HINDUSTAN PETROLEUM CORPORATION LIMITED

PRE-FEASIBILITY REPORT FOR THE PROPOSED LPG BOTTLING PLANT OF 60 TMPTA CAPACITY AT JHANSI, UTTAR PRADESH

ABC Techno Labs India Private Limited

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CHAPTER 1

EXECUTIVE SUMMARY

1.1 NAME OF PROJECT:

Hindustan Petroleum Corporation Limited (HPCL) has proposed to construct a 60 TMTPA capacity new LPG Bottling Plant at Ambabai, Jhansi, Uttar Pradesh.

1.2 LOCATION

The site is situated at Ambabai, Jhansi, Uttar Pradesh

Latitude : 25°32'32.80"N

Longitude : 78°30'6.81"E

1.3 PROJECT PROFILE

The proposal envisages construction of a new LPG bottling Plant of 60 TMTPA capacity with 1x24 filling guns automatic electronic carousal with downstream facilities, LPG mounded bullet storage of 3 x 350 MT, 6nos. of truck unloading bays and other allied facilities at Jhansi, Uttar Pradesh.

1.4 RESOURCE REQUIREMENT

i) Source and quantity of water

Water requirement shall be met through existing tube wells within the plant premises.

Table no. 1.1: Total Water requirement

S.No	Particulars	Quantity (m^3/day)
1.	Domestic	05
2.	Industrial	15

ii) Power

Total power requirement envisaged is 500 KVA and shall be supplied by Uttar Pradesh Power Corporation Limited (UPPCL). Two nos. of DG sets (1x 500 KVA main + 1x 125 KVA stand by) shall be provided to meet power demand during power failure/emergency.

iii) Man power

- Managers: 1
- Technical Experts: 5
- Skilled: 6
- Semi-Skilled: 25
- Unskilled: 2
- Administrative Staff: 2

iv) Cost of the project

The total cost of the proposed project has been estimated at Rs. 116.4 Crores

CHAPTER 2

INTRODUCTION OF THE PROJECT/BACKGROUND INFORMATION

2.1 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT:

HPCL is a Fortune 500 company, engaged in Refining and Marketing of petroleum products, with an annual turnover of over Rs.215673 Crores, having about 22 % marketing share in India with a strong marketing infrastructure.

HPCL operates 2 major refineries, producing a wide variety of petroleum fuels & specialties, one in Mumbai (West Coast) of 6.5 MMTPA capacity and the other in Visakhapatnam, (East Coast) with a capacity of 8.3 MMTPA. HPCL is also holding 49% equity stake in HMEL, Bhatinda refinery of capacity 9 MMTPA & an equity stake of 16.95% in Mangalore Refinery & Petrochemicals Limited, a state-of-the-art refinery at Mangalore with a capacity of 9 MMTPA.

2.2 BRIEF DESCRIPTION OF NATURE OF THE PROJECT:

The LPG bottling plant will be constructed as per Oil Industry Safety Directorate Standard OISD- 144.

The Bottling plant will be operated in two shifts /day and 300 days/year to achieve the targeted production of 60 TMTPA by making use of facilities.

Following facilities are proposed in the new LPG Bottling Plant:

- 1 nos.24 filling guns fully automatic Electronic Carousels
- LPG Cylinder Sheds (Filled & empty)
- Filling and testing equipment
- Nos. of 350 MT capacity Mounded Bullets
- Fire water storage tanks and allied Fire fighting facilities, Gas Monitoring system and PPE as per OISD 144
- 6 bays Tank Truck unloading facilities
- Nos. of Manual filling scales for 35 Kg./47.5 Kg. capacity cylinders filling
- Shed & Testing equipment for in-house Periodic Cylinder Testing Facility
- LPG Pump & Compressors
- Air Compressors, DG sets and electrical equipment.

2.3 NEED FOR THE PROJECT AND ITS IMPORTANCE TO COUNTRY AND OR REGION:

Govt. of India had ventured into promotion of LPG as a cooking fuel in the Country since more than 4 decades.

Petroleum products & Oil marketing companies have projected an increase in demand of LPG in future due to increase in its domestic use. The demand is likely to increase substantially over the years to come. Oil PSUs have planned enrolment of new customers to saturate the demand potential and provide LPG connections to BPL families under Pradhan Mantri Ujjwal Yojana (PMUY) scheme as per directive of the Ministry of Petroleum and Natural Gas, Government of India.

