Saraswati Sugar Mills

PRE – FEASIBILITY REPORT

FOR

ESTABLISHMENT OF PROPOSED 100.0 KLD MOLASSES BASED DISTILLERY WITHSLOP FIRED COGENERATION PROJECT.

AT

VILLAGE/TOWN: YAMUNANAGAR
TEHSIL: JAGADHRI,
DISTRICT: YAMUNANAGAR,
HARYANA.

BY

M/S, SARASWATI SUGAR MILLS LTD,
(DISITLLERY DIVISION)

PRE - FEASIBILITY REPORT

1.0 Executive Summary

(I) Introduction

Saraswati Sugar Mills Ltd., (SSM) located at Yamuna nagar in Haryana is one of the oldest plants in North India. It was established in the year 1947. It was Public incorporated on 20 July 2000. The present crushing capacity of the sugar plant is 10,000 TCD. Apart from selling the finished product plantation white sugar, the company also sells molasses, the basic raw material for ethanol production and the surplus bagasse from the season operations.

In order to derive the best value of the other by product, namely the molasses. SSM would like to implement an ethanol distillery project. It is estimated that the in-house generation of about 78,400 MT of molasses per annum along with an estimated bought out of 60126.12 Mt will enable the company to implement a distillery of 100 kilo Litres per day (KLPD) capacity operating for a period of 365 days per annum. The proposed Distillery will be multi product plant capable of producing Industrial grade rectified sprit and the anhydrous ethanol used for blending with gasoline.

The distillery will be designed as a Zero Effluent Discharge plant with the spent wash concentrated and incinerated in a specially designed boiler. The high pressure steam generated in the boiler will enable adequate power generation in a turbo generator for meeting the requirements of the distillery operations will also provide the process steam required for the distillery operations. The distillery design will employ the multi pressure technology with the distillation columns operating under various pressures to economize on the energy consumption in the distillation process. The distillery project will also include effluent treatment plant based on anaerobic digestion. Aeration, clarification and reverse osmosis. To treat the condensate generated in the spent wash concentration plant and the spent less generated in the distillation process. The permeate from the RO system will be used as a process water, Thus reducing the dependence on external water and the concentrated RO reject will be mixed with the effluent spent wash upstream of the concentration plant.

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).

TABLE – 1
Salient Features of the Project

Sr No	Particulars	Details
1	Nature and Size of Project	Proposed 100.0 KLPD Molasses Based Distillery along with Co gen power – 5.63 MW .
2	Category of the Project	As per EIA Notification dated 14th Sep., 2006 as amended from time to time; the project falls in Category ‘A’, Project or Activity - 5(g).

3	**Locations Details**	
	Village / Town	Yamuna nagar
	Tehsil	Jagadhri
	District	Yamuna nagar
	State	Haryana
	Latitude	30° 7'14.05"N
	Longitude	77°16'39.24"E
	Topo sheet No	53F/4 and 53F/8
4	**Area Details**	
	Total Plant Area	Total land for proposed Distillery – 3.58 Hectare
	Greenbelt / Plantation Area	~33% of the project area will be covered under green belt plantation of 1.18 Hectare.
5	**Environmental Setting Details (with approximate aerial distance & direction from plant site)**	
	Nearest Village	Isopur – 0.46 Km
	Nearest Town & City	SSM Colony – 0.34 Km in North west Yamuna nagar – 1.80 km in North East Lajpat Nagar – 0.76 km in North East
	Nearest National Highway / State Highway	SH - 6 (0.38 km in South East direction) NH - 73 (0.11 km in South direction)
	Nearest Railway station	Jagadhri Railway Station (0.94 km in South East direction)
	Nearest Airport	Chandigarh International Airport (~ 78.07 km in South direction)
	National Parks, Reserved Forests (RF)/ Protected Forests (PF), Wildlife Sanctuaries, Biosphere Reserves, Tiger/ Elephant Reserves, Wildlife Corridors etc. within 10 km radius	No National Park, Wild Life Sanctuary, Biosphere Reserve, Tiger / Elephant Reserve, Wildlife Corridors, Reserved Forests (RF) / Protected Forests (PF) etc. falls within 10 km radius of the plant site.
	River / Water Body (within 10 km radius)	River Yamuna – 7.9 km in South East Direction
6	**Cost Details**	
	Total Project Cost	17891.59 Lakhs
	Cost for Environment Management Plan	Capital Cost : 4530.0 Lakh or 45.30 Crores Recurring cost : Rs 6.0 Crores /Annum

7	**Basic Requirements for the project**	
	Fresh Water Requirement	**Industrial Use:** 680.0 KLD (@ 6.8 KL/KL of Product) **Domestic Use:** 20.0 KLD Source – Groundwater
	Power Requirement	2860 KWH Source – Co Generation Power Plant
	Man Power Requirement	155 (Source:- Unskilled / Semi-Skilled - Local Area; Skilled- Local & Outside)
8	**Product Mix**	Ethanol /Rectified Spirit
9	**Working Days**	365.0 Days

2.0 Identification of project and project proponent

Saraswati Sugar Mills Limited, Yamunanagar Haryana, is located in district Yamunanagar of Haryana. The factory is most ideally located with respect to the availability of raw material, water, skilled and unskilled manpower and infrastructure facilities. The Central Government has taken various steps like better pricing of ethanol, interest subvention, approval of bio-fuel policy and reduction in GST rates.

Due to favorable policy towards Ethanol by the Central Govt., the company has decided to establish the 100.0 KLPD Molasses based Distillery Plant at our Yamunanagar Unit (where our sugar plant is situated) with Slop Fired cogeneration power. The investment in this project is expected to be Rs. 178.91 Crore.

In view of the availability of molasses from sugar plant at Yamunanagar and other sugar plants of the group located nearby, it is a suitable location for installation of an alcohol plant to meet the demand of the automobile fuel sector. Blending of Ethanol with petrol is being encouraged by the Indian Government to reduce the country's dependence on high priced imported crude oil.

Ethanol is manufactured from molasses in three steps. First molasses is fermented to produce fermented wash, followed by distillation of fermented wash to produce rectified spirit and finally rectified spirit is dehydrated into ethanol, using molecular sieve system. Molecular sieve system is better than the conventional distillation system as it consumes less steam as compared to the latter.

Now, Saraswati Sugar Mills Limited is proposing 100.0 KLPD Molasses based Distillery along with 5.63 MW of Co-Generation Power Plant at adjacent to Saraswati Sugar Mills Limited, (Distillery Division), Village /Town: Yamunanagar , Tehsil : Jagadhri, District – Yamunanagar , Haryana.

