PRE-FEASIBILITY REPORT

FOR

Expansion of Molasses based Distillery
(60 KLPD to 180 KLPD)
and Co-generation Power Plant (2.0 MW to 8.0 MW)
within the Existing Plant Premises

AT
Village Jangraulipul,
Tehsil Pilibhit, District Pilibhit
(Uttar Pradesh)

APPLICANT
LH SUGAR FACTORIES LIMITED - DISTILLERY DIVISION
Regd. Office & Sugar Factory:
Civil Lines, Pilibhit, Uttar Pradesh - 262001
E-Mail: lhsugar@rediffmail.com, agm.dist@lhsugar.com
Phone No.: 05882-255867; Fax No.:05882-255518
PRE-FEASIBILITY REPORT

1.0 EXECUTIVE SUMMARY

(I) Introduction

LH Sugar Factories Limited - Distillery Division has its existing Molasses based Distillery of 60 KLPD and Co-generation power plant of 2.0 MW at Village Jangraulipul, Tehsil Pilibhit, District Pilibhit, Uttar Pradesh.

The Environmental Clearance for 60 KLPD Distillery Unit at the aforementioned location was obtained from the Ministry of Environment, Forest & Climate Change (MoEFCC), New Delhi vide letter no. J-11011/354/2013-IA-II dated 15th July, 2015.

The company is now proposing expansion of Molasses based Distillery (60 to 180 KLPD) and co-generation power plant (2 MW to 8 MW) within the existing plant premises.

As per EIA Notification dated 14th Sep., 2006 and as amended from time to time; the project falls in Category ‘A’, Project or Activity - 5(g) Distilleries and Category “B”, Project or Activity ‘1 (d)’ Thermal Power Plants.

Table – 1
Salient Features of the Project

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>PARTICULARS</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Nature &amp; Size of the Project</td>
<td>Expansion of Molasses based Distillery (60 KLPD to 180 KLPD) and Co-generation power plant (2 MW to 8 MW) within existing plant premises.</td>
</tr>
<tr>
<td>B.</td>
<td>Category of the Project</td>
<td>As per EIA Notification dated 14th Sep., 2006 and as amended from time to time; the project falls in Category ‘A’, Project or Activity - 5(g) Distilleries and Category “B”, Project or Activity ‘1 (d)’ Thermal Power Plants.</td>
</tr>
</tbody>
</table>

C. Location Details

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Village</td>
<td>Jangraulipul</td>
</tr>
<tr>
<td>Tehsil</td>
<td>Pilibhit</td>
</tr>
<tr>
<td>District</td>
<td>Pilibhit</td>
</tr>
<tr>
<td>State</td>
<td>Uttar Pradesh</td>
</tr>
<tr>
<td>Latitude</td>
<td>28°33’39.66”N to 28°33’56.81”N</td>
</tr>
<tr>
<td>Longitude</td>
<td>79°48’46.41”E to 79°49’02.07”E</td>
</tr>
<tr>
<td>Toposheet No.</td>
<td>H44T10, H44T11, H44T14 &amp; H44T15</td>
</tr>
</tbody>
</table>
## Expansion of Molasses based Distillery (60 KLPD to 180 KLPD) and Co-generation power plant (2 MW to 8 MW)

At Village Jangraulipul, Tehsil Pilibhit, District Pilibhit, Uttar Pradesh

### Pre - Feasibility Report

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>PARTICULARS</th>
<th>DETAILS</th>
</tr>
</thead>
</table>
|        | Total Plant Area                 | 11.74 ha (29.0 acres)  
No additional land is required for the proposed expansion project as the same will be done within the existing plant premises.                                                                                     |
|        | Greenbelt & Plantation Area      | 3.85 hectares (9.5 acres) i.e. almost 33% of the total plant area has already been developed as greenbelt & plantation and the same will be maintained.                                                   |

## E. Environmental Setting Details (with approximate aerial distance & direction from plant site)

1. Nearest Village Jangraulipul (~0.5 km in NW direction)
2. Nearest Town & City Pilibhit City (District Headquarters) (~5.5 km in North Direction)
3. Nearest National Highway / State Highway  
   - SH-29 (~0.5 km in West direction)  
   - SH-26 (~4.0 km in NE direction)  
   - NH-74 (~6.5 km in NW direction)
4. Nearest Railway station Pilibhit Railway Station (~ 5.5 km in North direction)
5. Nearest Airport Bareilly Airport (~39 km, SW direction)
6. National Parks, Reserved Forests (RF)/ Protected Forests (PF), Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves, Wildlife Corridors etc. fall within 10 km radius from the plant site.
7. Water Body (within 10 km radius)  
   - Takia Distributary (~0.3 km in NW direction)  
   - Singhni Nala (~0.4 km in East direction)  
   - Deoha River (~1.8 km in West direction)  
   - Sarda Canal (~3.2 km in ENE direction)  
   - Narra Nadi (~5.8 km in SSE direction)  
   - Nakti Distributary (~5.8 km in WNW direction)  
   - Sara Nala (~6.2 km in NNE direction)  
   - Khakra Nadi (~8.2 km in NNW direction)
### Expansion of Molasses based Distillery (60 KLPD to 180 KLPD) and Co-generation power plant (2 MW to 8 MW)  
At Village Jangraulipul, Tehsil Pilibhit, District Pilibhit, Uttar Pradesh  

#### Pre - Feasibility Report  

**PARTICULARS** | **DETAILS**  
---|---  
8. Seismic Zone | Zone –IV [as per IS 1893 (Part-I): 2002]  

#### Cost Details  

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost of the Project</td>
<td>Rs. 107.10 Crores</td>
</tr>
<tr>
<td>Cost for Environment Management Plan</td>
<td></td>
</tr>
</tbody>
</table>
  - Capital Cost: Rs. 15.0 crore  
  - Recurring Cost: Rs. 1.5 crore/ annum |

