Allied Blenders & Distillers

ABD/RANGAPUR/DISTILLERY/CPCB/2024-25/01
Date: 14.02.2025

To,
The Chairman,
Central Pollution Control Board,
Parivesh Bhawan, East Arjun Nagar,
Delhi - 110032

Subject: Submission of compliance status with reference to the directions issued by CPCB for M/s Allied Blenders and Distillers Limited (ABDL) for Existing Grain Based Distillery180 KLPD (180 KL x 365 days = 65,700 KLPA) with Existing 6.5 MW Power Plant at Survey No. 690/AA, 691/AA2, 692, Village - Rangapur, Mandal - Pebbair, District - Wanaparthy, State - Telangana, Pin Code – 509104 - Regarding. -

Reference: B-505/IPC-III/Dist./2K18-19 Dated 17.09.2018.

Dear Sir,

With reference to the above, we are herewith submitting the current compliance status for the directions issued by CPCB and our compliance status is mentioned below.

Sr.No.	Directions	Compliance status
a)	It shall be ensured that the installed OCEMS devices are functionaing properly & continuously and that data from that device are uninterrutedly transferred to CPCB. Any failure in his regard shall be recitifed at the earlist.	Our OCEMS devices Installed and fuctioning peroperly and contniusouly the Equipmets are connected,the data is uninterrutedly transferred to the SPCB & CPCB servers.
b)	Unit shall ensure periodic calibration of the analyzers as per standard opearting procedure/recommendations of the suppier and submit the calibration results.	We are conducting periodic calibration of the analyzers as per the Standard Opearting Procedure.. AAQMS,EQMS &Stack Monitoring Equipments calibration Certifictes Enclosed as **Appendix - 1**
c)	The unit shall submit performance audit report of ETP system every year to CPCB from Govt. Expert institute.	We have conducted performance audit of our Effluent water treatment system (ZLD) through JNTUH and report is enclosed as **Appendix - 2**

Thanking you.

For Allied Blenders and Distillers Limited,

Sudhansu Sekhar Rout
Head Distillery
Enclosure: As above
CC:

1. Regional Director – CPCB and MoEF&CC, ~~Bangalore~~ chennai
2. Regional Office – TGPCB, Hyderabad
3. Member Secretary – TGPCB, Hyderabad

POLLUTION CONTROL BOARD-REGIONAL OFFICE-HYDERABAD ★ TELANGANA ★ Inward No. 14 FEB 2025

M/s. Allied Blenders RANGAPUR

T.G. POLLUTION CONTROL BOARD 14 FEB 2025 Paryavarana Bhavan, A-3, Sanathnagar, Hyd-18.

ACCREDITED BY NAAC

INTERNAL QUALITY ASSURANCE CELL (IQAC)
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
(Establishment by Govt. Act No. 30 of 2008)
Kukatpally, Hyderabad - 500 085, Telanagana (T.G.), India.

A+ GRADE

Dr. M.V.S. S. Giridhar
B. Tech, M. Tech (IIT, KGP), Ph.D.,
Professor of Water Resources &
DIRECTOR I/c.,

Date: 11.02.2025
Hyderabad

To,
The Regional Head-South
M/s. Allied Bllenders & Distillers Pvt.Ltd.
Sy.no-690/AA,691/AA2&692,
Rangapuram (V), Pebberu(M),
Wanaparthy Dist.Telangana State

Dear Sir,

Sub: Submission of the performance evaluation audit report for the wastewater treatment system (ZLD) - reg

The Zero Liquid Discharge (ZLD) treatment systemis crucial for distillery units to ensure that all wastewater generated during the manufacturing process is treated and reused, preventing any discharge into the environment. This system typically involves a multi-stage treatment process, includingprimary treatment, secondary treatment, and advanced techniquessuch asreverse osmosis (RO) and MEE.The treated water can then berecycled for reuse in distillery operations, while DDGS is disposed of as cattle feed, andeffluent treatment plant (ETP) sludge is used as manure.

The Present study was undertaken by the M/s. Allied Bllenders & Distillers Pvt. Ltd. industry in the month of November from 28th to 30th - 2024 to evaluate the Performance of the ZLD system of M/s Allied Blenders & Distillers, Sy.no 690/AA, 691/AA2&692, Rangapuram(V), Pebberu(M), Wanaparthy District. The waste water samples were analyzed by the industry for the waste water quality parameters such as pH, TSS, TDS, COD, VFA, BOD, SVI, MLSS, DO. These samples were collected from 11 Points of the waste water processing system such as **1**.Collection Tank **2**. Equalization cum Neutralization Tank **3**.UASB inlet & Outlet **4**.Clarifier **5**.Aeration Tank-1 **6**.Aeration Tank-II **7**.Secondary Clarifier **8.** After Sand & Activated Carbon filter **9.** RO-I feed water **10**.RO-1 Permeate & reject water **11**.RO-II Permeate water & Reject.

Dr. M.V.S.S. Giridhar
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The collected samples were analyzed with appropriate methods and specific conclusions were drawn with respect to ZLD treatment system. Plant layout along with technical details of all the equipment's used in the plant was narrated in the report. Further, the following are the Wastewater Management Details

1. Wastewater Generation:
    - Non-Process Wastewater: 149.0 KLD
    - Process Wastewater: 578.0 KLD
    - Total Wastewater (Process + non-process): 578+18(RO Reject water) 596.0 KLD
2. Treatment Process:
    - Treated Water from RO System:
    - RO-1 Permeate: 111.6 KLD
    - RO-2 Permeate: 19.2 KLD
    - Total Treated Water: 130.8 KLD
3. Reuse of Treated Water:
    The 130.8 KLD treated water is recycled for cooling tower makeup.
4. Reject Water and MEE Operation:
    - RO Reject Water: 18.0 KLD
    - RO Reject + Process Wastewater to MEE: 596.0 KLD
    - Condensate from MEE: 520.0 KLD
    - Condensate Reuse: Recycled into the process.
5. DDGS Generation:
    - Dried Distillers Grains with Soluble (DDGS): 70 TPD
    - Usage: Sold as cattle feed.

Based on the study report the following were the specific conclusions.

1. COD Removal Efficiency: The Zero Liquid Discharge (ZLD) wastewater treatment system demonstrated 99.95% COD removal efficiency, effectively minimizing chemical oxygen demand in the treated water.
2. BOD Removal Efficiency: The system achieved a 98.88% BOD removal efficiency, ensuring the biological oxygen demand is well within permissible limits.
3. TDS Removal Efficiency: The Total Dissolved Solids (TDS) removal efficiency was recorded at 88.00%, indicating significant reduction, though potential enhancements might further optimize performance.
4. TSS Removal Efficiency: The Total Suspended Solids (TSS) removal efficiency reached 91.47%, showing effective removal of particulate matter.
5. Water Recycling and Reuse: Treated water is being recycled and reused at a rate of 89.51%, contributing to natural resource conservation and operational sustainability.
6. Compliance with Standards: The treated water complies with the standard permissible values and is deemed suitable for cooling tower makeup.

Dr. M.V.S.S. Giridhar
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Kukatpally, Hyderabad - 500 085.

Observations and Recommendations:

1. Efficiency and Recycling: Effective reuse of treated water (130.8 KLD) and MEE condensate (520 KLD) demonstrates strong water conservation practices. Ensure that cooling tower and process water quality is consistently monitored to prevent equipment scaling, fouling, and other issues.
2. Reject Water Handling: RO reject water (18 KLD) is effectively integrated into the MEE system, minimizing discharge.
3. DDGS Utilization: The generation of 70 TPD of DDGS and its use as cattle feed highlights a sustainable approach to by-product management. Overall Sustainability: The total wastewater generation of 727 KLD and 650.8 KLD of treated water being reused, this system achieves a highly efficient water recovery and recycling rate of 89.51%.

With regards

Dr. M.V.S.S. Giridhar

IQAC Director - JNTUH

Dr. M.V.S.S. Giridhar
Professor
University College of Engineering, Science and Technology,
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Kukatpally, Hyderabad - 500 085.

Zero Liquid Discharge (ZLD) System Overview

The Zero Liquid Discharge (ZLD) system ensures the recycling of permeate (treated water) and converts solutes into solid residues, effectively minimizing liquid waste discharge into the environment. This approach aligns with sustainability goals and regulatory compliance. Below are the key details:

ZLD Definition

ZLD involves:

- Recycling industrial effluent by recovering permeate (treated water).
- Concentrating and thermally evaporating dissolved and suspended solids into solid residues for proper disposal.

