9	3.15	1.05	3.15	2.6	1.2	1.35	1.3	2.60	0.9	1.1
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.012	0.027	0.024	0.031	0.019	0.021	0.033	0.012	0.015	0.017	0.029	0.011	0.018
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<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	<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	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**	<0.01	<0.01	<0.01	<0.01	<0.01
24	Sodium	mg/l	---		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**	<0.1	<0.1	<0.1	<0.1	<0.1
25	Cyanide	mg/l	0.2	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**	<0.05	<0.05	<0.05	<0.05	<0.05
26	Hexavalent Chromium	mg/l	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**	<0.5	<0.5	<0.5	<0.5	<0.5
27	Aluminium	mg/l	---		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**	<0.005	<0.005	<0.005	<0.005	<0.005
28	Lithium	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**	<0.1	<0.1	<0.1	<0.1	<0.1
29	Molybdenum	mg/l	---		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**	<0.02	<0.02	<0.02	<0.02	<0.02
30	Palladium	mg/l	---		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**	<0.1	<0.1	<0.1	<0.1	<0.1
31	Selenium	mg/l			397.00	988	915.00	1147.00	561.00	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Vanadium	mg/l	---		910.0	1630	1250.0	1910.0	890.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
33	Cadmium	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
34	Cobalt	mg/l			<0.01	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Produced Water Analysis Report of CBM Raniganj Project of Essar Oil and Gas Exploration and Production Limited
(Compliance Period: Apr'21 -Sep'21)

ANNEXURE III

MONTH					Sep'21			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDD-049-D2	EDC-409-D4	EDD-054-D4	EDD-052-D4
1	pH		5.5 to 9.0	5.5-9.0	6.81	6.70	7.11	6.75
2	Temperature			40 deg	28.9°C	30.9°C	28.4°C	27.8°C
3	Total Suspended Solids	mg/l	100	100	41	26	5	37
4	Total Dissolved Solids	mg/l	---	2100	3608	3276	2362	2768
5	Chloride	mg/l	---	600	1511	1271	935	1039
6	Total Hardness	mg/l	---	1000	145.00	329.00	31.00	102.00
7	Sulphate	mg/l	---	1000	7.0	6.0	4.0	6.0
8	Calcium	mg/l		100	34	82	8	23
9	Magnesium	mg/l	---	10	14.0	30.0	3.0	10.0
10	Dissolved Oxygen	mg/l		1.2	4.3	4.9	5.3	4.9
11	BOD, 3 Days at 27ºC	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	Sulphide	mg/l	2	2	<0.5	<0.5	<0.5	<0.5
16	Fluoride	mg/l	2	1.5	0.87	1.45	0.63	1.85
17	Total Chromium	mg/l	2	0.1	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	0.1	0.010	0.015	0.023	0.019
19	Copper	mg/l	---	0.2	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l		3	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l		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
23	Bicarbonate	mg/l			<0.01	<0.01	<0.01	<0.01
24	Sodium	mg/l	---		<0.1	<0.1	<0.1	<0.1
25	Cyanide	mg/l	0.2	0.2	<0.05	<0.05	<0.05	<0.05
26	Hexavalent Chromium	mg/l	0.1		<0.5	<0.5	<0.5	<0.5
27	Aluminium	mg/l	---		<0.005	<0.005	<0.005	<0.005
28	Lithium	mg/l			<0.1	<0.1	<0.1	<0.1
29	Molybdenum	mg/l	---		<0.02	<0.02	<0.02	<0.02
30	Palladium	mg/l	---		<0.1	<0.1	<0.1	<0.1
31	Selenium	mg/l			<0.01	<0.01	<0.01	<0.01
32	Vanadium	mg/l	---		<0.1	<0.1	<0.1	<0.1
33	Cadmium	mg/l			<0.05	<0.05	<0.05	<0.05
34	Cobalt	mg/l			<0.5	<0.5	<0.5	<0.5

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Apr'21 to Sep'21)

ANNEXURE IV

Date					Apr'21							Apr'21			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	GGS-01 RO			EDD-50 RO			EDH-64 RO			EDN-99 RO	
					Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet
1	pH		5.5 to 9.0	5.5-9.0	6.70	6.97	7.11	6.92	7.05	7.40	7.31	6.84	6.79	6.49	6.88
2	Temperature	deg C			34.3°C	33.2°C	34.1°C	34.7°C	36.7°C	35.5°C	33.2°C	36.9°C	32.6°C	32.9°C	32.9°C
3	Total Suspended Solids	mg/l	100	100	3	<2	4	5	<2	16	4	<2	4	<2	<2
4	Total Dissolved Solids	mg/l	---	2100	1612	862	3346	2342	742	3316	4688	588	7848	5396	1406
5	Chlorides	mg/l	---	600	640	310	1140	890	248	1310	1845	195	2610	2180	505
6	Total Hardness	mg/l	---	---	34.6	23.0	53.8	57.6	46.1	69.1	165.1	38.4	349.4	422.4	61.4
7	Sulphates	mg/l	---	1000	4.9	<2.5	5.3	4.5	<2.5	6.1	7.3	3.6	8.2	5.2	3.2
8	Calcium	mg/l			7.7	4.6	13.8	13.8	10.8	16.9	41.5	9.2	89.2	109.3	24.6
9	Magnesium	mg/l	---	---	3.7	2.8	4.7	5.6	4.7	6.5	14.9	3.70	30.8	36.4	10.2
10	Dissolved Oxygen	mg/l			4.6	5.3	4.0	3.9	5.1	3.1	4.2	5.80	3.7	3.7	4.9
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	10.0	<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	<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	<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	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	1.8	0.45	1.63	1.3	0.51	1.45	2.65	0.72	3.1	2.58	0.81
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.220	0.012	0.025	0.017	<0.01	0.014	0.029	0.011	0.033	0.016	0.015
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<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	<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	<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	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			409.0	246.0	745.0	421.0	181.0	927.0	866.0	148.0	1110.0	1232.0	299.0
24	Sodium	mg/l	---	---	710.0	462.0	1370.0	1145.0	360.0	1450.0	2316.0	280.0	3145.0	2410.0	670.0
25	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
27	Aluminum	mg/l	---	---											
28	Lithium	mg/l													
29	Molybednum	mg/l	---	---											
30	Palladium	mg/l	---	---											
31	Selenium	mg/l													
32	Vanadium	mg/l	---	---											
33	Cadmium	mg/l													
34	Cobalt	mg/l													

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Apr'21 to Sep'21)

