

Environmental Impact Assessment

For

***The Proposed Expansion and Modernization of Foundry Unit from
2790 TPM to 6125 TPM of Ferrous Castings***

At

***Kathivakkam Village, Tiruvottiyur Taluk, Tiruvallur District,
Tamil Nadu***

EXECUTIVE SUMMARY



Project Proponent
M/s. Ashok Leyland Limited
Chennai



EIA Consultant
M/s. Vimta Labs Limited
Hyderabad / Coimbatore
QCI/NABET Accredited EIA Consultant

July 2022

1.0 INTRODUCTION

M/s. Ashok Leyland Limited- Foundry Division (Formerly known as Hinduja Foundries Ltd) proposes to increase their manufacturing capacity of ferrous castings in their existing premise. The industry is situated at 39A & 39B at Kathivakkam village, Tiruvottiyur taluk, Tiruvallur District, Tamil Nadu.

M/s. Ashok Leyland Limited, Foundry Division (herein after referred to as ALL) established at Ennore in 1961 is a part of Ashok Leyland, India's largest foundry group. The erstwhile Hinduja Foundries Limited was amalgamated with Ashok Leyland Limited-Foundry division pursuant to the Order of the National Company Law Tribunal (NCLT) vide Order dated April 24, 2017. The NCLT order was filed with the Registrar of Companies, Chennai on April 28, 2017 and the scheme became effective on April 28, 2017. The amalgamation is effective from the appointed date of October 1, 2016.

The existing plant has been operating in a company owned land area of 13.86 ha (34.25 acres) which features furnace, sand preparation and mould making divisions. The furnace division comprises 2 nos. of 3 MT and 3 nos. of 5 MT induction furnace to produce castings of 2790 TPM.

As per the direction of the TANGEDCO/ Central Electrical Authority (CEA) in 2002 the unit was forced to change the Cupola and Arc furnace to Induction furnace in order to avoid the harmonic generation by the High-Tension Industries. Even after the installation of Induction furnace (5 Nos) the production of ferrous castings is remains to be same as the consented quantity of 2790 TPM. The company has obtained Consent to Operate granted under Air & Water Act from TNPCB for the existing unit which is valid up to March 2020.

Presently, the industry has proposed to increase the manufacturing capacity of ferrous castings from 2790 TPM to 6125 TPM. The projected production will be achieved by the existing 2 nos. of 3 MT and 3 nos. of 5 MT induction furnace and other supporting equipment's. The enhancement in the production doesn't require an additional area hence, the existing land would be sufficient to carry out the expansion activity. The estimated total cost for the proposed expansion is Rs. 15.0 Crores.

Project Scoping Category

In order to obtain Environmental Clearance from State Level Environment Impact Assessment Authority (SEIAA) and Consent for Establishment (CFE) from the Tamil Nadu Pollution Control Board (TNPCB), Environmental Impact Assessment (EIA) report with detailed Environmental Management Plan (EMP) is essential as per the EIA Notification 2006 and its subsequent amendments.

As per the Environmental Impact Assessment Notification dated 14th September 2006, the proposed expansion project falls under the **Schedule No. 3(a) [Metallurgical Industries-Ferrous and Non-ferrous]**.

Considering the project activity, nature the project proposal falls under the **Category 'B1'**. The project was considered in the 153rd SEAC meeting held on 04.06.2020 and subsequently in the 382nd SEIAA meeting held on 23.06.2020 received TOR vide letter No. **SEIAA-TN/F.No.7465/2020/3(a)/ALL/TOR-726/2020** dated **23.06.2020**

2.0 LOCATION OF THE PROJECT

The Plant site is situated at Kathivakkam Village, Tiruvottiyur Taluk, Tiruvallur District, Tamil Nadu. The plant site is about 15.5 km (SSW) from Chennai and 46.5 km from Tiruvallur district (West). Nearest habitation Ennore and Kathivakkam is about 0.02 km (NNE) and 0.35 km (NNW) from the plant site. The site is about adjacent to the SH-114 Connecting Chennai and Ennore. The nearest Railway station is Ennore R.S at a distance of 0.38 km in NNE. The Nearest Airport is Chennai International Airport at a distance of 29.0 Km in SW

The proposed expansion activities will be carried out within the existing industrial premises itself. Therefore, no additional land will be acquired for the proposed expansion. The Index map and the study area map of 10 km radius is shown in **Figure - 1.1** and **Figure - 1.2** respectively. Google map of 10 km radius of the existing plant site is shown in **Figure - 1.3**. The details of environmental setting are given in **Table - 1.1**.