The proposal will help to cut down on pollution and reduce deforestation and will be able to meet the increasing demand of LPG cylinder in the region. It will ensure easy availability of LPG

In line with the requirement envisaged and to ensure to fulfil the demand, MOP&NG has planned that different oil companies should increase their storage and bottling capacity for LPG. Accordingly, HPCL proposes to construct a 60 TMT capacity LPG Bottling Plant in Jhansi, UP along with allied facilities.

2.4 DEMAND-SUPPLY GAP

The total sales volume of LPG in the State of UP during the last three years are as under Table 2.1:

Table 2.1: Total sales in the State of Uttar Pradesh during the last three years

Year	Sales Volume (TMT)	% Growth over Historical
2013-14	1960	4.5%
2014-15	2166	10.5%
2015-16	2353	8.6%
2016-17	2612	11%

As per Vision 2015 Document of MOP & NG, GOI, the LPG penetration must be increased so as to achieve 90% penetration of LPG by 2018-19. The current LPG Penetration level in the State of UP is only 65%. The penetration is even lower than 25% in some Districts, which indicates the tremendous potential in terms of increase in growth in LPG Segment.

It is projected to release approx. 15 Lakhs new LPG connections in next 3 years by HPCL in the State of UP. Therefore, large nos. of regular and Gramin LPG Vitrak distributors are expected to be commissioned during next 2-3 years apart from the demand arising out of PMUY scheme. However, in absence of HPCL's own additional bottling plants, there will be a huge shortfall in the supply of Domestic LPG in the State of UP.

Keeping in view the increasing LPG Penetration level to 90% by 2018-19 as per directive of MOP&NG and implementation of PMUY Scheme, the projected demand supply scenario is as under:

Table 2.2: The projected demand supply scenario in the State of UP

Year	Projected Sales Volume (TMT)	Production Capacity (TMTPA)	Shortfall (TMTPA)
2016-17	267	240	27
2017-18	369	300	69
2018-19	484	420 (2nd Carousel at Unnao & Gorakhpur)	64

In order to meet the demand of HPCL, LPG customers and new enrolment under PMUY in the next five years HPCL proposes to set up a new Bottling Plant in the existing premises of old closed POL depot at Jhansi.

2.5 EMPLOYMENT GENERATION

It is envisaged that the proposed project would generate sufficient employment opportunity during construction phase and operation phase. For carrying out construction related activities, it is envisaged to engage skilled, semi-skilled and unskilled workers from local area to the maximum extent.

Table no.2.3: Employment Generation

Sr.	Posts	Numbers
1	Managers	1
2	Technical Experts	5
3	Skilled	6
4	Semi-Skilled	25
5	Unskilled	2
6	Administrative Staff	2

CHAPTER 3

PROJECT DESCRIPTION

3.1 TYPE OF PROJECT

As per EIA Notification, published in Gazette of India, Extraordinary Part-II, Section-3, subsection (ii) of Ministry of Environment & Forest dated 14.09.2006 & subsequent amendments, the proposed project falls in Activity 6(b), category A i.e. for isolated storage & handling of hazardous chemicals. As per the above notification, proposed project will have to obtain environmental clearance from MoEFCC.

3.2 LOCATION

A land to the extent of 14.95 acres (60500.50 m2) has been earmarked in the existing closed POL depot at Jhansi besides AH-43 (NH-44).

Nearest railway station/airport along with distance in kms.	Karari Railway Station around 5 KMs from the proposed LPG Bottling Plant. Nearest Airport: Gwalior
Nearest Town, city, district Headquarters along with distance in kms.	Nearest Town: Karari at 6 kms Nearest City: Jhansi at 21Kms District Headquarters: Jhansi at 21kms
Village Panchayats, ZillaParishad, Municipal Corporation, Local body (complete postal addresses with telephone nos. to be given)	Village Panchayat: Jay Ambabai ZillaParishad: - Jhansi