ANNEXURE IV

Date					Apr'21	Jun'21									
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards		GGS-01 RO			EDD-50 RO			EDH-64 RO			
					Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet
1	pH		5.5 to 9.0	5.5-9.0	6.96	6.93	6.81	6.80	7.65	7.26	6.95	6.98	6.65	6.58	6.89
2	Temperature	deg C			34.2°C	34°C	34.6°C	33.8°C	34.2°C	35.4°C	31.9°C	29.3°C	28.1°C	30°C	32.3°C
3	Total Suspended Solids	mg/l	100	100	<2	<2	<2	<2	<2	<2	2	<2	<2	<2	<2
4	Total Dissolved Solids	mg/l	---	2100	7252	1784	860	3728	2684	582	4164	4592	920	8358	4892
5	Chlorides	mg/l	---	600	2482	595	315	1485	1120	209	1560	1350	295	3046	1970
6	Total Hardness	mg/l	---	---	326.4	43.2	50.9	86.2	62.7	23.5	66.6	156.8	39.2	270.0	243.0
7	Sulphates	mg/l	---	1000	6.0	5.8	<2.5	6.3	7.2	<2.5	6.8	4.9	<2.5	7.9	8.3
8	Calcium	mg/l			130.8	11	12.6	20.4	14.1	6.3	15.7	39.3	9.4	69	53.4
9	Magnesium	mg/l	---	---	48.8	3.8	4.70	8.6	6.7	1.9	6.7	14.3	3.8	23.8	26.7
10	Dissolved Oxygen	mg/l			3.5	4.8	5.90	3.7	4.1	5.2	4.0	3.9	5.5	3.9	3.3
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<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	<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	<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	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	3.25	1.85	0.51	2.15	2.6	0.70	2.18	3.1	0.86	3.55	1.65
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.021	0.016	<0.01	0.024	0.020	0.013	0.029	0.025	<0.01	0.028	0.033
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<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	<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	<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	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			1196.0	680.0	158.6	795.4	353.8	170.8	427.0	1195.6	231.8	2257.0	866.2
24	Sodium	mg/l	---	---	3980.0	630.0	370.0	1710.0	1340.0	221.0	1435.0	1482.0	280.0	3870.0	2345.0
25	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
27	Aluminum	mg/l	---	---		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
28	Lithium	mg/l				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
29	Molybednum	mg/l	---	---		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
30	Palladium	mg/l	---	---		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
31	Selenium	mg/l				<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
32	Vanadium	mg/l	---	---		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
33	Cadmium	mg/l				<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
34	Cobalt	mg/l				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Apr'21 to Sep'21)

ANNEXURE IV

Date					Jun'21		Jul'21				Jul'21				
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN-99 RO		GGS-01 RO			EDD-50 RO			EDH-64 RO		
					Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject
1	pH		5.5 to 9.0	5.5-9.0	6.90	7.12	6.94	7.05	6.81	6.86	6.95	7.10	6.78	6.81	7.15
2	Temperature	deg C			29.8°C	31.7°C	28.9°C	28.6°C	28.3°C	27.5°C	28.1°C	27.7°C	27.6°C	27.4°C	27.8°C
3	Total Suspended Solids	mg/l	100	100	<2	<2	<2	<2	<2	4	<2	4	6	<2	31
4	Total Dissolved Solids	mg/l	---	2100	1178	5832	1726	908	2884	2640	720	3876	3066	668	4846
5	Chlorides	mg/l	---	600	430	2165	686	345	1160	1070	280	1540	1250	210	1980
6	Total Hardness	mg/l	---	---	105.8	419.4	27.0	20.0	39.0	51.0	16.0	110.0	122.0	20.0	157.0
7	Sulphates	mg/l	---	1000	4.1	8.9	6.0	3.0	6.9	4.9	3.0	5.6	6.9	3.5	8.5
8	Calcium	mg/l			25.1	106.8	6.3	4.7	11	12.6	3.1	26.7	29.8	4.7	44
9	Magnesium	mg/l	---	---	10.5	37.1	2.8	1.90	2.8	4.7	1.9	10.4	11.4	1.9	11.4
10	Dissolved Oxygen	mg/l			5.1	4.3	4.9	5.50	3.8	4.1	6.0	3.5	4.5	5.0	3.8
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<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	<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	<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	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	0.86	1.90	1.20	0.69	1.75	0.92	0.43	1.1	1.35	1.1	1.7
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.018	0.027	0.017	0.012	0.023	0.016	<0.01	0.021	0.018	0.013	0.024
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<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	<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	<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	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			268.4	988.2	549.0	238.0	9.3	793.0	214.0	1232.0	988.0	207.0	1183.0
24	Sodium	mg/l	---	---	465.0	2680.0	720.0	405.0	1220.0	1140.0	305.0	1680.0	1180.0	260.0	2075.0
25	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
27	Aluminum	mg/l	---	---	<0.01	<0.01									
28	Lithium	mg/l			<0.1	<0.1									
29	Molybednum	mg/l	---	---	<0.05	<0.05									
30	Palladium	mg/l	---	---	<0.5	<0.5									
31	Selenium	mg/l			<0.005	<0.005									
32	Vanadium	mg/l	---	---	<0.1	<0.1									
33	Cadmium	mg/l			<0.02	<0.02									
34	Cobalt	mg/l			<0.1	<0.1									

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Apr'21 to Sep'21)

ANNEXURE IV

Date					Jul'21			Aug'21							
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN-99 RO			GGS-01 RO			EDD-50 RO			EDH-64 RO	
					Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet
1	pH		5.5 to 9.0	5.5-9.0	6.58	6.70	6.86	7.12	7.90	6.95	7.45	7.80	7.30	7.64	7.70
2	Temperature	deg C			29.6°C	28.1°C	29.1°C	33.8°C	32.9°C	32.4°C	29.8C	30.5°C	29.3°C	33.8°C	35.7°C
3	Total Suspended Solids	mg/l	100	100	<2	<2	2	4	2	7	5	<2	7	8	2
4	Total Dissolved Solids	mg/l	---	2100	3688	1182	4208	2538	1246	3680	2692	1046	4604	5996	1050
5	Chlorides	mg/l	---	600	1450	508	1780	1040	490	1280	1048	402	1910	2577	380
6	Total Hardness	mg/l	---	---	318.0	94.0	392.0	27.0	16.0	35.0	51.0	23.0	63.0	161.0	39.0
7	Sulphates	mg/l	---	1000	9.5	4.8	10.3	4.7	3.0	6.0	4.2	<2.5	5.3	4.3	<2.5
8	Calcium	mg/l			81.7	23.4	106.8	6.0	3.0	8.0	12.0	5.0	14	36	9
9	Magnesium	mg/l	---	---	27.6	8.5	30.4	3.0	2.0	4.0	5.0	3.0	7.0	17.0	4.0
10	Dissolved Oxygen	mg/l			4.0	5.2	3.9	3.9	5.0	3.3	5.5	6.0	5.1	4.0	5.5
11	BOD	mg/l	30	30	<2	<2	<2	<2	<2	<2	<2	<2	<2	5	<2
12	COD	mg/l	250	100	<8	<8	<8	<8	<8	<8	<8	<8	<8	24.0	<8
13	Oil & Grease	mg/l	10	10	<5.0	<5.0	<5.0	<5.0	<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	<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	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	1.65	0.9	1.80	1.85	0.75	2.95	1.35	0.75	2.3	4.35	1.40
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.024	0.015	0.031	0.019	0.012	0.025	0.026	0.015	0.040	0.026	0.011
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<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	<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	<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	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			769.0	317.0	885.0	769.0	256.0	1366.0	769.0	220.0	1025.0	1192.0	305.0
24	Sodium	mg/l	---	---	1530.0	495.0	1830.0	1190.0	580.0	1540.0	1220.0	510.0	2130.0	2760.0	470.0
25	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
27	Aluminum	mg/l	---	---											
28	Lithium	mg/l													
29	Molybednum	mg/l	---	---											
30	Palladium	mg/l	---	---											
31	Selenium	mg/l													
32	Vanadium	mg/l	---	---											
33	Cadmium	mg/l													
34	Cobalt	mg/l													

