Pre-Feasibility Report

for

Manufacturing of Sugar from 5000 TCD to 12000 TCD along with Co-generation power plant of 19.5 MW to 59.5 MW

for

M/s INDIAN SUCROSE LIMITED

At

Village – Chak Allabaksh and Mahiuldinpur Dalel, Tehsil-Mukerian, District –Hoshiarpur, Punjab

Environment Consultant
Vardan Environet
(QCI and NABET/ EIA/ 1619/ RA 0037)
D-142, Sushant Lok-III, Sector 57
Gurgaon (Haryana)
PRE-FEASIBILITY REPORT

1. Executive Summary

Earlier, the assessment of the projects was done on Technical feasibility reports and Cost-Benefit-Ratio which mainly considered financial & technical resources. But no consideration was given to the environment protection in this evaluation and these flaws became apparent with continuous deterioration of environment. Thus in order to have more realistic evaluation, and keeping in view the deteriorating conditions, another dimension was added which is now called as “Environmental Impact Assessment” (E.I.A.). This forms an integral part of the project and is taken into account while appraising the project at different stages. Thus in the new comprehensive approach all considerations like, Technical, Financial & Environmental are given due weightage.

M/s Indian Sucrose Limited is proposing for capacity expansion of 5000 TCD to 12000 TCD of sugarcane based unit along with Cogeneration Power Plant of 19.5 MW to 59.5 MW. As per EIA Notification dated 14th Sept., 2006 and amended from time to time, the proposed project falls under Category “B”, Project or Activity 5(J). They have to submit Form-I along with Pre-Feasibility Report and other relevant documents for getting Environmental Clearance. This pre-feasibility report has, therefore, been prepared by the consultant to assess the likely impact of the proposed on various factors which may be affected with the implementation of the program and to suggest remedial/precautionary measures, if any.

2. INFORMATION OF PROJECT/BACKGROUND INFORMATION

i) Identification Of Project And Project Proponent

Project:

M/s Indian Sucrose Limited has an existing 5000 TCD sugar producing unit at Village Chak Allabaksh and Mahiuldinpur Dalel, Tehsil-Mukerian, District-Hoshiarpur, Punjab for which CTO (latest renewal) was granted by Punjab Pollution Control Board now it is proposing for capacity expansion of 5000 TCD to 12000 TCD of sugarcane based unit along with Cogeneration Power Plant of 19.5 MW to 59.5 MW.
Project Proponent

M/s Indian Sucrose Limited (2500 TCD unit) was set up in 1990 and came in operational phase in 1991 having its registered office is at Mukerian, Tehsil-Mukerian, Dist-Hoshiarpur, Punjab.

Proponent Details

Name : Mr. Ved Prakash Gupta (Plant Head)
Registered address: Indian Sucrose Limited
G.T. Road Mukerian,
144211, District Hoshiarpur,
Punjab
Mail : ved.gupta@yaducorporation.com
Mob : 9115110501

Besides this, the management team comprises of many other senior members. The company is managed by well-qualified persons having progressive attitude and qualification.

The promoters of the project have already worked in their small sugar mill, M/s Indian Sucrose Limited at Village Chak Allabaksh and Mahiuldinpur Dalel, Tehsil-Mukerian, District-Hoshiarpur, Punjab. The promoters having learnt from the operation of the unit strongly believe that there is ample scope for Sugarcane based unit in the State of Punjab.

ii) Brief description of nature of project:

The proposed project of M/s. Indian Sucrose Limited is for expansion of 5000 TCD to 12000 TCD of sugarcane based unit along with Cogeneration Power Plant of 19.5 MW to 59.5 MW at Village Chak Allabaksh and Mahiuldinpur Dalel, Tehsil-Mukerian, District-Hoshiarpur, Punjab.

iii) Need for the Project and its importance to the country and or region.
Sugarcane is generally regarded as one of the most significant and efficient sources of biomass for bio-fuel (ethanol) production. Sugarcane offers production alternatives to food, such as feed, fibre and energy, particularly co-generation of electricity and ethanol.

In India, sugar is an essential item of mass consumption and the cheapest source of energy, supplying around 10 percent of the daily calorie intake. India is the second largest producer of sugar (16.3 million ton production in 2008-09) and India is the largest consumer of sugar in the world. As per the latest production data, MY 2016/17 sugar production is estimated at 21.9 MMT, down by 8.4 percent from the previous estimate and almost 20 percent below last year’s production. As a result, total sugar supplies are limited to 32.6 MMT, which is just enough to meet the out-year consumption and stock requirements. For the third time in recent years, Indian sugar production dropped below consumption (25.6 MMT). Maharashtra and UP will contribute 22 percent and 43 percent respectively, of total production (crystal weight basis).