TABLE - 1.1
ENVIRONMENTAL SETTING OF THE PLANT SITE (10 KM RADIUS)

Sr. No	Particulars	Details		
		Point	Latitude	Longitude
1.	Latitude & Longitude	A	13°12'52.52"N	80°19'12.98"E
		B	13°12'46.78"N	80°19'23.73"E
		C	13°12'36.20"N	80°19'20.17"E
		D	13°12'42.57"N	80°19'03.55"E
2.	Elevation above MSL	4 – 9 m		
3.	Land use at the project site	Industrial Land use as per DTCP		
4.	Nearest Habitation	Ennore- 0.02 km, NNE Kathivakkam – 0.35 km, NNW		
5.	Nearest Highway	SH-114 Connecting Chennai to Ennore-Adjacent, W		
6.	Nearest Railway station	Ennore Railway Station – 0.38 km, NNE		
7.	Nearest Air Port	Chennai International Airport – 29.0 km, SSW		
8.	Nearest Harbor	Ennore Port - 5.31 Km, NNE		
9.	Nearest Town	Ennore – 0.02 km, W		
10.	Reserve Forest within 10-km radius	Nil in 10 km radius		
11.	Nearest water bodies	Bay of Bengal - 0.12 km, E Kosisttalayar River – 0.37 Km, WNW Kadapakkam Panchayat Lake – 7.1 Km, W Vichoor Lake – 8.27 Km, W		
12.	Ecologically sensitive zones like Wild Life Sanctuaries, National Parks and biospheres	None within 10-km radius		
13.	Defense Installation / Archaeological / Ports	Nil in 10 km radius		
14.	CRZ identification	CRZ-II as per CZMP/study by IRS, Anna University		
15.	Historical places	Nil		

Sr. No	Particulars	Details
16.	Socio-economic factors	No resettlement and rehabilitation involved
17.	Nearest Hospitals	Ernavur Government Hospital (2.86 Km, SW) Urban Primary Healthcare center (4.02 Km, SW)
18.	Religious places	CSI St. Peter church (0.01 Km, WNW) Masjid-e-Mammor (0.15 Km, SW) Sri Batherakali Amman Temple (0.43 Km, N)
19.	Nearby Industries	Ashok Leyland Defence Unit – Adjacent, S Coromandel International Limited – 0.15 Km, N Ennore Thermal Power Station-1.0 Km, SW NTPC thermal Power plant- 2.5 Km, N

