
Executive Summary

1.1 Background:

Human beings have used ethanol since prehistory as the intoxicating ingredients in alcoholic beverages. Dried residues on 9000-year-old pottery found in northern China imply the use of alcoholic beverages even among Neolithic peoples. Islamic alchemists who developed the art of distillation, the most notable of whom was Al-Razi, first achieved its isolation as a relatively pure compound. The writings attributed to Jabir Ibn Hayyan (Geber) (721-815) mention the flammable vapours of boiled wine. Al-Kindi (801-873) unambiguously described the distillation of wine. Distillation of ethanol from water yields a product that is at most 96 % ethanol, because ethanol forms an azeotrope with water. Johann Tobias Lowitz first obtained absolute ethanol in 1796, by filtering distilled ethanol through charcoal.

Alcohol is also sold in an untaxed "denatured" form, unfit for human consumption but suitable for many other purposes. Denaturing is accomplished by the addition of a few percent of foreign materials, which are not easily removed. Non-denatured ethanol is the alcohol contained in beverages, thus the expression "potable alcohol". It also finds wide use as an industrial solvent. Furthermore, it is the starting material for the preparation of a long list of industrial organic chemicals. Alcohol has assumed very important place in the Country's economy. It is vital raw material for a number of chemicals. It has been a source of large amount of revenue by way of Excise Duty levied by State Government on Alcoholic liquors.

M/S D.C.RATHORE has been incorporated with the registered office as 15/24, Sadar Bazar Sagar (M.P.). The promoters of the company are as follows:

1. Shri Gajendra Singh Rathore
2. Shri Nitendra Singh Rathore
3. Shri Virendra Singh Rathore
4. Shri Ritendra Singh Rathore
5. Shri Subhendra Singh Rathore

1.2 Proposed Project:

M/s D C Rathore has proposed to install 50 K.L. per day Grain/Molasses Base Distillery & Bottling unit with an installed capacity of 15000 K.L. potable alcohols & 6.0 Lakh cases Indian made foreign liquor per annum (300 working days) at Sagar Dist. in the State of Madhya Pradesh at estimated cost Rs. 3030 lacs. The project will be an integrated grain-processing complex to process about 37500 MT of grain. The plant will be located at Village: Mehar, Tehsil and District Sagar in the state of MP.

1.3 Objective of the study:

This Environmental Impact Assessment (EIA) study is prepared for obtaining the Environmental Clearance (EC) from Ministry of Environment and Forests (MoEF), Government of India, New Delhi, for the proposed distillery of 50 K.L. per day on Grain/Molasses Base & Bottling unit with an installed capacity of 15000 K.L. potable alcohol & 6.0 Lakh cases Indian made foreign liquor per annum.

Considering the above points, Environmental Impact Assessment report has been prepared along with Environment Management Plan (EMP) for various environmental components, which may be affected due to the proposed Plant. The Risk Assessment and Disaster Management Plan have also been prepared to meet the eventualities during operation of the plant. This EIA Report covers the primary data

collected during the period November 2007 to January 2008 covering winter season.

M/s Creative Enviro Services, Bhopal have prepared Rapid Environmental Impact Assessment (REIA) report for the proposed Plant at Village: Mehar, Tehsil and District Sagar (MP) by incorporating "Terms of References (TORs)" approved by Ministry of Environment & Forest (MoEF) New Delhi. The report contains detailed description of the following,

- a. Detailed characterization of status of environment with in an area of 10 km radius from the proposed plant site for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- b. Assessment of air emissions, liquid waste and solid waste from the proposed project along with the noise level assessment.
- c. Pollution control measures proposed to be adopted.

1.4 Environmental Setting:

The environmental setting of the proposed plant is given in **Table**.

Table
Environmental Setting of the proposed site

S. No.	Particulars	Details
1	Latitude	23°59'21"
2	Longitude	78°49'57"
3	Height above mean sea level	473 m
4	Nearest Town	Sagar - 20 km
5	Nearest Railway Station	Sagar- 20 km
6	Nearest Airport	Jhansi -180 km
7	Nearest Highway	NH-26 at about 0.2 km
8	Nearest Village	Mehar is about 0.5
9	Hills/Valley	No hill or valley

10	Ecological Sensitive Zone	No national parks and sanctuary within 10 Km radius
11	Historical Place	No
12	Nearest River	Dhasan River- (0.5 KM from the site in South direction of village Mehar) Karawan Nadi- 2.5 km in SE direction
13	Nearest City	Sagar 20 km
14	National Park/Wildlife Sanctuary	No in 10 km radius
15	Tiger Reserve/Elephant Reserve/Turtle Nesting Ground.	No in 10 km radius
16	Habitat for migratory birds	No in 10 km radius
17	Lakes/Reservoir/Dams	No in 10 km radius
18	Stream/Rivers	No stream/ River Dhasan (0.5 KM)
19	Estuary/Sea	No in 10 km radius
20	Notified Archaeological site	No
21	Industries/Thermal Power Plants	No
22	Defense Installation	No such area
23	Reserve forest	Hanota-Duhaga RF-W-1.5 Dhkuli RF-NE-2km Chitoli RF-NE-4.5km Ranipura RF-SE-5.5km
24	Annual Climatic Conditions	Max. Temperature 44°C Min ^m Temperature -4°C Average Rainfall-1200mm Max. RH (%) - 98% Min. RH (%) - 05 %

