

# **Executive Summary**

## **on**

# **Environment Impact Assessment and Environment Management Plan**

**For**

**Expansion of Chemical Complex and Establishment  
of Co-Gen Power Plant**

**By**

**GODAVARI BIOREFINERIES LTD., (GBL)  
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# **CHAPTER 1**

## **PROJECT DESCRIPTION**

### **1.1 Preamble**

Godavari Biorefineries Limited (GBL) is located at Sameerwadi, Mudhol Taluk, Bagalkot District, Karnataka. GBL is the leading company in the field of manufacturing and exporting of the Specialty Chemical products. Presently industry is operating Sugar, Co-gen plant, Distillery, and a small Chemical unit.

GBL, now proposes to expand its Chemical Complex within the available land at Sameerwadi site i.e., at Sy. Nos. 48/1, 53/1, 55, 47, 50/2, 57/1, 57/2, 57/3, 49/1, 49/2, 49/3, 49/4, 56/3 & 46 of Handigund Village, 150/1 of Kappalguddi and 74/1, 74/2, & 75 of Madhabhavi Village, Sameerwadi, Mudhol Taluk, Bagalkot District, Karnataka. The location is congruent with the Sugar & Distillery complex. Total land area of the entire Industrial complex is 525.4 acres. An area of 194.0 acres has been earmarked for the proposed establishment of proposed Chemical Complex. The estimated Capital cost for the proposed project is Rs. 350 Crores.

GBL proposed to manufacture various organic chemicals/solvents with a total capacity of 14966.35 TPM. The facility will also generate 16 MW power (2 x 8 MW) using excess steam generated from the boilers.

As per the EIA Notification 2006, the proposed activities covered under serial No. 5(f) and 1 (d) of the schedule and Category 'A' project. Accordingly, application for Environmental Clearance made annexed with a Pre-feasibility Report to MoEF & CC, GOI, New Delhi vide proposal no. IA/KA/IND2/70081/2017 on 05.05.2018.

In response, the MoEF & CC issued Standard Terms of Reference on 17<sup>th</sup> June 2018 for carrying out Environment Impact Assessment study and to prepare the EIA/EMP report. Subsequently, as there are changes in survey numbers of proposed chemical complex site, revised application was submitted to MoEF & CC and Amendment to ToR was obtained on 17.09.2020.

Baseline monitoring is carried out during post monsoon season 2018 for ToR issued by MoEF & CC and Draft EIA study report has been prepared.

## 1.2 PRODUCTS WITH PRODUCTION CAPACITIES

The Karnataka State Pollution Control Board has accorded consent to operate the existing and proposed production details are in Table 1.0;

Table 1.0: Existing and Proposed project details

| Sl. No.          | Description  | Existing products capacity in TPM | Proposed capacity in TPM | Total production capacity TPM |
|------------------|--|-----------------------------------|--------------------------|-------------------------------|
| 1                | a. Tri Ethoxy butane   | • 100                             | • -                      | • 100                         |
|                  | b. Ethyl Lactate/Methyl Lactate/Isopropyl Lactate  | • 50                              | • 50                     | • 100                         |
|                  | c. Cellulose   | • 3                               | • 750                    | • 753                         |
| 2                | a. Various chemical products (36 Nos.) to be manufactured on regular basis   | -                                 | • 13878.35               | • 13878.35                    |
|                  | b. Various chemical products (69 Nos.) to be manufactured on Campaign basis to manufacture only six products at a time | -                                 | • 130                    | • 130                         |
|                  | c. R&D products  | -                                 | • 5                      | • 5                           |
| Total production |  |                                   |                          | 14966.35 TPM                  |
| 2                | Power plant  |                                   | 16 MW (2 x 8MW)          | 16 MW (2 x 8MW)               |

## 1.3 MANUFACTURING PROCESS

Manufacture of organic solvents/chemicals are produced by chemical reactions of organic materials. Basic organic chemicals are substituted for aliphatic and aromatics compounds of various functional groups such as halogens, esters, amines, nitro, Sulphur, and carbonyl compounds etc. These organic chemicals are used as basic ingredients to downstream synthetic organic chemicals.

The main raw materials for the manufacture are alcohol, organic chemicals. Alcohol is sourced from GBL and other raw materials are either procured from Indian market or imported. Coal will be used as fuel in the Boilers.

As an example of process of chemical plant, the block diagram for the manufacture of Acetaldehyde is presented in Figure 1.0

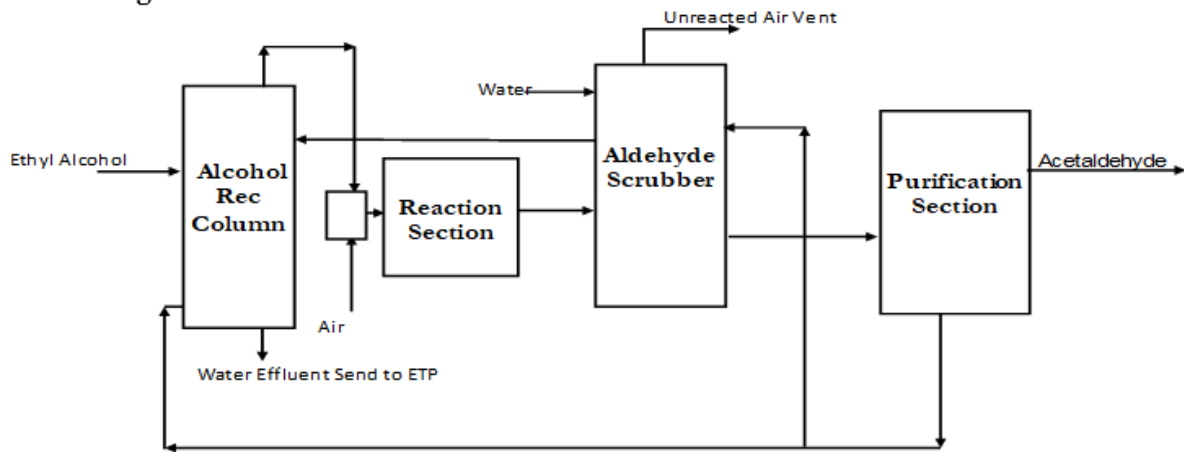


Figure 1.0 Acetaldehyde manufacturing process flow chart

Captive power will be generated by the utilization of excess steam from the proposed boiler and turbine of capacity 2 x 8 MW.

The total power requirement for the chemical complex is 8.7 MW and the balance 7.3 MW is required for the operation of utilities. The process flow diagram of captive power plant is in Figure. 2.0.