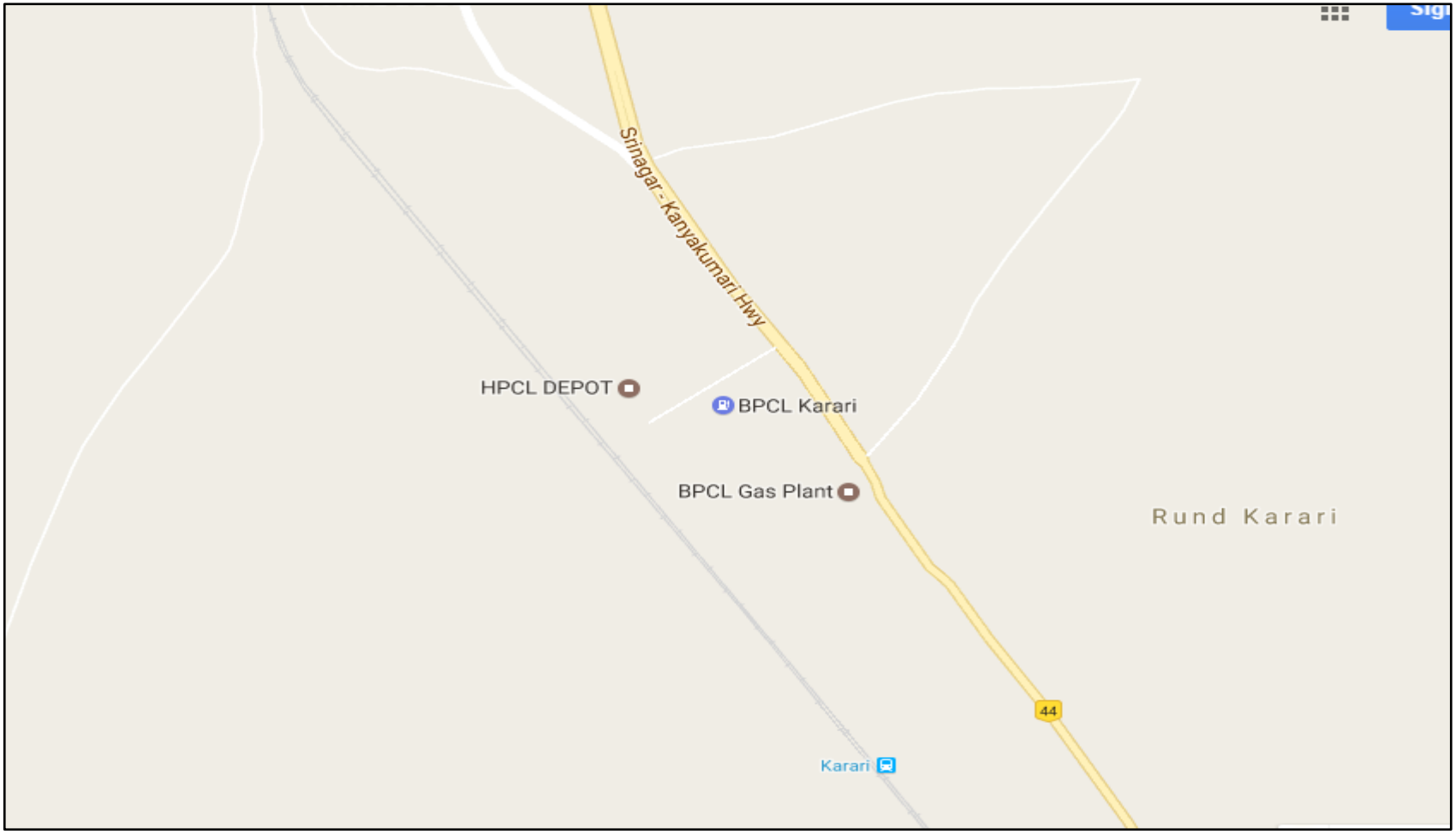

Fig.no.3.1: Site Location

Fig. no.3.2: Google Image of the Project Site

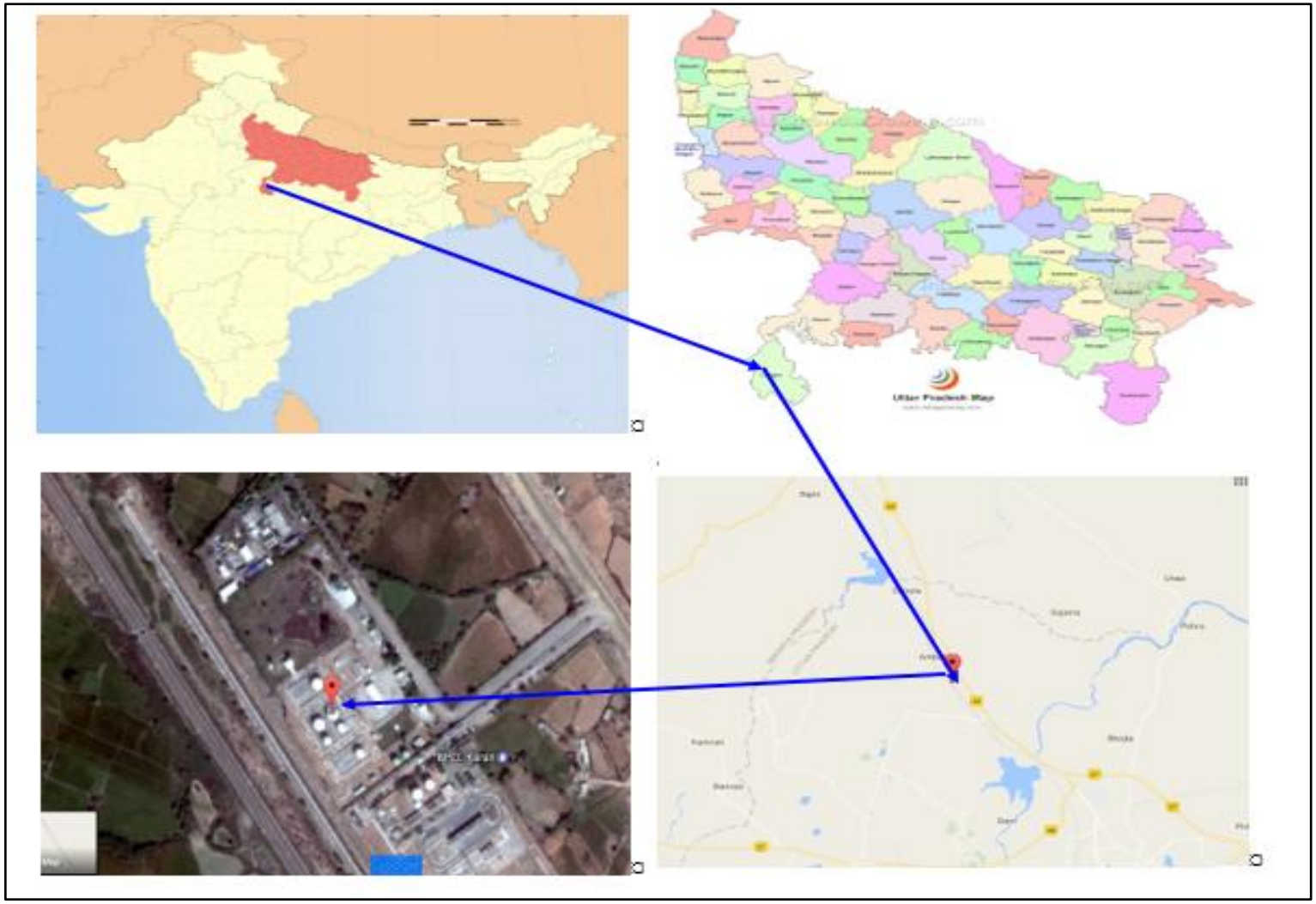

Fig no. 3.3: Location of Jhansi LPG Bottling Plant of HPCL in Geographical Map

3.3 SIZE OR MAGNITUDE OF OPERATION

The proposal envisages construction of a new LPG bottling Plant of 60 TMTPA capacity with 1x24 guns automatic electronic carousal with downstream facilities, mounded bullet LPG storage of 3 x 350 MT, 6 nos. of truck unloading bays and other allied facilities at Jhansi. The facilities shall also have structures like industrial sheds, shed structures with tubular trusses & AC sheet roofing, Administration, Amenity, MCC, DG set Room & Security office etc.

3.4 PROJECT DESCRIPTION

3.4.1 LPG Bulk Receipt:

The LPG bulk receipt shall be through Tank Trucks from Bhatinda or Haldia or Bina refinery and shall be unloaded & stored in the mounded bullet storage.

3.4.2 LPG Storage:

It is proposed to provide (3 nos.) of mounded bullet storage of 350 MT capacity each. The mounded Bullets shall be provided with 1 no. of 10" inch nozzle at the bottom for product receipt and dispatch, 2 nos. of 3" nozzles shall be provided at the top of the vessel for vapour inlet and vapour withdrawal and one no. of 4" nozzle for product return from the pump bypass, carousel return and evacuation. Vessel shall be designed as per the latest international standards viz. PD 5500:2000, ASME SEC III Div II.