ZLD Certification Parameters

Certification is based on two primary criteria:

1. Water Consumption vs. Reuse/Recycling: Evaluates the efficiency of treated wastewater recycling.
2. Solid Recovery: Measures the percentage of total dissolved and suspended solids recovered from the effluent.

Industrial Capacity and CFO Details

1. Manufacturing Capacity:
    - Production of rectified spirit, ethanol, or ENA: 180 KLD (Kiloliters per day).
    - Annual production capacity: 65,700 KLPA (Kiloliters per annum).
2. Consent for Operation (CFO):
    - CFO Number: 20234696127, issued on 19.10.2023.
    - Validity: Up to 31.03.2028.

Implementation Details

M/s Allied Blenders and Distillers Limited, located at Rangapur (V), Pebair (M), Wanaparthy District, Telangana State, has implemented the ZLD system in compliance with TGPCB norms and CPCB guidelines.

- Operation and Maintenance:
  The operation and maintenance of the ZLD system have been entrusted to M/s Thermax Engineering (Water & Wastewater Division).
- Performance Evaluation:
  The performance evaluation of the ZLD system has been conducted by:
  - Dr. B.B.S.V. Seshagiri Rao, EHS Consultant , Lead Auditor EMS,ESG, BRSR & Technical Expert, M/s TUV Nord India Limited.
  - Further examination was carried out by Dr. M.V.S.S. Giridhar, Head of the Department, Water Resources Engineering, JNTU Hyderabad

Significance

The ZLD system facilitates compliance with environmental regulations while supporting sustainable industrial practices by:

- Reducing water wastage.
- Mitigating the environmental impact of industrial effluents.

This commitment to environmental stewardship demonstrates the industry's dedication to sustainable and responsible manufacturing practices.

Water Requirement/Day as per CFO (Table.No-01)

S.NO	Purpose	Fresh water consumption as per CFO-KLD	Recycled water used KLD
1	Process	525	900
2	Cooling tower make up	608	951
3	Boiler feed	400	-
4	Green belt and ash quenching	---	155.0
5	CO2 Plant	12	-
6	Domestic	15	-
7	ETP Tertiary/WTP Water	840	-

Total fresh water Consumption /day=2400KLD
Total recycled water used /day =2006KLD

Waste water Generation/Day as per CFO (Table.No-02)

S.NO	Source	Max Daily Discharge	Point of Disposal (KLD)
1	Process Ro Rejects	900 201	Shall be sent to decanter and thin slop Shall be sent to MEE and Condensate Treated in Ecophotex and re used into process.
2	Cooling tower blow down	179	ETP UF&RO, RO reject water to MEE, RO Permeate shall be re used for dust suppression, ash quenching/green belt development
3	Boiler blow down	40	
4	CO2 Recovery Plant	12	
5	Domestic	12	
6	Fermentation cleaning/washings	90	Recycling into process

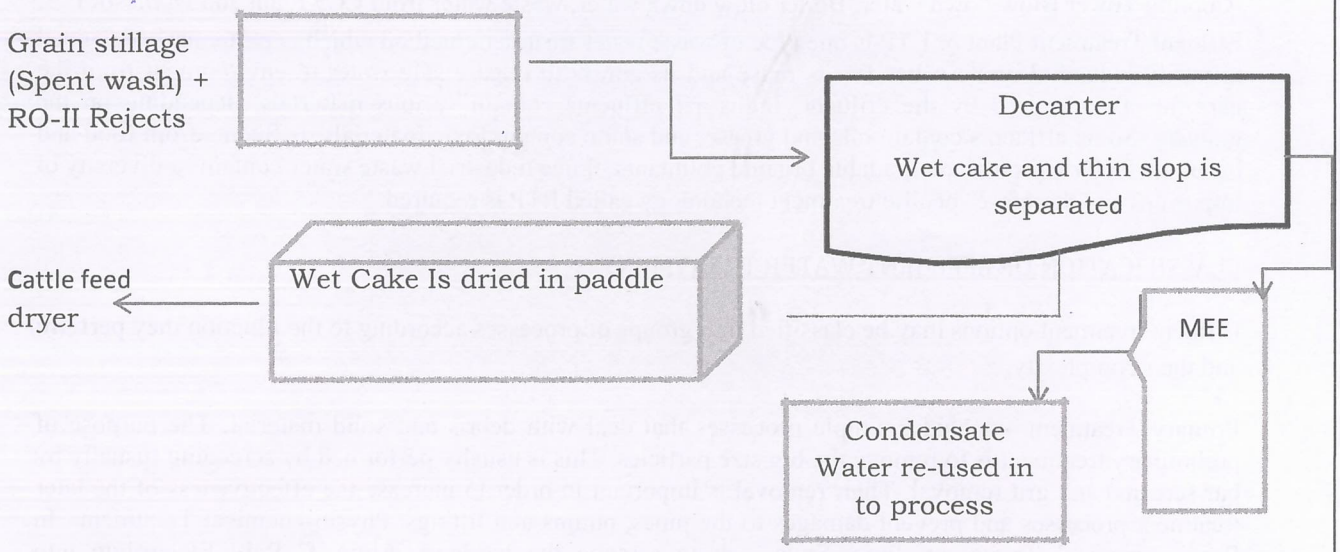
ZLD Treatment system:

The Zero Liquid Discharge (ZLD) treatment system is crucial for distillery units to ensure that all wastewater generated during the manufacturing process is treated and reused, preventing any discharge into the environment. This system typically involves a multi-stage treatment process, including primary treatment, secondary treatment, and advanced treatment such as reverse osmosis (RO) and evaporation techniques. The treated water can then be recycled for reuse in the distillery's operations, and the solids or sludge produced can be managed effectively.

For distillery units, ZLD systems are designed to meet the stringent guidelines set by the Central Pollution Control Board (CPCB), which aim to reduce water consumption and minimize the environmental impact of industrial wastewater. Compliance with CPCB regulations is essential to ensure that the distillery operates sustainably while minimizing the release of pollutants into green belt development.

In addition to wastewater treatment, the ZLD system can help distilleries recover valuable by-products, such as biogas from thin slop digestion or nutrients from effluent treatment sludge, which can be used for agricultural purposes. The ZLD approach aligns with sustainability goals by reducing water wastage and mitigating environmental pollution.

Process waste water treatment system



DECANTER AND DECANTER FEED PUMP (Process waste water &RO Rejects)

Biological treatment of wastewater perforce produces excess biological solids due to the growth and multiplication of bacteria and other microorganisms in the system. The excess biomass thus produced needs to be bled out of the system, and disposed of efficiently. This is a five-step process: sludge removal, storage, conditioning, dewatering and disposal. Sludge is removed ("bled") from the system from the sludge recirculation pipeline (through a branch). The sludge is in the form of thick slurry. It is taken into a sludge-holding tank, and kept under aeration (to prevent the living organisms from putrefying) until dewatering operations can be carried out. Before dewatering, polymer or other chemicals may be added for conditioning the sludge, to facilitate the process. Sludge is then dewatered in a Decanter. The Plate-and-Frame Decanter is the most commonly used method of dewatering the sludge. It consists of three to four parts: Sludge-holding tank with aeration. Decanter feed pump are used to feed sludge from the sludge holding tank to Decanter to dewatering the sludge and convert it into the dry sludge cake.

After the decanter, the spent wash is fed into the Multi-Effect Evaporator (MEE), and the condensate water is treated using the Ecophotex system and then re using into process and the DDGS is then sold as cattle feed.

EFFLUENT TREATMENT PLANT for Other than Process waste water

(Cooling Tower Blow down water, Boiler blow down water, waste water from CO_2 Plant and Domestic)

Effluent Treatment Plant or ETP is one type of waste water treatment method which is particularly designed to purify industrial waste water for its reuse and its aim is to release safe water to environment from the harmful effect caused by the effluent. Industrial effluents contain various materials, depending on the industry. Some effluents contain oils and grease, and some contain toxic materials. Effluents from food and beverage factories contain degradable organic pollutants. Since industrial waste water contains a diversity of impurities and therefore specific treatment technology called ETP is required.

