Executive Summary

January 2024

Environment Impact Assessment Report

For

Proposed Expansion of Foundry Unit

at S.F. No. 51/1A, 51/1B, 53/1A, 53/2, 58/1, 58/2, 59/2A, 59/2B, 60, 61/2, 57/1A, 54, 55/3, Oorattukuppai Village, Madukkarai Taluk, Coimbatore District

Sector No. 3(a) (Sector No. 8 as per NABET)

(Baseline Period – March 2023 to May 2023)

Environmental Consultant:

Ecotech Labs Pvt Ltd.,
No. 48, 2nd Main road,
South Extension Ram Nagar,
Pallikaranai,
Chennai-600100.

Project Proponent:

Bradken India Private Limited,
D.No. 191/3 & 191/4,
Chettipalayam – Palladam Road,
Orattukuppai,
Coimbatore – 641 201.

1.0 BRIEF DESCRIPTION OF THE PROJECT

M/s. Bradken India Private Limited is one of the leading Ferrous-casting companies in the world. In April 2017, Bradken became a wholly owned subsidiary of Hitachi Construction Machinery Co. Limited, leading the company into a new era**.** The production capacity of the foundry located Plot No. S. F. No. 51/1A, 51/1B, 53/1A, 53/2, 58/1, 58/2, 59/2A, 59/2B, 60, 61/2, 57/1A, 54, 55/3, Orattukuppai Village, Madukkarai Taluk, Coimbatore District is 23166 Tons per Annum of Saleable Ferrous Castings & 27000 Tons per Annum of Composite Mill Liners.

Now Bradken has proposed to increase their production capacity of Ferrous Castings from 23166 TPA to 57600 TPA and Composite Mill Liners from 27000 TPA to 50000 TPA by installing additional 1 No of induction furnace (2 Crucible - 8T Each), Shakeout machines (2 Nos), Mechanical Sand Reclamation Plant (2 Nos), Thermal Reclamation Plant (1 No), Sand Silo-1 No, Sand Mixer -2 Nos, core shooter – 1 No, Fettling Shop - 2 Nos, Shot Blasting Machines – 2 Nos, Chromite Sand Separator – 1 No, Thermic fluid heater – 2 Nos, Machine Shop – 2 Nos & Paint Booth – 1 No. The total cost of proposed expansion project is estimated as Rs. 22650 Lakhs.

As per Environmental Impact Assessment Notification 2006 dated 14th September 2006, the proposed expansion of foundry (Secondary Metallurgy Industry) falls under 'Category B' for which Environmental Clearance (EC) from State Level Impact Assessment Agency (SEIAA) is necessary. In line with EIA Notification dated 14.09.2006, SEAC meeting was held for determining Terms of Reference (TOR) on 9th June 2023 for the preparation of EIA report. Based on TOR conditions given by SEIAA vide its letter No. SEIAA-TN/F.No.10007/SEAC/3(a)/TOR-1492/2023 dated 22.06.2023, the EIA has been prepared.

1.1 Land Requirement

The total area of the existing plant is 18.57 ha and the built-up area is about 1.69 ha. The proposed expansion proposal does not require any additional land. The land use classification of the project site is industrial area as per Master Plan of LPA, Coimbatore. The land use break-up of the existing and after expansion of the plant is tabulated below in **Table-1.**

TABLE - 1: LANDUSE BREAK-UP OF PROJECT SITE

S. No.	Description	Before Expansion		After Expansion	
		Area (Ha)	Percentage (%)	Area (Ha)	Percentage (%)
1	Processing Area	1.69	9.10	3.06	16.47
2	Non-processing Area	0.614	3.31	1.26	6.79
3	Driveway & Pathway	2.13	11.47	5.27	28.38
4	Parking Area	0.253	1.36	0.253	1.36
5	Green belt	3.60	19.38	6.133	33.02
6	Future Expansion	10.28	55.36	2.59	13.94
	Total	**18.57**	**100**	**18.57**	**100**

1.2 Power & Fuel Requirement

The power requirement will increase from 13750 KVA to 23750 KVA after the proposed expansion, which will be sourced from TANGEDCO. To meet the emergency power requirement during the grid failure, DG Sets having capacity of 3 x 1010 KVA and 1 x 125 KVA are already available and is proposed to install two additional DG sets of 1010 KVA each.