Each bullet shall be covered with minimum 700mm sand cover on all sides to avoid heat transfer to the vessel surface from external sources. Each bullet shall be provided with 2 nos. safety relief valves, 2 gauging systems in the form of a Radar gauge and a servo gauge with high level switch. All the nozzles on the vessels shall be provided with remote operated valves for automatic emergency shutdown. The vessels shall also be provided with pressure & temperature gauges.

The mounded bullet facilities shall be provided with all the safety features including Cathodic protection system as per OISD 150.

The following safety provisions shall be provided for each mounded bullet:

- Two Safety Valves
- Remote Operated Valve (ROV) on all LPG inlet / outlet lines

- Radar Level Gauge & Servo Gauge
- Tank Farm Management System for Continuous Monitoring
- Cathodic Protection (CP) System
- Anti-Corrosive Painting
- Earthing System
- Gas Monitoring Sensors
- Remote operated Water Sprinkler system for Open portion of bullets & ROV's.

Table 3.1: Design & Operating parameters for LPG Mounded Storage Bullet

Sl. No.	Parameter	Remark
	Vessel	
1.	Storage Capacity	3 X 350 MT
2.	Volumetric Water Capacity each vessel	800 m^3
3.	Density of LPG	0.5 gm/cm^3
4.	Design Code	BS 5500 (Latest Edition)
5.	Design Pressure (Internal) (External)	14.5 kg/cm^2 gauge at Top 1.856 kg/cm^2 gauge
6.	Operating Pressure	8-9 kg/cm^2
7.	Design Temperature	-27^0 C to + 55^o C
8.	Operating Pressure	Ambient
9.	Hydraulic Test Pressure	As per code
10.	Radiography	100% before and after Post Weld Heat Treatment
11.	Corrosion Allowance	1.5 mm
12.	Post Weld Heat Treatment (PWHT)	Required
13.	Wet Fluorescent Magnetic particle testing	Required after PWHT
14.	Hardness checking of heat Affected Zone	Required after PWHT

15.	Mapping of Plate Thickness	Required
16.	Joint Efficiency	1
17.	Length of Pressure Vessel	33000 mm (approx.)
18.	Diameter of Vessel	6000 mm
19.	Dished Ends	Hemisphere

Note: All openings will be of Flanged type with nozzle construction

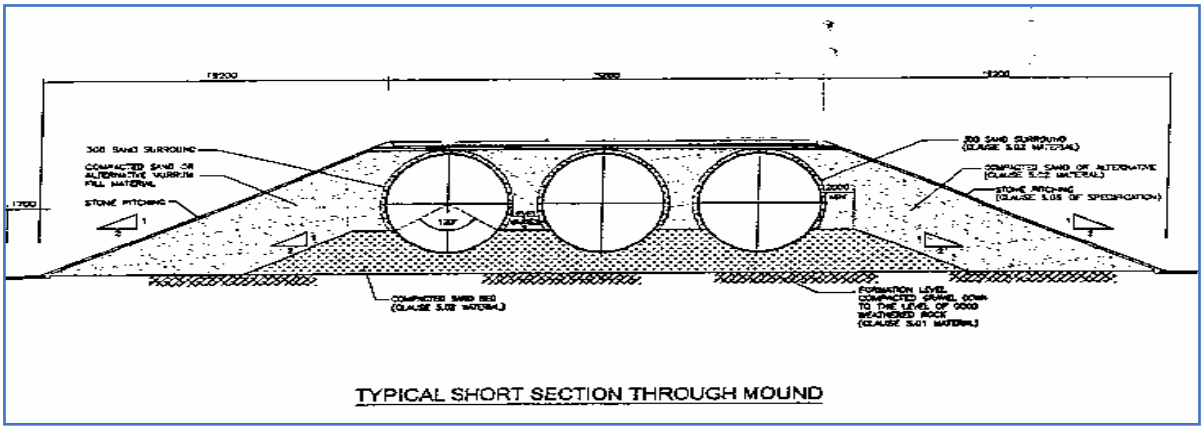

FIG 3.4: Mounded Storage (Typical Cross Section)

3.4.3 LPG Bottling:

Two nos. of LPG pumps (1W+1S) with low NPSH shall be provided for cylinder filling operation. Pumps shall be provided with double mechanical seals. The cylinder filling pumps shall be of 65 m^3/hr capacity with a max. differential head of 180 m. The design and construction of the pumps shall be as per API 610 duly inbuilt with all safety requirements like double mechanical seals etc. as per OISD 144.