CLASSIFICATION OF EFFLUENT WATER TREATMENT

Effluent treatment options may be classified into groups of processes according to the function they perform and their complexity:

Primary Treatment – includes simple processes that deal with debris and solid material. The purpose of preliminary treatment is to remove the big size particles. This is usually performed by screening (usually by bar screens) and grit removal. Their removal is important in order to increase the effectiveness of the later treatment processes and prevent damages to the pipes, pumps and fittings. Physio-chemical Treatment– In Physio-chemical Treatment, lime, Soda Ash to remove the hardness Alum & Poly Electrolyte into Coagulation Tank & Flocculation has been generate by slow mixing into Flocculator. Outlet of Flocculator feed to Primary Tube Settling Tank to remove suspended solids. Tertiary treatment – is the polishing process whereby treated effluent

is further purified to acceptable levels for discharge. It is usually for the removal of specific pollutants e.g. remaining suspended solid, color and order for the Effluent. Tertiary treatment processes are generally specialized processes. Ultra Filtration– Ultra filtration is a membrane process in which a porous membrane is used to separate or reject bacteria, viruses, and large organic molecules, colloidal and particulate matter. Similar to other membrane process, ultra filtration is a pressure driven process. High permeability of the Ultra filtration membrane and negligible osmotic effects allow the ultra-filtration to operate at relatively low pressures. Typical ultra filtration modules incorporate capillary or hollow fiber as the membrane structure. The benefit of this type of construction is that it allows for backwashing of the membrane when the filtrate or product flow rate has decreased due to accumulation of material on the membrane. The ultra filtration process can be operated "dead-end" or direct flow, which is 100% conversion of the feed fluid to filtrate, and cross flow. Cross flow. eliminates zero flow areas without increasing the concentration of the feed stream as in the recycle mode and minimizes the boundary layer.

Reverse Osmosis– Reverse osmosis (RO) is a membrane-technology filtration method that removes many types of large molecules and ions from solutions by applying pressure to the solution when it is on one side of a selective membrane. The result is that the solute is retained on the pressurized side of the membrane and the pure solvent is allowed to pass to the other side. To be "selective," this membrane should not allow large molecules or ions through the pores (holes), but should allow smaller components of the solution (such as the solvent) to pass freely.

UNIT DESCRIPTIONBAR SCREEN CHAMBER

The function of the bar screen is to prevent entry of solid particles above a certain size: such as plastic cups, paper dishes, polythene bags, ETC into the ETP. (If these items are allowed to enter the ETP, they clog and damage the ETP pumps, and cause stoppage of the plant.) The screening is achieved by placing a screen made out of vertical bars, placed across the Effluent flow. The gaps between the bars may vary between 10 and 25 mm. ETPs may have two screens: A coarse bar screen with larger gaps between bars, followed by a fine bar screen with smaller gaps between bars. If this unit is left unattended for long periods of time, it will generate a significant amount of odor: it will also result in backing of Effluent in the incoming pipelines and chambers.

COLLECTION CUM EQUALIZATION TANK

The Effluent from the bar screen chamber comes to the equalization tank. The equalization tank is the first collection tank in an ETP. Its main function is to act as buffer: To collect the incoming raw Effluent that comes at widely. Equalization tank is used only for buffering the daily fluctuations in the Effluent flow quantity. The equalization tank must be of sufficient capacity to hold the peak time inflow volumes. Equalization tank with a capacity to hold 4-6 hours of average hourly flow should be adequate.

EFFLUENT LIFT PUMPS

Effluent transfer pump is use to lift Effluent from equalization tank to anoxic chamber. It typical pair of pumps (working and standby). The pumping rate can be set at a calibrated uniform flow, so that downstream units are not affected by fluctuating flows.

COAGULATION AND FLOCCULATION TANK

It is a chemical water treatment technique typically applied prior to sedimentation and filtration (e.g. rapid sand filtration) to enhance the ability of a treatment process to remove particles. Coagulation is a process used to neutralize charges and form a gelatinous mass to trap (or bridge) particles thus forming a mass large enough to settle or be trapped in the filter. Flocculation is gentle stirring or agitation to encourage the particles thus formed to agglomerate into masses large enough to settle or be filtered from solution.

CHEMICAL DOSING FOR COAGULATION AND FLOCCULATION

Chemical dosing of Lime, Soda Ash, alum & Poly in Coagulation and flocculation tank are generally for the chemical treatment. Lime & Soda Ash is used to remove the hardness in the ETP for the further process and post coagulation and for clarity of water. Alum is used as coagulant for much industrial and sanitary waste water treatment application. Due to its high efficiency, effectiveness in clarification, and utility as a sludge dewatering agent. The chemical leaves no residual color, offers very good turbidity removal. Poly-aluminum chloride is used as a flocculent by which fine particulates are caused to clump together into a floc & increase the sludge water separation. The floc. may then float to the top of the liquid (creaming), settle to the bottom of the liquid (sedimentation), or be readily filtered from the liquid.

UASB REACTOR

Up-flow Anaerobic Sludge Blanket (UASB) uses an anaerobic process whilst forming a blanket of granular sludge which suspends in the tank. Wastewater flows upwards through the blanket and is processed (degraded) by the anaerobic microorganisms. The upward flow combined with the settling action of gravity suspends the blanket with the aid of flocculants. Small sludge granules begin to form whose surface area is covered in aggregations of bacteria. In the absence of any support matrix, the flow conditions create a selective environment in which only those microorganisms capable of attaching to each other survive and proliferate. Eventually the aggregates form into dense compact biofilms referred to as "granules".

LAMELLA TUBE SETTLER

Lamella tube settler is Incorporated before the biological process to settle down the agglomerate form after coagulation and flocculation process purpose and function of the clarifier is threefold: Allow settling of biomass solids in the Mixed Liquor coming out of the flocculation, to the bottom of the clarifier to thicken the settled biomass, in order to produce a thick underflow To produce clear supernatant water, in the overflow from the clarifier feed to Aeration Tank. All the above actions occur due to gravity. The thick biomass is re-circulated back to the aeration tank.

EXTENDED AERATION TANKS

The Aeration tank is at the heart of the treatment system. The bulk of the treatment is provided here, employing microbes/bacteria for the process. The main function of the Aeration tank is to maintain a high population level of microbes. This mixture is called MLSS (Mixed Liquor Suspended Solids). The mixed liquor is passed on to the clarifier tank, where the microbes are made to settle at the bottom. The settled microbes are recycled back to the aeration tank. Thus they are retained for a long period within the system.

SECONDARY CLARIFIER

The purpose and function of the clarifier is threefold: Allow settling of biomass solids in the Mixed Liquor (biomass slurry) coming out of the aeration tank, to the bottom of the clarifier To thicken the settled biomass, in order to produce a thick underflow To produce clear supernatant water, in the overflow from the clarifier The clarifier tank is only a passive device: All the above actions occur due to gravity. The thick biomass is re-circulated back to the aeration tank.

SLUDGE TRANSFER PUMP

The indivisible combination of the aeration tank, settling tank and sludge recirculation constitutes an "activated sludge biological treatment system". All three must be fine-tuned to act in unison to produce the desired high level of treatment. The optimum desired age of the microbes is between 25 to 30 days. At the same time, an ETP. Sludge Recirculation needs to maintain a high level of microbes in the aeration tank. Both these objectives are achieved by recirculating the sludge from the settling tank, and also bleeding out of excess microbes from the system at regular intervals.

ACTIVATED CARBON FILTER

An activated carbon filter, like the Pressure Sand Filter, is a tertiary treatment unit. It receives the water that is already filtered by the Pressure Sand Filter and improves multiple quality parameters of the water: BOD, COD, clarity (turbidity), color and odour.