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Apr'21 to Sep'21)

ANNEXURE IV

Date					Aug'21				Sep'21						
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards		EDN-99 RO			GGS-01 RO			EDD-50 RO			
					Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet	Outlet	Reject	Inlet
1	pH		5.5 to 9.0	5.5-9.0	8.01	7.25	7.10	7.30	7.20	6.81	6.98	7.25	7.65	6.95	7.08
2	Temperature	deg C			33.5°C	34.2°C	33.5°C	34.2°C	30.4°C	29.71°C	32.1°C	33.3°C	32.8°C	32.2°C	33.3°C
3	Total Suspended Solids	mg/l	100	100	4	9	<2	4	2	<2	3	7	<2	38	4
4	Total Dissolved Solids	mg/l	---	2100	8552	4158	1188	4582	1910	752	2430	1876	698	2592	4422
5	Chlorides	mg/l	---	600	3748	1663	460	1810	770	295	830	740	265	1090	1845
6	Total Hardness	mg/l	---	---	247.0	357.0	55.0	427.0	31.0	31.0	39.0	43.0	20.0	47.0	176.0
7	Sulphates	mg/l	---	1000	4.5	4.8	<2.5	5.5	5.0	3.0	7.0	6.0	3.0	7.0	8.0
8	Calcium	mg/l			50	85	14	105	8.0	8.0	9	9	5	12	44
9	Magnesium	mg/l	---	---	29.0	35.0	5.0	40.0	3.0	3.0	4.0	5.0	2.0	4.0	16.0
10	Dissolved Oxygen	mg/l			3.9	4.1	5.20	4.0	5.0	5.9	4.7	5.5	5.0	4.1	4.8
11	BOD	mg/l	30	30	5	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
12	COD	mg/l	250	100	20.0	<8	<8	<8	<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	<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	<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	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	5.15	2.45	1.3	2.8	1.55	1.45	1.9	0.95	0.55	1.1	2.06
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	0.035	0.019	0.012	0.023	0.013	0.016	0.018	0.019	0.018	0.023	0.010
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<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	<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	<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	<0.001	<0.001	<0.001	<0.001
23	Bicarbonate	mg/l			1818.0	915.0	281.0	1000.0	409	177	647	397	189	476	866
24	Sodium	mg/l	---	---	3805.0	1845.0	520.0	1960.0	902	330	920	850	310	1225	2060
25	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
26	Cyanide	mg/l	0.2		<0.02	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Aluminum	mg/l	---	---					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
28	Lithium	mg/l							<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
29	Molybednum	mg/l	---	---					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
30	Palladium	mg/l	---	---					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
31	Selenium	mg/l							<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
32	Vanadium	mg/l	---	---					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
33	Cadmium	mg/l							<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
34	Cobalt	mg/l							<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

R.O. water analysis report of CBM Raniganj Project of EOGEPL
(Compliance period: Apr'21 to Sep'21)

ANNEXURE IV

Date					Sep'21				
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH-64 RO		EDN-99 RO		
					Outlet	Reject	Inlet	Outlet	Reject
1	pH		5.5 to 9.0	5.5-9.0	7.78	6.90	6.75	6.75	6.90
2	Temperature	deg C			37.0°C	33.3°C	32.4°C	32.9°C	33.8°C
3	Total Suspended Solids	mg/l	100	100	<2	6	48	<2	4
4	Total Dissolved Solids	mg/l	---	2100	1080	6292	4736	1610	5262
5	Chlorides	mg/l	---	600	405	2770	1940	580	2145
6	Total Hardness	mg/l	---	---	31.0	235.0	537.0	216.0	666.0
7	Sulphates	mg/l	---	1000	5.0	10.0	9.0	6.0	8.0
8	Calcium	mg/l			8	56	137.0	55.0	173.0
9	Magnesium	mg/l	---	---	3.0	23.0	48.0	19.0	57.0
10	Dissolved Oxygen	mg/l			5.60	4.0	4.0	5.0	3.7
11	BOD	mg/l	30	30	<2	<2	<2	<2	2
12	COD	mg/l	250	100	<8	8.0	<8	<8	9.0
13	Oil & Grease	mg/l	10	10	<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
15	Sulphides	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5
16	Fluorides	mg/l	2	1.5	0.73	2.6	3.12	1.25	3.60
17	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05
18	Zinc	mg/l	---	---	<0.01	0.012	0.024	0.020	0.031
19	Copper	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05
20	Nickel	mg/l			<0.05	<0.05	<0.05	<0.05	<0.05
21	Lead	mg/l			<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
23	Bicarbonate	mg/l			275	817	915	519	988
24	Sodium	mg/l	---	---	510	3010	2145	670	2410
25	Hexavalent Chromium	mg/l	0.1		<0.02	<0.02	<0.02	<0.02	<0.02
26	Cyanide	mg/l	0.2		<0.01	<0.01	<0.01	<0.01	<0.01
27	Aluminum	mg/l	---	---	<0.01	<0.01	<0.01	<0.01	<0.01
28	Lithium	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1
29	Molybednum	mg/l	---	---	<0.05	<0.05	<0.05	<0.05	<0.05
30	Palladium	mg/l	---	---	<0.5	<0.5	<0.5	<0.5	<0.5
31	Selenium	mg/l			<0.005	<0.005	<0.005	<0.005	<0.005
32	Vanadium	mg/l	---	---	<0.1	<0.1	<0.1	<0.1	<0.1
33	Cadmium	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02
34	Cobalt	mg/l			<0.1	<0.1	<0.1	<0.1	<0.1