2.1 Brief description of the project

Brief description of the project Proposed site meets the guidelines prescribed by Ministry of Environment, Forest and Climate Change for sitting of an industry. Geographical coordinates of the site are 30° 7'14.20"N, 77°16'38.97"E. It is located approximately 0.11 km away from National Highway No. 73 (Jagadhri – Yamunanagar Marg) and State highway no. 6 is approximately 0.38 km in SE from the site.

Table 2.1,
Project Highlights

Sr No	Name of the proponent	M/s. Saraswati Sugar Mills Ltd, Unit - Distillery
1	Location of the project	At village/Town – Yamuna Nagar, Tehsil: Jagadhri, Dist.- Haryana .
2	Land	**Total land allocated =3.58 Hectare .** No need of acquisition of new land as, it is already under the possession of the project proponent (industrial land use) and the open plot near the sugar mill will be developed into a distillery.
3	Project	100.0 KLD Distillery along with 5.63 MW Co gen power.
4	Product	Rectified Spirit / Absolute alcohol (Ethanol) .
5	Operation days per annum	365.0 Days
6	Main Raw Material	Molasses 465.0 MT/Day (214.4 Litres of Alcohol can be obtained from 1 ton of molasses.)
7	Total Water Requirement	700.0 KLD (Industrial + Domestic)
8	Fuel	Bagasse (150.0 T/Day) + SLOP (300.0 KLD)
9	Steam	18.0 TPH (Process) and rest will utilised in co gen power.
10	Effluent Treatment System	Spent wash will be concentrated in Multi effect evaporation and then used as fuel in incineration boiler. Secondary effluent like MEE condensate and Blow down will be used treated in Secondary ETP.
11	Manpower	155 Numbes
12	Total Project Cost	17891.59 Lakhs
13	Capital expenses for Environment management	4530.0 Lakhs

2.3 Need of project and its importance to the country and region

As an agro based industry, Sugar industry in India is dependent on monsoon. Its financial viability drastically gets affected due to weather conditions as well as market. Therefore, it is forced to explore the alternative products from the available resources so as improve its financial stability. Molasses based distillery is one of such an alternative. Because raw material availability i.e. molasses is fulfilled in-house,

sugar mills produces own power (electricity). Therefore, the management of the factory has planned to establish a 100.0 KLPD molasses based distillery.

In India, mainly three types of alcohol are popularly produced, i.e. rectified spirit (RS), extra neutral alcohol (ENA) and anhydrous alcohol (AA). Of these, RS is used for large number of industrial, scientific, laboratory, medical and many other applications. Thus, demand for the same is immense and it is ever increasing. ENA is used for making liquors and other alcoholic beverages.

Molasses is a by-product of sugar industry. Since, the cane production in the area increases and with increase in efficiency of molasses production will also increase. Therefore, it has decided to install a new distillery of 100.0 KLD with Slop Fired cogeneration Project. The distillery unit will be producing, Ethanol / RS which are very significant for other industries, medical services, etc. Ethanol is used to blend with petrol, thus able to save valuable foreign exchange on import of fossil fuel.

2.4 Import vs. Indigenous production

The process is straight line and the technology even for the pollution control/disposal is available indigenously.

2.5 Export possibility

The finished products viz. Rectified Spirit (RS), and Ethanol is having great export potential.

2.6 Domestic / Export markets

Market places such as New Delhi, Ghaziabad, Chandigarh, Pune, Surat and Vadodara as well as chemical industries of Uttarakhand, Uttar Pradesh and Haryana are the potential domestic market for rectified spirit and Ethanol.

2.7 Employment Generation

Proposed project will be generating 155.0 direct employment opportunities, of which 100.0 number will be contractual. Apart from this, the project is anticipated to give plenty of indirect opportunities to transporters, shopkeepers and various facility providers such as schools, medical facilities, etc.

3.0 PROJECT DESCRIPTION

3.1 Type of project

Proposed project is a new installation of 100.0 KLPD molasses based distillery. Molasses is a by-product from the sugar industry which will be used as raw material in the proposed new distillery. The project is placed under item 5 (g) - for distillery unit as 'A' category as per EIA Notification, 2006 (as amended in 2009) and will be appraised at central level.

3.2 Location with coordinate

For EIA Study 5.0 & 10.0 km radial study area is covered and the same is shown on SOI Topo sheets 53F/4 and 53F/8 in the map below **Fig: 1.1 & 1.2** respectively.

Latitude and Longitude of the site at four corners and in the centre given below in Table 2.3

Table; 2.3

Latitude and longitude of the project site

Corners	Directions	Latitude and Longitude
1st	North	Lat : 30°07'19.44"N, Long: 77°16'32.61"E
2nd	South	Lat : 30°07'10.39"N, Long: 77°16'38.91"E
3rd	West	Lat : 30°07'13.94"N, Long: 77°16'31.50"E
4th	East	Lat : 30°07'12.57"N, Long: 77°16'53.23"E
	Centre	Lat : 30°07'14.07"N, Long: 77°16'39.02"E

3.3 Details of alternative site considered and basis of selecting the proposed site

Alternative sites for the proposed project are not considered, because of following reasons –

