EXECUTIVE SUMMARY

OF

Grain/Starch/Molasses Based Distillery Unit
Capacity- 150 KLPD (Grain/starch based) or 50 KLPD (Molasses based)
Category – 5(g) 'A'

AT

PLOT NO.-01, SECTOR-1, PHASE-2, INTEGRATED INDUSTRIAL ESTATE, SIDCUL, SITARGANJ, UTTARAKHAND

Reference: TOR issued vide F. No. J-11011/184/2013-IA II (I) dated 04-08-14
Document No. (PESPL/Golden Infracon/Final/2014/08/01)

PROJECT PROPONENT
M/s Golden Infracon Pvt. Ltd.

SF -16-17, 1st floor, Madame Bhikaji Cama Bhawan 11,
Bhikaji Cama Place, New Delhi-110066
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Telephone No.: 011- 40100100 & Fax No.: 011- 40100190

Project In charge: Gaurav Mittal, Director
Cost of the project: Rs. 103 Crores

ENVIRONMENTAL CONSULTANT
M/s Perfact Enviro Solutions Pvt. Ltd.

(NABET Registered wide list of accredited consultants organizations/ Rev. 20/ may 5, 2014 at Sr. No. 110)
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August, 2014

EXECUTIVE SUMMARY

Introduction:

The company M/s Golden Infracon Pvt. Ltd. proposes to set up a distillery unit of capacity 150 KLPD production (Grain/starch based) or 50 KLPD production (Molasses based) of Alcohol at Integrated Industrial Estate, SIDCUL Sitarganj, Uttarakhand. Government of Uttarakhand has done an MOU for setting up a distillery unit in Sitarganj, Uttarakhand. The company has already been allotted the land measuring 75 acres in SIDCUL Integrated Industrial Estate, Sitarganj, Uttarakhand. Out of 75 acres of land, 50 acre of land shall be utilized for setting up of Mega Food Park will be done through "M/s Golden Infracon Pvt. Ltd.", a CHD promoter's holding company. The Food Park will Process Grains like wheat, rice, corn (grains) etc., manufacture base products like Wheat Gluten, Liquid Glucose, Maltodextreme Powder, Starch, Bran and other derivatives. **Rest 25 acre of land shall be utilized for setting up of 150 KLPD (Grain/Starch) or 50 KLPD (Molasses) based Distillery Unit which will be setup by "M/s Golden Infracon Pvt. Ltd.", a CHD promoter's holding company. The proponent has applied for Environmental Clearance of Grain/Starch/Molasses based Distillery Unit only which shall be developed in 25 acres of land at Integrated Industrial Estate, SIDCUL Sitarganj, Uttarakhand.** The project is covered in Environment Impact Assessment Notification 2006 under 5(g) in category 'A' as per EIA Notification, 2006. Alcohol has assumed a very important role in the economy of our country.

M/s Golden Infracon Pvt. Ltd. is a company incorporated under the Companies Act 1956. The Certificate of incorporation bearing Corporate Identity Number (CIN) U15209DL2013PTC249415 has been issued by Registrar of Companies Act, National Capital Territory of Delhi and Haryana. The registered office of the company is situated at SF -16-17, 1st floor, Madame Bhikaji Cama Bhawan 11, Bhikaji Cama Palace, New Delhi-110066.

Project Details

The details of components of Project are as follows:

1. Grain/Starch/Molasses based Distillery Unit: This project will manufacture ENA (Extra Neutral Alcohol), Ethanol, Country liquor and IMFL (Indian Made foreign Liquor) and the plant will be setup in phases.
2. Bottling Unit: This project will also set up bottling plants to produce Country Liquor & IMFL for its own & tie up units.
3. Purification & bottling of CO_2 produced during fermentation process
4. DDGS & other allied production units.

The distillery unit will generate its own electricity by setting up a co-generation power plant of 6.5 MW. Rice husk/Coal will be used as fuel, which is available in plenty in the area. These solid fuels will be

mixed with slop from molasses distillery & burnt in boiler. Distillery will put up the most modern technology for treatment of distillery spent wash to ensure **Zero discharge of distillery effluents.**

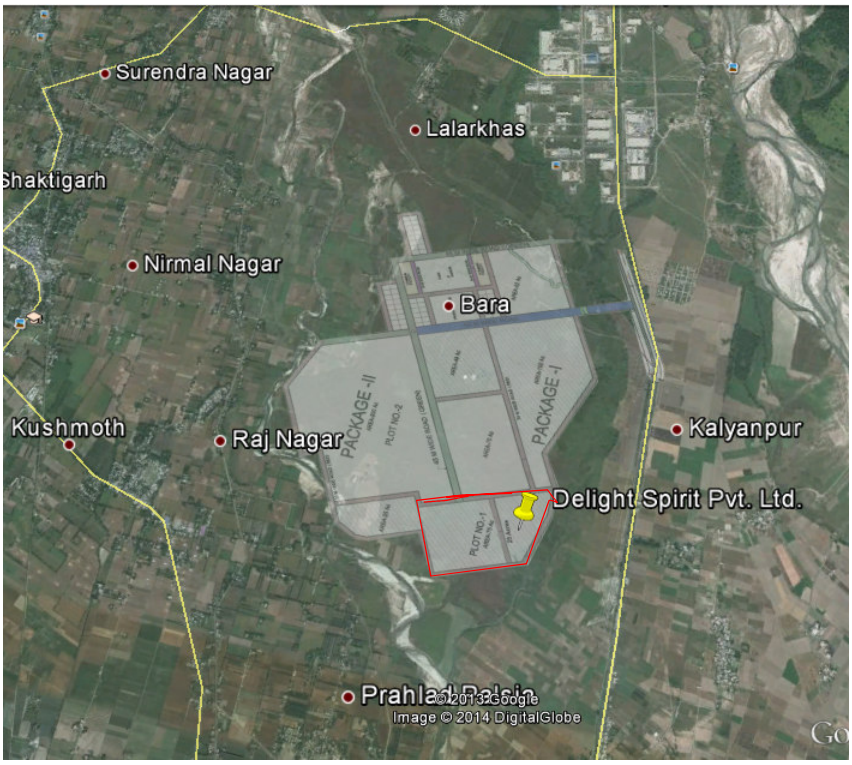
Purpose of Report

Proposed Distillery unit of capacity 150 KLPD production (Grain/starch based) or 50 KLPD production (Molasses based) of Alcohol at Integrated Industrial Estate, SIDCUL Sitarganj, Uttarakhand is covered in Environment Impact Assessment Notification 2006 under 5(g) in category 'A' as per EIA Notification, 2006. The unit will manufacture ENA (Extra Neutral Alcohol), Ethanol, Country liquor and IMFL (Indian Made foreign Liquor). In compliance to the prevailing statutes, an environment clearance is necessary for production capacities/processes.