1.5 DETAILS ABOUT THE PROJECT SITE

1. The plant site is located at Village: Mehar, Tehsil: Sagar, District: Sagar, MP.
2. The nearest railway facility is available at Sagar, which is about 20 Km. from the proposed project site. The nearest airport is Jhansi, which is about 180 km from the proposed project site.
3. Mehar, Bamnora, Bundri, Chitauwa, Luhori, Bamora, Devri, are the near by habitations to the proposed plant.
4. Total land is sufficient for installation is about 8 hact but project proponent has owned about 40.48 hact of land.
5. The major crops in the study area are Wheat, Paddy, etc.

1.6 Raw Materials

The following will be the raw material requirement for the proposed project.

Sr. No.	Item	Gross requirement
1.	Grain	37500 mt/year
2	Molasses	65500 mt/year
3	Coal	12000 mt/Year

All the raw materials will be transported through Road.

1.7 Process Flow of the Plant

- The grain are grounded in roller Mills. Suitabie roller Mills with a Capacity of 6.0 MT/Hr. will be required. The Grinding of grains is required to break their crystalline Structure in order to facilitate the iiquefication & Sachrification processes. The grains are to be crushed to be very fine size 0.3 mm, to 1.0 mm. in order to avoid forming of excessive gelatin.

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- The grounded grains or flour is mixed with hot water at about 60° C in a slurry tank is fitted with a stirrer which facilitate proper slurry preparation.
 - Slurry is transferred in holding vessel for pre-cooking at about 60 to 95° C (Max) and 15% enzyme add, Ph to be maintain at 6 to 6.5.
 - The slurry at Sp. Gr. 1.080 is cooked through a series of coil at about temperature of 105° C to 120° C.
 - The cooked slurry at about 105° C-120 ° C is taken in flash tank where it is cooled down to around 90° C . The flashes i. e. steam is either blown-off or condensed to recover heat.
 - The slurry at 90° C is taken into lequefication tank where enzyme-amylase is added to lequefy the same
 - The slurry in Sachharification tank is again subjected to agitation and enzyme Amyioglucocidase is added to convert starch into Sugars.
 - The **semi continouse cum continouse system** fermentation system comprises eight old batch fermantation time is normally 50-55 hours depending on grain feedstock.
 - Special yeast strains will require to be selected on industrial scale for **semi continouse cum continouse system** fermentation.
 - Mash is fed to the first fermenter, where the concentration of alcohol is kept below 6 vol % by controlling the retention time and yeast cell count.
 - During the emptying, cleaning, pitching and filling of the firstfermenter the other fermenters remain full and there is no interruption in the mash flow to distillation.
 - Molasses after weighing is diluted and also pre-treated to an appropriate sugar concentration while pumping through molasses broth mixer into the fermenter.

- The partial pre-treatment of molasses is required to reduce scaling of the equipment due to the sludge present in the molasses, which is separated out very easily in this pre-treatment. The fermenters are then inoculated with culture developed in the culture vessels
- To help the fermentation sustain the assailable nitrogen are added in the medium in the form of Urea and DAP as required
- After completion of reaction the fermented wash is delivered to wash settling clarifier. In Wash Settling Clarifier, settable solids settle down. The supernatant goes to Buffer Wash Tank (BWT) and sludge from bottom goes to Sludge Tank

- The fermenters are then inoculated with culture developed in the culture vessels. This culturing with suitable yeast is carried out only during the start-up of the plant. The culture thus developed maintains itself in fermenters on a continuous basis.
- The distillation system comprises five main. columns. These are mash, pre-distillation, rectification, methanol and head concentration (feints) columns
- The pre-distillation column separates and the feints column concentrates impurities of raw alcohol. Highly concentrated heads are removed from the feints column and the recovered impure alcohol is recycled back to the main column system
- The overhead vapor from the rectification column boils the low-pressure mash column and analogously the pre-distillation column boils both the feints and the methanol columns.
- After fermentation the next stage in the manufacture of alcohol is to separate alcohol from fermented wash and to concentrate it to 95% alcohol called as rectified spirit. For this purpose, method of distillation is Employed. Vacuum distillation system for production

of rectified Spirit consists of three to four distillation columns namely-

1. degasifying cum analyzer/stripping column – Operation under vacuum
2. pre-rectification column –Operation under vacuum
3. rectification cum Exhaust column – operated under pressure
4. fusel oil concentration column – Operated under pressure

Bottling unit section manufacturing process

Potable alcohol mixed with DM water up to 4 op & rest for 12- 24 hrs after that 12 hrs passes through carbon chamber for removing of impurity & bed smell, again add DM water and start agitator for proper mixing of alcohol & Dm water, after rest 2-3 hrs add essence, caramel & other required chemical as per formula of blends & well mixed through agitator and mention final strength as required as per norms, for clarity of blends passes through plate filter 2-3 time after that blend is ready for bottle filling.

1.8 Plant and Machineries

The major plant & machinery required for the proposed project as given under.

