

**EXECUTIVE SUMMARY ON ENVIRONMENTAL IMPACT
ASSESSMENT (EIA) REPORT -**

*Proposed Manufacturing of Castor Oil Derivatives
(Production Quantity: 363 MT/M)*

of



पंचगंगा

M/s. Panchaganga Industries Private Limited

*Gut No. 352, Talegaon (Dindori), Taluka: Dindori, District: Nashik,
Pincode - 422004, Maharashtra, India.*

EIA CONSULTANT



M/s. Sadekar Enviro Engineers Pvt. Ltd.



QCI-NABET Accredited EIA Consultancy for Schedule 5 (f) Cat 'A'.
Certificate No – NABET/EIA/2124/SA 0146, Valid up to 16.06.2023
NABL Accredited Laboratory, Valid up to 09.05.2023
Lab. Recognized by MoEF & CC, GOI
Certified by ISO 9001:2015 & IS / ISO 45001:2018



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Baseline monitoring period: March 2022 to May 2022

Project Schedule & Category – 5(f) 'A'

May, 2023



EXECUTIVE SUMMARY



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ES-1 Introduction

M/s. Panchaganga Industries Private Limited (PIPL) has proposed to develop a Green-field Project for Manufacturing Castor Oil Derivatives such as Methyl Ricinoleate Undecylenic Acid, Heptaldehyde, Crude Glycerine, and Mixed Fatty Ester, C11 Aldehyde, Zinc Undecylenic, Heptanoic Acid & Alpha Amyl Cinnamic Aldehyde. The Total Production Capacity is envisaged to be **363 MT/M**.

M/s Panchaganga Industries Pvt. Ltd. Is incorporated on 16th February 2021 under the Companies Act,2013 (18 of 2013) and the company is limited by shares of the three partners/directors namely Mr. Umakant Kothawade, Mr. Pravin Dashpute, and Mr. Sanket Kothawade.

The Corporate Identity number of the company is U01100MH2021PTC355315 and the copy of the Certificate of Incorporation (CIN) is attached as **Annexure-1.2**

M/s. Panchaganga Industries Private Limited (PIPL) is closely working with the Department of Oils, Oleochemicals & Surfactants Technology, ICT (DOOST) on lab-scale process development of castor oil methyl ester cracking. M/s. Panchaganga Industries Private Limited (PIPL) is executing its way forward based on the process demonstrated by ICT.

The Institute of Chemical Technology (ICT) is a well-known government institute in the country in the field of chemical engineering and has great credentials globally.

ES-2 History of the project

The company has purchased the land i.e. Gut No. 352, Talegaon (Dindori), Taluka: Dindori, District: Nashik, Pincode - 422004, Maharashtra, from Mrs. Chhayalata J. Patni, Mr. Pawan J. Patni, Mr. Pankaj J. Patni, Mr. Vijay D. Lohade, Mr. Madhusudan Joshi and Mrs. Suvarna Kale. For establishing the manufacturing setup of castor derivatives products.

Since it is a new project there is no history of earlier Environmental Clearance or any Violation of EIA Notification,2006, and its amendments to date. Also, there are no litigations present against Project Proponent or Project Site.



Note: the details regarding the land purchase and NOCs are provided in section 1.2.2 of this EIA report along with referenced annexures.

Table. ES-1: Salient Features of the Project

Salient Features of the Project				
Name & Address of Company	M/s Panchaganga Industries Pvt. Ltd. Gut No. 352, Talegaon (Dindori), Taluka: Dindori, District: Nashik, Pincode - 422004, Maharashtra, India.			
Project type	New			
Schedule of the project as per EIA Notification, 2006	5(f)			
Category of Project	'A' (Due to applicability of General Condition i.e. Project will be located outside the notified industrial area)			
Total Plot Area	S. No	Particular	Area in Square Meters (M²)	% of the total plot area
	1	Ground Coverage	4751.79	35.93%
	1a	Built-up area	5,000.00	-
	2	Parking area	786.38	5.94%
	3	Greenbelt area	4426.00	33.47%
	4	Open area for future expansion	3257.83	24.65%
	5	Total Plot area	13,222.00	100%
Production details	Sr. No.	Name of Product	Proposed Capacity (MT/M)	End Uses
	1	Undecylenic Acid (UDA)	44	Floral Odor With Fatty Node, Many Base Compound Perfumeries, Nylon 11
	2	Heptaldehyde	38	In Soap Perfumery, Jasmine Flavor.

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	3	Alpha Amylcinnamic Aldehyde	53	In Toilets Soap Perfumeries
	4	Heptanoic Acid	41	Lubricants & Anti-Corrosion Inhibitors
	5	C11 Aldehyde Undecylenic / Undecenal	20	Perfumery And Fragrances
	6	Zn UDA	51	Athlete Foot Antifungal Agents, Anti Dandruff Agent
	7	Mix Fatty Ester	23	Soap & Paint Industries
	8	Crude Glycerine	17	Soap & Cosmetic Industries
	9	Black Oil	38	In Alkyde Resin for Paints, Plasticizer, Soap
	10	Black Oil Aldehyde	20	To agarbatti manufacturer
	11	Sodium Sulphate	16	Detergent industry, textile industry
	12	Sodium Acetate	2	In the textile industry as a dye, and concrete industry as a sealant
		Total	363	
Water Requirement of Project	Proposed water requirement: 84.18 CMD Source of water: Open well. CGWB permission to be obtained.			
Effluent generation	Total Effluent Generation: 18.66 CMD Domestic Effluent: 4.0 CMD Trade Effluent: 14.66 CMD			
Sewage generation	4.0 CMD			
Effluent Treatment	<ul style="list-style-type: none"> • The project will be operated based on Zero Liquid Discharge (ZLD) system. • ETP of 25 CMD comprising Primary, Secondary and Tertiary systems will be provided for Industrial Effluent along with MEE of 5 CMD, ATFD of 1.5 CMD, and R.O. system of 25 CMD respectively. • The HCOD/HTDS effluent stream from Process (0.4 CMD) will be subjected to MEE & ATFD. • The LCOD/LTDS effluent stream from boiler blowdown (3.26 CMD) and cooling tower blowdown (11 CMD) will be treated in a full-fledged ETP with primary, secondary, and tertiary treatment along with MEE condensate. • The domestic effluent (4 CMD) will be sent to the aeration tank of the ETP. 			

