



Executive Summary

For

**PROPOSED EXPANSION OF ISOLATED STORAGE TERMINAL
WITH ADDITIONAL STORAGE TANKS FOR 42,940 KL HSD; 15,000
KL HSD(B5), 53,858 KL MS; 70KL SKO; 1442 KL ETHANOL AND 540
KL BIODIESEL**

At

**MANMAD BULK PETROLEUM TERMINAL, MANMAD NANDGAON ROAD,
VILLAGE NAGAPUR, TALUKA NANDGAON, DISTRICT NASHIK,
MAHARASHTRA**

Land/Plot Area: 262300 m² (64.8 acre)

Storage Capacity: 136226KL for 26 tanks (total; after Expansion)

[Unique No.: 0000000446, MoM Dated: 15-07-2017]

[Study Period: March 2017 to May 2017]

[Schedule 6 (b) Category–“B” as per EIA Notification 2006, amended till date]

APPLICANT

INDIAN OIL CORPORATION LIMITED

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INTRODUCTION

Indian Oil Corporation Limited (IOCL) is country's largest commercial enterprise and flagship national Oil Company. IOCL proposes for the an installation of isolated storage tanks thereby expanding fuel storage capacity of High Speed Diesel (HSD), Motor Spirit (MS), Superior Kerosene Oil (SKO), Ethanol and Biodiesel at Manmad Bulk Petroleum Terminal, Manmad Nandgaon Road, Village Nagapur, Taluka Nandgaon, District Nashik, Maharashtra.

PROJECT DESCRIPTION

The project is classified as Category "B" project. The proposed project falls under Schedule Project activity Service Sector, "6 (b)-Isolated storage & handling of hazardous chemicals (as per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)" as per EIA Notification 2006, as amended till date.

Proposed Project

Currently, Manmad Terminal has cumulative storage capacity of 22376 KL for MS, SKO, Ethanol, Bio Diesel and HSD. Proposed expansion will increase cumulative storage capacity of Manmad depot by 113850 KL i.e. total cumulative storage capacity will be 136226KL.

Out of total 11 existing tanks, 6 tanks will be converted and rest 5 tanks will remain same. Additional 15 tanks will be installed.

Existing Tanks Details

- High Speed Diesel (HSD) : 3 x 5000 KL tanks
- Motor Spirit (MS) : 2 x 932 KL tanks & 2 x 686 KL tanks
- Superior Kerosene Oil (SKO) : 2 x 2000 KL tanks
- Ethanol : 2 x 70 KL tanks

Proposed Tank Details

- High Speed Diesel (HSD) : 3 x 19290 KL tanks & 1 x 70 KL tank
- Motor Spirit (MS) : 4 x 13790 KL tanks & 1 x 70 KL tank
- Superior Kerosene Oil (SKO) : 1 x 70 KL tanks
- Ethanol : 2 x 70 KL tanks
- Biodiesel : 2 x 200 KL & 1 x 70 KL

After proposed expansion, there will be total **26 storage tanks**.

S. No.	Details	Description
General Description		
1	Nature	Isolated Storage and Handling of Hazardous Chemicals (as per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)
2	Product	Storage Tanks for HSD, MS, SKO, Ethanol and Biodiesel
3	Location	Survey No.: 26/A/7, 26/A/2, 26/A/3, 27/3A, 27(1+2)/, 27/3B/7, 27/3B/2,

S. No.	Details	Description
		27/3B/3, 27/3B/8, 27/3B/6, 29/2B/7, 29/2A, 29/2D+3, 29/2K, 29/7/7, 30/6, 30/5A, 30/9A, 30/7, 30/2, 30/3+4, 30/5B, 30/9B, 30/7 (Pimpali), 37/2, 28, 37/2A/2, 3/3, 30/6, 27(1+2)/7, 37/7, Manmad Bulk Petroleum Terminal, Manmad Nandgaon Road, Village Nagapur, Taluka Nandgaon, District Nashik, Maharashtra
4	Coordinates	20°15'54.90"N, 74°29'1.80"E
5	Total Plot Area	2,62,300 m ² (64.8 acre)
6	Cost of the project	~INR 233 Cr
Utilities		
1	Power	1350 KW, sourced from MSEB for proposed Two DG set proposed of 750 KVA (emergency power on need basis)
2	HSD	~80 Liters/Hour for proposed DG set, only in emergency
3	Water	Source: Groundwater through Borewell / other agency Water requirement: 21.7 KLD
Fire Fighting		
1	Facilities	DCP Extinguisher (2.5 Kg, 4.5 Kg, 6.0 Kg, 10 Kg, 25 Kg, 75 Kg), High Velocity Long Range (HVL R), Fire Hoses, Water cum Foam Monitor 750 GPM, Foam Compound Trolley 200/210; Water Curtain Nozzles; Sand Drum with Scoops; First Aid Box; Rubber Hand Gloves; Explosimeter; Water Jet Blankets; CO ₂ cartridges