M/s. Indian Sucrose Limited is for expansion of of 5000 TCD to 12000 TCD of sugarcane based unit along with Cogeneration Power Plant of 19.5MW to 59.5 MW at Village Chak Allabaksh and Mahiuldinpur Dalel, Tehsil-Mukerian, District-Hoshiarpur, Punjab. The proposed expansion of sugar mill plant will play an important role in upliftment of the socio economic condition of the region particularly nearby villages.

iv) Consumption

India’s centrifugal sugar production in marketing year (MY) 2017/18 (Oct-Sept) is expected to increase by 18 percent to 25.8 million metric tons (MMT). Uttar Pradesh will be the largest producer of sugar in India, followed by Maharashtra.

Out-year sugar consumption is forecast to recover to 26 MMT, a marginal increase from the 25.6 MMT estimated for current year. Bulk consumers account for two-thirds of total sugar consumption in India. Over the last six months, moderate sugar demand from soft drink manufacturers, bakeries, hotels, restaurants, and other bulk and individual users led to a decrease in aggregate demand, matched by relatively lower sales reported by sugar mills. The disruption in the flow of currency following India’s demonetization in November 2016 is the likely explanation for this dip. Most khandsari
sugar is consumed by local sweet shops and gur is mostly consumed in rural households and for feed use. India’s stable economy, rising incomes, growing young population, and changing consumption patterns are key drivers for food consumption.

v) **Sugarcane Production and Marketing policy**

The GOI supports research, development, training of farmers, transfer of new varieties, and improved production technologies (seed, implements, pest management) to sugarcane growers as to raise yields and recovery rates. The Indian Council of Agricultural Research conducts sugarcane research and development at the national level. State agricultural universities, regional research institutions, and state agricultural extension agencies support these efforts at the regional and state levels. Central and state governments also support sugarcane growers by ensuring finances and input supplies at affordable prices. To increase the area of cultivation and production in the country, the GOI has implemented the “Sustainable Development Fund of Sugarcane Based Cropping System Area under Macro Management Mode of Agriculture” program in various sugarcane growing states. Additionally, under the Rashtriya Krishi Vikas Yojana (National Agriculture Development Program), state governments have the flexibility to choose priorities for crop development projects, including sugarcane. Per media reports, the Union Budget 2017/18 (April-March) allocated about $76 million under the Sugar Development Fund to provide assistance in the form of interest to sugar mills towards working capital loans of about $980 million. The GOI projects a sugar tax collection of about $460 million. At the current exchange rate, the GOI collects $3.58 per MT of sugar produced by mills in support of the Sugarcane Development Fund (SDF), which is used to support research, extension, and technological improvement in the sugar sector.

As of April 1, 2017, the GOI will stop providing the INR 18.50/kilogram subsidy on sugar to states for selling it via public distribution system (PDS) at ration shops. A sum of about $3 billion was allocated in the Union Budget 2017/18 for clearing past claims by state governments. Earlier, the GOI continued to subsidize sugar for consumers by allowing state governments to procure sugar from the market through open tenders. The gap between open market prices and PDS sale prices/retail issue price was covered by the GOI.
Following two years of deregulation of sale of sugar, the GOI in 2015 reviewed the ‘decontrol of sugar marketing’ and allowed states/Union Territories to either absorb the additional cost, if any, on account of handling, transportation and dealer’s commission or pass it on to consumers by including it in the retail issue price (INR 13.50 per kg). The new system was adopted by 30 states/Union Territories (UTs). Industry sources expect that the sugar industry will continue to be subject to production controls by state governments, including sugar industry licensing, specified cane procurement areas for sugar mills, and cane pricing.

vi) Domestic/Export Market

There is a huge demand of Indian made Sugarcane based sugar in the national and international market. Assuming normal market conditions, India may import an estimated 0.5 MMT of sugar (mostly raw) in MY 2017/18. A 20-percent drop in total supplies over the last three years will encourage imports only to augment local supplies while consumption will recover marginally to 26 MMT. The preceding statement assumes duty-free imports for commercial viability while export in forecast year is estimated to be negligible except for some sugar re-exported under the under the Advance License Scheme (ALS). Under the ALS, local sugar millers are allowed to import raw sugar duty-free against a future export commitment. Note: If sugar production is higher than anticipated, the Government of India (GOI) will likely intervene with market controls and regulate levels of imports. International sugar prices have been lower than domestic Indian prices since October 2016. Prevailing domestic sugar prices should encourage mills to sell locally, keeping Indian sugar exports less competitive. Although India mostly imports sugar from Brazil, in recent years small volumes of New Zealand and British sugar were also imported (500,000-800,000 MT), along with even smaller volumes were from Germany, the United States, Italy, the UAE and Australia. Current year sugar exports are nil except for an estimated 1.2 MMT as refined sugar re-exported under the ALS. Commercial imports are now estimated at 500,000 MT (mostly raw).

vii) Employment Generation (Direct and indirect)
Due to the proposed expansion of sugar mill project in the region direct and indirect employment avenues will be created in the nearby areas. In existing 5000 TCD sugarcane based sugar mill 325 manpower is required in season and 25 persons will be added after expansion (12000 TCD). During off-season the existing manpower is 190 and after expansion 20 more persons will be added.