	The treated effluent from the ETP will be further subjected to RO treatment. RO permeate will be used for the boiler and in the cooling tower makeup. RO reject will be sent back to the MEE for further treatment.
Power requirement of the project	During the Operation Phase: Connected Load: 250 KVA Demand Load: 220 KVA Transformer capacity: 250 KVA Source: Maharashtra State Electricity Distribution Company Limited (MSEDCL)
Boiler & Thermopack Details	1) Steam boilers – 2 Nos. Capacity: 0.8 TPH x 1 No. Fuel: Briquette – 135 Kg/Hr Capacity: 0.6 TPH x 1 No. Fuel: LDO – 36 Kg/Hr <i>Note: It will be kept on standby</i> 2) Thermopack boiler – 1 No. Capacity: 4 Lac Kcal/Hr. x 1 No. Fuel: Briquette – 151 Kg/Hr 3) Pyrolyzer – 1 No. Capacity: 250 Kg/Hr. x 1 No. Fuel: LDO – 48 Kg/Hr
D.G. Set Details	60 KVA x 1 no. Fuel : HSD – 15 Lit/Hr.
Fuel Requirement	<ul style="list-style-type: none"> • Briquette – 286 Kg/Hr. • LDO – 84 Kg/Hr. • HSD for D.G. set - 15 Lit./Hr. <i>(D.G. fuel consumption will be based on actual hours of power failure)</i>
Scrubber Details	For Process Emissions: 2 Nos. of Single stage water scrubbers of capacity 500 CFM.
Stack height Details	For Boiler : <ul style="list-style-type: none"> • A stack of 30 meters in height will be provided for a Steam boiler of capacity 0.8 TPH. • A stack of 30-meter height will be provided for a Steam boiler of capacity 0.6 TPH. • A stack of 30-meter height will be provided for 4 Lac Kcal/Hr. Thermopack. • A Stack of 30-meter height will be provided for the Pyrolyzer of capacity 250 Kg/Hr. For D.G. Set : <ul style="list-style-type: none"> • 1 no. of the stack having a 2-meter height above the roof will be



provided to D.G. set of capacity 60 KVA x 1 no.

For Scrubber:

- **2 nos.** of stacks having a height of **6 meters** above the roof will be provided to the proposed scrubbers.

Hazardous waste Details	Sr. No.	Description	Cat. of waste	Proposed Quantity	Unit of Measurement (UOM)	Method of Disposal
	1	Used Oil	5.1	0.9	MT/M	Sent to authorized recyclers.
	2	Empty barrels/containers	33.1	30	Nos./M	Sent to authorized recyclers or CHWTSDF
	3	ETP Waste	35.3	2.0	MT/M	Sent to CHWTSDF or co-processing
	4	Used filter cloth	33.2	0.01	MT/M	Sent to preprocessing followed by co-processing or Sent to CHWTSDF
	5	Spent carbon	28.3	0.05	MT/M	Sent to preprocessing followed by co-processing or Sent to CHWTSDF
	6	Residue from used Ion Exchanged material in water	35.2	0.2	MT/M	Sent to CHWTSDF
	7	Residue from industrial effluent (Oil & Skimming)	35.4	0.01	MT/M	Sent to preprocessing followed by co-processing or Sent to CHWTSDF

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8	ATFD Residue	37.3	14	MT/M	Sent to CHWTSDF for disposal
9	Process waste (Recovered Mg Carbonate + Paraffin)	28.1	1.5	MT/M	Sent to authorized vendors or CHWTSDF

#Schedule I of The Hazardous and Other Wastes (Management and Transboundary Movement) Rule, 2016

*Industry shall ensure disposal to the Actual user having permissions under Rule 9 of Hazardous and Other Waste (M & TM) Rules, 2016.

Non-hazardous waste details			
Sr. No.	Description	Total Quantity	Method of Disposal
1	Paper, Plastic, Scrap metal (Non-Hazardous)	10 TPA	To MPCB authorized recycler
2	Wooden pallets & Empty bags	10 TPA	To registered scrap vendors
3	Briquette Ash	0.69 T/Day	To brick manufacturer

E-waste details				
Sr. No.	Particulars	E-Waste Category	Proposed (Kg/A)	Method of Disposal
1	Personal Computers (Central Processing Unit with input and output devices)	ITEW2	5	Sold to MPCB authorized recycler / returned to manufacturer/supplier
2	Personal Computing:	ITEW3	5	