#### Basic Requirements for the project  

<table>
<thead>
<tr>
<th>Water Requirement (KLPD)</th>
<th>Existing</th>
<th>Additional</th>
<th>Total (After Expansion)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>570</td>
<td>972</td>
<td>1542</td>
</tr>
<tr>
<td>Source</td>
<td>Groundwater</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power Requirement (MW)</th>
<th>Existing</th>
<th>Additional</th>
<th>Total (After Expansion)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.8</td>
<td>4.0</td>
<td>5.8</td>
</tr>
<tr>
<td>Source</td>
<td>Co Generation Power Plant of 8.0 MW</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Man Power Requirement</th>
<th>Existing</th>
<th>Additional</th>
<th>Total (After Expansion)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>65</td>
<td>165</td>
</tr>
<tr>
<td>(Source: - Unskilled / Semi-Skilled - Local Areas; Skilled - Local &amp; Outside)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Product Mix  

- Ethanol (Absolute Alcohol) / Extra Neutral Alcohol (ENA) / Rectified Spirit (RS) and Power  

#### By Products  

- CO₂  

#### Working Days  

- Existing - 330 days/annum  
- After expansion – 350 days/ annum  

### ENVIRONMENT MANAGEMENT PLAN  

#### Air Management  

- Bag Filter with stack of adequate height has been installed with the boiler (23 TPH) to control the particulate and gaseous emissions, as per CPCB guidelines.  
- ESP with stack of adequate height will be installed with the proposed boiler (56 TPH) to control the particulate and gaseous emissions due to combustion of fuel.  
- CO₂ generated during the fermentation process is being/will be collected by utilizing CO₂ scrubbers and sold to authorized vendors.  
- All the roads are concreted to control the fugitive dust emissions.
Online Stack Monitoring system is already in place and operational.

Greenbelt is being/will be developed all around the plant boundary and the same will be maintained.

**Water Management**

- The distillery is being/will be based on “ZERO EFFlUENT DISCHARGE”.
- The distillery will be based on “ZERO EFFlUENT DISCHARGE”.
- Spent Wash: Spent wash generated from the analyzer column during the operation, is being/will be concentrated in integrated & standalone Multi – Effect Evaporator (MEE) from initial 12% solid to 55% solid and transferred for complete incineration in a special boiler designed for spent wash. Hence, the complete spent wash is being/will be concentrated & incinerated.
- Process Condensate: Process condensate from MEE is being/will be treated & polished in CPU and recycled to process and cooling tower makeup.
- Spent Lees: The spent lees are completely being used in fermentation process.
- Closed water recycles system and plant process is designed to minimize fresh water requirement by recycling various effluents after treatment.
- Domestic waste water generated from the plant will be treated in STP.

**Noise Management**

- Personal Protective Equipment like earplugs and earmuffs is being/will be provided to the workers exposed to high noise level.
- D.G. sets are being/will be provided with acoustic to control the noise level within the prescribed limit.
- Proper maintenance, oiling and greasing of machines at regular intervals is being/will be done to reduce generation of noise.
- Proper greenbelt & plantation has been developed and the same will be further developed and maintained in future.
- Regular monitoring of noise level is being/will be carried out and corrective measures in concerned machinery are being/will be adapted accordingly to the possible extent

**Solid & Hazardous Waste Management**

- Spent wash generated during Molasses operation is being/will be concentrated in Multi-effect evaporator and then used as fuel in boiler.
- Sludge is being/will be used as manure (given to the farmers for soil amendment) or burnt in boiler.
Fly ash generated from the boiler is being / will be utilized for brick manufacturing/ soil amendment.

**Greenbelt Development & Plantation**
- Out of the total plant area of 11.74 ha, ~33% i.e., 3.85 ha has been already developed under greenbelt & plantation.
- Greenbelt has been developed as per Central Pollution Control Board (CPCB) guidelines.
- Native plant species is being / will be planted in consultation with local horticulturist.
- Greenbelt development along with the road & plant boundary will be continued to attenuate noise level, arrest dust and improve the environment in surrounding.

**Odour Management**
- Adequate greenbelt all around the periphery of the plant.
- Efficient CO2 scrubbing to avoid carryover of alcohol vapours & other fumes.
- Better housekeeping will maintain good hygiene condition by regular steaming of all fermentation equipment.
- Longer storages of any product/by-products are being / will be avoided & use of efficient biocides to control bacterial contamination.
- Regular use of bleaching powder in the drains to avoid generation of putrefying micro-organisms.

### 2.0 INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION

#### (i) Identification of Project and Project Proponeent

LH Sugar Factories Limited (LHSF) is a 10,000 TCD sugar mill located in Pilibhit in north-west Uttar Pradesh (UP). LHSF was promoted by two brothers – Raja Lalita (L) Prasad and Sahu Hari (H) Prasad in 1909 and was incorporated in 1933. The descendants of these two families have managed the operations of the sugar mill. Over the last few years, LHSF has been expanding its scale of operations by undertaking continuous expansion; de-bottlenecking measures and diversification by forward integrating into co-generation of power. In FY 2007-08, LHSF expanded its co-generation capacity to above 40 MW from 20 MW.

LH Sugar have install a molasses based Ethanol manufacturing plant at Jangraulipul, in FY-2017-18 for taking benefits of value addition by converting it into first Rectified spirit and subsequently into Ethanol. The LH Sugar have install a 60 KL/Day capacity multi products manufacturing distillery at Jangraulipul to first produce rectified spirit and
thereafter ENA and Ethanol as per market requirement. The project will be mainly funded out of the contribution from Sugar Development Fund (SDF) and also out of the loan taken from Financial Institutions/Bank. The raw material for the Ethanol Unit i.e molasses will be taken from our Sugar mill through tankers and balance requirement will be procured from nearby sugar mill. The products viz. Ethanol will be sold to Petroleum Companies and Rectified Spirit and ENA to others industrial buyers.

LH Sugar have is a molasses based Ethanol manufacturing plant at Jangraulipul, in FY-2017-18 for taking benefits of value addition by converting it into first

The Company is closely held Company and its shares are not listed on any exchange though it is professionally managed Company and being looked after by Board of Directors. The Board of Directors comprises of independent Directors. The Board of Directors is assisted by key personnel who are expert in their fields. At present the following Directors are in our Company.