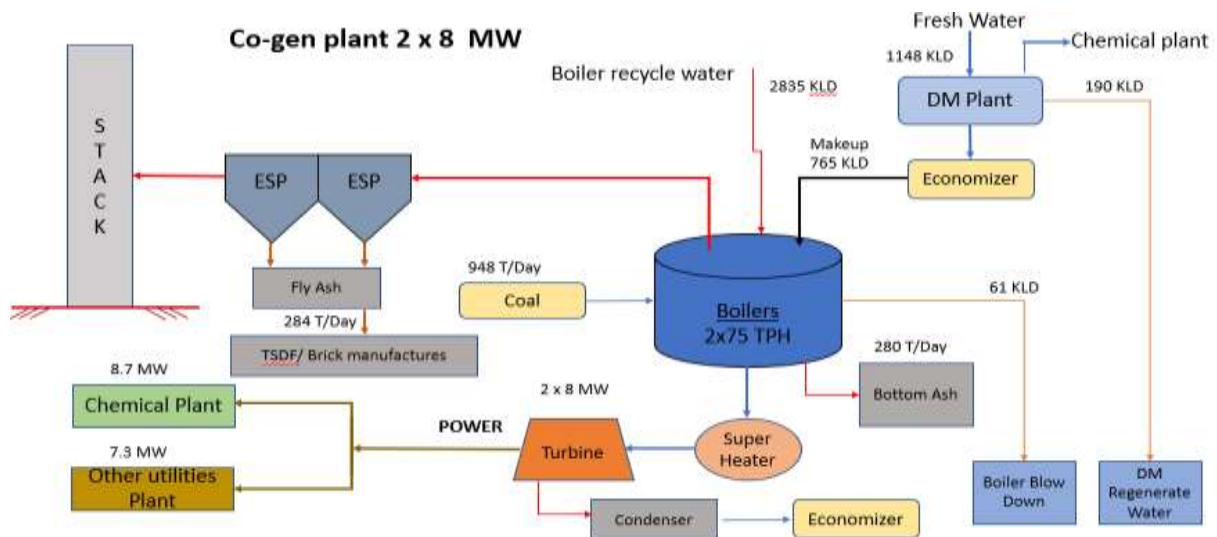


Figure 2.0 Co-gen power process flow chart

## **1.4 RESOURCE REQUIREMENT**

### **1.4.1 Water requirement and source**

Fresh water requirement to the industry will be met from Ghataprabha River. Government of Karnataka has accorded permission to draw water from Jack well situated at Dhavaleshwar across Ghataprabha river. The total fresh water requirement for the proposed project will be 4497 KLD. The permission is for drawing 7579.60 m<sup>3</sup>/day water for existing sugar, co-gen, distillery complex, and proposed chemical complex will be adequate to meet the water requirement of the activity together with the recycle of the treated effluent. Water balance flow chart is shown in Figure 3.0 and Industrial effluent treatment system is shown in Figure 4.0.

The details of the Fresh, recycled water requirement and wastewater generation, loss details and treatment methods are presented in Table 2.0;

Table 2.0: Total water requirement and wastewater generation details

| Purpose         | Input KLD   |                | Output KLD |          | Treatment methods   |
|-----------------|-------------|----------------|------------|----------|---|
|                 | Fresh water | Recycled water | Loss       | Effluent |   |
| Process         | 1760        | 4287*          |            | 6047*    | <ul style="list-style-type: none"> <li>The industrial effluents will be treated in Primary treatment units, Solvent stripper, RO followed by MEE.</li> <li>Condensate of MEE and RO permeates will be reused in cooling tower makeup.</li> <li>ZLD concept will be followed.</li> <li>Domestic sewage will be treated in Sewage. *STP Sludge</li> </ul> |
| Washings        | 120         |                |            | 120      |   |
| Scrubber        | 80          |                |            | 80       |   |
| Boiler feed     | 765         |                | 704        | 61       |   |
| Cooling tower   | 1272        | 2454           | 3347       | 379      |   |
| DM Regeneration | 190         |                |            | 190      |   |
| R&D             | 10          |                |            | 10       |   |
| Domestic        | 300**       |                | 30*        | 270      |   |
| Gardening       |             | 270+173*       | 270+173*   |          | -   |
| Gross total     | 4497        | 7184           | 4524       | 7157     |   |
| Total           | 11681       |                | 11681      |          |   |

\* Includes water formed during reaction and water in raw material and excess 173 KLD will be recycled to gardening.

