Prefeasibility Report for Proposed Expansion of Coal Tar Distillation and Addition of Carbon Black plant at Musinayakahalli, Taluka Sandur, District Ballari, Karnataka

MARCH 2018
EPSILON CARBON PRIVATE LIMITED

Prefeasibility Report for Proposed Expansion of Coal tar Distillation and Addition of Carbon Black plant at Musinayakahalli, Taluka Sandur, District Ballari, Karnataka

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PROJECT DETAILS

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1 EXECUTIVE SUMMARY

1.1 Plant Features and Production Capacity

ECPL proposes to expand its current coal tar distillation capacity from 300,000 TPA to 500,000 TPA. Also ECPL proposes to set up 300,000 TPA carbon Black plant along with cogeneration facility adjacent to present plant at Bellary district of Karnataka.

The Coal Tar Distillation Plant will be designed for production of various grades of Pitch and Naphthalene, Light Oil, Phenol Oil, Wash Oil, Heavy Oil (Anthracene Oil), Carbon Black Oil etc and By-Products like Ammonia Liquor and Sodium Phenolate.

Carbon Black unit will be designed for the production of multiple grades of Carbon Black (both Hard and Soft Grades) along with cogeneration of power from the tail gas from carbon black production.

ECPL also proposes to direct sale of tail gas from carbon black production to various industries in vicinity.

1.2 Environment

1.2.1 Water

Water is sourced from JSW Steel water network and after expansion it will be obtained from the same. Existing water consumption is 1440 KLD (1416 KLD Industrial + 24 KLD Domestic). After proposed expansion water consumption will be 10200 KLD (9880 KLD Industrial + 140 KLD Domestic).

1.2.2 Power

Power requirement of existing plant is 3500kW currently being met from JSW Steel Power network.

Additional power requirement would be 15333 kW, the total power requirement after expansion would be approximately 18833 kW which will be met by the in-house co-generation power plant being set up based on lean tail gas generated during carbon black production.

As an alternative, a long term power agreement will be signed with JSW Steel for above said power requirement in case co-generation plant is not available or non-operational

1.2.3 Air Emission

Suitable stack height provided for dispersion.

Bag filter is envisaged to arrest the any possible emissions from vents of Naphthalene Drum flaker and Elevated Liquid Naphthalene tank.

Comprehensive scrubbing system to mitigate VOC emissions

Electrostatic Precipitator (ESP) will be attached to boilers and Scrubbers/ Bag filters are attached to process vents. Bag Filters will be attached with proposed Vapor Bag Collector and Pneumatic Carbon

Greenbelt along plant boundary & open spaces within plant site
1.2.4 Hazardous Waste Generation and Disposal

There will be an increase in the quantity of hazardous waste generation due to the proposed project. The hazardous waste will be disposed at CHWTDSF site or sent to an authorized recycler as per consent.

1.3 Submission

In the light of the above, we would like to state that the proposed expansion would have in place systems, procedures, and hardware to ensure that all guidelines for protecting the environmental emission norms are followed and its operation has no adverse impact on the environment.
2 INTRODUCTION

2.1 Brief Description of the Project

Epsilon Carbon Private Limited (ECPL) was incorporated in August 2010 with its registered office at Upadrastha House, 3rd Floor, 48 Dr. V.B. Gandhi Road, Fort, Mumbai - 400 023.

ECPL wishes to emerge as a dynamic company in India in the field of coal tar processing for manufacture of various value added products. The company has aggressive plans to achieve the annual turnover of Rs. 5,000 crores by year 2025.

ECPL has been incorporated to carry on the business of manufacturers, processors, formulators, acquirers, refiners, converters, buyers, sellers, dealers, distillators, importers, distributors, exporters in the field of chemicals, heavy chemicals, chemicals compounds, basic intermediaries, laboratory chemicals, scientific chemicals, industrial chemicals, organic and inorganic chemicals in all forms and kinds.

ECPL proposes to expand its current coal tar distillation capacity from 300,000 TPA to 500,000 TPA. Also ECPL proposes to set up an 300,000 TPA carbon Black plant along with cogeneration facility adjacent to present plant at Bellary district of Karnataka.

The Coal Tar Distillation Plant will be designed for production of various grades of Pitch and Naphthalene, Light Oil, Phenol Oil, Wash Oil, Heavy Oil (Anthracene Oil), Carbon Black Oil etc and By-Products like Ammonia Liquor and Sodium Phenolate.

Carbon Black unit will be designed for the production of multiple grades of Carbon Black (both Hard and Soft Grades) along with cogeneration of power from the tail gas from carbon black production.

ECPL also proposes to direct sale of tail gas from carbon black production to various industries in vicinity.

The raw material (crude coal tar) is proposed to be sourced from JSW Steel Ltd. located at Toranagallu, Bellary district in Karnataka and from other steel plants.

The estimated project cost of the proposed project is 900 Crores.

2.2 Need for the project and its importance to region

India’s carbon black market is expected to grow at around 14% CAGR until 2020. Superior reinforcing properties make carbon black a suitable material for use in diverse applications ranging from tyres, plastics, electronic equipment to inks, dyes and coatings.

Expansion of tyre and rubber industries in the southern region of India is boosting the demand for carbon black in the country. The shift in manufacturing base of automobiles and tyre industries is expected to be a major driver for the carbon black market over the coming years.

Additionally, the use of carbon black has increased in specialty segments such as inks, conductive plastics and high-performance coatings, which have led to diversification in product range offered by key industry players.

Looking at the attractiveness of the market in long run, Epsilon Carbon has decided to forward integrate its existing coal tar distillation unit to produce Hard and Soft Grades Carbon Black to cater to tyre and non-tyre applications in domestic and International markets.
The proposed project will be in a close proximity of an integrated steel plant which is a major source of coal tar. This project will also generate direct and indirect employment.

2.3 Demand Supply Gap

Aluminum Industry

The Coal tar distillation plant will produce Binder grade pitch / Modified Pitch and Impregnated Pitch as the main products and Carbon black oil (CBO), Wash oil, phenol Oil, Light Oil, Anthracene Oil, Naphthalene Sulfonate Formaldehyde (NSF) and Naphthalene as the Co-products. The Coal Tar Pitch (Binder Grade) has tremendous market potential in India and with existing as well as growing Aluminum industries due to availability of basic raw material in abundance. Coal Tar Pitch (Binder Grade) is used as binder with coke in manufacture of carbon anodes which are required in Electrolytic pots in Aluminum Smelters.