3. PROJECT DESCRIPTION

i) Type of Project including interlinked and interdependent projects, if any

The proposed expansion project of sugar mill is for setting up of manufacturing facilities to produce Sugar and its by products are Molasses, Press Mud and Bagasse. It is based on primarily agricultural products (Sugarcane). The project will be equipped with fully diversified processing facilities. The number of working days for sugar production and power generation will be 160 days during season.

ii) Location (Map showing general location, specific location, and project boundary and project site layout) with coordinates

Location : 31°55'34.99"N Longitude-75°37'47.07"E
Village : Chak Allabaksh and Mahiuldinpur Dalel
Tehsil : Mukerian
District : Hoshiarpur
State : Punjab
**M/s Indian Sucrose Limited**
Expansion from 5000 TCD to 12000 TCD unit along with Cogeneration power plant of capacity 19.5 MW to 59.5 MW

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**Figure 1: Google Image**
M/s Indian Sucrose Limited
Expansion from 5000 TCD to 12000 TCD unit along with Cogeneration power plant of capacity 19.5 MW to 59.5 MW

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Figure 2: Key Plan showing 10 km radius study area
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Figure: 3 Layout Plan
iii) Details of alternate sites Considered and the basis of selecting the proposed site, particularly the environment consideration gone into should be highlighted.

No alternate sites have been considered for the proposed expansion of Sugar Industry project as the due to the existing Sugar Industry all the facilities are easily available and also has a well-developed infrastructure. Also, the land was easy available and area is rich in raw material sources with ease of accessibility.

Advantages of the Project Site

- Required Raw Material (Sugarcane) & Chemicals (Lime and Sulphur) is available easily in the nearby areas. Raw materials can be easily procured from fields states such as Haryana Punjab etc.
- Good availability of Water, Good Quality of Water.
- Well connected by Road / Rail Network
- Proximity of Sugar Consuming Markets
- Manpower availability
- Land availability for carrying out Project expansion
- Existing infrastructure

iv) Size or magnitude of operation

This is the expansion project of M/s. Indian Sucrose Limited from 5000 TCD to 12000 TCD of sugarcane based unit along with Cogeneration Power Plant of 19.5MW to 59.5 MW at Village Chak Allabaksh and Mahiuldinpur Dalel, Tehsil-Mukerian, District-Hoshiarpur, Punjab.

v) Project description with process details: (a schematic diagram/flowchart layout, components of the project)

The Sugar Industry will use sugarcane as raw material in the production of Sugar. The process description of Sugar production by using sugarcane as raw materials is as follows:

A) Process Description of Sugar Industry

The major unit operations are shown in figure these are
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Fig: 4 Manufacturing Process

1. **Extraction of juice**: The sugarcane is passed through devices like knives for cutting the stalks into chips before being subjected to crushing in a milling tandem comprising 4 to 6 three roller mills. Fine preparation with its impact on final extraction, is receiving special attention & shredders & particularly the fibrizers are gaining popularity. The mills are of modern design, being equipped with turbine drive, special feeding devices, efficient compound imbibitions systematic In the best milling practice More than 95% of the sugar in the cane goes into the juice, this percentage being called the sucrose extraction or more
simply the extraction. A fibrous residue called bagasse with a low sucrose content is produced about 25 to 30% of cane, which contains 45 to 55% moisture.

2. Clarification:
The dark green juice from the mills is acidic (pH4.5) & turbid, called raw juice or mixed juice. The mixed juice after being heated to 65 to 75°C is treated with phosphoric acid, sulphur dioxide & milk of lime for removal of impurities in suspension in a continuously working apparatus. The treated juice on boiling fed to continuous clarifier from which the clear juice is decanted while these settled impurities known as mud dissent to the field as fertilizer. The clear juice goes to the evaporators without further treatment.

3. Evaporation
The clarified juice contains about 85% water. About 75% of this water is evaporated in vacuum multiple effects consisting of a succeeding (generally four) of vacuum boiling cells arranged in series so that each succeeding body has higher vacuum. The vapours from the final body go to condenser. The syrup leaves the last body continuously with about 60% solids & 40% water.

