2 PROJECT DESCRIPTION

2.1 Key Block Information

Number of Wells	6
Depth of each Well	Range from 2500 m - 3500 m below ground level
Total Estimated Drilling Period for each well	45 days
Total Estimated Testing Period for each well	15 days
Type of hydrocarbon expected	Oil & Gas
Proposed Drilling Fluid for each well	Water Based Potassium Sulphate System (Environmental friendly system)
Anticipated Volume of Cuttings for each well	250-550 cu. metres (approximately)
Total time required for entire exploratory operation	7 years

Table 2.1 Key Block Information

2.2 Well Objectives

In Block AA – ONN-2004/4, Block operator is now planning to drill 6 exploratory wells to determine the presence of hydrocarbons in a geological formation starting at a depth of around 2500 m.

The objectives of the exploration wells are

- To drill and evaluate the oil prospects in the block safely;
- To drill and evaluate the oil prospects without impact to the environment;
- To determine the hydrocarbon potential of the designated prospect.

2.3 Prior to Drilling

2.3.1 Site Survey

The location for each well will be released by Block operator exploration department based on the geological data available and the seismic data acquired. A preliminary site survey will be undertaken by block operator drilling team and the civil works consultant team. It will be ensured that suitable location will avoid thick vegetation, large quantity of earth works, large road length and alteration of the natural contours.

The sequence of events involved between release of location and drilling of the exploration well is given below:

- Release of drilling location – Internally approved by the exploration team
- Site survey and access road alignment – will be undertaken through qualified consultant / contractor
- Land acquisition and removal of vegetation – All approvals and compensations will be secured through Forests Department
- Setting up of Access Road & Well Site – preparation by Civil contractor
- Drilling & Operating: Permit to drill and operate to be obtained prior to commencement of drilling.

2.3.2 Road and Site Construction

The road and site construction work will consists of the following works:

1. Upgradation and strengthening of the existing roads wherever available. As the existing road will be developed by widening/strengthening, thus it is necessary to add support base material, replacing and strengthening of old culvert pipes, etc.

2. Construction of new gravel road. A route survey will be undertaken to identify most suitable path to the drilling site. A new road will be constructed that will capable of moving of heavy machinery.

3. Construction of a flat rectangular drilling site (pad) at the end of the new road to facilitate drilling and testing of an Oil and Gas well.

2.4 The Exploratory Drilling Operation

The exploitation of hydrocarbons requires the construction of a conduit between the surface and the reservoir. This is achieved by the drilling process. Block operator is under the process of identifying the suitable capacity rig to execute the drilling operations.

2.4.1 Components of Drilling Rig

A typical drilling rig is shown in **Fig. 2.1** and its main components are discussed below

i) Draw Works

a. Input HP rating minimum 1500HP, nominal depth rating 5000m (approximately) with 5” drill pipe.

b. Draw works will be operated by minimum two DC motors.