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		Laptop Computers (Central Processing Unit with input and output devices)			
	3	Printers including cartridges	ITEW6	5	
	4	Telephones	ITEW12	1	
Battery waste Details	Battery waste				
	Particulars		Proposed	Method of Disposal	
	Lead batteries from D.G. Sets, UPS system		1 Nos./A	Returned to supplier	
Biomedical waste Details	Bio-Medical Waste				
	Particulars			Proposed	Method of Disposal
	Contaminated face mask, Hand Gloves, Cotton waste, bags			5 Kg/M	To CHWTSDF
Manpower Details	Total manpower = 100 Nos. Unskilled workers = 60 Nos. Skilled workers = 40 Nos.				
Project Cost	INR 14.30 Cr.				
EMP Cost Details	Construction Phase: Capital Cost – 21.36 INR Lakhs Recurring cost – 7.21 INR Lakhs Operation Phase: Capital Cost – 623.5 INR Lakhs O&M Cost – 158.5 INR Lakhs/Year				
CER Cost Details	INR 28.6 Lakhs (Considering 2.0% of the project cost)				



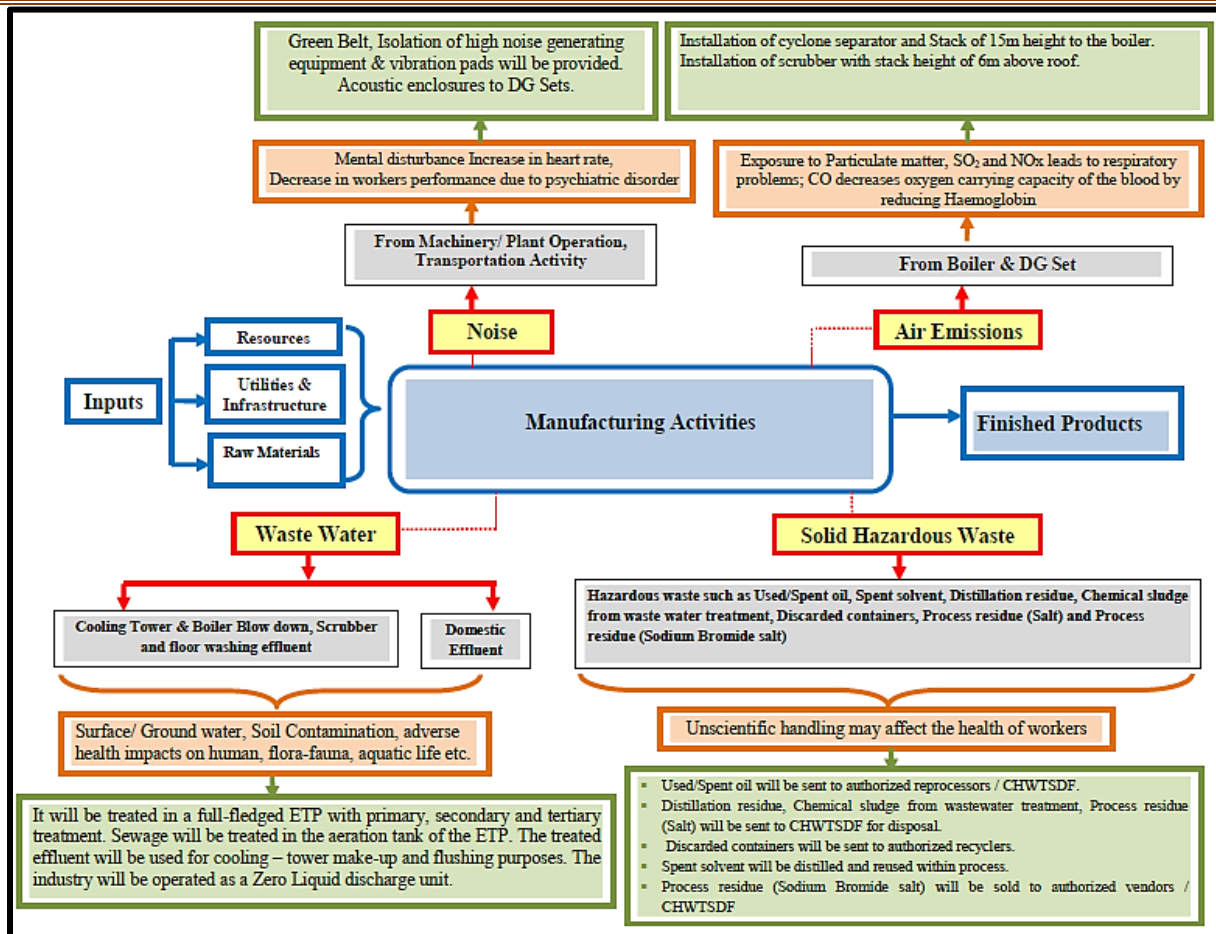
ES-3 Justification of project

Castor derivatives are mainly used as a raw material to manufacture many chemicals, which are utilized in the production of surfactants, specialty soaps, surface coatings, cosmetics & personal care products, pharmaceuticals, perfumes, plasticizers, greases & lubricants, and more. The project will provide direct & indirect employment opportunities to local people and as the industry has the export market, it will add to the net foreign exchange earning of the country. With the completion of the project, M/s. Panchaganga Industries Private Limited will achieve a very strong base in the global market and in turn bring in precious foreign exchange for our country. Through backward integration, this project will considerably reduce the usage of value-added imported raw materials, saving valuable foreign exchange. At the same time, this will de-risk the supply chain sustainably and strengthen/enhance our competitiveness in the global market.