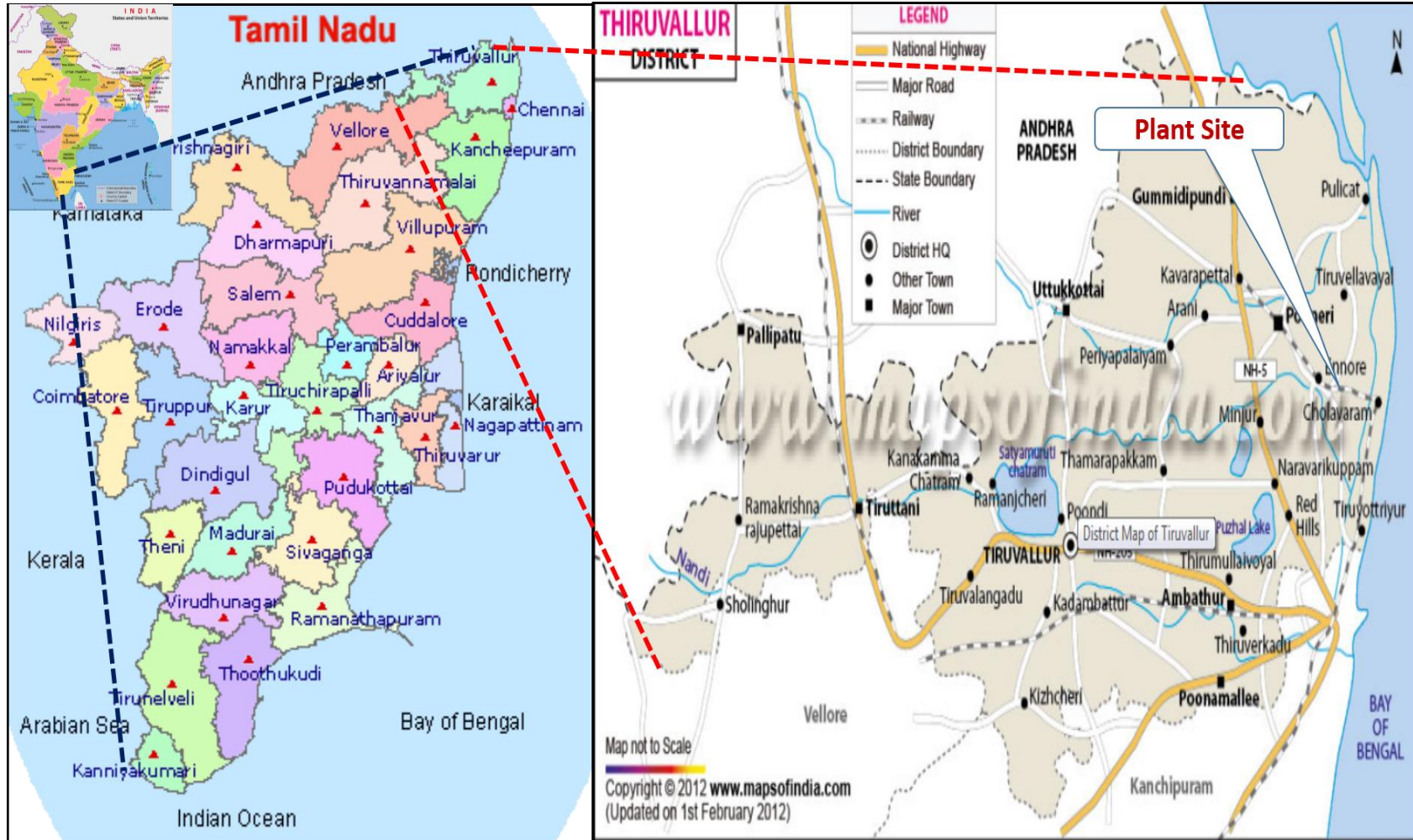


FIGURE - 1.1
INDEX MAP

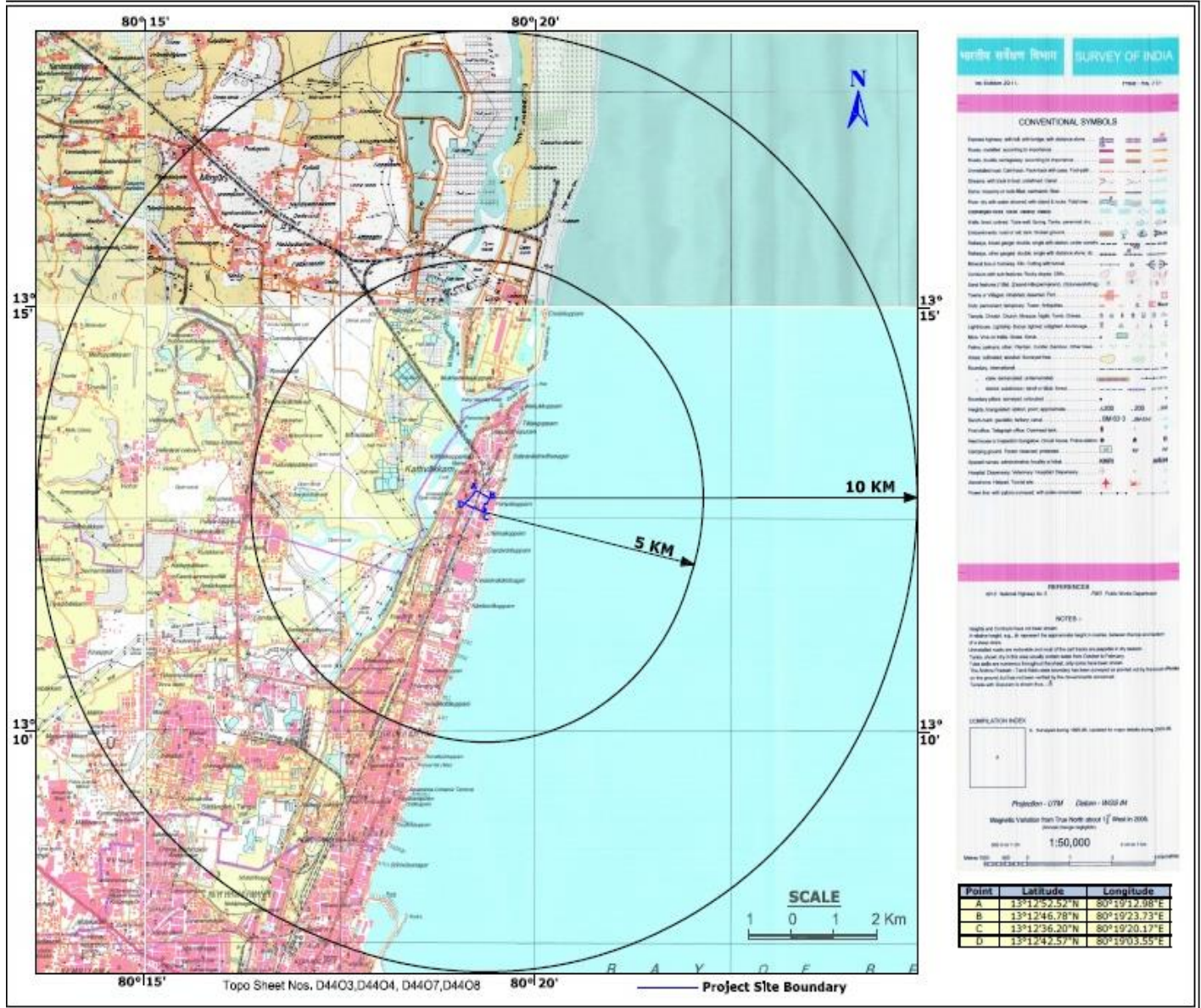


FIGURE - 1.2
STUDY AREA MAP



FIGURE - 1.3
GOOGLE MAP OF 10 KM RADIUS

3.0 PROJECT DETAILS

3.1 Manufacturing Details

The facility is proposed to enhance the production quantity of ferrous castings from 2790 TPM to 6125 TPM.