Process Description

Operation Philosophy, at present, can broadly divided into 3 parts viz.,

- Receipt of Material
- Storage of Material
- Dispatch of Material

Presently, the terminal receives MS, SKO & HSD like products from nearby BPCL from Pipe line and Ethanol from tankers. The Terminal also handles Ethanol, which is mixed in a proportion of 5% by volume with MS for dispatches.

There is also proposal for construction of 2 additional TLF and hence, with 12 bays, loading and dispatch rate of material will considerably be increased.

Present activities at Depot

- Tank Lorry Loading - MS, HSD, SKO
- Tank Lorry Unloading : Ethanol
- Rail wagon loading: Nil
- Rail wagon unloading: Nil
- Inter tank transfer
- Tank Water Draining Operation
- Sampling of Product from Tank after every receipt
- Emptying out of Tank at fixed interval for Maintenance/ Cleaning for Quality Control adherence
- Opening of Strainers for Cleaning of Strainer's Filters at fixed interval.

- Maintenance and Repair of various Equipments viz. Pumps, Motors, Fire Engines, Air Compressors etc.

Infrastructure

The infrastructure includes Tank Farm areas, Dyke areas, Fire Fighting facilities, Weighbridges, TLF Bay, Rail tracks, Sheds, Administrative building, Canteen, Parking area Security cabin, utility area etc.

Air Emissions & Control

- It is being storage facility, process stack is not applicable.
- Flue gas stack includes stack attached each DG Sets (2 nos.) and Fire Water Engines stacks (7 nos.). The flue gases will be predicted having pollutants like PM₁₀, SO₂, NO_x.
- DG sets and fire water engines will be installed with stacks of adequate height, which will be operated during power failure and during emergency only.

Noise

Noise generation sources are: DG Sets and vehicular movement for transportation of product.

Wastewater treatment & disposal

- The domestic wastewater will be disposed off into Soak pit.

Hazardous & Other Solid Waste

- Hazardous Waste: Used Oil, Tank Cleaning Sludge and Diesel Filters will be generated. Used oil will be reused in valve lubrications and Tank Cleaning Sludge will be disposed through bio remediation process and Diesel Filters will be given to recyclers/Scrape vendors.
- Domestic Solid Waste: Paper waste will be handed over to scrap dealers and waste will be sent to nearest municipal waste collection site.
- Small amount of e-waste and scrap will be handed over to authorized scrap dealers.

DESCRIPTION OF THE ENVIRONMENT

Study Period, Area & Monitoring/Sampling Locations

The baseline environmental study has been conducted for the study area of 10 Km radial distance from site for the period March to May – 2017.

Total eight ambient air samples, eight groundwater samples and four soil samples were collected. Noise monitoring was carried out at eight different locations. Surface water samples were collected from two locations and rest of selected six locations were dried up during study period.

Land Use and Land Cover

Land use of study area is classified as agricultural land (41.26%), fallow land (30.43%), built up area (2.71%), open scrubs (5.21%), water bodies (2.13%) and barren land (18.26%) approximately.

Meteorology

Micrometeorological data were collected by using the weather station as per CPCB guideline which was installed near project site. Following are the observations:

- Minimum temperature was recorded 18.4°C in March, 2017 and maximum temperature was recorded as 42.2°C in May 2017.
- Hourly data for humidity were collected and humidity in the range of 14 % to 90%
- Minimum and maximum wind speed data varies in the range of 0.0 to 14.2 km/h during study period. Maximum wind velocity was in the month of May 2017.