Filling operation shall be done on 24 point automatic electronic carousal. Cylinders shall be checked for correct weight & valve &'O' ring leakage automatically on electronic machines. Filling pressure shall not be more than 16.9 kg/cm^2.

3.4.4 LPG Bulk unloading / emergency loading:

The proposed LPG Plant shall be provided with 6nos. of TT gantry bays for bulk loading and emergency unloading. The TT gantry shall be provided with loading arms with inbuilt safety features like emergency relief device, breakaway coupling, excess flow check valve etc.

2 nos. reciprocating type LPG compressors including one standby shall be provided for bulk LPG TT unloading of capacity 300 m^3/hr with unloading time of around 150 minutes. Typical suction pressure of compressors shall be 10 kg/cm^2 abs. max. during unloading and 2-11.8 kg/cm^2 abs. during vapour recovery. Typical discharge pressure shall be 13 kg/cm^2 abs. The design and construction of the LPG Compressors shall be as per API 618 duly inbuilt with all safety requirements as per OISD 144.

During normal operations, approximately 35 nos. of bulk LPG tank trucks are expected to be handled in a day. These trucks shall arrive at the dedicated truck parking area earmarked at the project site which shall be duly covered by the networks of hydrants / monitors. The trucks shall enter the plant as per their rotational turn. Trucks shall proceed to the main gate for the security checks, document verification etc. and then shall proceed to the weigh bridge. One weigh bridge of 50 MT capacity shall be provided. The net weight of the tank truck shall be registered in the system and the vehicle shall proceed to the respective bay allotted to it for filling operation. The truck shall wait for its turn to enter the bay, and on entering, shall park at the designated point. The operator shall take over the truck to carry out safety checks, connect earthing, provide wooden chokes etc.

LPG loading arms shall be connected to the tank trucks for loading. The entire activities shall be monitored and controlled from the control room, which shall have real time data as to which truck is getting filled up, what is the quantity being filled, from which storage vessel the product is emptied out etc.

On completion of unloading operation, the tank trucks shall be released for weighing and documentation. LPG quantity shall be estimated through measurement of empty weight at the weigh bridge. On completion of entire activity and documentation, the trucks shall be systematically led out through the main gate.

The proposed truck parking area shall have capacity to park about 20 LPG Tankers and 30 cylinder (empty) trucks. All these can be safely parked and moved in / out from the parking area. The parking area shall have high mast lighting, separate amenity building for drivers/ cleaners etc. Parking area shall have dedicated parking slots for tankers and cylinder trucks and shall also have wide access areas to negotiate tanker turning movements and smooth ingress / exit.

The proposed roads shall be 12 m wide, which will be designed to take care of the maximum traffic envisaged during full scale two shift operation of the Bottling Plant.