Date					Apr'21					
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH-064(R.O Discharge)	EDD-50 (R.O-Discharge)	Kunur Nala Downstream between EDH 58 & 64	GGS-1(R.O Discharge)	Kunur Nala Upstream Near GGS-1	Kunur Nala Downstream Near Kuldiha Bridge
1	pH at 27 C		5.5 to 9.0	5.5-9.0	6.95	7.11	6.8	6.97	6.95	6.7
2	Temperature	Deg C	---	40 deg C	33.5°C	35.3°C	32.6°C	33.9°C	33.6°C	33.6°C
3	Total Suspended Solids	mg/l	100	100	<2	2	13	<2	3	4
4	Total Dissolved Solids	mg/l	---	2100	568	810	1746	1322	582	634
5	Acidity as CaCO3	mg/l	---		31	26	29	31	31	29
6	Total Alkalinity as CaCO3	mg/l	---		80	105	310	295	120	95
7	Total Hardness	mg/l	---		19.2	96	46.1	34.5	88.3	142.1
8	Calcium	mg/l	---		4.6	23.1	10.8	7.7	21.5	35.4
9	Magnesium	mg/l	---		1.9	9.3	4.7	3.7	8.4	13.1
10	Biochemical Oxygen Demand	mg/l	30	30	<2	<2	<2	<2	<2	<2
11	Chemical Oxygen Demand	mg/l	250	100	<8	<8	<8	<8	<8	<8
12	Oil & Grease	mg/l	10	10	<5	<5	<5	<5	<5	<5
13	Phenolic Compounds (as C6H5OH)	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
14	Sulphides (as S2) in mg/l	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
15	Fluoride	mg/l	2	1.5	0.65	1.02	1.13	2.04	1.2	0.86
16	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
17	Zinc	mg/l	5	2	<0.01	0.013	0.019	0.022	<0.01	<0.01
18	Copper	mg/l	3	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Nickel	mg/l	3	3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Lead	mg/l	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Cyanide	mg/l	---	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Nitrate Nitrogen(as N),mg/L		0.5		0.58	3.2	1.4	3.15	0.71	2.85
25	Vanadium	mg/l	0.2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Date					Apr'21					
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH-064(R.O Discharge)	EDD-50 (R.O-Discharge)	Kunur Nala Downstream between EDH 58 & 64	GGS-1(R.O Discharge)	Kunur Nala Upstream Near GGS-1	Kunur Nala Downstream Near Kuldiha Bridge
26	Iron		3		0.42	0.60	4.15	0.35	0.8	1.05
27	Manganese	mg/l	2		<0.05	<0.05	<0.05	<0.05	<0.05	0.08
28	Dissolved Phosphate	mg/l	5		0.11	0.16	0.21	0.19	0.1	0.17
29	Selenium		0.05		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
30	Cadmium	mg/l	2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
31	Arsenic	mg/l	0.2		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Free Amonia	mg/l	5		0.02	0.03	0.04	0.04	0.04	0.03
33	Ammonical Nitrogen	mg/l	50		2.8	3.1	4	3.8	2.9	2.5
34	Total residual chlorine	mg/l	1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
35	colour	Hazen Units	Colourless		<5	<5	<5	<5	<5	<5
36	Odor		Odourless		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

Date					Apr'21	Jun'21				
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN-99 (R.O-Discharge)	Kunur Nala Upstream Near GGS-1	GGS-1(R.O Discharge)	EDD-50 (R.O-Discharge)	Kunur Nala Downstream between EDH 58 & 64	Kunur Nala Downstream Near Kuldiha Bridge
1	pH at 27 C		5.5 to 9.0	5.5-9.0	7.2	6.95	7.13	7.2	7.1	6.65
2	Temperature	Deg C	---	40 deg C	30.3°C	36.9°C	34.2°C	33.6°C	33.1°C	35.7°C
3	Total Suspended Solids	mg/l	100	100	2	6	<2	<2	9	3
4	Total Dissolved Solids	mg/l	---	2100	1932	146	1192	878	122	260
5	Acidity as CaCO3	mg/l	---		26	21	18	16	18	22
6	Total Alkalinity as CaCO3	mg/l	---		417	32	225	195	26	75
7	Total Hardness	mg/l	---		188.2	90.2	54.8	62.7	66.6	121.5
8	Calcium	mg/l	---		47.7	22	12.6	15.7	15.7	29.8
9	Magnesium	mg/l	---		16.8	8.6	5.7	5.7	6.6	11.4
10	Biochemical Oxygen Demand	mg/l	30	30	<2	<2	<2	<2	<2	<2
11	Chemical Oxygen Demand	mg/l	250	100	<8	<8	<8	<8	<8	<8
12	Oil & Grease	mg/l	10	10	<5	<5	<5	<5	<5	<5
13	Phenolic Compounds (as C6H5OH)	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
14	Sulphides (as S2) in mg/l	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
15	Fluoride	mg/l	2	1.5	2.2	0.75	0.62	1.1	0.53	0.41
16	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
17	Zinc	mg/l	5	2	0.013	0.012	0.023	0.015	0.019	0.012
18	Copper	mg/l	3	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Nickel	mg/l	3	3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Lead	mg/l	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Cyanide	mg/l	---	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Nitrate Nitrogen(as N),mg/L		0.5		3.10	0.35	2.78	1.62	0.64	2.44
25	Vanadium	mg/l	0.2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Date					Apr'21	Jun'21				
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDN-99 (R.O-Discharge)	Kunur Nala Upstream Near GGS-1	GGS-1(R.O Discharge)	EDD-50 (R.O-Discharge)	Kunur Nala Downstream between EDH 58 & 64	Kunur Nala Downstream Near Kuldiha Bridge
26	Iron		3		0.55	1.25	0.31	0.22	1.36	0.65
27	Manganese	mg/l	2		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
28	Dissolved Phosphate	mg/l	5		0.11	0.22	0.07	0.09	0.28	0.06
29	Selenium		0.05		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
30	Cadmium	mg/l	2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
31	Arsenic	mg/l	0.2		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Free Amonia	mg/l	5		0.08	0.39	0.42	0.47	0.3	0.28
33	Ammonical Nitrogen	mg/l	50		3.8	3.9	4.2	4.7	3	2.8
34	Total residual chlorine	mg/l	1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
35	colour	Hazen Units	Colourless		<5	<5	<5	<5	<5	<5
36	Odor		Odourless		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