\*\* Includes residential

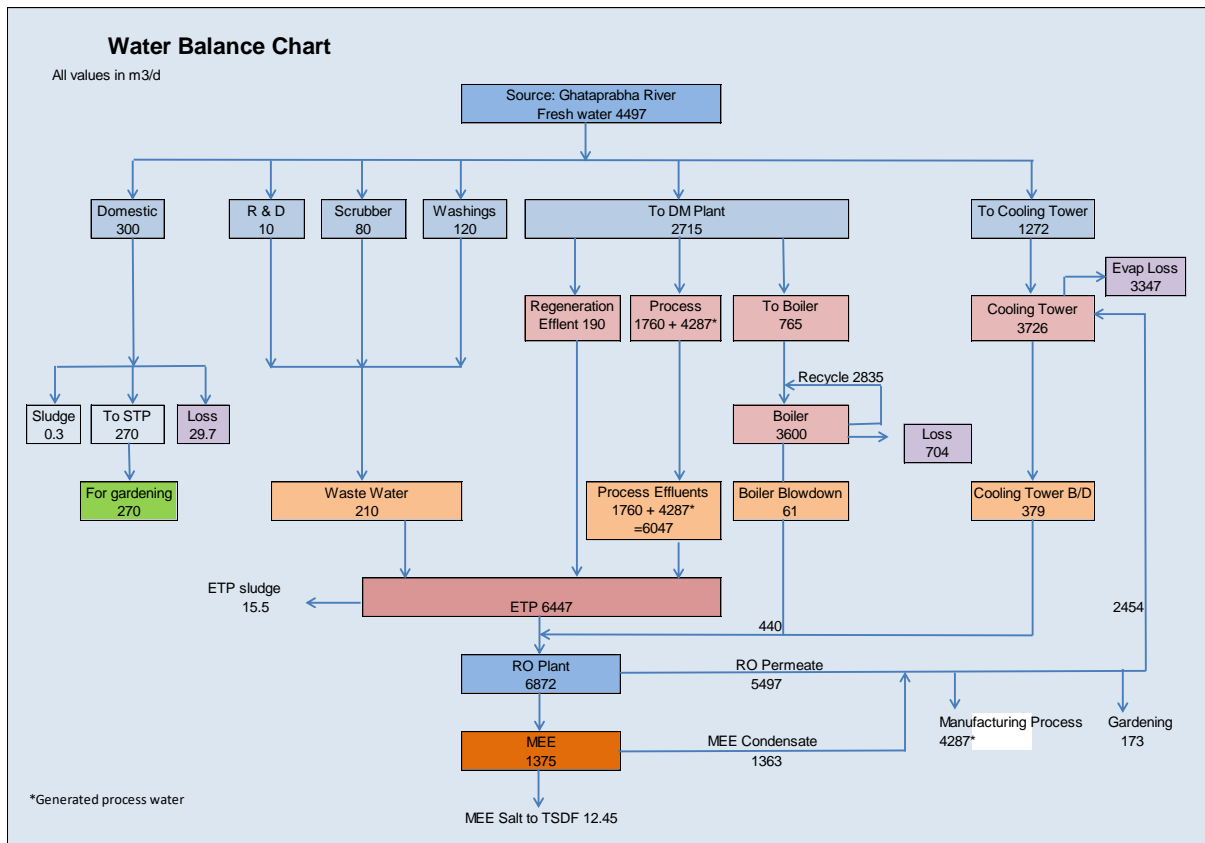


Figure 3.0 Water balance chart

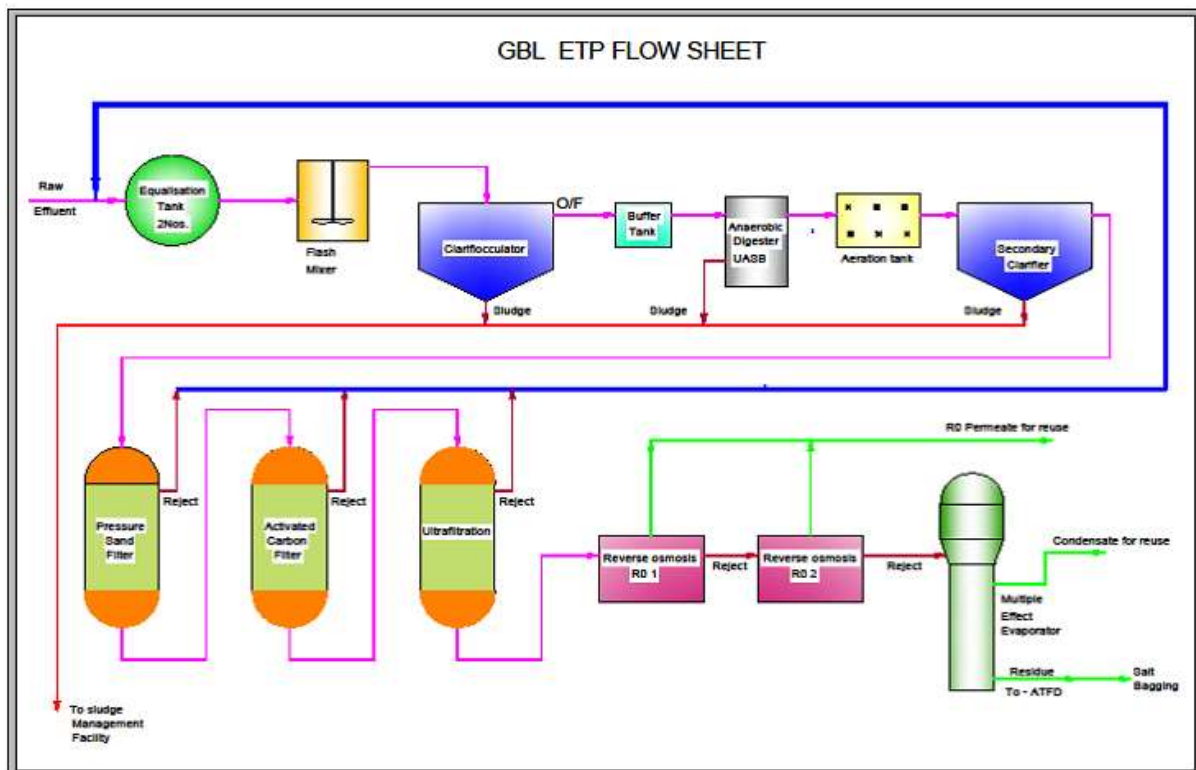


Figure 4.0 Industrial effluent treatment system

### 1.4.2 Air pollution control measures

The proposed Air pollution sources and its control measures are given in Table 3.0

Table 3.0: Proposed Air pollution sources and its control measures

| Stack attached to   | Fuel used | Stack/s height        | Air pollution control unit         |
|---|-----------|-----------------------|------------------------------------|
| Process Section   | -         | 5 m ARL               | Two stage scrubbers                |
| Boilers<br>2 x 75 TPH   | Coal      | 68 m individual stack | Electro static precipitators (ESP) |
| Thermic Fluid Heater<br>2 x 2 lakh kCal/ h<br>1 x10 lakh kCal/h | HSD       | 30 m                  | Stack                              |
| DG sets 1500 kVA x 6  | HSD       | 30 m                  | Stack                              |

### 1.4.4 Employment

The total number of employee's requirement to the chemical complex will be 549 Nos.

### 1.4.5 Project Cost and environment management cost

Total Project cost is Rs. 350 Crores. Capital and recurring cost towards the environmental management program is given in Table 4.0.

Table 4.0: Capital and recurring cost towards the environmental management program

| Sl. No.      | Activity  | Total           |                     |
|--------------|---|-----------------|---------------------|
|              |   | Capital (Lakhs) | Recurring (Lakhs/A) |
| 1            | Air Pollution Control System                        | 437.5           | 26.25               |
| 2            | Water pollution control systems                     | 1400            | 175                 |
| 3            | Noise pollution control                             | 17.5            | 1.75                |
| 4            | Green Belt Development/Maintenances                 | 43.75           | 8.75                |
| 5            | Environmental monitoring / Environmental Management | 70              | 14                  |
| 6            | Occupational health & safety                        | 87.5            | 26.25               |
| 7            | Solid Waste Management                              | 35              | 350                 |
| 8            | Energy Conservation Measures                        | 87.5            | -                   |
| <b>Total</b> |   | <b>2178.75</b>  | <b>605</b>          |



## CHAPTER 2

### DESCRIPTION OF ENVIRONMENT

#### 2.1 STUDY AREA

To study the environmental status in the factory area and surrounding, an area of 10 km radius from the project site is considered as study area as per the ToR issued by MoEF & CC.

#### 2.2 CLIMATE

The climate of the region is semi-arid. The maximum temperature during the year ranges from 21° C to 39° C. The humidity in the region varies from 25% to 73%. The annual rainfall in the district is 495 mm.

