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F. No. J-11011/351/2009- IA II (I)
Government of India
Ministry of Environment and Forests
(I.A. Division)

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Dated 23th September, 2011

To,

Shri Prem Sawhney
Chief Operating Officer –Clean Coal Business
M/s Essar Oil Limited (E&P Division)
"Essar Technopark" Building nO.II
Swan Mill Compound, LBS Marg, Kurla (West) .
Mumbai - 400 070, Maharashtra

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Subject: Pilot-cum-Production Wells at Raniganj East Coal Bed Methane (CBM) Block RG (E)-CBM-2001/1 in Durgapur, West Bengal by M/s Essar Oil Limited (E&P Division) – Environment clearance req.

Ref. : Your letter no. nil dated 29th June, 2010.

Sir,

This has reference to your letter no. nil dated 29th June, 2010 on the above mentioned subject alongwith project documents including Prefeasibility Report, Draft Terms of References, EIA/EMP, Public Hearing Report and subsequent communications vide letters dated 1st, 9th, 13th September, 2010 and 30th July, 2011 on the above mentioned subject.

2.0 The Ministry of Environment & Forests has examined your application. It is noted that the proposal is for pilot-cum-production wells at Raniganj East Coal Bed Methane (CBM) Block RG (E)-CBM-2001/1 in Durgapur, West Bengal by M/s Essar Oil Limited (E&P Division). The block is located in the coal ferrous Zone (Raniganj Coal Field) of Burdwan, Birbhum and Bankura Districts in West Bengal. Durgapur town is located at 2.6 km from project boundary and 3.7 Km from the nearest proposed drilling well. Essar Oil Ltd. (EOL) has 100% ownership in the CBM Block and as Operator has signed a Production Sharing Contract (PSC) with the Government of India on 26th July, 2002 for block RG(EAST)-CBM-2001/1. Petroleum Exploration License (PEL) for carrying out exploratory operation within the block has been granted by the Govt. of West Bengal on 29th March, 2005 vide letter no. 185-CI/O/Coal/028.02/M1. Total area of CBM block is 500 km². The coordinates of the block are 23° 22' 10" – 23° 41' 12" N latitude and 87° 14' 15" – 87° 28' 46" E longitudes. Protected forests (Durgapur PF & Ukhra PF) fall within the block. River Ajay and Damodar flow through the block area. No national park / wildlife sanctuary is located within 10 Km. Panagarh air base is located at 15 km from the block. Total cost of the project is Rs. 260.00 Crores. Following are the details of existing and proposed activities: ✓



Phase-1: (Completed; Environmental clearance for the existing phase-I has been accorded by the Ministry vide letter no. J-11011/660/2007-IA(II)-I dated 6th May, 2008.)

- 120 LKM of HRSS Seismic Survey (2 D)
- 12 Nos. of Core hole Drilling
- 15 Nos. of test well drilling.

Phase-II: (Proposed wells will be drilled in the area of 45 km² out of total block area 500 km²)

- 90 Nos. of Pilot cum Production well drilling were proposed. Out of which, 32 wells are falling in the forest land of 14.24 ha. Essar Oil Ltd vide letter no. EO/CBM/ENV/07-11/01 dated 30th July, 2011 informed that 32 wells falling under forest land be kept out of purview of the EC. Thus only 58 nos. of Pilot cum Production well will be drilled.
- 3 Nos. of Group Gathering Station (GGS).
- 40 km length of pipeline from GGS to Durgapur.
- Drilling will not be carried out in the forest area.

3.0 58 pilot-cum-production wells will be drilled upto a depth of 1000 m. Plot area for each pilot well will be 1.5-2.0 acres. Drilling will be done by truck mounted RD-20 Rig using water based mud upto 500 m depth and air mist drilling beyond 500 m. One cluster will have 40-50 wells and one Group Gathering Stations (GGSs) in area of 4 -5 acres. Each well site will have a separator for initial separation of gas and water. Coal Bed Methane (CBM) will be transported by underground pipelines. Emergency gas flaring facilities will be provided at well site and GGSs. Expected total gas production from pilot wells will be about 5 Lakhs m³/day. The compressed gas will be transported through underground pipeline & filled into cascade system cylinders for supply to final consumers.

4.0 Air emissions from D.G. sets will be controlled by providing adequate stack height. Air emissions will be reduced by installing CBM gas based power generator sets. Flaring will be done during emergency as per the guidelines for flaring vide GSR (E) dt. April, 1996. Air drilling technique will be used to reduce water consumption. Water requirement for each pilot well will be 75 m³/well and sourced from local approved water suppliers. Produced water will be stored in pit for recycling/reuse (process, irrigation etc) after treatment and solar evaporation. No effluent will be discharged outside the premises and 'Zero' discharge will be adopted. Drill cuttings will be stored in HDPE lined pits, treated and disposed in accordance with CPCB guidelines. Waste oil/used oil will be sent to authorized re-processors. Site closure and decommissioning will be initiated for wells not indicative of any commercially viable gas production. Wells will be plugged and abandoned by investing reluctant plugs (slurry of cements and water) at strategic location. Wells providing positive gas productions results will be converted to production wells.