1. Milling Section.

- a. De stoner& pre-cleaner
- b. Weigh loading &unloading machine
- c. Hammer mill with screw feeder
- d. Flour hopper with RPM controller screw feeder
- e. Bucket elevator

2. Cooking & Liquefaction section.

- a. Flour & water pre-mixer
- b. Slurry holding vessel
- c. Jet cooker
- d. Holding quills
- e. Flash vessel
- f. Flash cooler
- g. Liquefaction vessel
- h. Plate heat exchanger
- i. Cooling tower

3. FERMANTATION

- a. Yeast propagation vessel
- b. Pre fermentation
- c. Fermentation
- d. Plate heat exchanger
- e. Cooling tower
- f. Root type Air blower.
- g. CO₂ & Yeast purification.
- h. Molasses and Water Mixer

4. DISTILLATION

- a. Analyzer column
- b. Rectification column.
- c. Aldehyde column
- d. Purification column

- e. Re-rectification column.
- f. Fusel oil column.
- g. Re-boilers
- h. Condenser's
- i. Cooling tower
- j. Vacuum pump & other pump

5. WARE HOUSE

- a. Spirit receiver& storage tank

6. BLENDING & BOTTLING SECTION

- a. Spirit receiver& storage tank
- b. Blending tank with agitator
- c. Plate filter with pump.
- d. Rotary washing machine.
- e. Brushing machine.
- f. Chain conveyer.& Belt conveyer.
- g. Vacuum filling machine.
- h. Sealing machine.
- i. Inspection box.
- j. Labeling machine.

7. UTILITY SECTION.

- a. R.O & D.M. plant with all accessories.
- b. Raw water storage tank
- c. Boiler with all accessories.
- d. Fuel handling system with all accessories.

- e. Steam turbine with all accessories.
- f. D.G. set with all accessories.
- g. Transformer & main electric panel.

8. EFFLUENT TREATMENT & ZERO DISCHARGE PLANT

- a. Centrifuge Decanter.
- b. Clarifier
- c. Bioreactor with all accessories.
- d. Gasholder with all accessories.
- e. Multi effective evaporator with all accessories.
- f. Force circulation finisher with all accessories.
- g. Concentrate storage & Handling system
- h. Dry powder-handling system with all accessories.
- i. Condensate water storage tank.

1.9 Storage Facility

It is proposed to provide adequate storage facilities for the raw materials and fuel to be used in the plant. All the raw materials like coal / grain / molasses/ other's are stored above the ground level under covered shed. (Size -1700 sq met) There will be a grain storage silo tank of 2000 MT capacity & molasses storage mild steel tank of 4000 MT capacities & products storage tank capacity will be 15,000,00 lit of ss/ms material.

1.10 Electric System

Internal consumption of power plant will be 800 kva that will supply by the M P State Electricity Board. DG set of 500 kva shall also be installed for power supply as alternative arrangement.

1.11 Water Balance

Use Of Raw Water / Treated Water / Mee Condensate / Other,s (Spent Leese) In Distillation & Bottling Plant

	Raw Water (m ³ /day)	Treated Water (RO/DM)	Condensate Water Re Use	Other (Spent Lees)
Distillation process	150	-	165	125
RO Plant	110	-	-	-
DM Plant	12	-	-	-
Boiler House	-	80	-	-
Distillery Cleaning	-	-	5	-
Bottle washing	8	-	-	-
Bottle Floor Cleaning	2	-	-	-
Bottling Domestic	4	-	-	-
Bottling Other's	4	-	-	-
Bottling Blending	-	10	-	-
Cooling Tower	-	-	125	-
Distillery Domestic	10	-	-	-
Horticulture	10	-	-	-
Dust Suppression /Spraying	-	-	10	-
Total	310	90	305	125

Condensate Generation & Re-Use In Process (Section Wise)

(a) Condensate Generation (MEE) - 411.356 m³/day

(b) Condensate re-use in process

Distillation process	- 165 m ³ /day
Cleaning of equipment	- 5 m ³ /day
Cooling tower	- 125 m ³ /day
Dust suppression/ Spraying	- 10 m ³ /day

Total **305 m³/ day**

Note: - Balance 106.356m³/day will be use in plantation/agricultural use. Therefore total raw water requirement for the plant will be only 305 m³/ day.

1.12 Project Cost

The cost of the proposed project for manufacturing POTABLE ALCOHOL & I.M.F.L & C.L. with an installed capacity of 15000 Kilo Liters & 6.0 lakhs cases per annum at Sagar in the state of Madhya Pradesh is estimated as under:

Particulars	Amount (Rs./lacs)
Land & Site Development	70.0
Building & Shed	141.00
Plant & Machinery	2500.0
Other Fixed Assets	44.0
Technical Know-how Fee	25.0
Escalation & Contingencies	50.0
Margin money for working capital	200.0
Total	3030.00

1.13 SOURCE OF POLLUTION & CONTROL MEASURES

AIR POLLUTION

The flue gases coming from Boilers will pass through Multicyclone. The particulate matter at the outlet of all the Electro Static Precipitators will be less than 100 mg/NM³ or as per norms given by the statutory authority. These treated gases will be let out into the atmosphere through stack of 30m height for effective dispersion of pollutants into the atmosphere.