#### 2.3 ENVIRONMENTAL STATUS STUDY, PERIOD OF BASELINE MONITORING

The base line environmental status was monitored during November 2018, December 2018, and January 2019 with respect to quality of ambient air quality, water quality (surface and ground), soil quality, ambient noise level.

##### 2.3.1 Baseline Monitoring location

The details of the sample locations studied and analysed for environmental characteristics are as given in below Table 5.0.

Table 5.0: Monitoring locations

| Air quality monitoring station, distance, and direction from the project site | Noise level monitoring station, distance, and direction from the project site | Soil quality monitoring station, distance, and direction from the project site | Ground water monitoring station, distance, and direction from the project site | Surface water monitoring station, distance, and direction from the project site    |
|---|---|--|--|--|
| Project Site,   | Project Site  | Project Site   | Project Site   | Upstream and downstream of Ghataprabha River canal located at Dhavaleshwar, 4.5 km |
| Hallur Village, 5.3 km (SW)   | Hallur Village 5.3 km (SW)  | Hallur Village 5.3 km (SW)   | Handigund Borewell, 3.0 km (N)   |  |
| Sultanpur Village, 5.1 km (NW)  | Sultanpur Village 5.1 km (NW)   | Sultanpur Village, 5.1 km (NW)   | Bisnal village, 2.1 km (SE)  |  |
| Kesarkoppa Village, 3.2 km (E)  | Kesarkoppa Village 3.2 km (E)   | Kesarakoppa Village, 3.2 km (E)  | Koppalguddi Govt. school, 3.2 km (NW)  |  |
| Handigund village, 3.0 km (N)   | Handigund, 3.0 km (N)   | Handigunda, 3.0 km (N)   | Hallur Village, 5.3 km (SW)  |  |

|   |   |   |                                  |
|---|---|---|----------------------------------|
| Kappalguddi govt school 3.2 km (NW)     | Kappalguddi govt school                 | Kappalguddi govt school, 3.2 km (NW)    | Sultanpur Village, 5.1 km (NW)   |
| Bisnal village (KIAAR farm) 2.1 km (SE) | Bisnal village (KIAAR farm) 2.1 km (SE) | Bisnal village (KIAAR farm) 2.1 km (SE) | Kesarkoppa Village, 3.2 km (E)   |
| Madabhavi govt school, 3.5 km (S)       | Madabhavi govt. school, 3.5 km (S)      | Madabhavi Govt school, 3.5 km (S)       | Madabhavi Village, 3.5 km (S)    |
| -                                       |   |   | Kappalguddi village, 3.5 km (NW) |

### 2.3.2 Land use

Six different land use/land cover classes have been identified in the study area. Table 6.0 shows the information about the extent of land use/land cover classes thus derived from the satellite image in the study area.

Table 6.0 Study area land use/land cover classes

| Sl. No. | Land use Land cover classes          | Area (ha) | Are (%) |
|---------|--------------------------------------|-----------|---------|
| 1       | Forest Plantation                    | 71.10     | 0.23    |
| 2       | Tree Outside Forest                  | 69.48     | 0.22    |
| 3       | Agriculture / Agriculture Plantation | 23,378.76 | 74.59   |
| 4       | Agriculture Fallow                   | 4,048.02  | 12.92   |
| 5       | Built up                             | 3,493.98  | 11.15   |
| 6       | Water body                           | 279.81    | 0.89    |

### 2.3.3 Air Environment

Baseline ambient air quality is monitored for the criteria pollutants Viz., PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub> and VOC, NH<sub>3</sub>, CO, Ozone and Pb. Ambient air quality is compared with NAAQ standards Notified in EP Rules 1086. Ambient air quality status of the study area is given in Table 7.0

Table 7.0: Ambient air quality status of the study area

| Sl. No. | Parameter         | Unit              | Min   | Max   | 98 <sup>th</sup> percentile | AAQ Std |
|---------|-------------------|-------------------|-------|-------|-----------------------------|---------|
| 1       | PM <sub>10</sub>  | µg/m <sup>3</sup> | 39.86 | 73.18 | 70.06                       | 100     |
| 2       | PM <sub>2.5</sub> | µg/m <sup>3</sup> | 19.46 | 33.41 | 31.77                       | 60      |
| 3       | SO <sub>2</sub>   | µg/m <sup>3</sup> | 4.18  | 11.42 | 10.94                       | 80      |
| 5       | NO <sub>2</sub>   | µg/m <sup>3</sup> | 9.14  | 13.58 | 13.38                       | 80      |
| 6       | VOC               | µg/m <sup>3</sup> | BDL   |       | BDL                         | -       |
| 7       | NH <sub>3</sub>   | µg/m <sup>3</sup> | BDL   |       | BDL                         | 400     |
| 8       | CO                | mg/m <sup>3</sup> | BDL   |       | BDL                         | 2       |
| 9       | Ozone             | µg/m <sup>3</sup> | BDL   |       | BDL                         | 180     |
| 10      | Pb                | µg/m <sup>3</sup> | BDL   |       | BDL                         | 1       |

It can be observed that at all the locations were found to be well within NAAQ standards.

### 2.3.4 Noise Environment

Ambient noise levels are monitored during day & night. The maximum and minimum values in the study area are in Table 8.0:

Table 8.0: Noise level in the study area

| Location       | Maximum Noise level in dB(A)Leq      | Limits as per Env. Protection Rules, 1986 in dB(A)Leq | Remarks                 |
|----------------|--------------------------------------|---|-------------------------|
| Project site   | 65.7 - day time<br>52.3 - night time | 75 - Day time<br>70 Night time                        | Industrial area limits  |
| Other location | 53.1 - day time<br>47.9 - night time | 55 - Day time<br>45 - Night time                      | Residential area limits |

The maximum noise level except Bisnal village, KIAAR Farm (during night time) all the locations are within the limits stipulated in the Environmental (protection) Rules 1986 and the Noise Rules 2000 for industrial and residential area.

### 2.3.5 Water environment

The quality of groundwater (09 sources) and surface water (01 sources) are analysed at different locations within 10 km radius from the project site and surface water samples are upstream and downstream Ghataprabha River canal located at Dhavaleshwar were analysed.

It was observed that

- 1) All the parameters of the groundwater samples analyzed are meeting maximum permissible limits in the absence of alternate source as per IS: 10500-2012 standards.
- 2) It is observed that, surface water quality falls Class C/D standards as per the classification of CPCB for "Water Quality Criteria for best use practice".

