

1.0 Pre-Feasibility report:

Ahmedabad field is situated 12 km south-east of Ahmedabad city in southern part of the Ahmedabad-Mehsana tectonic block of Cambay Basin. Its areal extent is about 50 Sq. Km. The pressure in this sector is near to initial pressure of 195-205 Kg/cm². Hirapur area is located in south-east sector of Ahmedabad field which is having good potential and requires comprehensive development scheme for better recovery. Hence, a total of 32 new wells are proposed to be drilled in this south-east sector of Ahmedabad field which includes 27 oil producer wells and 05 Water injector wells. In view of drilling of 32 new wells in south-east sector (Hirapur area) of Ahmedabad field where already 13 wells are existing, it is proposed to create new Quick Production System (QPS) to process 155 m³/day of liquid and 50,000 scmd of gas at AM#37 well site. Hence, a total of 45 wells shall be connected to the proposed QPS.

Thus, there is urgent need of enhancing the oil and gas by constructing and operating Ramol QPS to handle the peak production of about 155 m³/day and 50,000 scmd of gas and thus adequately monetize the resources in the interest of nation.

1. All the existing Oil and Gas processing facilities in the Ahmedabad field, are maintaining third party certified Environment Management System based on ISO 14001, integrated with Quality Management System (ISO 9001) and Health and Safety Management System (OHSAS 18001). This implies that all the environmental risk along with health and safety risks have been identified and being managed. All these facilities are operating under consolidated consent and authorization (CCA) from Gujarat Pollution Control board (GPCB). Regular monitoring of stacks, ambient air, produced water, noise and vibration, hazardous waste etc. is carried out by third party and returns are filed with GPCB online on monthly and annual basis. All the Effluent Treatment Plants are annually audited by schedule auditors at the behest of Hon'ble Gujarat High Court and report is submitted to GPCB which in turn ensure compliance of observations raised during the audits.

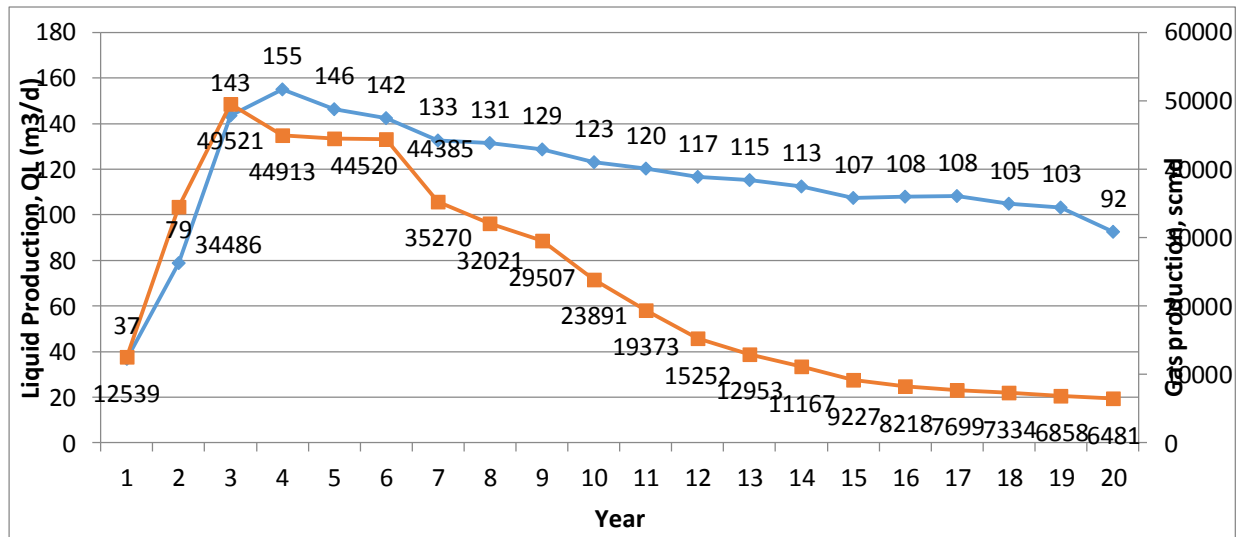
2. Proposed facility i.e. Ramol QPS will also maintain the same management system to address its environmental issues to minimize the impact of its product, activities and services on the surroundings.

