

## Executive Summary

# Environmental Impact Assessment & Environmental Management Plan For The Proposed Exploration Of Coalbed Methane At Singrauli, Madhya Pradesh

*Submitted By*



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*Submitted To*

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## EXECUTIVE SUMMARY

### 1.0 INTRODUCTION

**M/s. Deep Industries Limited (DIL)**, established in the year 1991 with headquarters in Ahmedabad, Gujarat primarily caters to ever increasing demand for Oil and Gas Field Services requirements. DIL along with its consortium members has been awarded CBM blocks under the third round of Coal bed Methane Exploration. Subsequently DIL signed a production sharing contract with GOI for exploration of Coal bed Methane for a period of 34.5 years. The current project deals with exploration of Methane gas entrapped within the coal seams. In case of encouraging results of exploration, development of the block for the purpose of sustained production of Methane gas is also envisaged.

### 2.0 SITE SELECTION

Site selection was done by taking considerations of identifying the factors like Gas content, presence of coal seams having adequate thickness, CBM Resources, transportation, land development and basic infrastructure cost, availability of utilities like water, power, the capital and operating cost.

### 3.0 PROJECT REQUIREMENTS

#### 3.1 WATER

The total water requirement for the proposed activity is given in the table below

**Water Requirement**

S.No.	Purpose	Source	Water requirement (m <sup>3</sup> /day)
1	Operation/Dust Suppression	Ground Water	38
2	Domestic	Ground Water	2
3	Green belt	Ground Water	10
<b>Total</b>			<b>50</b>

Therefore, the total water requirement for the proposed operation is 50 m<sup>3</sup>/day. The daily requirement will be met through the ground water as available in the project premises.



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### **3.2 POWER**

The power requirement for the proposed CBM operation at Singrauli coal block is estimated to be 1200 KVA of diesel Engine (600 KVA for Rig, 600 KVA for Compressor / Mud Pump), Mobile Diesel Generating Set of 63.5 KVA capacity for Camp lighting and utilities. About 1 kiloliter of fuel per day will be used for the power generation.

### **3.3 LAND**

The GoI has identified Singrauli Coal Block as potential coalbed methane reserve area. The extent of Singrauli Coal Block is 330 Sq.kms and needs to be explored in details. The land for the proposed CBM operation will be acquired as per the requirement. The government land will be acquired as per the government policy and private land will be acquired by providing adequate compensation to land owners or as availed remedy.

### **3.4 MANPOWER REQUIREMENT**

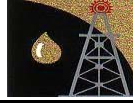
The manpower is the crucial backbone of any facility or project. The total manpower that is likely to be anticipated for the proposed CBM operation is given as 35 people for nearly 30 days at each drill site.

### **4.0 ENVIRONMENT ASPECTS AND POLLUTION CONTROL**

The baseline environmental study for the Coalbed Methane was carried in the study area for one season (summer season – March to May 2007). The Study area was selected where CBM Core Holes/Drill Sites are taken for exploration in order to analyze the potential impacts around the drill sites due to drilling techniques employed.

### **4.1 AIR ENVIRONMENT**

The ambient air quality of the study area has been monitored for eight locations with a frequency of two consecutive days per week. The baseline environmental concentration for critical pollutants like SO<sub>2</sub>, NO<sub>x</sub>, SPM and CO have been analyzed in detail and compared with the National Ambient Air Quality Standards. The analysis results were found to be well within the Standard of NAAQ. The baseline values of the study area for SO<sub>2</sub> ranged between 5.0 to 14.5 ug/m<sup>3</sup>, NO<sub>x</sub> 5.1 to 11.8 ug/m<sup>3</sup>, and SPM 56 to 94.7 ug/m<sup>3</sup>.



Predictions were carried out as per CPCB guidelines “Assessment of Impact to Air Environment: Guidelines for conducting air quality modeling” for the proposed CBM project. It is found that while the baseline values are well below the permissible limit in the Industrial, Residential zones.