### 2.3.6 Hydro-Geology

The area is part of Krishna River basin and is drained by Ghataprabha River. All the streams in the study area exhibit sub dendritic drainage pattern. Two first order streams originate on Northern part of the industry flows in Easterly direction for about 1.5 kms then flows Southerly and joins another second order stream at Bisnal village to form third order stream which joins Ghataprabha River at Aralimatti village. Two more first order streams originate in Western part of this Industry, flows in southerly direction to form third order stream which joins fourth order stream at Khanhatti village. This stream joins Ghataprabha River after flowing for about 4 kms. One more first order stream originates in southern part of the

Industry, which flows in Southerly direction adjacent to the villages Saidapur and Madabhavi and joins Ghataprabha River.

Deep-seated aquifers are tapped by bore wells in this area. The depth of these bore wells ranges from 150 m to more than 300 m bgl. These bore wells are utilized either for domestic purpose or ground water irrigation for growing Sugarcane, turmeric, and other crops.

The entire industrial area as well as surrounding areas of Industry is covered by Basaltic rock formation.

### 2.3.7 Soil quality

Black soil found in the study area. It is having high humus and low phosphate content, with alkaline pH-value and very low infiltration characteristic. Summary of analytical results are presented below:

- The pH of the soil samples ranged from 6.82 - 7.83 i.e. Neutral to moderately alkaline.
- Nitrogen content ranged from 221.2 to 298.2 kg/ha i.e. better.
- Phosphorous from 88.3 to 98.61 kg/ha i.e. more than sufficient.
- Potassium content ranges from 286 to 328 kg/ha i.e. average.
- Conductivity ranges from 0.298 to 0.614 mS/cm i.e., non-saline

Soil is suitable for agriculture.

### 2.3.8 Socio-economics

GBL has positive impact on the socio-economic conditions of the people in the study area i.e., growth of industrial sectors and infrastructure development in and around the agricultural area i.e. villages and semi-urban settings and towns is bound to create certain socio-economic impacts on the local populace.

Proposed products are intended to be marketed at 40 % by Export & 60 % for Domestic market to meet the demand supply gap both in domestic and international market.

The total number of employment both direct and indirect for the proposed project will 549 Nos. Indirect job opportunities like raw material suppliers, transportation, and security system. Thereby local infrastructure facility will be improved. Development of social facilities like, temple, educational facilities to the local etc.,

### 2.3.9 Ecology and Biodiversity

Study area is predominantly agriculture and the open land is with grass and shrubs. The vegetation and fauna in the study area is not affected by the operation of this industry. The impact on the environment is controlled as all the pollution mitigation measures have been taken by the industry. It is also open to improve the environmental conditions by proactive participation with the local people around the industry.

It is observed during the study that there is one tree species, *Santalum album*, which is falling under the Vulnerable (VU) category according to the IUCN conservation criteria. This species needs to be conserved in the vicinity and surrounding areas of the industry. This can be achieved through propagation of the species and reintroduced into the surrounding areas. The species found during the visit are presented in the Chapter 3 Environmental Shock Study report.

### CHAPTER 3

## ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Sources of environmental impact due to the construction and operation industry and mitigation measures are in Table 9.0 and 10.0;

Table 9.0: Environmental Impacts and mitigation measures during construction phase:

| Sl. No. | Activity  | Impact on  | Duration   | Mitigation measure   | Significance       |
|---------|---|--|------------|--|--------------------|
| 1       | <ul style="list-style-type: none"> <li>• Civil work like levelling, excavation, construction, erecting etc.</li> <li>• Use of earth moving equipment for civil work and other vehicles for transporting construction material could result is emissions to environment</li> <li>• Gas cutting and welding jobs - the release of gaseous pollutants have the potential to have higher concentrations in work site</li> </ul> | Ambient air quality - generation of airborne particles | Short term | <ul style="list-style-type: none"> <li>• Water sprinkling to suppress the dust generated during excavation, levelling and other operations.</li> <li>• Use of properly well-maintained construction machinery &amp; vehicles.</li> <li>• Construction materials to be stored in a barricaded area and covered to avoid dust-getting air borne.</li> <li>• Roads will be sprinkled with water to avoid fugitive dust due to vehicle movement</li> <li>• Earth moving equipment and transport vehicles with emission test report indicating normal values will be deployed.</li> <li>• The vendors transporting the material will be communicated for deploying vehicles with normal emission reports, while issuing the work order</li> <li>• Barricades will be provided all sides of the project site</li> <li>• The welding and cutting jobs will be carried out with adequate ventilation/exhaust arrangement.</li> </ul> | Low and reversible |

|   |   |                      |             |   |                      |
|---|---|----------------------|-------------|---|----------------------|
| 2 | <ul style="list-style-type: none"> <li>• Use of earth moving equipment for civil work could result in some noise.</li> <li>• Vehicular movements carrying construction materials<br/>Some intermittent noise is expected during erection of reactors.</li> <li>• Construction debris and storage of M sand etc.</li> </ul>  | Noise level          | Short terms | <ul style="list-style-type: none"> <li>• There is no significant impact on the noise environment as the impact it is restricted at work zone only as project site will be covered with barricades and the impact is reversible</li> <li>• In order to avoid the adverse impact on the workers, the personnel will be provided with suitable PPE.</li> <li>• Civil works will be carried out only day time and vehicular movement will be monitored and regulated</li> </ul>   | Low and reversible   |
| 3 | <ul style="list-style-type: none"> <li>• Water will be required for domestic purpose for the workers deployed for erection activities and is anticipated to generate wastewater</li> </ul>  | Ground Water quality | Short term  | <ul style="list-style-type: none"> <li>• Domestic sewage will be treated in existing sugar plant STP.</li> <li>• Implementation of suitable disposal methods of construction debris at designated places to avoid water logging at construction site.</li> </ul>  | Low and reversible   |
| 4 | <ul style="list-style-type: none"> <li>• Conversion of land use pattern for industrial use</li> <li>• Disposal of excavated soil and debris may result in water logging and loss of fertile topsoil</li> <li>• Runoff during rainy season&amp; wind carrying fugitive dust</li> <li>• Spillage of oil and grease</li> </ul> | Land quality         | Long term   | <ul style="list-style-type: none"> <li>• Adoption of soil conservation by proper management viz., the excavated earth shall be collected and used for refilling in foundation, levelling, plinth, landscaping and excess disposed to land filling in low laying areas and road construction.</li> <li>• Separating of top soil and used for gardening.</li> <li>• Spillage to be collected and immediately and disposed scientifically.</li> <li>• Entry of rain water to work zone will be controlled by constructing drainage system.</li> <li>• Boiler ash will be collected and sold to brick manufacturers or to TSDF</li> </ul> | Low and Irreversible |

|   |                       |                          |            |  |                    |
|---|-----------------------|--------------------------|------------|--|--------------------|
| 5 | From above activities | Socio economic           | Short term | <ul style="list-style-type: none"><li>• Employment opportunities for skilled and unskilled manpower</li></ul>                      | Low and Beneficial |
| 6 | Building Construction | Ecology and Biodiversity | No impact  | <ul style="list-style-type: none"><li>• As project site is vacant land, there will be no impact on ecology and diversity</li></ul> | -                  |



