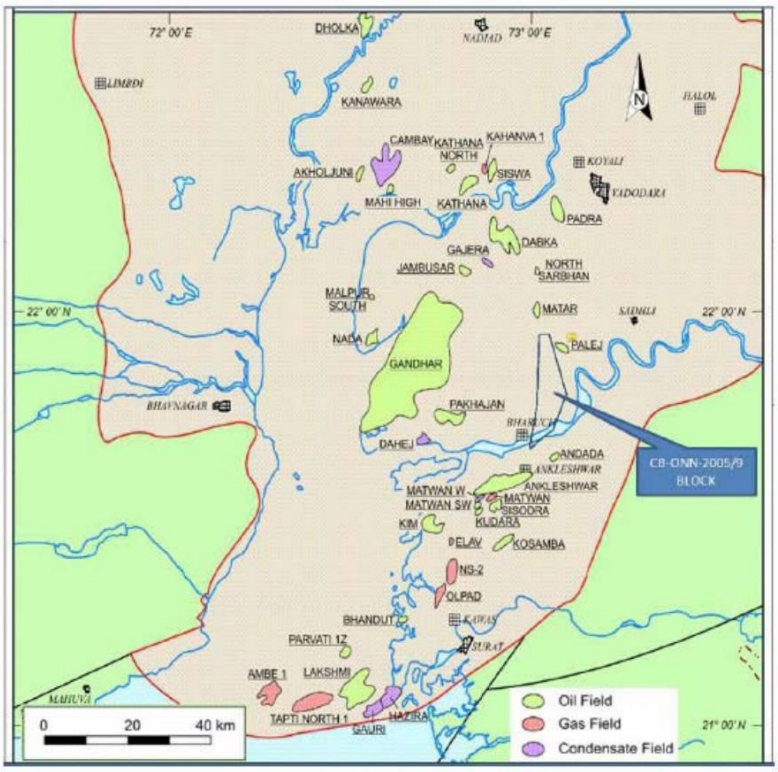
M/ S MERCATOR PETROLUM LIMITED

PRE-FEASIBILITY REPORT: ONSHORE OIL AND GAS EXPLORATION, PRODUCTION AND DEVELOPMENT IN BLOCK CB-ONN-2005/9 IN BHARUCH DISTRICT, GUJARAT

NOVEMBER 2017



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QUALITY CONTROL							
Name of Publication	Onshore Oil and Gas Development & Production for the Block CB-ONN-2005/9 in Bharuch District, Gujarat						
Project Number	1731540210	**Report No.**	1	**Version**	1	**Released**	Nov, 2017
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CONTENTS

1 EXECUTIVE SUMMARY

Mercator Petroleum Ltd. (MPL) is a wholly own subsidiary of Mercator Ltd. (ML). MPL is engaged in the business of Petroleum Exploration, Development and Production in India and abroad.

Exploration block CB-ONN-2005/9 (referred to as CB-9) was awarded to Mercator Petroleum Limited (MPL) by the government of India under the NELP-VII round of bidding. The block is located in the onshore part of Cambay Basin in what is known as Bharuch – Jambusar Tectonic Unit. MPL has 100% Participating Interest (PI) and Operatorship of the block.

The original area of the block was approximately 170 km², but due to habitation in the southern side of the block, exploration area was curtailed to 132.22 km², the block is located in Bharuch and Vadodara Districts in one of the highly industrialized centers of Gujarat state.

After award of block MPL has obtained Environment clearance from MOEF&CC for drilling 15 exploratory wells in the block vide letter J-11011/12/2011- IA II (I) dated 26th September,2012.

MPL proposes drilling of up to 15 new development wells (including water injector wells) along with 2 existing discovery wells (Jyoti-1 and Jyoti-2) which will be re-completed, through appropriate workover jobs and converted to production wells. Construction of Production facilities (EPS) is planned nearby to Jyoti-1 well site. Although the block covers two districts, the proposed wells and production facility will be located in Bharuch District only.

MPL intends to drill wells to a depth of about 3200 meters This would take around 45 days' time for each well. The approximate capital cost of the project would be about ~ INR 200 Crores.

The production facility is planned to be built near well Jyoti-1. From the production facility crude oil will be transported by pipeline (by a new hot tap or to the hot tapping point operated by HOEC roughly 20km away) OR via road tankers either to CTF, Ankleshwar owned by ONGC (roughly at a distance of 50km) for onward pumping to the IOCL's Koyali Refinery. Separated gas from production separator and heater treater will be routed into Flash Gas compressor Skid for gas intermediate compression. Part of gas from the production separator, heater treater and test separator (when active) will be routed to gas scrubber to remove entrained liquids before it can be sold off. This will be done through gas compression system, metering and gas pipe.

The production facility is planned to handle nearly 6000 BOPD oil, 6400 BLPD produced water and 1.0 MMSCFD gas.

Power requirement during drilling would be met by DG sets while Power for the production facilities is planned to be sourced from nearest feeders of Gujarat Electricity Board (GEB). In case of power outage, emergency generators (on temporary basis) will take-up the emergency load.