(ii) Brief description of nature of the project

LH Sugar Factories Limited - Distillery Division has its existing Molasses based Distillery of 60 KLPD and 2 MW Co-generation power plant at Village Jangraulipul, Tehsil and District Pilibhit, Uttar Pradesh.

The Environmental Clearance for the same was obtained from the Ministry of Environment, Forest & Climate Change (MoEFCC), New Delhi vide letter no. J-11011/354/2013-IA-II dated 15th July, 2015.

The company is now proposing expansion of Molasses based Distillery (60 KLPD to 180 KLPD) and co-generation power plant (2 MW to 8 MW) within the existing plant premises.

(iii) Need for the project and its importance to the country and/or region

Advancement in science and technology has created so many products that have enhanced the quality of human life in every passing year. The human race is largely dependent on industrialization for up gradation in quality of life. Progress of the nation is judged through its economic growth which is largely dependent on industrial productivity. In Indian economy (which is agro based) many industries are dependent over agricultural produce for production of luxury and need based commodities. Alcohol has assumed a very important place in the Country’s economy. It is a vital raw material for a number of chemicals. It has been a source of revenue by way of excise duty levied by the State Government on alcohol liquors. It has a potential as fuel in the form of power alcohol for blending with petrol which is expected to achieve the ratio of 20:80.
The use of alcohol for the purpose of potable liquor is as high as its use for industrial purposes.

According to analysts, the Indian alcoholic beverages industry is expected to witness accelerating growth in coming years with the consumer base likely to expand amidst rising disposable income. The domestic alcoholic drinks market is estimated around $13 billion and has been growing at a compounded annual growth rate in excess of 10% in the past few years. The growth rate is higher than other major Asian markets like China and South Korea, etc.

In the path of company’s growth and development this project will serve as yet another milestone.

Presently, Govt. of India is pushing ethanol blending programme in a big way to achieve blending target of approximately 10% in near future and progressively increase to 20%. To achieve this target GOI is coming out major policy announcement to encourage setting up of molasses based distilleries.

(iv) Demand- Supply Gap

Presently, ethanol blending programme has achieved only 3-4% blending target which is way short of 10% limit.

(v) Import vs. Indigenous Production

With the increase of percentage of ethanol blending in petrol, dependence on crude import will decrease in the coming years.

(vi) Export Possibility

With the current scenario, possibility of export doesn’t arise.

(vii) Domestic/ Export Markets

Domestic market presently driven by ethanol blending programme.

(viii) Employment Generation (Direct and Indirect) due to the project

For smooth functioning of the plant, the company has already a team of 70 persons on regular basis and 30 persons on contract basis. These persons are responsible towards their respective departments such as all process plants, boilers and other utility sections, Purchase & Commercial Sections, Marketing, loading/ unloading of raw materials, fuels, & chemicals etc., housekeeping, gardening’s, Stores, Accounts, HR & Administration Sections. After the expansion, another additional 65 people (25 persons on regular basis and 40 persons on contract basis) will be appointed thus the total manpower after expansion will be 165 persons.

3.0 PROJECT DESCRIPTION

(i) Type of Project including interlinked and independent projects, if any.
There are no interlinked projects related to this expansion project.

(ii) Location (map showing general location, specific location, and project boundary & project site layout) with coordinates
Expansion of Molasses based Distillery (60 KLPD to 180 KLPD) and Co-generation power plant (2 MW to 8 MW) at Village Jangraulipul, Tehsil Pilibhit, District Pilibhit, Uttar Pradesh

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**Figure - 1: Location Map**
(iii) Key Plan

Figure 3: Map Showing Environmental Settings of the 10 Km Radius Study Area
(iv) Details of alternative sites consideration and basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.

Expansion will be done within the existing plant premises and in the land adjacent to the existing plant; therefore, no alternative site has been considered.

(v) Size or magnitude of operation

LHSFL is proposing an expansion of Molasses based Distillery from existing (60 KLPD to 180 KLPD) and Co-generation power plant (2 MW to 8 MW) at Village Jangraulipul, Tehsil Pilibhit, District Pilibhit, Uttar Pradesh.

The process includes basic raw material requirement, sizing of equipment, utilities & services, infrastructure facilities & sources of waste generation, their quantity, treatment & safe disposal of waste.

Table – 2

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Units</th>
<th>Existing Capacity</th>
<th>Additional Capacity</th>
<th>Total Capacity after proposed expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Distillery</td>
<td>60 KLPD</td>
<td>120 KLPD</td>
<td>180 KLPD</td>
</tr>
<tr>
<td>2.</td>
<td>Co-Generation Power Plant</td>
<td>2 MW</td>
<td>6 MW</td>
<td>8 MW</td>
</tr>
</tbody>
</table>

(vi) Project Description with Process Details

For Molasses Based Distillery Operation

- Molasses unloading and storage

Molasses from tankers/pipe line will be unloaded at unloading point and transferred in to molasses storage tank.

- Yeast propagation and fermentation:

Yeast activation:

Yeast seed material will be prepared in water-cooled Yeast Activation vessel by inoculating sterilized mash with active dry yeast. Optimum temperature will be maintained by cooling water. The contents of the yeast activation vessel will be then transferred to fermenter.

Fermentation:

The Molasses from storage tank to be pumped to dilutor installed in fermentation section and diluted with water. The diluted molasses called Wort will be fed into culture
vessels and Pre-fermenter for activation of yeast. The activated yeast from the yeast activation vessel transferred into pre fermenter.

Once the yeast activated in pre-fermenters, it will be transferred in to fermenters and diluted molasses to be added. The process of fermentation is to convert the fermentable substrate into alcohol. The pH of the wort is adjusted by the addition of acid. Yeast will be available in sufficient quantity to initiate fermentation rapidly and complete it within the cycle time.

