

EXECUTIVE SUMMARY

1.0 Introduction

M/s Indian Oil Corporation Ltd. proposes Augmentation of LPG storage capacity from 300 MT to 900 MT by installing 2x300 MT mounded storage unit at Puducherry LPG bottling plant. Consequent to detailed presentation before 12th Expert Appraisal Committee on 23-24 August, 2016, SEAC granted Terms of Reference (ToR) vide letter Oct 25, 2016.

In the proposed augmentation works, the LPG will be stored in pressurized mounded bullets.. There are 3 x 100MT existing mounded bullets and proposed mounded storage in 2 bullets of 300 MT each with a total capacity of 900 MT.

2.0 Details of Site

The site for the project is within the existing premises of the plant so no extra land has been acquired. The site is well connected for easy transportation of LPG bullets and cylinders. The Plant site is located at a distance of 10 km from the Puducherry railway station and 12 Km from Puducherry airport. The site is well connected to through NH-45A which is in nearby vicinity to the site in South direction.

3.0 Project details

The mounded storage will be in 2 bullets of 300 MT each with a total capacity of 900 MT. The details of existing and proposed LPG storage and bottling plant capacities are provided in table below.

Existing And Proposed - LPG Storage

| Type of Vessel | Existing/Proposed | Nos. | Capacity | Total Capacity |
|-----------------|-------------------|------|----------|----------------|
| Mounded Bullets | Existing | 3 | 100 MT | 300 MT |
| Mounded Bullets | Proposed | 2 | 300 MT | 600 MT |
| Total | | | | 900 MT |

The details regarding description of proposed storage facility and process flow chart are presented in Chapter 2 of EIA Report

4.0 Utilities

The water requirements for the project have been estimated at 25 m³/d. Required water will be supplied through local authorized body.

Power requirement is estimated at 320 kVA. Puducherry Electricity Board will supply the necessary power.

The total manpower requirement for the proposed project works out to 70 persons. It is expected that a number of ancillary industries are likely to be developed near the project site which will be mutually beneficial.

5.0 Baseline Studies

The baseline studies as per CPCB guidelines and protocol (meteorology, Air Water and Soil Quality, Noise levels, Ecology, etc) were conducted during **January 2016 to March 2016**. Data were supplemented with interaction with government officials, NGOs, as well as gram panchayats.

Environmental Monitoring Schedule

| Sr. No. | Environmental Component | Sampling Parameters | Sampling Period | Sampling Frequency |
|---------|---------------------------------------|---|------------------------------------|--------------------------|
| 1 | Meteorology | Temperature, Wind Speed, Wind Direction | 3 months | Hourly |
| | | Rainfall | 3 months | Daily |
| | | Relative Humidity, Cloud Cover | 3 months | Hourly |
| 2 | Ambient Air Quality | As per NAAQS 2009- PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO, O ₃ , As, Ni, Pb, C ₆ H ₆ , BaP, NH ₃ | Two days per week for 13 weeks | 24 hourly |
| 3 | Water Quality | As per IS:10500-2012 | Grab sampling | Once in study period |
| | | Heavy metals (As, Hg, Pb, Cd, Cr ⁻⁶ , Total Cr, Cu, Zn, Se, Fe) | Grab sampling | Once during study period |
| 4 | Noise | L _{eq} , L _{day} , L _{night} , L _{D/N} | Hourly readings for 24 hours | Once during study period |
| 5 | Soil | Soil profile, Chemical constituents, Suitability for agricultural growth | Composite sample up to 90-cm depth | Once during study period |
| 6 | Terrestrial Ecology | Flora and fauna | Field observations | Once during study period |
| 7 | Demography and Socio-economic aspects | Demographic profile | - | - |

Air Quality: It could be noted from the results that the air quality in the study area is within NAAQS Nov 2009 limits.

Surface water: In general, the samples are free from metallic and industrial pollutants, such as fluoride, copper, iron, zinc, boron, arsenic and lead. These elements were found to be below detectable levels. All the parameters were found to be within the prescribed limits.

Ground Water: All the parameters, including the metals like copper, iron, zinc, lead etc. were within the limits prescribed by IS 10500:2012.

Ecology: There will not be any direct or indirect impact on the ecology of the study area as there isn't any process or emission involved.

Socio-Economics: Since the set up of proposed expansion is planned within existing facility, critical issues like land acquisition, compensation, rehabilitation and resettlement do not feature in the study.

6.0 Pollution Control Construction Phase

Air: Suspended particulate matter will be the main pollutant, which would be generated due to site developmental activities and vehicular movement on the road, and would be controlled by water sprinkling. Pollutants like NO_x, SO₂ and CO may also slightly increase due to increased vehicular traffic movement. However, the impact will be insignificant. As most of the construction equipments will be mobile, the emissions are likely to be fugitive.

It shall be ensured that gasoline and diesel powered construction vehicles are properly maintained to minimize smoke in the exhaust emissions. Additional recommendations include the following:

- Sprinkling of water shall be done at frequent intervals by preferably using truck-mounted sprinklers. Sprinkling of water will be done along the roads and work zone areas to reduce the fugitive dust;
- Construction equipment shall be maintained and serviced regularly so that the gaseous emissions from these equipments are maintained within the design specifications;
- Since electrical power is available near the plant, attempts shall be made to utilize the electrically powered machinery to the extent possible to minimize the emissions of SO₂ and NO_x during construction.

Water: Temporary and localized impacts on hydrology are expected due to construction activities. These could arise from temporary obstruction to natural flow of rainwater due to foundation excavation, stacked material, etc. These are insignificant impacts which can be easily overcome by appropriate construction methodology and practices.

The water requirement during the construction period is estimated to be about 10 m³/d. No impact is expected on other users.