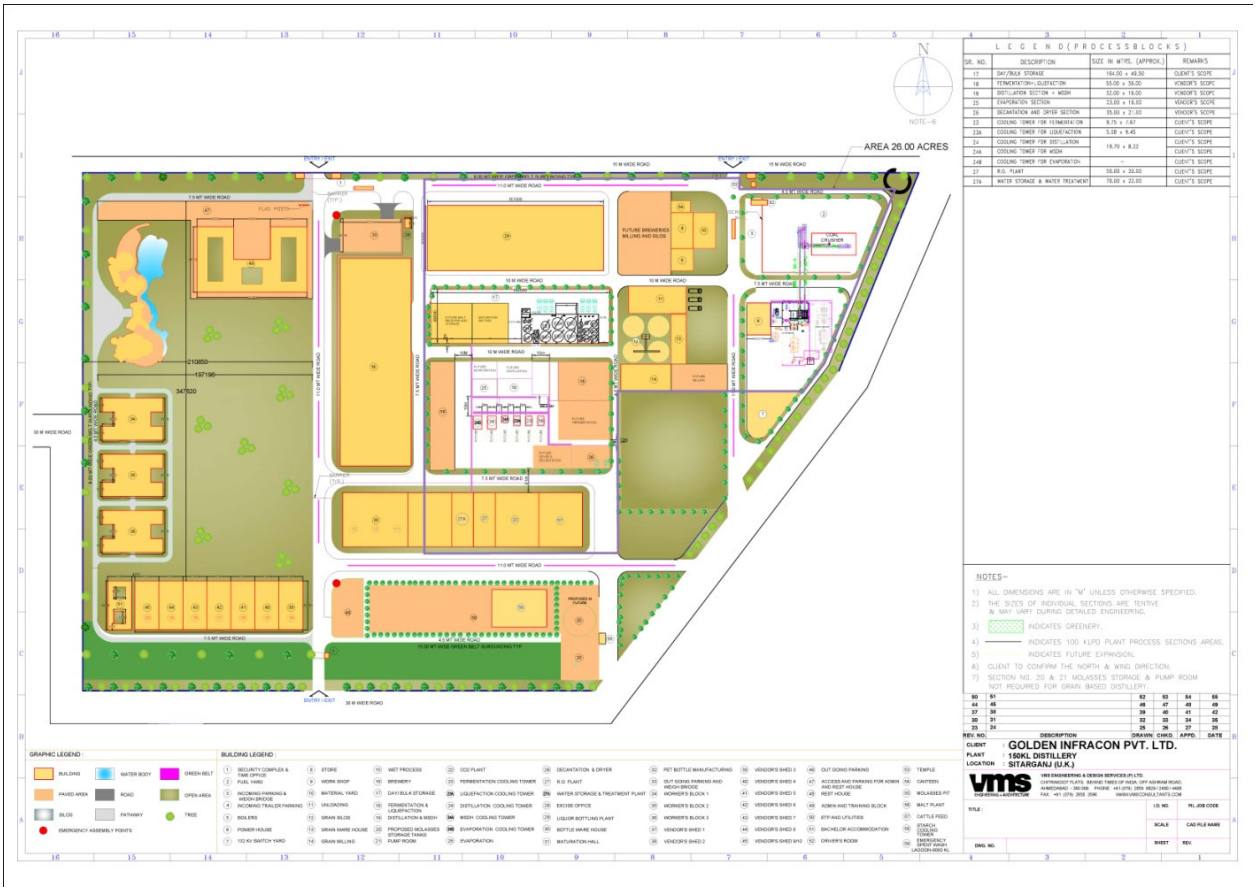
Location of the Project

The proposed facility is Plot No.-01, Sector-1, Phase-2, Integrated Industrial Estate, SIDCUL, Sitarganj, Uttarakhand. The geographical location of the site is having Longitude – 79°41'3.76"E & Latitude – 28°59'41.44"N.

Google Image on Integrated Industrial Estate, SIDCUL



Layout of Project Site



Terms of Reference

This Environment Impact Assessment (EIA) study is based on:

- Presentation made to the Committee for grant of TOR on 29-05-14.
- MoEF has accorded Terms of Reference (TOR) for Grain/Starch/Molasses Based Distillery Unit at Integrated Industrial Estate, SIDCUL, Sitarganj, Uttarakhand vide F. No. J-11011/184/2013-IA II (I) dated 04-08-14.

Project Description:

Project Details:

PARTICULARS	DETAILS
Plot Area for Distillery Unit	101200 Sqm (25 Acres)
Built up Area/Covered Area	10,000 Sqm
Green Area	35000 Sqm (34.58% of plot area)
Road area	5000 sqm
Plant Capacity	150 KLPD Production (Grain/starch based) or 50 KLPD Production (Molasses based) of Alcohol.

Raw materials	Grain – 365 tonnes/day or Starch – 219 tonnes/day, Molasses – 205 tonnes/day
Project Composition	Power plant, Grain milling, Fermentation, Multi-Pressure Distillation, Evaporator, DDGS Drier, Liquor Bottling Plant & Effluent Treatment Plant
Product Mix	ENA (Extra Neutral Alcohol), Ethanol, Country liquor and IMFL (Indian Made Foreign Liquor)
By Product	CO_2, Distillers Wet Grain Sludge (DWGS)
Power Requirement	3 MW & shall be met through co-generation power plant of 6.5 MW
Total Water Requirement	For grains/starch – 4082 KLD or for molasses – 1496 KLD
Source of Water	Supply from SIDCUL
Total Employees	120 No. (Staff = 80 No. & workers = 40 No.)
Estimated Project Cost	Rs. 103 Crores

In case there is shortage of grain/starch, molasses will be used as raw material for the production of 50 KLPD alcohol to maintain the pollution load at same level as grains.

Plant Capacity

The distillery is designed for a capacity of 150 KLPD production (Grains/Starch) or 50 KLPD production (Molasses) of alcohol.

No. of working days of the unit : 330 days

The following capacities shall be there in the distillery section:

	For Grains/Starch	OR	For Molasses
• Total Distillery Capacity	: 150 KLPD		50 KLPD
• Bottling facilities :			
➢ Blending & Bottling of Country Liquor & Indian Made Foreign Liquor (IMFL)	: 8000 cases/day		8000 cases/day

Raw Materials Required With Daily Consumption after expansion

1. Molasses:

Molasses, a by-product of sugar industry is used as raw material in the distillery for the production of ethanol by fermentation and distillation process. It is a dark coloured syrupy mass and contains uncrystallizable sucrose and invert sugar (a mixture of glucose and fructose).

Daily requirement of Molasses will be 205 tonnes/day. The Molasses will be used as raw material only during shortage of Grains/starch.

2. Grains/Starch:

Grain is the basic ingredient used to make most distilled spirits.

Quantity of Grains/Starch Required

1.	Grains required (like Wheat, Broken Rice (Non-edible), Corn)	365 tonnes/day
	Or Starch Required	219 tonnes/day

Broken Rice (Non-Edible Rice) will be used as major raw material available with nearby rice millers produced during milling operation and not suitable for human consumption. They will be transported through truck/Lorries.