Ambient Air Quality

The broad findings of the ambient air quality monitoring are:

- The average concentration of PM₁₀ is found within the standard at all locations and the values are in the range of 74.7 to 80.1 µg/m³.
- The average concentration of PM_{2.5} is found in the range of 38.8-41.8 µg/m³ and the concentration values are found within the standard. The concentration of PM_{2.5} is higher at Nagapur village than other 7 monitoring stations.
- Average concentration for SO₂ is observed in the range of 13.2-15.7 µg/m³. Minimum and maximum values are found 9.5 µg/m³ and 17.6 µg/m³ respectively.
- CO concentration values in ambient air are found within the standard.

Noise Level

- Maximum noise level was recorded 73.5 dB during day time at Project site (N1) while the equivalent noise level was 69.0 dB (A) which is well within the limit for Industrial area.
- Equivalent noise level taken from all the villages also meet with the norms for residential area as per the Noise criteria given by the MoEF & CC, 2009.

Soil Quality

Based on the soil analysis for its physical and chemical properties, it is observed that:

- pH ranges between 7.51 – 8.12,
- Organic matter ranges between 0.4 – 3.5 %,
- Total Nitrogen ranges 12.4 – 13.5 mg/100g,
- Total Phosphorous ranges 13.8 – 14.2 mg/100g,
- Total Potassium ranges 1.2 – 4 mg/100g,
- Available Calcium ranges 22.8 – 36.6 meq/100g and
- Available Magnesium ranges 8.8 – 14.5 meq/100g.

Geological Environment

Topographically, the study area is highly undulating in nature. Regional slope of the study area is toward East to NE.

Basalt rocks and their varieties in the form of numerous horizontal flows cover entire study area. Low lying areas are covered by black cotton soil ranging in varying thickness.

Hydrology and Ground Water

The only aquifer of the study area is Basalt. Groundwater occurs mostly in joints/fractures, voids and weak planes of Basalt. Groundwater occurs in water table i.e. Phreatic, semi-confined and confined condition and showing considerable fluctuations during pre and post monsoon seasons. As per CGWA guideline, Nandgaon taluka falls under Safe zone.

Groundwater Quality

The test results were compared with the Drinking Water Specification: IS: 10500, 1992 (Reaffirmed 2012) and it is summarized as under:

- The TDS is below desirable limit in the Village Chandgaon (GW3), while TDS is below permissible limit in all samples.
- Total Hardness is below permissible limit and above desirable limit in all other samples.
- Total Alkalinity is below permissible limit in sample at all locations and it is above desirable limit in at village Chandgaon (GW3).
- Magnesium is below permissible limit in all villages sample.
- Total Nitrogen is found more than permissible limit in all the samples.
- The higher value of Total Hardness and Total Alkalinity found into study area may be due to the hydrogeological setup of the study area and inherent salinity of aquifer.

Surface water

At the time of location selection, eight numbers of locations were selected but during the sampling it was observed that most of the waterbodies/ponds were dried. Hence, sampling was done only at two locations.

- pH of the samples was found of 7.45 and 8.27
- TDS was found between 452 and 638 mg/L
- Dissolved Oxygen measured during analysis was found 5.0 mg/L
- COD was found 14-18 mg/L while BOD was found 6-5 mg/L

Ecology and Biodiversity

Project Site / Core Zone:

The proposed project site is located within the existing premises. The flora reported at project site includes Neem, Niligiri, Piple & some Fruit trees.

Buffer Zone/Study area:

- Floral diversity:

Trees: Dhawada, Dhupali, Bahawa, Apta, Amla, Hirda, Moho, Nimb, Khair, Maharuk, Badam, Umbar, AMrood, Nilgiri, Jambhul etc.

Shrubs: Amboni, Henkal, Tantani, Tarwad, Palsvel, Chillar, Vikankar, Bor, Nirgundi, Karen etc.

Herbs: Darudi, Karadia, Anghedi, Barmasi, Marchi, Bhrami, Tali, Methi etc.

- Faunal Diversity:

Mammals: Noria, Khiskoli, Rat, Mouse and Blue Bull

Birds: Red-wattled lapwing, Yellow-wattled lapwing, Little ringed plover, Indian Treepie, Blue rock pigeon, Indian ring dove, Spotted dove, Black winged kite etc.

Reptiles: Common garden lizard, Roux's fores lizard, Fan-throated lizard, Indian chameleon, Indian cobra, Russell viper.