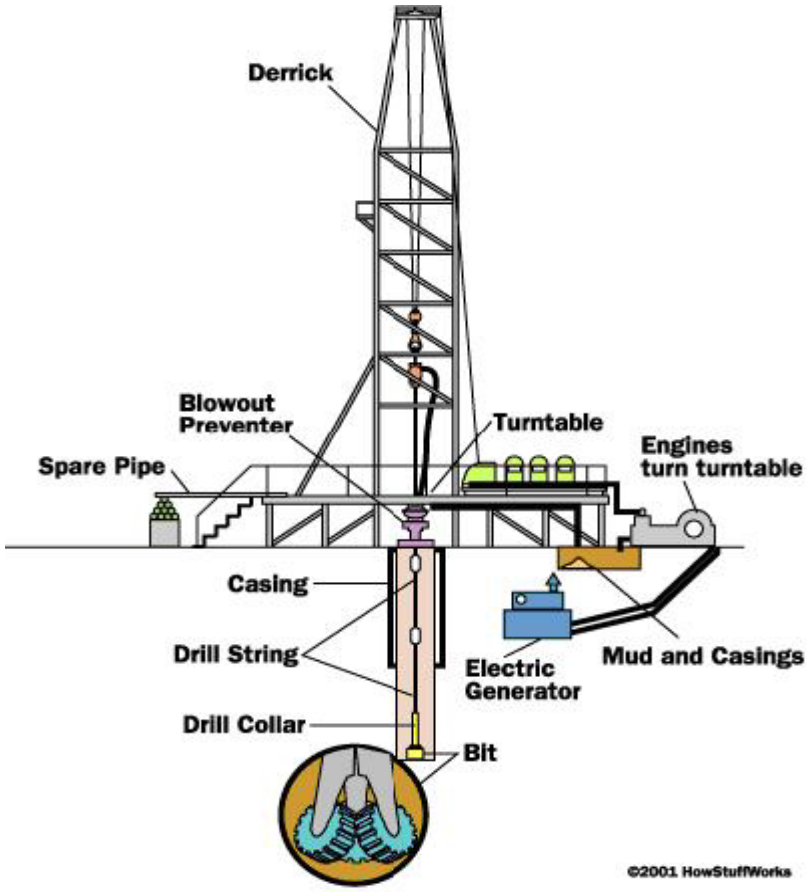

Fig. 2.1: The Anatomy of Drilling Rig

ii) Mud Pump

Two triplex mud pumps equivalent to minimum input horse power of 1300 each. Pumps will be fitted with liners (7"-5 ½ sizes) and pistons. Power transmission is driven by 2 DC motors of 900 HP each. The pumps will be coupled with centrifugal charging pumps driven by 50 HP motors for flooded suction. Pulsation Dampner of 5000 psi.

ii) Mast

Self elevating mast with minimum clear height of 142 feet. It will have a hook load capacity (derrick capacity) of 1,000,000 lbs.

iii) Sub-Structure

Rotary capacity will be approximately 1,000,000 lbs and set back capacity 500000 lbs. Combined capacity of hook load & setback will be minimum 850000 lbs.

iv) Rotary Swivel

Swivel will have a minimum dead load rating of 500 T with 5000 psi working pressure.

v) Power Pack

Engines-minimum 4 (four) nos turbocharged, after cooled, air start, diesel driven.

vi) Top Drive System

Electric AC motor driven with a rated capacity of 500T.

vii) Travelling Block and Hook

Unitized traveling block and hook assembly of 500T capacity with 6 sheaves grooved suitable for drill line and with minimum 12 line operation.

viii) Drill Pipes

A total of 5400 m of 5" OD drill pipe consisting of 3400 m of 19.5 PPF Grade 'G' and 2000m of 19.5 PPF Grade 'S' flash welded square.

ix) Drill Collars

Suitable size & numbers of Drill Collars to be used

x) BOP Control Unit

Proper BOP (Blow out Preventer) system will be used for the drilling operation to contain any unexpected pressures from the well.

xi) Total Tank Volume

The total tank volume is 2600 bbl.

The Rig including drilling & auxiliary equipment & Camp facilities comprise of around 50 trailer loads.

To support the drilling operation, the following systems and services are included for the drilling operations:

i) Portable Living Quarters – to house essential personnel on site on a 24 hr basis. These units are provided with Bath/Washroom.

ii) Crane-age - cranes for loading/off loading equipment and supplies.

iii) Emergency Systems - this includes fire detection and protection equipment. Medical doctor will be there for emergency medical attention.

iv) Environmental Protection – Blow out Prevention (BOP) system, wastewater treatment unit, cuttings handling equipment.

A typical layout of drilling site giving locations of various facilities is shown in **Fig. 2.2.**