Date					Jun'21		Jul'20			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH-064(R.O Discharge)	EDN-99 (R.O-Discharge)	GGS-1(R.O Discharge)	EDD-50 (R.O-Discharge)	EDN-99 (R.O-Discharge)	EDH-64(R.O Discharge)
1	pH at 27 C		5.5 to 9.0	5.5-9.0	6.45	6.85	7.65	7.50	7.36	7.59
2	Temperature	Deg C	---	40 deg C	29.9°C	32.2°C	28.2°C	27.7°C	28.9°C	27.8°C
3	Total Suspended Solids	mg/l	100	100	<2	<2	6	<2	<2	<2
4	Total Dissolved Solids	mg/l	---	2100	994	1580	1036	894	2068	858
5	Acidity as CaCO3	mg/l	---		28	20	22	26	32	22
6	Total Alkalinity as CaCO3	mg/l	---		215	415	280	130	740	240
7	Total Hardness	mg/l	---		35.3	86.2	20	24	145	31
8	Calcium	mg/l	---		7.8	22.0	4.7	4.7	34.6	7.8
9	Magnesium	mg/l	---		3.8	7.6	1.9	2.8	14.2	2.8
10	Biochemical Oxygen Demand	mg/l	30	30	<2	<2	<2	<2	<2	<2
11	Chemical Oxygen Demand	mg/l	250	100	<8	<8	<8	<8	<8	<8
12	Oil & Grease	mg/l	10	10	<5	<5	<5	<5	<5	<5
13	Phenolic Compounds (as C6H5OH)	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
14	Sulphides (as S2) in mg/l	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
15	Fluoride	mg/l	2	1.5	1.35	1.7	1.30	0.86	1.65	0.73
16	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
17	Zinc	mg/l	5	2	0.02	0.017	0.016	0.013	0.019	0.011
18	Copper	mg/l	3	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Nickel	mg/l	3	3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Lead	mg/l	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Cyanide	mg/l	---	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Nitrate Nitrogen(as N),mg/L		0.5		1.75	2.51	1.62	0.98	2.78	0.64
25	Vanadium	mg/l	0.2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Date					Jun'21		Jul'20			
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	EDH-064(R.O Discharge)	EDN-99 (R.O-Discharge)	GGS-1(R.O Discharge)	EDD-50 (R.O-Discharge)	EDN-99 (R.O-Discharge)	EDH-64(R.O Discharge)
26	Iron		3		0.27	0.31	1.83	0.54	0.39	0.28
27	Manganese	mg/l	2		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
28	Dissolved Phosphate	mg/l	5		0.24	0.21	0.17	0.12	0.22	0.13
29	Selenium		0.05		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
30	Cadmium	mg/l	2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
31	Arsenic	mg/l	0.2		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Free Amonia	mg/l	5		0.21	0.37	0.11	0.05	0.04	0.08
33	Ammonical Nitrogen	mg/l	50		2.1	3.7	3.8	2.6	4.3	4.1
34	Total residual chlorine	mg/l	1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
35	colour	Hazen Units	Colourless		<5	<5	<5	<5	<5	<5
36	Odor		Odourless		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

Date					Jul'20			Aug'21		
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	Kunur Nala Upstream Near GGS#1	Kunur Nala Downstream between EDH 58 & 64	Kunur Nala Downstream Near Kuldiha Bridge	EDN-99 (R.O-Discharge)	EDH-64(M.S.R.O Discharge)	Kunur Nala Downstream Near Kuldiha Bridge
1	pH at 27 C		5.5 to 9.0	5.5-9.0	7.8	6.9	7.15	7.8	8.15	8.02
2	Temperature	Deg C	---	40 deg C	26.9°C	26.9°C	27.6°C	33.4°C	32.6°C	35.6°C
3	Total Suspended Solids	mg/l	100	100	3	44	65	<2	3	30
4	Total Dissolved Solids	mg/l	---	2100	54	60	122	1834	1480	120
5	Acidity as CaCO3	mg/l	---		18	38	34	21.5	8	13
6	Total Alkalinity as CaCO3	mg/l	---		12	10	20	340	217	29
7	Total Hardness	mg/l	---		12	31	110	129	43	55
8	Calcium	mg/l	---		3.1	7.8	25.1	31	11	14.0
9	Magnesium	mg/l	---		1.0	2.8	11.4	12	4	5
10	Biochemical Oxygen Demand	mg/l	30	30	<2	<2	<2	<2	<2	<2
11	Chemical Oxygen Demand	mg/l	250	100	<8	<8	8	<8	<8	<8
12	Oil & Grease	mg/l	10	10	<5	<5	<5	<5	<5	<5
13	Phenolic Compounds (as C6H5OH)	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
14	Sulphides (as S2) in mg/l	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
15	Fluoride	mg/l	2	1.5	0.19	0.19	0.28	1.45	0.92	0.45
16	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
17	Zinc	mg/l	5	2	<0.01	0.012	0.019	0.021	0.03	<0.01
18	Copper	mg/l	3	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Nickel	mg/l	3	3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Lead	mg/l	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Cyanide	mg/l	---	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Nitrate Nitrogen(as N),mg/L		0.5		0.35	0.82	1.55	1.32	0.64	0.35
25	Vanadium	mg/l	0.2		<0.1	<0.1		<0.1	<0.1	<0.1

Date					Jul'20			Aug'21		
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	Kunur Nala Upstream Near GGS#1	Kunur Nala Downstream between EDH 58 & 64	Kunur Nala Downstream Near Kuldiha Bridge	EDN-99 (R.O-Discharge)	EDH-64(M.S.R.O Discharge)	Kunur Nala Downstream Near Kuldiha Bridge
26	Iron		3		1.15	1.75	2.46	0.55	0.61	6.02
27	Manganese	mg/l	2		<0.05	0.215	0.34	<0.05	0.091	0.265
28	Dissolved Phosphate	mg/l	5		0.08	0.15	0.22	0.06	<0.01	0.09
29	Selenium		0.05		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
30	Cadmium	mg/l	2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
31	Arsenic	mg/l	0.2		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Free Amonia	mg/l	5		0.12	0.03	0.04	0.05	0.04	0.03
33	Ammonical Nitrogen	mg/l	50		3.0	3.1	3.8	1.8	0.59	0.8
34	Total residual chlorine	mg/l	1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
35	colour	Hazen Units	Colourless		<5	<5	<5	<5	<5	<5
36	Odor		Odourless		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