LPG is used for ladle preheater, thermal sand reclamation system, heat treatment furnace & thermic fluid heater and its requirement is about 7 TPD which will be increased to 11 TPD after the proposed expansion. HSD is the fuel used in the plant for standby DG sets and its requirement use to vary with power failure & its maximum requirement is about 3.5 KLD which will increase to 4.5 KLD after the expansion.

1.3 Raw Materials Requirement

The raw materials required for the production of castings and composite mill liners including its quantity before and after expansion are tabulated in **Table – 2.** The raw materials are brought in to the plant through trucks from the local market.

TABLE – 2: RAW MATERIAL REQUIREMENT

S. No.	Raw Material	Requirement (Tons/Annum)	
		Before Expansion	After Expansion
	Castings		
1	Pig Iron/Steel Scarps	22086	55300
2	Ferro Alloys / Alloying Metals	1800	4800
3	Rejects, Runner & Riser	5814	19900
4	Sand	3600	8200
5	Resin	900	1900

6	Catalyst	300	700
7	Refractories	600	1300
8	Mould Coating	180	380
9	Sleeves	144	300
	Composite Liners		
10	Steel / Casting inserts	18000	33350
11	Unvulcanised Rubber	9024	16900

1.4 Water Requirement

The water requirement of the plant is about 73 KLD which will increase to 123 KLD after the proposed expansion. The water is being sourced from the NTADCL / TWAD Board supply. The total water requirement before and after expansion is given in **Table - 3.**

TABLE – 3: WATER REQUIREMENT

S. No.	Category	Requirement (KLD)	
		Before Expansion	After Expansion
1	Cooling tower makeup	51	84
2	Dust Suppression	1.92	4
3	Wet scrubber	0.08	2
4	Domestic	20	27
5	Machining	-	4
6	Floor washing	-	2
	Total	**73**	**123**

1.5 Man Power Requirement

The manpower requirement of the existing plant is about 400 No which will be increased to 600 No after the proposed expansion. The proposed expansion will also provide indirect employment to about 500 persons. The additional man power requirement is mostly fulfilled by the region of 10 – 15 km radius except specific technical persons.

2.0 DESCRIPTION OF THE ENVIRONMENT

2.1 Location and description of the site

The terrain of the land in the plant site is plain and no water streams are present in the site area. The environmental setting of the plant site is given in **Table - 4**. Study area of 10-km radius around the project site is shown in **Figure - 1**.

TABLE – 4: ENVIRONMENTAL SETTING IN 10-KM RADIUS

S. No.	Particulars	Details
1	Latitude	10°56'18.31" to 10°56'13.31" N
2	Longitude	77°03'10.23" to 77°03'10.98" E
3	Elevation above MSL	450 m
4	Land use	Industrial Area
5	Nearest Highway	SH 163 - Palladam - Cochin Frontier Road - Adjacent, SE
6	Nearest Railway Station	Podanur Railway Station – 7.5 km, WNW Coimbatore Junction-11.5 km, NW
7	Nearest Airport	Coimbatore International Airport -10.5 km
8	Nearest Habitation	Chettipalayam - 3.0 km
9	Nearest Town	Coimbatore - 13.2 km, NW
10	Reserve Forests	Nil in 10 km radius
11	Nearest Water Bodies	1. Periya Kuttai-3.5 km, SSW 2. Pattanam Pond - 5 km, N 3. Kurichi Kulam - 6.2km, WNW 4. Pallapalayam Lake - 6.3 km, NNE 5. Vallalore Lake - 6.4 km, NW 6. Noyyal River-6.8 km, WNW 7. Singanallur Lake - 6.9km, NNW 8. Kandikaudan Kuttai-7.8 km, SW 9. Kannampalayam Lake - 8.4 km, NNE
12	Ecologically sensitive	Nil in 10 km radius
13	Defense Installation	Nil in 10 km radius
14	Archaeological /Historical places	Mandapakkadu (Structure with Mound) – 1.8 km, NNW
15	Socio-economic factors	No Resettlement and Rehabilitation issues are involved