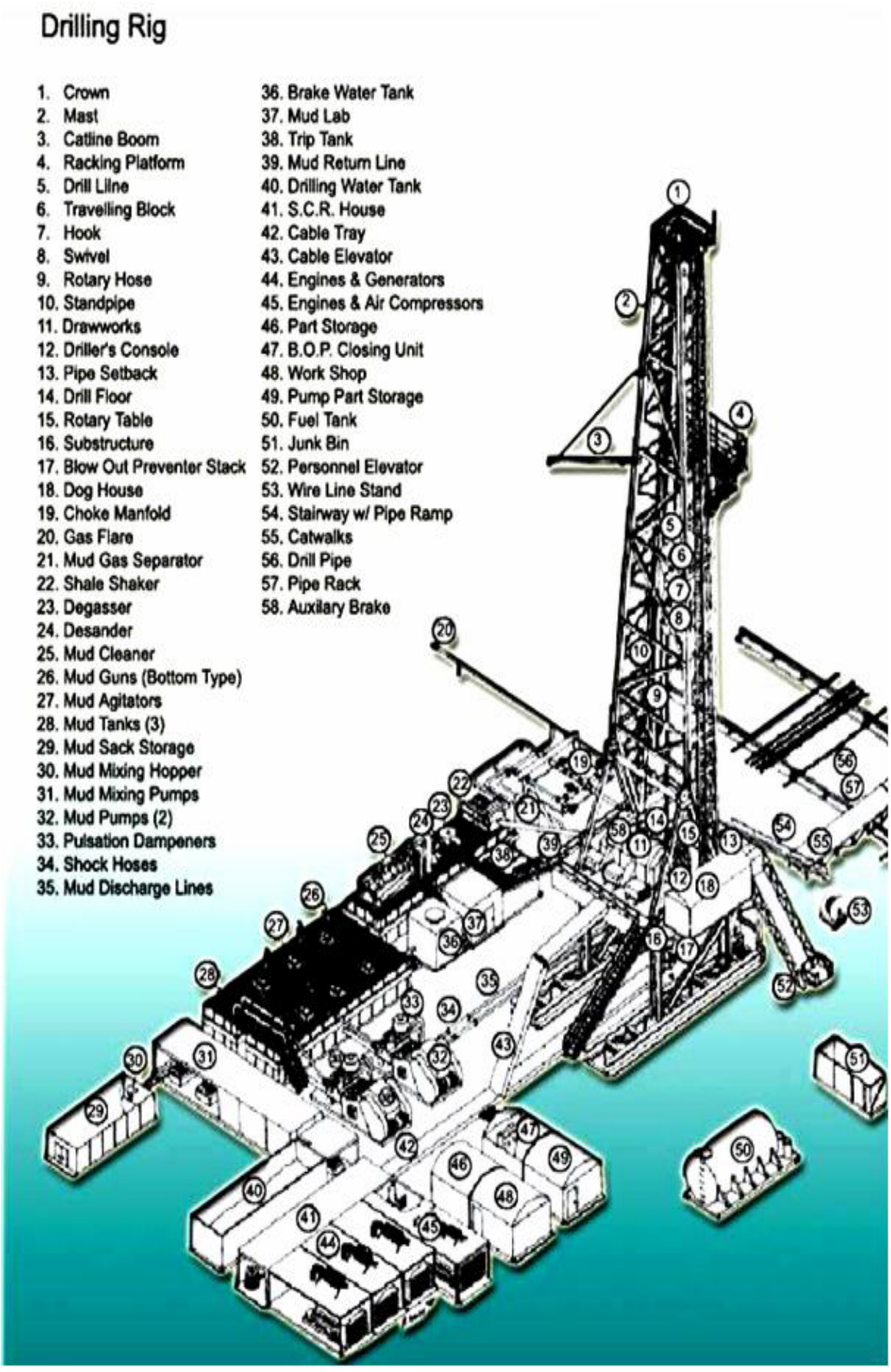

Fig. 2.2: Typical Land Drilling Rig

2.4.2 Well Construction

Wells are drilled in sections, with the diameter of each section decreasing with increasing depth. Before commencing the actual drilling, large diameter pipe (Conductor) is lowered into a hole and cemented/grouted. Conductor pipes provide a conduit for the return fluid during drilling next section and also prevent hole unconsolidated material falling into hole and potential washout problems. Typical lengths of such pipes are 12 m.

The lengths and diameters of each section of the well are determined prior to drilling and are dependent on the geological conditions through which the well is to be drilled. Once each section of the well is completed, the drill string is lifted and protective steel pipe or casing lowered into the well and cemented into place. The casing helps to maintain the stability of the hole and also helps reduce fluid losses from the well bore into surrounding rock formations.

2.4.3 Drilling Fluids

During drilling operations a fluid known as drilling fluid (or 'mud') is pumped through the drill string down to the drilling bit and returns between the drill pipe –casing annulus up to surface back into the circulation system after separation of drill cuttings /solids through solids control equipment as shown in **Fig. 2.3**. Drilling fluid is essential to the operation. It performs the following functions:

- Removes drilled cuttings from the bottom of the hole and transports the cuttings back to the surface, where they are separated from the mud and discarded (in effluent pits)
- Lubricates and cools the drill bit and string
- Forms a layer (wall cake) on the sides of the hole by arch action, which seals the walls and prevents mud from entering the formations
- Keeps the drill cuttings suspended if drilling is interrupted
- Counters natural formation pressures, preventing the uncontrolled flow of oil, gas, or water into the borehole.

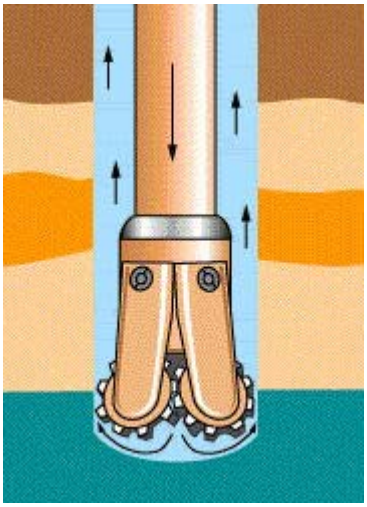

Fig 2.3: Mud Circulation

An **environment-friendly water-based mud system** comprising two types of mud will be used for the wells. Unlike an oil-based mud system, the use of water-based mud will not pose any risk of contamination to subsurface formations, and the disposal of the fluid and the cuttings will also be less problematic. However, in case of borehole instability problems it may be necessary to introduce a base salt, such as Potassium Sulphate (K_2SO_4) into the system. Base salt additions will only be considered after all commonly accessed freshwater aquifers have been securely cased and cemented off.