The following measures will be taken for control of fugitive emissions

- Dust extraction system with bag filters & Water Sprinkling system will be provided at material handling & raw material storage areas.
- All Conveyors will be totally covered with GI sheets to prevent the fugitive emissions.

Water Pollution

The total quantity of the effluent from distillery stream will be 430 KL / Day. The management has decided to evaporate of the total effluent after Bio-methanation. And the left out material/ residues will be used as fuel in boiler. No effluent will be discharged outside the plant premises.

Effluent Treatment Plant

The **distillery section's** combined effluent is contaminated with grain/molasses and high temperature and thus necessitating the requirement of filtration unit (to filter the grain / yeast sludge) followed by one holding tank for cooling down the temperature which is favorable for bio-methanation process. The filtered grain / yeast sludge will be removed and taken for solar drying / other's heating type drying and after it is sold to the poultry / cattle feed manufacturers. Considering the features of the effluent as indicated above in the report, bio - methanation followed by concentration by MEE & Force Circulation Finisher. Bio - methanation is now a well-established process. It is a UASB type.

The combined stream of distillery's effluents because of their different characteristics are separated and collected individually. The spent wash stream as indicated earlier is highly concentrated with organic matter.

The effluent from the acidification stage flows into the main anaerobic digester for the Methanation reaction. Here, the organic acids are decomposed to methane and carbon dioxide.

The gases produced are separated from the liquid and collected over water in a gas storage system with floating bell type roof. From here it is then used in boiler.

The effluent from the digester flows through a degasser unit into the hopper bottom type settler and from here it overflows into a clarifier-II. The settled sludge from the clarifier is recycled back into the digester or to the sludge drying beds and overflow is collected in holding tank- II. The extent of removal of BOD from this system would be about 90%. From holding tank- II, The Effluent feed through plate heat exchanger in M.E Evaporators For ZERO DISCHARGE of effluent & saving high quantity of water and Concentrate as a fuel.

After Bio-mentholated effluent is feed to the vacuum evaporator to concentrated from 4% to 55-60 % TS. The total process is under vacuum and the vapors generated in the system are re-used to economize steam consumption through thermal vapor recompression system in order to reduce steam consumption in multi effect evaporation system with thermal vapor recompression system is use water recovered from the evaporation is colorless it can be recycled in the plant (dilutor of slurry/molasses, cooling tower, floor, washing plantation etc.) and the resultant slurry is passes through Force circulation finisher for 50-55% concentration. Resulted 50-55% concentrated spent wash is sprayerd at the of the incinerator / Boiler where the water is evaporated and dry matter is burnt at the grate near the bottom, from where the ash is to be collected and the flue gases generated sufficient steam for multi effect evaporator.

Salient Features Of Treatment System

- 1- Very small space required is only 900 sq. met.

- 2- **Condensed Water:** - Recycle in process (mixing of slurry, molasses, boiler feed water, cooling tower make up water floor cleaning and plantation etc. so fresh water requirement for this distillery will very low. It is one of the main advantages for helping of environmental and manufacture.
- 3- **Powder:** - Can be used as a fuel in boiler for generation of steam. This quantity of powder will generate 90% steam those will use in our MEE system only 10% fuel is required
- 4- Bio gas/Concentrate can be used in boiler.
- 5- Power requirement is it compared to three-stage treatment system.
- 6- Operation cost is same compared to other treatment system.
- 7- Saving OF water.
- 8- It process is 100% ZERO EFFLUENT DISCHARGE process due to 100% Effluent is Reuse in process after using MEEFCP. .
- 9- It process is closed inline process so noise level will not increase.

1.14 Solid Waste Management

Name	Quantity
ETP Sludge	
Grain Based	0.85 mt/day
Molasses Based	1.9 mt/day
Disposal: Used as Manure	
Spent Grain	17 mt/day
Yeast Sludge	1.5 mt/day
Disposal: Used as cattle feed	
Ash generation	20 mt/day
It will use as a raw material of brick manufacturing.	

Spent Wash Concentrate	32800 kg/day (55% Solid)
It will use as a fuel in boiler.	

1.15 BASELINE DATA

Ambient air quality

Ambient air quality was monitored for RPM, SPM, SO₂ & NO_x at 8 stations including project site for one season as per MOEF guidelines. The following are the concentrations of various parameters at the monitoring stations.