UF FEED PUMP

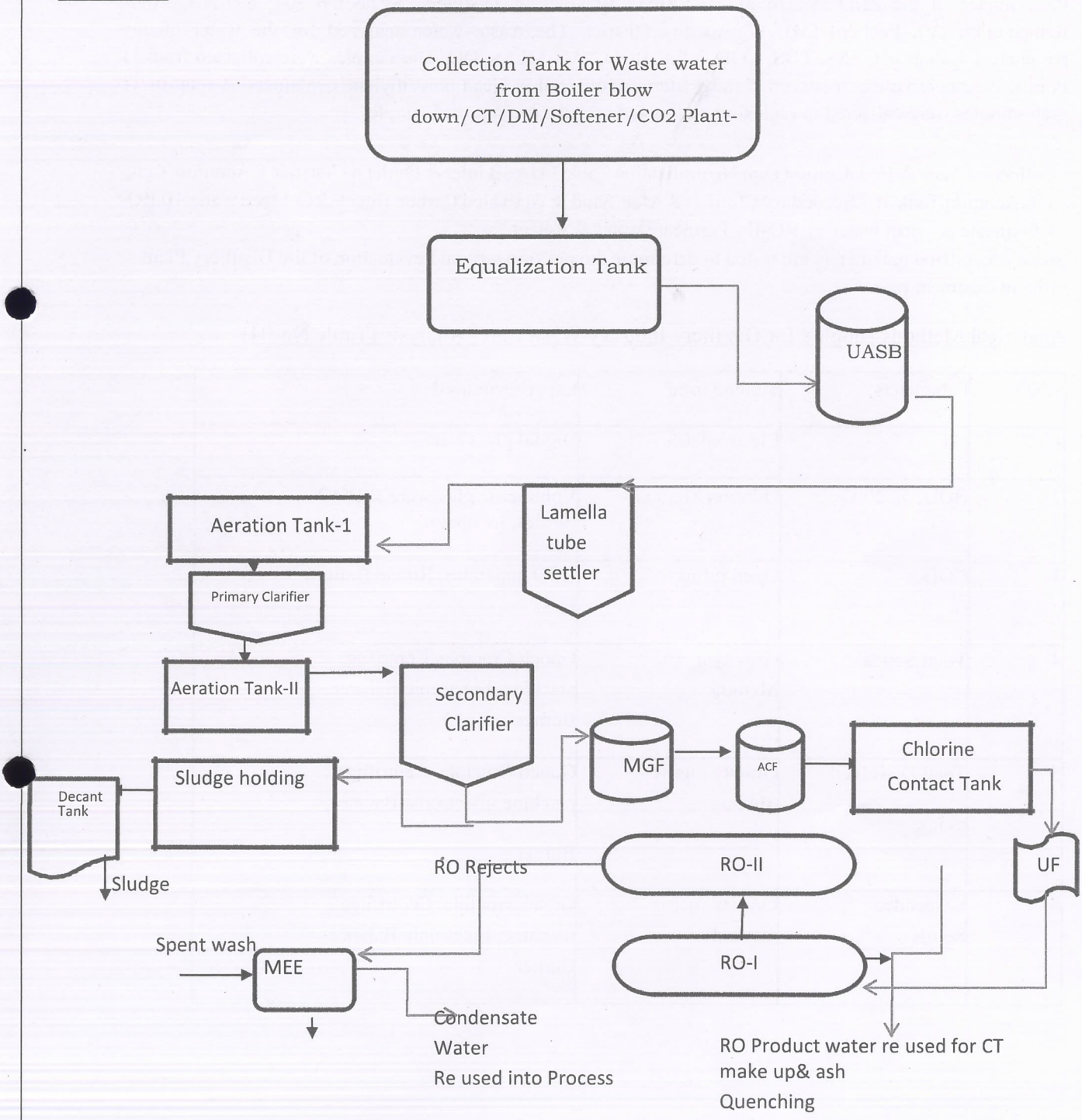
UF feed pumps feed treated water from the UF feed tank to the UF module operating 100% of the feed water is converted to filtrate. As contaminants are removed during the operating step the membrane pressure will rise. At the end of the preset operating cycle time, a backwash sequence is triggered.

ULTRA FILTRATION MEMBRANE MODULE

Ultra filtration (UF) involves pressure-driven separation of materials from a feed solution. The technology is used to remove particulate and microbial contaminants, but it does not remove ions and small molecules. Pressure drives the process, which typically operates with a feed pressure of 4 to 100 psig. UF plants are automated and have low operational labour requirements. These systems, however, can require frequent cleaning. UF membranes have a service life of three to five years or longer, which is comparable to reverse osmosis membranes. UF modules are commercially available in tubular, hollow-fiber, plate and frame, and spiral wound configurations.

UF membranes reject solutes ranging in size from 0.03 microns and larger. The UF membrane process separates molecules in solution on the basis of size. The pore size and molecular weight cut-off (MWCO) are often used to characterize a membrane. The pore size is the nominal diameter of the openings or microspores in the membrane expressed in microns. And feed to TWO stage RO system and permeate water is re used into Cooling tower make up.

ZLD system


Collection Tank for Waste water from Boiler blow down/CT/DM/Softener/CO2 Plant-
Equalization Tank
UASB
Lamella tube settler
Aeration Tank-1
Primary Clarifier
Aeration Tank-II
Secondary Clarifier
MGF
ACF
Chlorine Contact Tank
Sludge holding
Decant Tank
Sludge
RO Rejects
RO-II
UF
Spent wash
MEE
RO-I
Condensate Water Re used into Process
RO Product water re used for CT make up& ash Quenching

ZLD Performance Study:

The Present study has been undertaken in the month of November from 28th to 30th - 2024 to evaluate the Performance of the ZLD system of M/s Allied Blenders & Distillers, Sy.no 690/AA, 691/AA2&692, Rangapuram (V), Pebberu (M), Wanaparthy District. The waste water analyzed for the water quality parameters such as pH, TSS, TDS, COD, VFA, BOD, SVI, MLSS, DO. The samples were collected from 11 Points. A sample volume between 2 and 3 liters is collected in clean polyethylene containers. A total of 11 grab samples were collected in each shift and mixed to make a composite sample

Collection Tank 2. Equalization cum Neutralization Tank 3.UASB inlet & Outlet 4.Clarifier 5.Aeration Tank-1 6.Aeration Tank-II 7.Secondary Clarifier 8.Afetr Sand & Activated Carbon filter 9.RO-I feed water 10.RO-1 Permeate & reject water 11.RO-II - Permeate water & Reject

Some generalized parameters are tested to determine the performance and evaluation of the Distillery Plant effluent treatment plant.

Analytical Methods adopted for Distillery Industry Wastewater Analysis (Table.No-04)

S.NO	Parameters	Method used	Experiment used
1	pH	Electrometric	Digital pH meter
2	BOD_5 @ 20°C	Dilution Method	Volumetric glassware's, BOD Bottles, Incubator
3	COD	Open reflux	COD apparatus, Round Bottom Flask
4	Total Solids	Gravity metric Method	Gooch Crucible, Centrifuge machine, Electronic Balance, Burner
5	Total Dissolved Solids	Gravity metric Method	Gooch Crucible, Centrifuge machine, Electronic Balance, Burner
6	Suspended Solids	Gravity metric method	Gooch crucible, Centrifuge machine, Electronic Balance, Burner

1. Feed water Parameters: Table.N0-05

S.NO	Parameters	Boiler Blow Down	Cooling tower Blow Down	DM water softener regeneration on	CO2 Plant	Combined ed waste water
1	pH	9.5	6.8	6.0	6.5	6.38
2	TSS (mg/li)	70	350	50	1600	300.33
3	TDS (mg/li)	1500	800	5500	850	2239.33
4	COD (mg/li)	50	80	500	6000	5420.0
5	BOD (mg/li)	25	80	50	6250	806.0
6	Chlorides (mg/li)	45	120	1800	40	796.03
7	Hardness-Mg(mg/li)	48	35	2350	28	998.33
8	Hardness-CaCo3(mg/li)	55	24	2150	12	912.53

During the study period the Avg. waste water Generation details are given below

1.Boiler blow down ---40.0KLD
2.Cooling tower Blow down -91.0KLD
3. Domestic----------10.0KLD
4. Waste water From Co2 Plant-12.0KLD

} 149.0KLD

5. Spent wash Generation from Process is 578KLD and RO- reject water 18 KLD (Total 596KLD) same is feed in to multiple effect Evaporator to Concentrate the solids to30% and then feed to Decanter further to 90% Solids and Condensate water 526KLD is re-used in to process. The Avg. DDGS generation is 70.00TPD

1.Waste water Collected into Collection tank cum Equalization Tank (Table.No-06)

S.NO	Date of Sample & Monitoring	Collection Tank Cum Equalization Tank (flow M3/hr)	pH before adjustment	Hydrate lime Consumption Kgs/Day	pH after adjustment
1	28.11.2024	6.08	6.20	120.0	7.28
2	29.11.2024	6.54	6.54	80.0	6.94
3	30.11.2024	6.0	6.42	95.0	6.90