The starch will be readily available in adequate amount from the proposed food park established by project proponent only and shall be established adjacent to the proposed Distillery unit.

3. Chemicals and Consumables:

Chemicals consumed are broadly given below:

Name of the chemical
Conc'n Sulfuric Acid
Antifoam (Silicon based)
Caustic (Lye -48% w/w)
Urea (46% w/w Nitrogen)
Liquefaction Enzyme
Saccharification Enzyme
Yeast

Source & Transportation/Traffic requirement for Raw Material, Fuel & Product

- **Raw Material:**

  Broken Rice (Non-Edible Rice) will be used as major raw material available with nearby rice millers produced during milling operation and not suitable for human consumption. They will be transported through truck/Lorries.

  The starch B & C will be readily available in adequate amount from the proposed Food Park which shall be established adjacent to the proposed Distillery unit by M/s Golden Infracon Pvt. Ltd.

  The Molasses will be used as raw material only during shortage of Grains/starch. Molasses will be used as raw material only during shortage of Grains/starch. Molasses will be procured from state cooperative sugar factories and nearby sugar plants in UP.

Product Detail

The distillery is primarily envisaged as potable liquor manufacturing oriented. Hence the primary products will be potable grade Extra Neutral Alcohol with capacity of 150 KLPD which goes into branded potable liquors manufacturing along with country liquor and IMFL manufacture bottling operations. ENA shall be manufactured as on line in order to be able to give energy efficient configuration to the whole production system. The bottling plant shall have a capacity to manufacture and bottle 8000 cases/day each of IMFL of 75% v/v strength as per requirement Excise Department & Country Liquor.

Products	**Quantity (From Grains/Starch)**	**Quantity (From Molasses)**
ALCOHOL (Extra Neutral Alcohol & Ethanol)	150 KLPD	50 KLPD
Country liquor & Indian Made Foreign Liquor (IMFL)	8000 cases per day	8000 cases per day

Break-up for total Product Capacity of 150 KLPD:

Parameters	**Details**
Extra Neutral Alcohol (ENA) (with Min. 96.2 % v/v of Alcohol Concentration)	150 KLPD Out of which ethanol is 30 KLPD

BY-PRODUCTS:

By-Products	Quantity
Animal Feed i.e. Distillers Dry Grain Sludge (DDGS) CO_2	102 TPD 80 TPD (approx.)

Process of Ethanol Production

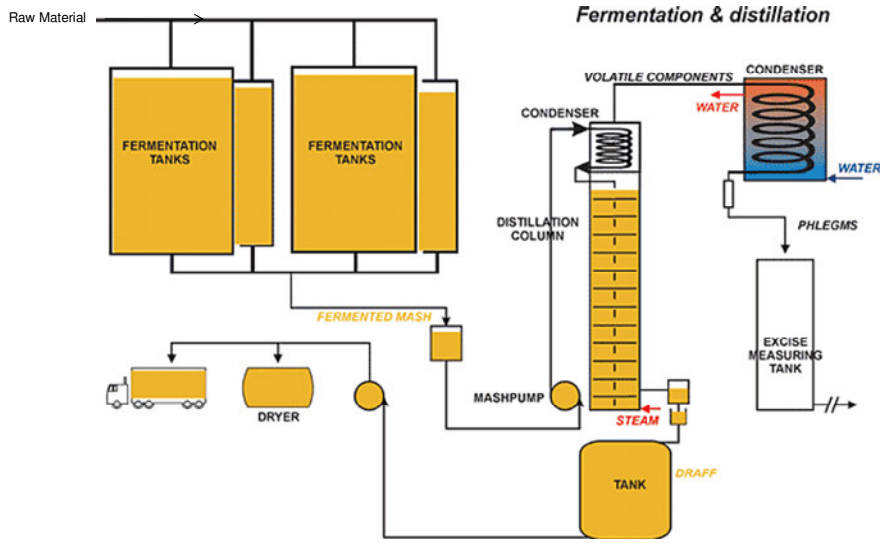
Ethanol production by fermentation comprises four steps:

1. Yeast propagation from yeast slant from the laboratory.
2. Fermentation of raw material (grains/starch/molasses etc.) to produce wash containing alcohol.
3. Recovery, enrichment and purification of alcohol from fermented wash.
4. Production of absolute alcohol by dehydration of 98% v/v alcohol.

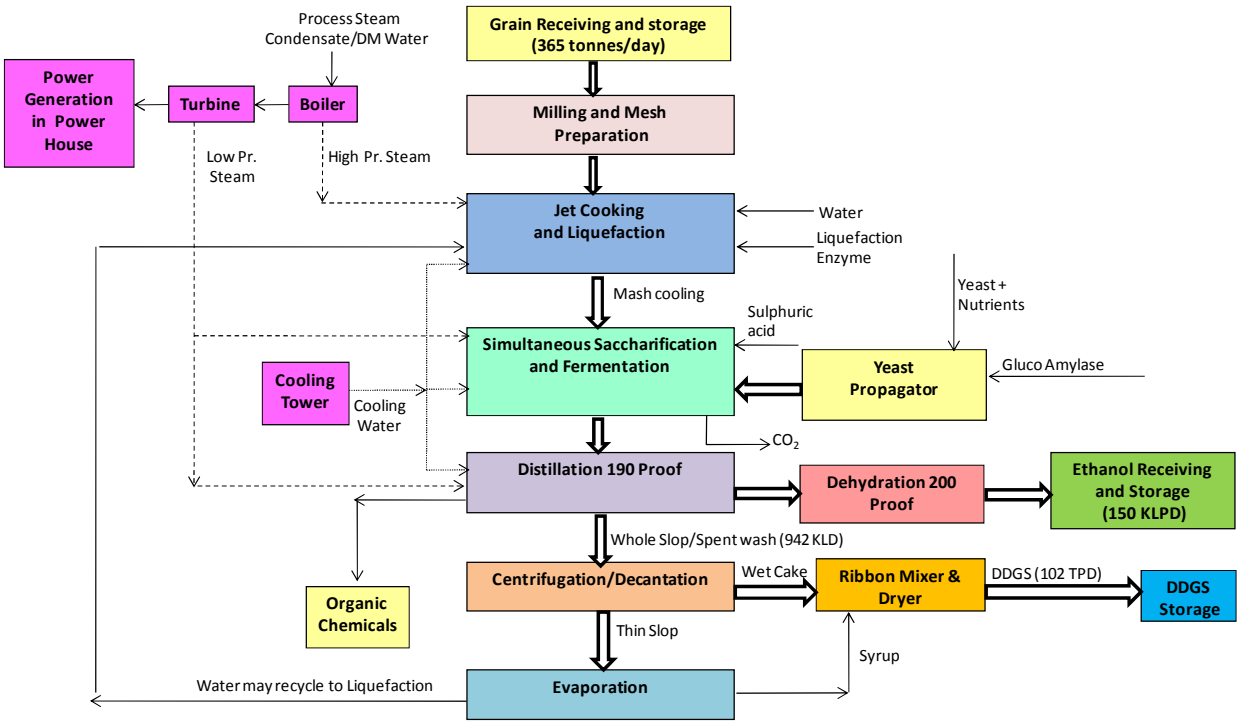
$$C_{12}H_{22}O_{11} + H_2O \xrightarrow[\text{in yeast}]{\text{Invertase}} \underset{\text{glucose}}{C_6H_{12}O_6} + \underset{\text{fructose}}{C_6H_{12}O_6}$$

$$\underset{\text{glucose or fructose}}{C_6H_{12}O_6} \xrightarrow[\text{in yeast}]{\text{Zymase}} 2\underset{\text{ethanol}}{C_2H_5OH} + \underset{\text{carbon dioxide}}{2CO_2}$$