CODE NO	Location Name	98 th Percentile Values			
		SPM	RPM	SO ₂	NO _x
A-1	Plant site	152.1	54.2	9.3	14.6
A-2	Mehar	120.6	42.9	7.3	9.9
A-3	Bamnora	129.6	42.2	7.5	10.6
A-4	Bundri	128.6	45.7	7.6	10.6
A-5	Chitauwa	123.6	43.4	7.5	10.4
A-6	Luhori	122.6	38.6	6.9	9.9
A-7	Bamora	120.0	39.1	7.8	11.3
A-8	Devri	145	51	9.7	13.9

1.16 Water quality

Station Code	Location	Source	Distance From Plant Site (Km)	Direction Wrt Plant Site
SW1	Dhasan river (Up stream)	Surface water	0.5	SW
SW2	Dhasan river (Down stream)	Surface water	0.5	SE

Sw3	Karawan Nadi	Surface water	1.5	SE
GW1	Mehar	Borewell	0.5	S
GW2	Bamnora	Borewell	2.0	W
GW3	Bandri	Borewell	3.5	N
GW4	Luhari	Borewell	5	NW
GW5	Semra	Borewell	4.0	N
GW6	Kanghari	Borewell	4.0	E
GW7	Piparla	Borewell	4.0	S

The summary of the water quality of the samples collected is given below:

Dhasan River and Karawan Water

- pH was found to be 7.1 – 7.8.
- Total dissolved solids in the sample were found to be of 196 – 214 mg/l.
- Total Hardness was found to be 60 – 65 mg/l.
- Chlorides concentration was found to be 12 – 14 mg/l.
- Fluoride concentration was 0.4 mg/l.
- Sulphates concentration was 25 – 31 mg/l.

Water samples collected from Dhasan River showed compliance of all parameters with the drinking water standards of IS 10500.

Surrounding Borewells

- pH was found to be 7.2 – 7.7.
- Total dissolved solids in the sample were found to be of 750 – 1070 mg/l.
- Total Hardness was found to be 420 – 565 mg/l.
- Chlorides concentration was found to be 117 – 118 mg/l.
- Fluoride concentration was 0.7 – 0.85 mg/l.
- Sulphates concentration was 91 – 172 mg/l.

All the ground water samples collected from various sources within the study area showed compliance of all parameters with the drinking water standards of IS 10500.

The water quality data of the study area is given in **Table 3.8 & 3.9 of EIA report**

1.17 Noise levels

Noise levels recorded were found to be in the range of 53.3 – 62.5 dB (A) during daytime and in the range of 46.3 – 53.4 dB (A) during nighttime.

Table
Noise Levels In The Study Area (10 Km Radius)

Station Code	Location	Noise Level dB (A)		
		Day Equivalent	Night Equivalent	Day – Night Equivalent
N1	Plant site	45	32	38
N2	Mehar	44.2	32.2	38.1
N3	Bamnora	42.1	32.8	37.6
N4	Bundri	41.2	31.2	34.2
N5	Chitauwa	44.2	34.2	36.2
N6	Luhori	41.8	33.2	37.2
N7	Bamora	47.2	31.2	40.6
N8	Devri	42.3	30.2	34.2

1.18 PREDICTION OF IMPACTS

Prediction of impacts on Air Environment:

There are no process emissions from the distillery. Air emission sources are boiler and DG set. Boiler is for steam generation and DG set is for standby arrangement for power generation. The boiler will be fired with Bio Gas/ Coal / dry Solid residue.

Bio Gas and Dry solid residue is cleaner fuel as compared to others. The SO₂ generation from the boiler shall not be significant. Multicyclone shall be installed to achieve the norms given by the state pollution control board. Stack height shall be provided 30 mt The height of the stack of the DG set shall be as per the norms of CPCB. The ash will be collected in hoppers underneath boiler bank/air preheater and dust collection system, which shall be given to local brick manufacturer.

1.19 Prediction of impacts on water quality

The treatment scheme starts with the collection of the effluent after filtration to remove the solid material in a collection chamber / holding tank. The solid material separated will be used as cattle feed. The holding tank is fitted with a mixer / agitator. Initially during start up and other disturbed process conditions the pH of the effluent will be adjusted by addition of lime slurry from a storage tank. The effluent from the holding tank is pumped into the first phase section of the anaerobic digester tank.

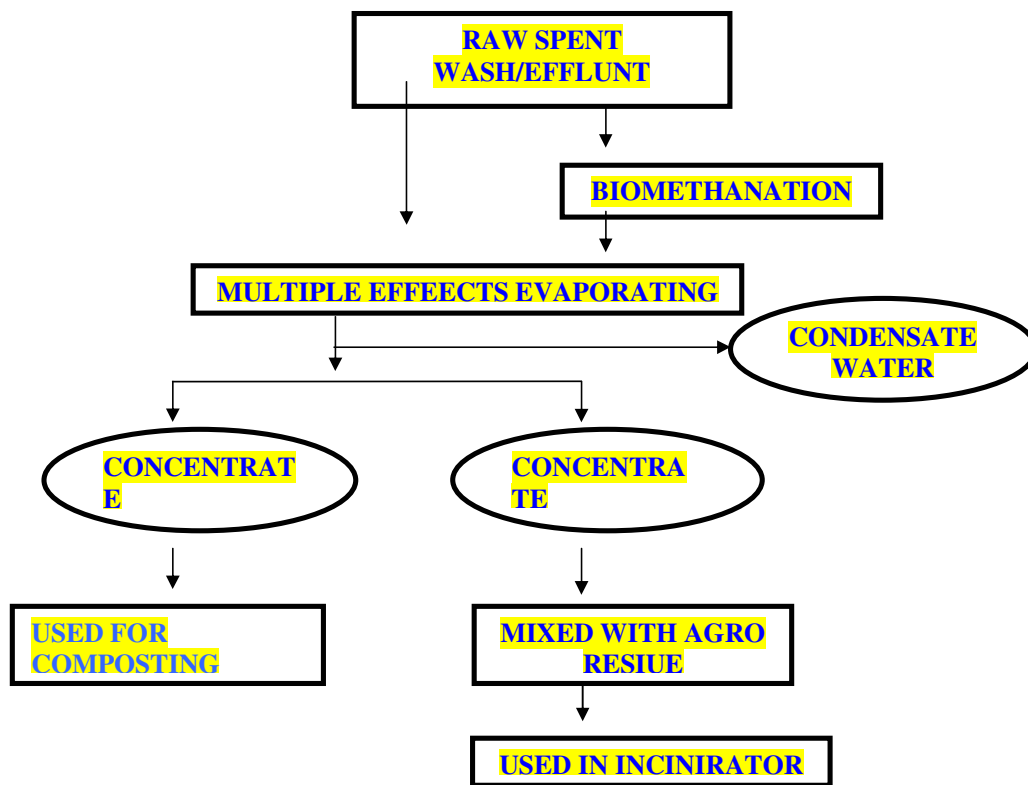
This is known as the acidification stage when the first reaction step of acid formation takes place.