Current market potential for Coal tar pitch (CT Pitch) in India is mainly used in making green carbon anodes for electrolytic pots in Smelters and manufacture of graphite electrodes.

Aluminum consumption in India is poised to grow from 3.3 million tonne (mt) in 2015-16 to 5.3 mt in 2020-21 riding on a host of government initiatives like, Make in India, Smart Cities, Housing for all, rural electrification, and freight corridors.

India is richly endowed with bauxite resources, which is the basic raw material for Aluminum production. Estimated bauxite reserves of the country (proven and probable) stand at 593 million tonnes. The country occupies 7th place in the world in terms of bauxite reserve base.

The Aluminum per capita consumption level in India continues to be very low i.e. it stands currently at around 1.4 kg as against the world average of roughly 8kg. However, the demand for Aluminum in India is projected to grow, largely in line with the annual GDP growth rate of about 5.5 % per annum. In India, the power sector continues to be the major consumer of Aluminum. Besides this, demand growth is also likely to be high in transport, packaging, building and construction sectors.

With the addition of new aluminum capacities, India aims at not only satisfying domestic demand, but also playing a major role in the global aluminum market.

Growth of Aluminum industry will directly translate in to growing market for binder coal tar pitch.

Carbon Black Industry

Volume demand for carbon black has a direct association with the end use industries, with the automotive industry taking precedence, given that the largest quantity of this material is utilized by tires and other rubber products largely used in automobiles. Carbon black is used as a reinforcement material providing tensile strength to tyres. It is a critical component for manufacturing tyres and forms ~26% by volume of the tyre weight and ~10% by value of tyre costs.

Other industries that make use of carbon black, albeit to a lesser extent, include plastics, printing inks and paints and coatings. Of these, plastics and paints and coatings are widely utilized by the construction sector, which has been posting steady to rapid growth depending upon the region. For instance, the mature markets of the developed world, such as North America and Western Europe are witnessing stagnation in their construction industries, while the emerging economies of Asia-Pacific, Latin America and Eastern Europe are flourishing construction hubs. Therefore, it goes without saying that demand for carbon black in the latter regions is bound to record faster growth than the former due to impetus in construction activity aimed at boosting infrastructure.
Based on informal survey carried out and reliable statistics we can envisage the supply gap of these products is likely to increase in near future.

2.4 Import vs. Indigenous Production
At present the carbon black from international market is not available at competitive prices. Increase in indigenous production can fill the gap.

2.5 Export Possibility
Current market for final products will be domestic market. However, depending upon the market dynamics, possibility of export in future can be evaluated

2.6 Employment Generation (Direct and Indirect) due to the project.
Construction phase - 700 nos

Operational Phase - 575 nos personnel will be required comprises of management staff, supervisory staff, clerks and company workers in different departments i.e. administration, plant (production & allied services), stores & dispatch.
3 PROJECT DESCRIPTION

3.1 Type of Project including interlinked and interdependent projects, if any

Expansion project of the existing coal tar distillation project

3.2 Location (map showing general location, specific location and project boundary & project layout) with coordinates

The site is located at Musinayakahalli, Taluk: Sandur, District: Ballari, Karnataka. Site location map is as below.
3.3 Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.

There was no alternate site considered.

This project is a forward integration of existing coal tar distillation set up. Carbon black oil produced during coal tar distillation would be used as a raw material in the proposed carbon black unit. Also all the utilities like land, water, power is already available on the proposed site.
3.4 Size or Magnitude of Operation

Coal Tar Distillation - Expansion from 300,000 TPA to 500,000 TPA

Carbon Black - 300,000 TPA

Cogeneration power plant - 54 MW

<table>
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<tr>
<th>S. No.</th>
<th>Products</th>
<th>Production Capacity in MTPA</th>
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<tr>
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<td>Existing</td>
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<tr>
<td>Coal tar Distillation Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Coal Tar Pitch (Binder Grade)</td>
<td>153000</td>
</tr>
<tr>
<td>2</td>
<td>Zero OI/Impregnated Pitch</td>
<td>6000</td>
</tr>
<tr>
<td>3</td>
<td>Carbon Black Oil (CBO)</td>
<td>70000</td>
</tr>
<tr>
<td>4</td>
<td>Anthracene Oil/Heavy Creosote Oil</td>
<td>42000</td>
</tr>
<tr>
<td>5</td>
<td>Wash Oil</td>
<td>25500</td>
</tr>
<tr>
<td>6</td>
<td>Naphthalene</td>
<td>18000</td>
</tr>
<tr>
<td>7</td>
<td>NSF</td>
<td>33000</td>
</tr>
<tr>
<td>8</td>
<td>Phenol Oil</td>
<td>6000</td>
</tr>
<tr>
<td>9</td>
<td>Light Oil</td>
<td>6000</td>
</tr>
<tr>
<td>10</td>
<td>De-hydrated coal tar</td>
<td>291000</td>
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<tr>
<td>11</td>
<td>Phenolics (Phenol, Cresols (ortho, meta, para or mixture thereof), Xylenols)</td>
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</tr>
<tr>
<td>12</td>
<td>Special Graphite/Advanced Graphite</td>
<td>0</td>
</tr>
<tr>
<td>By- Product of Coal Tar Distillation Section</td>
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<td></td>
</tr>
<tr>
<td>1</td>
<td>Neutral Sodium Phenolate (14%)</td>
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<tr>
<td>2</td>
<td>Ammonical water</td>
<td>90</td>
</tr>
<tr>
<td>3</td>
<td>Calcium Carbonate</td>
<td>17340</td>
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<td></td>
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<td>Carbon Black Unit Section</td>
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<tr>
<td>1</td>
<td>Carbon Black</td>
<td>300000</td>
</tr>
<tr>
<td>2</td>
<td>Lean Gas/ Tail Gas</td>
<td>270000 Nm3/hr.</td>
</tr>
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</table>

Captive Power Plant

1. CPP* | 54 MWH | 54 MWH |

Notes:

Coal Tar distillation - Byproducts including Neutral Sodium Phenolate, Ammonical water, Calcium Carbonate, Dilute Sodium Hydroxide, Sodium Carbonate etc will be generated during the process

* Captive Power plant - Based on technical and commercial feasibility, lean gas generated during carbon black process will be either sold to nearby industries or may be converted to power using a captive power plant

3.5 Technology and Process Description

The expansion of coal tar plant will be based on continuous coal tar distillation technology. The various components present in the coal tar are separated by distillation process. Coal tar will be received at plant by road tankers or by
means of direct pipeline which will be unloaded in unloading tanks. Coal tar from unloading tanks will be pumped to storage tanks using pumps. The preheated coal tar will then be fed to distillation system in which various fractions will be separated depending on product mix.