Date					Aug'21				Sep'21	
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	Kunur Nala Downstream between EDH 58 & 64	EDD-50 (R.O-Discharge)	GGS-1(R.O Discharge)	Kunur Nala Upstream Near GGS#1	EDH-64(M.S.R.O Discharge)	EDD-50 (R.O-Discharge)
1	pH at 27 C		5.5 to 9.0	5.5-9.0	8.4	8.26	8.3	8.43	7.6	7.89
2	Temperature	Deg C	---	40 deg C	31.2°C	29.8°C	32.6°C	28.2°C	32.4°C	31.8°C
3	Total Suspended Solids	mg/l	100	100	16	4	3	17	<2	<2
4	Total Dissolved Solids	mg/l	---	2100	86	778	1318	94	876	762
5	Acidity as CaCO3	mg/l	---		Nil	Nil	Nil	Nil	22	16
6	Total Alkalinity as CaCO3	mg/l	---		18	181	230	15	305	205
7	Total Hardness	mg/l	---		31	102	59	39	23	43
8	Calcium	mg/l	---		6	23.0	15.7	9.0	6	9
9	Magnesium	mg/l	---		4	10.0	4.8	4	2	5
10	Biochemical Oxygen Demand	mg/l	30	30	<2	<2	<2	<2	<2	<2
11	Chemical Oxygen Demand	mg/l	250	100	<8	<8	<8	10	<8	<8
12	Oil & Grease	mg/l	10	10	<5	<5	<5	<5	<5	<5
13	Phenolic Compounds (as C6H5OH)	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
14	Sulphides (as S2) in mg/l	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
15	Fluoride	mg/l	2	1.5	0.27	0.91	1.2	1.1	0.63	1.6
16	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
17	Zinc	mg/l	5	2	<0.01	0.016	0.024	0.019	0.01	0.021
18	Copper	mg/l	3	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
19	Nickel	mg/l	3	3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
20	Lead	mg/l	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Cyanide	mg/l	---	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
23	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Nitrate Nitrogen(as N),mg/L		0.5		0.17	1.75	0.98	1.62	1.5	0.75
25	Vanadium	mg/l	0.2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Date					Aug'21				Sep'21	
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	Kunur Nala Downstream between EDH 58 & 64	EDD-50 (R.O-Discharge)	GGS-1(R.O Discharge)	Kunur Nala Upstream Near GGS#1	EDH-64(M.S.R.O Discharge)	EDD-50 (R.O-Discharge)
26	Iron		3		2.15	0.43	0.35	3.7	<0.1	<0.1
27	Manganese	mg/l	2		0.102	<0.05	<0.05	0.169	<0.05	<0.05
28	Dissolved Phosphate	mg/l	5		0.12	0.06	0.09	0.11	0.08	0.11
29	Selenium		0.05		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
30	Cadmium	mg/l	2		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
31	Arsenic	mg/l	0.2		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
32	Free Amonia	mg/l	5		0.07	0.1	0.08	0.16	0.06	0.08
33	Ammonical Nitrogen	mg/l	50		0.65	1.1	0.89	1.45	3.1	2
34	Total residual chlorine	mg/l	1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
35	colour	Hazen Units	Colourless		<5	<5	<5	<5	<5	<5
36	Odor		Odourless		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

Date					Sep'21				
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	Kunur Nala Downstream Near Kuldiha Bridge	Kunur Nala Downstream between EDH 58 & 64	Kunur Nala Upstream Near GGS#1	GGS-1(R.O Discharge)	EDN-99 (R.O-Discharge)
1	pH at 27 C		5.5 to 9.0	5.5-9.0	7.56	7.8	7.95	7.77	7.1
2	Temperature	Deg C	---	40 deg C	32.6°C	33.8°C	30.6°C	29.9°C	31.7°C
3	Total Suspended Solids	mg/l	100	100	32	30	31	2	3
4	Total Dissolved Solids	mg/l	---	2100	210	148	168	1024	1826
5	Acidity as CaCO3	mg/l	---		22	18	14	20	28
6	Total Alkalinity as CaCO3	mg/l	---		50	26	26	260	380
7	Total Hardness	mg/l	---		82	70	70	39	255
8	Calcium	mg/l	---		20.0	17	17.0	9	66.0
9	Magnesium	mg/l	---		8	7	7.0	4	22
10	Biochemical Oxygen Demand	mg/l	30	30	<2	<2	<2	<2	<2
11	Chemical Oxygen Demand	mg/l	250	100	8	8	<8	<8	<8
12	Oil & Grease	mg/l	10	10	<5	<5	<5	<5	<5
13	Phenolic Compounds (as C6H5OH)	mg/l	1	1.2	<0.002	<0.002	<0.002	<0.002	<0.002
14	Sulphides (as S2) in mg/l	mg/l	2	2	<0.5	<0.5	<0.5	<0.5	<0.5
15	Fluoride	mg/l	2	1.5	0.32	0.51	0.23	0.83	0.95
16	Total Chromium	mg/l	2	1	<0.05	<0.05	<0.05	<0.05	<0.05
17	Zinc	mg/l	5	2	0.015	0.013	<0.01	0.016	0.02
18	Copper	mg/l	3	0.2	<0.05	<0.05	<0.05	<0.05	<0.05
19	Nickel	mg/l	3	3	<0.05	<0.05	<0.05	<0.05	<0.05
20	Lead	mg/l	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
21	Mercury	mg/l	0.01	0.01	<0.001	<0.001	<0.001	<0.001	<0.001
22	Cyanide	mg/l	---	0.2	<0.02	<0.02	<0.02	<0.02	<0.02
23	Hexavalent Chromium	mg/l	0.1		<0.01	<0.01	<0.01	<0.01	<0.01
24	Nitrate Nitrogen(as N),mg/L		0.5		2.10	0.48	1.40	2.2	0.80
25	Vanadium	mg/l	0.2		<0.1	<0.1	<0.1	<0.1	<0.1

Date					Sep'21				
S. No.	Parameter	Unit	CPCB Limit for Discharge	Onshore Discharge Standards	Kunur Nala Downstream Near Kuldiha Bridge	Kunur Nala Downstream between EDH 58 & 64	Kunur Nala Upstream Near GGS#1	GGS-1(R.O Discharge)	EDN-99 (R.O-Discharge)
26	Iron		3		1.8	1.55	2.05	0.45	0.6
27	Manganese	mg/l	2		0.063	0.059	0.052	<0.05	<0.05
28	Dissolved Phosphate	mg/l	5		0.19	0.16	0.06	0.10	0.12
29	Selenium		0.05		<0.005	<0.005	<0.005	<0.005	<0.005
30	Cadmium	mg/l	2		<0.02	<0.02	<0.02	<0.02	<0.02
31	Arsenic	mg/l	0.2		<0.01	<0.01	<0.01	<0.01	<0.01
32	Free Amonia	mg/l	5		0.07	0.12	0.17	0.09	0.04
33	Ammonical Nitrogen	mg/l	50		3.7	4	3.3	2.9	3.7
34	Total residual chlorine	mg/l	1		<0.1	<0.1	<0.1	<0.1	<0.1
35	colour	Hazen Units	Colourless		<5	<5	<5	<5	<5
36	Odor		Odourless		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable

Ground Water Analysis of Surrounding Areas of CBM Raniganj Project of EOGEPL **ANNEXURE V**

Compliance Period: Apr'21 to Sep'21

S. No.	Parameter	Unit	S:10500 -1991		Gopalpur Village	Sarenga Village	Ghatakdanga Village	Saraswatiganj village	Jatgoria near Mosjid	Bargoria Village	Kantaberia Village
			Desirable limit	Permissible limit							
1	Colour	Hazen	5	15	<5	<5	<5	<5	<5	<5	<5
2	pH Value		6.5-8.5	No relaxation	6.6	6.25	6.7	6.8	6.89	6.75	6.59
3	Turbidity, NTU	NTU	1	5	4	<1	25	<1	1.5	6.5	3.5
4	Total Dissolved Solids	mg/l	500	2000	138	242	60	114	106	92	114
5	Total Suspended Solids,	mg/l	---	---	2	<2	12	<2	78	3	2
6	Total Alkalinity as $CaCO^3$	mg/l	200	600	165	201	41	88	46	80	78
7	Total Hardness	mg/l	200	600	101.9	180.3	31.4	86.2	54.9	70.6	90.2
8	Aluminium (as Al)	NTU	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
9	Ammonia (as total ammonia -N)	mg/l	0.5	No relaxation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
10	Anionic Detergents (as MBAS)	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
11	Barium (as Ba)	mg/l	0.7	No relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
12	Boron (as B)	mg/l	0.5	1	<1	<1	<1	<1	<1	<1	<1
13	Calcium (as Ca)	mg/l	75	200	25.1	45.5	7.8	22	12.6	15.7	22
14	Chloride (as Cl)	mg/l	250	1000	32	39	18	25	17	9	19
15	Copper (as Cu)	mg/l	0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
16	Fluoride (as F)	mg/l	1	1.5	0.41	0.30	0.15	0.71	0.68	0.4	0.35
17	Free Residual Chlorine	mg/l	0.2	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	Iron (as Fe)	mg/l	0.3	No relaxation	0.65	0.19	2.8	<0.1	20.5	0.85	0.45
19	Magnesium (as Mg)	mg/l	30	100	9.5	16.2	2.8	7.6	5.8	7.6	8.6
20	Manganese (as Mn)	mg/l	0.1	0.3	<0.05	<0.05	0.083	<0.05	0.286	<0.05	<0.05
21	Mineral Oil	mg/l	0.5	No relaxation	<1	<1	<1	<1	<1	<1	<1
22	Nitrate (as NO^3)	mg/l	45	No relaxation	2.82	10.27	4.3	1.52	<0.5	4.32	1.15
23	Phenolic Compounds (as C^6H^5OH)	mg/l	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
24	Sulphate (as SO^4)	mg/l	200	400	2.5	3.5	<2.5	4	4.8	<2.5	<2.5
25	Silver (as Ag)	mg/l	0.1	No relaxation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26	Sodium (as Na)	mg/l	---	---	10	12	5	12	4	6	11
27	Selenium (as Se)	mg/l	0.01	No relaxation	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
28	Cadmium (as Cd)	mg/l	0.003	No relaxation	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
29	Cyanide (as CN)	mg/l	0.05	No relaxation	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
30	Lead (as Pb)	mg/l	0.01	No relaxation	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
31	Mercury (as Hg)	mg/l	0.001	No relaxation	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
32	Total Arsenic (as As)	mg/l	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
33	Polynuclear aromatic hydrocarbons (as PAH)	mg/l	0.0001	No relaxation	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
34	Pesticide Residues	mg/l	0.01	No relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
35	Total Coliform Count,	MPN/100 ml	Shall not be detectable in any 100 ml sample		<1	2	<1	<1	<1	<1	<1
36	Odour		Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
37	Polychlorinated Biphenyls	mg/l	0.0005	No Relaxation	Not Detectable	Not Detectable	Not Detectable	Not Detectable	Not Detectable	Not Detectable	Not Detectable
38	Chloramines	us/cm	4	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
39	Molybdenum	mg/l	0.07	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
40	Sulphide,mg/L	mg/l	0.05	No Relaxation	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Ground Water Analysis of Surrounding Areas of CBM Raniganj Project of EOGEPL

ANNEXURE V

Compliance Period: Apr'21 to Sep'21

S. No.	Parameter	Unit	S:10500 -1991		Gopalpur Village	Sarenga Village	Ghatakdanga Village	Saraswatiganj village	Jatgoria near Mosjid	Bargoria Village	Kantaberia Village
			Desirable limit	Permissible limit							
41	Electrical Conductivity at 25° C,	µmhos/cm	---	---	380	470	102	250	240	160	190
42	Phosphorus(as P)	mg/l	---	---	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
43	Nickel	mg/l	0.02	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
44	Total Chromium	mg/l	0.05	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
45	Zinc	mg/l	5	15	0.015	0.01	0.018	0.017	0.023	0.012	<0.01

Annexure VI

1st Copy

FORM 10

WEST BENGAL WASTE MANAGEMENT LIMITED

103, Mouza – Purba Srikrishnapur, P.O. & P.S. – Sutahata, PIN – 721635, Haldia, Dist. – Purba Medinipur, West Bengal