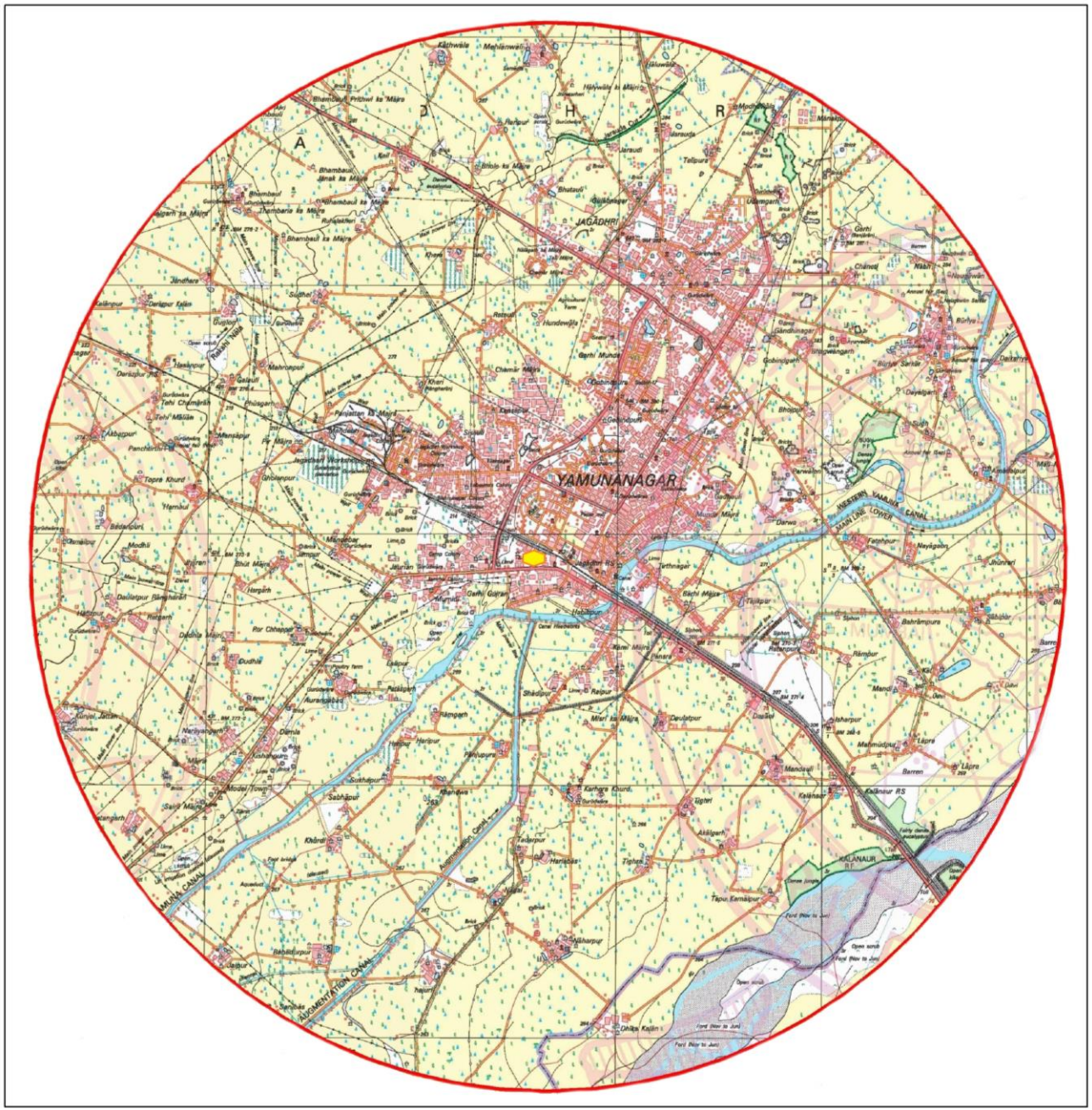
I. The project proponent is having land which is adequate for the proposed units as well as ancillary units thereof such as storage, treatment, disposal units, etc.

II. The present site meets the guidelines for sitting of an industry prescribed by MoEF & CC,

III. No rehabilitation or restoration issues involved with the proposed site,

IV. The plot is open and barren, thus minimal disturbance to the ecology,

V. Infrastructure and resources such as road, water, electricity, manpower, etc is already available.



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TOPO SHEET MAP WITHIN 10.0 KM RADIUS OF PROJECT SITE

Project Proposal :
Proposed establishment of 100.0 KLD (Molasses based) Distillery along with 5.3 MW Co gen Power.

Address :
Adjacent to existing sugar mill premises, at Yamunanagar, Tehsil : Jagadhri, District : Yamunanagar (Haryana)

Project Proponent :
M/s Saraswati Sugar Mills Limited, Unit - Distillery

Total Area Proposed : 3.58 Hectare

Topo sheet no : 54I/1, 53L/4

SCALE
2 1 0 2 4 6 8 10
Kilometers

Legends :

Fig : 1.1, Toposheet Map within 10.0 Km radius.

LOCATION OF PROJECT SITE

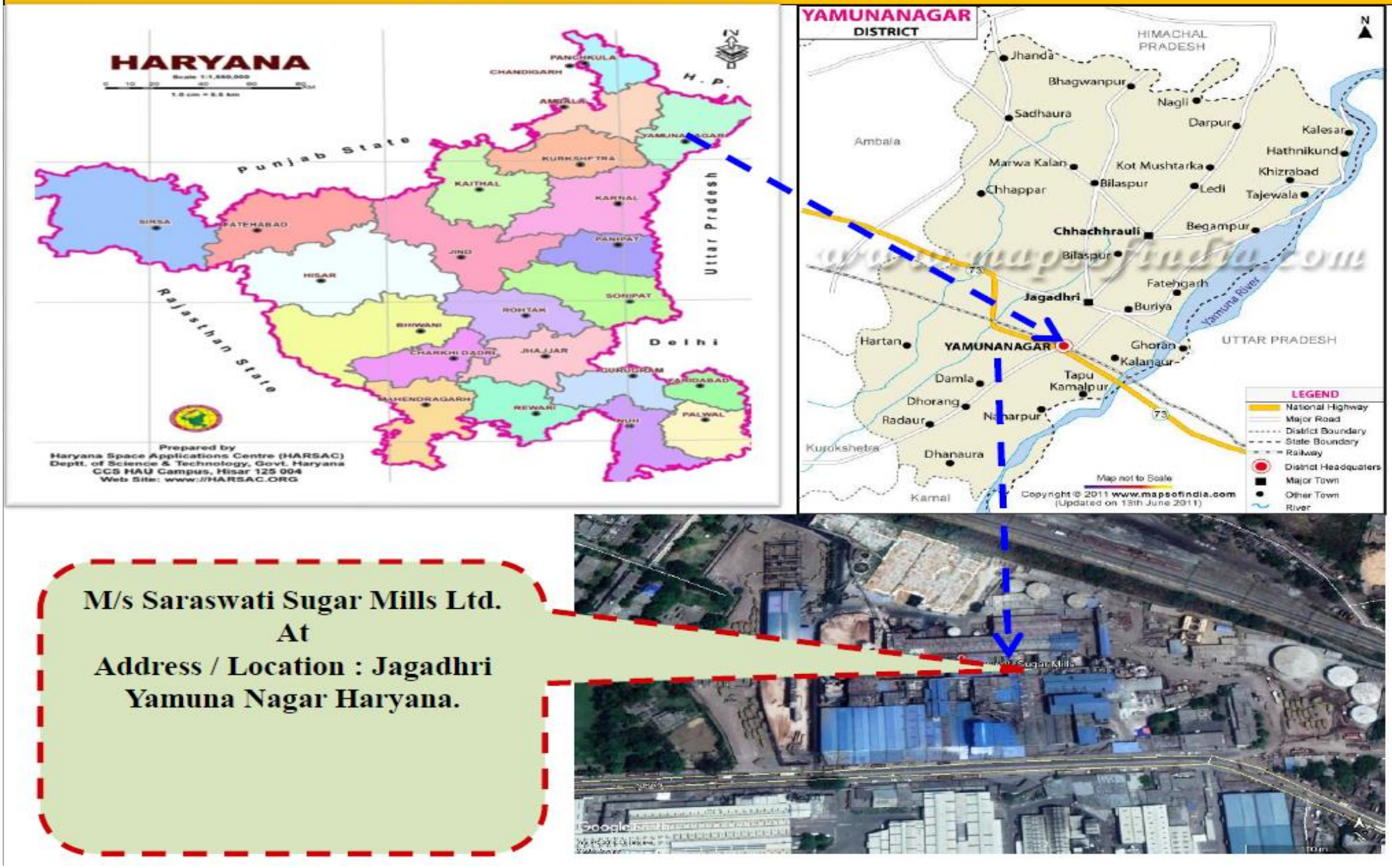

Fig: 1.3, Location of Proposed Project Site.