Socio Economy

The summary of the social survey, as per 2011 census, for the study area is provided as below:

Population Structure

- Total number of households are 22538 with average occupancy of 5.06 persons per household
- Total geographical area of 17737.59 sq. km. Villages are 131.6652 sq. km and overall population density was 36 persons/sq. Km
- Total child (below 6 years of age) population is 14625 (12.80%)
- Total SC population is 25359(22.21%)
- Total ST population is 9369(8.20%). It is very lowest than other population.
- Sex ratio (number of females per 1000 males) of total population is 947.

Literacy

- Overall literate population is 86189(75%) and illiterate population is 27981(25%).
- Out of total literates, male literates are 46940(54%) and female literates are 39249(46%).
- Out of total illiterates, male illiterates are 11692 (42%) and female illiterates are 16289(58%).

Occupational Pattern

- Total worker population in the study area is 44293(39%).
- Main workers were 40697(36%) and marginal workers are 3596(3%). Total non-working population is 69877(61%)

Traffic Survey

Based on LOS value National Highway No. 222 is good and State Highway No. 7 is very good. The available assimilative capacity of National Highways is 30% for more PCU to be added in the existing traffic scenario.

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Air Environment

Air quality dispersion modeling (using "AERMOD view" software) was carried out by considering stack as point source.

This indicates:

- The highest values of incremental increase in pollutants PM₁₀, SO₂, NO_x are 0.97, 6.88 & 4.88 µg/m³ at project site respectively.
- While at rest of monitoring stations, PM₁₀, SO₂, NO_x incremental concentration values are found in the range of 0.02-0.18, 0.14-1.25, 0.11-0.98 µg/m³ respectively.
- The highest resultant concentration values of PM₁₀, SO₂, NO_x are 89.47, 24.48, 29.08 µg/m³ respectively at project site compared to rest of monitoring stations.
- All values are well within the prescribed NAAQ standards, 2009.

Noise Environment

Due to the proposed activities the noise will be generated from Vehicular movement and heavy fabrication work during construction phase, running of DG set and vehicular movement for products transportation during operation phase. This noise will be very negligible.

Control measures will be provided. These include passive and active controls such as noise barriers (hollow blocks) or acoustic enclosure. Where this is not possible, control measures in the form of use of suitable PPE (ear muffs or ear plugs) will be provided.

Water Environment

Surface Water: The proposed unit does not involve any process and hence generation of industrial effluent is nil. Only domestic wastewater will be generated and will be disposed off into soak pits / septic tanks.

Ground Water: Impact on groundwater environment is envisaged due to project activities like groundwater withdrawal and due leakage or spillage of petroleum products. Mitigation measures suggested are:

- The tank farm area, pump house, loading/unloading areas of plant will be paved, therefore the likelihood of contaminants entering groundwater and harming the same is improbable (i.e. unlikely).
- Separate drains for storm water and will be connected to Oil Water Separator to remove Oil/Grease from storm water if any.
- Rainwater Harvesting and Groundwater Recharge practice is/ will be carried out..
- Flow meters will be provided for raw water consumption

Land Environment

Proposed project only for an additional storage tank within the existing facility, so there is no additional land requirement. Land clearance will be done leading to removal of top soil which will be used for greenbelt management.

Solid and Hazardous Waste

The debris generated from the excavation and paving of site during construction phase will be used for filling low lying area, while the scraps generated during heavy fabrication will be given to scrap vendors.

During operation phase, the hazardous waste generated includes Tank Cleaning Sludge, Diesel Filters and Used Oil. Tank cleaning sludge is Disposed through bio remediation process, Used oil is reused for valve lubrication and Diesel Filters is send to recycler/ scrap vendors.

Biological Environment

Removal of common site specific floral species from project site will not have significant or permanent impact on the habitat structure of associated faunal diversity.

As there are no process emissions from the Terminal and flue gas emission is/ will be regulated and minimal with respect to the specified norms, and with a very healthy greenbelt existing at the site in the form of several species, it follows that the biological environment will be protected.

Green Belt Development

The unit is having existing well developed greenbelt area of 74648 square meters (29% of total plot area) within existing site boundary. The number of trees at present is ~3336 which include local trees like Neem, Niligiri, Bekam, Piple and some Fruits trees.

Socio-Economic Environment

While assessing the socio-economic and sociological impact including health impacts to surrounding population, the upcoming project will bring job opportunities for the local people.