The effluent from the acidification stage flows into the main anaerobic digester for the Methanation reaction. Here, the organic acids are decomposed to methane and carbon dioxide.

The gases produced are separated from the liquid and collected over water in a gas storage system with floating bell type roof. From here it is then used in boiler.

The effluent from the digester flows through a degasser unit into the hopper bottom type settler and from here it overflows into a clarifier-II. The settled sludge from the clarifier is recycled back into the digester or to the sludge drying beds and overflow is collected in holding tank- II. The extent of removal of BOD from this system would be about 90%. From holding tank- II, The Effluent feed through plate heat exchanger in M.E Evaporators For ZERO DISCHARGE of effluent & saving high quantity of water and Concentrate as a fuel.

SCHMATIC FLOW DIAGRAM FOR EFFLUENT TREATMENT FOR TOTAL POLLUTION CONTROL SYSTEM



1.20 Prediction of impacts on noise quality

The major stationary sources of noise generation in the plant are steam release valve, compressor, blowers and DG sets. Proper arrangement shall be made for the transportation of workers who are required to be present there for extended period of time. The impact of noise from distillery plant at battery limits will remain well within the standard. There is however no habitation in 1 km distance all around the core area of the proposed plant. The ambient Noise level monitoring in and around area reflects that at locations near to the area, noise levels are with the standards prescribed. The working environment in the plants shall be satisfies the standards prescribed by OSHA. The workers involved in operations will be provided with earmuffs/ earplugs. All the noise generating equipments shall be provided noise shield and enclosures as per the requirement. Thus it can be concluded that the noise environment of the area does not reached to an objectionable level and adverse effect of activity over noise environment of the area is low.

Prediction of Impacts on Land Environment Quality

As proposed plant of M/s D C Rathore will be installed on own land near to village Mehar, in the dist. of Sagar, hence, there will be no change in land use and disturbance of soil. The land of 100 acres has already been in possession of the project proponent. The land is under moderate agriculture activity. Some cut and fill operations shall disturb the soil profile but impact will be temporary.

The proposed plant will have no adverse impact on soil quality as there is no effluent discharge on the land and hence no soil quality will be disturbed.

Certain part of the site area will be used for piling and storage of construction materials and temporary offices and maintenance of heavy equipment. The land use pattern, outside the proposed site area will not be affected to any extent as the area will be barricaded and surrounded by plantation. It is also to note that out of 100 acres land, project proponent has proposed to develop green belt on 40% of the area, therefore aesthetic value of the area will increase by way of dense plantation.

1.21 Biological Environment

As there is no large source of emission or noise generation, there is no observed impact on terrestrial flora or fauna in the surrounding area of the plant. Moreover there is ample open space in the plant premises, which provides sufficient buffer between the plant operations and boundary limits. The biological environment mainly consists of flora and fauna and its relationship with surroundings. The massive afforestation planned for the project shall generate a forest having greater tree density. The proposed extensive will enhance the vegetation quality as well as aesthetic quality of the area. Thus there is no adverse impact envisaged over biological environment due to proposed power plant.

1.22 Socio - Economic Environment

The production from this industrial unit alone is expected to add substantially to the gross economic yield of the state. The study area of project is dominated by agricultural activity and is devoid of any organized animal husbandry, significant house hold industries etc. As the distillery will come up in 100 acres area impact on demographic and socio logical aspects shall be insignificant.

Deleted

Socio economic impacts as a result of the distillery in nearby areas is expected to be on moderate site in terms of employment, housing education, medical transport facilities, economic status, health and agriculture.

Deleted

There is no historical, biosphere reserve, defence installation of national importance in 10 k radius therefore no adverse impact on the same is envisaged.

The impacts of the project would be felt in an integrated manner on the socio-economic environment in the study area. The impacts on the different components viz employment, housing, educational, and medical and transport facilities, fuel availability, economics, status, health agriculture is moderately significant. Though size of project is small, but it will generate direct and indirect employment in the area.