The mud used during the operation will flush out formation cuttings from the well hole. These cuttings will be separated from the drilling mud using a solids-control and waste management package. This will comprise a stepped system of processes consisting of linear motion vibrating screens called shakers, hydro-cyclones (including de-sanders and de-silters), and centrifuges to mechanically separate cuttings from the mud fluid. The cuttings separated will be

discharged into an auger, which will transport the cuttings over to a Hi-G dryer. The dryer will knock out additional liquid associated with the cuttings so that the liquid content will be reduced to less than 30%. From the Hi-G dryer, the cuttings will be discharged into a cuttings corral via an auger. The corral will be designed in slope so that even more moisture is removed through the gravity drainage process. These cuttings will be disposed off in lined pits as per the regulatory requirements.

Once the cuttings have been separated, the drilling fluid will be reused or processed after further treatment in a chemically enhanced dewatering (CED) system designed to remove suspended solids that are too fine for mechanical separation in the solids control package. The CED system comprises a chemical mixing and dosing unit and decanting centrifuges. By injecting a tailored blend of coagulants and flocculants the fine solids are chemically aggregated—producing inert particles called 'flocs'. The flocs will be removed in the decanting centrifuges and the resultant sludge disposed off in High Density Polyethylene (HDPE) lined pits designed as per the regulatory requirements. The cleaned waste water will also be stored in HDPE lined pits and disposed off, after testing and any necessary treatment, as per the regulatory requirements.

The whole process by which the drilling fluid will be reused during the drilling operation is commonly known as a "closed loop system." This system is ideal for drilling operations in sensitive environments as it cuts down immensely on the total water consumption for the formulation of drilling mud and also saves on the consumption of chemicals. **Fig. 2.4** shows the schematic layout of the drilling waste management settings for the exploratory wells in block.

It is expected that two different types of drilling mud will be used while drilling the wells. **Table 2.2** shows generic mud program for the well. These are made up through the addition of specific mud products to adjust the mud properties to ensure that following functions are met:

i) Fluid loss control: The layer of fluid on the wall of the well bore retards passage of liquid into the surrounding rock formation. Bentonite as well as naturally occurring additives such as starch and cellulose are added.

ii) Lost circulation: Naturally occurring fibrous, filamentous and granular or flake materials are used to stop lost circulation when the drill bit enters a porous or fractured formation. Typical materials include groundnut shells and mica.

iii) Lubricity: Normally the drilling fluid is sufficient to lubricate and cool the bit. However, under extreme loading, other lubricants are added to prevent the drill string from becoming stuck.

iv) Shale Inhibition: Potassium assists in the hydration of shale which in turns prevents their sloughing into the well bore. This potassium ion is normally introduced to the mud via Potassium Chloride (KCl) or Potassium Sulphate (K_2SO_4).

v) pH control: Caustic and lime are used to control the alkalinity of the fluid to a pH of 9 to 10. This ensures the optimum performance of the polymers in the fluid and controls bacterial activity.

vi) Pressure control: Barite is generally used as a weighting agent to control down-hole pressure.