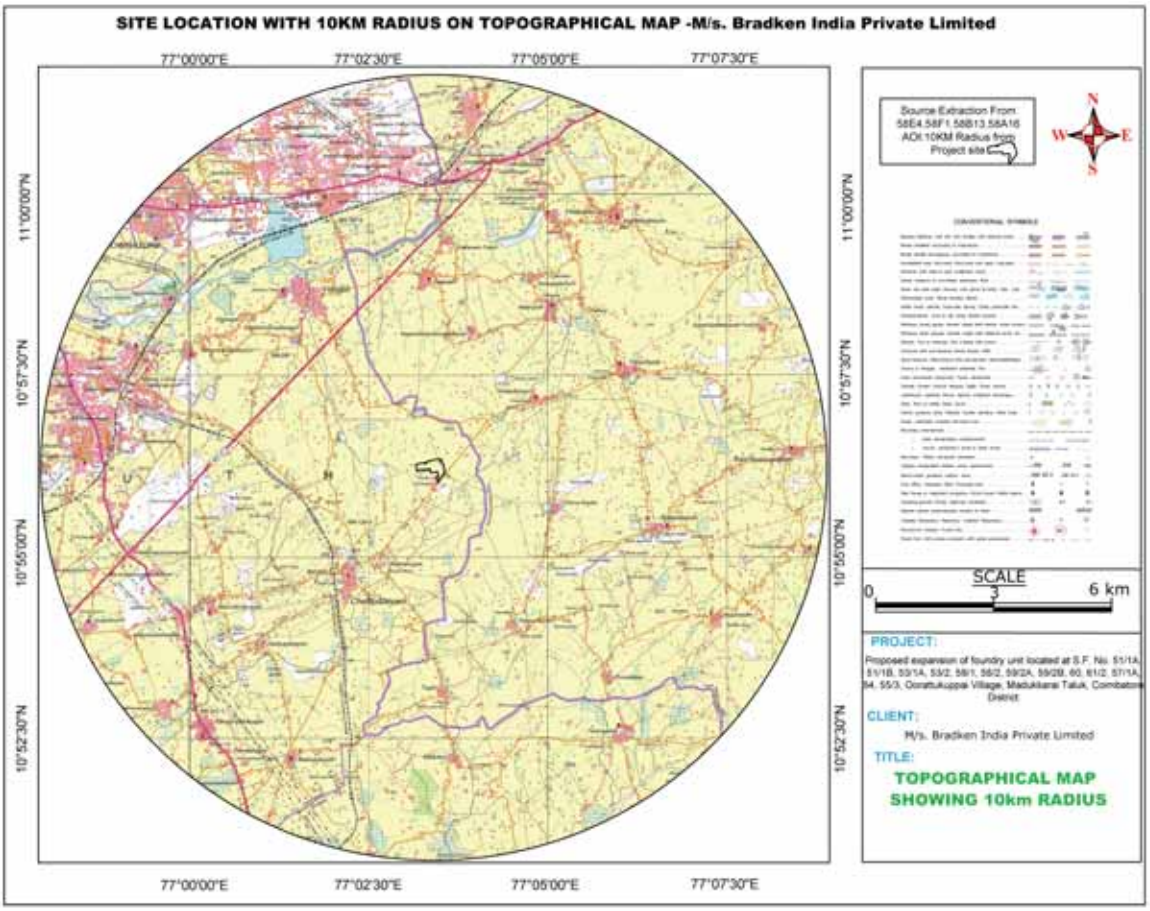

FIGURE-1: STUDY AREA MAP – 10-KM RADIUS

2.2 Baseline environmental monitoring

Baseline environmental monitoring studies for the various environmental attributes were carried out during March 2023 to May 2023 covering the summer season. As the EIA consultant has been carrying out the EIA studies for the similar projects earlier, the points mentioned in the ToR were contemplated beforehand and the same were included in the study. Hence, even though the ToR letter was not received before starting the baseline data generation for this project. The details of the base line study are presented as follows:

2.2.1 Meteorology

The predominant wind direction observed during the study period is South West direction. The calm conditions were observed for 3.0% of the total time. The mean maximum and mean minimum temperatures recorded at site during study period were 38^{o}C and 18^{o}C. The maximum and minimum relative humidity was observed to be 100% and 13% respectively during the study period.