At the start of the cycle, the fermenter will be charged with wort and contents of the yeast activation vessel. Significant heat release takes place during fermentation. This is removed by passing cooling water through the fermenter PHE’s to maintain an optimum temperature. The recirculating pumps also serve to empty the fermenters into beer well. After the fermenters will be emptied, they will be cleaned with water and caustic solutions and sterilized for the next batch. The carbon dioxide evolved during the process will be vented to atmosphere (to be processed and stored for industrial use) after recovery of alcohol in a scrubber.

**Distillation: (Multi Pressure Distillation with Integrated Evaporation)**

Fermented wash from wash holding tank will be pumped by wash feed pump to the top of degassing column after preheating the same in beer heater and spent wash heat exchanger. The vapours along with non-condensable gases from the top of degassing column will be rectified in Heads column, to expel the high volatiles, technically known as heads. Bottom liquid from the degasser flows into analyzer column where alcohol is stripped from the liquid. The liquid from bottom of analyzer column will be completely stripped of alcohol and will be pumped out by thick slop discharge pump through heat exchanger where it preheats the fermented wash before it enters degassing column. The slop from the analyzer column will be fed in to decanter. The dilute alcohol vapors from near the top of analyzer column will be condensed first in beer heater while exchanging heat with wash feed and then in analyzer condenser. Degasser and analyzer operate under vacuum. The condensate will be collected in rectifier feed tank. The vapors for stripping alcohol will be generated from analyzer column bottom liquid in the analyzer column re-boiler by using the rectified column top vapors, as discussed subsequently. Vapors from the top of heads column are condensed in heads column condenser and then in head column vent condenser. Part of the condensate is returned to column as reflux while a small portion is taken out as an impure spirit cut. Liquid from bottom is also taken into rectified feed tank.
Dilute alcohol water mixture from rectifier feed tank will be pumped by rectifier feed pump through rectifier feed pre-heater in to rectifying column. Rectifier and its associated equipment work under pressure so that these vapors can supply the necessary heat for generating the vapors.

The condensate is then pumped as reflux to rectifying column. Rich alcohol vapors at a concentration of 95.5% v/v from top of rectifying column are condensed first in analyzer and then in reflux vent condenser. The liquid form will be collected in rectifier reflux tank. Part of the liquid may be drawn off as impure spirit. The impure spirit cut will be maintained as little as possible to maintain aldehyde levels to meet the required limits in RS/ENA. From rectifier column the draw will be taken to produce RS and for ENA draw will be sent to ED column, rectifier column and finally to polishing column to maintain quality of ENA and final draw from polishing column will be sent to receivers.

Liquid from the reflux tank is pumped by product pump partly as product and partly as reflux to the top of the rectifying column. The necessary rectifying vapors are generated by boiling the bottom liquid in Rectifier Column Re-boiler using medium pressure steam. Some side streams are drawn from rectifier column as light and heavy fractions of higher alcohols called fusel oils and cooled in fusel oil coolers and are mixed with water and allowed to separate out in fusel oil separator. All vents will be connected to Vent Gas Absorber where the vent gases are scrubbed with water to recover entrained alcohol. The scrubber water is used for washing the fusel oils in fusel oil separator to recover alcohol from the fusel oil fractions. The absorber vent is connected to vacuum pump which is used to create vacuum in the analyzer and degasser.

Absolute alcohol is manufactured by dehydration of Rectified Spirit. The process adopted here is based on Pressure Swing Adsorption (PSA) system using Molecular Sieves.

Rectified spirit, after preheating by waste hot streams, is vaporized and superheated by using medium pressure steam at 6 Kg/cm²g pressure. Hot vapors at 6 kg/cm² g pressure and 130° C temperature pass through PSA column, where the water vapors are retained while water free alcohol is released as vapors. The vapors are condensed and collected as absolute alcohol. When the molecular sieve bed is saturated with water the alcohol vapors are shifted to the other tower and the first tower is taken for regeneration. Regeneration is done first by pressure releasing and creating vacuum and then by elutriating with dehydrated alcohol vapors from the tower in dehydration operation. The vapors are condensed and the vent vapors are recovered through scrubber. Vacuum can be created. Product will be cooled and transferred to absolute alcohol receiving tank and then on to storage tank.
> **Alcohol bulk storage:**

Alcohol will be first taken to daily receiver storage tanks, which will be based on the State Excise laws, storage for three days considering the weekly holidays of two days. Thereafter, the alcohol will be transferred to bulk storage tanks after taking the daily receiver Dip. This is transferred using flameproof pumps. Final dispatch of alcohol will be metered and again will be carried out using special flameproof pumps. The Bulk spirit storage is proposed to be set up for 30 days.

> **Effluent handling section in the process**

**a) Evaporation section:**

- The spent wash coming from distillation section will be fed in to first calandria of the evaporator section. There will be five calandrias installed as per design to concentrate the dissolved solids. Suggested treatment scheme is a four FF + finisher evaporation plant for spent wash evaporation. The following points will elucidate the basic working principle:
- After Integrated evaporator spent wash will be fed to stand alone evaporators four effects ( 3+1) Forced circulation to concentrate it up to 60 brix to burn in incineration boiler
- Shell & tube type evaporators with highly efficient liquid distributor working on the principle of falling film evaporation will be used, with Plate type Preheaters for preheating of FEED stream which serves the purpose of energy conservation.
- Analyzer vapor will be fed to the first effect evaporator shell side at the given pressure and temperature as the heating medium.
- The feed from the feed balance tank will be taken to make the best heat recovery.
- The feed after getting heated to the predetermined temperature in pre-heater will be fed from the first effect evaporator which is falling film evaporator -1
- Vapors generated in 1<sup>st</sup> effect VLS (Vapor Liquid Separator) will be used as heat source in the 2<sup>nd</sup> effect and from 2<sup>nd</sup> to third and so on.
- The product at the desired concentration of TS will be obtained at the outlet from the final effect.
- A Shell & tube type multi-pass surface condenser will be employed for condensing the shell side vapors.
- The pure and the process condensate are collected in receiving vessels.
- Highly efficient operating pumps will be provided for pumping the required fluid.
• The operation of the plant will be under vacuum. Vacuum is created with the help of a water ring vacuum pump.
• The plant will have high level of automation to get consistent output at required concentration.
• The system will operate under vacuum. Water-ring vacuum pumps will be used to maintain a desired vacuum.
• Cooling water from cooling tower is used in the surface condensers for condensing the vapors.

b) **Incineration boiler along with the turbine generator:**

The concentrated effluent will be mixed with bagasse/biomass/coal and fired into specially designed incineration boiler to generate steam and power.
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Figure 4: Process flow diagram of Molasses based Distillery
Distillery Effluent Treatment Scheme - RO based Process condensate Treatment Plant

The process condensate treatment plant will be based on the process of Reverse Osmosis technology. The system will comprise of following unit process & equipment.