3.4 Size or magnitude of operation

New molasses based distillery of 100.0 KLPD along with Co gen power – 5.63 MW.

3.5 Project description with process details

Process Distillery

SSML Distillery Division decided to adopt the latest technology to achieve Zero Liquid Discharge (ZLD) for the proposed 100.0 KLPD distillery unit along with Co gen power – 5.63 MW; the peculiarities of manufacturing process are as follows

Manufacturing Process: The production process involves the following stages:

1. Fermentation
2. Distillation

Fermentation- Molasses is the chief raw material used for production of alcohol. Molasses contains about 50% total sugars, of which 30 to 33% are cane sugar and the rest are reducing sugar. During the fermentation, yeast strains of the species Saccharomyces cerevisieae, a living microorganism belonging to class fungi converts sugar present in the molasses such as sucrose or glucose in to alcohol. The continuous fermentation process involves addition of fresh nutrients medium either continuously or intermittent withdrawal of portion of nutrient for recovery of fermentation products. In continuous process, fermenter is in constant usage with little shut down and after initial inoculation of yeast culture, further inoculation is not necessary.

Distillation- After fermentation, the next stage in the manufacturing process is to separate alcohol from fermented wash and to concentrate it to 95%. This is called Rectified Spirit(RS). For this purpose, method of distillation is employed. After separation of alcohol, the remaining part is the effluent of the process i.e. spent wash and spent lees.

Anhydrous Alcohol (AA)

Anhydrous alcohol is an important product required by industry. As per IS specification it is nearly 100% pure or water free alcohol. Alcohol as manufactured by Indian distilleries is rectified spirit, which is 94.68% alcohol. It is not possible to remove remaining water from rectified spirit by straight distillation as ethyl alcohol forms a constant boiling mixture with water at this concentration and is known as azeotrope. Therefore, special process for removal of water is required for manufacture of anhydrous alcohol.

The various processes used for dehydration of alcohol are as follows

i) Azeotropic Distillation

ii) Molecular Sieves

iii) Pervaporation / Vapour permeation system.

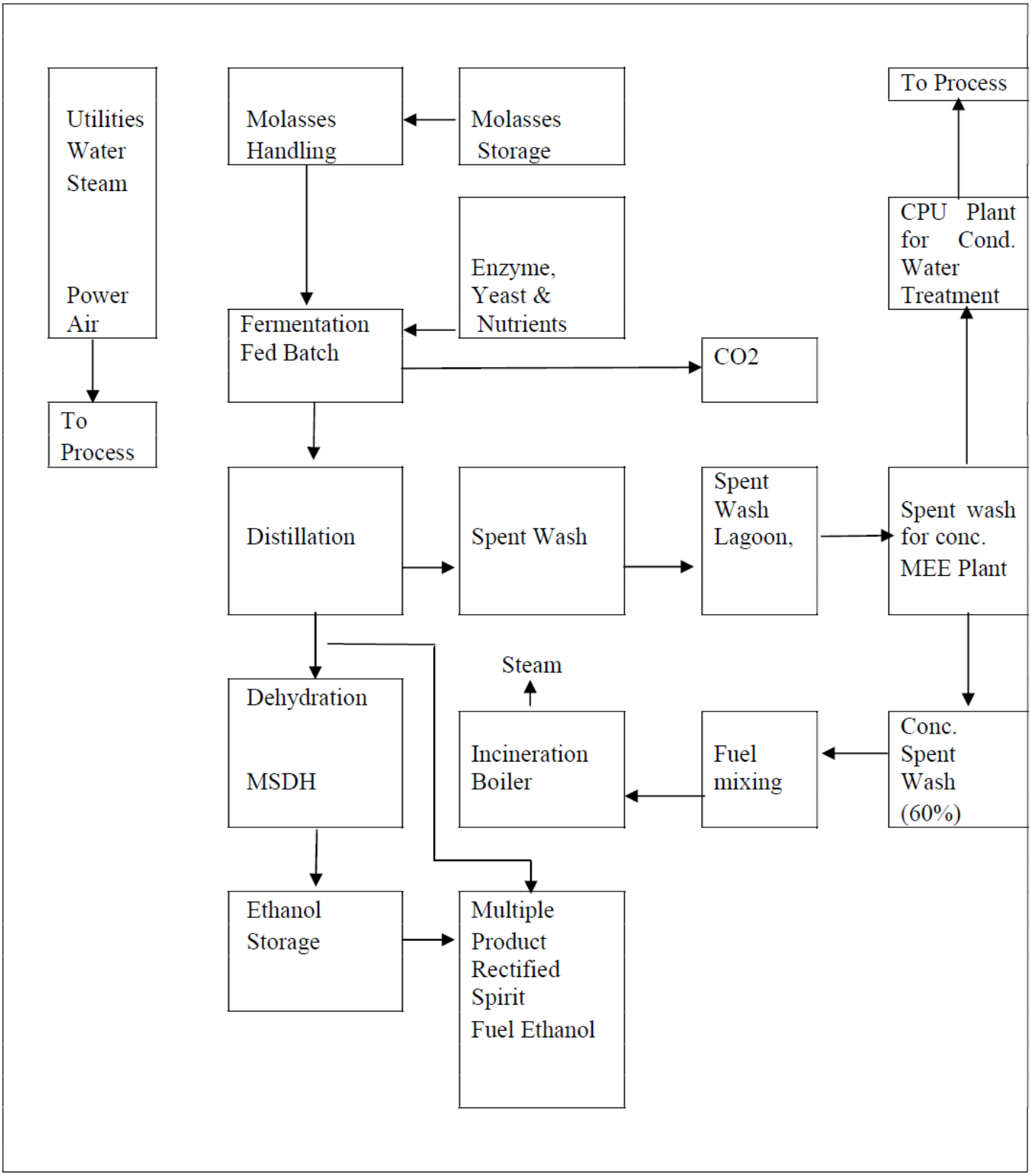

Fig: 1.1, Schematic Flow chart of RS / AA

3.6 Raw Materials required for finished products

Raw materials for the proposed project will be available from the local market. Molasses as raw material will be available from adjacent inhouse sugar mills. Product wise raw material consumption is given below:

Sr No	Particular	Quantity, MT/Day	Source of raw material & Mode of Transportation
1.	Molasses and B heavy Molasses	466.0 MT/Day	Adjacent sugar mills and other local sugar units. Tanker will be used for molasses transport.
2.	**Other Chemicals**		
	Sulphuric Acid	800 kg/Day	Nearby Market by Truck. 30 Days storage will be provided after the proposed Establishment.
	Nutrients (DAP/Urea	340.0 Kg/Day	
	Caustic (47 % w/w)	1600.0 kg/Day	
	Antifoam Agent	120.0 kg/Day	

3.7 Resource optimization / recycling and reuse envisaged in the project

Optimum utilization of the available resources is strived by the management. These resources include land, water, steam, molasses and power. Press-mud is a by-product of sugar factory that will be used for making manure by mixing fermenter sludge and potash rich fly ash generated in the distillery. Thereby, nutrients will be recycled.

3.8 Availability of water and its source

Necessary water requirement for the proposed project will be met from bore well. Water will be required for domestic, process and utility purpose. Daily fresh water requirement for the proposed distillery unit will be around 680.0 m3/d (@ 6.8 KL /KL of Product) .

Table 3.2:
Water Balance: Distillery of 100.0 KLPD with Slop Fired Cogeneration Power
Total Water Input for Proposed 100.0 KLD Distillery.

S No	Section	Water required (in KLD)
1.	Process water to Fermentation	350.0
2.	Sealing water & Vaccum Pump	200.0
3.	Cooling Tower Makeup	428.0
4.	Water in Molasses Dilution	105.0
5.	Steam Condensate	706.0

6.	CIP Cleaning	46.0
7.	Floor Washing	50.0
8.	Green Belt	50.0
9.	Other (Miscellaneous)	114.0
	Total (Recycle)	**2049.0**
	Fresh water requirement	680.0
	Domestic Use	20.0
	Total water requirement for the first run	**2749.0**

Total Water Output for Proposed 100.0 KLD Distillery

S No	Section	Water required (in KLD)
1.	Steam Condensate	766.0
2.	Spent wash	750.0
3.	Spent leese	237.0
4.	Cooling tower evaporation	628.0
5.	Blow Down (Boiler, CT)	190.0
7.	Sealing water & Vaccum Pump	200.0
8.	CIP	46.0
9.	Floor washing	50.0
10.	CO2 Scrubbing	76.0
	Grand Total	**2749.0**

Total Water Recycle for Proposed 100.0 KLD Distillery

S No	Section	Water required (in KLD)
1.	**Process water to Fermentation**	**350.0**
2.	**Sealing water & Vaccum Pump**	**200.0**
3.	**Cooling Tower Makeup**	**428.0**
4.	**Water in Molasses Dilution**	**105.0**
5.	**Steam Condensate**	**706.0**
6.	**CIP Cleaning**	**46.0**
7.	**Floor Washing**	**50.0**
8.	**Green Belt**	**50.0**

9.	**Other (Miscellaneous)**	**114.0**
	Total (Recycle)	**2049.0**

3.8.1 Steam & Power requirement

Steam requirement for the process is 18.0 TPH at 4.5 bar(a) Saturated, rest steam will be utilised in Co gen power. The steam Requirement for spent wash concentration from approximately 19.68 % w/w solid to 60 % w/w solids in the stand alone evaporation system is 6.0 TPH at 2.5 bar (a) saturated. In addition to the above the Spent wash fired boiler is provided with deaerator which requires steam for deaeration purposes and also for heating the combustion air in the steam air pre –heater.

The total power requirement (at 415V, 3PH, 50 Hz level) for the distillery and co – generation plant is given below:

- Distillery Process requirement: 980 KW
- spent wash concentration plant: 420 KW
- Condensate /lees polishing unit: 110 KW
- Boiler and other utilities : 1485 KW
- Lighting and Misc. : 25 KW
- Total (operating reqt.) : 2860 KW

3.8.2 Fuel

Slop and Bagasse will be used as a fuel for the steam generation activity of the proposed industry. The requirement of Bagasse will be 150.0 T/Day and SLOP will be 300.0 KLD. Bagasse will be procured from adjacent sugar mills of our group and other sugar mills present in nearby areas.

3.8.3 Quantity of waste generation & disposal scheme

Estimated daily total water requirement of distillery will be (input) 2749.0 m3/d. However, during day-to-day operations 2049.0 m3/day water will be recycled and thus fresh water requirement will be restricted to 680.0 m3/day. Effluent in the form of spent wash will be 750.0 m3 /day. It will be treated concentrated in Multi effect evaporation and then concentrate from MEE will be utilised in Incineration fired boiler as a fuel along with bagasse.

At secondary stage, its volume will be reduced to 300.0 m3/day using multi effect evaporation (MEE). This effluent will be safely disposed through incineration in boiler to achieve “Zero Liquid Discharge” as per CPCB norms. The remaining moderately polluted effluent due to spent lees and evaporating condensate will be treated in polishing unit and recycled in the same unit. Estimated domestic effluent will be 12.0 m3/d, which will be treated separately in septic tank and soak pit. Quantity of waste to be generated & scheme for their disposal is given in the following chart.