For drilling operation and maintains of drilled site have various water requirements. The most significant requirements is for mud preparation & cement preparation. The other requirements would be for engine cooling, floor / equipment / string washing, sanitation, fire-fighting storage / make-up and drinking. The requirement of water as a provision-for emergency firefighting would initially be around 100 m^3 and make-up of the same will have to be made on a regular basis. Water requirement during drilling would be 40 KLD per well while during EPS operation about 2 KLD water will be required, which include domestic, green belt development and firefighting makeup.

Wastewater in the form of Drill cutting washing + Rig washing+ cooling etc. is expected to be generated at an average rate of around 5 m^3/day during the drilling operations from a single well. Waste water will be generating and it will be discharged in to HDPE lined pit at site for evaporation

Produced water generated due to separated water from production separator, heater treater and test separator at production facility will be first treated to meet the regulatory requirements and stored in water storage tank and then can be trucked or pipes to one of the nearby existing wells Jyoti-3 or Jyoti-4 or Jyoti-6 for disposal through reinjection, in case of shortfall, water shall be made available from alternate sources.

It is estimated that 400 MT of drill cuttings/well will be generated in the form of waste during drilling operation which will be disposed off as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 while at production facility following waste will be generated

- Waste oil / used oil shall be utilized for internal purpose or disposed off as per regulations.
- Oily cotton waste shall be handed to authorized disposal site.
- Used chemical drums generated shall be handed over to authorized dealers.
- ETP sludge which will be disposed off at TSDF

The project will help in contributing to the ongoing efforts of the Government to meet the demand of crude oil and gas from domestic sources and thereby also help in saving foreign exchange resource.

The proposed activities shall generate indirect employment in the region due to the requirement of workers in supply of raw material, auxiliary and ancillary works, which would marginally improve the economic status of the people. The service industries of Hotel, transportation etc shall also be boosted due to movement of people in and around the area.

Thus, it can be concluded on a positive note the proposed activities by MPL will have overall beneficial impact and will continue to benefit the local community.

2 INTRODUCTION OF THE PROJECT

2.1 Identification of project and project proponent

2.1.1 Project Proponent

Mercator Petroleum Ltd. (MPL) is a wholly own subsidiary of Mercator Ltd. (ML). ML is one of the second largest private sector shipping companies in India in terms of tonnage. The fleet size of the company is one of the largest in private sector in India and has prominent presence in major navigation routes. ML also has a dredging division and has one of the largest Dredging fleet in the private sector in India.

Through its other subsidiaries ML has ventured into coal mining & trading in Indonesia. ML is listed on the Bombay Stock Exchange & National Stock Exchange.

MPL is engaged in the business of Exploration and Production of Petroleum projects in India and abroad.

2.1.2 Project Background

The block CB-ONN-2005/9 (referred to as CB-9) was awarded to Mercator Petroleum Limited (MPL) in the government of India under the NELP-VII round of bidding. The block is located in the onshore part of Cambay Basin in what is known as Bharuch – Jambusar Tectonic Unit MPL has 100% PI and operatorship of the block.

The original area of the block was approximately 170 km², but due to habitation in the southern side of the block, exploration area was curtailed to 132.22 km², the block is located in Bharuch and Vadodara Districts in one of the highly industrialized centers of Gujarat state. MPL obtained Environment clearance from MOEF&CC for drilling of 15 exploratory wells in the Block vide letter J-11011/12/2011- IA II (I) dated 26th September, 2012.

The chronology of event after award of the block to MPL is given in Table 2-1

Table 2-1: **Major Event & Their Chronology in the Block CB-ONN-2005/9**

Time	Event
December 2008	Awarded license in NELP- VII & signed production sharing contract (PSC)
June 2010	Secured PEL From Govt. of Gujarat
July 2010	Formed Management committee (MC) with DGH, India and had first MC meeting
August 2010	Commenced exploration work on the blocks
November 2011	Completed seismic data acquisition
March 2012	Completed the seismic data processing
September 2012	Received Environmental Clearance for exploratory drilling of 15 wells
May 2014	Extension of exploration phase -1 from June 2014 till December 2014 (1st 6 month extension to be set off from exploration phase-II)
May 2014	Commenced drilling of Jyoti-1
November 2014	Extension of exploration phase – 1 from December 2014 till December 2015 (under excusable delay due to delay in receipt of Environment Clearance)
May 2015	Commenced well testing for Jyoti – 1. oil flowed to surface (1st Oil discovery)
June 2015	Commenced drilling of Jyoti- 2

Time	Event
August 2015	Commenced well testing for Jyoti – 2, oil flowed to surface (2nd oil discovery)
October 2015	Appraisal plan for the two oil discoveries (Jyoti- 1 & 2) submitted to DGH
November 2015	Commenced drilling of Jyoti-3
December 2015	Commenced drilling of Jyoti-4
October 2016	Extension of exploration phase-1 from December 2015 till March 2016 (under excusable delay due to delay in receipt of CTE)
March 2017	Submitted declaration of commercially (DOC) for Jyoti 1 & 2 discoveries.
April 2017	Extension of exploration phase- 1 from April-2017 till April 2018 (under policy A3 of MoPNG , the period between March 2016 & April- 2017 was also regulation due to delay in grant of approval
April 2017	Commenced drilling of Jyoti-5
May 2017	DGH reviews Documents
August 2017	Commenced drilling of Jyoti -6
August 2017	DGH advises MPL to go ahead with submitting the field development plan (FDP) within the stipulated time period as per PSC

2.1.3 Proposed Project

MPL proposes

- Drilling of up to fifteen (15) new wells – with a mix of development well & water injector wells,
- 2 existing discovery wells (Jyoti-1 and Jyoti-2) will be re-completed, as planned through appropriate workover jobs and converted to development/ production wells.
- Construction of Production facilities (EPS) at a location near to Jyoti-1

2.2 Brief description of nature of the project

The proposed project is onshore oil and gas exploration, development and production which is covered under schedule 1(b) of EIA notification 2006.