3.2 Land Requirement

The total land available under the ownership of the Ashok Leyland Limited-Foundry Division is 13.86 ha (34.25 acres). The existing plant site is classified as Industrial Land use Zone. The proposed expansion will be carried out within the existing premises itself. The details of land-use breakup of the existing plant and after the proposed expansion are given in **Table - 1.2**

TABLE - 1.2
DETAILS OF LANDUSE BREAK-UP

S. No.	Break up	Area		Percentage
		Ha	Acres	
1	Process building area	4.79	11.83	34.55
2	Non-process building area	0.68	1.66	4.84
3	Storage area	0.34	0.84	2.45
4	Parking Area	0.06	0.17	0.50
5	Driveway & pathway area	2.16	5.36	15.65
7	Green belt area	4.90	12.1	35.32
8	Open area	0.93	2.29	6.69
	Total	13.86	34.25	100

3.3 Raw Material Requirement

The major raw materials required for the proposed expansion project are Scraps, Mild steel, CI borings, Pig iron and Silica sand. The details of various raw materials, sources and their mode of transport are given in **Table-1.3**

TABLE - 1.3
DETAILS OF RAW MATERIAL REQUIREMENT FOR FOUNDRY UNIT

S. No.	Raw Material	Existing (TPM)	After Expansion (TPM)	Source
1	Pig Iron	203.0	565.0	Goa, Karnataka
2	Mild Steel	1522.0	3300.0	Tamil Nadu
3	CI Borings, CI Scrap & Foundry Returns	1268.0	2825.0	Tamil Nadu
4	Product scrap	320.0	0	-
5	Washed Silica Sand	2635.6	3675.0	Andhra Pradesh
6	Sodium Silicate	8.36	1.5	Tamil Nadu
7	Resin & Binders	41.0	59.0	Maharashtra

8	Core Paints	50.0	66.0	Maharashtra
9	Casting Paints	8.36	13.8	Maharashtra
10	Thinner (3:1 ratio)	3825.0	4600.0	Maharashtra
11	Di methyl Formaldehyde	396.0	594.0	Tamil Nadu
12	S M Release Oil (Silicone oil)	253.0	380.0	Tamil Nadu

3.4 Power and Fuel Requirement

The peak power demand for the entire unit is 18600 KVA while the average power demand will be about 17000 KW. In order to meet the desired quantity additional power supply of 5600 KVA will be required. Therefore, the peak power demand for the entire unit after expansion will be 24200 KVA while the average power demand will be about 21800KW. The entire power requirement will be sourced through TANGEDCO. The Induction furnaces are installed in the existing activity as per Central Electricity Authority's directions to minimize the power surge and harmonic distortion in the incoming feeders. To meet the emergency power requirement during power cuts and grid failures 2 Nos of 1250 KVA DG Sets will be installed and the existing DG set of 5000 KVA will be decommissioned. The Power & fuel requirement details are given in **Table – 1.4 and Table 1.5**

**TABLE-1.4
POWER REQUIREMENT**

Particulars	Existing	After Expansion
Power Requirement Source: 1. TANGEDCO	18600 KVA	24200 KVA
Backup facility DG-Set	1x5000 KVA	2x1250 KVA

Note: After the Proposed expansion DG set of capacity 5000 KVA will be decommissioned.

**TABLE-1.5
FUEL REQUIREMENT**

S. No	Description	Existing TPD	After Expansion TPD
1	HSD	3.0	5.0
2	HFO	0.1	0
Existing DG set of 5000 KVA will be decommissioned, hence HFO will not be used			

3.5 Water Requirement

The total water requirement for plant activity will be 447.0 KLD. The daily freshwater demand will be 425.0 KLD which will be sourced from wells located within the plant premises. The NOC for the groundwater withdrawal has been obtained from Chennai Metropolitan Development Authority. The water requirement of the existing and after expansion is shown in **Table-1.6**

TABLE - 1.6
DETAILS OF WATER REQUIREMENT

S No	Category	Requirement in KLD	
		Existing	After Expansion
1.	Cooling tower makeup	28.0	50.0
2.	Process	72.0	97.0
3.	Domestic requirement	350.0	300.0
Total		450.0	447.0

3.6 Manpower Requirement

The total manpower available in the existing plant is about 1950 nos. After expansion activity additional man power of 250 Nos will be equipped from the nearby communities for various plant operations. The unit is operated round the clock in 3 shifts. Total manpower after the proposed expansion will be 2200 nos.

3.7 Process Description

The conversion of MS scrap in to castings does not require any sophisticated technology. Various grades of scraps, borings and ferro alloys are melted in furnaces and pour into the moulds. The moulds of required size and shape prepared by using sand and bentonite (clay) which act as a binding material. Then the castings separated from sand moulds and cleaned.

The manufacturing process of steel castings involves the following steps in sequence.

- Sand preparation and Mould Making/Core making;
- Making cores and sand moulds;
- Melting in induction furnace and Pouring;
- Shot blasting and fettling; and
- Quality testing and Dispatch.

4.0 BASELINE ENVIRONMENTAL STATUS

The 10 km radial distance from the existing plant boundary has been considered as study area for EIA baseline studies. Environmental monitoring for various attributes like meteorology, ambient air quality, surface and ground water quality, soil characteristics, noise levels and flora & fauna have been conducted at specified locations and the secondary data collected from various Government and Semi-Government organizations. Baseline Environmental monitoring studies for the various environmental attributes were carried out during 1st July 2020 to 30th September 2020. The details of the baseline study are presented as follows:

4.1 Meteorology

Meteorological data at the site was monitored during 1st July 2020 to 30th September 2020. It was observed that during study period temperature ranged from 23°C to 38°C. During the same period of observations, the relative humidity recorded was ranged from 36% to 96%. Predominant wind directions are mostly from the WSW followed by SW.

4.2 Ambient Air Quality

To establish the baseline status of the ambient air quality in the study area, the air quality was monitored at eight (8) locations. The summary of the ambient air quality monitoring results is given in **Table - 1.7**.