3. Construction of proposed facility will result in development of infrastructural facility in the area for the benefit of people residing nearby.
4. Construction of proposed facility will involve significant number of skilled and unskilled workers. This would generate employment for the locals.
5. Ahmedabad Asset has been the flag bearer when it comes to corporate social responsibility's schemes for the area will help in improving the living conditions of societies in this area.
6. To deal with any eventuality of oil spillage, Ahmedabad Asset in association with M/s OTBL is equipped with facility of bioremediation and restoration of site back to normal.
7. Asset is member of landfill (TSDF) site to dispose of hazardous waste generated through its facilities.
8. The Ahmedabad oil field is holding mining lease and exploration and production activities are being carried out since 1965.
9. Environment Clearance already granted by MoEF&CC to the project "Development Drilling of (406 nos) wells in oil field Ahmedabad Asset at Kheda, Gandhinagar and Ahmedabad districts of Gujarat by M/s ONGC. (File no. J-11011/92/2012-IA II (I)" vide order dated 22.03.2016

In the back drop of the justification, it is requested to accord Environmental clearance to the proposed facility of Ramol QPS.

1.1 Predicted performance of Ramol QPS:

The expected peak production from 45 connecting wells is about 155 m³/day in the fourth year as per the production profile which is as below:



1.2 Process

Description:

The well fluid from the well locations will be brought to the proposed QPS through 4" oil pipeline network. The flowlines will be connected with to the group/test headers. The well fluid from the group header would first fed to bath heater for heating the liquid up to 50⁰ - 60⁰ C for effective flow and fluid separation. Thereafter, the liquid from bath heater would be fed to separators for separation of gas & liquid. The separated liquid (crude oil & produced water) will be stored in storage tanks and then finally pumped Nawagam CTF and then to Nawagam Desalter Plant for desalting by knocking out the water. The effluent generated at Nawagam Desalter Plant will be treated in ETP and subjected to underground injection below sub surface (1000 mts. or below) in compliance to the conditions prescribed in EPA Rule 1986. The individual wells will be tested routinely through test headers, test separators and test tanks. Water injection facilities include 5 finger manifold.

Firefighting system is in line with OISD-189 suitable for QPS.

A 30 mtr. height flare package has also been considered for safe disposal of vent gas as per statutory guidelines. All the vents will be connected to flare header for safe disposal as per norms.

No effluent processing & disposal facility is envisaged as no effluent will be generated.

Details of facilities:

The details of the facilities proposed to be created in new Ramol QPS are as below:

S.No.	Equipment	For Ramol QPS
1	Scrubber	2 Nos.
2	IDBH	2 Nos.
3	Vertical two phase HP separators (16 atm)	2 Nos.
4	Vertical two phase LP separators (6 atm)	1 No.
5	Firefighting system	As per OISD-189
6	Service water tanks	2 nos. PVC tanks of 2 M3 capacity each
7	Bore Wells for utility	1 no.
8	Well manifold	15 (9 HP+ 6 LP) finger 8" Group header and 4" Test Header
9	WI Header	5 finger 4" WI header
10	Storage Tanks	4 nos. of 45 m3 tanks
11	Oil Dispatch Pumps	2 nos. of 12 m3/hr & pressure 64 Kg/cm2
12	Elevated Flare package	1 No. – 30 M Stack Hot flare
13	Pig Launcher along with shed, valves and platform	1 No. for Oil transfer line
14	Oil transfer line (8"TPL) from AM-37 to NJ -14	8" - 9 km
15	Transformer	1 no. (500 KVA)
16	High Mast	1 nos.
17	Area lighting	As required
18	DG Set	1 DG set for backup power (125 kVA)
19	Electrical substation and panels	As required
20	Electrical HT/LT cables, DP cost, etc	As required

21	Other utilities	Power, Drinking water etc.
22	SCADA system	As required
23	Mass flow meters for Oil & Custody transfer meters for Gas.	1 nos.
24	Computer, furniture , Office building	As required

The above processing facility shall be handling about 200 m³/day of liquid and 65,000 scmd of gas from about 38 nos. of wells and catering water injection to about 07 WI wells.

1.3 Crude oil properties of Ahmedabad field:

- 1.API gravity of crude oil of Ahmedabad field ranges from 30 to 40 degree and average is 37.39 degree.
- 2.Average and range of Pour point, Specific gravity, API, Wax %, Asphaltene % and Resin % of Ahmedabad oil is as given below:

Average Properties of Ahmedabad Oil

	P P °C	Density at 15 °C	Specific Gravity	API	Wax, %	Asph %	Resin%
Avg.	30	0.8374	0.8374	37.39	19.33	0.98	8.92

2.0 HSE & Environmental issues:

2.1 Environment Impact Assessment and Environment Management Plan:

All the existing Oil and Gas processing facilities in the Ahmedabad field, are maintaining third party certified Environment Management System based on ISO 14001, integrated with Quality Management System (ISO 9001) and Health and Safety Management System (OHSAS 18001).