2.3 Need for the project and its importance to the country and or region

Cambay Basin is an established Oil and Gas production area in India. The Block CB- 9 falls within the Cambay Basin and is surrounded by various producing fields such as Palej, Ankleshwar and Gandhar Fields. The Block is in similar setting to these fields but has not been explored till date for hydrocarbons. Exploration in the block lead to discovering of new hydrocarbon fields.

The demand for petroleum has recorded a considerable increase over the years from 30 million tons in 1980-81 to about 250 million tonnes at present. This growing demand poses a big challenge to oil producing companies.

The seismic survey followed by exploratory drilling undertaken by MPL in this Block lead to discovery of petroleum reserves that will help to meet some part of the rising oil and gas requirements of the country. Also, new oil finds of the block will lead to reduction in India's dependence on imported crude oil and thereby result in saving in foreign exchange.

2.4 Demand-Supply Gap

India currently imports around 85% of its crude oil requirement and only 15% produced within the country against total requirement.

2.5 Import vs. Indigenous production

India currently imports around 85% of its crude oil requirement and only 15% produced within the country against total requirement

2.6 Export Possibility

Nil, as 85% of total requirement is fulfill through import.

2.7 Domestic/ Export Markets

All produced crude oil can be refined in India and sold locally. In case of gas, it would be fed through the existing pipeline within the nearby regions within the state of Gujarat.

2.8 Employment Generation (Direct and Indirect) due to the Project

2.8.1 Direct

Drilling

About 5persons will be deployed at the drilling rig for a short duration of about 45 days at each well.

Production Facility

About 10 persons will be deployed at production facility.

2.8.2 Indirect

People would be engaged in providing support services to the drilling operation including warehouse support (managing the logistics of securing and supplying the required materials for the project).

Hydrocarbons produced will be sold to customers for use or further processing. This will generate additional economic demand that could translate into additional employment.

3 PROJECT DESCRIPTION

3.1 Type of Project including Interlinked and Interdependent Projects

As per the EIA Notification on 14th September 2006 and amendments till date by MoEF&CC, Setting up, expansion or modernization of all projects of offshore and onshore oil and gas exploration, development and production requires prior EC from the MoEF. The proposed project of onshore exploration, development and production of M/s Mercator Petroleum Limited falls under 'A' category of schedule 1(b), as already mentioned. The project is not interlinked project.

3.2 Location (Map Showing General Location, Specific Location and Project Boundary and Project Lay Out with Coordinates

Block CB-ONN-2005/9 lies in the broach tectonic block of the Cambay Basin and is located in Vadodara and Bharuch District of Gujarat State. The Map showing location of block is given below.

Location details are as follows:

- Talukas: Bharuch and Karjan
- Districts: Bharuch and Vadodara
- State: Gujarat

The coordinates of block is given in Table 3-1.

Table 3-1: Blocks-Ordinates

Block Coordinates						
Longitude				**Latitude**		
Pt.	**Deg.**	**Min.**	**Sec.**	**Deg.**	**Min.**	**Sec.**
A	73.00	3.00	32.41	21.00	43.00	24.52
X	73.00	1.00	56.14	21.00	45.00	54.60
D	72.00	59.00	45.00	21.00	45.00	30.00
E	72.00	59.00	49.00	21.00	47.00	21.00
F	73.00	0.00	8.77	21.00	55.00	13.00
G	73.00	0.00	14.00	21.00	57.00	24.00
H	73.00	1.00	26.00	21.00	57.00	16.00
I	73.00	4.00	47.06	21.00	47.00	56.60
A	73.00	3.00	32.41	21.00	43.00	24.52

3.3 Details of Alternate Sites Considered and the Basis of Selecting the Proposed Site

No alternate site has been examined, since Block CB-ONN-2005/9 has been awarded to MPL by Government of India (GoI) under a Production Sharing Contract (PSC) for exploration, development and production of hydrocarbon reserves within the block.

3.4 Size or Magnitude of Operation

MPL Proposes

- Drilling of up to fifteen (15) new wells,
- 2 existing discovery wells (Jyoti-1 and Jyoti-2) will be re-completed, as planned through appropriate workover jobs and converted to development/ production wells.
- Construction of Production facilities (EPS) nearby to Jyoti-1

3.5 Project Description

3.5.1 Drilling of Development wells

Overview of Project

Drilling operations shall be conducted round-the-clock for 24 hrs. The time taken to drill a borehole depends on the depth of the hydrocarbon bearing formation and the geological conditions. Mercator Petroleum Limited intends to drill wells to a depth of about 3200 meters. This would take around 45 days' time for each well.