TABLE - 1.7
SUMMARY OF AMBIENT AIR QUALITY IN THE STUDY AREA

Sr. No	Parameters	Concentration ($\mu\text{g}/\text{m}^3$)		NAAQS Limits, 2009 ($\mu\text{g}/\text{m}^3$)
		Maximum	Minimum	
1	Particulate matter $\text{PM}_{2.5}$	32.8	15.1	60
2	Particulate matter PM_{10}	88.6	59.7	100
3	Sulphur dioxide (SO_2)	33.4	7.1	80
4	Oxides of Nitrogen (NO_x)	33.5	8.5	80
5	Carbon monoxide, CO	330	193.0	2000

4.3 Water Quality

Eight (8) ground water samples and four (4) surface water samples within the study area were considered for assessment. The water samples are compared with the standards of drinking water IS 10500:2012

Ground water quality

The results of the ground water samples are compared with the standards for drinking water as per IS: 10500:2012. The analysis results indicate that the pH ranges in between 7.02-8.05, which is well within the specified standard of 6.5 to 8.5. The maximum pH of 8.05 was observed at Kattukuppam (GW3) and the minimum pH of 7.02 was observed at Thulsikuppam (GW6). Total hardness was observed to be ranging from 188.1-559.9 mg/l. The maximum hardness was recorded at Edayanchavadi (GW4) and the minimum hardness was recorded at Kattukuppam (GW3). The Total Dissolved Solids (TDS) concentrations were found to be ranging in between 616-2698 mg/l. The maximum TDS was recorded at Edayanchavadi (GW4) and the minimum TDS was recorded at Kattukuppam (GW3).

Chlorides at all the locations were within the permissible limit, ranging in between 158.4-724.6 mg/l. Fluorides are ranging in between 0.6-0.9 mg/l and are found to be within the permissible limit. Nitrates were found to be in the range of from 2.9-9.5 mg/l. The heavy metal content is below detectable limits.

Surface water quality

During the baseline period season, most of the surface water bodies in the study area were dry hence 4 samples were taken for analysis. The analysis results indicate that the pH ranges in between 7.86-8.03, which is well within the specified standard of 6.5-8.5. The maximum pH of 8.03 was observed at sea (SW4) and the minimum pH of 7.86 was observed at Kosathalayar River (SW1).

Total hardness was observed to be ranging from 1122.3-2010.8 mg/l. The maximum hardness was recorded at Sea (SW4) and the minimum hardness was recorded at Kosathalayar River (SW1). The Total Dissolved Solids (TDS) concentrations were found to be ranging in between 1072-31225 mg/l. The maximum TDS was recorded at Ennore Creek (SW3) and the minimum TDS was recorded at Kosathalayar River (SW1).

Chlorides at all the locations were within the permissible limit, ranging in between 284-15365 mg/l. Fluorides are ranging in between 0.7-1.3 mg/l and are found to be within the permissible limit. Nitrates were found to be in the range of from 4.5-19.7 mg/l. The heavy metal content is below detectable limits

4.4 Soil Characteristics

Six (6) soil samples were collected in and around the plant site to assess the present soil quality of the region. It has been observed that the texture of the soil is mostly "clay soil" in the study area. The common color of the soil is pale brown. The pH of the soil ranged from 7.47 to 7.95, indicating that the soil is alkaline in nature. The bulk density of soil ranges from 1.2 to 1.3 gm/cc

4.5 Noise Levels

The noise monitoring has been conducted for determination of ambient noise levels at Eight (8) locations in the study area. The daytime (L_{day}) noise levels were found to be in the range of 47.8 dB (A) to 63.2 dB (A). The night time (L_{night}) noise levels were observed to be in the range of 43.2 dB(A) to 59.4 dB(A). Hence, the noise levels were found to be well within the range specified by CPCB norms.

4.6 Ecological Environment

From the field observations there are no reserve forests in the 10km radius of the study area. As per MoEF and Forest Department of Tamil Nadu state, there are no National Parks, Wildlife Sanctuaries, Elephant/Tiger Reserve (existing as well as proposed), migratory routes / wildlife corridors or IBAs within 10 km of the project site. As per the records of the Botanical Survey of India, there are no plants of conservation importance in the study area.

No rare or endangered or threatened (RET) or Schedule I species in the study area as per the Wildlife Protection Act, 1972.

4.7 Socio Environment

The study area (10-km radius) has a total population of 4,55,972 persons according to 2011 Census. The male and female constitute 50.3 % and 49.6 % of the total population respectively. As per census, the study area comprises 20.6% population belonging to Scheduled Castes (SC) and 0.44% belonging to Scheduled Tribes (ST).

The literacy rate is found to be 77%. As per census 2011 records, the main workers were found to be 31% of the total population. The marginal workers and non-workers constituted to 5% and 62% of the total population.

5.0 Anticipated Environmental Impacts and Mitigation Measures

Impacts during Operational Phase

5.1 Impact on Soil

The soil quality remains the same as the proposed expansion does not involve a change in land use pattern. The probable sources of degradation of soil quality will be due to generation and disposal of ash and fugitive dust emission. The airborne fugitive dust from the plant is likely to be deposited on the topsoil in the immediate vicinity of the plant boundary. However, the fugitive emissions are likely to be controlled to a great extent through pollution control measures like water sprinkling and the greenbelt development. Hence, no impact is envisaged on soil quality of the project site

5.2 Impact on Air Quality

Particulate Matter (PM), Sulphur dioxide (SO₂) and Oxides of Nitrogen (NO_x) will be the major pollutants from the proposed expansion. In order to control the emissions of particulates, the pollution control equipments are proposed. Adequate stack height has been provided to disperse gaseous emissions over a wider area.