4. Crystallization
The syrup is again treated with sulphur dioxide before being sent to the pan station for crystallization of sugar. Crystallization takes place in single-effect vacuum pans, where the syrup is evaporated until saturated with sugar. At this point ‘seedgrain’ is added to serve as a nucleus for the sugar crystals & more syrup is added as water evaporates. The growth of the crystals continues until the pan is full. Given as killed sugar boiler (or adequate instrumentation) the original crystals can be grown without the formation of additional crystals, so that when the pan is just full, the crystals are all of desired size & the crystal & syrup form a dense mass known as ‘mass ecuite’. The ‘strike’ is then discharged through a foot valve into a crystallizer.

5. Centrifugation
The mass ecuite from crystallizer is drawn into revolving machines called centrifuges. The perforated lining retains the sugar crystals, which may be washed with water if desired. The mother liquor ‘molasses’ passes through the lining because of the centrifugal force exerted &
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after the sugar is ‘Purged’ it is cutdown leaving the centrifuge ready for another charge of mass ecuite. Continuous centrifuges may purge low grades. The mother liquor separated from commercial sugar is again sent to pan for boiling and re-crystallization. Three stages of recrystallization are adopted to ensure maximum recovery of sugar in crystal form. The final molasses is sent out the factory as waste being unsuitable for recovery of sugar under commercial condition from economical point of view.

It may be noted that the expansion is only marginal by 10 to 14% and is achieved by modernization of machinery hardware notably as–

- Stabilization of crush rate by addition of one new mill with TRPF
- Reduction in sugar loss in Bagasse by improving Reduced Mill Extraction and Cane preparation
- Power saving by replacing fibrizer turbine drive
- Steam reduction by adopting use of extensive vapour bleeding with addition of evaporator bodies, one juice heater and flash heat recovery system
- Improvement in sugar quality by replacing gold centrifugal machines

Co-generation Power Plant

Indian Sucrose Limited proposes to expand a bagasse based Co-Generation Power Plant to 59.5 MW, the peculiarities of manufacturing process are as follows.

This is a simple three step process namely Water preparation, Steam Generation and Power Generation. The standard flow-sheet as will be adopted can be given as
The steam turbine operates on basic principles of thermodynamics. After leaving the boiler, superheated vapour enters the turbine at high temperature and high pressure. The high heat/pressure steam is converted into kinetic energy using a nozzle (a fixed nozzle in an impulse type turbine or the fixed blades in a reaction type turbine). Once the steam has left the nozzle it is moving at high velocity and is sent to the blades of the turbine. A force is created on the blades due to the pressure of the vapour on the blades causing them to move. A generator or other such device can be placed on the shaft, and the energy that was in the vapour can now be stored and used. The gas exits the turbine as a saturated vapour at a lower temperature and pressure than it entered with and is sent to the condenser to be cooled.
Table 1: Raw Material Requirement

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particular</th>
<th>Existing 500 TCD</th>
<th>Proposed 1200 TCD</th>
<th>Source of the Raw Material &amp; Mode of Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sugarcane</td>
<td>5000 TCD</td>
<td>12000 TCD</td>
<td>From reserve area by tractor trolley/trucks.</td>
</tr>
<tr>
<td>2.</td>
<td>Lime</td>
<td>10 MT/Day</td>
<td>15 MT/Day</td>
<td>Nearby market</td>
</tr>
<tr>
<td>3.</td>
<td>Sulphur</td>
<td>4 MT/Day</td>
<td>6 MT/Day</td>
<td>Nearby market</td>
</tr>
</tbody>
</table>

**Chemicals**

4. Bagasse (In season) 1400 TPD 1960 TPD From their own mill
5. Rice Husk (Off-season) 630 TPD 882 TPD From market
6. Paddy Straw (Off-season) 398 TPD 560 TPD From market
7. Wood Chips (Off-season) 200 TPD 280 TPD From market
8. Maize Cobs (Off-season) 107 TPD 150 TPD From market

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

M/s. Indian Sucrose Ltd. will make optimum utilization, recycling and reuse. These resources include Land, Fuel (Bagasse, Rice husk, Paddy Straw, Wood Chips, Maize Cobs), Sugarcane, Water and Electricity. Wastewater generated from the whole sugar making process will be treated and recycled for further process, domestic & green belt development uses.

A) Water Requirement

Table 2: Water Requirement

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Particulars</th>
<th>Existing</th>
<th>Expansion</th>
<th>Total</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water</td>
<td>468 KLPD</td>
<td>364 KLPD</td>
<td>832 KLPD</td>
<td>Ground Water through</td>
</tr>
</tbody>
</table>
B) Power Requirement

Details of power consumption in the sugar mill are shown in **Table 3**.