1.23 ENVIRONMENT MANAGEMENT PLAN

Environment Management During Construction Phase:

In case of proposed project, the site is fairly level and clean. The various structures will be so located and designed that minimum levelling work will be needed, before excavation for foundation is started.

During excavation dust will be generated temporarily and nuisance will be minimised by sprinkling water. During construction phase many worker will be reside at project site. The workers will be provided with temporary dwellings with suitable amenities.

Deleted

No adverse impact on labour situation is expected. Job opportunity for many local people at the maximum will be created. This will have a beneficial impact on the economy of the surrounding area.

The material transportation by trucks may give rise to some air pollution, mainly due to loading and unloading for small period. It shall be kept in the mind that the dust nuisance during unloading operation will be confined only to the site. The aesthetic of the area is not likely to be affected since dust nuisance will be limited to the site. Noise pollution during construction phase will be negligible effect on the nearby population, since the impact distance is not likely to be more than 0.4KM, whereas nearest village situated at 1.0 KM.

1.24 Environment Management during Operation Phase:

Air Pollution Management

Air Pollution Control Equipment – Proposed Plant

It is proposed to installed a Multicyclon having efficiency to reduce particulate emission below 100 mg/ NM³

Fugitive Emissions

To control the fugitive emissions, the following measures are proposed:

- ❖ All the conveyors will be provided with conveyer covers and hoods to offset any trapping of material in wind stream. The height of the chutes at each of the transfer points and the slope of chutes to be considered to avoid dust generation;
- ❖ High efficiency reverse air jet type bag filters are considered to arrest the air borne dust at all the locations where transfer of material from one conveyor to other takes place;
- ❖ Unloading of coal from trucks will be carried out with proper care avoiding dropping of the materials from height. It is advisable to moist the material by sprinkling water while unloading;
- ❖ The sprinkling of water will be done along the internal roads in the plant in order to control the dust arising due to the movement of vehicular traffic;

- ❖ All the workers and officers working inside the plant will be provided with disposable dust masks;
- ❖ Thick greenbelt will be developed around the plant to arrest the fugitive emissions.

Air Pollution Control Schemes

Adequate and efficient control equipment will be installed in the proposed plant to keep the dust emission at a minimum. The following measures shall be taken:

Low NOx burners will be installed to control the NOx emissions below 50 ppm. Further, chimney of 30 m height is proposed for adequate dispersion of pollutants.

Since, the Coal to be used in the plant, lime injection system will be provided to reduce SO2 pollution. Generation of NOx gases depends to a great extent on the combustion temperature. A well-designed burner system will be installed which limits the temperature to a reasonably low value of NOx generation.

1.25 Noise Pollution Management

The extensive greenbelt proposed around the boundary of the plant will attenuate the noise emitted by the various sources in the plant. Earplugs will be provided for the personnel working close to the noise generating units as a part of the safety policy. Apart from this, some of the design features provided to ensure low noise levels are as follows:

- ❖ All rotating machinery will be well lubricated and provided with enclosures as far as possible to reduce noise transmission;
- ❖ Provision of silencers will be made wherever possible;
- ❖ The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers;
- ❖ Necessary enclosures will also be provided on the working platforms/areas to provide local protection in high noise level areas;

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- ❖ The workers will be provided with ear plugs; and
- ❖ Plantation in the zone between plant and nearest habitation would attenuate noise in the residential area.

1.26 Water Pollution Management

After Bio-mentholated effluent is feed to the vacuum evaporator to concentrated from 4% to 55-60 % TS. The total process is under vacuum and the vapors generated in the system are re-used to economize steam consumption through thermal vapor recompression system in order to reduce steam consumption in multi effect evaporation system with thermal vapor recompression system is use water recovered from the evaporation is colorless it can be recycled in the plant (dilutor of slurry/molasses, cooling tower, floor, washing plantation etc.) and the resultant slurry is passes through Force circulation finisher for 50-55% concentration. Resulted 50-55% concentrated spent wash is sprayerd at the of the incinerator / Boiler where the water is evaporated and dry matter is burnt at the grate near the bottom, from where the ash is to be collected and the flue gases generated sufficient steam for multi effect evaporator.

- 1- Very small space required is only 900 sq. met.
- 2- Condensed Water: - Recycle in process (mixing of slurry, molasses, boiler feed water, cooling tower make up water floor cleaning and plantation etc. so fresh water requirement for this distillery will very low. It is one of the main advantages for helping of environmental and manufacture.
- 3- Powder: - Can be used as a fuel in boiler for generation of steam. This quantity of powder will generate 90% steam those will use in our MEE system only 10% fuel is required
- 4- Bio gas/Concentrate can be used in boiler.
- 5- Power requirement is same compared to three stage treatment system.

- 6- Operation cost is same compared to other treatment system.
- 7- Saving OF water.
- 8- It process is 100% ZERO EFFLUENT DISCHARGE process due to 100% Effluent is Reuse in process after using MEECFCP. .
- 9- It process is closed inline process so noise level will not increase.

It is thus presented that instead of any additional negative impact on water quality; there will be a positive impact in the water table due to proposed water harvesting techniques.