2.2.2 Air Quality

Ambient Air Quality Monitoring (AAQM) stations were set up at eight locations. The air samples were analyzed as per standard methods specified by Central Pollution Control Board (CPCB), IS: 5184 and American Public Health Association (APHA).

The maximum value for PM_{10} was observed at Project Site & Chettipalayam as 59-µg/m^3 and minimum value for PM_{10} was observed at Nagammanaickenpalayam & Chinnakuyili as 41-µg/m^3. The maximum value for $PM_{2.5}$ was observed at Pappampatti as 32-µg/m^3 and minimum value for $PM_{2.5}$ was observed at Kallapalayam as 15.5-µg/m^3. The maximum value for SO_2 was observed at Pappampatti as 14-µg/m^3 and minimum value for SO_2 5.0-µg/m^3 was observed at Chettipalayam. The maximum value for NO_2 was observed at Pappampatti as 26-µg/m^3 and minimum value for NO_2 was observed at Orathukuppai as 5-µg/m^3. The concentrations of PM_{10}, $PM_{2.5}$, SO_2 and NO_2 are observed to be well within the standards prescribed by Central Pollution Control Board (CPCB) for rural/residential zone.

2.2.3 Water Quality

The water quality monitoring has been conducted at 8 ground water locations and 2 surface water locations covering 10 km radius and it is examined for physico-chemical, heavy metals and bacteriological parameters. The water is fit for drinking as most of the parameters meets the standards prescribed under IS 10500 drinking water standards. The pH value of the ground water in the study area varies between 7.68 to 8.03 and conductivity varies from 866 to 3810 µS/cm. TDS values were found to be from 428 to 1910 mg/L. The total hardness varied from 141 - 638 mg/L. The chloride values were found to be in the range 74 mg/L to 324 mg/L. Metals such as Copper, Lead, Cadmium, Chromium, Arsenic, Selenium, and Mercury were observed to be below detection limit in the ground water samples. The surface water quality at the study area meets the acceptable limits as per IS 10500 drinking water standards.

2.2.4 Soil Quality

Eight locations within 10-km radius of the project site were selected for soil sampling. At each location, soil samples were collected from three different depths viz. 30 cm, 60 cm and 90 cm below the surface and homogenized. The homogenized samples were analyzed for physical and chemical characteristics.

It has been observed that the texture of soil is predominantly sand in the study area. It has been observed that the pH of the soil quality ranged from 6.65 to 6.95. The Electrical Conductivity was observed to be in the range of 0.017 to 0.047 mS/cm. Organic Carbon of the soil varied from 1.12 to 1.45%, which indicates more than Sufficient level of organic carbon present in the soil. The Nitrogen values ranged between 310 to 520 mg/100gm indicating that the soil has 'sufficient' quantity of nitrogen. The Phosphorus

values range in between 17.8 to 575.6 mg/100gm indicating that the soil is having 'less' to 'medium' quantity of phosphorous. The Potassium values range in between 154 to 383 mg/100gm indicating that the soils in the area have 'moderate' to 'high' quantity of Potassium.

2.2.5 Noise Levels

The noise monitoring has been conducted for determination of ambient noise levels at eight locations in the study area. The day time noise level at industrial zone was observed to be 54 dB (A) which is within the prescribed limit of 75 dB (A). The day time noise level at all rural & residential zone was observed to be 50 to 53 dB(A) which is within the prescribed limit of 55 dB (A). The day time noise level at commercial zone was observed to be 64 dB (A) which is within the prescribed limit of 65 dB (A).

The night time noise level at industrial zone was observed to be within the prescribed limit of 70 dB (A), which was 44 dB (A) at project site. The night time noise levels at residential locations were found to be 39 to 43 dB (A) within the prescribed limit of 45 dB (A). The night time noise level at commercial zone was observed to be 54 dB (A) which is within the prescribed limit of 55 dB (A).