There is also possibility of drilling a number of wells from a single site, which increases the time during which the site is occupied and is termed as directional drilling or cluster well drilling. Some of the wells may be drilled horizontal also to improve sweep efficiency and in turn enhance production. This mode of drilling would also reduce the land used or "foot print". A mobile drilling rig of about 1100 HP has been envisaged for drilling of wells. At the time of actual execution of work depending upon the availability of rigs in the market, the HP of the rig can be optimized. Depending upon equipment availability, at the time of project execution, 13 3/8" conductor casing may be pre-set using smaller rig prior to the main rig move on location to optimize the overall project completion time & cost. A two-casing policy with a production casing liner and a packer is the proposed completion along with a production tubing of 2 7/8".

Access and Transport

To access the drill site, care would be taken to utilize the public metaled roads as far as possible without compromising geological objectives. However, some hardening may be required over kaccha roads to provide access to some well sites and to the facilities identified for the drilling. In some cases, permanent access roads will have to be built so that equipment can be moved in and out of the locations initially and during later maintenance. While making access roads, following guidelines will be followed:

- Use of existing roads, when suitable, to prevent further land acquisition.
- Site roads along ridgelines to minimize road grades and to lessen the potential of disturbing a watercourse
- Avoid designing roads with sharp curves, blind spots, steep grades in or near streams and valleys.

The transportation of the rig, drilling and well testing equipment to (and from) the drill site will be by truck and trailer using the existing and proposed road system outlined above. Conventional oil field equipment will be employed during the drilling of the well. –60-80 truck / trailer loads are expected for delivery of this equipment over a ten day period prior to drilling of well.

Site Clearance

The site selected for proposed drilling activity shall be first surveyed topographically and site boundaries shall be marked. Land clearance for site construction at each drilling site shall practicably be minimum in order to safely accommodate the facilities required for installation.

The area of land required would be approximately of the order of 110 m x 110 m. The extent of the strengthening activities required to be carried out at the site shall depend on the season during which these activities would be carried out. Strengthening shall be done using ballast.

The primary purpose of strengthening the land is to provide sufficient load-bearing capacity to enable all construction and drilling operations to be executed safely and with minimum impact on the environment.

Site Preparation and Installation of Drilling Site Facilities

The site perimeter will be appropriately fenced in the interests of security and public safety.

Each drilling site will require following drilling facilities:

- Potable office cabins / rest rooms;
- Drilling rig foundation and cellar pit;
- Foundation / pits for ancillary equipment's;
- Space for drill rig equipment, working area and materials lay down area;
- Cutting disposal (impervious lined) pits;
- Solar evaporation pits (waste drilling fluid disposal);
- Water storage pit;
- Sewage treatment system (septic tank with soak away pits);
- Paved and contained chemical storage area;
- Above ground diesel storage tanks with paved and bunded area;
- Storm water drainage system;
- fencing

Installation of Facilities

Within the cleared site, construction will be taken up. This would include the impermeable layer (HDPE) lined for drilling fluid, drill cuttings, waste and water storage pits as required, foundations for the drilling rig and accessories, inter-connecting drains, secure storage provision for chemical, oil and waste oil, portable-cabins and a sewage treatment system (septic tank and soak away pits and piping). The mobilization of the drill site involves transportation of drilling rig in modules and erected by means of mobile cranes. The drill site equipment's are designed as modular / skid mounted type, which facilitates quick demobilization and re- mobilization. The installation of the drill site equipment's / facilities involves about 60-80 trailer loads spread over 10days. Once the site is prepared, drilling equipment, supplies and drilling personnel will be mobilized and the drilling rig will be erected.

Other Utilities

The drill site area will be fenced by high barbed wire. The drilling rig will be positioned almost in the middle of this area, when mobilized. Excavation work shall be carried out under the permit-to-work

system and in such a manner that the collapse of sidewalls is precluded. Measures shall be taken to prevent persons and livestock from accidentally falling into an excavation pit.

Raw material

Drilling mud used during the proposed drilling activity includes additives for providing viscosity, lubrication, and well bore stability etc. and use Water Based Mud (WBM), which is nontoxic and non – hazardous campaign.

Equipment Required for Drilling

Equipment that will be used for drilling include:

- Drill bit, drill string, connecting sections of drill pipes and drill collars
- Kelly (situated on the derrick floor allows the drill string to be rotated)
- Top drive / rotary table
- Drilling rig
- Swivel, to which the high pressure flexible drilling fluid hoses are attached
- Diesel engines to supply the necessary power to run the drilling operation and supporting logistic.
- BOP blow out preventer
- Tanks for mud fluid, diesel storage.

Water

Drilling operations and maintenance of the drill site facilities have various water requirements. The most significant of these requirements in terms of quantity is that for mud preparation. The other requirements would be for engine cooling, floor / equipment / string washing, sanitation, fire-fighting storage / make-up and drinking. The requirement of water as a provision-for emergency firefighting would initially be around 100 m^3 and make-up of the same will have to be made on a regular basis. The water requirement is about 40 KLD per well.

Waste Water Generation

It will be expecting that wastewater in the form of Drill cutting washing + Rig washing+ cooling etc will be generating at an average rate of around 5 m^3/day during the drilling operations from a single well. Waste water will be generating and it will be discharged in to HDPE line Pit at site for evaporation

Waste Management

The drilling rig system to be employed for drilling will be equipped for the separation of drilled cuttings and solids materials from the drilling fluid. The drill cuttings, cut by the drill bit, will be removed from the fluid by shale shakers (vibrating screens) and centrifuges and transferred to the cuttings containment area. Once the drilling fluid / mud have been cleaned, it will be returned to the fluid tank and pumped down the drill string again.