For Carbon Black, Furnace Black technology is the standard technology used world-wide for production of ASTM Rubber Grade Carbon Black. This technology is established globally and various operators offer minor variants of the same technology.

### 3.5.1 Salient Features of Technology

The selection of technology for both coal tar distillation and Carbon Black is based on following criteria:

- Energy efficient technology
- Quality of products meeting the global standards
- Minimal adverse environmental impact.
- Approved and already successfully tested technology
- Minimal adverse environmental impact.

### 3.6 Raw Materials

Details of raw materials consumption are given in Form I vide Annexure 7.

### 3.7 Process Description

#### 1. Coal Tar Distillation Process

The various components present in the coal tar are separated by distillation process. Coal tar will be received at plant by road tankers or by means of direct pipeline which will be unloaded in unloading tanks. Coal tar from unloading tanks will be pumped to storage tanks using pumps. The preheated coal tar will then be fed to distillation system in which various fractions will be separated depending on product mix. Process and operating steps of the plant starting from receipt of raw materials to dispatch of products are briefly described below. Process flow is shown diagrammatically in Fig below.

#### 2. Coal Tar Pitch (Binder Grade) Production

For production of Coal Tar Pitch (Binder Grade), first soft pitch is generated by removal of moisture, Light Oil, Phenol oil, Anthracene oil & three mixed oils in Dehydration & Pitch column respectively. The produced soft pitch will be
converted into modified pitch in modified pitch section which also can be sell as product. Coal tar will be heated by
means of Mixed Gas as a heating source. Additional High QI pitch will be blended with modified pitch for as to produce
Binder pitch.

A pitch melting system will be used for melting of High QI pitch. In pitch melting system High QI pitch is crushed to
reduce size in roller crusher. Crushed High QI pitch will be charged to pitch melter using conveyor assembly. The pitch
melter will take approximately 12 hours to melt the pitch. The molten High QI pitch will be blended with modified pitch
to produce binder pitch.

3. Zero QI / Impregnated Production

The process comprises of blending of coal tar and creosote oil in specific ratio and raising the temperature of the
mixture in preheating-distillation kettle for removal of moisture as well as improved blending of Coal Tar and Creosote
Oil. The Preheating Process for each batch requires around 14 to 18 hours of time. The dehydrated mixture is
transferred to Settling tank provided with draw-off valves at different levels. The settling time depends on the QI value
of coal tar; however the required residence time in Settler varies from 72 to 84 hours. The QI value of material in
settling tank has increasing profile from top to bottom of the tank. The upper layer material of the settling tank at the
height of about 1.5 meter to 2.5 meter has the QI value at around 0.10% which is drawn and transferred to Process
distillation kettle. The residual material having higher QI is used in Coal Tar Pitch (Binder Grade) process circuit. The
temperature in Process Distillate kettle is raised and maintained for about 30 to 32 hours. The Creosote oil collected
from the top of Process Distillate is transferred to Oil receivers and Zero QI / Impregnated Pitch drawn from the bottom of
Process Distillate is transferred through Cooler for reducing the temperature of material to around 260°C. The material thus
produced is either loaded in the tanker at 260°C in liquid form for dispatch to desired destination or transferred to
granulating unit for cutting into required sizes.

4. Carbon Black Oil (CBO) Production

For the production of Carbon Black Oil, soft pitch will be blended with Anthracene Oil produced in distillation process in
specific proportion to meet product specification.

5. Refined Naphthalene Production

Vapors containing crude naphthalene oil generated in distillation process will be continuously cooled in condensers and
collected by gravity into the receivers. The collected and cooled mixture will be transferred refined naphthalene section.
In refined naphthalene section crude naphthalene will be enriched and purified using crystallizer. The refined
naphthalene will be solidified using flakers. Residual naphthalene will be collected and pumped to NSF unit.

6. Naphthalene Sulfonate Formaldehyde (NSF) Production

The naphthalene oil produced from Industrial Naphthalene Section or the residual naphthalene oil generated in refined
naphthalene section which is treated with sulphuric acid (Sulfonation Reaction), followed by formaldehyde
(Condensation) and further neutralized by sodium hydroxide to produce Naphthalene Sulfonate Formaldehyde.

7. Oils - Light oil, Phenol oil & Anthracene oil

Tar is pumped through preheater and fed to dehydration column in which azeotropic distillation takes to remove light oil
and moisture content in the tar from the top of column. Light oil and moisture is further separated in separator to
obtain pure light oil. Dehydrated tar from the bottom dehydration column is pumped to pitch column. The overhead
vapor from pitch column flow to the distillation column in which they are separated the top fraction contains phenol oil,
the middle fraction contains Naphthalene oil along with phenols and washes oil & the bottom product contains
Anthracene oil.

8. Phenol purification
Phenol oil from C3/C4 top and sodium hydroxide is charged in agitated vessel in calculated proportions. Sodium phenolate formed from phenol oil along with sodium phenolate from washing section can be processed using steam blowing. The steam blowing is carried out in order to increase the concentration of sodium phenolate from 18% to 22% and reduce neutral oil content in sodium phenolate from 2-3% to 0.5%.

The concentrated 22% sodium phenolate is reacted with CO2 gas in packed column to form crude phenol. The purity of crude phenol is 83%. The remaining component is water which cannot be separated by decantation. Water can be removed by evaporation. The further separation of components is carried out by distillation.