2.Performance Evaluation of UASB (table.NO-07inlet & out let)

UASB (inlet Parameters)

Date of sample Collection	Date of sample analysis	Flow rate KL/hr	pH	TSS	TDS	COD	BOD
28.11.2024	28.11.2024	6.08	7.28	326.0	2240.0	5960.0	868.0
29.11.2024	29.11.2024	6.54	6.94	280.0	2248.0	5500.0	748.0
30.11.2024	30.11.2024	6.0	6.90	295.0	2230.0	4800.0	802.0

UASB Out let Parameters

Date of sample Collection	Date of sample analysis	Flow rate KL/hr	pH	VFA	TSS	TDS	COD	BOD
28.11.2024	28th	6.08	7.10	240.0	290.0	2084.0	480.0	124
29.11.2024	29th	6.54	7.08	245.0	245.0	2164.0	320	128
30.11.2024	30th	6.0	7.20	268.0	268.0	2208.0	380.0	120

Avg. Waste water Collected into Collection cum Equalization tank @6.20KL/hr and Avg. inlet pH is 6.38 and Avg. Hydrate lime consumption 98.33kgs/Day and Avg. pH after adjustment is 7.04

UASB performance

Avg inlet COD 5420.0mg/lit and Avg. Out let COD 393.33mg/lit, COD reduction @ 92.74%

Avg inlet BOD 806.0mg/lit and Avg. Out let BOD 124.0mg/lit BOD reduction @84.61%

3. TSS reduction in after Tube Settler. (Table.No-08)

Source	Date of sample Collection	Date of analysis	TSS
Inlet	28.11.2024	28.11.2024	290
Out let	28.11.2024	28.11.2024	81.5
Inlet	29.11.2024	2911.2024	245
Out let	29.11.2024	2911.2024	70.0
Inlet	30.11.2024	30.11.2024	268
Out let	30.11.2024	30.11.2024	64.9

Avg. inlet TSS is 267.66mg/lit and Avg. Outlet TSS is 72.13mg/lit.

Note: Over all Avg. reduction of TSS after Tube Settler @73.05%

4. Aeration Tank -1Table.NO.09

Source	pH	TSS	TDS	COD	BOD	DO	SVI	MLSS	MLVSS
28.11.2024 (int)	7.10	81.5	2084.0	480.0	124	1.50	-	-	-
28.11.2024 (out)	7.08	69.27	2082.0	144.0	24.8	1.45	235	2500	1875
29.11.2024 (int)	7.10	70.0	2164.0	320.0	128	1.40	-	-	-
29.11.2024 (out)	7.10	59.5	2160.0	80	38.5	1.50	245	2420	1815
30.11.2024 (int)	7.20	64.9	2208.0	380	122	1.40	-	-	-
30.11.2024 (out)	7.15	55.16	2205.0	114.0	24.4	1.45	250	2455	1841.2

After Aeration Tank-1Avg. reduction of COD @71.35% and BOD reduction is @76.42%

5. Aeration Tank-II. Table.NO.10

Source	pH	TSS	TDS	COD	BOD	DO	SVI	MLSS	MLVSS
Inlet	7.08	69.27	2082	144	24.8	1.45			
Out let	7.10	60.0	2075.5	36	7.44	1.50	220	2350	1762.5
Inlet	7.15	59.5	2160	80	38.5	1.50			
Out let	7.10	55.0	2158.2	19.2	11.55	1.45	235	2450	1837.5
Inlet	7.15	55.16	2205	114	24.8	1.48			
Out let	7.10	51.5	2203.8	27.36	8.68	1.48	230	2400	1800.0

Aeration Tank –II Avg.COD reduction @77.57% and BOD reduction @ 89.53%

The observations indicate the performance of two aeration tanks in a biological treatment system. Below is a detailed analysis of the provided data

Aeration Tank-I

1. SVI (Sludge Volume Index): 243.3 mL/g
   - A high SVI indicates poor settling properties of sludge, often due to filamentous bacteria or bulking sludge. Optimal SVI is typically in the range of 50–150 mL/g.
2. MLSS (Mixed Liquor Suspended Solids): 2441.66 mg/L
   - The MLSS value is within an acceptable range for activated sludge systems (2,000–4,000 mg/L).
3. MLVSS (Mixed Liquor Volatile Suspended Solids): 1843.73 mg/L
   - MLVSS/MLSS ratio is ~0.755, indicating the sludge is largely organic, which is typical for an activated sludge system.
4. COD Reduction: 77.35%
   - This indicates moderate organic load removal. COD reduction should ideally be above 85% for good treatment efficiency.
5. BOD Reduction: 76.42%
   - This is slightly low compared to ideal values (>85%), suggesting room for optimization in oxygen transfer or sludge management.

Aeration Tank-II

1. SVI (Sludge Volume Index): 228.3 mL/g
   - Similar to Aeration Tank-I, this is higher than optimal, indicating settling issues.
2. MLSS (Mixed Liquor Suspended Solids): 2400 mg/L
   - Within the acceptable range.
3. MLVSS (Mixed Liquor Volatile Suspended Solids): 1800 mg/L
   - MLVSS/MLSS ratio is ~0.75, consistent with Tank-I and typical for organic sludge.
4. COD Reduction: 77.57%
   - Similar to Tank-I, suggesting similar organic load removal efficiency.
5. BOD Reduction: 89.53%
   - This is significantly better than Tank-I and close to the ideal range, indicating better biological activity or oxygen availability

Observations and Recommendations:

1. Sludge Settling Issues:
   - Both tanks have high SVI values, suggesting filamentous bulking or sludge swelling. Conduct a microscopic examination of the sludge and evaluate the F/M (Food to Microorganism) ratio and aeration patterns.
2. COD/BOD Reduction in Tank-I:
   - While BOD reduction is relatively low, COD reduction is moderate. Optimize aeration efficiency and check for possible toxic or inhibitory substances.
3. Oxygen Transfer:
   - Ensure aerators or diffusers are functioning optimally. Dissolved oxygen (DO) levels should be maintained between 2-4 mg/L.
4. Nutrient Balance:
   - Evaluate the C:N:P ratio in the influent to ensure balanced nutrient availability for microbial growth.
5. Sludge Wasting:
   - Adjust sludge wasting rates to maintain MLSS within the optimal range and prevent excessive sludge age, which could exacerbate settling issues.

A Total Suspended Solids (TSS) removal efficiency of 91.47% after the secondary clarifier and multi-grade filter (MGF) indicates a well-functioning treatment system.

Key Insights:

1. Effectiveness:
    - A 91.47% removal efficiency is generally acceptable for many wastewater treatment systems, particularly if the TSS levels in the effluent meet discharge or reuse standards.
2. Potential Bottlenecks:
    - Secondary clarifier performance could be impacted by factors like sludge settling characteristics, surface overflow rate, and hydraulic loading.
    - Multi-Grade Filters (MGF) rely heavily on proper backwashing cycles, media condition, and flow rates for optimal performance.

Recommendations for Optimization:

1. Upstream Quality:
    - Assess influent TSS levels entering the secondary clarifier. High influent TSS can reduce the overall efficiency and increase the load on subsequent units.
    - Optimize aeration in biological treatment to improve floc formation, making TSS easier to settle in the clarifier.
2. Clarifier Operation:
    - Ensure proper sludge removal frequency to prevent sludge carryover.
    - Check for short-circuiting or uneven flow distribution within the clarifier.
3. MGF Maintenance:
    - Evaluate the filter media condition and ensure it's not clogged or degraded.
    - Verify backwash efficiency and schedule to prevent filter breakthrough.
4. Polishing Treatment:
    - If higher efficiency is required, consider adding a polishing step like ultrafiltration (UF) or activated carbon filters (ACF) to further reduce TSS and improve water quality.
5. Regular Monitoring:
    - Conduct regular testing for TSS in both influent and effluent to identify trends or potential deviations.
    - Maintain operational records to identify any long-term inefficiencies.