ES-4 Process Description:

The process of the company is depicted in Figure. ES -1.

Figure No.ES-1: Process Description Diagram



ES-5 Baseline Environmental Status

The study area is 10 km radial distance from center of plant site. All the monitoring has been completed in various locations within the study area during the period of March 2022 – May 2022. The findings of the baseline environmental status on Land (Topography, Soil Quality, Land Use Pattern), Micrometeorology (Temperature, Humidity, Rainfall, Wind Speed), Air (Ambient Air Quality- PM₁₀, PM_{2.5}, SO₂, NO_x, CO, and VOC), Noise Level, Biotic Environment (Flora, Fauna & assessment of conservation aspects), Socio Economic conditions are presented in the report and interpreted with reference to Standards.

ES-5.1 Air Environment

PM₁₀

The maximum & minimum concentrations recorded for PM₁₀ was 49.8 and 38.1 µg/m³ respectively. The maximum concentration was recorded at sampling location (A2) which is



Bhavani Mata Road, Korhate village and the minimum concentration was recorded at location at A7 (Indore village). The minimum & maximum average concentrations of PM₁₀ during the study ranged between 40.7 µg/m³ to 46.9 µg/m³. The maximum concentration of particulate matter recorded at Bhavani Mata Road, Korhate village may be due to transportation activity on Bhavani matata road and nearby unpaved road. There was one abandon basalt stone quarry present near to the A2 location.

PM_{2.5}

The maximum concentration of PM_{2.5} 22.0 µg/m³ during the study period was recorded at location A3, whereas the minimum concentration 10.1 µg/m³ was recorded at A2 location (Near Bhavani Mata Road Korhate) which is an open land. The mazimum concentration recorded at location A3 is an indicative of vehicular activity on unpaved road and activity in play ground of nearest The average 24 hourly concentrations of PM_{2.5} during the study period were in the range of 14.7 to 21.1 µg/m³.

Sulphur dioxide (SO₂)

High levels of SO₂ in the ambient air are generally an indicative of combustion of fossil fuels in the vicinity. The ambient air monitoring results indicate that the highest average concentration of SO₂ was recorded at the Akrale Village, i.e. location A4. The regular movement of heavy vehicles for dispatch of products in nearest agriculture industry can be considered as principle source of SO₂ emission.

The minimum & maximum concentrations of SO₂ recorded at all the monitoring locations during the study period were in the range of 3.3 to 19.7 µg/m³ respectively. The lowest and highest concentrations of SO₂ viz. were recorded at locations A2 and A8 respectively. The average concentration of SO₂ at all the monitoring locations varied in the range of 5.4 to 13.7 µg/m³.

Oxides of Nitrogen (NO_x)

The various forms of Nitrogen in NO, NO₂ and N₂O are collectively called as Oxides of Nitrogen (NO_x). During the study period amongst all the monitoring locations the maximum



value $19.8 \mu\text{g}/\text{m}^3$ of NO_x was recorded at location A8 and the minimum value $8.0 \mu\text{g}/\text{m}^3$ was recorded at location A7 and the average concentrations of NO_x were in the range of 8.9 to $15.3 \mu\text{g}/\text{m}^3$.

Carbon monoxide (CO)

The source of CO in the ambient air for the study area in consideration can be attributed to vehicular movement in the study area. The maximum concentrations of CO at all the locations recorded during the study period were in the range of 0.7 to $1.8 \text{mg}/\text{m}^3$ whereas the minimum concentrations ranged between 0.4 to $1.0 \text{mg}/\text{m}^3$. The highest average value for CO was recorded at location A1 and the lowest was recorded at A7.

ES-5.2 Noise Environment

Noise monitoring was conducted as per the standard operating procedures.

Industrial Zone

The day time noise level at the project premises was observed to be 66.9 dB (A) Leq while during night time the noise level was recorded to be 56.9 dB (A) Leq. However at location N4 the noise level observed to be 50.3 dB (A) Leq while during night time the noise level was recorded to be 42.1 dB (A) Leq. It should be noted that the noise levels during the day time as well as night time were observed to be within the prescribed standards by Central Pollution Control Board.

Residential Zone

The noise monitoring was conducted at representative sites at seven locations for 24hr. As prescribed the sampling was carried out once in a week and average hourly readings were recorded. The minimum noise level recorded during the daytime was 48.7 dB (A) which was observed at location N6, whereas the maximum noise levels recorded during the daytime was 54.9 dB (A) which was observed at location N2. The minimum noise level recorded during the night time was 40.3 dB (A) which was observed at location N7, whereas the maximum noise levels recorded during the night time was 44.2 dB (A) which was observed at location N2. The high values of noise are due to the presence of major road in the vicinity of the sampling location. It should be noted that the permissible limits for noise did not exceed at any of the locations selected for sampling.

ES-5.3 Water Environment

Surface Water Study

Based on the analysis results of water samples it can be stated that the pH of all the samples was found to vary between 7.43 –8.35. This is to infer that the values obtained were within the desirable limit for pH as prescribed by CPCB. The total hardness was observed to be ranging between 92 to 512 mg/l. The maximum value of hardness was recorded at SW3 and the minimum value was recorded at SW5. The concentration of Total Dissolved Solids was in the range of 174 mg/l to 906 mg/l. The maximum concentration of Total Dissolved Solids (TDS) was observed at SW3 whereas the minimum TDS concentration was observed at SW4. The Chemical Oxygen Demand (COD) & Biochemical Oxygen Demand (BOD) values were calculated to be in the range of 8.0 mg/l to 40.0 mg/l & 2.4 mg/l to 9.0 mg/l respectively. It is important to note the nitrate concentration in the surface water ranges from 2.07 to 5.49 mg/l. The values of Nitrate and Phosphates also indicate that domestic sewage can be a major source of pollution in the selected water bodies. Moreover, some parts of the surrounding area is known to be engaged in agricultural activity, which utilizes chemical fertilizers. It is possible that these fertilizers have been leached into the water bodies.