**Table 3: Power requirement**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Particulars</th>
<th>Details @0.032 MW/T</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power Requirement for existing 5000 TCD sugar mill</td>
<td>160 MW/day during season</td>
<td>From their own Cogeneration power plant</td>
</tr>
<tr>
<td>2</td>
<td>Power Requirement for proposed expansion 12000 TCD sugar mill</td>
<td>224 MW/day during season</td>
<td></td>
</tr>
</tbody>
</table>

Total 384 MW/day

Cogeneration Power Production 59.5 MW/h

C) Steam Requirement

Steam is required in the processes such as generation of Power. 3 turbines are already installed at the project site for power generation and 1 turbine will be added for expansion project. Total steam requirement for the proposed project is shown in the table below:

**Table 4: Steam Requirement**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Steam Requirement for Existing 5000 TCD sugar mill</th>
<th>Steam Requirement for proposed Expansion to 7000 TCD sugar mill</th>
<th>Total Steam Requirement for 12000 TCD sugar mill</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100TPH</td>
<td>75TPH</td>
<td>175TPH Source: From industries own boilers</td>
</tr>
</tbody>
</table>

(ix) Quantity of waste to be generated (Liquid and solid) and scheme for their management.

**Waste water generation & treatment**

Most of the water will be recycled back. Effluent from manufacturing process will be treated in existing ETP. Treated water will be used for green belt development.

**Air Pollution**
The following air pollution control systems are to be installed in this project to reduce the anticipated adverse impacts: Air quality marginally may get affected due to emissions generated from burning fuel in boiler and D.G. sets; they are Particulate matter and small amount of SO\textsubscript{x} an NO\textsubscript{x}. To mitigate the impact, stack of appropriate height of 30 meters provided for all the three existing boilers of capacity 160 TPH each and proposed one boiler of capacity 200 TPH. To reduce particulate matter concentration Electro Static Precipitator will be installed. Green belt will developed in 7.70 Ha area. Additional 33% area will be developed as Green belt for proposed expansion which will acts like adsorbent of air pollutants. To combat fugitive emissions roads are paved and regularly swept. Water sprinklers are provided for suppression of dust. Vehicular exhaust is being maintained by providing regular maintenance and servicing of vehicles. Same will be continued for future also.

**Solid Waste Management**

All the solid waste generated will be managed as under:

<table>
<thead>
<tr>
<th>Name of the Solid Waste</th>
<th>Quantity</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiler Ash</td>
<td>Existing: 25 Ton/Day Proposed: 35 Ton/Day</td>
<td>Boiler ash will be given to the farmers</td>
</tr>
<tr>
<td>ETP Sludge</td>
<td>Existing: 2 Ton/Day Proposed: 2.8 Ton/Day</td>
<td>ETP Sludge will be given to the farmers</td>
</tr>
<tr>
<td>Bagasse</td>
<td>Existing: 1400 Ton/Day Proposed: 1960 Ton/Day</td>
<td>Bagasse will be used as fuel in the boiler</td>
</tr>
<tr>
<td>Molasses</td>
<td>Existing: 216 Ton/Day Proposed: 302 Ton/Day</td>
<td>Molasses will be Sold</td>
</tr>
<tr>
<td>Press mud</td>
<td>Existing: 195 Ton/Day Proposed: 273 Ton/Day</td>
<td>Press mud will be given to the farmers</td>
</tr>
</tbody>
</table>

4. **SITE ANALYSIS**

   i) **Connectivity**
The Plant site is located at Villages-Chak Allabaksh and Mahiuldinpur Dalel, Tehsil-Mukerian, Distt. Hoshiarpur, Punjab approximately 0.5 KM from nearest National Highway (NH-1A). The nearest Railway Station is Mukerian, Railway Station, approximately 3 km in North direction from the project site. The nearest town is city is mukerian approximately 3 km in North direction. Hoshiarpur, District Headquater is approximately 55 km in South-East direction from the project site.

ii) Land form, Land Use and Land Ownership

The existing land for 5000 TCD sugar mill is 21.46 Ha. The land is completely acquired. Land papers are enclosed as Annexure. No additional land is required for setting up of 12000 TCD sugar mill. This area will be enough for the following areas of working:-
1. Storage for raw material and finished goods.
2. Plant and Machinery
3. Offices
4. Toilets
5. Water storage tanks
6. ETP Plant
7. STP Plant

Open space will be landscaped and trees will be planted in due course of time.

iii) Topography (along with map):

The district Hoshiarpur is located in Indo Gangetic plains and Sutlej sub basin constituting the part of Indus Main basin. Topography of Hoshiarpur is divided into three main regions. The fertile region of Dasuya, Mukerian and Tanda blocks comes under flood plains and is nearly one fourth of the total area of this district. The main cultivable areas of Hoshiarpur are located under this region with adequate irrigation facilities. The second topographical region is Kandi belt of Hoshiarpur II with Bhunga and Talwara being its other significant parts. This is the region that is covered with undulating plains at the foothills of Shivalik Ranges. Geography of Hoshiarpur, Physical Features of Hoshiarpur, Climate. The slopes of this region fall towards the western parts of district with soil erosion caused by the small streams of water inundating this area. This region is nearly the half of Hoshiarpur district and cultivation is generally rain fed here. The third region of this district has Hoshiarpur I, Garh Shankar, and Mahilpur as main areas. This
The topographical region also has undulating plains with sandy soil. The soil of Hoshiarpur region is yellowish to dark brown with sand forming major portion of it. Calcareous sand, sandy loams and silts are the main components of soil here. There are alluvial deposits of piedmont and fluvial types occupying whole district with better ground water conditions. There are mineral deposits of white quartzite in several areas of district. Some areas also have calcareous Tufa with shells of invertebrates. Coal, clay, and building materials like gravel and boulder are also found in this region.