ENVIRONMENTAL MONITORING PLAN

The following will be monitored on a regular basis during operation phase to ensure that a high level of environmental performance is maintained:

- Ambient air monitoring for PM₁₀, PM_{2.5}, SO₂ and NO_x will be carried out during the operational phase within site premises and nearby villages, location of downwind direction, once every season.
- Groundwater sample from site or nearby location once every season.
- Post project sampling and effect on baseline data generated during construction and operation.
- The general effectiveness of pollution control measures shall also be monitored.

ADDITIONAL STUDIES

Socio Economic Development Activities

Socio-economic development activities towards community welfare in the field of education, health care services, sanitation, & infrastructure development programs in the study area will be based on the need of the community.

Risk Assessment

Risk Assessment has been analysed using methodology called HIRA-Hazards Identification & Risk Assessment carried out for Storage and Handling of petroleum products like HSD, MS, SKO, Ethanol and Biodiesel. Major hazards identified and related risk involved (impact) during construction phase are mainly related to injuries, fall, burn, accidents etc. of workers. Mitigation measures suggested are by providing proper PPEs and adequate safety measures.

Fire and Hazard

Hazard identified for operation phase is mainly related to storage and handling of petroleum products which involved hazards like fire, blast or both. Proper safety measures will be taken to ensure no spillage will take place during each stage i.e. receipt of material, Storage of material and dispatch of material. Proper handling and storage procedures will be followed to avoid any kind of accidents. Firefighting facilities like fire hydrant line and fire extinguishers are provided. In addition, HVLR system will be installed for proposed tanks also.

Safety training and mock drills for all workers will be carried out periodically

Occupational health and safety

The project does not envisage any activity leading to high noise level still It will be ensured that all workers will wear ear plugs, muffs etc. The project does not envisage conditions that could lead to excess heating. However, it will be ensured that proper ventilation of air will be provided for heat evacuation, drinking water availability at several locations and providing suitable PPEs for handing of heated equipment.

PROJECT BENEFITS

Due to establishment of the proposed project following benefits are envisaged for the locals and country:

- The proposed installation of tanks for HSD, MS, SKO, Ethanol and Biodiesel 2 TLF bays will create direct and indirect employment in the nearby areas. The unskilled employment potential will be used for site clearing during pre-construction phase. The skilled and unskilled employees/workers will work during construction phase for activities like excavation, site leveling, etc.
- IOCL's various CSR activities will up-lift the conditions of the people living in neighbourhood of its units/ installation

- The proposed expansion will fulfill the necessity for IOCL to meet the POL requirement of Nasik, Aurangabad, Ahmednagar, Jalgaon, Jalna, Parbhani, Beed, Dhule, Buldhana, Hingoli, Nandurbar & Nanded.
- It will help in proper customer service and optimization of resources and has the projected return on investment of 14.8%. The payback period of investment is likely to be around 7 years.

ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan for suggested mitigation measures and monitoring plan will include:

- Review of Compliance of EMP, EC & statutory conditions in the management meeting
- Preparation and timely submission of required statutory reports & Cess
- Proper hazardous waste inventory accounting by HSE department
- Monitoring for reduction in air emissions generation of hazardous waste quantity by concerned department heads as per QMS developed by IOCL
- Reviewing time bound action plan for imparting training to drivers and availability of TREM cards
- Reviewing annual performance of EHS in board meeting
- An Environmental Management Cell with adequate professional expertise and resources shall be established to discharge responsibilities related to environmental management including statutory compliance, pollution prevention, environmental monitoring, etc.

IOCL-Manmad Terminal is/ will have Environmental Management Cell headed by Dy. General Manager -HSE and supported by Chief Terminal Manager & Managers at Manmad-Terminal.

CONCLUSION

Based on the EIA study conducted in Summer Season of 2017 and as per terms of reference given by SEAC dated 15th July, 2017, the following highlights emerge

- There are no Protected Areas, Critically polluted areas, Eco-sensitive areas, Interstate boundaries and international boundaries located in 10 km of study area from the proposed project site.
- There will be negligible pollution potential on air, water and noise environment, which, with the implementation of the mitigation measures and EMP, can be reduced considerably.
- The proposed project activities will have positive beneficial effect on the local population, economic output and other related facilities viz. employment, development of business, transportation etc.

- Rapid risk assessment including emergency response plan and DMP has been prepared to handle any sort of emergencies.

Looking to the overall project justification, process, pollution potential and pollution prevention measures /technologies installed by proponent, environmental management activities of proponent; the proposed project would be environmentally acceptable, in compliance with environmental legislation and standards.