It is estimated that 400 MT of drill cuttings/well will be generated in the form of solid waste, during the drilling of a well. Drill cutting would be disposed off as per Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

3.5.2 Production Facility (EPS)

The EPS is planned to be built near well Jyoti-1. From the EPS, separated crude oil will be transported by road tankers either to CTF, Ankleshwar owned by ONGC (roughly at a distance of 50km) or to the hot tapping point operated by HOEC (roughly 20km away) for onward pumping to the IOC's Koyali Refinery.

Produced water production from the wells, after treatment to meet regulatory norms can be trucked or pipes to one of the nearby existing wells Jyoti-3 or Jyoti-4 or Jyoti-6 for disposal. That well will be used as a produced water disposal well.

The gas production from the wells is planned to be entirely sold to the consumers to ensure zero gas flaring. For this purpose, a suitable compression system to bottle CNG will be installed at the EPS itself. A flare system will also be provided to meet the technical flaring requirements such as equipment shutdown or any emergency. The flare system will comprise of flare piping, Knock-out Drum (KOD), KOD pumps and a vertical flare stack equipped with gas pilot and auto-ignition system

The EPS is planned to handle 6000 BLPD of oil, 6400 BLPD of water and Gas Production of 1.0 MMSCFD. Total installed capacity for injection is planned to handle peak injection rates of 6900 BWPD.

The new production facility shall be used as an Early Production System (EPS) which will include the following

- Well Manifold
- Production Separator (3 Phase Separator)
- Flare Assembly
- Instrumentation Gas System
- Electrical Package (transformer, power distribution board, cabling, lighting, earthing etc.)
- Heating System (Heater Treater etc.)
- Crude oil transfer pump & Storage tank
- Oil Tanker Loading and transportation for either hot tapping at Palej or to CTF Ankleshwar (to be confirmed after negotiations)
- Water storage and settling tank
- Water disposal in one of the existing wells like Jyoti-3, 4 or Jyoti-6

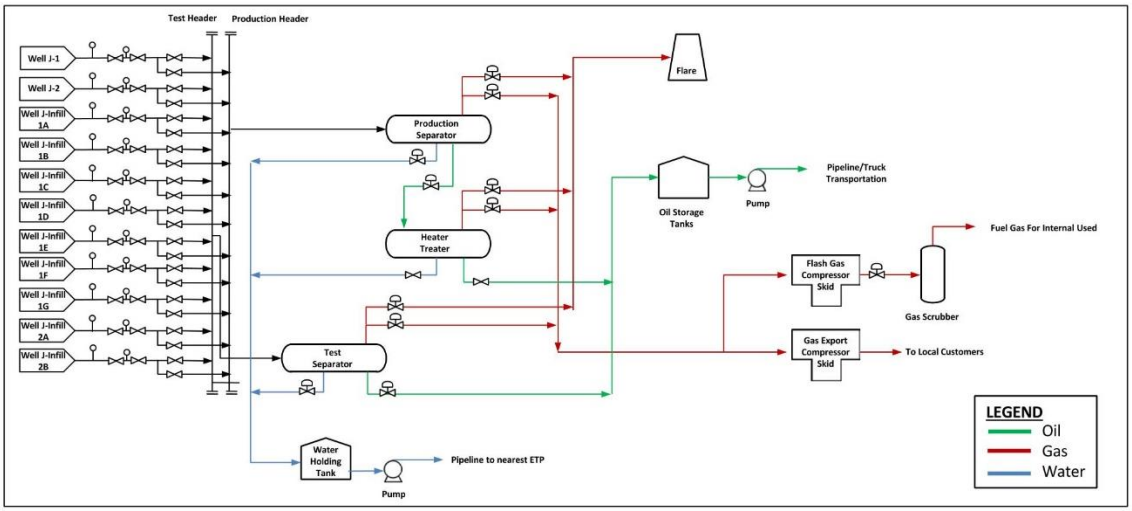


Figure 3-1: Schematic Design of EPS at Jyoti-1

Inlet Manifold

The inlet manifold will consist of

- A production header and a test header
- Slots for connecting incoming production lines and test lines from individual wells to the production header and test header, respectively
- Provision for routing wells connected by dedicated pipelines either to production header or to test header

Production Separator (Three Phase)

Production fluid will be introduced into three phase separator for liquid separation by gravity. The separated oil will be flowed into heater treater for further separation from water and gas. Water from production separator will be either treated as per the quality control requirements and then flowed into water storage tank before being trucked/pumped to disposal wells Jyoti-3, Jyoti-4 or Jyoti-6.

Heater-Treater

Liquid from production separator will flow into heater treater for further separation of liquid. Heater treater speeds up emulsion separation by heating. Heater-Treater would typically consist of a heating section free water knock out section and coalescing section. The heating section will contain the fire tube where fuel gas will be burnt to deliver heat to the oil-water mixture. Free water separated after heating will be knocked out and the remaining oil-water mixture will then move to the coalescing section where high voltage electrical grids will be used to polarize and coalesce the emulsified water droplets so that they can settle down at the bottom and exit through the water outlet piping. Oil will flow from the top of the Heater- Treater and will be routed to storage tank after cooling in Crude-Crude Heat

Exchanger.