**HYDROGEOLOGY:** Unconsolidated alluvial sediments lying south of Siwalik foothills mainly occupy the district. The alluvial sediments are classified as piedmont and fluvial deposits. The piedmont deposits lie along Siwalik Hills, which comprises boulders, pebbles, gravel, sand and...
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clay. It is further divided into Kandi and Sirowal, which are contemporaneous, and merge imperceptibly with each other. The fluvial comprise of silt, sand, gravel and clay in association with Kankar. Ground water is generally fresh at all levels. Ground water exploration was carried out at 48 sites which includes 5 piezometers. The boreholes at Patti Khas, Naloian, Jian, Hariana and Niala were abandoned due to insufficient thickness of aquifers. In the rest of the area, as well the ground water occurs under unconfined conditions in shallow aquifers and under semi-confined to confined condition in deeper aquifers. The drilling depth range from 126 to 460m bgl and constructed in the depth range of 103 to 374m. The yield of these wells ranges from 708 lpm to 2900 lpm with draw down of 5 to 12m. The wells constructed in the northwestern part of the district were high yielding wells than those constructed along the Siwalik foothills zone. Transmissivity of aquifers ranges from 634 to 4120 m²/day. The hydraulic conductivity value in the district varies from 2 to 29m/day. The value of storage coefficient worked out to be $58 \times 10^{-2}$ to $1.8 \times 10^{-3}$.

Ground water flow: The elevation of the water table in the district varies from 221.34 to 229.34 m above mean sea level. The water table elevation map shows the general slope of the water table towards South SE from North. The average gradient of the water table is of the order of 1.5 m/km. The overall flow of ground water is from north to southeast direction.

RAINFALL & CLIMATE: The climate of Hoshiarpur district is classified as tropical steppee, hot and semi-arid which is mainly dry with very hot summer and cold winter except during monsoon season when moist air of oceanic origin penetrates into the district. There are four seasons in a year. The hot season starts from mid March to last week of the June followed by the south west monsoon which lasts upto September. The transition period from September to November forms the post monsoon season. The winter season starts late in November and remains up to first week of March. Rainfall: The normal annual rainfall of the district is 938 mm which is unevenly distributed over the area in 38 days. The south west monsoon, sets in from first week of July and withdraws in end of September, contributes about 77% of annual rainfall. July and August are the wettest months. Rest 23% rainfall is received during non-monsoon period in the wake of western disturbances and thunder storms. Generally rainfall in the district increases from southwest to northeast.

Rainfall:
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Normal Annual Rainfall: 938 mm
Normal monsoon Rainfall: 720 mm
Temperature Mean Maximum: 39°C (May- June)
Mean Minimum: 5°C (January)
Normal Rainy days: 38

Drainage:

Hoshiarpur along with the districts of Nawanshehar, Kapurthala and parts of Jalandhar represents one of the cultural region of Punjab called Doaba or the Bist Doab - the tract of land between two rivers namely Beas and Sutlej. The area along with the Shivalik foothills on the right side of Chandigarh-Pathankot road in Hoshiarpur is submountainous and this part of the district is also known as Kandi area. The two rivers, Sutlej and Beas along with two other seasonal streams provide drainage to the region. Besides these, the Kandi region is full of seasonal streams.

Drainage system with description of main rivers

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of River</th>
<th>Area drained (Sq.KM)</th>
<th>% Area drained in the District</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>River Beas Downstream</td>
<td>50x1200’ or 50x0.366=18.30 Sq.KM</td>
<td>-</td>
</tr>
</tbody>
</table>

vi) Social Infrastructure Available

The entire social infrastructure, as mentioned below, is available within 10 - 20 Km. of proposed sugar mill Project Site.