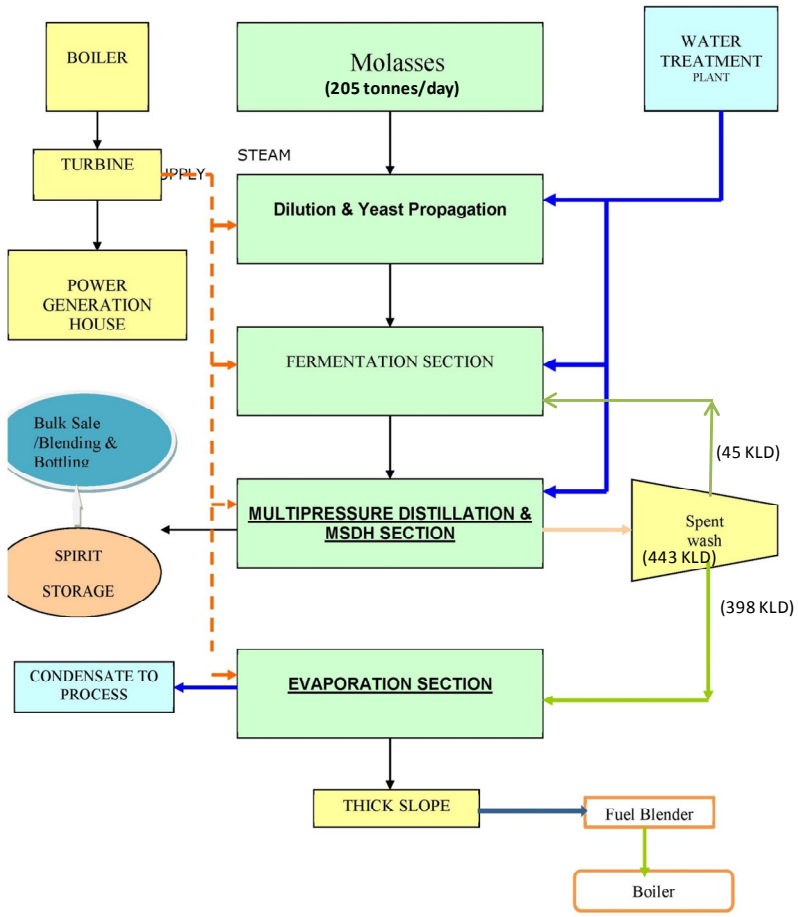
Process Flow Diagram For Fermentation & Distillation Process



.The detailed Process Flow Sheet for the grain/starch based process is as follows:



The detailed Process Flow Sheet for the molasses based process is as follows:



Approach to Site

The site is well connected with road and railways route to all major cities. Nearest railway station is Lalkuan Railway Station at 20 Km from project site. Nearest airport is at Pant Nagar which is 16 Km W from project site & Nearest Highway is NH-125 (Sitarganj-Pithoragarh) - 13 Km S

MANPOWER

During construction/Installation phase, 50-100 local labours shall be employed. During operation phase overall there will be an employment of 120 personnel. The details are given below:

Particulars	No. of People
Staff	80
Labours	40

Power Supply

Total power requirement: 3MW

Source: The unit shall generate its own power from co-generation power plant of 6.5 MW and power requirement of the unit will be met from this power plant.

D.G. Sets: 2 x 500 KVA

Fuel: Low Sulphur Diesel of 100.0 Lt/Hr shall be used for D.G. Sets.

Boiler –I capacity - 50 TPH
Pressure /temperature: 67 kg/cm^2(g)/500˚ C
Fuel for Boiler –I, Rice Husk (300 tons/day) & Coal (200 tons/day)

Boiler –II capacity (For Future Use) -15 TPH

Pressure/temperature: 45 Kg/cm^2 (g)/385˚ C

Fuel for Boiler –II, Rice Husk (24 tons/day) & Slop (80 tons/day)

Water Supply & Waste Water Management

During Construction Phase

During construction/installation phase of the proposed project the services required like water supply and sewage facilities will be arranged on a temporary basis and the same will be maintained without any adverse impact on the environment. The water required for curing and other purpose will be arranged on temporary basis through tankers. Domestic Sewage will be disposed off in septic tank via soak pit.

During Operational phase:-

Supply from SIDCUL will be the main source of water supply. The total water requirement is about 4082 KLD for grains/starch based process or 1496 KLD for molasses based process. Water required in the plant comprises of process water namely in the cooking and fermentation section. De-mineralized water is used in boiler for steam generation, in distillation for dilution and in bottling for blending. Raw water as such is used for bottle washing and for domestic use. Most of the water shall be recycled back particularly from the evaporation section. The total waste water generation from Grain/Starch based process will be 1098 KLD & from Molasses based process will be 562 KLD. Domestic Sewage will be disposed off in septic tank via soak pit and other effluents discharged will be treated in ETP (Effluent Treatment Plant) of 1300 KLD. The project proponent proposed to adopt Multi-effect Evaporation System for spent wash generated from molasses and Decantation system for spent wash generated from grain.

Atmospheric Emissions

During the construction phase, construction activities and vehicular movement will result in atmospheric emissions and during the operation phase vehicular activities will mainly lead to

atmospheric emissions.

During operation phase Air emissions will be generated from boilers used for producing steam & D.G. Sets used for power back-up. The emissions from the boilers shall be PM, SO_2 and NO_X for which stack height of 60 m shall be provided and **Electrostatic precipitator system** shall also be installed to meet the desired emission standards of Boilers. Stack height of 4.5 m above roof level shall be provided for D.G. Sets to control the air emissions. Proper ventilation shall be maintained. 35000 Sqm (34.58% of plot area) shall be developed as green area.