2.2.6 Ecology

There is no reserve forest in 10 kms around this project site. No wildlife sanctuaries or national parks or biosphere or hotspots located in 10 km radius from the project site area.

Field survey conducted during the study period revealed that total number of 67 species have been recorded of which maximum of 36 species are accounted for trees followed by 10 species of Herbs & 15 species of Shrubs.

About 46 species of fauna components recorded/reported from study area which are mainly belongs to mammals, birds, reptiles, amphibians and butterflies. Out of observed faunal components 3 species belongs to Schedule-II, 34 species belong to Schedule-IV and 2 species belong to Schedule-V.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The anticipated environmental impacts and mitigation measures are presented in **Table - 5**.

TABLE – 5: ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Discipline	Potential Negative Impacts	Probable Source	Mitigation Measures	Remarks
Constructional Impact				
Water Quality	Increase in suspended solids due to soil run-off during heavy precipitation	Loose soil at construction site	During monsoon season run off from construction site will be routed to a temporary sedimentation tank for settlement of suspended solids.	---
Air Quality	Increase in dust and NO_2 concentration	Leveling activity and Vehicular movement	Sprinkling of water in the construction area and unpaved roads. Proper maintenance of vehicles will be done.	The impact will be low, as the main approach road is tarred.
Noise	Increase in noise level	Construction equipment	Equipment will be kept in good condition to keep the noise level within 85-dB (A).	Workers will be provided with necessary protective equipment like ear plugs, masks, etc.
Terrestrial Ecology	Depression of plant growth	Dust emission from construction	Landscaping and extensive plantation will be done during the construction period itself in consultation with the local forest department.	---
Operational Impact				
Air Quality	Increase in PM, SO_2 and NO_2 levels in ambient air.	Stack emissions and material handling	• High efficiency Cassette Filter type fume extraction system will be installed to control the emission from proposed induction furnaces. • Dust collectors of required size will be provided for Sand Plant, shot blasting machine, fettling machines and paint trap filters to paint booths. • Adequate stack height will be provided as per CPCB guidelines for the proper dispersion of gaseous pollutants. • Internal roads in the plant area will be black	The resultant air quality as per air quality modelling is confirm to the stipulated standards. Dust emission from the proposed emission sources will be kept below 50-mg/Nm^3.

Discipline	Potential Negative Impacts	Probable Source	Mitigation Measures	Remarks
			topped to reduce dust emission. • Plantation programs will be undertaken around the plant area. • Dust suppression measures will be implemented material handling area.	
Noise	Increase in noise levels in the plant area.	Equipment in main plant and auxiliaries	Equipment will be designed to conform to noise levels prescribed by regulatory agencies. Providing acoustic enclosure as source control. Provision of green belt and plantation would further help in attenuating noise.	Employees working in high noise areas would be provided earplugs as protective device.
Water Quality	Deterioration of surface water quality.	Discharge from wastewater from domestic & industrial usages.	Sewage Treatment Plant will be upgraded from 20 KLD to 30 KLD to manage additional sewage and an ETP of capacity 10 KLD is proposed to treat the effluent.	Entire quantity of treated sewage and effluent will be reused in green belt.
Solid waste	Burnt sand, Furnace slag and dust from filter	From knockout section, furnaces and APC measures	Burnt sand will be sent back to the sand mixer to use multiple times after required reclamation. The furnace slag will be used in cement plant / road laying material. The dust from filters will be disposed for co-processing in cement plant.	Efforts will be made to utilize the solid waste to the extent possible.
Ecology				
a. Terrestrial	Impact on plant species	Emissions from stack	Emission will be controlled as well as dispersed through appropriate design.	As ambient air quality will be within limits, no active injury to the vegetation is expected.
b. Aquatic	Impact on aquatic life of the water bodies	Sewage & Effluent	Additional quantity of sewage will be treated in the upgraded STP and effluent will be treated in the proposed ETP.	The treated sewage and effluent will be reused in green belt.