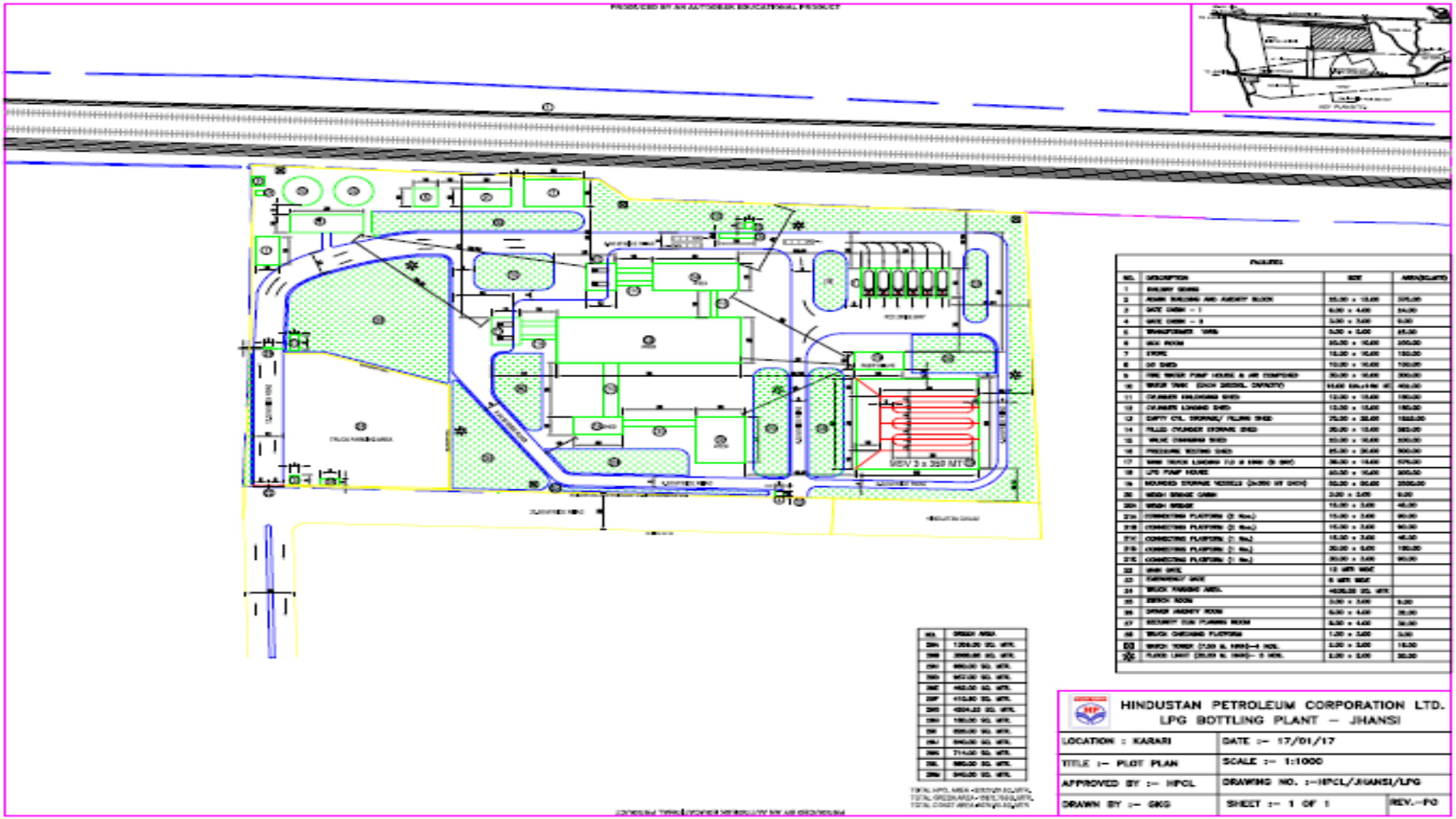

Fig no. 3.5: Layout plan

3.5 WATER REQUIREMENT

Water requirement shall be met through existing tube wells within the plant premises.

Table no. 3.2: Total Water requirement

S.No	Particulars	Quantity (m^3/day)
1.	Domestic	05
2.	Industrial	15

The water shall be stored in over-head water tanks within plant premises. Primary treatment unit shall be proposed for drinking water and other purpose.

3.6 POWER REQUIREMENT

Total power requirement envisaged is 500 KVA and shall be supplied by Uttar Pradesh Power Corporation Limited (UPPCL). Two nos. of DG sets (1x 500 KVA main + 1x 125 KVA stand by) shall be provided to meet power demand during power failure/emergency.

CHAPTER 4

SITE ANALYSIS

4.1 CONNECTIVITY

Around 60500.50 $m^2$of land will be used in the existing closed POL depot at Jhansi besides AH-43 (NH-44).

The project site is 5 km away from Karari Railway Station and near to Gwalior airport. Nearest city is Jhansi, approximately 6 km away.

4.2 LAND USE

Sr.no.	Particulars	Area (m^2)	Area (%)
1	Area required for construction of Mounded Storage	2500	4.1
2	TT Gantry area	3500	5.8
3	LPG Sheds	5000	8.3
4	Non-Plant Buildings	2000	3.3
5	Water Tanks	500	0.8
6	Truck Parking Area	5000	8.3
7	Green Belt & Gardening	19965	33
8	Approach Road	8000	13.2
9	Plant Roads & Driveways	9490	15.7
10	Others	4545	7.50
Total		60500	100

4.3 EXISTING LAND USE PATTERN

The land to be used is earmarked in an existing closed POL depot of HPCL.

CHAPTER 5

PLANNING BRIEF

5.1 PLANNING CONCEPT

The proposal envisages construction of a new LPG bottling Plant of 60 TMTPA capacity with 1x24 guns automatic electronic carousal with downstream facilities, mounded bullet LPG storage of 3 x 350 MT, 6 nos. of truck unloading bays and other allied facilities at Jhansi.