Table 10.0: Environmental Impacts and mitigation measures during operation phase:

| Sl. No. | Environmental components | Source of impact  | Predicted impacts   | Mitigation measures  | Remarks                                   |
|---------|--------------------------|---|---|--|---|
| 1       | Air quality              | <ul style="list-style-type: none"> <li>Process Reactors</li> <li>Solvent storage yard</li> <li>Boilers</li> <li>DG sets</li> <li>Thermic Fluid Heaters</li> <li>Vehicular movement</li> <li>ETP/STP area</li> </ul> | <ul style="list-style-type: none"> <li>Effect on air quality</li> <li>Acid mist, VOCs &amp; odour generation from process section</li> <li>Fugitive emission from solvents storages area</li> <li>Emissions from utility services like Particulate matters, SO<sub>2</sub>, NO<sub>x</sub></li> <li>Emission CO and SO<sub>2</sub> due to vehicular movements</li> <li>Odour generation from effluent treatment facility</li> </ul> | <ul style="list-style-type: none"> <li>Manufacturing activity is in closed loop</li> <li>Double stage scrubber will be provided to control and treat process emissions.</li> <li>The treated gases and fumes will be let out through stacks of 5m ARL height for dispersion of pollutants.</li> <li>VOC detectors will be provided.</li> <li>VOC monitoring will be carried out at work zone on regular basis.</li> <li>Solvents will be transferred in automatic pumping system and gaskets will be replaced to avoid leakages.</li> <li>The emissions from Boilers are controlled by providing ESP as APC equipment and individual stack 68 m height will be provided.</li> <li>DG sets &amp; TFH emissions will be let out through stacks of 30 m height.</li> <li>HSD with low Sulphur content will be used as fuel for TFH and DG sets.</li> <li>Waste water to be taken for treatment within six hours.</li> <li>Regular maintenance of vehicles and regular cleaning and watering of internal roads and movement of vehicles will be restricted.</li> <li>Fragrant flowering trees or shrubs will be planted near odour generating areas like near ETP, STP and Hazardous waste storage area etc.,</li> </ul> | Low adverse impact (localized in nature). |

|   |               |   |   |  |  |
|---|---------------|---|---|--|--|
| 2 | Noise         | <ul style="list-style-type: none"> <li>Noise from operation of Machineries, motor pumps, compressors</li> <li>Operation of Boilers, DG sets, THF, Hydrogen and Nitrogen generator.</li> <li>Vehicular movement</li> <li>Process section</li> <li>Transportation of raw materials and finished products</li> <li>Operation of utilities</li> </ul> | <ul style="list-style-type: none"> <li>Increase in Noise level</li> </ul>   | <ul style="list-style-type: none"> <li>As Process, operation will be in closed system, noise generation will be limited to work zone only. Operators will be provided with ear plugs.</li> <li>Motor pumps, compressors will be provided with acoustic enclosures.</li> <li>Other Machineries and conveying system will be maintained by following routine and periodic maintenance to reduce noise generation.</li> <li>Use of PPE (earplugs)/ear muffs will be mandatory in high noise area.</li> <li>DG sets &amp; THF are with pre-built acoustic enclosures.</li> <li>Speed limit inside plant will be restricted and transportation will be done only during peak hours.</li> <li>Green belt at the project site boundary will further act as noise barrier and help in attenuation of noise.</li> </ul> | Low adverse impact (localized in nature) |
| 3 | Water quality | <ul style="list-style-type: none"> <li>Discharge of domestic sewage from canteen and toilets.</li> <li>Discharge of process effluents.</li> <li>Leachate from raw material &amp; finished products storage and hazardous waste</li> </ul>   | <ul style="list-style-type: none"> <li>Water Pollution - effect on the surface and ground water quality.</li> </ul> | <ul style="list-style-type: none"> <li>Domestic sewage will be treated in Sewage Treatment Plant to the standards stipulated and used for gardening</li> <li>The effluent generated from the industry will be treated in Primary treatment units, Solvent stripper, RO and followed by MEE and condensate of MEE and RO permeates will be reused for cooling tower makeup.</li> <li>ZLD concept will be followed.</li> <li>Raw materials and finished products will be stored in dedicated storage area/tank farm.</li> <li>Impervious surface will be provided for storage of hazardous waste as per the</li> </ul>   | Low adverse impact (localized in nature) |

|   |                |  |   |  |                                       |
|---|----------------|--|---|--|---------------------------------------|
|   |                |  |   | requirement and will not be hold it for more than 03 months.   |                                       |
| 4 | Land           | <ul style="list-style-type: none"> <li>• Discharge of wastewater</li> <li>• Spillage of chemicals/ solvents</li> <li>• Spillage/ disposal of hazardous waste.</li> </ul> | <ul style="list-style-type: none"> <li>• Land Contamination</li> </ul>    | <ul style="list-style-type: none"> <li>• The treated wastewater will be re-used for cooling tower makeup.</li> <li>• The domestic solid wastes are segregated at source, collected in bins, will be handed over to local municipality.</li> <li>• Impervious surface will be provided for storage of hazardous waste in scientific manner and will not be hold it for more than 03 months. Disposed through authorized vendors.</li> </ul>                             | No significant impact                 |
| 5 | Socio-economic | <ul style="list-style-type: none"> <li>• Employment of local people</li> <li>• Cultural impact</li> </ul>  | <ul style="list-style-type: none"> <li>• Socio Economic impact</li> </ul> | <ul style="list-style-type: none"> <li>• Locally available manpower will be utilized to the maximum possible extent based on qualification.</li> <li>• Indirect job opportunities like raw material suppliers, transportation, and security system.</li> <li>• Local infrastructure facility will be improved</li> <li>• Revenue to the State exchequer</li> <li>• Development of social facilities like, temple, educational facilities to the local etc.,</li> </ul> | Strongly beneficial (positive) impact |

## CHAPTER 4

### ENVIRONMENTAL MONITORING PROGRAMME

#### 4.1 ENVIRONMENTAL CELL

An Environmental Cell will be established in the chemical complex to implement and monitor environmental policy and program.