This implies that all the significant environmental attributes under normal, abnormal and emergency conditions associated with product, activities and services during construction, operation and maintenance of the each process of installation have been

assessed and technical and administrative management of these attributes are in place to address to minimize the environmental footprints of the process.

Proposed facility i.e Ramol QPS will have same equipment and processes as are available in the existing oil and gas processing and thus the environmental aspects will remain almost same as in other installations. Ramol QPS, once put in operation will also maintain third party certified quality health safety and environment management system based on international standards.

Based on the baseline conditions of the area and the environment management plan, a detailed monitoring program for the construction and operation phase shall be designed. Environment monitoring will serve as an indicator for any deterioration in environment conditions due to operation of the project. Regular monitoring of environment parameters will serve as a measure to check the efficiency of Pollution control measures implemented. Company shall appoint SPCB recognized laboratory for the sampling and analysis of environment parameters.

The significant environmental attributes pertaining to construction, operation and maintenance of proposed facility – Ramol QPS and proposed Environment Management Plan is as follows:

i. Air:

Construction phase:

The main pollutant will be particulate matter during the construction phase.

Operation phase:

During operation phase NO_x, SO₂, PM₁₀ and PM_{2.5}, HC, CO, VOC will be the pollutant from stacks of bath heaters, DG set and flare stack.

Ambient Air Quality Monitoring:

The ambient air quality with respect to NO_x, SO₂, PM₁₀ and PM_{2.5}, HC, CO, VOC shall be monitored at project location. The selected monitoring stations shall be monitored for a period of 24 hours quarterly and will be recorded in log book for evaluation of impact and to decide required mitigation measures.

Stack Monitoring Quality Monitoring:

The stacks in the proposed project shall be monitored on quarterly basis, with respect

to temperature, oxides of nitrogen (NO_x), Suspended Particulate Matter (SPM), SO_x, HC, CO, VOC.

ii. Noise and vibrations:

Construction phase:

Minor increase in noise generation will take place due to transportation of construction material at site.

Operation phase:

None of the production activities in the proposed project will lead to major increase in noise level in the surrounding. Minor increase will be within the project boundary premises due to the operation of flare, running of fire pump, DG set etc. None of these operations shall be continuous operation.

The EMP for noise is as mentioned below:

A good quality sound level meter and noise exposure meter will be made available to monitor the noise levels from machines/equipment/DG set etc. and to assess the effectiveness of Environmental Management Plan implemented to reduce noise levels. Audiometric tests shall be conducted periodically for the employees working close to the high noise sources.

Though the effect of noise on the nearby inhabitants due to construction activity will be insignificant as per the proposed plot plan, noise prone activities should be restricted to the extent possible during day time in order to have minimum noise impact during night time. Ear muffs shall be provided to workers to minimize the effect of noise during construction activity.

Noise generation due to friction from the machines shall be avoided by regular maintenance.

Human movement shall be prohibited in the area during the operation of flare.

To reduce the sound level of DG sets following measures will be taken:

(a) acoustic barriers (b) acoustic insulation (c) isolation mounts (d) cooling air attenuation (e) Maximizing distance between the generator set and the property line (or

people) – When there are no reflecting walls to magnify the noise produced by the generator set, the noise level will decrease by approximately 6 dB(A) every time the distance is doubled (f)Exhaust silencers – Generator sets will always be equipped with an exhaust silencer (muffler)and (g) ONGC PPE policy shall be implemented .

iii.Water:

Construction phase:

Water requirement during site preparation shall be negligible quantity and restricted for domestic purposes.

Operation phase:

The major water requirement is for domestic purposes and Bath Heater. There requirement will be around 5 m³/day.

Water Conservation:

The first step toward the management of water environment would be conservation of the raw water. Proper step shall be taken to conserve the water from the operation phase, apart from the reuse and recycle of the wastewater generated.

- Storm water drainage network shall be designed.
- Faucets uses are of low water consumption type.
- W.C, Flush and Urinal Flush valve shall be of low water consumption type.