Solid and Hazardous Waste

Solid waste	Disposal Method
During Construction : Muck & Slurry	Will be used as backfilling material to raise soil levels and for road leveling in nearby area.
During Operation:	
Municipal solid waste	18 kg/day Municipal Solid Waste will be generated out of which 13 kg/day biodegradable waste will be disposed to Integrated Industrial Estate SIDCUL & 5 Kg/day recyclable waste will be given to authorized recycler.
ETP Dried Sludge	ETP Sludge will be used as manure. ETP sludge generation from molasses based process will be 1300 kg/day & from grain based process will be 2300 kg/day.
Boiler Fly Ash	Boiler Fly Ash is a non-biodegradable sludge & will be reprocessed for silica recovery or will be used by cement/brick industry as a filler material.
Used Oil	Approx. 1.6 Lt/day of Used oil from D.G. Set will be carefully stored in HDPE drums in isolated covered facility. The used oil will be sold to vendors authorized by Central Pollution Control Board for the treatment of the same. Suitable care will be taken so that spills / leaks of used oil from storage could be avoided.
Process Waste	**From grains:** The wet cake from decanters will be blended with the concentrated slurry (Syrup) from Evaporation section in a ribbon mixer and approx. 102 TPD of Distillers Dry Grain Sludge (DDGS) which has high nutritional value will be sold as cattle feed. **From Molasses:** No Solid waste is generated. The waste from evaporated spent wash from molasses will be mixed with rice husk/agro waste and used as fuel in the boiler

Project Cost

The estimated project cost is Rs. 103 Crores.

ENVIRONMENTAL SETTING

Study Period

The study period as per TOR is for three months, Hence the season October 2013 to December 2013 has been taken as study period. Findings of the study are included in EIA report.

Study Area

The study area is defined as area within 10.0 Km radius from proposed site, which is as per the MoEF guidelines. Air, Water, Soil, and Noise sample were collected within 10 km detail study of the area given in Baseline chapter of EIA report.

Climatology

- Site-specific meteorological data shows that average Wind speed normally was in the range of 0.1 km/hr in December 2002, October 2004 &November 1998 to 7.6 km/hr in May 2002.
- The Maximum temperature of the area in 11 Years, was recorded as 43.2 in June 2005, where as the minimum temperature of the area was recorded as -2.2 in January 2007.
- The Maximum relative humidity was recorded as 96% in January 2003. Minimum relative humidity was recorded as 26% in April 2005. The area is semi arid.
- The maximum rainfall was recorded in July (769.4 mm) in August 2008. Minimum rainfall was recorded 0.3 mm in Feb-2008 & October 2002. Maximum time of year remain dry, the dry months exceed wet months. The July & August are the wettest months and are considered as monsoon season

Ambient Air

Ambient air quality monitoring was carried out at 8 stations namely at On site (2 station in core zone), **Village Rajnagar**, **Village Shisham Bagh**, **Village Kalyanpur**, **Village Akrauli**, **Village Sisauna** & **Sidcul Industrial Area** during the season Oct 2013 to Dec 2013. The frequency of monitoring was twice a weeks at each station. The parameters monitored were Particulate Matter (PM_{10}), Particulate Matter ($PM_{2.5}$), Sulphur Dioxide (SO_2) & Nitrogen Oxides (NOx).

Average results of parameters monitored in the study areas (nearby villages) are below the permissible standards prescribed by the CPCB.

- The average concentration of PM_{10} was in between **62.9** µg/ m^3 to **84.8** µg/ m^3.
- The average concentration of $PM_{2.5}$ was in between **27.3** µg/ m^3 to **36.8** µg/ m^3.
- The concentration of SO_2 and NOx was observed in between **6.9** µg/ m^3 to **9.3** µg/ m^3 and **20.1** µg/ m^3 to **27.0** µg/ m^3.

Noise

For each measurement, dB (A) readings was taken for every 15 minutes for 24 hrs ones in a season to get Leq values. In core, during day time the ambient noise level at the proposed project site is 52.4 dB (A), which is within the standard of industrial area are ~ 75 dB (A). During night the noise level at the project site was observed 44.0 dB (A), which is also within the nighttime noise standards of 65 dB (A).

For maintaining the noise level, plantation and traffic management during operation phase are suggested.

The ambient noise level of the Buffer zone was on higher side than the standard of residential area due traffic movement and local activities of the people in nearby areas

Water Environment

Groundwater samples were collected from different locations. Analysis results of the samples were compared (for key parameters) as per IS: 10500 (Drinking Water Standards).

It was observed that in core zone Ph of water is basic (pH- 7.8). Other parameters like Alkalinity (268 mg/l) and Hardness (156 mg/l) T.D.S (350 mg/l) Sulphate (12.9 mg/l), Chloride (11.9 mg/l), Calcium (35.3 mg/l) and Magnesium (16.5 mg/l) are within the drinking water standards. Water can be used for domestic purposes after using disinfectant.

Buffer zone is taken as the area within 10 km radius from the proposed project site. Collected samples are from Hand Pump and Surface Water. In Buffer zone water collected from ground is neutral in nature, as pH ranges from 8.0-8.4. Other parameter like T.D.S, Alkalinity and Hardness, Calcium, Magnesium, chloride & Sulphate are within the limit drinking water standard. In Buffer zone surface (Sukhi Nadi, Kaljas river and Gari drain) water is neutral in nature (7.3-7.7). Other parameters like phosphate of Kaljas river is slightly on higher side.

Soil

To assess the soil quality of the proposed area, following stations were selected. Soil profile and quality was studied at 7 different locations. These were analyzed for a range of parameters mentioned in the EIA manual published by MoEF. Texture of soil is observed to be Clay at the site and clay to silt clay at other locations in nearby areas.

Soil from core zone shows that Colour was Light Brown, pH 7.2 Amount of primary nutrients like Organic matter 0.78 %, the available nitrogen 89.6 mg/kg is low in range, the available Phosphorus (14.0 mg/kg) is medium in range & available Potassium (20.8 mg/kg) is also lower in range. Primary nutrient profile shows that soil is low in fertility due to the availability of low amount of nitrogen, Potassium. Adding bio fertilizer enrich in nitrogen will enhance the fertility of soil. .

Soil of buffer zone shows that Colour varies from Light Brown to Blackish Brown. pH ranges from 6.9 – 7.4. Amount of primary nutrients like Organic matter ranges from 0.44 % - 0.67 %, the available nitrogen ranges from 61.6 - 78.4 mg/kg, the available Phosphorus varies between 8.4 -20.6 mg/kg and the amount of available Potassium is between 12.8-17.9 mg/kg. Primary nutrient profile shows that soil is low in fertility due to the low amount of Nitrogen. Adding bio fertilizer will enhance the fertility of soil.