Gas Handling

Separated gas from production separator and heater treater will be routed into Flash Gas compressor Skid for gas intermediate compression. Part of gas from the production separator, heater treater and test separator (when active) will be routed to gas scrubber to remove entrained liquids before it can be sold off. This will be done through gas compression system, metering and gas pipeline.

Flare System

The flare system will be provided to meet the technical flaring requirements such as equipment shutdown or any emergency. The flare system will comprise of flare piping, Knock-out Drum (KOD), KOD pumps and a vertical flare stack equipped with gas pilot and auto-ignition system.

Oil Storage

The stabilized crude oil will be stored in storage tanks. Four storage tanks with capacity of 45 Mbbl for each tank will be used to store the crude oil production. This is equivalent to 4 weeks of storage at peak production.

Produced Water Storage and Unloading

Separated water from production separator, heater treater and test separator (when in service) will be first treated to meet the regulatory requirements and stored in water storage tank before being pumped to effluent treatment plant via pipeline.

Other Facilities

Other facilities would include:

- Crude Oil Export Pumps
- Drain system
- Instrument air system
- Raw water treatment system
- Fire water system
- Firefighting system
- Fire and Gas detection system
- Electrical Power distribution system
- Emergency diesel generators
- Provision of custody transfer meters for gas sales to local customers, if available

Power Requirements

Power for the facilities and well sites is planned to be sourced from nearest feeders of Gujarat Electricity Board (GEB). In case of power outage, emergency generators (on temporary basis) will take-up the emergency load.

Water

During EPS operation about 2.0 KLD water will be required, which include domestic, green belt development and firefighting makeup.

Waste water generation

During EPS operation, waste water generation will be in form of domestic waste water which will be disposed through septic tank/soak pit system

Produced water generated due to separated water from production separator, heater treater and test separator (when in service) will be first treated to meet the regulatory requirements and stored in water storage tank and then can be trucked or pipes to one of the nearby existing wells Jyoti-3, Jyoti-4 or Jyoti-6 for disposal through reinjection, in case of shortfall, water shall be made available from alternate sources.

Waste Management

- Waste oil / used oil which shall be internal purpose.
- Oily cotton waste which shall be handed to authorized disposal site.
- Used chemical drums generated shall be handed over to authorized dealers.
- ETP Sludge will be disposed off in TSDF.

3.6 Cost of the Project

Approximate cost of the project is INR 200 Crore

4 SITE ANALYSIS

4.1 Connectivity

Bharuch city is about the 3.75 km from the Block. The connectivity of block through road and railway lines is given below.

By Road:

- National highway 8 passing through the block
- NH228 Connecting Ahmedabad - Dandi is at 8.5 km in W from block area
- Broad-gauge Railway line from Vadodara to Mumbai is passing through the block
- State highway from Palej to Amod is at 0.35 km in NE from Block area
- State Highway connecting Bharuch to Palej is passing through the block.
- State highway connecting Karjan to Amod is at 5km in north direction of block

By Railway:

- Vadodara Mumbai Broad Gauge Line

4.2 Land Form, Land Use and Land Ownership

Government of India awarded the Block CB-ONN-2005/9 to MPL under the National Exploratory Licensing Policy. Land for drilling wells and for production facilities will be taken on lease.

4.3 Topography (along with map)

The block area is almost flat topography with elevation varying from 3 m to 20 m across block area.

4.4 Existing land use

The entire block area is divided into following land use types

- Agriculture land
- Industrial Area
- Land with scrubs
- Land without scrubs
- Habitation
- Water bodies

Among this agriculture land is major landuse type in the block.

4.5 Existing Infrastructure

The block is located in Bharuch and Vadodara districts and well equipped with existing infrastructure like roads, rail lines, water supply, power supply, sewerage facility, telecommunication facilities, hospitals, schools etc.

4.6 Soil Classification

The texture of soil in the block area is observed clay loam type

4.7 Climatic data from secondary sources

The general agro-climate zone of the study area is Semi-Arid.

Information presented in subsequent paragraphs is from the Indian Meteorological Department (IMD), Long Term Climatological Tables, 1961-1990, Bharuch. These tables give useful information about a region's weather, since they are collected over a 30-year period.

4.7.1 Temperature

Mean daily maximum temperature is recorded in the month of May at 43.8°C. From October to December, both day and night temperatures begin to decrease rapidly.

January is generally the coldest month, with minimum morning temperature at 11.3°C. During the post-monsoon months of October and November, day temperatures remain between 16.7-35.9ºC.

In winters, i.e. December, January and February, average day temperatures remain between 11.3-33.5ºC.