MANIFEST FOR HAZARDOUS AND OTHER WASTE

	Sender's name and mailing address (including Phone No. and e-mail) :	ESSAR OIL AND GAS EXPLORATION AND PRODUCTION LIMITED AN 518, SECTOR - 2, MARTIN LUTHER KING SARANI, BIDHAN NAGAR, DURGAPUR - 713 212
2	Sender's authorization No. :	15125 (HW) - 249 912 008
3	Manifest Document No. :	1 15100
4	Transporter's name and address (including Phone No. and e-mail) :	**West Bengal Waste Management Limited** J.L. No. 103, Mouza Purba Srikrishnapur, P.O. & P.S. Sutahata, Haldia 721635 Dist. Purba Medinipur, West Bengal, Ph. No.-03224-278238 / 39 E-mail : wbwml_haldia@ramky.com
5	Type of vehicle :	(Truck/Tanker/Special Vehicle)
6	Transporter's registration No. :	1-MD(E)/X/06
	Vehicle registration No. :	WB 31N 0098
8	Receiver's name and mailing address (including Phone No. and e-mail) :	**West Bengal Waste Management Limited** J.L. No. 103, Mouza Purba Srikrishnapur, P.O. & P.S. Sutahata, Haldia 721635 Dist. Purba Medinipur, West Bengal, Ph. No.-03224-278238 / 39 E-mail : wbwml_haldia@ramky.com
9	Receiver's authorization No. :	
10	Waste description :	OIL CONTAMINATED WASTE, FILTER, RO MEMBRANE,
11	Total quantity No. of Containers :	..... 3105 Kg. ..... m3 or MT ..... Nos.
12	Physical form :	(Soild/Semi-Solid/Sludge/Oily/Tarry/Slurry/Liquid)
13	Special handling instructions and additional information	Safety Shoe, Hand Gloves, Goggles, Helmets
14	Sender's Certificate	I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping categorized, packed, marked and name and are labeled and are in all respects in proper conditions for transport by road according to applicable National Government Regulations.
	Name and stamp	Signature — Day: 25 Month: 05 Year: 2021
15	Transporter acknowledgement of receipt of Wastes :	
	Name and stamp: Raj Kumar	Signature — Day: 25 Month: 05 Year: 2021
16	Receiver's certification for receipt of hazardous and other waste :	
	Name and stamp	Signature — Day: Month: Year:

1. White Colour forwarded to WBPCB by HzW Sender
2. Yellow Colour retained by HzW sender
3. Pink Colour retained by HzW Receiver
4. Orange Colour retained by transporter
5. Green Colour forwarded to WBPCP ofter disposal by HzW Receiver
6. Blue Colour returned to sender after disposal by HzW Receiver

FORM 10

WEST BENGAL WASTE MANAGEMENT I IMITED

1st Copy

JL No 80, Mouza - Pabayan, P.S.-Saltora Dist- Bankura , West Bengal – 722158

MANIFEST FOR HAZARDOUS AND OTHER WASTE

	Sender's name and mailing address (including Phone No. and e-mail) :	ESSAR OIL AND GAS EXPLORATION AND PRODUCTION LIMITED. AN 518, SECTOR-2, MARTIN LUTHER KING SARANI, BIDHANNAGAR DURGAPUR-713213
2	Sender's authorization No. :	15/25 (HWJ)-2449/2008
3	Manifest Document No. :	1 **15090**
4	Transporter's name and address (including Phone No. and e-mail) :	West Bengal Waste Management Limited JL No 80, Mouza - Pabayan, P.S.-Saltora Dist- Bankura , West Bengal – 722158
5	Type of vehicle :	(Truck/Tanker/Special Vehicle)
6	Transporter's registration No. :	1-MD(E)/X/06
7	Vehicle registration No. :	WB-31N-0098
8	Receiver's name and mailing address (including Phone No. and e-mail) :	West Bengal Waste Management Limited JL No 80, Mouza - Pabayan, P.S.-Saltora Dist- Bankura , West Bengal – 722158
9	Receiver's authorization No. :	
10	Waste description :	OILY CONTAMINATED WASTE, FILTERS, ROMEMBRANE, Torch Battery-15V, Silica Gel.
11	Total quantity No. of Containers :	87.3025 K.g. ..... m3 or MT ..... Nos.
12	Physical form :	(Soild/Semi-Solid/Sludge/Oily/Tarry/Slurry/Liquid)
13	Special handling instructions and additional information	Safty shoe, Hand Gloves, Goggles, Helmets.
14	Sender's Certificate	I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping categorized, packed, marked and name and are labeled and are in all respects in proper conditions for transport by road according to applicable National Government Regulations.
	Name and stamp	Signature — Day: 25 Month: 05 Year: 2021
15	Transporter's acknowledgement of receipt of Wastes :	
	Name and stamp: Ranjit Kumar	Signature — Day: 25 Month: 05 Year: 2021
16	Receiver's certification for receipt of hazardous and other waste :	
	Name and stamp	Signature — Day: Month: Year:

1. White Colour forwarded to WBPCB by HzW Sender
2. Yellow Colour retained by HzW sender
3. Pink Colour retained by HzW Receiver
4. Orange Colour retained by transporter
5. Green Colour forwarded to WBPCP ofter disposal by HzW Receiver
6. Blue Colour returned to sender after disposal by HzW Receiver

Expenditure towards Environmental Protection Measures at EOGEPL CBM Project, Raniganj
(April' 21 to September' 21)

S. No.	Particular	Expenses (INR)
1	Installation of Reverse Osmosis Treatment System for Produced Water Treatment (Recurring)	1,47,56,567
2	Environmental Monitoring Activities (Recurring)	Rs. 562,710.00
3	HDPE liners for produced water storage at site when needed (Capital)	Rs. 166,500.00
4	TCLP Analysis of Hazardous waste (One time)	Rs. 1.00
5	Non Hazardous Waste Disposal (Recurring)	Rs. 101,775.00
6	Hazardous Waste Disposal (Recurring)	Rs. 240,204.81
TOTAL		**Rs. 1,071,190.81**

Groung Water Level report of surrounding areas of CBM Ranigan project by EOGEPL
Compliance Period: Apr'21 to Sep'21

ANNEXURE VIIII

S. No.	Location	Latitude	Longitude	Parapet Height (m)	Well Diameter (m)	Depth to Water from Parapet top (m)	Depth to Water below ground level (m)
1	Nachan	23°36′42.4″N	87°19′58.9″E	0.68	1	1.143	0.463
2	Bansia	23°37.464″N	87°20.151″E	0.76	0.97	1.4224	0.6624
3	Kalikapur	23°37.464″N	87°20.151″E	0.8	1.85	1.1176	0.3176
4	Bargoria	23°37′580″N	87°21′397″E	0.7	2.5	1.778	1.078
5	Jatgoria	23°36′973″N	87°23′432″E	0.6	1.8	1.4986	0.8986
7	Dhabani	23°35′519″N	87°22.085″E	0.95	1.8	1.905	0.955
8	Labnapara	23°35′05.36N	87°22′15.8″E	1.2	1.5	2.3876	1.1876
9	Akandara	23°34′461″N	87°23′013″E	0.65	1.85	2.7686	2.1186
10	Sarenga	23°31′665″N	87°24′400″E	0	0.6	1.7526	1.7526
11	Saraswatigunj	23°35′226″N	87°24′784″E	0.6	1.75	1.651	1.051
12	Ghatakdanga	23°34′147″N	87°24′308″E	1	2.4	1.9558	0.9558
13	Kantaberia	23°36′829″N	87°22′242″E	0.6	1.3	1.8542	1.2542
14	Gopalpur	23°30′639″N	87°23′408″E	0.5	1.53	1.9304	1.4304