### 3.7.1 Carbon Black Process

Heavy aromatic oils of petroleum oil refinery or coal tar distillation units are used as main feedstock. The furnace is basically a specially designed refractory lined horizontal steel vessel having different segments like combustion zone, vent zone, reaction zone, quench zone & evaporation cum conveying sections.

**Combustion zone or hot flue gas generating section:**

Secondary feed stock e.g., natural gas or fuel oil or sometimes the main feed stock in proper ratio with preheated air is introduced in this section to produce hot gas. Adiabatic flame Temperature is maintained nearly 1900°C-2000°C.

**Venture section:**

Preheated main feed stock (aromatic oil) is introduced in atomized form under controlled conditions on the hot gas where liquid oil vaporizes. Velocity of gas stream maintained ~ 2000 FPM.

**Reaction section:**

Pyrolysis of oil takes place in the vapour phase to form microscopic carbon particles. The basic reaction is dehydrogenation.

**Quench zone:**

The reaction rate is controlled by using water sprays.

**Evaporation cum conveying sections:**

Water vaporizes in this zone. After all, carbon particles along with combustion gas convey to the next downstream equipment.

Furnace black process consists of several downstream sections after reactor e.g., Heat recovery sections, filtration sections, conveying section, beading & drying sections and finished product transportation & storage, ware housing, pulling & dispatch section. The process which is selected for this project is illustrated below.

**Heat recovery sections:**

Hot reactor combustion gas along with carbon black particles are cooled down by air. Preheated air is used in combustion section of reactor. Relatively cooled combustion gas along with carbon black again passes through oil preheat to preheat main feed stock. After passing through oil preheater, the combustion gas has sufficient sensible heat. In most of the energy efficient carbon black plants have in line sensible heat recovery (waste heat recovery) boilers. Saturated Steam is generated from waste heat recovery boilers which are used for steam tracing, & other equipment heating purposes.
Main Filtration section:

High filtration efficiency pulsejet bag filter modules (main filter) will be used for filtering carbon black from carbon black laden gas (process gas). A specially designed agglomerator unit will be installed before bag house to agglomerate carbon black particles. This agglomerator unit will not only enhance filtration efficiency, it will also enhance life of the filter cloth. Agglomerated carbon black particles will be deposited on the outer surface of the cloth and compressed air pulse will release carbon black particles from bags. A sequential timer will be used in pulsing system. Gas will pass through bags and finally it will be passed through a common header which is connected to other downstream unit e.g., dryer combustor etc. Carbon black dislodge from the bags will be collected in hopper. Accumulated carbon black powder will be transported to the conveying system via rotary air locks.

Conveying system:

It consists of drop box of rotary air locks, suction conveying ducts, conveying fans, conveying fan discharge ducts, conveying bag filter, conveying bag filter vent scrubber & a surge tank at the bottom of conveying bag house. All the rotary air locks placed at the bottom of main bag filter modules will be discharging carbon black particles to a common duct which is connected with a pneumatic conveying fan. In this process, air will be used for conveying carbon black. All carbon black particles from the rotary air locks discharge will be picked up by air and conveyed to another bag filter called conveying bag filter by conveying fans. Air from the bag filter can be vented to atmosphere after passing through venture scrubber. Carbon black collected from bag filter will be stored in surge tank to remove adsorbed air from carbon black.

Beading & drying system:

The beading & drying system consists of pelletizer, polisher, rotary dryer with insulated jacket and combustor as hot gas generator and purge gas filter. Fluffy carbon black, water and molasses solution (used as binder) mixed in pelletizer to form beads. Polishers are also used for making uniform diameter beads or pellets. This polisher also helps to reduce fines in carbon black. After polishing the pellets, the wet pellets pass through indirect heating rotary dryer to remove water from pellets. Hot gas required for drying is generated in refractory lined combustor. Process combustion gas from main bag filter is used as fuel in combustor. Vapour generated inside dryer along with fines is sucked by purge gas fan and filter through purge gas filter. Carbon black from purge gas filter is connected in main conveying line and vapour is vented to atmosphere after passing through venture scrubber.

Product transportation & storage:

This section consists of elevator, screw conveyors magnetic separator, rotary screen, storage silos, off spec silo & de dusting bag house. Dried carbon black is transported to final storage silos by above mentioned material handling equipment.

Warehouse, Packaging & Dispatch section:

Depending on customer requirement, the granular carbon black is packed in 25 kg paper bag or in 1 MT PP jumbo bulk bags.
Co-generation Power plant - A co-generation power plant may be installed based on lean tail gas generated by power plant.

3.8 Raw material required along with estimated quantity, likely source, marketing area of final products, mode of transport of raw material and finished product.

3.8.1 Raw Material Consumption

Table 3-1: Details of Raw Material Consumption Details

<table>
<thead>
<tr>
<th>S. No</th>
<th>Area of Consumption</th>
<th>Raw Material</th>
<th>Form</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
<td>Additional</td>
<td>Total</td>
</tr>
<tr>
<td>Coal tar Distillation Section</td>
<td>Coal Tar</td>
<td>300000</td>
<td>200000</td>
<td>500000</td>
</tr>
<tr>
<td></td>
<td>High QI Pitch</td>
<td>40000</td>
<td>26667</td>
<td>66667</td>
</tr>
<tr>
<td></td>
<td>Sodium Hydroxide (30%)</td>
<td>8068</td>
<td>4379</td>
<td>12447</td>
</tr>
<tr>
<td></td>
<td>Sulfuric Acid (98%)</td>
<td>3061</td>
<td>0</td>
<td>3061</td>
</tr>
<tr>
<td></td>
<td>Formaldehyde (37%)</td>
<td>2703</td>
<td>0</td>
<td>2703</td>
</tr>
<tr>
<td></td>
<td>Crude Benzene</td>
<td>72</td>
<td>48</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>Sodium Chloride</td>
<td>80</td>
<td>53</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td>Lime</td>
<td>0</td>
<td>9700</td>
<td>9700</td>
</tr>
<tr>
<td></td>
<td>Carbon Dioxide</td>
<td>0</td>
<td>7000</td>
<td>7000</td>
</tr>
<tr>
<td>Carbon Black Unit Section+ CPP</td>
<td>CBFS/Coal Tar/Coal Tar Based feedstock and/or Blend</td>
<td>490000</td>
<td>490000</td>
<td>Liquid</td>
</tr>
<tr>
<td></td>
<td>Fuel Oil/Heavy Oil/CBFS for firing</td>
<td>37000</td>
<td>37000</td>
<td>Liquid</td>
</tr>
<tr>
<td></td>
<td>Coke oven gas (Alternative to Oils in Point 2)</td>
<td>45</td>
<td>45</td>
<td>Gas</td>
</tr>
<tr>
<td></td>
<td>Molasses</td>
<td>1350</td>
<td>1350</td>
<td>Liquid/Solid</td>
</tr>
</tbody>
</table>
### 3.8.2 Transportation details of Raw Materials