The concentration of heavy metals such as Arsenic, Mercury, Cadmium and Lead was observed to be below the detection limit. The concentration of Zinc was observed to present in trace quantity at all the locations.

The analysis of microbiological parameters reveals that Total coliforms & E-coli are present at all the locations in the selected water bodies. It is possible that the water bodies are experiencing contamination due to discharge of uncontrolled and untreated domestic waste in the form of sewage and storm water drainages.

Ground Water Study

The above results indicate that the pH of all the ground water samples was within the prescribed standards following in the range of 7.3 – 8.05.



The concentration of heavy metals like arsenic, chromium, lead, mercury, Iron, nickel & cadmium were below the detection limit. Zinc was observed in the range of <0.1 – 0.9 mg/lit which is well below the acceptable standards of IS: 10500:2012.

The hardness of all the ground water samples was found to be ranging between 110 - 400 mg/lit. The value of hardness was exceeding the acceptable limit for 6 of the locations namely GW1, GW3, GW4, GW6, GW7 & GW8, although none of the samples were exceeding the permissible limit of drinking water.

It can be observed that the values for total dissolved solids in all the sampling locations were estimated to be under the permissible standards for drinking water. The concentration of total dissolved solids ranged between 254 - 710 mg/lit. The maximum concentration was observed at location GW7 whereas the minimum concentration was observed at GW5.

It should be noted that the microbiological analysis of all the samples indicate that Total coliforms and E. Coli were present with concentration of <2.0 MPN Index/100 ml.

The fluoride concentrations are ranging between <0.5 mg/l – 1.07 mg/l. The presence of the fluoride in all the water samples is mostly due to geogenic in nature. The nitrates concentrations were ranging between 1.73 – 15.52 mg/l well below the acceptable limits of drinking water. The probable sources of nitrates in the ground water could be the use of fertilizers in the nearby agricultural activity.

The COD and BOD values of all the ground water samples were found to be in range of <4.0 to 8 mg/lit and <1.0 to 2.0 mg/lit respectively. Thus, based on the above results it can be stated that the water from the said samples can be considered fit for domestic purpose with primary treatment.

ES-5.4 Soil Environment

The findings of the study reveal that pH of the soil in the study area ranged between 7.28 to 8.01 This is indicative of the neutral to moderately alkaline nature of soil. The values for Nitrogen at all locations varied between 0.0573 to 0.1505 mg/kg. Maximum concentration of nitrogen was observed at location S4, while the minimum concentration was observed at location S7.



The concentration of phosphate was estimated to be between 100 to 168 mg/kg. The highest concentration can be observed at location S5, while the lowest concentration can be observed at location S7.

The concentration of potassium was estimated to be between 1293.6 – 8442.4 mg/kg. The highest concentration can be observed at location S7, while the lowest concentration can be observed at location S1. whereas maximum concentration of heavy metals such as Arsenic, Cadmium, Chromium, Lead, Iron was estimated as 1.62 mg/kg, 0.398 mg/kg, 2975.7 mg/kg, 9.89 mg/kg, 60632.1 mg/kg respectively.

ES-5.5 Biological Environment

The proposed project activity does not pose any threat to any species of conservation importance also does not involve any sort of liquid or solid discharge/disposal on the ground or in the water bodies within the study area and no adverse impacts are anticipated on the surrounding biotic environment.

ES-5.6 Socio Environment

Data Interpretation:

a. Educational Facilities:

The Maximum and Minimum score from the study, for Educational Facilities was recorded to be 4 (Satisfied) and 2(dissatisfied) respectively. Off the Max score i.e. 250, the total score obtained from the survey, for Educational Facilities was 134. Subsequently, the percentage obtained from the response for satisfaction from the samples for Educational Facilities was calculated to be **54.8%**.

b. Health Facilities:



The Maximum and Minimum score from the study, for Health Facilities was recorded to be 4 (Satisfied) and 1 (strongly dissatisfied) respectively. Off the Max score i.e. 250, the total score obtained from the survey, for Health Facilities was 139. Subsequently, the percentage obtained from the response for satisfaction from the samples for Health Facilities was calculated to be **55.6%**.

c. Water Facilities:

The Maximum and Minimum score from the study, for Water Facilities was recorded to be 4 (Satisfied) and 1 (strongly dissatisfied) respectively. Off the Max score i.e. 250, the total score obtained from the survey, for Health Facilities was 129. Subsequently, the percentage obtained from the response for satisfaction from the samples for Water Facilities was calculated to be **51.6 %**.

d. Transport Facilities:

The Maximum and Minimum score from the study, for Transport Facilities was recorded to be 4 (Satisfied) and 2 (dissatisfied) respectively. Off the Max score i.e. 250, the total score obtained from the survey, for Transport facilities was 155. Subsequently, the percentage obtained from the response for satisfaction from the samples for Transport Facilities was calculated to be **62%**.

e. Local Body Functioning & support:

The Maximum and Minimum score from the study, for Local Body Functioning & support was recorded to be 4 (Satisfied) and 2 (dissatisfied) respectively. Off the Max score i.e., 250, the total score obtained from the survey, for Local Body Functioning & support was 170. Subsequently, the percentage obtained from the response for satisfaction from the samples for Local Body Functioning & support was calculated to be 67.6%.