7. After Secondary Clarifier. Table.NO-11

Source	pH	TSS	TDS	COD	BOD
Inlet	7.20	60	2082	144	24.8
Out let	7.18	39	2075.5	36	7.44
Inlet	7.35	55	2160	80	38.5
Out let	7.30	38	2158.2	19.2	11.55
Inlet	7.25	51.5	2205	114	24.8
Out let	7.15	33.2	2203.8	27.36	8.68

8. After MGF filtration. Table.NO-12

Source	pH	TSS	TDS	COD	BOD
Inlet	7.18	39	2075.5	36	7.44
Out let	7.15	23.4	2075.0	34.5	7.40
Inlet	7.25	38	2158.2	19.2	11.5
Out let	7.20	22.5	2155.0	15.5	11.2
Inlet	7.15	51.5	2203.8	27.36	8.68
Out let	7.10	30.9	2203.0	27.10	8.45

9. RO-I feed water Quality. Table.NO-13

Source	RO-I feed water Quality	Permeate water	Reject water
Inlet 28.11.2024	Flow rate @ 6.08m3/hr	4.56m3/hr	1.52m3/hr
pH	7.15	7.20	6.95
TSS	23.4mg/lit		
TDS	2075mg/lit	250mg/lit	7549.89mg/li
COD	34.5mg/lit		
BOD	7.40mg/lit		
Inlet 29.11.2024	Flow rate @6.54m3/hr	4.90m3/hr	1.63m3/hr
pH	7.20	7.15	6.98
TSS	22.5mg/lit		
TDS	2155mg/lit	240mg/lit	7924.59mg/lit
COD	15.5mg/lit		
BOD	11.2mg/lit		
Inlet 30.11.2024	Flow rate @6.0m3/hr	4.5m3/hr	1.5m3/hr
pH	7.10	7.10	6.90
TSS	30.9		
TDS	2203	250mg/lit	8061.94mg/lit
COD	27.10		
BOD	8.45		

10. RO-II water Quality. Table.No-14

Source	Permeate water Quality	Reject water Quality
Ro-1rejects 28.11.24 feed rate to RO-II 1.52m3/hr(7549.89mg/lit TDS)	Output rate @0.76m3/hr TDS-400mg/lit	0.76m3/hr TDS -14731.31mg/lit
RO-1 rejects 29.11.2024 Feed rate to Ro-II @ 1.63m3/hr 7924.59mg/lit TDS	Output rate @0.89m3/hr TDS -450mg/lit	0.74m3/hr TDS-17143.83mg/lit
RO-1 rejects 30.11.2024 Feed rate to Ro-II @ 1.50m3/hr,8061.94mg/lit TDS	Output rate @0.75m3/hr TDS -420mg/lit	0.75m3/hr TDS-15691.11mg/lit

The waste water flow rates can be analyzed as follows:

1. Feed Water to RO-I: 6.20 KL/hr
2. Permeate Water: 4.65 KL/hr
3. Reject Water: 1.56 KL/hr

Observations:

- Water Recovery Rate:
  Recovery Rate (%)= Permeate water/feed waterx100
  Substituting the values:
  Recovery Rate % = 4.65/6.20x100=75%
- Reject Water Percentage: Reject water/feed water x100
  Substituting the values:
  Reject Water (%)= 1.56/6.20x100=25%

Summary:

- Recovery Rate: 75%
- Reject Water Percentage: 25%

The performance range for an RO-I system, with a high recovery rate indicating efficient operation.

The Performance range of RO-II system = water Recovery rate%= 0.8/1.55 x100=51.66%
Reject water %=0.75/1.55x100=48.38%

Wastewater Management Details

1. Wastewater Generation:

   Non-Process Wastewater: 149.0 KLD
   Process Wastewater: 578.0 KLD
   Total Wastewater (Process + non-process): 578+18(RO Reject water) 596.0 KLD
2. Treatment Process:
   Treated Water from RO System:
   RO-1 Permeate: 111.6 KLD
   RO-2 Permeate: 19.2 KLD
   Total Treated Water: 130.8 KLD
3. Reuse of Treated Water:
   The 130.8 KLD treated water is recycled for cooling tower makeup.
4. Reject Water and MEE Operation:
   RO Reject Water: 18.0 KLD
   RO Reject + Process Wastewater to MEE: 596.0 KLD
   Condensate from MEE: 520.0 KLD
   Condensate Reuse: Recycled into the process.
5. DDGS Generation:
   Dried Distillers Grains with Solubles (DDGS): 70 TPD
   Usage: Sold as cattle feed.

Observations and Recommendations

1. Efficiency and Recycling:
   Effective reuse of treated water (130.8 KLD) and MEE condensate (520 KLD) demonstrates strong water conservation practices.
   Ensure that cooling tower and process water quality is consistently monitored to prevent equipment scaling, fouling, and other issues.

2. Reject Water Handling:
   - RO reject water (18 KLD) is effectively integrated into the MEE system, minimizing discharge.
   - Consider optimizing MEE operations to further reduce reject water volumes.
3. DDGS Utilization:
   - The generation of 70 TPD of DDGS and its use as cattle feed highlights a sustainable approach to by-product management.
   - Explore opportunities to expand its market or diversify its applications for added revenue streams.
4. Overall Sustainability: The total wastewater generation of 727 KLD and 650.8 KLD of treated water being reused, this system achieves a highly efficient water recovery and recycling rate of 89.51%

Treated Water Re -used /Day. Table.No.15

S.NO	Purpose	Recycled water used KLD during study period
1	Process	520
2	Cooling tower make up	130.8
3	Boiler feed	-
4	DM & softener	-
5	CO2 Plant	-
6	Domestic	-
	Total	650.8

11. Overall Performance of waste water Treatment system. Table.No.16

Parameters	Before Treatment (mg/lit)	After Treatment (mg/lit)	%Reduction rate
Waste water Generation	727KLD	Tread water 650.8 KLD	89.51%
TDS	2239.33	268.57	88.00
TSS	300.33	25.6	91.47
COD	5420.0	25.7	99.95
BOD	806.0	9.01	98.88

. The chemical and power consumption during the study period:

Chemicals Consumption

1. Lime (for pH adjustment): Average consumption: 98.33 kg/day
2. Polyelectrolyte: Average consumption: 0.05 kg/day
3. Alum: Average consumption: 10.0 kg/day
4. Anti-Scalent: Average consumption: 10.0 kg/day
5. Hydrochloric Acid (HCl): Average consumption: 58.0 liters/day
6. Sodium Metabisulfite (SMBS): Average consumption: 1.3 kg/day
7. Hypochlorite (Hypo): Average consumption: 32.3 kg/day

Power Consumption

- Average power consumption: 1690 units/day

Conclusion:

Study Results and Key Observations:

1. COD Removal Efficiency: The Zero Liquid Discharge (ZLD) wastewater treatment system demonstrated a 99.95% COD removal efficiency, effectively minimizing chemical oxygen demand in the treated water.
2. BOD Removal Efficiency: The system achieved a 98.88% BOD removal efficiency, ensuring the biological oxygen demand is well within permissible limits.
3. TDS Removal Efficiency: The total dissolved solids (TDS) removal efficiency was recorded at 88.00%, indicating significant reduction, though potential enhancements might further optimize performance.
4. TSS Removal Efficiency: The total suspended solids (TSS) removal efficiency reached 91.47%, showing effective removal of particulate matter.
5. Water Recycling and Reuse: Treated water is being recycled and reused at a rate of 89.51%, contributing to resource conservation and operational sustainability.
6. Compliance with Standards: The treated water complies with the standard permissible values and is deemed suitable for cooling tower makeup and ash quenching purposes.

Technical Details of Equipment:

1. Bar screen : Qty-1No,Size:1000MMx600MM,M.O.C-SS304,Make:MWM

2. Effluent transfer pump: 2nos(1W+1S) ,Capacity : 25m3/hr,10m Head, Type: Horizontal Centrifugal, self-priming, Rating /RPM: 2.2KW/2900, Make : kirloskar

3. Alum Dosing Pump: Qty -1No, Capacity -35LPH, Type-Mechanically actuated Diaphragm type, Max pressure-4kg/cm2, Make: Milton Roy.