5.2 LAND USE PLANNING

The total area of plant site for the proposed depot is 60500 m^2. Land would be levelled and consolidated to the required standards. The following units will be located inside the plant boundary:

- 1x24 guns automatic electronic carousal with downstream facilities,
- Mounded bullet LPG storage of 3 x 350 MT,
- 6 nos. Of truck unloading bays
- Industrial sheds, shed structures with tubular trusses
- AC sheet roofing,
- Administration,
- Amenity,
- MCC,
- DG set room
- Security office

5.3 ASSESSMENT OF INFRASTRUCTURE

i) Future facilities

Facilities required for functioning of a LPG Plant like, welfare facilities for employees and contract workmen will be provided.

ii) Housing for employees

Since HPCL will engage local manpower as contract workmen for operation of the plant, no separate housing is envisaged. Permanent employees of HPCL will stay in Jhansi. Maintenance & housekeeping activities will be outsourced.

CHAPTER 6

PROPOSED INFRASTRUCTURE

6.1 INDUSTRIAL AREA

The proposal envisages construction of a new LPG bottling Plant of 60 TMTPA capacity with 1x24 guns automatic electronic carousal with downstream facilities, mounded bullet LPG storage of 3 x 350 MT, 6 nos. of truck unloading bays and other allied facilities at Jhansi. The facilities shall also have structures like industrial sheds, shed structures with tubular trusses & AC sheet roofing, Administration, Amenity, MCC, DG set Room & Security office etc.

6.2 RESIDENTIAL AREA

No residential infrastructure is proposed as locals will be hired.

6.3 GREEN BELT

As per the Regulations. Green belt is proposed to be developed in approx 19965 m^2 of area. This would not only prevent the fugitive dust emissions but also improve the peripheral appearance of the plant from aesthetics point of view. Unpaved areas, if any, within the plant boundary would be provided with grass cover.

6.4 SOCIAL INFRASTRUCTURE

- Development of roads and extension of the existing networks to aid connection
- It will develop the area economically and employment opportunities to the local people

6.5 DRINKING WATER MANAGEMENT

The source of water supply will be from existing tube well in the closed POL Depot.

6.6 SEWERAGE SYSTEM

Total wastewater generation shall be $5m^3$/day. The generated sewage shall be treated in Septic Tank and finally disposed off through Soak pit.

6.7 INDUSTRIAL WASTE MANAGEMENT

Industrial waste water (from washing of cylinders) will be treated in ETP and treated water will reused for gardening purpose.

Solid waste from the ETP drying beds and painting booth dry paints will be disposed through approved recyclers having valid license on periodic basis.

6.8 SOLID WASTE MANAGEMENT

The solid waste generated will be handed over to the local body.

CHAPTER 7

REHABILITATION AND RESETTLEMENT (R & R) PLAN

The proposed project will be spread over in an area of about 14.95 acres of free unencumbered land within existing premises of old closed POL depot of HPCL. The total area of land is under the administrative possession of HPCL. The proposed new LPG Bottling plant installation shall be carried out in the vacant available land. Hence, any planning with respect to Rehabilitation & Resettlement is not applicable.

CHAPTER 8

PROJECT SCHEDULE & COST ESTIMATES

The construction work for the project will be initiated after obtaining the Environmental clearance. The total cost of the project will be approximately Rs. 116.46 Crores.

Sr.no	Particulars	Cost (In lakhs)
1.	Land	750
2.	Roads	835
3.	Civil jobs (plant & non-plant bldgs)	2129
4.	Filling/Testing Equipment	1081
5.	Equipment/Pipe Lines	749
6.	Fire Fighting System	913
7.	Storage Vessels	1995
8.	Electrification	833
9.	Miscellaneous	675
10.	**Total (Including Land & Land DVPT):**	**9960**
11.	Owner Management @3%	276
12.	Contingency @3%	276
13.	**Total (Incl OM & Contingency)**	**10513**
14.	IDC Cost	1133
Total Project Cost (Rs.Lakh)		**11646**

CHAPTER 9

ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

9.1 FINANCIAL BENEFITS OF THE PROJECT

Proposed LPG plant will create employment opportunity to local populations and also create opportunity to local vendors/ suppliers during construction period and also during operation period. Uninterrupted Supply of cylinders in the market from the proposed plant will solve the problem of LPG shortage in the vicinity of the plant and also stop black marketing of LPG.

9.2 SOCIAL BENEFITS

The proposal for installation of LPG Bottling plant will be able to cater the demand of LPG in nearby areas of Jhansi, Uttar Pradesh& also meets the Govt. of India initiative of supplying LPG to rural areas and cut downs pollution, especially women to be made free from pollution in their kitchen.