Socio-economic study result, the percentage obtained for the study parameters i.e. Educational Facilities, Health Facilities, Water Facilities, Transport Facilities, Local Body Functioning & support are 54.8 %, 55.6 %, 51.6%, 62%, & 67.6% The Minimum percentage for satisfaction obtained was 51.6% i.e. for Water Facilities and the maximum percentage for satisfaction obtained was 67.6 % i.e. for Local Body Functioning & support.



ES-6 Prediction of Impacts & Mitigation Measures

The summary of mitigation measures is presented in tabulated format in Table ES-2 & ES-3

Table. ES-2: Overview of probable environmental pollution & mitigation measures during construction phase.

A) Construction Phase				
Sr. No.	Environmental Parameters	Aspect Attributes	Impact	Proposed Mitigation Measures
1	Air Quality	Dust emissions from handling & transportation of cement/concrete/stone aggregates.	The emission would be around 1.409 tons/month of the construction activity. 50 Nos. workers will be getting exposed to the dust pollution generated due to the construction activity can suffer from respiratory problems and prolonged exposure can lead to malfunctioning of lungs.	<ul style="list-style-type: none"> Traffic management for loading and unloading of the materials. Regular sprinkling of water on the working site for avoiding the cement dust emission and managing the stockpiles. Creating wind barrier for controlling the dust emissions.
2	Noise Quality	Noise generated from construction equipment's / machinery like spade, shovel, dabber, drill, hammer, concrete mixer etc. Transportation of construction materials.	The impacts of high noise level would be Temporary/Permanent hearing loss, Mental disturbance, Increase in heart rate, Affecting worker's performance.	<ul style="list-style-type: none"> Appropriate PPEs will be provided to the 50 Nos. of construction workers. Implementation of Traffic management. Development of Green belt area.
3	Water Quality	Water used for construction activity mainly for concrete mixing, sprinkling etc.	Contamination of the soil at the project site and nearby water bodies due to the surface runoff.	<ul style="list-style-type: none"> Proper surface water runoff management would be implemented. Storm water drain will be provided.
4	Solid Waste Management	Construction wastes such as left off concrete, stone, aggregates, wooden piles, excavated material etc.	Fire Hazard, congested and unhealthy work condition at project site	<ul style="list-style-type: none"> The solid waste generated in the construction phase will be reused for leveling purpose within the plot premises. Other non-consumable waste like plastic and



A) Construction Phase

Sr. No.	Environmental Parameters	Aspect Attributes	Impact	Proposed Mitigation Measures
				bags shall be sold to recycler.
5	Soil	Soil erosion due to construction activity	The nutrient in the top soil will get wasted if is not utilized for greenbelt development	<ul style="list-style-type: none"> Utilize excavated soil for greenbelt development within plant premises

Table.ES 3: Overview of probable environmental pollution & mitigation measures during operational phase.

B) Operational Phase

Sr. No.	Environmental Parameters	Aspect Attributes	Impact	Proposed Mitigation Measures
1.	Air Quality	Operation of Boiler, Thermic fluid heater, Pyrolizer, D.G Set & Gaseous emission from manufacturing process, Non spontaneous emissions from transportation of raw materials & finished goods. VOC emission generated due to the handling and storage of the solvents & other raw materials.	<p>The maximum incremental concentration within study area will be</p> <p>PM₁₀ – 1.039 µg/m³ @450 m in NE direction</p> <p>PM_{2.5} – 1.01 µg/m³ @450 m in NE direction</p> <p>SO₂ – 0.654 µg/m³ @450 m in NE direction</p> <p>NO_x – 0.848 µg/m³ @450 m in NE direction</p> <p>CO - 4.163 µg/m³ @450 m in NE direction</p> <p>The Health effects related to particulate matter are majorly respiratory, pulmonary injury & lung cancer etc. Exposure to SO₂ and NO_x majorly leads</p>	<ol style="list-style-type: none"> Installation of individual stacks of 30 m to each boiler, Thermic Fluid Heater and Pyrolizer for efficient dispersion of pollutants 1 No. of D.G Set of 60 KVA capacity will be provided with a stack height of 2.0 m above roof level. 2 No. of single stage water scrubber (Capacity: 500 CFM) will be provided to mitigate the process emissions with a stack height of 6 m above roof level. The roads within the premises will be concreted / paved to avoid the dust generation from vehicular activity.



B) Operational Phase

Sr. No.	Environmental Parameters	Aspect Attributes	Impact	Proposed Mitigation Measures
			<p>to respiratory problems. Carbon monoxide decreases the oxygen carrying capacity of the blood by reducing the hemoglobin. The health effects related to VOC emission are eye, nose and throat irritation headaches, loss of coordination and nausea, damage to liver, kidney and central nervous system etc.</p> <p>The air emissions in long course of time may affect the immediate surrounding vegetation stature physically (leaf senescence, hampered growth etc.) & biologically thus may affect the overall surrounding ecology.</p>	<p>5. It will be ensured that all the vehicles used for transportation activity will have a valid PUC (Pollution under Control) Certificate.</p> <p>6. Proper servicing & maintenance of vehicles will be carried out. Same practice will be continued in future.</p> <p>7. Regular sweeping of all the roads & floors will be done.</p> <p>8. Development of the green belt will help to capture the fugitive emission.</p> <p>9. To control VOC emission carbon adsorption system can be implemented.</p> <p>10. Double condensers with chilling arrangement followed by activated carbon candle filter will be provided for recovery of solvent vapors from process</p> <p>11. Industry to ensure that at no point of time the air emission concentrations does not exceed the prescribe standards.</p>