- Equalization tank
- Neutralization tank
- Filtration section
- Pressure sand filter
- Dual media filter
- Feed RO system
- Permeate RO system
- Reject RO system
- RO CIP system

Neutralization process: The stored process condensate will be transferred to the downstream neutralization tank. Process condensate will be neutralized in this tank with dosing of alkali solution. The neutralization process will be automated & will be controlled through the controller. Neutralized condensate will be then collected in filter feed tank for further processing through the filtration system.

Filtration Process: Neutralized condensate from the filter feed tank will be passed through two stage media filters. First condensate will be filtered by pressure sand filter in order to remove suspended matters & turbidity present in it. The primary sand filter outlet will be filtered in Dual media filter to remove the fine suspended solids.

Feed RO system: The neutralized & filtered water will be treated through Feed RO system. The feed water will be dosed with anti-scalant & SMBS solutions to condition the feed water prior to passing it through Feed RO system. The feed RO skid will be two stage systems comprising of two pressure vessels containing six elements each configured in series. As the feed water flows through the first pressure membrane from feed to reject end, the pure water permeates through membrane and will be collected in the permeate header. The concentrated water will be collected in Reject header & then passed through the second pressure vessel. The permeate generated from the Feed RO system will be collected in the permeate RO feed tank & Reject generated will be collected in the Reject RO feed tank.

Permeate RO system: The permeate generated from the feed RO skid will be passed through the permeate RO system for further removal of dissolve solid. The system comprises of two pressure vessels containing four elements each configured in series.
the feed water flows through the first membrane from feed to reject end the pure water permeates through the membranes & will be collected in the permeate header. The concentrated water will be collected in Reject header & then passes through the second pressure vessel. The permeate generated from the system will be collected on the permeate RO product tank & Reject generated will be collected in reject RO feed tank.

**Reject RO system:** The reject generated from the feed RO skid & permeate skid will be passed through the Reject RO system for further recovery of low TDS water. The system will comprise of two pressure vessels containing four elements each configured in series. As the feed water flows through the first membranes from feed to reject end the pure water permeates through the membranes & will be collected in the permeate header. The concentrated water will be collected in Reject header & then passed through the second pressure vessel. The permeate generated from the Reject RO system will be collected in the reject RO product tank & reject generated will be collected in the final reject collection tank. The permeate from Permeate RO system & permeate from Reject RO system will be used in cooling towers & fermentation for makeup water & molasses dilution. The final reject will be fed to evaporation again.

**Table - 3**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameters</th>
<th>Untreated Effluent</th>
<th>Treated effluent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Evaporation process condensate</td>
<td>Cooling tower blow down</td>
</tr>
<tr>
<td>1.</td>
<td>TDS</td>
<td>200 mg/l</td>
<td>2000 mg/l</td>
</tr>
<tr>
<td>2.</td>
<td>pH</td>
<td>3.5</td>
<td>7.2</td>
</tr>
<tr>
<td>3.</td>
<td>BOD</td>
<td>2500 mg/l</td>
<td>60 mg/l</td>
</tr>
<tr>
<td>4.</td>
<td>COD</td>
<td>3500 mg/l</td>
<td>200 mg/l</td>
</tr>
</tbody>
</table>

**Power Co-generation (2.0 MW to 8.0 MW)**

**OPERATIONS**

The unit has existing 2 MW co-generation power plant with an existing boiler of 23 TPH and power turbine. After proposed expansion additional boiler of 56 TPH will be installed to produce additional 6 MW power.

The boiler is/ will be based on Concentrated Spent Wash and Bagasse / Rice husk / Coal as available fuel options. This boiler will operate mainly to feed steam to Molasses based operations and 8 MW power generations from Turbine.
8.0 MW Co-Generation plant consists of a high pressure water tube steam boiler extraction cum condensing steam turbine. Fuel in the steam boiler will be burnt with the help of air in the Incineration boiler furnace. Water will be circulated in the Incineration boiler drum and tubes thus getting heated by the flame burning in the Incineration boiler furnace. Water comes out of the Incineration boiler drum located at the top of the Incineration boiler as steam. Flue gases rise in the Incineration boiler furnace and come in contact with the steam coming out of Incineration boiler drum. Steam after coming in contact with flue gases gets heated up further thus getting superheated. Superheated steam leaves the incineration boiler in a pipe. Flue gases after super heating the steam pass through economizer where they pre-heat the incineration boiler feed water before it enters the incineration boiler drum. After economizer, flue gases pass through air pre-heaters where they heat the air which is fed to the incineration boiler furnace for burning the fuel. After air pre heaters flue gases pass through ESP/Bag Filter where the dust particles are collected. The dust is collected in closed system with dense phase technology for final disposal.

High pressure superheated steam from incineration boiler is passed through a steam turbine, which is used for distillery process operations. While passing through the turbine, the high pressure and temperature steam rotates the turbine rotor and an electric alternator mounted on the same shaft. Electric power is generated by the alternator. This electric power generated is consumed in house i.e. for running the distillery and utilities like incineration boiler’s auxiliaries etc.

Figure 5: Process Flow Chart for Co-Generation Power Plant
(vii) Raw material required along with estimated quantity, likely source, marketing area of final products, mode of transport of raw material and finished product.

(a) Raw Material Requirement

The basic raw material for the manufacturing of (Ethanol/Impure Alcohol / ENA/RS) is being /will be Molasses. In the present scenario, Molasses is easily available in the nearby own & others sugar mills and will be procured from the same.