4. Agitator for Coagulation Tank: Qty-2Nos, Type-Two Blade pitched, 200mm diax400mm Width RPM-100, Make –MWM.

5. Neutralization tank --size: 3.3 Mtrs length X 5 Mtrs width X 3 Mtrs height ----capacity-50 –KL.

6. UASB-Size-: 10 mtrs dia X 9 mtrs height-----Capacity: 700 KL.

7. Clarifier capacity-100 KL and Size: 6.5 Mtrs dia X 3 Mtrs height.

8. Aeration Tank ---size: 13.6 Mtrs Dia X 4 Mtrs Height and capacity: 580 KL.

9. Aeration tank -II size: 7 Mtrs length X 4 mtrs width X 2.85 Height and capacity 80 KL.

10. Primary Tube settler: Qty-1No, Tube Plan area-9m2, size-3mx3m+2.1mH.B+0.4 M (F.B),Make-MWM.

11. Primary Sludge Transfer Pump: Qty-1No, Capacity -10m3/hr @10m head, type- Horizontal Centrifugal , self priming, Rating/RPM-0.75KW/2760,Make-Kirloskar.

12. Filter feed Pumps: Qty-2Nos (1W+1S), Capacity -21m3/hr@30m head, Type-Horizontal Centrifugal, Rating/RPM-5HP/2900, and Make-Kirloskar.

13. Pressure Sand Filter: Qty-1no, Flow rate -25m3/hr, Dia/HOS-1300mm/1500mm, filtration rate-16m3/m2/hr, Make-MWM.

14. Activated Carbon filter: Qty-1no, Flow rate -25m3/hr, Dia /HOS-1300mm/1500mm-filtration rate -16m3/m2/hr -make-MWM.

15. Coarse Bubble Diffuser: Qty-12nos, Size-4" Dia, MOC-EPDM, Make-W2P/Eqv.

16. Media for Pressure sand filter: fine sand -0.2-0.3---350kgs, fine sand-0.5-1.0-1050kgs, Fine silex6-3mm-350kgs, Gravels12-6mm-350kgs, Pebbles 25-12mm-600kgs.

17. Media for Activated Carbon: Activated Carbon -350kgs, Fine Sand0.5-1.0-350kgs, fine silex-6-3mm 350kgs, Gravels-350kgs, Pebbles25-12mm-600kgs.

18. pH meter -1No- Range-0-14 , Tank mounted , Make-Aster.

19. Pressure Gauge: 1 lot Make-Micro Electromagnetic flow meter: 2nos, Flow -25m3/hr, size - 65NB, Make-Adept.

20. UF feed tank -1No, Capacity-50KL, size-4.0m (Dia) x 4(H).

21. UF feed Pump-Qty-2Nos (1W+1S), Capacity40m3/hr@ 30m Head, Type-Centrifugal, and Rating/RPM-7.5HP/2900,Make-Kirloskar.

22. Hypo Dosing Pump: Qty -1No, Capacity- 5LPH, Make-Milton Roy,

23. Caustic Dosing Pump: Qty-1No, Capacity-380LPH, Make-Milton Roy.

24. ACID Dosing Pump: Qty-1No, Capacity-170LPH, Make-Milton Roy.

25. Dosing Tank: Qty -3Nos, Capacity -1000Ltrs, Make-Sintex.

26. UF Membrane: Qty-10Nos, membrane Type-Hollow type, UF Model-SFP2880, Make - DOW.

27. UF Permeate /Backwash Tank: Qty-1No, Capacity-120KL, Tank size-5.7m (Dia) x 4.7(H).

28. RO-I Feed Pump-Qty-2Nos (1W+1S), Capacity-60m3/hr @ 30 m Head, Rating/RPM-9.2KW/2900, Make-CNP.

29. Antiscalant, Acid & SMBS Dosing Pump: Qty-3Nos, Capacity -6LPH, Make-Milton Roy.

30. Micronic cartridge Filter: Qty-1No, Capacity-60m3/hr, Make-MWM.

31. HP Pump-Qty-2Nos (1W+1S), Capacity-60m3/hr@120m Head, Rating/RPM-30KW/2900, Make-Grundfos.

32. RO Membrane Housing: Qty-10Nos, Pressure-300PSI, Size-8" Diax 3Ele, Make-Pentair

33. Membranes in 1st Array: Qty-36nos, Dia/length-8"/40, make-DOW.

34. Membranes in 2rd Array: Qty-24 Nos, Dia/length-8"/40, make-DOW.

35. RO Permeate Tank: 2 Nos , Capacity-125KL each, make-MWM.

36. RO Reject Storage Tank-1No, Capacity -100Kl-make-MWM.

37. RO Stage-II- Pressure feed Pump- Qty-2Nos (1W+1S), Capacity -20Kl/hr@30m head, Make-CNP.

38. RO Reject water Storage Tank: Qty-1no, Capacity-50KL, make-MWM.

39. Antiscalant & Acid dosing Pump: Qty-2Nos, Capacity-6LPH, Make-Milton Roy.

40. Micron cartridge Filter: Qty-1No, Micron-5micron, make-MWM.

41. HP Pump: Qty-2 Nos (1W+1S), Capacity-17.4 Kl/hr@30m head, Rating/RPM-40HP/1440, make-Preevol.

42. RO Housing: Qty-3Nos, Pressure -600 PSI, Size-8" Diax5Ele, Make-Pentair.

43. RO membranes: Qty-15 Nos, Dia/length-8"/40, Make-DOW.

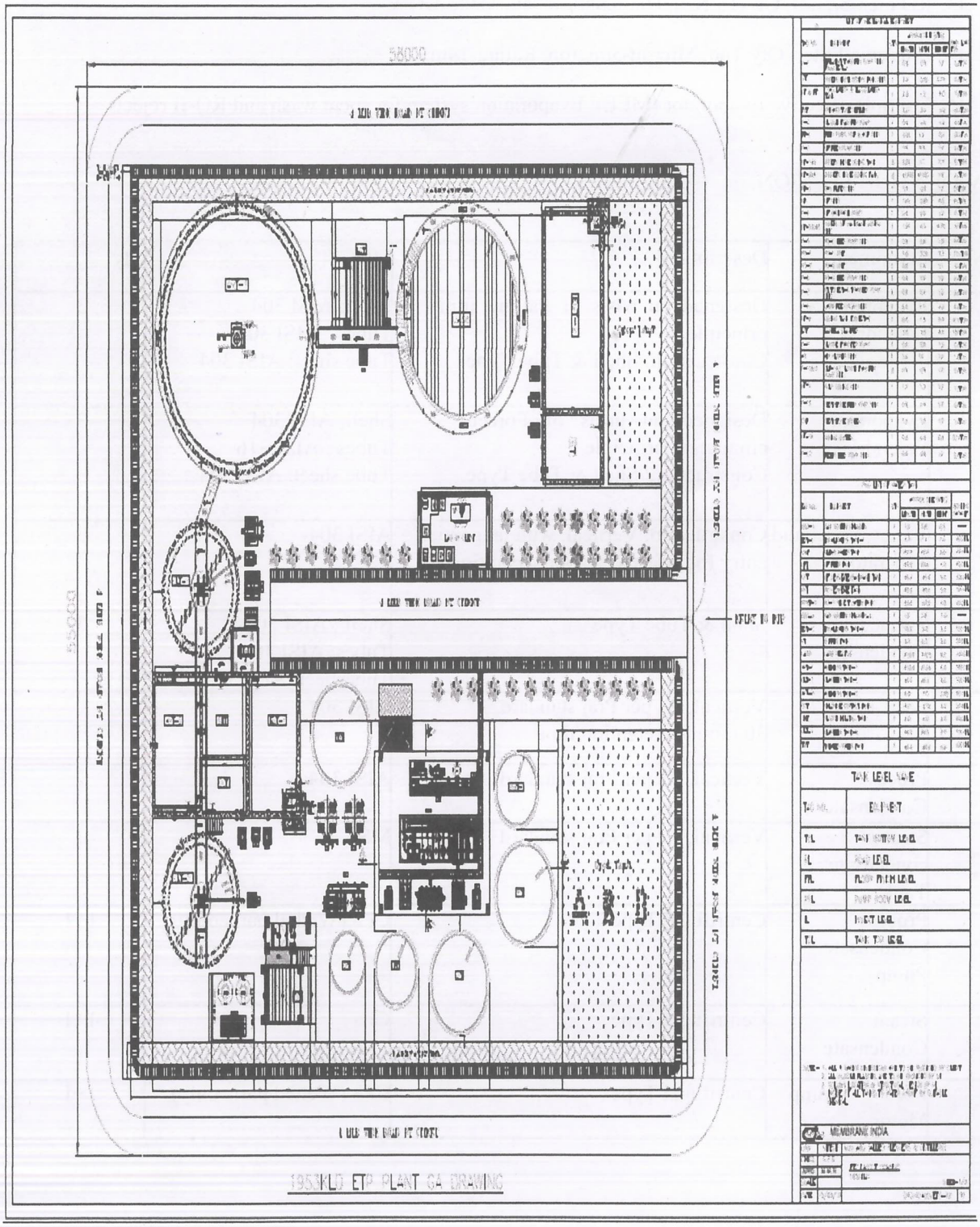
44. Micronic Filter: Qty-1no, Micron-5micron, Rating-14m3/hr.