Gaseous Emission Control Measures:

Melting of metals and alloys in the induction furnaces generates dust and metal oxide fumes. These dust and fumes are extracted from the furnace and they are passed through an air pollution control system consisting of spark arrestor, dilution damper followed by wet scrubber etc. and then it would be released into the atmosphere through stacks of required height. Bag filter will be provided to shot blasting machines, sand recycling plant. Also, SNAG grinders are provided with cyclone separator with stack. Necessary vents will be provided in the sand mill and other required areas. The Regular monitoring and maintenance of the pollution control equipment's enhances the complete process of the plant site.

5.3 Impact on Water Quality & Management

As the manufacturing process will be operated only on the dry process, water is mainly used at certain stages in the process like machinery cooling, scrubber make up and domestic needs. The entire water demand for the existing operation and proposed expansion will be met from existing bore well located within the industrial premises.

The total water requirement for plant activity will be 447.0 KLD after the proposed expansion activity. The daily freshwater demand will be 425.0 KLD which will be sourced from open wells located within the plant premises. After expansion, the generated sewage (270.0 KLD) will be treated in common STP of capacity 1600 KLD. No wastewater will be discharged outside the plant premises. Hence, there is no impact on the water regime due to the wastewater generation from the plant operation.

5.4 Impact due to Solid Waste Generation

In order to avoid problems associated with solid waste disposal, an effective solid waste management system will be followed. Hence, the impact due to solid waste generation during the plant operation is not envisaged. The sources, quantity of the solid waste generated and waste management measures for existing and after the proposed expansion are presented in **Table - 1.8**

**TABLE - 1.8
DETAILS OF SOLID WASTE GENERATION AND MANAGEMENT**

S. No.	Waste Generation	Quantity (TPM)		Mode of Disposal
		Existing	Expansion	
Non-Hazardous Waste				
1	Used Sand	3250	3675.0	Send out through authorized Contractors
2	Furnace Slag	166.6	330.0	Send out through authorized Contractors
3	Grinding Dust	8.33	12.0	Send out through authorized Contractors
4	Municipal solid waste	7.35	3.10	Will be collected and given to civic bodies
Hazardous Waste				
1	Used/Spent Oil	100	150	Sold to CPCB authorized recyclers
2	Waste/Residues containing oil	2	2.5	Sold to CPCB authorized recyclers
3	Paint Waste/Residues	1.2	2.0	Sold to CPCB authorized recyclers
4	Discarded containers	60	190	Disposed to SPCB authorized disposer
5	ETP Sludge	2.0	3.0	Disposed to CTSDf

5.5 Impact on Noise levels

The major noise generating sources are from cooling tower, air compressors, transformer, sand plant, moulding section, DG sets, loading & unloading operation. The predicted noise level through mathematic modeling at the boundary due to various plant activities will be ranging in between 48-50 dB (A). It is seen from the modelling results that the incremental noise levels are within the CPCB standards.

Noise Attenuation Measures

The following control measures will be implemented for the proposed expansion project:

- All the design/installation precautions as specified by the manufacturers with respect to noise control will be strictly adhered to;
- High noise generating sources will be insulated adequately by providing suitable enclosures;

- All the necessary noise protective equipment will be supplied to workmen operating near high noise generating sources.
- The air compressor, DG sets, transformer will be provided with acoustic enclosure;
- Other than the regular maintenance of the various equipment, ear plugs/muffs will be recommended for the personnel working close to the noise generating units; and
- Adequate greenbelt development is also being developed in the plant boundary of the plant.

5.6 Impact on Ecology

The incremental concentrations of the air quality modelling show that the resultant levels of PM, SO₂ and NO_x are well within the permissible limits as per National Ambient Air Quality Standards, 2009. The impacts on aquatic ecology due to the proposed expansion activity would be negligible as the treated water will be properly reused and no waste water is discharged outside the plant premises. The proposed expansion does not create any significant impact on aquatic bodies.

5.7 Impact on Public Health

The discharge of waste materials (stack emission, wastewater and solid wastes) from process operations can have some adverse impact on public safety and health in the surrounding area, if appropriate treatment procedures are not followed. As the plant pollution control equipments will be designed as per the modern available technology for controlling the impacts, no adverse impacts on public health in the area are anticipated.

6.0 ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan during the Erection Phase

6.1 Soil Environment Management

Preparation of site will involve excavations and fillings. The earthen material generated during excavations and site grading periods, shall be properly dumped and slope stabilisation shall be taken. The topsoil generated during erections shall be preserved and reused for plantations.

The additional greenbelt area shall be delineated before start-up of earthwork and tree plantation shall be taken up during erection stage itself.

6.2 Air Quality Management

The activities like site development, grading and vehicular traffic contribute to increase in PM and NO_x concentrations. The mitigation measures recommended to minimize the impacts are:

- Water Sprinkling in construction area;
- Asphalting the main approach road;
- Proper maintenance of vehicles and construction equipment; and
- Tree plantation in the area earmarked for greenbelt development.