Details regarding quantity of raw materials required, their source, mode of transportation along with their storage facilities for proposed Molasses based distillery are given in table below:

Table 4
Raw Material Requirement for Molasses Based Distillery

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particular</th>
<th>Existing</th>
<th>Additional (Proposed)</th>
<th>Total (After Expansion)</th>
<th>Source of the Raw Material &amp; Mode of Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Molasses (MT/day)</td>
<td>280 - 285</td>
<td>578 - 580</td>
<td>858-863</td>
<td>From own sugar mills / By road</td>
</tr>
<tr>
<td>2.</td>
<td>Chemicals</td>
<td></td>
<td></td>
<td></td>
<td>Nearby market by trucks</td>
</tr>
<tr>
<td></td>
<td>Sodium Hydroxide</td>
<td>2.0 MT/day</td>
<td>4.0 MT/day</td>
<td>6.0 MT/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Caustic)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enzyme</td>
<td>4 Kg/day</td>
<td>8 Kg/day</td>
<td>12 Kg/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Antifoam Agent</td>
<td>150 Kg/day</td>
<td>300 Kg/day</td>
<td>450 Kg/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yeast</td>
<td>Own Propagation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Fuel Requirement

Concentrated Spent Wash and Bagasse / Rice husk/Indian coal is being / will be used for the boilers of existing 23 TPH & proposed 56 TPH. Details regarding fuel requirements are given below.

Table 5
Fuel Requirement

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Fuel</th>
<th>Approx. Quantity (T/Day)</th>
<th>Source</th>
<th>Mode of Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
<td>Additional</td>
<td>Total</td>
</tr>
</tbody>
</table>

(viii) Resources optimization/ recycling and reuse envisaged in the project, if any, should be briefly outlined.

Water as a resource is being/will be recycled at each possible step of the process and latest technology and methodology is being/will be adopted to conserve and reuse the resources.

- The distillery is Zero Effluent Discharge so does not pose any threat to ground or surface water quality.
- Incorporation of advanced technique i.e. Multi Effect Evaporator is enabling substantial reduction of final effluent.
- Water is conserved at every stage of process. Large quantity of water is re-used & recycled.
- Rainwater from rooftop is collected and stored in water tanks and reused.

(ix) Availability of water it’s source, energy /power requirement and source should be given.

(a) Water Requirement and Source

Existing water requirement is 570 KLPD. After proposed expansion the total water requirement for the project will be 1542 KLD. Water will be sourced from ground.

<table>
<thead>
<tr>
<th></th>
<th>Existing</th>
<th>Additional</th>
<th>Total After Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source - Groundwater</td>
<td>570</td>
<td>972</td>
<td>1542</td>
</tr>
</tbody>
</table>

Existing Water Balance for 60 KLPD Molasses Based Operation

The total water requirement for the existing distillery is 570 KLPD, worked out as per details given below:

**TABLE - 6**

**Water Balance - 60 KLPD**

Total water input for existing 60 KLPD Distillery
### Expansion of Molasses based Distillery (60 KLPD to 180 KLPD) and Co-generation power plant (2 MW to 8 MW)

At Village Jangraulipul, Tehsil Pilibhit, District Pilibhit, Uttar Pradesh

#### Pre-Feasibility Report

**S. No.** | **Section**                                                      | **Water Quantity (KLPD)** |
---|------------------------------------------------------------------|---------------------------|
1. | Process Water in fermentation                                   | 522                       |
2. | DM Water for RS Dilution                                        | 575                       |
3. | DM Water for Boiler Feed                                        | 552                       |
4. | Soft Water for Analyser Flash Tank                             | 117                       |
5. | Soft Water for Vacuum Pumps & Others                           | 30                        |
6. | Soft Water for Makeup for Cooling Tower                        | 283                       |
7. | Water in Molasses                                               | 56                        |
8. | Other Domestic Usage                                            | 10                        |
9. | Miscellaneous Washings (Provisional)                           | 10                        |
**TOTAL WATER INPUT**                                           | **2155**                  |

**Recycling & utilizing stream for existing 60 KLPD Distillery**

<table>
<thead>
<tr>
<th><strong>S. No.</strong></th>
<th><strong>Section</strong></th>
<th><strong>Water quantity (KLPD)</strong></th>
</tr>
</thead>
</table>
1. | Lees Recycle For RS Dilution                                    | 495                       |
2. | Steam Condensate Recycle For BOILER                             | 364                       |
3. | Spent Lees (Rect) Cooling Tower Make up                         | 80                        |
4. | Process Condensate Recycle to Process                           | 616                       |
5. | Vacuum Pump Water Recirculation                                 | 30                        |
**TOTAL RECYCLING /RE-UTILIZATIONS OF WATER PER DAY**            | **1585**                  |
**TOTAL FRESH WATER INPUT**                                      | **570**                   |
Expansion of Molasses based Distillery (60 KLPD to 180 KLPD) and Co-generation power plant (2 MW to 8 MW)
At Village Jangraulipul, Tehsil Pilibhit, District Pilibhit, Uttar Pradesh

Pre - Feasibility Report

Figure 6: Water balance for existing 60 KLPD Molasses based Operation

NOTE: FIGURES GIVEN ABOVE ARE ONLY INDICATIVE & MAY VARY BASED ON MOLASSES CHARACTERISTICS AND OVERALL PLANT OPERATING PARAMETERS. THE ABOVE FIGURES ARE SUBJECT TO DETAILED ENGINEERING.
**Water balance for 120 KLPD Molasses based Distillery along with 6.0 MW Co-generation power Plant**

Water requirement for 120 KLPD Molasses based Distillery along with 6.00 MW Co-generation power Plant will be 972 KLPD.