The hole section-wise use of chemicals is presented in **Table 2.3.**

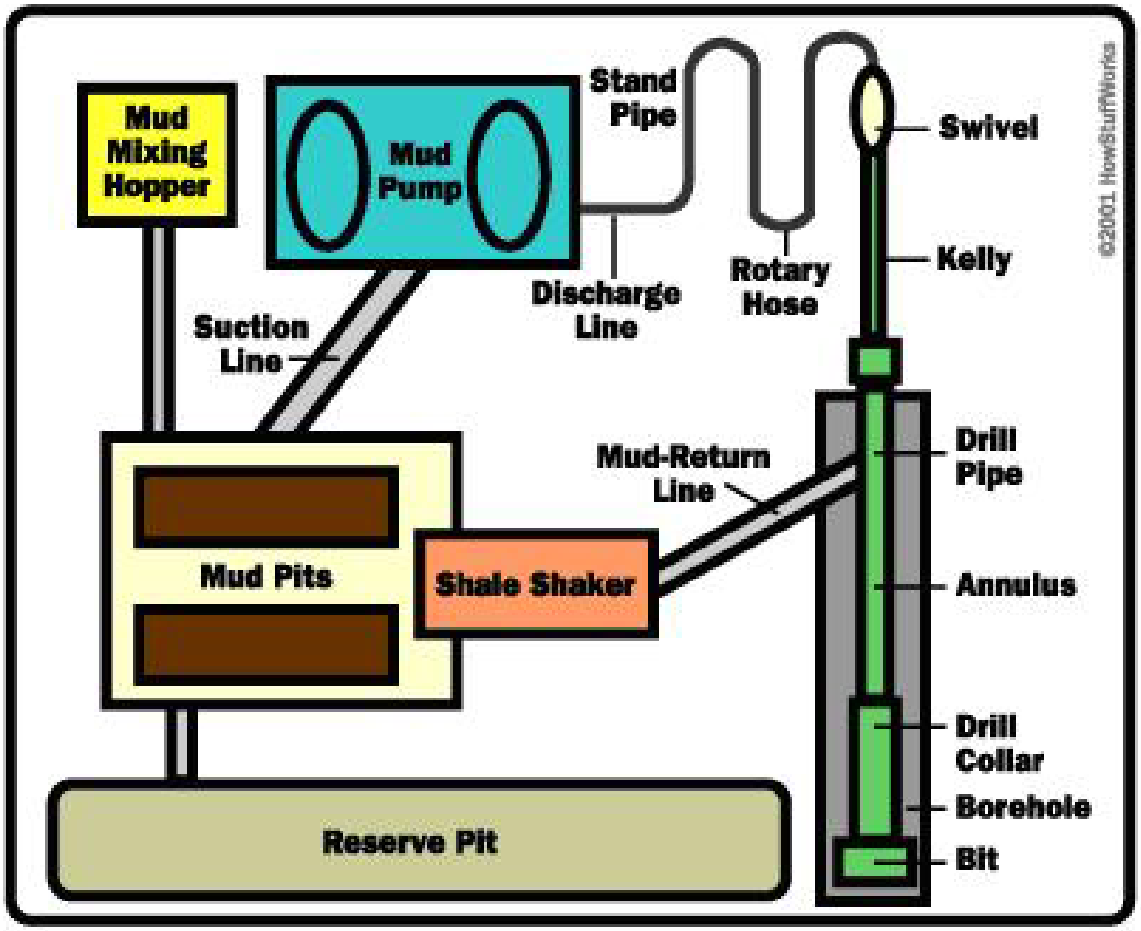

Fig. 2.4: Typical Drill Fluid Circulation System

Table 2.2: Generic Mud Program for the Wells

	Hole Depth m	Casing Depth m	Mud Type
		30" @ +/-40 m	Water
◢	26" Hole to 350 m.	20" Csg. @ 350 m.	Bentonite-PAC Mud
◢	17-1/2" Hole to 1250 m	13 $^{3}/_{8}$" Csg @ 1250 m.	K_2SO_4/Polymer mud system
◢	12¼" Hole to 2900 m	$9^{5}/_{8}$" Csg @ 2900 m.	K_2SO_4-Asphasol-Polymer mud system
◢	8-1/2" Hole to 4000 m	7" Liner @ 4000m	K_2SO_4-Asphasol- Polymer mud system

NB: Alternative option of drilling the actual prospect formation with a non formation damaging, environmentally safe "Drill-in" Fluid or Amine based mud system will also be considered.

NOTE: Detailed Mud program for exploratory wells with exact quantities of chemicals is not yet developed but a tentative Mud program is given in **Table 2.2.**

Table 2.3: Hole Section Wise Drilling Fluid Chemical Usage

26" Hole				
Product	**Function**	**Unit**	**Unit Size**	**Estimated Usage**
Barite	Weighting additive	Kg	50	As required
Bentonite	Viscosifier	Kg	50	25 Tons
Caustic Soda	Inorganic	Kg	25	2 Tons
Kwikseal	LCM	Kg	25	15 Tons
Biocide	Bacterial control	Gal	5	53 Gallons
Nut plug	LCM	Kg	25	7 Tons
Soda Ash	Calcium Control	Kg	50	0.52 Tons
17-1/2" Hole				
Product	**Function**	**Unit**	**Unit Size**	**Estimated Usage**
Barite	Weighting additive	Kg	50	As required
Bicarbonate of Soda	PH Control	Kg	50	0.6 Tons
KOH	PH Control	Kg	50	2.25 Tons
Kwikseal	LCM	Kg	25	1.5 Tons
Biocide	Bacterial control	Gallons	5	83 Gallons
PAC	Filtrate Control	Kg	25	18 Tons
Starch	Filtrate Control	Kg	25	1.5 Tons
Pot. Sulphate	Hole stabilization	Kg	50	150 tons
Soda Ash	Calcium Control	Kg	50	0.6 tons