- Schools (Primary as well as secondary)
- Colleges (Science, commerce, Arts, engineering, medical, pharmacy, education)
- Health centers, dispensaries, hospitals
- Electricity
M/s Indian Sucrose Limited
Expansion from 5000 TCD to 12000 TCD unit along with Cogeneration power plant of capacity 19.5 MW to 59.5 MW

PRE FEASIBILITY REPORT

- Drinking water supply
- Banks (Cooperative as well as nationalized) and credit societies

Table 6: Details of 10 km radius study area

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Location</td>
<td></td>
</tr>
<tr>
<td>a)</td>
<td>Village/ Town/Plot No.</td>
<td>Chak Allabaksh and Mohiuldinpur Dalel</td>
</tr>
<tr>
<td>b)</td>
<td>District</td>
<td>Hoshiarpur</td>
</tr>
<tr>
<td>c)</td>
<td>State</td>
<td>Punjab</td>
</tr>
<tr>
<td>d)</td>
<td>Latitude</td>
<td>31°55'34.99&quot;N</td>
</tr>
<tr>
<td>e)</td>
<td>Longitude</td>
<td>75°37'47.07&quot;E</td>
</tr>
<tr>
<td>f)</td>
<td>Toposheet No.</td>
<td>H43D9/H43D12</td>
</tr>
<tr>
<td>2</td>
<td>Elevation</td>
<td>256-260m</td>
</tr>
<tr>
<td>3</td>
<td>Land use at the project site</td>
<td>Not Industrial</td>
</tr>
<tr>
<td>4</td>
<td>Climatic Conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
<td>Temperature Mean Maximum: 39°C (May-June)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean Minimum: 5°C (January)</td>
</tr>
<tr>
<td></td>
<td>Rainfall</td>
<td>Normal Annual Rainfall: 938 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal monsoon Rainfall: 720 mm</td>
</tr>
<tr>
<td>5</td>
<td>Nearest highway</td>
<td>NH-1A is 0.5 km at a distance in West direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SH-25 is 2.55 km at a distance in North direction</td>
</tr>
<tr>
<td>6</td>
<td>Nearest Railway Station</td>
<td>Mukerian Railway Station is 3 km (approx) in North direction from the project site.</td>
</tr>
<tr>
<td>7</td>
<td>Nearest airport</td>
<td>Sri Guru Ram Das jee International Airport Amritsar Airport is 95 km (approx) in South-West direction from the project site.</td>
</tr>
<tr>
<td>8</td>
<td>Nearest city/settlement</td>
<td>Mukerian is 3 km (approx) in North direction from the project site.</td>
</tr>
<tr>
<td>10</td>
<td>Features with 10 km</td>
<td></td>
</tr>
<tr>
<td>i)</td>
<td>Defence installations</td>
<td>Nil</td>
</tr>
<tr>
<td>ii)</td>
<td>Archaeological important places</td>
<td>Nil</td>
</tr>
<tr>
<td>iii)</td>
<td>Wild life sanctuaries</td>
<td>Nil</td>
</tr>
</tbody>
</table>
M/s Indian Sucrose Limited
Expansion from 5000 TCD to 12000 TCD unit along with Cogeneration power plant of capacity 19.5 MW to 59.5 MW

PRE FEASIBILITY REPORT

<table>
<thead>
<tr>
<th>iv)</th>
<th>Reserved/Protected forest</th>
<th>No Reserved/Protected forest within 10KM of Project unit area.</th>
</tr>
</thead>
<tbody>
<tr>
<td>vi)</td>
<td>Rivers</td>
<td>Beas river is at a distance of 10km (approx) in West direction from project site.</td>
</tr>
<tr>
<td>vii)</td>
<td>Hill ranges</td>
<td>Nil</td>
</tr>
<tr>
<td>viii)</td>
<td>State Boundary</td>
<td>Nil</td>
</tr>
</tbody>
</table>

5. PLANNING BRIEF

i) Planning concept (type of Industries, facilities, transportation etc) Town and country planning/Development authority classification.

Type of Industry
As per EIA Notification dated 14\textsuperscript{th} Sept., 2006 and amended from time to time, the proposed project falls under Category “B”, Project or Activity 5(J).

ii) Population Projection
Unskilled Man Power required for the proposed expansion Project will be met from the local villages completely. Qualified semi-skilled man power requires will be met from local villages if available. Hence there will not be much population increase in the area.

iii) Land Use Planning
The existing 5000 TCD sugar mill is set up in an area of 21.46 Ha and the expansion of proposed 12000 TCD sugar mill will be set up in existing land. The land use break up is as follows:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Land Usage</th>
<th>Area in Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sugar Mill Plant</td>
<td>9.9</td>
</tr>
<tr>
<td>2</td>
<td>Power Plant</td>
<td>4.5</td>
</tr>
<tr>
<td>3</td>
<td>Effluent Treatment Plant</td>
<td>1.0</td>
</tr>
<tr>
<td>4</td>
<td>Sewage Treatment Plant</td>
<td>1.0</td>
</tr>
<tr>
<td>5</td>
<td>Housing Colony</td>
<td>4.57</td>
</tr>
<tr>
<td>6</td>
<td>Green Plantation</td>
<td>19.25</td>
</tr>
<tr>
<td>7</td>
<td>Internal Road</td>
<td>1.73</td>
</tr>
<tr>
<td></td>
<td><strong>Total Area</strong></td>
<td><strong>42.0</strong></td>
</tr>
<tr>
<td>8</td>
<td>Open &amp; Cane Yard Area</td>
<td>11.08</td>
</tr>
</tbody>
</table>
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Whole Area of the mill