B) Operational Phase

Sr. No.	Environmental Parameters	Aspect Attributes	Impact	Proposed Mitigation Measures
2.	Noise Quality	Operation of D.G set, Boiler, Reactors, ancillary utilities & transportation activity.	The impacts of high noise level would be Temporary / Permanent hearing loss, Mental disturbance, Increase in heart rate, Decrease in workers performance due to psychiatric disorder, Workers developing Tinnitus due to high level of noise exposure on regular basis.	<ol style="list-style-type: none"> 1. Acoustic enclosure will be provided to D.G set for attenuation of noise level during operation. 2. Boiler will be placed in a confined space viz. boiler house where the surrounding walls acts as a Barrier for noise propagation. 3. Isolation of high intensity noise generating equipment's. 4. Appropriate traffic management to be implemented. 5. Green belt developed in the company premises will acts a noise barrier. 6. Appropriate PPE will be provided to workers.
3.	Water Quality	<ol style="list-style-type: none"> 1. Effluent from Manufacturing process and Scrubber operations. 3. Blow down water from Boiler and Cooling Tower. 4. Domestic wastewater 	Indiscriminate release / discharge of effluents may contaminate the surrounding surface and groundwater & there by affecting the overall ecology & agricultural productivity.	<ol style="list-style-type: none"> 1. Effluent from manufacturing process will be treated as HCOD/TDS effluent by giving Primary Treatment followed by MEE with ATFD further treated in Aeration tank of ETP along with LCOD/TDS effluent. 2. The LCOD/TDS from Boiler and Cooling tower will be treated in ETP consist of Primary,



B) Operational Phase

Sr. No.	Environmental Parameters	Aspect Attributes	Impact	Proposed Mitigation Measures
				Secondary and tertiary treatment facility followed by RO system 3. The Reject from RO will be treated in MEE section. 4. The treated effluent will be cooling tower and boiler etc. The industry will be operated as a Zero Liquid discharge unit.
4.	Solid Waste Management - Hazardous Waste	<ol style="list-style-type: none"> 1. Used / Spent oil 2. Empty Containers 3. ETP Sludge 4. Used filter cloth 5. Spent Carbon 6. Residue from used Ion exchanged material in water 7. Residue from industrial effluent (Oil & Skimming) 8. ATFD Residue 9. Process waste 	Unscientific handling & disposal may lead to contamination of surrounding soil, water sources & there by affecting the ecology & health of the workers coming in direct contact with the hazardous waste like skin allergies / rashes / burns etc.	<ol style="list-style-type: none"> 1. Hazardous waste generated from the effluent treatment will be disposed to CHWTSDF or will be sold to authorized preprocessors. 2. Spent solvent will be distilled and reused within process. 3. Hazardous waste generated from the manufacturing process will be disposed to CHWTSDF / Sold to authorized vendors or recyclers.
5	Solid Waste Management - Non Hazardous waste	<ol style="list-style-type: none"> 1. General scraps (Polythene bags, Empty containers, Glass waste, Wood waste, Metal waste, Office waste and plastic bags). 	Hap-Hazard handling & storage may lead to inadequate open space in plant premises & it may lead to rodent breeding.	<ol style="list-style-type: none"> 1. Designated area for Scrap materials will be provided in the plant. 2. General scrap materials will be recycled through registered scrap vendors.



B) Operational Phase

Sr. No.	Environmental Parameters	Aspect Attributes	Impact	Proposed Mitigation Measures
		2. Briquette ash		3. Daily housekeeping waste and food waste will be disposed through municipal waste management facility. 4. Briquette ash will be sold to authorized brick manufacturer.

ES-7 Risk Assessment Study

DOW Index is done for the raw materials whose Nf factor is 3 and above. Methanol is the only flammable raw material company proposes storing on its premises.

It is found that The Fire & Explosion Index for storage of 2 MT methanol is. **56**. The Degree of Hazard was found to be Light. The Radius of is determined to be **14.34** meters, and the Area of exposure is around **645.69 Sq. m**. The impact would be within the factory. The company could handle the situation in an emergency through appropriate mitigation measures.

According to the Mond's Index the toxicity is calculated for the storage of Sodium methoxide, Sodium Hydroxide, Sulfuric Acid, Formic acid indicating **Moderate** degree of hazard. Whereas, Acetic acid indicating **Light** degree of hazard.

ES-8 Disaster Management Plan

In view of the Castor oil Derivative manufacturing industry, Onsite and Offsite Emergency Plans are important hence, has been prepared for the industry. During operational phase, surrounding population shall be made aware of safety precautions to be taken in case of any emergency situation due to the overall project activity. On-site disaster management plan and Off-site emergency management plan, commands communication and controls will be established and maintained. Adequate provisions like emergency response, response organization, response plan, Material Safety Data Sheets (MSDS), command and control, capabilities, transportation, medical facilities, mitigation measures, training, education, public awareness emergency plan review etc. to control any disaster situation will be made available.