6.3 Water Quality Management

- The earthwork (cutting and filling) will be avoided during the rainy season and will be completed during the summer season.
- Stone pitching on the slopes and construction of concrete drains for storm water to minimize soil erosion in the area will be undertaken.
- Soil binding and fast-growing vegetation will be grown within the plant premises to arrest the soil erosion.

6.4 Noise Level Management

Operation of construction equipment and vehicular traffic contribute to the increased noise level. Recommended mitigation measures are:

- Enclosures for noise making units like pumps, compressors etc.,
- Good maintenance of vehicles and construction equipment;
- Plantation of trees around the plant boundary to attenuate the noise; and
- Provision of earplugs and earmuffs to workers.

6.5 Ecological Management

Clearing of vegetation will not be required as the land is already under possession of the project proponent. Thus, there will not be any ecological impact due to the project expansion in its erection stage.

Environment Management Plan during the Operation Phase

During operation phase, the impacts on the various environmental attributes should be mitigated using appropriate pollution control equipment. The Environment Management Plan prepared for the proposed expansion project aims at minimizing the pollution at the source itself.

6.6 Air pollution Management

Fugitive and Stack emission from the foundry unit will contribute to increase in concentrations of PM, SO₂ and NO_x. The mitigation measures recommended are as follows:

- Raw material handling sections are major source for fugitive emissions;
- Adopting good housekeeping practice will also help in control of fugitive emission. Maintaining shop floor and roads in good condition minimizes the chances of fugitive emission; and
- The trucks and other vehicles shall be maintained and serviced regularly to reduce air emissions.

6.7 Water pollution management

The recommended measures to minimise the impacts are as follows;

- Recycling of wastewater for greenbelt areas;
- Adequate treatment of wastewater prior to recycling/reuse to maximum extent;
- Utilization of treated domestic wastewater in greenbelt development and plant operation;

- Lining of effluent dyke suitably to prevent any seepage into ground to avoid any groundwater contamination;
- Provision of storm water system to collect and store run-off water during rainy season and utilization of the same in the process to reduce the fresh water requirement; and
- Suitable rainwater harvesting structures to be constructed.

6.8 Noise pollution Management

The major noise generating sources are the cooling tower, air compressors, transformer, furnace section, DG sets, loading & unloading operation. Some recommendations are;

- Adequate protective measures in the form of ear muffs/ear plugs have been provided to the workers working in high noise areas;
- In addition, reduction in noise levels in the high noise machinery areas could be achieved by adoption of suitable preventive measures such as suitable building layout in which the equipment is to be located; and
- Adequate greenbelt development is also being developed in the plant boundary.

6.9 Solid Waste Management

- The Non-hazardous wastes such as used sand, furnace slag, grinding dust and municipal solid wastes will be Send out through authorized Contractors.
- The Hazardous wastes such as Used/Spent Oil, Waste/Residues containing oil, Paint Waste/Residues, discarded containers will be collected and given to CPCB authorized recyclers and ETP Sludge will be Disposed to CTSDF.

7.0 TRAFFIC STUDY

The project site is located to from SH-114 which is Chennai-Ennore highway. The engine driven vehicles were classified into various levels like two wheelers, Auto Rickshaw, Car/Utility, Buses and Trucks. The proposed expansion involves the transport of raw material and finished goods near to and from the plant site. The present level of traffic on the existing road is found to be 417.2 PCUs/hr. Total traffic generated from the proposed expansion is 429.2 PCUs/hr (417.2+12=429.2).The transportation in the proposed expansion not create any significant impacts to the environment.The traffic scenario presented in **Table-1.9**.

TABLE-1.9
TRAFFIC SCENARIO

Road	V	C*	V/C Ratio	LOS
Chennai – Ennore Hwy (SH-114)	Existing			
	417.2	1500	0.28	B
	After Expansion			
	429.2 (417.2+12)	1500	0.29	B

V= Volume in PCUs/hr & C= Capacity in PCUs/ hr
* Note: Capacity as per IRC Guidelines

The existing level of service (LOS) of the Chennai – Ennore Hwy (SH-114) is 'B' which is very good. After considering the transportation of trucks due to the proposed project expansion, meagre impact was envisaged. The level of service predicted to be 'B' (**very Good**) even after the proposed expansion.

There will be a frequent movement of trucks in the plant premise for the transportation of raw material and products but the proposed expansion involves only a small increase in truck numbers which may never cause a significant impact. The vehicular movements can discharge SO₂, NO_x and particulate emissions due to combustion engines. The emission from the vehicular movements can be controlled by good management practices of the vehicles.

- Vehicles used for transportation will be equipped with novel engine for reducing emissions.
- Low sulphur-High Speed Diesel will be used for fuelling vehicles.
- Periodical maintenance of vehicles with emission testing will be carried out.

8.0 ENVIRONMENTAL MONITORING PROGRAM

The environmental monitoring program is important in terms of evaluating the performance of pollution control equipment installed in the plant. The sampling and analysis of the environmental attributes will be as per the guidelines of CPCB/TNCPB. The frequency of air, noise, surface water and ground water sampling and location of sampling will be as per the directives of Tamil Nadu Pollution Control Board.