#### Table 3-2: Details of Raw Material Transportation Details

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Chemical</th>
<th>State</th>
<th>Vessel</th>
<th>Means of Transportation</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Material Existing: 200000TPA Coal Tar Distillation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Coal Tar</td>
<td>Liquid</td>
<td>Tankers/ rake</td>
<td>Road / Railway</td>
<td>Local Steel Plants (Coke ovens, coal Gasifiers)</td>
</tr>
<tr>
<td>2</td>
<td>High QI Pitch</td>
<td>Solid</td>
<td>Truck</td>
<td>Road</td>
<td>Local &amp; Imported</td>
</tr>
<tr>
<td>3</td>
<td>Sodium Hydroxide</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>4</td>
<td>Sulfuric Acid (98%)</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>5</td>
<td>Formaldehyde (37%)</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>6</td>
<td>Crude Benzene</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>7</td>
<td>Sodium Chloride</td>
<td>Solid</td>
<td>Truck</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>Raw Material: 200000TPA to 300000TPA Coal Tar Distillation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Coal Tar</td>
<td>Liquid</td>
<td>Tankers/ rake</td>
<td>Road / Railway</td>
<td>Local Steel Plants (Coke ovens, coal Gasifiers)</td>
</tr>
<tr>
<td>2</td>
<td>High QI Pitch</td>
<td>Solid</td>
<td>Truck</td>
<td>Road</td>
<td>Local &amp; Imported</td>
</tr>
<tr>
<td>3</td>
<td>Sodium Hydroxide</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>4</td>
<td>Sulfuric Acid (98%)</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>5</td>
<td>Formaldehyde (37%)</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>6</td>
<td>Crude Benzene</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>7</td>
<td>Sodium Chloride</td>
<td>Solid</td>
<td>Truck</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>8</td>
<td>Lime</td>
<td>Solid</td>
<td>Truck</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>9</td>
<td>Carbon Dioxide</td>
<td>Gas</td>
<td>Cryogenic Tanker/Pipeline</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>Raw Material : 300000TPA to 500000TPA Coal Tar Distillation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Coal Tar</td>
<td>Liquid</td>
<td>Tankers/ rake</td>
<td>Road / Railway</td>
<td>Local Steel Plants (Coke ovens, coal Gasifiers)</td>
</tr>
<tr>
<td>2</td>
<td>High QI Pitch</td>
<td>Solid</td>
<td>Truck</td>
<td>Road</td>
<td>Local &amp; Imported</td>
</tr>
<tr>
<td>3</td>
<td>Sodium Hydroxide</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>4</td>
<td>Sulfuric Acid (98%)</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>5</td>
<td>Formaldehyde (37%)</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>6</td>
<td>Crude Benzene</td>
<td>Liquid</td>
<td>Tanker</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>7</td>
<td>Sodium Chloride</td>
<td>Solid</td>
<td>Truck</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>8</td>
<td>Lime</td>
<td>Solid</td>
<td>Truck</td>
<td>Road</td>
<td>Local</td>
</tr>
<tr>
<td>9</td>
<td>Carbon Dioxide</td>
<td>Gas</td>
<td>Cryogenic Tanker/Pipeline</td>
<td>Road</td>
<td>Local</td>
</tr>
</tbody>
</table>
3.9 Availability of water its source, energy/power requirement and source should be given

3.9.1 Water consumption

Water is sourced from JSW Steel water network and after expansion it will be obtained from the same. Existing water consumption is 1440 KLD (1416 KLD Industrial + 24 KLD Domestic). After proposed expansion water consumption will be 10200 KLD (9880 KLD Industrial + 140 KLD Domestic). Detail of water consumption is given as below.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Area of Consumption</th>
<th>Water Consumption in KLD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
</tr>
<tr>
<td>1</td>
<td>Processing</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Make up water WTP (DM/Regeneration/Softener, RO)</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Washing (DMF, Reactor and Floor) - Misc.</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>Boiler</td>
<td>216</td>
</tr>
<tr>
<td>5</td>
<td>Cooling Tower</td>
<td>1152</td>
</tr>
<tr>
<td>6</td>
<td>Gardening</td>
<td>24</td>
</tr>
<tr>
<td>7</td>
<td>Domestic</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1440</strong></td>
</tr>
</tbody>
</table>

3.9.2 Power

Power requirement of existing plant is 3500kW currently being met from JSW Steel Power network.

Additional power requirement would be 15333 kW, the total power requirement after expansion would be approximately 18833 kW which will be met by the in-house co-generation power plant being set up based on lean tail gas generated during carbon black production.
As an alternative, a long term power agreement will be signed with JSW Steel for above said power requirement in case co-generation plant is not available or non-operational.