Biological Environment

- Core zone is devoid of any tree species there are few shrubs and grass found in the site, they are mainly *Lantana camara*, *Lantana aculeate*, *Cassia tora*, *Cynodon dactylon*, *Imperata cylindrical*, *Typha elephantine, Colocasia esculenta* etc. There will be no displacement of trees due to set-up of proposed industry. However plantation is suggested to enrich the green area.
- As project area falls in SIDCUL Industrial area, mammals are not seen during study period, however avifauna like crow, parrot, Heron, Mayna, Cuckoo, House sparrow are seen. Cobra and garden lizards are also found.
- In the buffer zone of 10 Km there is no protected forest. However Gola reserve forest is situates at a distance of 6.0 Km in West, Barkoli reserve forest 7.2 Km in NW direction forest patch near Dhainpur village 6.5 Km in SE direction. The buffer zone is characterized by some trees/shrubs/which are common in occurrence, some less common trees and some isolated and rare plants. In buffer zone crop of wheat is also seen during visit.
- The buffer zone is full of diversity of animals. Barkoli range & Dauli range is within the 10 km radius. Many Shedule I animals are found in Barkoli range.
- **Endangered and Threatened Species**: No threatened, rare, endangered or endemic species were observed during the survey in core zone. In buffer zone, (Barkoli and Dauli range) following Schedule I, II & III species were listed.

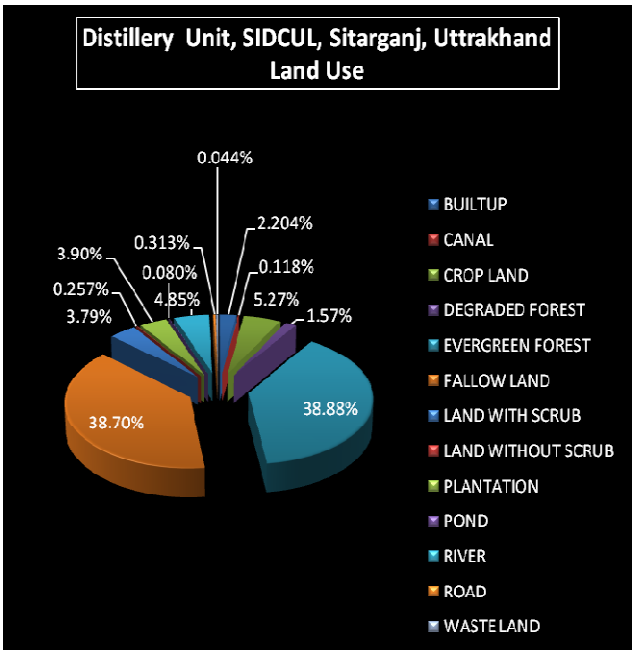
Sr. No.	Common Name	Scientific Name	Schedule list as per Wildlife Protection Act
Mammals			
1	Common Langur	*Semnopithecus*	
2	Panther	*Panthera pardus*	Schedule I
3	Tiger	*Panthera tigris*	Schedule I
4	Sloth Bear	*Melursus ursinus*	Schedule I
5	Barking Deer	*Muntiacus muntjak*	Schedule III
6	Indian Elephant	*Elephas maximus indicus*	Schedule I
Aves			
1	Common peafowl	*Pavo cristatus*	Schedule I
Reptile			
1	Indian Tent Turtle	*Kachuga tentoria*	Schedule I
2	Soft-shelled Turtle	*Trionyx spp*	Schedule I
3	Gharial	*Gavialis gangeticus*	Schedule I
4	Maesh crocodile	*Crocodylus palustris*	Schedule I

Land Use

All vector layer superimposed on GIS based land use land cover map for final map composition and used for analysis and study of area.

Land use/ land cover categories of study area (10 km Radius)

CATEGORY	AREA(SQ. M)	HECTARE	PERCENTAGE
BUILT UP	6923367.085	692.3367085	2.204%
CANAL	369689.4707	36.96894707	0.118%
CROP LAND	16560942.05	1656.094205	5.272%
DEGRADED FOREST	4943694.89	494.369489	1.574%
EVERGREEN FOREST	122157738.7	12215.77387	38.884%
FALLOW LAND	121605640.2	12160.56402	38.708%
LAND WITH SCRUB	11910986.8	1191.09868	3.791%
LAND WITHOUT SCRUB	252877.2734	25.28772734	0.080%
PLANTATION	12263763.4	1226.37634	3.904%
POND	139564.6456	13.95646456	0.044%
RIVER	15237995.37	1523.799537	4.850%
ROAD	982419.8127	98.24198127	0.313%
WASTE LAND	808939.9424	80.89399424	0.257%
TOTAL	314157619.6	31415.76196	100.000%



Socio Economic (Sitarganj)

A socioeconomic survey within the Buffer Zone was conducted of Perfact Enviro Solutions Pvt.Ltd. survey covered 108 households in the buffer zone of Akrrauli, Sesambagh, laxmijhala, Kalyanpur,

Sisona, Rajnager-1nearShaktifarm village. The result of the survey is summarized as below:

Sr. NO.	Udham singhnager - Sitarganj	Village level micro information based on census data 2011 & field survey				
	Parameter	**Akrauli**	**Seasambagh**	**Kalyanpur**	**Rajnagnagar**	**Sisona**
1	**Holds Approximate**	200	150	300	500	400
2	**Occupation or source of income**	Agriculture/ Service/labour/Pvt.business	Agriculture / Service/labour/Pvt.business	Agriculture/ Service/labour/Pvt.business	Agriculture/ Service/labour/Pvt.business	Agriculture/ Service/labour/ Pvt.business
3	**Population**	1000	750	1500	3000	2400
4	**Literacy Rate %**	50	80	80	75	75
5	**Common annual income of a person %Rs wise distribution**					
	9000-30000	55.0	10.0	75.0	80.0	40.0
	31000-50000	30.0	40.0	15.0	15.0	30.0
	51000-100000	10.00	10.00	3.00	5.00	10.00
	100000-150000	5.00	30.00	2.00	Nil	5.00
	<150000	Nil	10.00	5.00	Nil	5.00
6	**Main crop**	Wheat ,Paddy ,Mustard	Wheat ,Rice Urd,Pea	Wheat ,pea paddy Sugercane	wheat ,Paddy	Wheat ,pea paddy Sugercane
7	**School**	Primary School Govt.	Primary School Govt.	Junior SchoolGovt., Highschool Pvt.	Junior SchoolGovt., Highschool Pvt.	Junior SchoolGovt.,Highschool
8	**Hospital**	Nil	Nil	Pvt clinic	Nil	Primary sub Health center
9	**Post office**	1	1	Nil	Nil	1
10	**Bank**	Nil	Nil	Nil	Nil	1
11	**Market**	Pvt shop	Pvt shop	Pvt. Shop	Pvt. Shop	Pvt. Shop
12	**Electricity**	90	80	90	70	90
13	**Source of water**	Handpump,	Handpump, Suppply water by Tap	Handpump, Tap water supply by panchyat	Handpump, Tap water supply by panchyat	Handpump, Tap water supply by panchyat
	Fit(approximate)	100	60	60	40-120	40-140
14	**Type of life style**	simple/other	simple/other	simple/other	simple/other	simple/other
15	**Toilet facilities %**	40	20	80	70	50
16	**Earthquake Flooding**	yes	Nil	Nil	yes	yes
17	**spring in the village**	Nil	Nil	Nil	Nil	Nil
18	**Transport system**	Pvt.Transport	Pvt Tran.	Pvt.Transport	Pvt.Transport	Pvt.Transport

(Source - Field survey)

Infrastructure

The study area is well served with infrastructural facilities such as road and rail, power and telecommunication facilities.