#### **4.2 LAND AND SOIL**

For soil quality assessment studies, 7 sampling sites were selected at proposed drill sites, with in the CBM block for Physico-chemical parameters. The soil samples were analyzed for all the important parameters such as pH, electrical conductivity, calcium, magnesium, nitrogen, phosphorus, potassium, etc.

#### **4.3 NOISE**

Assessment of equivalent day and night noise levels in and around the mine lease reveal that noise levels are ranging from 34.5 to 49.8 dB(A), which can be taken as the existing baseline status. The minimum noise level 34.5 dB (A) was recorded at Gajra dandi while the maximum noise level was 49.8 dB (A) recorded at Gannal & Kasiyaritola. The day equivalent values calculated considering the noise levels recorded from 6 AM to 9PM. The values were found to be ranging between 46.5 dB (A) at Gajra dandi to 46.9 dB (A) in Gannal.

The high values of noise observed in many of the rural and suburban areas are primarily owing to vehicular traffic and other anthropogenic activities. In rural areas even chirping of birds could have attributed to the higher noise levels especially during the nights.

#### **4.4 WATER**

In total 8 water samples were collected during the study period from the study area. Out of 8 water samples collected 7 samples were from ground water sources and one is surface water sample. The water samples were analyzed as per standard methods for analysis of water and wastewater, American Public Health Association (APHA) Publication. The results were compared with the guidelines given by Bureau of Indian Standards (BIS) and IS.10500 - 1991 as amended in 1993. All the parameters analyzed were found which are in the permissible limited



## 4.5 FLORA AND FAUNA

Forest areas cover about 40% of the land in the district out of which 24 percent of the total area or about 2400 Sq. Km. has dense canopied forest (density above 0.8) and about 16 percent or about 1600 Sq. Km. are has open forest that has a density between 0.3 and 0.4. Of the eight blocks of district, three: namely, Kusmi, Devsar and Chitrangi have significant forest cover (mixed tropical deciduous forests). The forests are also source for variety of mahua, chironji, tendu etc., which are an important source of livelihood for population residing in the close vicinity of the forests.

## 5.0 ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

### 5.1 AIR ENVIRONMENT

Deep Industries Ltd is proposing to use mobile DG set of 63.5 KVA to meet lighting and utilities, 600 KVA Diesel Engine used for the rig and 600 KVA Diesel Engine used for the Air Compressor/ Mud Pump. Predictions are carried out for the DG set having a capacity of 600 \* 2 KVA diesel engines and 63.5 KVA DG set.

The emissions from the proposed mobile DG set and diesel engine are given below:

#### Predicted Increase in Ground Level Concentrations - SO<sub>2</sub> & NO<sub>x</sub>

Pollutant	Baseline Max. Value	Predicted Maximum contribution to GLC's	Predicted concentration
Sulphur dioxide (SO <sub>2</sub> )	15.7	13.2	28.9
Oxides of Nitrogen (NO <sub>x</sub> )	15.7	13.4	29.1

*(24 hrly average and all values in µg/m<sup>3</sup>)*

No exceedance of potential operational air quality has been predicted during occupancy in the EIA Study. Therefore, no EMP relating to air quality is required for the operational phase, except for stack height for DG generator set.



## 5.2 ODOUR CONTROL

Though Deep Industries Ltd. is not exploring any product that would generate odorous gases, however it is proposed to control whatever little Odour that might be generated during the process by adopting physical adsorption techniques or by using chemical adsorbents and bio-scrubbers.

## 5.3 NOISE QUALITY:

The values of noise observed are primarily due to the DG set, Rig, Compressor, Mud- Pump. Acoustic enclosure will be providing for the DG Set. Noise will be generated during operation of rig, compressor and mud pump equipment. The area will be cordoned off and necessary PPEs (ear muffs) will be provided for the personnel working in the area. Necessary acoustic enclosures will be provided.

Other noise generating sources are the Compressors, Mud Pumps and drilling rigs etc. Noise will be degenerated due to operation of rig/DG Sets at drilling site but the same will be limited to 75dB(A) at the periphery of exploratory drilling location/plinth.