**TABLE - 7**

Water Balance

<table>
<thead>
<tr>
<th>Water Type</th>
<th>Total Water first run Input KLPD</th>
<th>Total Fresh water for recycling KLPD</th>
<th>Total water after recycling KLPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Water</td>
<td>934</td>
<td>452</td>
<td>482</td>
</tr>
<tr>
<td>Soft Water</td>
<td>690</td>
<td>489</td>
<td>201</td>
</tr>
<tr>
<td>DM Water</td>
<td>1021</td>
<td>732</td>
<td>289</td>
</tr>
<tr>
<td>Total</td>
<td><strong>2645</strong></td>
<td><strong>1674</strong></td>
<td><strong>972</strong></td>
</tr>
<tr>
<td>KL/KL</td>
<td></td>
<td></td>
<td><strong>8.1 KL/KL</strong></td>
</tr>
</tbody>
</table>
Expansion of Molasses based Distillery (60 KLPD to 180 KLPD) and Co-generation power plant (2 MW to 8 MW)
At Village Jangralipul, Tehsil Pilibhit, District Pilibhit, Uttar Pradesh
Pre - Feasibility Report

Figure 7: Water balance for additional 120 KLPD Molasses based Operation
(b) Power Requirement and Source

Existing power requirement is 1.8 MW and additional 4.0 MW of power will be required for proposed expansion. Thus, the total power requirement after proposed expansion project will be 5.8 MW approx.

*Source:* 8 MW Co-generation Power Plants.

(c) Steam Requirement

Steam generated from the boiler will be utilized in the distillery process and generation of 8 MW Power which will be for the own consumption and also for boiler feed water heating and distillery. The steam requirement for different purposes is given below:

<table>
<thead>
<tr>
<th>Table – 8 Steam Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. No.</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Boiler Details

Details regarding this are mentioned in the table given below:

<table>
<thead>
<tr>
<th>Table – 9 Boiler Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. No.</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
</tbody>
</table>
Details regarding the D.G. Sets

Details regarding the D.G. Sets are mentioned in the table given below:

**Table – 10**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Type of Fuel</td>
<td>Diesel</td>
</tr>
<tr>
<td>2.</td>
<td>Capacity</td>
<td>2 x 320 KVA</td>
</tr>
<tr>
<td>3.</td>
<td>Stack Height (above roof level)</td>
<td>As per CPCB/SPCB norms</td>
</tr>
<tr>
<td>4.</td>
<td>Pollution Control Equipment Measures</td>
<td>Adequate stack height/ acoustic enclosure</td>
</tr>
</tbody>
</table>

(x) Quantity of waste to be generated (liquid and solid) and scheme for their management/disposal

Waste Water Generation:

- The project is/ will be based on “ZERO EFFLUENT DISCHARGE”.
- Fresh water requirement of the project is being/ will be met by Ground Water. Efforts are will be made to conserve as much water as possible by recycling and reuse.
- Spent wash generated during Molasses operation, is being/ will be concentrated in Multi-effect evaporator and then used as fuel in boiler.
- Process condensate from MEE is being/ will be recycled back to the process.
- Fly ash from the boiler is being/ will be utilized in nearby brick manufacturing units/as per CPCB guidelines

4.0 SITE ANALYSIS

(i) Connectivity

LHSFL is located at Village Jangraulipul, Tehsil Pilibhit, District Pilibhit, Uttar Pradesh. The site is connected with SH-29 & 26 and NH-74 (6.5 km in North West direction). Nearest Railway station is Pilibhit (~ 5.5 km in North direction). Nearest Airport is Bareilly Airport (~39 km, SW direction). It has an easy access to raw materials, Molasses and Bagasse from own sugar mills through road. For other infrastructural facilities e.g. land, power, water, transport and communication, approach through road & access distances from the nearest highway, railway station etc.

(ii) Land from Land use and Land ownership

Total plant area is 11.74 ha and the same has been acquired by the company.

(iii) Topography
Topography of the core zone of the proposed expansion plant is almost flat.

(iv) **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, eco 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

<table>
<thead>
<tr>
<th>S. NO.</th>
<th>PARTICULARS</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Nearest Village</td>
<td>Jangraulipul (~0.5 km in NW direction)</td>
</tr>
<tr>
<td>2.</td>
<td>Nearest Town &amp; City</td>
<td>Pilibhit City (District Headquarters) (~5.5 km in North Direction)</td>
</tr>
</tbody>
</table>
| 3.     | Nearest National Highway / State Highway | SH-29 (~0.5 km in West direction)  
SH-26 (~4.0 km in NE direction)  
NH-74 (~6.5 km in NW direction) |
| 4.     | Nearest Railway station | Pilibhit Railway Station (~ 5.5 km in North direction) |
| 5.     | Nearest Airport | Bareilly Airport (~39 km, SW direction) |
| 6.     | National Parks, Reserved Forests (RF)/ Protected Forests (PF), Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves, Wildlife Corridors etc. within 10 km radius | No National Parks. Reserved Forests/ Protected Forests, Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves, Wildlife Corridors etc. fall within 10 km radius from the plant site. |
| 7.     | Water Body (within 10 km radius) | Takia Distributary (~0.3 km in NW direction)  
Singhni Nala (~0.4 km in East direction)  
Deoah River (~1.8 km in West direction)  
Sarda Canal (~3.2 km in ENE direction)  
Narra Nadi (~5.8 km in SSE direction)  
Nakti Distributary (~5.8 km in WNW direction)  
Sara Nala (~6.2 km in NNE direction)  
Khakra Nadi (~8.2 km in NNW direction)  
Bagha Nadi (~8.5 km in SSE direction)  
Naula Nala (~8.8 km in WNW direction) |
| 8.     | Seismic Zone | Zone –IV [as per IS 1893 (Part-I): 2002] |

*Source: Site Visit*
(v) **Existing Infrastructure**

Total plant area is 11.74 ha. Expansion will be done within the existing plant premises.

(vi) **Soil classification**

District Pilibhit is underlain by quaternary alluvium comprising sand, clay, siltgravel and kankar in varying proportions. The area falls under interfluve area of Ganga and Sarda which is a part of Indo-Gangetic plains. Tarai belt occurs in the northern fringe of the districts comprising mainly sand pebbles beds interbeded with clays. South of Tarai belt is underlain by the deposits of the older gengeticalluvium composed of fine to medium grained sand and clay with kankar in varying proportions. Further south, lies the belt of younger alluvium of recent age which occupies the lower grounds at thick sequence of clay, silt and sand with occasion alkankar.