The wastewater generation during the construction period will be from the sanitary units provided for the workers. This waste will be treated in septic tanks and discharged into soak pits.

Soil: The earthen work will be avoided during monsoon. Stone pitching on the slopes and construction of concrete drains for storm water will be undertaken to minimize soil erosion in the area. Settling pond is planned for storage and recycling of surface water for use in the plant area. The green belt development in and around the plant will be taken up during the monsoon season. Soil binding and fast growing vegetation will be grown within the plant premises to arrest soil erosion.

Noise: The noise due to construction equipment will be a temporary phenomenon. However, noise levels due to construction equipment may result in significant impacts due to operation of several equipment simultaneously.

Noise levels are predicted at different distances and at project boundary using random distribution of the equipment in the project area. Based on the similar construction activity experience, it is assumed that only one-third of the equipment will be operational at a time.

The noise impact due to transportation will occur during the construction phase when maximum 20-30 trucks (each way) per day will be plying on State Highway for the transportation of construction materials. This will not be a continuous operation but it may last up to 2-3 years, during which added noise impact on background noise level will be 2-3 dBA.

Operational Phase

Air: From the baseline monitoring in the study area, it shows that there will not be change in the present air quality as no process and emissions involved in the proposed project.

Water: Wastewater will be generated from domestic use. Septic tanks will be provided to treat the domestic wastewater. The treated water will be used for landscaping.

Noise: The entire operation will be carried out in confined area. The workers and staff, working in high noise areas, will be provided with necessary protective devices e.g. ear plug ear-muffs etc.

Solid Waste: No process / manufacturing involved. Hence no solid waste generated because of the operation. The solid domestic waste shall be segregated and stored within the premises temporarily and then sent to Salem Municipal Corporation waste management facility. The solid wastes such as paints, lubricants, oil or any other non-biodegradable wastes that have leachable constituents will be disposed to authorized recyclers.

7.0 Risk Assessment Study

The main operation of LPG Bottling Plant in Salem is to receive bulk LPG, store into mounded storage vessels, and bottle in cylinders and dispatch the same to distributors in Puducherry and adjoining villages. The plant handles Liquefied Petroleum Gas and the composition (by mole fraction) is as follows: Propane: 0.55 and Butane: 0.45

The probabilities associated with the sequence of occurrences which must take place for the incident scenarios to produce hazardous effects and the modelling of their effects.

Considering the present case the outcomes expected are

- Jet fires
- Vapor Cloud Explosion (VCE) and Flash Fire (FF).

In Consequence Analysis studies, in principle three types of exposure to hazardous effects are distinguished:

1. Heat radiation due to fires. In this study, the concern is that of Jet fires and flash fires.
2. Explosions
3. Toxic effects, from toxic materials or toxic combustion products.

The knowledge about these relations depends strongly on the nature of the exposure. All above accident scenarios form the basis for conventional risk assessment. The results of consequence analysis for the above accident scenarios are detailed in Chapter 7 of the report.

8.0 Environmental Monitoring Plan

EMP is prepared separately for construction and operation phases, and it also includes green belt development and environmental monitoring program. EMP specifies various technological measures for pollution prevention, waste minimization, end-of-pipe treatment, attenuation, etc. proposed to be undertaken to mitigate the environmental impacts on each sector of environment.

Schedules: There will be three facets to design and follow the schedules viz.: (A) for compliance of responsibilities, (B) for day-to-day operation and management of ETP and ECE, and (C) for routine environmental monitoring, to assess the impact and take timely warning.

Daily Compliance

- To record meter readings - initial and final, for checking the water consumption.
- Maintain the electricity consumption record for pollution control.
- Monitor ambient air quality periodically as per the Consent Order.

Monthly Compliance

- Monitor the emission sources through the competent authority and submit the analysis reports to the board.
- Monitor ambient/work zone noise levels and ensure conformance to standards.

Quarterly Compliance

- Monitor the ambient air quality in upwind and downwind locations.
- Review the Water Reuse performance.

Yearly Compliance

- Prepare “Environmental Audit Statement” of various environmental aspects, review the environmental policies with the help of experts and make the up-gradation /changes accordingly.
- Submit the “Environmental Statement” to the State Pollution Control Board in Form V under Rule 14 of the Environment (Protection) Second Amendment Rules 1992 of the Environment (Protection) Act, 1986.
- Renew the Consent to Operate under the Water and Air Acts.
- File the Cess returns to the State PCB under the Water (Prevention and Control of Pollution) Cess Act, 1977.
- Renew the Hazardous Waste Authorization under sub-rule 3 of the Hazardous Waste (Management and Handling) Rules, 2003

Cost Provision for Environmental Measures: It is proposed to invest about Rs. 1.5 Crores annually on pollution control, treatment and monitoring systems.

9.0 Project Benefits

The project will result in creation of job opportunities for local persons during construction and operation phases.

The proposed expansion will provide direct employment and indirect employment. Apart from the employment and business opportunities for the local people, the society will also be benefited through various CSR initiatives proposed by the IOCL

10.0 Conclusion

The Proposed project will have indirect positive impact on surrounding area which is as mentioned below:

- Plant will be set up within the existing plant boundary; hence no displacement of people is required.
- Substantial Socio-economic benefits.
- Good Techno-commercial viability.
- Around the project site semi-skilled and unskilled workmen are expected to be available from local population in these areas to meet the manpower requirement during construction and Operational phase.
- There will be employment opportunity for local people during construction and operation phase.
- Infrastructural facilities will be improved due to the project.
- Critical analyses of the existing socio-economic profile of the area indicate that the impact of the Project is expected to be of varying nature.
- Secondary employment will be generated thereby benefiting locals.
- Project will have substantial benefits in savings of transportation cost
- Thus a significant benefit to the socio-economic environment is likely to be created due to the project.