Rainwater harvesting structures will be constructed to harvest the run-off water from rooftops by laying a separate storm water drainage system for recharging of ground water in consultation with Central Ground Water Board.

It is proposed to deploy Rainwater harvesting (roof top water collection) technique at suitable building of the plant.

1.27 Greenbelt Development

Due care will be taken to ensure that a greenbelt is developed in and around the plant. All areas devoid of vegetation and having low density will be systematically and scientifically afforested. Proponent has proposed to develop greenbelt on morethan 40% of Total area that is as per guideline of CPCB.

1.28 Health and Safety

Occupation safety and health is very closely related to productivity and good employer-employee relationship. The main factors of occupational health in plant are fugitive dust and noise. Safety of employee during operation and maintenance of equipment and handling of materials are proposed to be taken care of as per regulations. To avoid any adverse affects on the health of workers due

to dust, heat, and noise sufficient measures have been provided in the project.

The project proponent is conscious of its moral and legal obligation to prevent hazards and to provide healthy working environments. They are proposed to do the following activities:

- Provision of rest shelters for workers/staff with amenities like drinking water, fans, toilets etc.
- Provision of personal protection devices to the workers;
- Rotation of workers exposed to noise premises;
- Dust suppression of road; and
- First-aid facilities in the plant area.
- The management should make annual budget for the safety and health of their employees and provide sufficient facilities in order to effectively implement the health and safety measures.
- The management shall carry out periodical audit of safety and health with view to ascertaining the effective implementation of policy.
- Regular medical examination shall be conducted for the employees. The Medical Officers renders timely advice to the Management on preventive measures and safe guards.
- A safety Committee under MP Factory Rule 1962, under the chairmanship of the Vice President (Mech.) shall be constituted.
- Emergency Plan duly approved by the Director, Industrial Health and Safety shall be prepared and will be updated periodically.

- The following measures will be taken to prevent occupational diseases and health hazards.
- Pre-employment, pre-placement and periodic medical examination of employees.

- Regular monitoring of working environment and implementation of safety and control measures.
- Use of protective equipment, clothing, helmets, gas mask, shoes, etc.
- Periodical medical examination of every worker is necessary to be done once in five years to detect preventable and curable diseases at an early stage.
- Cases suspected having Pneumoconiosis are to be examined by a Special Board constituted by the Chief Medical Officer. Established cases will be suitably compensated and their job shall be changed if required.

1.24 Socio-Economic Development

The environmental department will be in regular touch with local surrounding villages to monitor the implementation of various developmental schemes made by the project authority. They will also consider any immediate requirement, which could be taken care of in near future.

Social welfare activities shall be taken up on a large scale. The social welfare activities can be planned in the following areas:

- Medical assistance;
- Primary education;
- Animal husbandry;
- Rural water supply;
- Agricultural improvement;
- Vocational training; and
- Assistance in utilizing government programs.

The following activities can be implemented in each of these areas:

Medical Assistance

- Providing better medical care to local people by extending them the hospital facilities or first aid facilities;

- Regular immunization programs;
- Medical assistance including provision of ambulance in emergencies;
and
- Periodic specialist camps

Education

- Institution of scholarship and prizes;
- Supporting adult education programs.

Vocational Training

Orientation programs for self-employment in collaboration with District Industries Center and Rural Development Agencies.

Agricultural Improvement

- Organize with the help of Agricultural Department, training programs for farmers in relevant areas such as pisciculture, animal husbandry, dairy development, modern cultivation, scientific storage of grain, water conservation etc;
- Arrange supply of high yielding variety of seeds together with subsidy or interest free loan for their purchases; and
- Arrange if necessary, for soil testing and technical inputs for increasing yield.

Assistance in Utilizing Government Programs

Collecting and disseminating information pertaining to various government schemes and providing guidance and assistance to eligible persons for making good use of these schemes e.g. getting loans for setting up small businesses.

Employment

Preference shall be given to local population while inducting the new manpower.

The proponent has proposed to incur the 5% of the total profit towards the implementation of above socio economic programme and

same shall be routed through District Collector and committee contrasted by the collector to execute the decided programme.

Communication

The proponent shall maintain roads to the project site from nearest state roads and shall also help in establishing the facilities like post office, telegraph office, telex office etc through government bodies.

1.30 Institutional Arrangement for Pollution control

Environment division of M/s D C Rathore will be responsible for environment management activities. The Department should be nodal agency to coordinate and provide necessary service on environmental issues during operation and maintenance of the plant.

Environment cell is formed for overall activities for implementation of Environment Management Plan, compliance of statutory requirements as well as interaction with regulatory bodies namely state pollution control board, etc.

SUMMARY OF ENVIRONMENTAL MANAGEMENT PLAN

AIR	Periodical maintenance of pollution control equipments, regular Ambient Air Quality, Stack Monitoring and well developed green belt.
WATER	Proper sanitary facilities present in the plant to inhibit ground water pollution, ponds are provided for domestic waste water management.
NOISE	Regular Maintenance of machinery & well developed green belt. Provision to provide sound protective devices.
SOLID WASTE	To take the material in process.
BIO-	Annual medical check up of all employees and

MONITORING	various safety measures for employees has been taken.
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