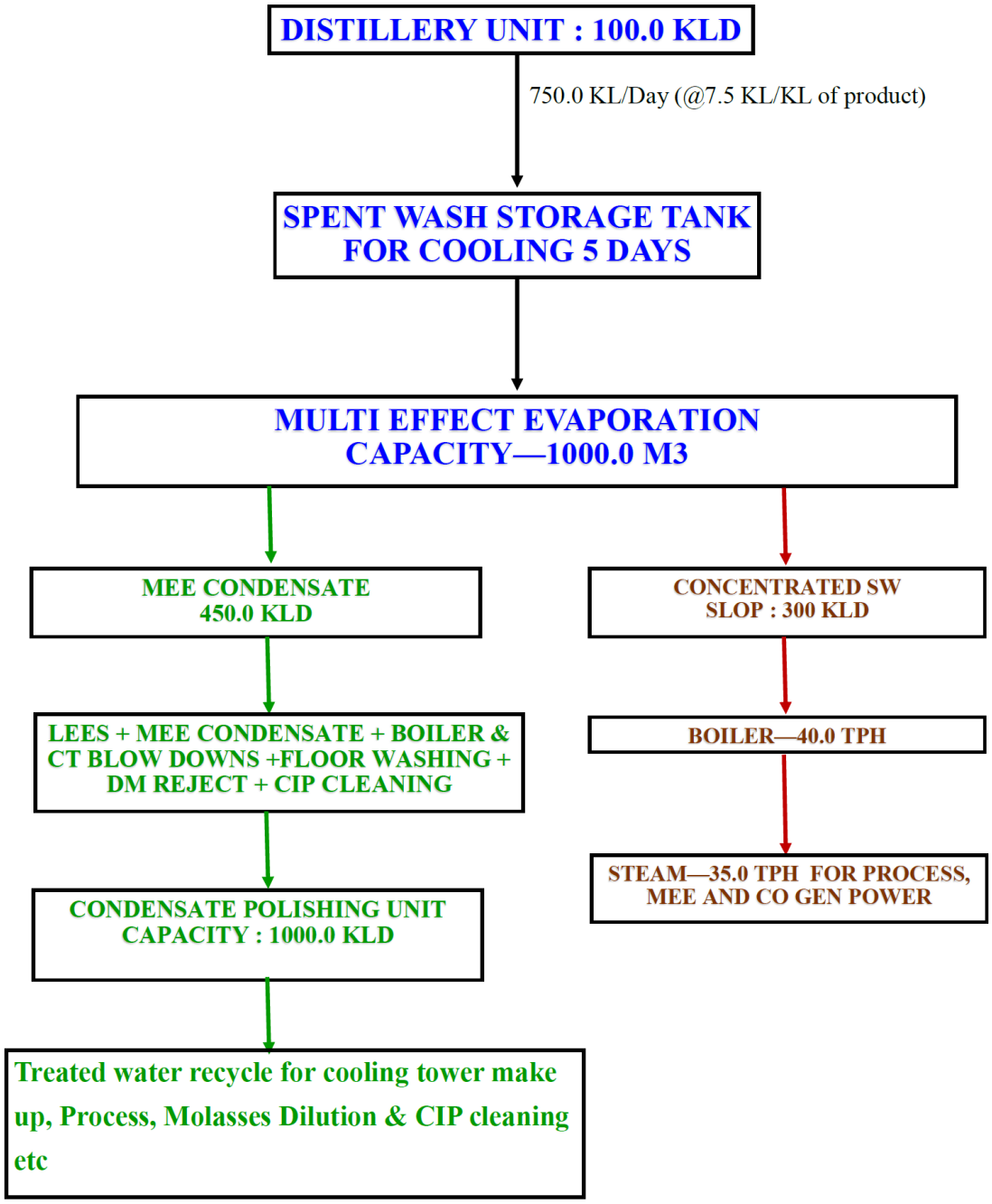

Fig : 3.4, Flow Chart of Spent Wash treatment strategy.

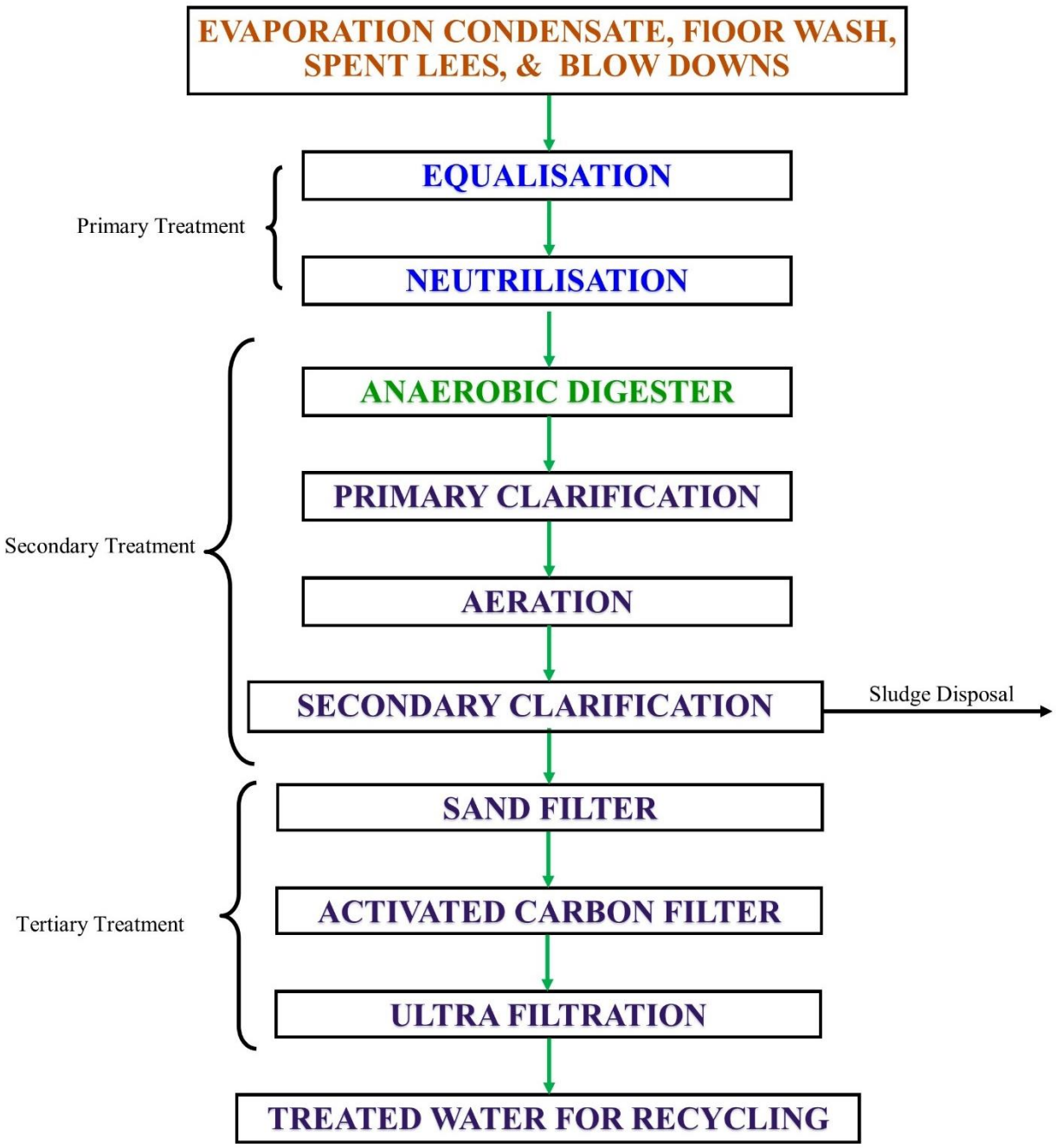

Fig: 3.5, Flow Chart of Spent Wash treatment strategy

3.9.1 Solid waste

The proposed industrial activity could generate solid waste in the form of yeast and ETP sludge, boiler ash. These are biodegradable material. The quantity and disposal technique is given briefly in the following **Table 2.3**.