#### 4.2 ENVIRONMENTAL MONITORING SCHEDULE

Ambient air, stacks emissions, ambient noise level, water and wastewater are monitored on regular basis. Monitoring of all environmental attributes will be done as per the clearances and consents issued by the regulatory agencies viz., MoEF & CC/ SPCB. Environmental Attributes, Frequency and Parameters is given in Table 11.0.

Table 11.0: Environmental Attributes, Frequency and Parameters

| Sl. No.                  | Particulars   | Monitoring frequency                           | Duration of monitoring                      | Important parameters for monitoring  |
|--------------------------|---|--|---|--|
| <b>Air environment</b>   |   |  |   |  |
| 1                        | Ambient Air quality at Project premises at downwind and up wind direction | Once in a month.                               | 48 hours- consecutive days, once in a month | PM <sub>10</sub> , PM <sub>2.5</sub> , NO <sub>2</sub> , SO <sub>2</sub> , CO, NH <sub>3</sub> |
| 2                        | Stack monitoring<br>a. Boilers, Thermic Fluid Heater and DG sets stack    | Once in a month                                | KSPCB standards                             | Particulate Matters, SO <sub>2</sub>   |
| <b>Noise environment</b> |   |  |   |  |
| 1                        | At the boundary of the factory.   | Once in six months                             | Day and Night                               | Noise level in dB (A) Leq.   |
| <b>Water environment</b> |   |  |   |  |
| 1                        | Raw effluent  | Once a week                                    | Grab  | pH, TSS, TDS, COD, BOD, potash, chloride, and Phosphate  |
| 2                        | All intermediate stages of ETP  | Once a week                                    | Grab  | pH, TSS and COD  |
|                          |   | Min once a day                                 | Grab  | pH, TSS and COD  |
| 3                        | Treated effluent  | Once a week                                    | Grab  | pH, TSS, TDS, COD, BOD, potash, chloride, and Phosphate  |
|                          |   | Min once a day                                 | Grab  | As per KSPCB consent   |
| 4                        | Ground Water within industry site   | Twice - once before and once after the monsoon | Grab  | pH, TDS, Nitrate and Phosphate, Ca, and Mg.  |
| 5                        | Surface water sources   | Twice a year, before and after monsoon.        | Grab  | pH, DO, EC, TSS, TDS, Chlorides  |
| <b>Soil environment</b>  |   |  |   |  |
| 1                        | Within project premises   | Once in a year                                 | Composite sample                            | EC, Organic carbon, pH, available NPK  |

Budgeted cost for environmental monitoring is Rs. 14.0 Lakhs per annum

## CHAPTER 5

### ADDITIONAL STUDIES

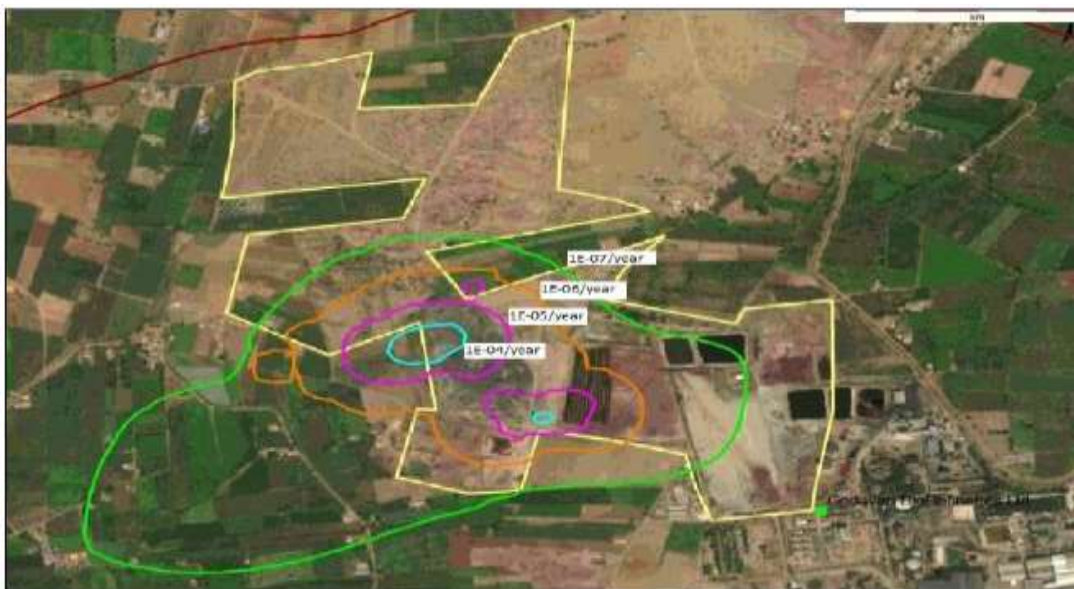
#### 5.1 PUBLIC HEARING AND CONSULTATION

M/s. Godavari Biorefineries Limited with the help of KSPCB will conduct public consultation and the proceedings of the same will be included in the Final EIA report duly incorporating the action plan for the issues raised during the public hearing.

#### 5.2 RISK ASSESSMENT

Integrated Risk Assessment for proposed chemical complex is carried out through DEKRA India Pvt. Ltd., Studies indicate that the flammable raw materials are at medium risk. Report discuss about preventive and mitigative measures for risk due to storage of chemicals and solvents and during the operation. The Risk assessment report covers the following aspects

1. Identification of process hazards associated with the facility
2. Determining the consequence of Hydrocarbon release from process piping and equipment
3. Determining the failure frequencies of equipment
4. Quantifying risk to people and present it in terms of Iso Risk, Counters, F-N Curves
5. Identifying major risk contributors for individual & group risk
6. Identifying reduction options appropriate for the phase of the development to demonstrate that risks are being managed to a level which is As Low As Reasonable Practicable (ALARP)



LSIR Contour for Godavari Biorefinery Sameerwadi Facility

With respect to above LSIR Contour map, none of the chemical units in GBL, Sameerwadi facility fall under unacceptable risk region. All the process units, storage areas & other processing facilities are coming under acceptable risk zone as per UK HSE Risk Acceptance criteria.

#### **Risk mitigation measures**

- Ensure detailed HSE Plan & HSE Philosophy to be developed during engineering & construction phase of the project and its implementation on site.
- In order to prevent secondary incident arising from any failure scenario, it is recommended that sprinklers and other firefighting & protective devices provided are regularly checked to ensure these are functional.
- Ensure that fire & gas (flammable & toxic) detectors are provided at required locations i.e. wherever there is a presence of flammable & toxic materials in facility, in order to immediately act upon detection of any leak's gases or fire. Also, ensure that isolation philosophy is developed for Sameerwadi facility.
- Ensure that Hazardous Area Classification study has been carried out in order to ensure that all the electrical equipment & instruments are classified according to classified zone.
- Ensure enough escape routes from the site are available to allow redundancy in escape from all areas. Also, ensure that escape route layouts are displayed at the entry of each plant.