### Table 3-2: Details of Fuel consumption

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Stack attached to</th>
<th>Capacity (Unit)</th>
<th>Fuel Type</th>
<th>Consumption in Gcal/hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EC &amp; CTO Received for</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Coal Tar Tube Furnace-1</td>
<td>38.5 LKcal</td>
<td>Mixed Gas</td>
<td>3.85</td>
</tr>
<tr>
<td>3</td>
<td>Naphthalene Tube Furnace-1</td>
<td>15 LKcal</td>
<td>Mixed Gas</td>
<td>1.5</td>
</tr>
<tr>
<td>5</td>
<td>Modified Pitch Furnace</td>
<td>10 LKcal</td>
<td>Mixed Gas</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Boiler</td>
<td>15 TPH</td>
<td>Mixed Gas</td>
<td>9.95</td>
</tr>
<tr>
<td>8</td>
<td>Thermic Fluid Heater-1</td>
<td>20 LKcal</td>
<td>Mixed Gas</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Thermic Fluid Heater-1</td>
<td>5 LKcal</td>
<td>Mixed Gas</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>EC Received for</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Coal Tar Tube furnace-2</td>
<td>38.5 LKcal 2.5</td>
<td>Mixed Gas</td>
<td>2.5</td>
</tr>
<tr>
<td>11</td>
<td>Naphthalene Tube Furnace-2</td>
<td>15 LKcal</td>
<td>Mixed Gas</td>
<td>1.5</td>
</tr>
<tr>
<td>12</td>
<td>Boiler-Stand By</td>
<td>15 TPH</td>
<td>Coal/Mixed Gas</td>
<td>5.38</td>
</tr>
<tr>
<td>13</td>
<td>Thermic Fluid Heater-3</td>
<td>20 LKcal</td>
<td>Mixed Gas</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Proposed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Coal Tar Tube furnace-1</td>
<td>38.5 LKcal</td>
<td>Mixed Gas</td>
<td>3.85</td>
</tr>
<tr>
<td>2</td>
<td>Naphthalene Tube Furnace-1</td>
<td>15 LKcal</td>
<td>Mixed Gas</td>
<td>1.5</td>
</tr>
<tr>
<td>3</td>
<td>Modified Pitch Furnace</td>
<td>10 LKcal</td>
<td>Mixed Gas</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Boiler</td>
<td>15 TPH</td>
<td>Mixed Gas</td>
<td>9.95</td>
</tr>
<tr>
<td>5</td>
<td>Thermic Fluid Heater-1</td>
<td>20 LKcal</td>
<td>Mixed Gas</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Thermic Fluid Heater-3</td>
<td>20 LKcal</td>
<td>Mixed Gas</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Boilers - 3Nos</td>
<td>70 TPH/90 TPH</td>
<td>Tail Gas from CB Unit</td>
<td>180</td>
</tr>
<tr>
<td>9</td>
<td>DG Set stand by</td>
<td></td>
<td>Mixed Gas/ Fuel Oil</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>Dryer Stacks - 3 Nos for 6 dryers</td>
<td>180 TPD/250 TPD</td>
<td>Tail Gas from CB Unit</td>
<td>40</td>
</tr>
<tr>
<td>10</td>
<td>Flare stack</td>
<td>Only to be used in case of CPP breakdown for a brief period of time</td>
<td>Tail Gas from CB Unit</td>
<td>-</td>
</tr>
</tbody>
</table>
3.10 Quantity of waste to be generated (liquid and solid) and scheme for their management / disposal

### 3.10.1 Waste Water Generation

Existing wastewater generation is 96 KLD (84 KLD Industrial + 12 KLD Domestic). After proposed expansion wastewater generation will be 895 KLD (815 KLD Industrial + 70 KLD Domestic). Industrial wastewater will be treated in 1000 KLD ETP and domestic wastewater will be treated in 75 KLD STP after proposed expansion.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Area of Consumption</th>
<th>Wastewater Generation in KLD</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
<td>Proposed</td>
</tr>
<tr>
<td>1</td>
<td>Processing</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Make up water WTP (DM/Regeneration / Softener, RO)</td>
<td>0</td>
<td>400</td>
</tr>
<tr>
<td>3</td>
<td>Washing (DMF, Reactor and Floor) - Misc.</td>
<td>12</td>
<td>58</td>
</tr>
<tr>
<td>4</td>
<td>Boiler</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>Cooling Tower</td>
<td>0</td>
<td>235</td>
</tr>
<tr>
<td>6</td>
<td>Gardening</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Domestic</td>
<td>12</td>
<td>58</td>
</tr>
</tbody>
</table>

**Total** 96 799 895

**3.10.2 Solid and Hazardous Waste Generation**

Details of Hazardous waste are given below:

*Table 3-3: Hazardous Waste Generation and disposal Details*

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of Waste</th>
<th>Hazardous Waste Category</th>
<th>Tonner per annum</th>
<th>Source</th>
<th>Treatment / Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Existing</td>
<td>Proposed</td>
<td>Total</td>
</tr>
<tr>
<td>1</td>
<td>Residual Oil</td>
<td>5.2</td>
<td>1.2</td>
<td>0.8</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Spent Oil</td>
<td>5.1</td>
<td>0.12</td>
<td>3</td>
<td>3.12</td>
</tr>
<tr>
<td>3</td>
<td>Oil Sludge</td>
<td>5.1</td>
<td>0.12</td>
<td>0.08</td>
<td>0.2</td>
</tr>
<tr>
<td>4</td>
<td>Sludge/salt from ETP/ZLD</td>
<td>33.2</td>
<td>297</td>
<td>698</td>
<td>995</td>
</tr>
<tr>
<td>6</td>
<td>Oily Cotton Waste</td>
<td>33.2</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Discarded Container &amp; Barrel</td>
<td>33.1</td>
<td>0</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>Plastic Waste</td>
<td>33.1</td>
<td>0</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>S. No.</td>
<td>Type of Waste</td>
<td>Hazardous Waste Category</td>
<td>Tonner per annum</td>
<td>Source</td>
<td>Treatment / Disposal</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------</td>
<td>--------------------------</td>
<td>------------------</td>
<td>--------</td>
<td>---------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Existing</td>
<td>Proposed</td>
<td>Total</td>
</tr>
<tr>
<td>9</td>
<td>Oily Cotton Waste/Leather Hand Gloves / Cotton Hand Gloves</td>
<td>33.2</td>
<td>0</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>10</td>
<td>Waste Insulation Material</td>
<td></td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
4 SITE ANALYSIS

4.1 Connectivity
The site is at about 29 km away from nearest city Bellary. The national highway NH 63 runs at 3 km. Toranagallu railway station is at about 10 km from the site.
Nearest airports are Vijyanagar Airport at 11 Kms and Hubli 195 km from site.
The proposed site has following advantages

- Proximity to exiting ECPL facilities
- There is sufficient availability of utilities such as water, electricity & gaseous fuel.
- The site is well connected to roads & railway network.
- The soil condition, geometry & geography of land are suitable.