ES-9 CER Activity

In order to carry out the CER activity, with reference to the results obtained for Socio-Economic study carried out for project of M/s. Panchganga Industries Pvt. Ltd., it was decided that M/s. Panchganga Industries Pvt. Ltd. would provide basic facilities in the area of Water (safe drinking water), street light facilities etc for the nearby villages.

For the purpose of this as per the OM vide no F.No.22-65/2017-IA.III dated 01-05-2018 the project proponent commits to contribute 2.0 % of the proposed project cost to be engaged in the social welfare

The CER plan is prepared and presented in Table ES-5 below.

Table.ES-5: List of CER Activity

Executive Summary for Proposed Manufacturing of Castor Oil Derivatives by M/s. Panchaganga Industries Private Limited



Cost of Project	CER Activity Budget	Year of Implementation	Distance from the Project site (km)	Activity	Cost Estimate
143 Lakhs	28.6 Lakhs	2023	Rural Hospital, Saputara Nashik Road, Dindori Maharashtra at an aerial distance of 4.72 km in the NNE direction from the project site	Government Hospital at Saputara Nashik Road : <ul style="list-style-type: none"> • Providing wheelchair • Providing Oxygen Concentrator of 5 LPM • Providing Ambulance 	19,90,000/-
		2024	Zilla Parishad Primary School, Talegaon Dindori, Taluka – Dindori. Present at an aerial distance of 1.94 km from the project site in SSE direction.	Zilla Parishad Primary School, Talegaon Dindori: <ul style="list-style-type: none"> • Providing Computers • Providing Color Printer • Providing LED Tv 	4,69,000/-
		2024	Zilla Parishad Primary School, Aambe Dindori, Taluka – Dindori. Present at an aerial distance of 7.0 km from the project site in SE direction.	Zilla Parishad Primary School, Ambegaon Dindori: <ul style="list-style-type: none"> • Providing Computers • Providing Color Printer • Providing LED Tv • Providing solar lights • Providing water purifier 	4,72,000/-

ES-10 Occupational Health Measures

The company will strictly adhere to the rules of Factories Act 1948 with its latest amendments regarding the occupational health facilities to be provided to the workers of the company. The company has planned all the necessary control measures to prevent air pollution, water pollution and degradation of soil in the project surrounding areas. Since all the pollution control measures are planned. Minor accidents, noise, poor ventilation and accidental chemical exposure are the only possible occupational health hazards from the manufacturing activities. For the prevention of it, the company will educate the operators and workers for the safety rules, procedure and preventive measures and to use personnel protective measures.

The company has provided budgetary allocation of Rs.6,00,000/- for purchase of Personal Protective Equipment's (PPEs) & Rs. 3,00,000/- per annum as recurring expenditure for annual medical, health checkup & other occupational safety related aspects of workers for 100 Nos. of manpower as a part of Occupational Health & Safety measures.

ES -11 Post Project Monitoring Plan

Monitoring of environmental parameters shall be done as per the guidelines provide by MoEF&CC / CPCB / MPCB. The method followed shall be recommended / standard method approved/recommended by MoEF&CC/CPCB. The table below explains the approach for environmental monitoring program.

Table. ES-6: Environmental Monitoring Program

Sr. No.	Activity / Area	Pollutant	Pollutant Characteristics	Frequency	Period
OPERATION PHASE					
1.	Ambient air	Air emissions	CO, SO ₂ , NO _x , PM ₁₀ , PM _{2.5} in Ambient Air	Intermittent / Periodic	Quarterly
2.	Stack of DG set and Boilers, Thermopack, Pyrolizer	Air emissions	CO, SO ₂ , NO _x , SPM from boiler Thermopack, Pyrolizer, TPM, SO ₂ from DG stack	Intermittent / Periodic	Quarterly
3.	Scrubbers	Air emissions	Acid fumes and other gases	Intermittent / Periodic	Quarterly

Executive Summary for Proposed Manufacturing of Castor Oil Derivatives by M/s. Panchaganga Industries Private Limited



4.	Utility Area, ETP, Work Place Area, DG Set	Sound	Noise Level dB (A)	Intermittent / Periodic	Quarterly
5.	Effluent treatment plant	All parameters	pH., O & G, TDS, TSS, COD, BOD. Heavy Metals & Organic Compounds specific to project	Intermittent / Periodic	Monthly
6.	Hazardous Wastes	ETP Sludge, Distillation Residue etc.	H.W. characteristics	As per CHWTSDF	Annual
7.	Work Place	Air Pollutant and Heavy Metals	Volatile Organic Compounds & Heavy Metals in ambient air specific to project.	Intermittent / Periodic	Quarterly
8.	Monitoring of Six-Monthly Compliance	--	--	--	Six Monthly.

ES - 12 EMP Cost & Budgetary Allocation

The proposed capital investment of the company is envisaged to be 14.30 Cr. and the proposed capital investment for Environmental Pollution Control Measures is around 623.5 lakh.

The cost details for Environmental Management are as below:

Table. ES-7: Cost details for environmental management

Sr. No.	Parameters	Capital Cost (Rs. In lakhs)	Recurring Cost (Rs. In Lakhs/yr)
1	Air Pollution Control	350	30
2	Water Pollution Control	200	75
3	Noise Pollution Control	10	2
4	Occupational Health	6	3
5	Green Belt Development	8.5	4.0
6	Solid Waste Management	3	1
7	Hazardous Waste Management	5	15
8	Fuel & Energy Conservation	20	2.5
5	Rain Water Harvesting	6	1
10	Environmental Monitoring and Management	15	25
Total Cost		623.5	158.5