ENVIRONMENT IMPACT IDENTIFICATION, PREDICTION & MITIGATION

Ambient Air

Construction phase

During construction phase, impacts on ambient air would be mainly due to dust emissions and movement of vehicles. However these impacts would be short term in nature and limited only to the construction period. To minimize such impact following measures shall be taken:

- All the loose material either stacked or transported shall be provided with suitable covering such as tarpaulin.
- Water sprinkling shall be done at the location where dust generation is anticipated.

Operation Phase

The Power requirement of distillery unit is 3 MW. The unit shall generate its own power from co-generation power plant of 6.5 MW and power requirement of the unit will be met from this power plant. Air emissions will be generated from boilers & D.G. Sets used for power back-up. For 6.5 MW co-generation power plant, Multi fuel boilers will be installed.

Following measures shall be adopted to mitigate the air emissions:

1. Air emissions will be generated from two boilers & D.G. Sets used for power back-up.
2. The emissions shall be PM, SO_2 and NO_X for which stack height of 60 m and Electrostatic precipitator system shall also be installed to meet the desired emission standards of Boilers & stack height of 4.5 m above roof level shall be provided for D.G. Sets.
3. 35000 Sqm (34.58% of plot area) shall be developed as green area. The plantation work for green belt development shall be carried out as per CPCB guidelines.
4. Ambient air quality and stack emission would be regularly monitored to ensure that ambient air quality standards and suggested limits will be met at all the time.

From the above mentioned measures, it is clear that there will be no significant impact on air quality.

Water Environment

Impact on water resources

Municipal Supply from SIDCUL will be the main source of water supply during operation phase. The total water requirement is about 4082 KLD for grains/starch based process or 1496 KLD for molasses

based process. In order to substantiate the impact, rain water harvesting will be promoted through 25 no. of rain water harvesting pits, so impact on ground water resources is not envisaged.

Impact on water quality

Construction Phase

Work Equipment and labour

Approx. 4.5 KLD of waste water generated through labors will be discharged to septic tank via soak pit. Waste water generated from construction area like equipment washing, hand washing etc will be collected in impervious collection pit for reuse in curing activity.

Development of site

Development of site could lead to excavation activity on site, thereby causing erosion of base soil, the runoff from site may contain high quantity of suspended solid, however the impact of runoff may not be significant except monsoon. During the installation period, runoff from site shall not be allowed to stand (water logging) or enter into the roadside or nearby drain.

Operation Phase

The total water requirement is about 4082 KLD for grains/starch based process or 1496 KLD for molasses based process. The total waste water generation from Grain/Starch based process will be 1098 KLD & from Molasses based process will be 562 KLD. Domestic Sewage will be disposed off in septic tank via soak pit and other effluents discharged will be treated in ETP (Effluent Treatment Plant) of 1300 KLD. The project proponent proposed to adopt Multi-effect Evaporation System for spent wash generated from molasses and Decantation system for spent wash generated from grain. There will be no discharge of any effluent outside the complex. It will be a zero discharge Distillery Unit.

Land / Soil

Construction Phase

No major impact is likely to occur on the soil quality during construction phase. Land is generally plain, thus the topography of the area would not be affected by proposed development. There will be controlled use of heavy machinery and storage of material. Compaction and stabilization will be resorted during filling to ensure that no top soil is washed away. Every care will be taken to prevent soil erosion. Topsoil will be cleared and preserved and shall be used it for existing landscaping work within the premises.

Operation Phase

Several environment management measures will be implemented to minimize the soil erosion and other impacts such as removal and use of top soil from construction activity for future plantation, construction of silt traps etc. Carefully designed landscaped areas and plantation will be maintained. Maximum open area will be utilized for landscaping. No significant impact is expected on the soil on and around the site.

Noise Levels

Construction Phase

During the construction phase, source of noise will be of construction equipment's, vehicles for transportation of raw material and DG sets. However noise during this phase would be only for specific period of construction. To prevent any occupational hazard, earmuff / earplug shall be given to the workers working around or operating plant/machinery emitting high noise levels.

Operation Phase

During operation phase, Noise generating units like manufacturing plant, DG sets etc. will be well insulated with enclosed doors. Maintenance of vehicles and machinery will be done in a sustainable manner to ensure best performance and less loss. 35000 Sqm (34.58 % of plot area) shall be developed as green area. Earmuffs will be used while running equipments of the plant.

Solid Waste

Construction Phase

Whatever quantity of construction waste is generated shall be stacked and disposed off at the designated disposal site within industrial area and care shall be taken to ensure that temporary stacking and transportation shall not cause any disturbance to the surrounding environment. Muck and slurry generated will be used as backfilling material to raise soil levels in nearby areas. Approx. 15 kg/day of municipal solid waste will be generated and shall be disposed off at municipal solid waste site within the Integrated Industrial Estate of SIDCUL.

Operation Phase

IMPACTS	MITIGATION MESURES
18 kg/day of municipal solid waste will be generated from the Distillery unit every day.	The closed & color coded bins for biodegradable & non-biodegradable waste shall be placed in Distillery Unit. Bio Degradable waste of 13 Kg/day will be disposed off at MSW Site of Integrated Industrial Estate SIDCUL & Recyclable Waste of 5 Kg/day shall be given to Authorized Recycler.
Process waste	**Process waste from grains:** The wet cake from decanters will be blended with the concentrated slurry (Syrup) from Evaporation section

	in a ribbon mixer and approx. 102TPD of Distillers Dry Grain Sludge (DDGS) which has high nutritional value will be sold as cattle feed. **Process Waste from Molasses:** No Solid waste is generated. The waste from evaporated spent wash from molasses will be mixed with rice husk/agro waste and used as fuel in the boiler
ETP Sludge	**ETP Sludge** will be used as manure. ETP sludge generation from molasses based process will be 1300 kg/day & from grain based process will be 2300 kg/day.
Boiler Fly Ash	**Boiler Fly Ash** is a non-biodegradable sludge & will be reprocessed for silica recovery or will be used by cement/brick industry as a filler material.
Hazardous Waste i.e Used Oil	**Used Oil**: Approx. 1.6 Lt/day of used oil from machineries/D.G. Set will be carefully stored in HDPE drums in isolated covered facility. The used oil will be sold to vendors authorized by Central Pollution Control Board for the treatment of the same.