## 5.4 WATER QUALITY:

Water will be mainly required for the domestic purposes during the construction and operation phases. The CBM operation in itself is a low water consumption project wherein no beneficiation or ancillary facilities are required. Instead water is drawn during the coalbed methane extraction, if the quality is not met it will be treated and used accordingly.

The domestic water requirement for the proposed activity is estimated for 35 people that will be on the site.

Therefore, the total water requirement for the proposed operation is 50m<sup>3</sup>/day. The daily requirement will be met through the ground water as available in the project premises.

Ground water is protected by lining drill holes with casing and cementing holes from production levels to the surface. These procedures are designed to protect drinking water sources, fish habitat and local vegetation. If water quality testing indicates that CBM produced water is generally of good quality (low Total Dissolved Solids and Chlorides). After testing if water meets



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discharge quality standards of MOEF, the same will be discharged into near by surface waters (rivers, lakes, ponds, etc).

## **5.5 PLUGGING AND ABANDONMENT**

Wells are plugged and abandoned once all recoverable gas has been extracted. The concerned authority monitors the process to ensure that it confirms to all regulations. In general cement is used to permanently seal the flow of gas and water from the coal.

## **5.6 IMPACT ON FLORA AND FAUNA:**

There is no wildlife sanctuaries located on the proposed stretch. There are no known rare, endangered or ecologically significant animal and plant species. Except for a few wild species of plants and grasses and a few animals that are very commonly spotted in any rural environment, the study area does not have any endangered or endemic species of animals.

## **5.7 AFFORESTATION**

Some trees will be cut and timber is likely to be salvaged due to the clearing of access route and preparation of nearly 0.5 hectare of area at drilling site. Compensatory afforestation will be carried out. Forest species which is found in that particular forest will be planted.

Net loss of small size of plantation habitats of little ecological values will constitute the residual impacts which are predicted to be non-significant.

## **5.8 WILDLIFE PROTECTION**

The effect of CBM development on wildlife occurs primarily from surface disturbances, during the construction of well sites and the pipeline network. To protect both domestic and wild animals, well facilities are fenced and pipelines are buried underground where ever necessary. CBM operators are also subjected to the general wildlife measures outline in the State and Central forest department guidelines. Once the well is depleted, the operator restores the area close to its original state.



## 5.9 SOLID WASTE MANAGEMENT

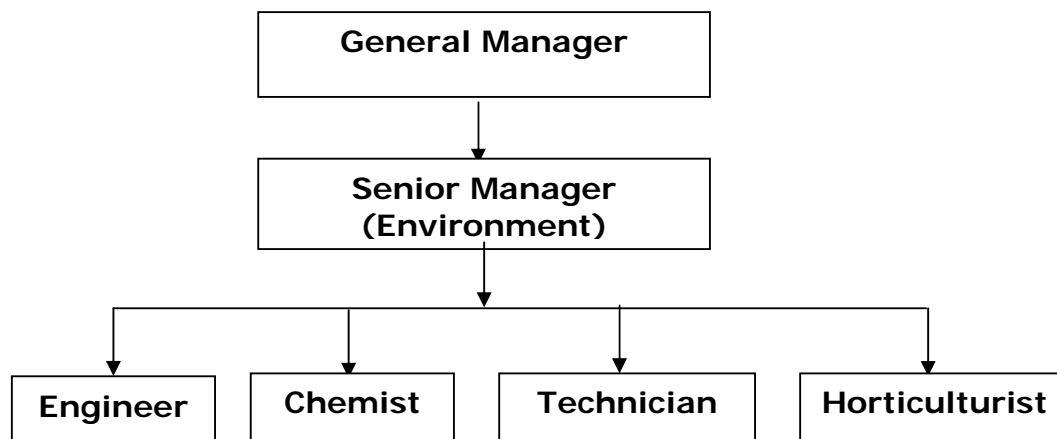
The solid waste generated during operation phase is given in Table

S. No.	Sources	Quantity	Disposal method
1	Core samples and Drilling Mud will be extracted	2MT per each well	Core are Used in the road making material and Drilling Mud is recycled and refilled into the bore holes.
2	Domestic waste (35 person x 0.25 Kg/day)	8.75 kg/day	After Composting this is used as manure.