Table: 2.3, Solid waste generation and disposal

Sr No	Waste	Quantity (MT/Day)	Treatment
1	Fly Ash	56.25	Due to high potash content, will be used as manure.
2	Yeast Sludge	10.0	Will be mixed with press mud of Sugar mill and sold to the farmer.
3	Condensate polishing unit sludge	1.0	Will be mixed with press mud of Sugar mill and sold to the farmer.

3.9.2 Air Emission and control

One boiler of capacity 40.0 TPH will be used with working pressure of 45 Kg/cm2. Bag filter of 125 % capacity system will be attached to the boiler. Bag filter efficiency will be 99.99 %. DG Set with adequate stack height and acoustic enclosures will be installed for the proposed project.

3.9.3 Noise pollution

The plant and equipment will be specified and designed with a view to minimize noise pollution. The major noise producing equipment will be provided with sound proof devices and silencers. DG set will be provided with acoustic enclosures. Ear Plugs and ear muffs will be provided to the workers in utility section. Greenbelt will be developed.

3.9.4 Health and Safety Measures

SSML Distillery Division strives to provide hygienic & safe work place and continually improve the effectiveness of Health & Safety system.

To meet these objectives the SSML will;

- Comply all relevant Laws, regulation, statutory provisions & codes of practice,
- Continually asses risks & hazards so as to evolve establish & upgrade hazard control measures, emergency preparedness, & risks mitigation and correct the deficiency identified in timely manner.
- Ensure safe handling, storage, use and disposal of all substance & materials which are classified as hazardous to health & environment,
- Create awareness in employees by providing appropriate training, motivation information's so as to create individual sense of duty, responsibility & participations & an institutionalize culture of continually improvement in safety, health & environment matters,
- Make supervisors responsible for implementation of the safety precautions, use of safety devices, & the safety of the people,
- Empower employees at all levels to be responsible & accountable for their personal health & safety,

- Fire protection system will be provided in accordance to the local fire authorities regulations. The firefighting system will consist of a hydrant network. It also incorporates suitable firefighting equipment and flameproof lighting and power control arrangements.
- Portable fire extinguishers will be provided in strategic locations in new construction area.

3.10 Schematic representation of the feasibility drawing which give information of EIA purpose

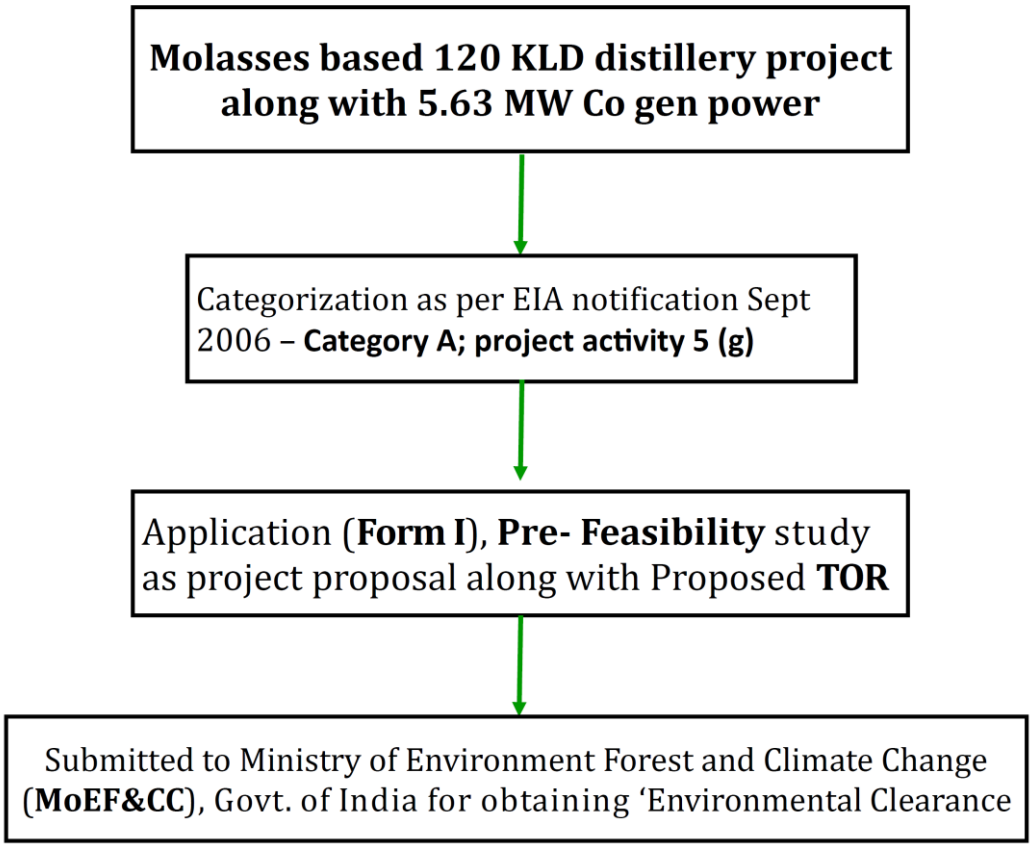

Figure 3.6: Procedure of Environmental Clearance

4.0 SITE ANALYSIS

4.1 Connectivity

The site is well connected by road, railway. It is approx. 0.11 km and 0.38 km from the National highway no. 73 (Jagadhri - Haryana) and State Highway no. 6 respectively. Jagadhri railway station (of central railway) is approx. 1.06 km. away from the project site. The Chandigarh International Airport is approx. 78.07 km.

4.2 Land form, land use and ownership

The factory is holding 3.58 Hectare of land. The land is flat, open and already under the possession of the SSML , Distillery Division. So out of available land, a provision of approx. 1.18 Hectare is for green belt and rest 2.4 Hectare for the proposed distillery and ancillary units thereof such as boiler house, turbine, storage etc.

4.3 Topography

Yamunanagar Distt. Came into existence on Ist November, 1989. Its area is 1756 square kilometres, in which there are 623 villages, 441 Panchayat, 2 towns, 2 Subdivisions, 3 tehsils and 3 sub-tehsils. Before being named Yamunanagar it was known as Abdullapur.

The district is mainly drained by the rivers Yamuna, Markanda and its tributaries. Markanda is tributary of river Ghaggar and drains major part of the district. The high land between Markanda River and small rivulets of River Yamuna acts as basin boundary between west flowing rivers of Indus system and east flowing rivers of Ganga basin. River Yamuna drains eastern part of the district and acts as boundary between Haryana and Uttar Pradesh State.