#### **5.3 ON-SITE & OFF-SITE EMERGENCY PLAN**

Onsite and Offsite emergency plan will be prepared before commissioning of the facility. Mock drills will be carried out periodically for the safety aspects.

#### **5.4 OCCUPATIONAL HEALTH AND SAFETY OF THE EMPLOYEES**

Annual health check-up will be conducted for all employees and reports will be maintained for any future use. Industry ensures that employees working in safe condition and EHS team will be ensuring that usage of right PPEs by the working during operation.

## **CHAPTER 6**

### **PROJECT BENEFITS**

Any project coming up in an area will bring in improvements in physical infrastructure, social infrastructure, employments for the skilled and unskilled people besides other tangible benefits.

#### **6.1 IMPROVEMENTS IN THE PHYSICAL AND SOCIAL INFRASTRUCTURE**

The proposed project site is located within the premises of well-established Sugar, Distillery and Co-gen complex and hence, required infrastructure facilities are like vacant land, transportation, road, electricity and water source and manpower are readily available. These will support the proposed project on great extent.

The existence of GBL (existing Sugar, Distiller and Co-gen complex unit) and the development of the adjacent villages together has benefitted the local population to enhance the standard of living by enhancing the social culture, basic amenities like road, water supply to the villages around, educational facilities, health care institutions both government and private.

As a part of Corporate Environment Responsibility (CER) management has planned further development of physical and social infrastructure to the nearby villages. There will be improvement in market availability of proposed products.

#### **6.2 TANGIBLE BENEFITS**

There will be an overall socio-economic development in the area around the project. Apart from these benefits, the proposed project will also generate revenue to the Central & State Government in the form of GST. By this, the proposed chemical complex at Sameerwadi will help in overall positive development in the area. The project will contribute additional revenue to the State and Central exchequer

#### **6.3 CORPORATE ENVIRONMENT RESPONSIBILITY (CER)**

The Company GBL has been undertaking and implementing CSR activities by promoting various social, cultural, and philanthropic activities. Activities proposed under CER is given in Table 12.0.

Table 12.0: Budget and activities proposed under CER

| Sl. No. | Activity under CER   |
|---------|--|
| 1.      | Providing solar street light to nearby villages namely Madabhvi, Kappalaguddi, Handigund, kesargoppa, sanganatti, Dhawaleshwar, Bisnal.  |
| 2.      | Electrification of local community villages namely Handigund, Kappalaguddi, Munnyal, Akkimaradi, Saidapur, Nandgaon, Aralimatti, Mugalkhod (MDL).  |
| 3.      | Plantation in community area villages namely Chimmad, Hosur, Kalathippi, Golabhanvi, Sultanpur, Palabhanvi, Marakudi, Saidapur, Bisanal, Kesaragoppa, Sanganatti, Nagaral, Awaradi, Dhawaleshwar (GKK), Mugalkhod (MDL)  |
| 4.      | Skill development & Training in schools' village namely Kappalaguddi, Hallur, Marapur, Bisanal, Handigund, Saidapur, Sanganatti.   |
| 5.      | Providing drinking water facility at village namely Kappalaguddi, Hallur, Munnyal, Shivapur, Marapur, Bisanal, Handigund, Marakudi, Saidapur, Sanganatti.  |
| 6.      | Environmental education in schools under awareness program of KSPCB. village namely Kappalaguddi, Hallur, Marapur, Bisanal, Handigund, Saidapur, Sanganatti, Sameerwadi.   |
| 7.      | Medical & Health Facilities in nearby villages namely Munnyal, Handigund, Hallur, Bisanal, Sameerwadi, Saidapur, Marakudi, Sultanpur, Khannti, Shivapur, Kappalaguddi. Madabhanvi, Marapur, Awaradi, Yaragudri, Belagali, Akkimaradi, Nandagaon, Dhawaleshwar, Budni PD, Kesaragoppa, Sanganatti, Nagaral, Mugalkhod (MDL) |



## **CHAPTER 7**

### **ENVIRONMENT MANAGEMENT PLAN**

#### **7.1 SOCIO ECONOMIC ENVIRONMENT**

GBL has positive impact on the socio-economic conditions of the people in the study area.

#### **7.2 GREENBELT MANAGEMENT PLAN**

In line with ToR conditions, 1500 tree are required to be planted per hectare for greening of the industrial land. Total land area is 525.4 acres (212.62 hectares), 33 % i.e. 173 acres is to be earmarked for greening. About 126 acres of green area is developed in the existing Sugar, Distillery, Co-gen and chemical unit by planting various species like Teak, Neem, Gul mohar, Mango etc., and remaining 52.8 Acres of land is earmarked for greenbelt development within the proposed chemical complex. Overall, 34 % of greenbelt will be developed and maintained by GBL.

#### **7.3 RAINWATER HARVESTING**

The existing site has rainwater harvesting potential of 1,25,000 m<sup>3</sup> capacity from Sugar, Distillery units. The quantity of rainwater that can be harvested from proposed chemical complex will be 1816 m<sup>3</sup>/day. Storage tanks will be provided for storing rainwater collected from rooftop. After primary treatment, collected rainwater will be used for green development / horticulture / dust suppression / washing / cleaning purposes. It will be ensured that, rain water and storm water generation will not be mixed.

GBL believes in the concept of sustainable development and is committed to continue operations without giving room for any adverse impacts on the environment.

#### **6.5 SOCIO-ECONOMIC BENEFITS**

The construction phase provides employment opportunities for the local people. In addition to the opportunity of getting employment in construction work, the local population would also have employment opportunities in related activities like petty commercial establishments, small contracts, and supply of construction materials etc.,

The total number of employment both direct and indirect for the proposed project will 549 Nos. Indirect job opportunities like raw material suppliers, transportation, and security system. Thereby local infrastructure facility will be improved. Development of social facilities like, temple, educational facilities to the local etc.,

Baseline environmental survey was carried out to analyze the present status of environmental attributes. Baseline studies of ambient air quality, ground water, soil, Noise, biodiversity, and socio-economic environment indicate that there is no/marginal impact of existing industrial operation.

However, the beneficial impacts far outweigh any marginal impacts and are anticipated in terms of the employment opportunities during the operation of the existing sugar, distillery industry and society. Also, there will be economic growth at the regional level.

The industry will have Environmental Management Cell in its organization to monitor and implement programs to improve its environmental status from time to time and will adopt all such technological advances to reduce the impact due to its operation on the environment.