4.7.2 Wind

Table 4-1: Predominant Wind Direction (IMD Bharuch)

Month	Predominant Wind					
	First		Second		Third	
	Morning	Evening	Morning	Evening	Morning	Evening
January	NE	NE	SW	SW	SE	SE
February	NE	NE	NW	NW	SW	SW
March	SW	SW	NE	NE	SE	SE
April	SW	SW	NW	NW	SE	SE
May	SW	SW	NW	NW	SE	SE
June	SW	SW	SE	SE	NW	NW
July	SW	SW	S	S	W	W
August	SW	SW	W	W	NW	NW
September	SW	SW	NW	NW	W	W
October	SW	SW	NE	NE	SE	SE
November	NE	NE	SE	SE	SW	SW
December	NE	NE	SE	SE	SW	SW

4.7.3 Rainfall

The rainfall in the district is received during the south – west monsoon season from June – September. July is normally the month with the highest rainfall. The annual average rainfall of last thirty years in the district across talukas varied from 889 mm in Bharuch to 518 mm in Amod with the district average of 707 mm.

The average rain fall during the last decade (2003 to 2012) is 707 mm.

4.7.4 Cloud Cover

The area remains cloudy between the months of June – September, which is the active period of the monsoon season.

4.7.5 Humidity

Most humid conditions are found in the monsoons, followed by post-monsoons, winter and summer in that order. Mornings are more humid than evenings and humidity ranges from a high of 81 – 90% in monsoon mornings to a low of 29 – 39% in summer evenings. During post-monsoon season, in morning humidity remains between 73 – 76% and in the evening it remains between 42 – 46%.

4.8 Social Infrastructure available

As given in Topic 4.5.

5 PLANNING BRIEF

5.1 Planning Concept

Type of Industry: Oil and Gas Exploration, Development and Production

Facilities: Drilling rig, drilling platform

Transportation: Material will be transported through trucks and manpower through cars to and from the drilling rig during drilling operation, transportation of crude oil from production facility would be through by road tankers either to CTF, Ankleshwar owned by ONGC (roughly at a distance of 50km) or to the hot tapping point operated by HOEC (roughly 20km away) for onward pumping to the IOC's Koyali Refinery

Town and Country Planning Development Authority Classification: not applicable, since this is a drilling project

5.2 Population Projection

Not applicable since the project entails drilling of wells for a short duration and development of production facility which required very few people for operation.

5.3 Land use planning (breakup along with green belt etc)

As mentioned in 5.2 above. Details will be provided in EIA report.

5.4 Assessment of Infrastructure Demand (Physical & Social)

Existing infrastructure is adequate and with respect to the proposed project.

5.5 Amenities/Facilities

The project entails drilling of wells and development of production facilities in block, villages and towns in study area have fairly good infrastructure and communication facilities.

6 PROPOSED INFRASTRUCTURE

6.1 Industrial Area (Processing Area)

Not applicable.

6.2 Residential Area (Non-Processing Area)

Not applicable. Accommodation for the duration of the drilling would be provided at drill site.

6.3 Greenbelt

Greenbelt will be developed only at production facility

6.4 Social Infrastructure

Discussed in Chapter 4, Section 4.5

6.5 Drinking water management (source & supply of water)

Discussed in Chapter 3, Section 3.5.1, 3.5.2

6.6 Sewerage system

Discussed in Chapter 3, section 3.5.1, 3.5.2.

6.7 Industrial Waste Management

Discussed in Chapter 3, Section 3.5.1

6.8 Solid Waste Management

Discussed in Chapter 3, Section 3.5.1, 3.5.2

6.9 Power Requirement and Supply / Source

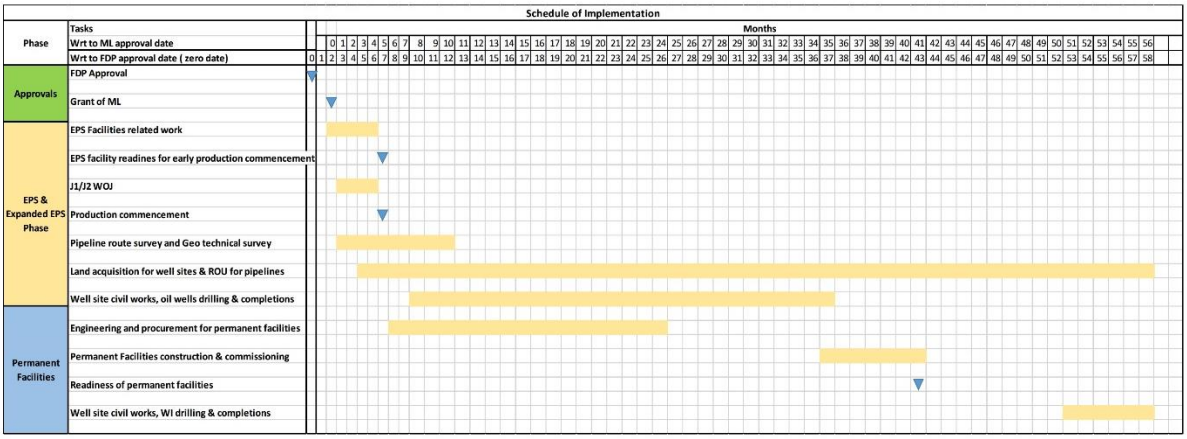
Discussed in Chapter 3, Section 3.5.1, 3.5.2

7 REHABILITATION AND RESETTLEMENT (R& R) PLAN

No rehabilitation and resettlement is either required or proposed for the project.