4.2 Land Form, Land Use and Land ownership
The land for the proposed site falls under Heavy Industrial Area of the special industrial zone of Vijayanagar Area Development Authority (VADA). The project area is devoid of any greenery and the general topography of the area is plain with slight undulation.
Presently the land is not used for any purpose as it is barren land. The proposed land will be leased/ transferred through outright sale agreement from JSW to Epsilon Carbon Private Limited.

4.3 Topography
The topography of land is suitable for project construction as the Land is more or less flat with minor undulations.

4.4 Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ)), shortest distances from the periphery of the project to periphery of the forests, national park, wild life sanctuary, etc sensitive areas, water bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.

Land use pattern: Industrial

| Table 4-1: Distance of Project Site from Sensitive Areas (within 10 kms) |
|---|---|---|
| Area | Dist. in km | Direction |
| Torangallu RF | 1.06 | N |
| Chikkantapur RF | 2.32 | S |
| Kodalu RF | 6.29 | SW |
| Marutla Extension RF | 7.53 | S |
| DarojiKere | 6.0 | NW |
| Daroji Reserved Forest | 5.1 | NW |
Distance of Project site from Water Bodies

- No major river within 5km of the project site
- The only major drainage feature is the Kanigananala and its streams which is a seasonal stream draining into the Darojikere tank.
- General drainage pattern of the area is dendritic pattern

4.5 Existing Infrastructure

Required infrastructure facilities are prevailing in the proximity of existing project site.

4.6 Soil classification

In terms of the Indian Standard Classification system the soil at ECPL site classifies mainly as a "GP" soil type, these being Poorly Graded Gravel with sand. The other types found are "MH" - Sandy Elastic Silt and "SM" Silty sand with Gravel. The Atterberg's Limit on fine grained soil revealed highly plastic soil which indicates it has more plastic fines. The site been extensively disturbed and mainly blanketed by brownish/blackish brown sandy Gravel (fragments of rock).

4.7 Climatic data from secondary sources

Sultanpur has a semi-arid climate. It has an average elevation of 495 meters. As it lies in the rain shadow region of the Western Ghats, it receives little rain from the southwest monsoon.

Temperatures remain high from the months of March to mid-June, with highest temperature recorded at 44.9 °C, hereby one of the hottest cities in Karnataka.

The months from July to October are relatively pleasant, and the months from November to February are mild warm with average mean temperatures of around 22 °C.

The location receives about 650 mm of rain every year, mainly in the months from August to October.

4.8 Social infrastructure available

Social infrastructures like hospitals, schools, Universities are present in vicinity of plant area.
5 PLANNING BRIEF

5.1 Planning Concept

Epsilon Carbon Private limited (ECPL) propose to expand the existing coal tar distillation plant from processing capacity of 300,000 TPA to 500000TPA with new Carbon black plant with a capacity of 300000TPA at Sultanpur, Bellary in state of Karnataka nearby existing ECPL Coal tar distillation facility.

Additional and required for proposed expansion project is 65 Acres.

5.2 Population Projection

The proposed project as per applicable regulations would employ local workers. However due to foreseen employment opportunities in the proposed project and increase in ancillary economic activities, growth in migrant population is anticipated.

With establishment of proposed project; infrastructure and social development simultaneously progresses. The project will contribute in rising up standard of living of the population by creating job and business opportunities.

The plant activities will also boost up ancillary industries, business and market establishments. The whole set up will require both skilled and unskilled labor. This will result in increase in population density.

5.3 Land - use Planning

The land use pattern of the proposed plant in Table below

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Title</th>
<th>Area, m²</th>
<th>% of total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
<td>Additional</td>
</tr>
<tr>
<td>1</td>
<td>Processing Area</td>
<td>36561</td>
<td>72417</td>
</tr>
<tr>
<td>2</td>
<td>Storage Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Hazardous Chemicals</td>
<td>2789</td>
<td>8160</td>
</tr>
<tr>
<td>b</td>
<td>Other Non-hazardous chemicals</td>
<td>12417</td>
<td>13917</td>
</tr>
<tr>
<td>c</td>
<td>Hazardous Waste</td>
<td>0</td>
<td>2500</td>
</tr>
<tr>
<td>d</td>
<td>Water Storage</td>
<td>765</td>
<td>4765</td>
</tr>
<tr>
<td>e</td>
<td>Fuel Storage</td>
<td>0</td>
<td>1500</td>
</tr>
<tr>
<td>3</td>
<td>Effluent Treatment Plant</td>
<td>4200</td>
<td>8200</td>
</tr>
<tr>
<td>4</td>
<td>Boiler</td>
<td>1800</td>
<td>13800</td>
</tr>
<tr>
<td>5</td>
<td>Cooling tower</td>
<td>1050</td>
<td>9050</td>
</tr>
<tr>
<td>6</td>
<td>DG Sets</td>
<td>0</td>
<td>3000</td>
</tr>
<tr>
<td>7</td>
<td>Roads+ walkways</td>
<td>22000</td>
<td>23000</td>
</tr>
<tr>
<td>8</td>
<td>Administrative Building/ Laboratory</td>
<td>1200</td>
<td>2000</td>
</tr>
<tr>
<td>9</td>
<td>Open Space</td>
<td>7400</td>
<td>12000</td>
</tr>
<tr>
<td>10</td>
<td>Greenbelt Area</td>
<td>49118</td>
<td>73000</td>
</tr>
<tr>
<td>11</td>
<td>Other utility areas</td>
<td>898</td>
<td>2800</td>
</tr>
</tbody>
</table>
The layout would also house canteen, administrative buildings, workshop, stores, in-plant roads, etc.

A detailed planning would be carried up to optimally design the new facilities in synergy with existing facilities.

### 5.4 Amenities/ Facilities

Industry will provide with following amenities/facilities in the proposed plant.

- Transportation will be provided to all company employees.
- Firefighting/alarm system and ambulance shall be provided in case of emergency.
- Occupational Health Centre with qualified doctor will be set up for periodical health checkup of employees.
- Greenbelt shall be developed in and around plant.
- Drinking water, canteen and rest room facilities will be provided.
- Separate sanitary facilities shall be provided.
- PPE’s and facilities related to safety will be provided.
6 PROPOSED INFRASTRUCTURE

6.1 Industrial Area (processing area)
About 65 acres of land will be required for setting up of the 300,000 tpa coal tar distillation plant. Company will be using nearest railway siding and road for transportation of equipment, input materials & dispatch of products.