12-1/4" Hole				
Product	**Function**	**Unit**	**Unit Size**	**Estimated Usage**
Barite	Weighting additive	Kg	50	307 Tons
Bicarbonate of Soda	PH Control	Kg	50	0.75 Tons
Calcium Carbonate C	LCM	Kg	25	14 Tons
Citric Acid	PH Control	Kg	25	0.75 Tons
Douvis	Rheology Control	Kg	25	1.9 Tons
Caustic Soda/ KOH	PH Control	Kg	50	2.4 Tons
Biocide	Bacterial control	Gallons	5	75 Gallons
Poly-Sal/PAC	Filtrate Control	Kg	25	9 Tons
MICA/Starch	Filtrate Control	Kg	25	1.5 Tons
Pot. Sulphate	Hole stabilization	Kg	50	8.5 Tons
Soda Ash	pH Modifier	Kg	50	0.3 Tons
8-1/2" Hole				
Product	**Function**	**Unit**	**Unit Size**	**Estimated Usage**
Barite	Weighting additive	Kg	50	105 Tons

Bicarbonate of Soda	PH Control	Kg	50	0.375 Tons
Calcium Carbonate	LCM	Kg	25	9 Tons
Douvis	Rheology Control	Kg	25	1.9 Tons
EP Lube	Lubrication	Gallons	55	990 Gallons
Glycol	Cloud point	Gallons	55	2700 Gallons
KOH	PH Control	Kg	50	1.5 Tons
Biocide	Bacterial control	Gallons	5	83 Gallons
Poly-Sal/PAC	Filtrate Control	Kg	25	4.5 Tons
Starch	Filtrate Control	Kg	25	0.75 Tons
Pot. Sulphate	Hole stabilization	Kg	50	19 Tons
Soda Ash	Calcium Control	Kg	50	0.15 Tons

2.4.4 Cementing Program

Cementing is a necessary aspect of drilling oil and gas wells. Cement is used to

- Secure/support casing strings
- Isolate zones for Production purposes
- To solve various hole problems

Cementing utilizes Portland cement (API Class G Oil Well Cement) with various additives in small quantities as accelerators/retarders, density adjusters, dispersants, fluid loss additives, anti gas migration additives, etc. Detailed cementing program for exploratory wells with exact quantities of chemicals is not yet developed but a tentative outline-cementing plan is given in **Table 2.4.**

Table 2.4: Outline Cement Program

Hole size	Casing size		Interval m TVD	Cement height m TVD	Slurry weight ppg	Excess allowed on gauge hole
-	30”		pre-set at +/-40 m below surface	Up to cellar floor	-	-
26”	20”	Lead	Surface – 350 m	350 m	13.2	100% *
17 1/2”	13 3/8”	Lead Tail	150 – 1000 m 1000 – 1250 m	850 m 250 m	13.2 15.8	40% *
12 1/4”	9 5/8”	Lead Tail	1000 – 2700 m 2700 – 2900 m	1700 m 200 m	13.2 15.8	30% *
8 1/2”	7”	Lead Tail	2800 – 3700 m 3700 – 4000 m	900 m 300 m	13.2 15.8	10% *
6”**	4 1/2”					

* Actual cement volume in 81/2” hole will be based on calliper logs.
**Contingency hole size.

2.4.5 Well Evaluation

i) Well Logging

Between the drilling operations for different zones, logging operations are undertaken to provide information on the potential type and quantities of hydrocarbons present in the target formations.

Technicians employed by a specialist logging Service Company do well logging. There are many different well logging techniques including electric, sonic and radioactive logging. Logging instruments (sensors) are attached to the bottom of a wire line and lowered to the bottom of the well. They are then slowly brought back, the devices reading different data as they pass each formation and recording it on graphs, which can be interpreted by the geologist, geophysicist and drilling engineer. There are no emissions to the environment associated with wire line logging operations. The radioactive source required for well logging operations will be kept in specially designed container.

ii) Well Testing

Normally, in the event that hydrocarbons are encountered in sufficient quantities, as determined by electric wire line logs, a temporary drill stem test string may be run and the well fluids flowed to surface and processed using a surface well testing package, involving the oil being stored and trucked off site and associated gas being flared to atmosphere.

For this block wells, block operator is planning a series of MDT Test, which involves sampling the reservoir formation and pressure points during logging operations and reduces the requirement to flow hydrocarbons to the surface, significantly reducing the atmospheric emissions associated with the testing operation.

2.4.6 Completion of Drilling

On completion of activities, the well will be either plugged and suspended (if the well evaluations indicate commercial quantities of hydrocarbons) or will be killed and permanently abandoned. In the event of a decision to suspend the well, it will be filled with a brine solution containing very small quantities of inhibitors to protect the well. The well will be sealed with cement plugs and some of the wellhead equipment (Blind Flange) will be left on the surface (Cellar).