8 PROJECT SCHEDULE AND COST ESTIMATES

8.1 Project Schedule



8.2 Estimated Project Cost Along with Analysis in Terms of Economic Viability of the Project

The project is economically viable and the Declaration of Commerciality has already been reviewed by DGH on 30th May 2017. The project will be gradually ramped up during which 15 wells including water injection wells shall be drilled while the 2 existing exploration wells shall be converted to production wells entailing a cost of about Rs 170 crores. The wellsite & infield pipelines shall cost another Rs 20 crores. About Rs 10 Crores is kept as contingent.

Below is the table of Economic analysis was carried out based on the CAPEX, OPEX and production forecast in the Base Case

PROJECT NPV ($US Mln) (Pre-Tax)				
Oil Price, $US/bbl	Project NPV @ 0%	Project NPV @ 7%	Project NPV @ 10%	Project NPV @ 15%
40.00	778	510	437	347
50.00	1008	661	566	450
60.00	1237	811	696	554
70.00	1467	962	825	658

9 ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

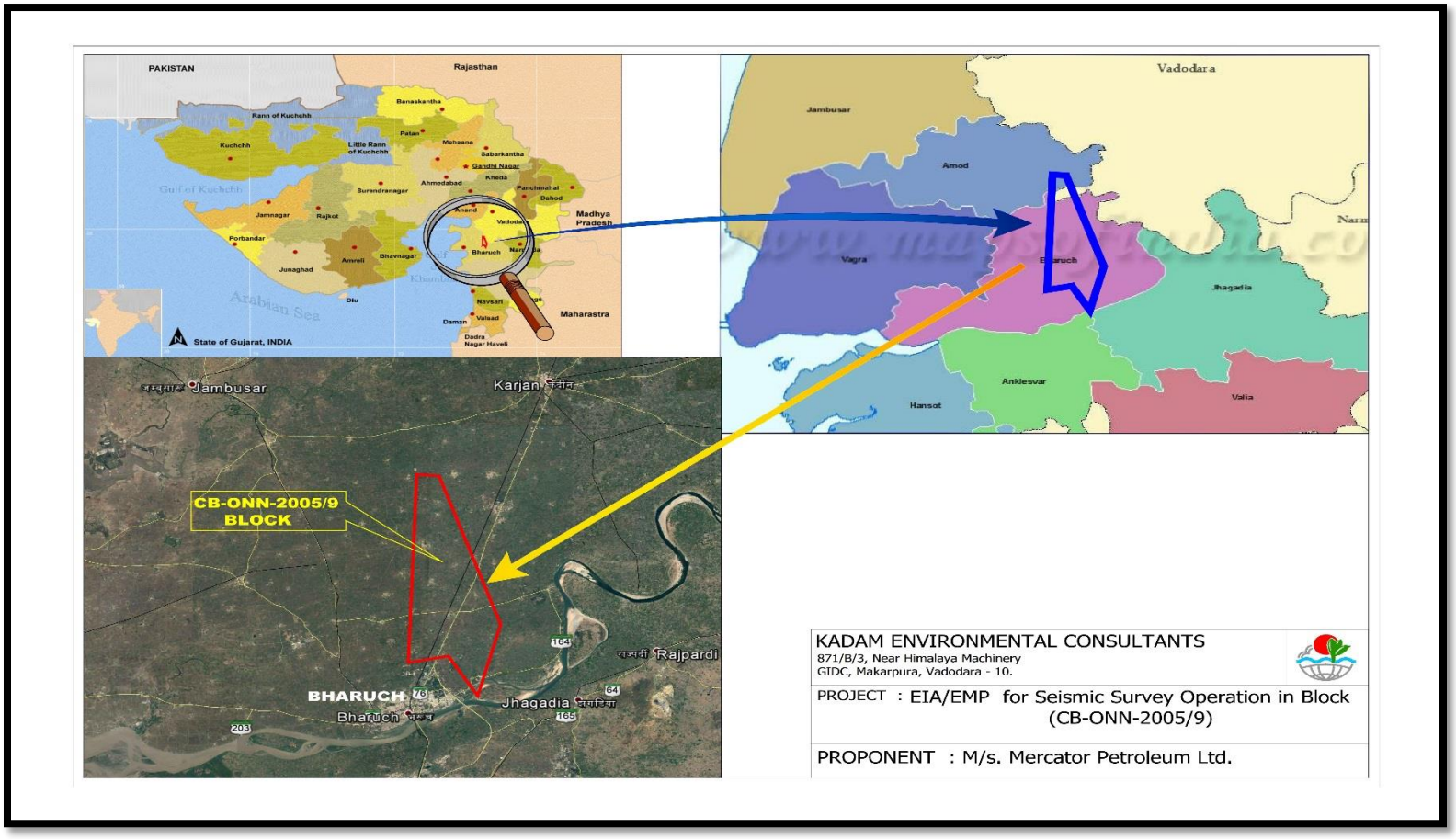
Critical analysis of the existing socio-economic profile of the area vis-à-vis its scenario with proposed project activities identifies the following:

The project will help in contributing to the ongoing efforts of the Government to meet the demand of crude oil and gas from domestic sources and thereby also help in saving foreign exchange resource.

The proposed activities shall generate indirect employment in the region due to the requirement of workers in supply of raw material, auxiliary and ancillary works, which would marginally improve the economic status of the people.

Thus, it can be concluded on a positive note the proposed activities by MPL will have overall beneficial impact and will continue to benefit the local community.

Annexure 1: Location Map of Block



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