Rain water harvesting scheme shall be implemented. As a part of EMP, recharging of ground water aquifer will be planned. Scientific approach should be followed for undertaking ground water development work in this area.

iv.Waste Water:

Construction phase:

The major waste water generated during construction activity will be from domestic activities. The same shall be disposed through septic tank/ soak pit.

Operation phase:

The scheme doesn't envisage generation of process effluents. Facility will only be used

for collection of liquid and dispatch to Nawagam CTF. No treatment except heating will be done at Ramol QPS. Domestic effluent will be disposed of through septic tank/soak pits. The water coproduced with the crude oil shall be dispatched to Nawagam CTF along with the crude where the separated effluent shall be treated and injected below sub sursurface(1000 mts or below) in compliance to the conditions prescribed in EPA Rule 1986.

Water and Waste water quality monitoring:

Drinking water shall be analyzed to check the drinking water standard as prescribed in IS (10500:2004). The scheme doesn't envisage generation of much amount of liquid effluents.

v. Solid and Hazardous Waste:

Insignificant amount of domestic waste, which shall be addressed by soak pit.

Construction phase:

Hazardous materials such as lubricating oil, paints and varnishes are required during construction phase which shall be stored properly as per the safety regulations at isolated places. Accidental spillages of oil from construction equipment and storage sites shall be prevented.

Operation phase:

The hazardous wastes generated during the operation phase are as mentioned below:

Hazardous waste generation

Item	Quantity
Used oil	250 Ltrs./year
Oily soaked cotton waste	50 Kg/month
Oily sludge Hydro testing of separators and tank bottom sludge.	50 kg/year
Containers POL and chemicals	200 empty barrels/year

Used oil (negligible quantity) shall be used for internal purpose for greasing whereas oil soaked cotton waste and oily sludge generated from bottom of storage tanks will be send

to approved TSDF site. Asset is member of landfill (TSDF) site.

Oil contaminated soil will be subjected to bioremediation through consortium of bacteria in association with M/s. OTBL, both ex-situ and in-situ, depending on the situation and the contaminated site will be restored to its near original condition.

Containers of POL / chemicals shall be stored at a designated place in the facility and will be transported to authorized recyclers.

These wastes shall be disposed of in accordance to the conditions prescribed by Gujarat Pollution Control Board(GPCB).

Hazardous Waste storage room:

- Generated used oil shall be stored in 200 liters drums and will be kept in dedicated hazardous waste storage shed.
- Direct manual handling of waste will be avoided. The person handling the waste will be equipped with hand gloves resistant to the waste, respiratory mask and goggles.
- Record of the hazardous waste generated will be maintained as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 in the prescribed format and the same will be regularly submitted to statutory authority. Prior to dispatch of the waste to the recycler company, representative will keep a check on the valid authorization and approval obtained by the recycler from Central Pollution Control Board.

vi. Monitoring schedule:

Area of monitoring	Number of sampling station	Frequency of Sampling	Parameters to be analyzed
Ambient Air Quality Monitoring	Onsite : One Villages: One	Quarterly	PM10 ,PM2.5, NO _x , SO ₂ , CO, HC, VOC
Stack Emission Quality Monitoring	All the stacks	Quarterly	Temperature, NO _x , SO ₂ , SPM,HC,CO,VOC
Noise	Near all the sound generating devices and near the project site	Quarterly (day time and night time)	Sound pressure level (Leq)

3.0 Emergency Response Plan:

Comprehensive site specific Emergency Response Plan (ERP) to harness the resources to quickly respond to the situation shall be in place. This plan will incorporate the physical resources, action and responsibilities of the officials and personnel of the installation to mitigate the emergency condition and restoration of operation. The emergency response plan will be kept in readiness through regular (monthly) mock drills.

4.0 Disaster Management Plan:

Ahmedabad Asset maintains Disaster Management Plan (DMP) to deal with eventuality of larger dimensions for which internal and external resources are harnessed. This plan is revised regularly and vetted by Disaster Management authorities.

5.0 Protection of reserve forest/wild life sanctuary:

There is no reserve forest or wild life sanctuary within 10 Km area around the facility.

6.0 Expected gain in terms of Oil and Gas:

The expected peak oil production from 45 wells is 155 m³/day and gas gain is about 50,000 m³/day. The total gain expected from 45 wells in period of 20 years is 0.367 MMT of oil.