Discipline	Potential Negative Impacts	Probable Source	Mitigation Measures	Remarks
Demography and Socio-economics	Strain on existing amenities like housing, water sources and sanitation, medical and infrastructure facilities.	Influx of people of proposed expansion employees as well as contractor's employees/ labourers.	Most the worker requirement will be fulfilled by local people. No significant impact is envisaged	Overall socio-economic status of the area is expected to improve.

4.0 ENVIRONMENTAL MONITORING PROGRAM

Environmental monitoring is being conducted on regular basis by Bradken India Private Limited to assess the pollution level in the surrounding area. A comprehensive monitoring program is suggested in **Table – 6.**

TABLE – 6: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S. No.	Component	Parameter	No of Locations	Frequency/ Duration
1	Ambient Air Quality	PM10, PM2.5, SO2, NO2, CO & Pb	4	Once in a month
2	Fugitive Emission	PM_{10}, $PM_{2.5}$, SO_2, NO_2 & CO	4	Once in a month
3	Stack Emission Monitoring	PM, SO_2, NO_2, CO & HC	10	Once in a month
4	Source Noise	Instantaneous Noise level in dB(A)	6	Once in a month
5	Ambient Noise Quality	Ambient noise level (L_{eq}, L_{Day} & L_{Night})	4	Once in a month
6	Ground water Quality	Parameters specified under IS:10500-2012	1	Once in 3 months
7	Soil Quality	Parameter for soil quality: pH, texture, EC, Organic Matter, N, P, K, Na, Ca & Mg	1	Once in a year

5.0 ADDITIONAL STUDIES

A preliminary Risk Assessment Study, Disaster Management Plan & Occupational Health & Safety has been carried out for the proposed expansion project and associated facilities like HSD & LPG storage and the broad conclusions are as follows:

- There will be no significant community impacts or environmental damage consequences.

The hazardous event scenarios and risks in general at this facility can be adequately managed to acceptable levels by performing the recommended safety studies as part of detailed design, applying recommended control strategies and implementing a Safety Management System.

6.0 PROJECT BENEFITS

The basic requirement of the community needs will be strengthened by extending health care, educational facilities to the community, strengthening of existing roads in the area. Bradken will initiate the above amenities either by providing or by improving the facilities in the area, which will help in uplifting the living standards of local communities. Medical facilities will be augmented in dispensaries located near the project site which will be beneficial to the local people in the surrounding villages. The proposed expansion foundry project will result in improving the social infrastructure in following manner:

- Generation of employment and improved standard of living;
- Establishment of small-scale ancillary & supply industries;
- Increased revenue to the state by way of royalty, taxes and duties;
- Improved communication and transport facilities etc.

The total manpower required for the proposed expansion project during the operation phase is about 600 persons which would be mainly sourced from local community in and around the foundry and few technical persons will be employed from outside area. In addition to the above, indirect employment opportunities shall arise after expansion of the foundry.

7.0 EMP - ADMINISTRATIVE ASPECTS

A permanent organizational set up will be formed to ensure the effective implementation of mitigation measures and to conduct environmental monitoring. The major duties and responsibilities of Environmental Management Cell will be as follows:

- To implement the environmental management plan;
- To ensure regular operation and maintenance of pollution control devices;
- To assure regulatory compliance with all relevant rules and regulations;
- To minimize environmental impacts of operations by strict adherence to the EMP;
- To initiate environmental monitoring as per approved schedule;
- Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit.

- To report the non-compliances / violations of the environmental norms to the board directors of the company.

Normal activities of the EMP cell will be supervised by General Manager of the unit who will report to the Director. Environmental Engineers & Technicians will report the issues to the GM to make the possible preventive actions.

8.0 CONCLUSIONS

The proposed expansion of foundry project will have certain level of marginal impacts on the local environment. However, development of this project has certain beneficial impact / effects in terms of providing the employment opportunities that the same will create during the course of its setting up as well as during operational phase of the project.

Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed expansion project will be beneficial to the society and will help reduce the demand – supply gap of Ferrous Castings and will contribute to the economic development of the region in particular and country in general.