## 5.10 SOCIO-ECONOMIC QUALITY:

The proposed exploration of coalbed methane is likely to provide direct and indirect employment including the technical and non technical workers like contract labor employed during the construction phase and operation phase. The proposed exploration of coalbed methane is likely to increase the socio-economic status of the villages in the study area especially the stretch where the project is coming up in a distance of 330 sq km. Due to proposed project the facilities for public transport, water supply telecommunications, education, public wealth, etc are likely to improve.

## 6.0 ENVIRONMENTAL MANAGEMENT CELL





## 7.0 POST PROJECT MONITORING

A well-defined environmental monitoring program would be followed for the proposed exploration of coalbed methane. It would be ensured that trained and qualified staff supervises the monitoring of ambient air, stack gases, effluents, noise, etc. to see that prescribed standards lay down are obtained. The post project monitoring works is summarized in the following table:

### Environmental Management Plan

Environmental Component	Locations	Frequency	Parameters
Ambient Air quality	Three AAQ stations located at 1200 angle between each	Monthly	For SPM, SO <sub>2</sub> , NO <sub>x</sub> , HC, CH <sub>4</sub>
Stack Emissions	Site	Monthly	For SPM, SO <sub>2</sub> and NO <sub>x</sub>
Groundwater Quality	Bore wells (Down stream & Up stream)	Monthly	For IS 10500 parameters
Solid waste	Storage area	Monthly	pH, EC, N, P, K

In order to comply with the environmental protection measures as suggested in the above sections, Deep Industries Limited has budgetary provision for Environmental Protection and Safety measures is Rupees Sixty Lakhs (Rs.60 Lacs) towards the following:

### COST TOWARDS ENVIRONMENTAL MITIGATION MEASURES

S. No.	Particulars	Capital Cost in lakhs
1	Construction of Effluent Treatment Plant as per specification provided by MoEF/ State PCB.	60
2	Pumping System	
3	Preparation of Disposal Well	
4	Day to day operational expenditure	
5	Fire Extinguishers and safety equipments	
6	Vehicle for emergency	
7	Regular medial checkup and visit of qualified doctor	
8	Storage of anti dotes of poison	
9	First aid kit shall be available at the site	
10	Operational recurring cost	

Note: services from Sl.No 5 to 9 will be extended to the nearby villages.



## 8.0 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

Risk involves the occurrence or potential occurrence of some accident consisting of an event or sequence of events. The main objectives of the study are

- i. Identification of hazard prone area and estimation of damage distance for the Maximum Credible Accident scenarios visualized for storages.
- ii. Computation of frequency of occurrence of hazards and evaluation of risk.
- iii. Based on the studies, suggest risk mitigation measures and arrive at guidelines for Disaster Management and Emergency Preparedness

Major types of accidents seen in Drilling Operations are Dropped Objects, HSD Release and Fires, Collisions, Structural damage, Structural failure and Blowout. Safety measures taken during drilling are as follows:

- Safety in handling and use of Rig and equipment – compulsory use of safety kits
- Safety on well – use of BOP and other proper equipments
- Safety during well completion and testing.

## 9.0 BENEFITS FROM THE PROJECT

- Future mining of coal will be safer due to the degasification of coal seams.
- CBM is a relatively newer concept in INDIA and is being encouraged by Government of India.
- The present project will help in enhancement of know-how for future projects.
- The produced methane which is much cleaner will substitute other fuels such as Coal/ Fire woods/ Oil
- It will reduce the gap between supply and demand of natural gas.
- Exchequer payment to state Government as well as central Government
- Generation of employment
- All-round development in adjacent area of the project.

## 10.0 CONCLUSION

The operation of the proposed plant at this site with the pollution abating systems and with sound environment management systems will result in a negligible impact on air, water, and land.