Flora and fauna

Construction Phase

The industry shall be established in SIDCUL Industrial area of the state, hence minimal damage to flora and fauna is envisaged. However, this will be compensated by carrying out plantation in an area. There will be negligible impact on flora of core zone. However Plantation will be done on 34.58% of plot area which will include 6-15 m green belt, area under green belt will be done 15% of plot area and landscaping will be done on 20.58% of plot area which will enhance the green of the area.

Operation Phase

IMPACTS	MITIGATION MESURES
Impact due to thermal radiation caused due to accidental fire on flora and fauna of core zone & buffer zone	Industrial fires can be intense emitters of heat, smoke, and other combustion products. This is particularly true if the fuel is with a high heat of combustion and soothing potential. Fire will result in release of thermal radiation. The thermal energy, falling upon a given area from a specified fire/explosion will be less the farther thermal from the explosion. Main Impact will be on the flora and fauna of core zone for which fire fighting measures are already given.
Impact due transport of raw material to plant	During operation phase source raw material will be mainly from SIDCUL Industrial area only, so there will be negligible impact from transport of raw material to the existing flora and fauna of buffer zone. Plantation will be maintained within the project area, which will have positive impact on the existing SIDCUL Industrial Area.

Socio-economic environment

The industry shall be established in SIDCUL Industrial area of the state. During construction/Installation phase, 50-100 local labours shall be employed. During operation phase overall there will be an employment of 120 personnel. Thus a positive benefit is likely to be created to the socio-economic environment. No rehabilitation and resettlement is required for proposed Distillery unit project. Employment opportunities will be generated for the local population.

Odour Control:

Causes of odour are bad management of fermentation house, long retention of fermented & ETP. Following measures shall be taken in the proposed distillery to mitigate odour:

1. Better housekeeping by regular steaming of all fermentation equipments.
2. Regular steaming of all fermentation equipments.
3. Use of efficient bio-ides to control bacterial contamination.
4. DDGS will be kept under sheds.
5. Control of temperature during fermentation to avoid inactivation/killing of yeast.
6. Regular use of bleaching powder in the drains to avoid generation of putrefying micro organisms.

Safety and Security

1. Smoking must be prohibited.
2. Vehicle access should be strictly controlled.
3. Ventilation must be sufficient to cope with the maximum expected vapor levels in building.
4. Storage tank vents to atmosphere should be sized for fire-heated emergency vapor release.
5. Electrical equipment must be explosion-proof to meet national electrical code requirements.
6. Dry chemical extinguishers should be accessible for small fires. An adequate supply of hand-held and wheeled types should be available.
7. Hydrants should be strategically placed with adequate hoses.
8. Small spills should be remediated with sand, earth, or other non-combustible absorbent material, and the area then flushed with water. Larger spills should be diluted with water and diked for later disposal.
9. Lighting should be grounded. Tall vessels and structures should be fitted with lightning conductors that are securely grounded.

After getting Clearance from the competent authority the commercial operation of the distillery unit will commence.

First Aid Measures

- In case of chemicals come in contact with the skin, remove contaminated clothing. Wash with soap and water for 15 minutes. Seek medical attention if irritation occurs.
- In case of chemicals contact with the eyes, flush immediately with gently running water for a minimum of 15 minutes, ensuring all surfaces and crevices are flushed by lifting lower and upper lids. Obtain medical attention.
- In case of inhalation of chemical's vapours, remove the individual to fresh air, but only if it is safe to do so. Asphyxiation from vapours may require artificial respiration. Due to the possibility of delayed onset of more serious illness, it is important to obtain medical attention.
- Ingestion of chemicals is life threatening. Onset of symptoms may be delayed for 18 to 24 hours after ingestion. Do not induce vomiting. Transport to medical attention. The individual should remain under close medical care and observation for several days.

Environmental Management Plan

- Environment management cell will be created and specific responsibilities will be assigned to various members.
- Environment monitoring plan will be prepared for air pollution, water pollution and solid waste generation. Regular monitoring of pollutants will be undertaken during the operational phase of the project and the monitoring locations will be finalized in consultation with the SPCB.
- Safety aspects related to personnel and operation will be taken into consideration.
- It is expected that authority shall incur a capital expenditure of about 38.48 Crores and an annual recurring expenditure of about Rs. 3.26 Crores, at current prices on environmental matters.

Cost on EMP

S. No	Particulars	Amount (Rs. In Lacs)
	Capital Expenditure	
1	Landscaping/ Plantation	130.0
2	Solid Waste Management	18.0
3	Waste Water Management	600.0
4	Air Management & Electro Static Precipitator	350.0

5	Multi effect Evaporator & Drier	1500.0
6	Centrifuge Decanter	350.0
7	Civil work for Environmental Eq.	900.0
	Total	**Rs. 3848.0 Lacs i.e 38.48 Crores**
	Recurring Expenditure	**Amount (Rs. In Lacs/Year)**
1	Landscaping	13.0
2	Monitoring (Environment)	4.0
3	Solid waste management	9.0
4	Waste Water Management	30.0
5	Maintenance of Pollution Control System	50.0
6	Operation and maintenance cost for evaporator	200.0
7	Misc.	20.0
	Total	**Rs. 326 Lacs/Year i.e 3.26 Crores**

Socio-economic Welfare Activities

The company will spend **at least 5 %** of project cost for Enterprise Social Commitment. The detail of social welfare activities are given below:

- Education – Proper education shall be provided to the poor children of the local villages by promoting Teaching Campaigns.
- Hygiene & sanitation - Health Camp & Hygiene - sanitary awareness programs shall be organized. Regular awareness activities shall be conducted on range of issues such as health & nutrition awareness.
- Women & Youth Empowerment – Tailoring & other small scale activities class, Computers class, employment opportunities & other training calls shall be conducted in the nearby area.
- Greening – Proper tree species shall be planted on the road side areas. Parks shall be maintained in the nearby area.
- Provision of drinking water facilities will be provided to the nearby Village.

Project Benefits

- It will provide direct and indirect employment to local youth.

- The Distillery Unit as designed by us is pollution free since there is will be no water discharge. So it's an eco-friendly project.
- ENA & IMFL will be exported to earn foreign exchange which will help in national economy.
- Project is designed for low energy consumptions and rain water harvesting is adopted for water conservation.
- Distillery is located near to Food Park from where project will get starch B&C and used as a feed stock in distillery which will help for low process water consumption.
- The rural economy will get a big boost due to purchase of large quantity of grain by-products, rice husk etc.
- Development of road, transportation, communication and related infrastructure in the region.
- Opportunity of opening of educational and training institutes around the project site.

Conclusions

The study brings out the following points:

- Existing ambient air quality, ground water quality and noise levels are within acceptable norms and will continue to remain so, upon implementation of the proposed mitigation measures.
- Risk to flora, fauna and soil is negligible due to effective implementation of effective EMP.
- Socio-economic benefits are envisaged due to creation of direct/indirect employment.
- Thus, it can be concluded on a positive note that after the implementation of the mitigation measures and Environmental Management Plan, the normal operation of the project will have negligible impact on environment and will benefit the local people.