8.1 Budgetary Allocation for Environmental Protection

The capital cost of the project is around 1200 crores and the total project cost for the proposed expansion project is about Rs. 15.0 Crores. Out of this, Rs. 2620 lakhs has been spent on environment protection, management, pollution control, treatment and monitoring systems, appropriate budgetary provision would be made and provision for recurring expenditure for environment management of the project would be made **Table - 1.10**

TABLE - 1.10
COST PROVISION FOR ENVIRONMENTAL MEASURES

Sr. No.	Description of Item	Environment Capital Cost (Rs. in Lakhs)	Environment Recurring Cost (Rs. in Lakhs/annum)
1	Air pollution control systems	2500.0	500.0
2	Water pollution control system	25.0	10.0
3	Solid Waste Management	10.0	2.5
4	Noise pollution control	10.0	2.5
5	Environment Monitoring	25.0	6.5
6	Occupational Health & Safety (OHS)	20.0	25.0
7	Green belt Development	30.0	20.0
Total		2620.0	566.5

9.0 Greenbelt Development

Greenbelt will be developed along with the existing greenbelt area. Greenbelt/landscaping are already being maintained at 35.32% which covers a land area of 4.90 ha for the existing plant. Additionally, plantation developed within existing greenbelt area.

10.0 Disaster Management Plan

To tackle the consequences of a major emergency inside the plant premises or its immediate vicinity, a Disaster Management Plan has been formulated. The objective of the Disaster Management Plan is to make use of the combined resources of the foundry unit and the outside services, to achieve the following:

- Effect the rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Identify any dead;
- Provide for the needs of relatives;
- Provide authoritative information to the media;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the Emergency.

11.0 Occupational Health & Safety Measures

Large projects where multifarious activities are involved during construction, erection, testing, commissioning, operation and maintenance, the men, materials and machines are the basic inputs. Along with the benefits, the industrialization generally brings several problems like occupational health and safety.

The industrial planner therefore has to take steps to minimize the impacts and to ensure appropriate occupational health and safety in the foundry unit. The following measures are proposed:

- Conducting awareness programs at regular intervals to the employees;
- Providing safety kits and prevention kits; and
- Provision of Clinic at the plant site to handle emergency situations that may arise.

12.0 Corporate Environment Responsibility

The existing CSR policy lays down the guidelines and mechanism to carry out CSR projects/programs by Ashok Leyland Limited-Foundry Division and to report their CSR work in the format provided by the rules under the Companies Act, 2013.

ALL have developed the policy in consonance with section 135, Companies Act, 2013 on CSR and in accordance with the CSR rules notified thereof by the ministry of Corporate Affairs, Government of India in 2014.

M/s. Ashok Leyland Limited-Foundry Division. CSR policy is formed by the guiding principles that form part of the CSR rules. CSR policy is applied to all CSR

projects/program undertaken by Ashok Leyland Limited-Foundry Division as per Schedule VII of the Companies Act 2013, within the geographical limits of India only, for the benefits of marginalized, disadvantaged, poor or deprived sections of the community and the environment.

M/s. Ashok Leyland Limited-Foundry Division proposes to take part in various CER activities like water supply, tree plantation, bus shelters, medical camp, road facilities and development of the villages. 2.0% of the project cost will be allocated for CER activity. The CER activity action plan for the existing and proposed expansion is shown in **Table - 1.11(a)** and **Table-1.11(b)**.

TABLE - 1.11(a)
EXISTING CORPORATE SOCIAL RESPONSIBILITY ACTIVITIES

Sr. No.	CSR Activity
1	Child development activities from underprivileged rural communities
2	Road to school program has been initiated in 3 districts (Chennai, Namakkal, Hosur)
3	Water ATMs has been installed in various schools
4	Health care for students has also been carried out

TABLE - 1.11(b)
CORPORATE ENVIRONMENT RESPONSIBILITY ACTION PLAN

Sr. No	Activity	Capital cost (Lakhs)	Recurring cost (Lakhs/ annum)
1.	Water supply facility to nearby villages	5.0	2.0
2.	Funding for the education, distribution of free books, uniforms for students	2.5	5.0
3.	Improvement of nearby water bodies	20.0	15.0
4.	Free periodical health camps for the nearby habitation people	2.5	5.0
	Total	30.0	27.0

13.0 Project Benefits

The basic requirement of the community needs will be strengthened by extending health care, educational facilities to the community, providing drinking water to the villages, building/strengthening of existing roads in the area.

Implementation of the power project will result in the following benefits

- Temporary employment for people from the neighboring villages during construction phase;
- Community development activities such as training of local unemployed youth in various construction skills, English speaking, personality development,



development of self-help groups for women, providing drinking water facility, strengthening of rural roads, deepening of ponds etc.,

- State will get revenue from payment towards taxes and water cess etc.,
- Providing dispensary with a medicine bank to cater to the health care needs of the surrounding villages;
- Providing vocational training to women in areas for their self-employment.
- Utilizing the services of ex-servicemen for providing training to youth in areas of personality development, security etc.,

Conclusion

The proposed Expansion of foundry unit has certain level of marginal impacts on the local environment. Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed expansion project would be beneficial to the society as well as to reduce the demand-supply gap of ferrous castings products which contributes to the economic development of the region in particular and country in general.