6.2 Residential Area (non-processing area)
Existing colony will be used for proposed expansion.

There is no such planning to build any residential facility within the plant premises. All the workers during plant operation will be accommodated in existing residential facilities at Sunrise valley Sultanpur.

6.3 Green belt
33.5% of total plot area will be developed as greenbelt. Greenbelt will be developed within the plant premises as per MoEF guidelines.

6.4 Social Infrastructure
ECPL is planning to improve the socio-economic status of the area. The company will also promote Medical/Health check-up camps for the nearby villagers as a social responsibility.

With the implementation of the project, the adjoining areas will open up, resulting in the development of modern infrastructure such as schools, roads, health center, sports facilities center, clean water etc

6.5 Connectivity (Traffic and transportation road/ rail/ metro/ water ways etc)
The site is at about 29 km away from nearest city Bellary. The national highway NH 63 runs at 4 km. Toranagallu railway station is at about 9.5 km from the site. Nearest airport is at Vijayanagar Airport at 7.5 km from site.

6.6 Drinking water management & Sanitation facilities
The workers at the plant during construction shall be provided with water for their requirement and for the construction activities.

The construction labour will be provided with sufficient and suitable toilet facilities to allow proper standards of hygiene. These facilities would be connected to a septic tank and shall be maintained properly to have least environmental impact.

Drinking water required for the workers will be sourced from existing ECPL drinking water facilities.
6.7 **Sewage system**

Domestic waste water generated will be treated in septic tank followed by soak pit.

6.8 **Industrial waste management**

Industrial waste generated during plant construction phase & in regular operation stage will be sent for reprocessing to certified facility.

6.9 **Solid waste management**

Municipal solid waste will be disposed in accordance with the existing norms through the local authority.

Sludge waste generated from effluent treatment plant will be transported to government approved solid waste treatment unit for treatment and disposal.

6.10 **Power requirement & supply/ source**

Power requirement of existing plant is 3500 kW currently being met from JSW Steel Power network.

Additional power requirement would be 15333 kW, the total power requirement after expansion would be approximately 18833 kW which will be met by the in-house co-generation power plant being set up based on lean tail gas generated during carbon black production.

As an alternative, a long term power agreement will be signed with JSW Steel for above said power requirement in case co-generation plant is not available or non-operational or not constructed.
7 REHABILITATION AND RESETTLEMENTS (R& R) PLAN

7.1 Policy to be adopted (central/ state) in respect of the project affected persons including home
oustees, land oustees and landless labourers(a brief outline to be given)

There is no existence of inhabitant in the proposed area. Proposed land is also devoid of any vegetation and habitat.

As the required land is already under possession of JSW Steel and the same will be transferred to ECPL, no R&R is involved.

Local people will be engaged for construction and operation activities.
8 PROJECT SCHEDULE AND COST ESTIMATE

8.1 Likely date of start of construction and likely data of completion (time schedule for the project to be given)

Likely Date of Completion of Project: December 2019

Required statutory approvals and Clearances will be obtained from concerned authorities for setting of the plant.

Project Planning

Careful planning of all the activities is one of the pre-requisite for timely completion of the project.

The following strategies would be adopted for smooth functioning as well as timely execution of the project:

- The task of implementing the project in time shall be achieved by ensuring a well-coordinated project implementation task force in-house and from external agencies.
- A well-chosen team of experienced personnel for project execution shall coordinate the implementation of the project from in-house.
- Experienced engineering consultants with proven track records shall be selected for detailed engineering of the project.
- Reputed and experienced contractors with adequate resources of finance, men, material and tools and tackles will be engaged for execution of the construction and erection work.
- Effective project monitoring including project planning schedule and monitoring shall be employed in this project.
- Timely execution and resources will be monitored using computer based project monitoring tools.
- In case of deviations in project progress, suitable corrective actions will be implemented.
- The schedule may vary depending on the supply of material and other external factors

8.2 Estimated project cost along with analysis in terms of economic viability of the project.

An indicative capital cost of the proposed Plant is Rs. 900 Crores including pre-operative expenses, contingency and interest during construction.

8.2.1 Fixed Capital

900 Crores

8.2.2 Working Capital

250 Crores/year

8.2.3 Revenues

Additional revenue/turnover from expansion project - 2700 Cr
8.2.4 Payback period

4 years

8.2.5 Profitability

After payback period
9 ANALYSIS OF PROPOSAL

The proposed expansion project will improve the socio-economic status of the society in the region by generating direct and indirect employment opportunities. The financial benefits accrued from the project would not only profit the company but also strengthen the economy of the state due to earning from taxes and duties from the Plant. Installation of a state-of-art facility and associated facilities would also add huge impetus to the growing economy of the state and the country.

Social Benefits

The proposed Brownfield project would
- yield local direct and indirect employment opportunities in the project influence area
- promote the development of ancillary industries, medium, small scale trade & commercial establishments, local entrepreneurship and diversification in skill set
- generate local income, boost the local purchasing power and
- promote an increase in land prices & rent
- contribute to the local economy and the state revenue

Employment

It is estimated that the total requirement of manpower for the proposed expansion project will be approx. 525.
The project related construction activities will benefit the local populace in a number of ways such as supply of construction laborers - skilled, semi-skilled and un-skilled, tertiary sector employment and provision of goods and services for daily needs including transport.
Besides direct employment, indirect employment opportunities will also open up.

As ECPL strongly believes that it is a part of the larger community where it operates, the company has taken cognizance of the cultural ethos and socio economic environment of the locality where its plants are located. With this approach, ECPL shall consider the following general measures for the socio-economic upliftment / welfare of the nearby villages:
- Local infrastructure development
- Social afforestation
- Extending support to games, sports and culture to local community
- Health and medical facilities
- Social awareness program will further improve the quality of life and standard of living such as sanitation and hygiene, HIVPrevention Program etc.
- Implementation of adult education and female education program in the villages surrounding the project area.
• Financial assistance to talented and poor students for higher studies. (Management /Engineering / Medical studies etc.)

The project would bring forward an overall social development with emphasis in the areas of education, training, health and infrastructure.