5.0 The proposal was considered by the Expert Appraisal Committee (Industry-2) in its 1st, 14th and 25th Meeting held during 24th-25th July, 2009, 16th-17th September, 2010 and 28th-30th July, 2011 respectively.

6.0 Public hearing/public consultation meeting was held on 26th March, 2010.

7.0 The Ministry of Environment and Forests hereby accords environmental clearance to the above project under the provisions of EIA Notification dated 14th September, 2006 subject to strict compliance of the following specific and general conditions:

A. SPECIFIC CONDITIONS :

- i. As proposed, Only 58 pilot-cum-production wells shall be drilled upto a depth of 1000 m. No additional wells shall be drilled without prior permission from this Ministry.
- 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.
- 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.
- 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.
- v. Prior permission from the Ministry of Defence shall be obtained regarding impact of proposed plant on Panagarh air base, if any.
- vi. The surface facilities shall be installed as per the applicable codes and standards, international practices and applicable local regulations.
- 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 PM₁₀, PM_{2.5}, SO₂, NO_x, CO, CH₄, VOCs, HC, Non-methane HC etc. Efforts shall be made to improve the ambient air quality of the area.
- 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.
- ix. Mercury shall also be analyzed in air, water and drill cuttings twice during drilling period.
- 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 regulatory requirements and emissions from stacks shall meet the MOEF/CPCB guidelines.
- 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. ✓

- 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 30th August, 2005.
- 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/SGWA.
- 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 premises and 'zero' discharge shall be adopted.
- xv. Water produced during drilling shall be reused in drilling of other core/test wells.
- 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.
- xvii. Ground water quality monitoring shall be done to assess if produced water storage or disposal has any effect.
- xviii. Drilling wastewater including drill cuttings wash 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.
- 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 Transboundary Movement) Rules, 2008. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers/re-processors.
- 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.
- 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 drums shall be installed to minimize gaseous emissions during operation.
- 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.

- 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.
- xxiv. The design, material of construction, assembly, inspection, testing and safety aspects 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 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.
- 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.
- xxvii. The company shall develop a contingency plan for H₂S release including all necessary aspects from evacuation to resumption of normal operations. The workers shall be provided with personal H₂S detectors in locations of high risk of exposure along with self containing breathing apparatus.
- xxviii. Adequate well protection system shall be provided like BoP or diverter systems as required based on the geological formation of the blocks.
- xxix. Blow Out Preventor (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 fluid logging etc.
- xxx. The top soil removed shall be stacked separately for reuse during restoration process.
- xxxi. Emergency Response Plan shall be based on the guidelines prepared by OISD, DGMS and Govt. of India. Recommendations mentioned in the Risk Assessment & Consequence Analysis and Disaster Management Plan shall be strictly followed.
- xxxii. Project proponent shall comply with the environment protection measures and safeguards recommended in the EIA/EMP/risk analysis report/disaster management plan.
- 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.

- xxxiv. Occupational health surveillance of the workers shall be carried out as per the prevailing Acts and Rules.
- 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.
- xxxvi. All the commitments made to the public during the Public Hearing / Public Consultation meeting held on 26th March, 2010 shall be satisfactorily implemented.
- xxxvii. Company shall adopt Corporate Environment Policy as per the Ministry's O.M. No. J-11013/41/2006-IA.II(I) dated 26th April, 2011 and implemented.
- 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, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

B. GENERAL CONDITIONS:

- 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.
- 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.
- iii. The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained, wherever applicable.
- 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.
- 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). ✓

- 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.
- 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 alongwith the implementation 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.
- ix. A copy of clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parishad / Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions / representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the company by the proponent.
- x. The project proponent shall upload the status of compliance 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, SO₂, NO_x, 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.
- xi. The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the WBPCB. The Regional Office of this Ministry / CPCB / WBPCB shall monitor the stipulated conditions.
- 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 alongwith the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.
- xiii. The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the WBPCB and may also be seen at Website of the Ministry of Environment and Forests at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated.

in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office.

- xiv. Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.

8.0 The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

9.0 The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

10.0 The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management and Handling) Rules, 2003 and the Public (Insurance) Liability Act, 1991 along with their amendments and rules

(Dr. P. B. Rastogi)
Director

Copy to :

1. The Secretary, Department of Environment, Govt. of West Bengal, Kolkata, West Bengal.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
3. The Chairman, West Bengal Pollution Control Board, Parivesh Bhawan, 10A Block-LA Sector-III, Salt Lake, Kolkata - 700091, West Bengal.
4. The Chief Conservator of Forests, Regional Office (EZ), Ministry of Environment and Forests, A-3, Chandrashekharapur, Bhubaneswar – 751 023, Orissa.
5. Adviser (IA-II), Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
6. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
7. Guard File / Monitoring File / Record File.

(Dr. P. B. Rastogi)
Director