If the well is abandoned it will be sealed with a series of cement plugs, all the wellhead equipment will be removed leaving the surface clear of any debris and the site will be restored per the protocols discussed in section 2.6.8

2.4.7 Rig Demobilization

Demobilization will involve the dismantling of the rig and residential camp, and transporting it out of the project area. It is expected that demobilization will take approximately 30 days and will require around 50 truckloads.

2.4.8 Restoration and Rehabilitation

If no indications of a commercial quantity of oil or gas are encountered either before or after testing, the well will be declared dry, accordingly plugged and abandoned, and the site restored in line with local regulations and good industry practice. As a minimum, the following steps will be undertaken to restore and rehabilitate the area:

- The wellhead and all casing string will be cut off to a minimum depth of 3 m (10 ft) below ground level.
- All concrete structures will be broken up, and the debris disposed off as per the regulatory requirements.
- All other waste products, solid and liquid, will be disposed of in accordance with the requirements of the EIA and will be treated to render them harmless.

- All fencing and access gates will be removed.
- All pits whose contents would show regulatory compliance for on-site disposal, at the time of site closure, will be backfilled and closed out as per the legal requirements. Tree plantation will be done on the closed pits to restore the original top soil conditions.
- That portion of the access track likely to be of no use for other exploratory wells in the reserved forest will be restored by removing cross drainage structures.

2.4.9 Staffing

The total number of personnel involved in the road & site construction and Drilling activities for each well is expected to be between 50-100 and 80-100 respectively. At any one time there will be 25-35 staff and security personnel on the well site thus a small accommodation area will be set up to provide boarding & lodging.

2.4.10 Supplies during Well Drilling

All supplies, both for the drilling rig and machinery and for the camp at the well site as well as drilling site will be transported from available locations. This will include all fuels and oils, chemicals for drilling mud, spare parts for the rig and vehicles, and food and other supplies for the residential camp. Fuels, oils, and chemicals will be unloaded in designated areas with impermeable floors (either concrete or covered with an impermeable material) and lined by dykes or walls to prevent soil and water contamination from spills.

i) Fuel

It is estimated that approximately 15-20 kiloliters per day of fuel (high speed diesel) will be required during the drilling operation for generation of maximum 7000 kW power for all uses for each well. The fuel will be provided by the drilling contractor and transported to site in tankers.

ii) Water

During the drilling process, a maximum of 20 m^3 (20,000 liters) of water will be required per day to run the drill rig continuously, 24 hours a day. The total water requirement for the drilling phase is estimated to be 1200 m^3 for each well.

Block operator will drill bore holes to tap ground water at the well location to meet the water requirement during drilling or bring water from nearest surface water source.

iii) Electricity

Diesel generators will be used to generate power to operate the drill rig and for the residential camp. It is expected that four diesel-engine generators, each with a capacity of 448 kW, will be sufficient for rig operations. Three generators will be used at a time and one will be kept on standby. A 63 kW generator will be available for lighting and other emergency requirements.

iv) Chemical Usage

Various chemicals will be used during the drilling phase. At the planning stage, an estimate of the potential usage for every chemical will be made. Some of the major chemicals which are planned to be used for the drilling campaign are as follows:

i. Barite
ii. Defoamer

iii. Chrome free Lignosulphate
iv. Shale Inhibitor.
v. Oxygen Scavenger
vi. Sodium Bicarbonate.
vii. Bentonite
viii. Caustic Soda-only on drums.
ix. Concentrated Corrosion Inhibitor.
x. PAC (Polyanionic Cellulose)
xi. Xanthum Gum
xii. Bactericide.
xiii. Cloud Point Glycol
xiv. Mica
xv. Nut plug
xvi. Kwik-Seal.
xvii. Wyoming Bentonite.

During the operation chemical usage will be monitored and efforts will be made to reduce or conserve chemical usage as much as technically possible.