4.4 Land use pattern

The proposed project requires no additional land; existing land is under the ownership of Saraswati Sugar Mills Limited, Unit - Distillery. Therefore, no social issues are involved. There won't be change in the land use pattern since the land is under the possession of the industry. There is no sanctuary, bio-sphere reserve or national park in the 10 km radius area. The land surrounding the project site is used for agricultural purpose. There are more than 40 villages within 10 km of the study area. Yamuna River is approx. 7.91 km away from the project site in east direction.

Table 4.1: Salient features of the project location

Nearest City/ Town	Jagadhri Tehsil : - 5.51 Km in North from the project site Yamunanagar : 1.0 km
Railway Station	Jagadhri railway station is approx. 0.94 km from the site
Airport	The Chandigarh International Airport is approx. 78.07 km.
River	Yamuna river is approx. 7.91 km away from the project site in South East direction.
Schools	New English medium and Hindi Medium school and Junior college, is Yamuna nagar approx. 5.0 km from the project site
Medical and health care centers	Government Hospital & Private Hospital is within approx. 15.0 km from the project site.
Market places	Yamunanagar is a nearest market place at approx. 1.0 km from the project site.
Protected Area/ Sanctuaries/NP	None within 15.0 km radius
CRZ applicability	Not applicable
Seismicity	Seismic Zone- IV (High)

4.5 Existing Infrastructure

Proposed project is new project. There are no existing infrastructures within the project site. The nearest residential area to the factory is at a distance of 500 m towards west. There is an agricultural and

cultivated land in the surrounding area of the site. Within 10 km Influence Zone, there is no Tropical Forest, Biosphere Reserve, National Park, Wild Life sanctuary. Yamuna nagar district is 7.91 km from site towards south east.

4.6 Soil Classification

Soils in the district are deep and well drained, with loamy surface. In the south-western part, the soils are mainly fine silty to coarse loamy, whereas in north-eastern part they are mainly fine to coarse loamy and calcareous (based on Soil Map published by NBSS & LUP).

4.7 Climatic data from secondary sources

The district has subtropical continental monsoon climate where we find seasonal rhythm, hot summers, cool winter, unreliable rainfalls and great variation in temperature. In winters frost sometime occurs during December and January. This district occasional winter rains from cyclones. There in falls is mostly restricted to rainy seasons. Area experiences extreme climate conditions May & June are the hottest months while December and January are the coldest. Maximum and Minimum temperature on average goes as high as 44 degree centigrade temperature starts rising steadily from February onwards till the onset of monsoon Yamuna Nagar district receive second highest rainfall after Panchkula district in the state. The average annual rainfall of the district comes out to be 970.33.

4.8 Social Infrastructure available

Infrastructure such as school, colleges, market, banks, hospitals, public transport, road, drinking water, electricity, post, telecommunication, cinema halls, radio, etc. are easily available to the local people.

The present project is proposed by one of the leading and progressive sugar industry from Haryana.

The sugar factory has already initiated several activities for the development of the region. Some of the prime activities are as follows.

- The factory is providing medical aid to the employees and their dependents
- It provides primary school educational facilities to the children of workers
- It helps member farmers by supplying organic and chemical fertilizers, press-mud and the developed cane seeds approved by Government agency like NSI Kanpur. The factory also arranges field demonstration to educate the farmers in sugarcane cultivation through application of scientific methods.
- Regular tree plantation with development being done every year through the separate tree plantation cell in their campus and surrounding area. For nearby schools, hospitals free of cost plants are provided.

5.0 PLANNING BRIEF

5.1 Planning concept

(i) Planning Concept (type of industries, facilities, transportation etc.) Town and country Planning/ Development authority classification.

The proposed project is molasses based distillery. Facilities required for the proposed project will be provided as per requirement. Transportation of raw material and final product will be done via existing road network and cement concrete road will be developed within the proposed project area.

(ii) Population Projection

Temporary influx of people will be there as the managerial and supervisory staff will generally be outsider. A projection may be made by a governmental organization, or by those unaffiliated with a government.

(iii) Assessment of infrastructure demand (Physical & Social)

The Company will assess the demand of infrastructure (Physical & Social) in nearby area of the proposed site and will be developed in under corporate social responsibilities programs.

(iv) Amenities/Facilities

The Company will develop the Amenities/Facilities in nearby area of the proposed project site as per requirement of local people under corporate social responsibilities programs.

5.2 PROPOSED INFRASTRUCTURE

The proposed project will be carried out in the area owned by the Saraswati Sugar Mills Limited, Unit - Distillery. The total allocated land for the proposed project is 3.58 Hectare.

5.2.1 Greenbelt Area

The total greenbelt area provided is ~ 1.18 Hectare.

5.2.3 Social infrastructure

The physical infrastructures such as land, roads, power, water, transportation etc. are easily available for the proposed unit. Raw material and filler material are also available with factory adequately. Very minor influx of population is anticipated due to the project. Available social infrastructure such as schools, colleges, market, medical facilities, etc. is adequate to support the probable minor population increase.

5.2.4 Connectivity

The site is well connected by road, railway. It is approx. 0.11 km and 0.38 km away from the National highway no. 73 (Jagadhri - Yamuna nagar marg) and State Highway no. 6 respectively.

Jagadhri railway station is approx. 0.94 km away from the project site. The Chandigarh International Airport is approx. 78.07 km.

5.2.5 Sewerage system

Estimated domestic effluent will be 12.0 m3/d, which will be treated separately in septic tank and soak pit.

5.2.6 Drinking water management

SSML Distillery Division draws water from well and supply the drinking water to factory as well as the staff colony.

5.2.7 Industrial Waste management

The proposed Molasses based distillery would be based on "ZERO EFFLUENT DISCHARGE".

5.2.8 Solid Waste Management

- Spent wash generated during molasses operation, would be concentrated in Multi-effect evaporator and then used as fuel in boiler.
- Fly ash from the Boiler would be utilized as manure.
- Yeast sludge will be mixed with Press Mud for manufacturing Organic Manure.

5.2.9 Power requirement and source

The total power requirement for the proposed project will be 2860 KW, which will be sourced from Co generation power plant of 5.3 MW and for emergency DG set will be installed.

6.0 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).

The proposed plant is nearby Sugar Mill named Saraswati Sugar Mills Limited. The land is already under the possession of SSML. Therefore, there will not be any displacement of people and hence, Rehabilitation & Resettlement is not applicable.

7.0 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 all other required clearance and will complete within 1.5 years of commencement.

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

- Total cost of the Project: Rs. 178.91 Crores
- Cost for Environment Protection Measures:
  - Capital Cost: Rs. 4.53 Crores
  - Recurring Cost/annum: Rs 6.0 Crores/annum

8.0 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.

Proposed 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.

Haryana 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.