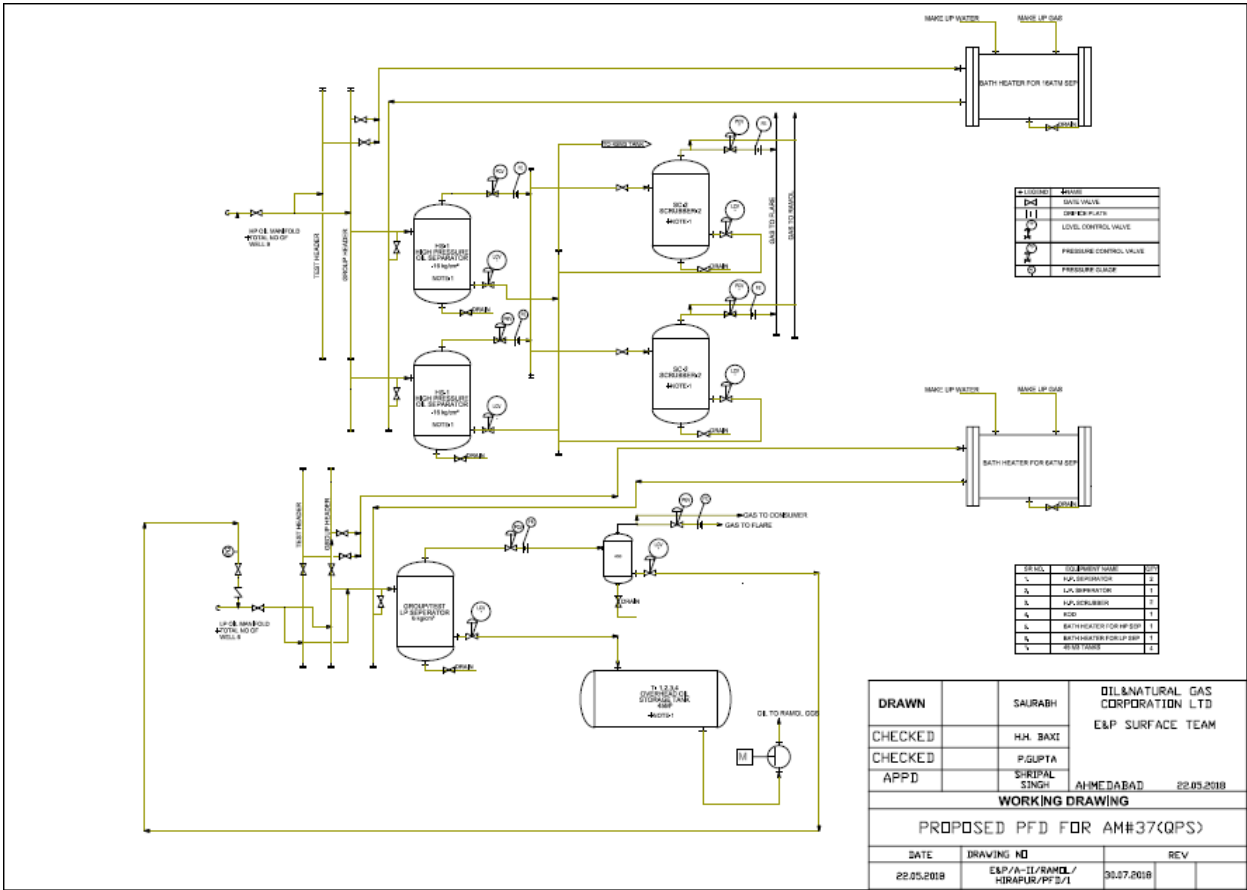
7.0 Capital cost estimates of the project:

Sl. No.	Description	Ramol QPS
1	Ramol QPS & associated headers	18.00
Total:		18.00

8.0 Lay out plan and Process flow diagram of Ramol QPS

Lay out plan enclosed as Annexure-1 and process flow diagram of QPS enclosed as (Annexure-2).

Annexure- 2



9.0 Copy of Environmental Clearance for Drilling of wells in Ahmedabad Asset:

Copy of Environment Clearance granted by MoEF & CC vide order no F. No. J-11011/92/2012-IA II (I) dated 22.03.2016 to the project "Development Drilling of (406 nos) wells (Oil and Natural gas) in oil field Ahmedabad Asset at Kheda, Gandhinagar and Ahmedabad districts of Gujarat by M/s ONGC is attached as Annexure- 4.

10.0 Location of the project, GPS file depicting location of project:

Location of project on survey of India topsheet, GPS file depicting location of the project in .KML format and location of the proposed project in JM sheet indicating Latitude and Longitude of the corners are attached as Annexure-5, 6 and 7 respectively.