2.4.11 Waste Streams

The following types of wastes are likely to be generated during exploratory drilling:

- Drill Cuttings: comprising of drilled formation cuttings, mainly comprise of shale, sands and clay;
- Waste drilling fluid (mud): Generated from treatment of return drilling fluid from well for solids removal;
- Drilling Wastewater: The drilling wastewater generated as a result of washings of drilling cuttings, silt and sand comprises of chemical ingredients of drilling fluid thereby rendering effluent to be polluted and needs prior treatment before discharge to meet the given criteria for its discharge;
- Chemical Sludge: Wastewater treatment would result in generation of chemical sludge.
- Hydrocarbon Wastes: Waste oils from oil changes or leakage from equipment or diesel storage tanks. Used oil (from engine oil changes) is designated as hazardous;
- Non hazardous solid waste: Non hazardous wastes like paper, wood, plastics, containers, etc.,
- Off specified hazardous wastes: Off specified hazardous wastes are Containers (including poly bags) holding hazardous ingredients like fluid, or testing chemicals, or previously holding volumes of hazardous chemicals or used batteries, etc.; and
- Medical Wastes: Medical wastes like bandages; syringes; etc are also classified as hazardous.
- Biodegradable waste: The drilling/camp site would generate food waste or fallen leaves constituting biodegradable wastes.
- Air Emissions: The air emissions are expected from the proposed exploratory drilling will be from combustion of diesel in the diesel generators to meet power requirement of the drilling rig.

2.4.12 Noise, Air Emissions, Effluents, and Solid Waste Generation

i) Noise

Noise is likely to be generated by the following drilling activities:

- Vehicular traffic on the access road
- The operation of diesel generators and other equipment at the well site

Measured at a distance of 15 m, vehicular traffic is expected to generate 60 to 70 dBA of noise and the rig between 70 to 98 dBA.

ii) Air Emissions

Emissions produced during the drilling phase will consist of the following:

- Dust emissions from vehicular traffic on roads
- Exhaust emissions from generators at well site
- Emissions from flares during testing and any abnormal drilling operations
- Exhaust fumes from vehicles

The proposed each drilling site will have four diesel generators each of 448 kW capacity.

No treatment of air emissions is expected as these involve burning of diesel with low Sulphur content (< 0.1%).

iii) Effluents and Solid Waste

All efforts will be made to minimize the waste generated while the project is in progress. The main types of waste that will be generated are:

- Drill cuttings, waste mud, sludge and waste water
- Used fuels and chemicals
- Used oil and filters
- Sewage
- Camp waste
- Medical waste

iv) Drill Cuttings, Waste Mud, Sludge and Waste Water

A water-based mud system will be used to drill each exploratory well and a base salt (Potassium Sulphate) will be added to the system to avoid borehole instability problems. Dry cuttings will be disposed in an HDPE lined pit. Waste mud, sludge and waste water will be stored on site in HDPE lined pits and will be tested to ascertain hazardous or non-hazardous nature. All HDPE lined pits will be 1mm thick impervious layer. If non hazardous, pits with these wastes will be closed as per regulatory pit closure protocols. In case of hazardous status, drilling wastes will be disposed as per the Hazardous Wastes Management & Handling Rules, 1989 and amendments 2000 and 2003.

v) Fuels and Chemicals

Used fuels, oils, and chemicals will be stored in containers in areas lined with impervious floors and surrounded by containing dykes at the rig site. Recyclable material will periodically be transported out of the project area and given to the contractors. Disposal of off specified hazardous wastes is to be ensured through the suppliers of the material.

Block operator, through its suppliers, ensure that all surplus or residual chemical additives will be given back to them on restocking basis.

vi) Used Oil and Filters

Garage waste, such as used Oil & filters and spare parts, can largely be recycled. All such waste will be collected and transported out of the project area and sold to recycling contractors.

vii) Sewage

As part of the site preparation stage, a drainage and sewerage system will be constructed for the camp and the rig. The sewerage system will consist of soak pits for the collection and treatment of wastewater from the camp kitchen, laundry, and showers. Water from the soak pits will be sprayed over the ground allowing it to soak away or evaporate.

Sewage from toilets will go into septic tanks from where, after being treated, the wastewater will go into a soak pit and the semi-solid waste will be collected.

viii) Medical Waste

Small amounts of medical waste like used syringes, bandages, empty medicinal bottles and other used items will be generated. Usually this may not be more than few kgs (5-10 kgs). After proper segregation, this waste will be given to the local hospital for proper disposal.

ix) Camp Waste

It is expected that paper, plastics, metal wood, kitchen and food waste will be generated during the drilling operations. All camp wastes will be segregated at the segregation pit built at the well site. All biodegradable waste (food & kitchen waste) at the drilling site is to be collected and disposed off into two small humus pits (each of 2m x 2m x 1.5 m) within the drilling site area away from common use by rig crewmembers. The humus pits are to be covered with soil on daily basis to avoid any odour nuisance due to decomposition and check any contact with the flies or insects. Any non-combustible and non-biodegradable waste, such as glass, metal, and plastic, will be separated and transported out and given to a contractor for recycling.

2.4.13 Total Project Cost

Cost for Geophysical, Geological and Satellite Survey - USD 6 Million ~ INR 24 Crores.
Exploratory Drilling – USD 16 Million ~ INR 64 Crores.