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Sugarcane storage section</td>
</tr>
<tr>
<td>2.</td>
<td>Sugarcane Handling Section</td>
</tr>
<tr>
<td>3.</td>
<td>Steam Boiler with accessories</td>
</tr>
<tr>
<td>4.</td>
<td>Steam Turbine</td>
</tr>
<tr>
<td>5.</td>
<td>Steam Condensers</td>
</tr>
<tr>
<td>6.</td>
<td>Air Compressors</td>
</tr>
<tr>
<td>7.</td>
<td>Storage Section</td>
</tr>
<tr>
<td>8.</td>
<td>Centrifugal Machines</td>
</tr>
<tr>
<td>9.</td>
<td>Product storage section</td>
</tr>
<tr>
<td>10.</td>
<td>Waste water Treatment</td>
</tr>
<tr>
<td>11.</td>
<td>Fire Protection Equipments for entire Plant</td>
</tr>
<tr>
<td>12.</td>
<td>Water Storage Tanks</td>
</tr>
<tr>
<td>13.</td>
<td>Electricals</td>
</tr>
<tr>
<td>14.</td>
<td>Piping works</td>
</tr>
</tbody>
</table>

i) Amenities/Facilities

Facilities like canteen, rest rooms and recreation facilities will be provided in the proposed expansion project. No other additional facilities are proposed.

6. PROPOSED INFRASTRUCTURE

The following plant and machinery will be installed in the Industrial processing area.

Table 8: List of Plant & Machinery

<table>
<thead>
<tr>
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</tr>
<tr>
<td>14.</td>
<td>Piping works</td>
</tr>
</tbody>
</table>

ii) Residential Area

Facilities like canteen, rest room and indoor games facilities will be provided in the proposed project.

iv) Green Belt

Green belt is developed in 7.70 Ha area. Additional approximately 33% area will be developed as Green belt for proposed expansion project. Green belt will be developed in 7.70 Ha of land.

v) Social Infrastructure
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Social infrastructure will be developed as per need based in the Villages.

vi) Connectivity
The Plant site is located at village Chak Allabaksh and Mahiuddinpur Dalel, Tehsil-Mukerian, Dist: Hoshiarpur, Punjab, and approximately 0.5 KM from nearest National Highway (NH-1A). The nearest Railway Station is Mukerian Railway Station approximately 3 km in North direction from the project site. The site is well connected to Mukerian through NH-1A and to Gurdaspur, Amritsar and Hoshiarpur through SH-25, SH-22, SH-24 respectively.

vii) Drinking water management
Proper Drinking water will be made available to the workers by RO within the plant premises.

viii) Sewerage System
Domestic waste will be treated in STP.

viii) Industrial Waste Management
Waste water generated from the proposed Project will be treated in Effluent Treatment Plant.

ix) Power requirement & Supply / Source:
The power requirement shall be met from their own cogeneration power plant of capacity 59.5 MW.

7. REHABILITATION & RESETTLEMENT PLAN
No rehabilitation or resettlement plan is proposed as there are no habitations in the in the Plant site.

8. PROJECT SCHEDULE & COST ESTIMATES
The project for expansion will start only after obtaining Environmental Clearance and all other required clearance and will complete after one year of commencement. The Capital Cost of the project will be 190 Crore.

9. ANALYSIS OF PROPOSAL (Final Recommendations)
With the implementation of proposed expansion project, the socio-economic status of the local people will improve substantially. The land rates in the area will improve in the nearby areas due to the proposed activity. This will help in upliftment of social status of the people in the area. Educational institutes will also come up and will lead to improvement of educational status of the people in the area. Primary health centers will also come up and medical facilities will certainly improve due to the proposed project.

Socio-Economic Developmental Activities
The management is committed to uplift the standards of living of the villagers by undertaking following activities / responsibilities.

- Health & hygiene
- Drinking water
- Education for poor
- Village roads
- Lighting
- Creating harmonious relationships
- Helping locals to conduct sports
- Training to the unskilled manpower

**Health & Hygiene**
1. Personal and domestic hygiene,
2. Maintaining clean neighborhood,
3. Weekly health camps offering free-check up & medicines
4. Ambulance services
5. Education & drug de-addiction, aids.

**Drinking Water**
- Making drinking water available at centralized locations in the village,

**Supporting Education**
1. Providing books to all poor children,
2. Conducting annual sports festival in the village schools,
3. Providing amenities like fans, lavatories