Pilibhit district obviously has undergone diversified pedogenesis depending upon the composition of the parent materials Paleo-geographical & climatic conditions to which it was subjected. Only these soils group which have got strategic significance in present day land utilization are described in the Table

<table>
<thead>
<tr>
<th>Order</th>
<th>Suborder</th>
<th>Local Name</th>
<th>Description of Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hollis-ic</td>
<td>Hoplaguolls</td>
<td>Tarai Soils</td>
<td>The tarai soil have developed on calcareous, medium to moderately coarse textured materials under predominante influence of mixed forest vegetation in the northern part of the district. It is essentially fine grained soils, comprising clay and silt in humus marshy &amp; swampy environment.</td>
</tr>
<tr>
<td>Enti Sols</td>
<td>Undifluents</td>
<td>Younger alluvium soil (Khader)</td>
<td>These soils are restricted in northern Gangetic plain which are deficient in Nitrogen, Phosphate, but enriched in potash lime. The general texture of the soil in the area is sandy to sandy loam. The younger soil are laden with</td>
</tr>
</tbody>
</table>
(vii) Climatic data from secondary sources
The average annual rainfall as per record of Pilibhit district is 1255.9 mm. The monsoon in the district sets in last week of June till middle of September. The district received maximum rains from June to August. Winter rains occurs in January and February, but year 2002, 2008 recorded no rainfall from January to April. The maximum mean monthly atmospheric temperature 39°C has been recorded during the month of May and minimum (8°C) in January. The temperature generally starts increasing from February and reaches to maximum in May / June (highest temperature 44°C). After June temperature decreases and touches minimum in January. The mean percentage of relative humidity in the district varies from 49 to 67%. Light to moderate south-westerly winds prevail in the winter and early summer period. At the end of summer, easterly and northerly winds set in and continue throughout the monsoon period. The mean wind velocity is 5.1 K.M.P.H. and potential transpiration is 1402.8 mm has been recorded.

(viii) Social Infrastructure available
There are primary schools, dispensaries, small hospitals, places of worship in nearby area of the plant site.

5.0 PLANNING BRIEF

(i) Planning Concept (type of industries, facilities, transportation etc.) Town and country Planning/ Development authority classification.
The proposed expansion project is molasses based distillery. Facilities required for this project will be provided as per requirement. Transportation of raw material and final product is being / will be done via existing road network.

(ii) Population Projection
There will be indirect jobs and business opportunities to the local people such as daily wage labourers, transporters and raw material suppliers. The project would increase and generate opportunities for ancillary and auxiliary business at the local and regional levels.

(iii) Assessment of infrastructure demand (Physical & Social)
The Company will assess the demand of infrastructure (Physical & Social) in nearby area of the proposed expansion site and will be developed in under corporate social responsibilities programs.
(iv) **Amenities/Facilities**

The Company has developed the Amenities/Facilities in nearby area of the proposed expansion plant site. The company will develop more amenities / facilities as per requirement of local people under corporate social responsibilities programs.

### 6.0 PROPOSED INFRASTRUCTURE

(i) **Industrial Area (Processing Area)**

Total plant area is about 11.74 ha (29 acres). Proposed expansion will be done within the existing plant premises.

(ii) **Residential area (Non Processing area)**

Existing housing facilities will meet the requirements for the proposed expansion project.

(iii) **Greenbelt**

Appropriate greenbelt & plantation has been developed and the same will be maintained in future.

(iv) **Social Infrastructure**

The project will result in growth of the surrounding areas by increased direct and indirect employment opportunities in the region including ancillary development and supporting infrastructure.

(v) **Connectivity**

The plant is well connected with rail and road.

(vi) **Drinking Water**

Around 5 KLD of water will be required for drinking purpose.

(vii) **Sewerage system**

Domestic waste water generated from the plant will be treated in STP.

(viii) **Industrial Waste management**

The Molasses based distillery is/ will be based on “ZERO EFFLUENT DISCHARGE”.

(ix) **Solid Waste Management**

Solid waste generated would be ash from the boiler. The following are the management measures that are/ will be taken up by the company:

- Spent wash generated during Molasses operation is being/ will be concentrated in Multi-effect evaporator and then used as fuel in boiler.
- Sludge is being / will be used as manure (given to the farmers for soil amendment) or burnt in boiler.
- Fly ash generated from the boiler is being / will be utilized for brick manufacturing/ soil amendment.

(x) **Power requirement and source**
Existing power requirement is 1.8 MW and additional 4.0 MW power will be required for proposed expansion. Thus, the total power requirement after expansion & installation project will be 5.8 MW which will be sourced from 8 MW Co-generation Power Plant (2 MW Existing + 6 MW proposed).

7.0 REHABILITATION AND RESETTLEMENT (R & R) PLAN

(i) 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).

Proposed expansion will be done within the existing plant premises. No additional land is required for expansion project. Therefore, there will not be displacement of people and hence Rehabilitation & Resettlement is not applicable.

8.0 PROJECT SCHEDULE AND COST ESTIMATES

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

The project will start only after obtaining Environmental Clearance and other statutory permissions. Project will be completed in 2 to 3 years period after getting all the regulatory approvals.

(ii) Estimated project cost along with analysis in term of economic viability of the project.

- Total cost of the Project: 107.1 Crores
- Cost for Environment Protection Measures:
  - Capital Cost: 15.0 Crores
  - Recurring Cost/annum: 1.5 Crores / annum

9.0 ANALYSIS OF PROPOSAL

(i) Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.

The project will result in growth of the surrounding areas by increasing ancillary development and supporting infrastructure. Special emphasis on Financial and Social benefits will be given to the local people including tribal population, if any, in the area. Development of social amenities will be in the form of medical facilities, education to underprivileged and creation of self-help groups.

Uttar Pradesh state will get revenues in terms of taxes. Business opportunities for local community will be available like transport of raw material/product to market, fly ash transport to Brick manufactures, maintenance & house-keeping contract work etc.