45. Multiple effective Evaporator (MEE): Evaporation system for spent wash and RO-II rejects

EVAPORATION SECTION

Sr.No	Equipment	Description	MOC	Qty
1.	Evaporator Calendria	Designed on basis of Falling film principle Construction: Shell & Tube Type.	Shell: AISI 304 Tubes : AISI 304 Tube sheet: AISI 304	3
2.	Evaporator Calendria	Designed on basis of Forced circulation principle Construction: Shell & Tube Type.	Shell: AISI 304 Tubes : AISI 316 Tube sheet: AISI 304	3
3.	Vapor Liquid Separators	Construction: Vertical, with tangential entry for effective vapor separation.	AISI 304	3
4.	Surface Condenser	Shell & Tube Type	Shell : AISI 304 Tubes: AISI 304 Tubesheet: AISI 304	3
5.	Feed Tank	Vertical, As per Praj standard. 30 minutes retention time	AISI 304	2
6.	Process Condensate	Vertical, As per Praj standard	AISI 304	2
7.	Steam condensate Tank	Vertical, As per Praj standard	MS	3
8.	Process Condensate Pump	Centrifugal Type	CF8 (Wetted parts only)	1+1
9.	Steam Condensate Pump	Centrifugal Type	CI	1+1
10.	Feed Pump + Motor	Centrifugal Type	CF8 (Wetted parts only)	1+1

Plant lay out



SUNSHINE TECHNOLOGIES
AIR•WATER•ENERGY

CALIBRATION CERTIFICATE

Reference:SST/MAC/ 101-1/11/24-25

Customer Name	Allied Blenders and Distillers ltd
Instrument	EQMS
Serial Number	203488
Reference Flow Meter	**AWA Instruments CX1000-3922**
Date of Calibration	18.09.2024
Next Calibration Date	17.03.2025

Note: This Instrument is calibrated with reference to TSS with $H_2AL_2Si_2O_8$ - H2O , COD with $C_8H_5KO_4$& pH Buffer capsules.

Parameter - unit	Buffer Sample value		Observed value	
	ZERO	SPAN	ZERO	SPAN
BOD – mg/l	0.00	250	0.90	243
COD – mg/l	0.00	500	1.16	486
pH -pH	0.00	9.2	0.12	9.10
TSS – mg/l	0.00	1000	2.90	1012

Calibration Done by : **Neeraj Babu**

SUNSHINE TECHNOLOGIES

Reg Address: # 4-7-83, Flat No. 403; Kalanjali Classic, Scientist Colony, Habsiguda, Hyderabad - 500 007.
GST No. : 36ACKFS4315E1Z7, Phone : +91-8801231166, +91-9133377854, +91-91333 77851, 852, 853.
Email: satish@sunshinetechno.com, sunshinetechnologies@yahoo.com, ● www.sunshinetechno.com

SWAN TECHNICAL SERVICES PVT. LTD.,

(Group of Swan Environmental Pvt. Ltd.,)

(ISO 9001 : 2015 CERTIFIED)

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Ph: + 91 - 40 - 4021 6184 / 85, Fax : 40216183.

Email : info@swanenviron.com service@swanenviron.com Website : www.swanenviron.com

CALIBRATION CERTIFICATE

Certificate No.: SWAN/AAQMS/2024-25/1082 **Date of Issue** : 16.10.2024

Customer : M/s. ALLIED BLENDERS AND DISTILLERS LTD., Rangapur, Wanaparthy-509104.

Instrument Details:

Instrument : PM -10 Analyzer
Make : DKK, Japan
Model : FPM – 222
Serial No. : 863028

Station Name : ABD_ Rangapur
Date of Calibration: 14.10.2024
Due Date : 13.04.2025

Calibration Film Details:

Details	Serial No.	Calibration Film Value
Calibration Film	863028	1.54 mg/m3

Calibration Details:

Parameter	Span Calibration		
	Standard Value	Measured Value	% Of Deviation
Film Value	1.54 mg/m3	1.55 mg/m3	0.6 %

Accepted Tolerance: ± 2 %

Result: The Calibration of above instrument is performed and it meets the acceptance criteria.

Calibrated By:

Sk. Rafi
Service Engineer

Swan Technical Services Pvt. Ltd. Hyderabad

Reviewed By:

V. Pradeep
Manager - Service

SWAN TECHNICAL SERVICES PVT. LTD.,

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Email : info@swanenviron.com service@swanenviron.com Website : www.swanenviron.com

CALIBRATION CERTIFICATE

Certificate No.: SWAN/AAQMS/2024-25/1083 **Date of Issue** : 16.10.2024

Customer : **M/s. ALLIED BLENDERS AND DISTILLERS LTD, Rangapur, Wanaparthy-509104.**

Instrument Details:

Instrument : PM -2.5 Analyzer
Make : DKK, Japan
Model : FPM – 222
Serial No. : 863030

Station Name : ABD_ Rangapur
Date of Calibration: 14.10.2024
Due Date : 13.04.2025

Calibration Film Details:

Details	Serial No.	Calibration Film Value
Calibration Film	863030	1.42 mg/m3

Calibration Details:

Parameter	Span Calibration		
	Standard Value	Measured Value	% Of Deviation
Film Value	1.42 mg/m3	1.42 mg/m3	0 %

Accepted Tolerance: ± 2 %

Result: The Calibration of above instrument is performed and it meets the acceptance criteria.

Calibrated By:

Sk. Rafi
Service Engineer

Swan Technical Services Pvt. Ltd. Hyderabad

Reviewed By:

for

V. Pradeep
Manager - Service

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Ph: + 91 - 40 - 4021 6184 / 85, Fax : 40216183.

Email : info@swanenviron.com service@swanenviron.com Website : www.swanenviron.com

CALIBRATION CERTIFICATE

Certificate No.: SWAN/AAQMS/2024-25/1084 **Date of Issue:** 16.10.2024

Customer : M/s. ALLIED BLENDERS AND DISTILLERS LTD, Rangapur, Wanaparthy-509104.

Instrument Details:

Instrument : SO_2 Analyzer
Make : HORIBA, Japan
Model : APSA-370
Serial No. : 6PYY3UMT

Station Name: ABD_ Rangapur
Date of Calibration: 14.10.2024
Due Date : 13.04.2025

Calibration Gas Details:

N_2 Gas : 99.999% purity
SO_2 Gas : 50 PPM SO_2, Balance N_2

Calibration Diluter : AM5800
Serial No. : YYDZ0029
Ratio : 1: 166

Calibration Equipment Details:

Details	SO_2 Gas Cylinder
Serial Number	CSL-49602

Calibration Details :

Parameter	Zero Calibration		Span Calibration		
	Standard Gas Concentration	Measured Value	Standard Gas Concentration	Measured Value	% Of Deviation
SO_2	0.0ppm	0.0ppm	0.3 ppm	0.2986 ppm	-0.46 %

Accepted Tolerance: ± 2 %

Result: The Calibration of above instrument is performed and it meets the acceptance criteria

Calibrated By:

Sk. Rafi
Service Engineer

Swan Technical Services Pvt. Ltd. Hyderabad

Reviewed By:

for

V. Pradeep
Manager - Service

SWAN TECHNICAL SERVICES PVT. LTD.,

(Group of Swan Environmental Pvt. Ltd.,)

(ISO 9001 : 2015 CERTIFIED)

Plot. No. 922 & 935, Swami Ayyappa Co-Op Society, Madhapur, Hyderabad - 500 081, Telangana, India.

Ph: + 91 - 40 - 4021 6184 / 85, Fax : 40216183.

Email : info@swanenviron.com service@swanenviron.com Website : www.swanenviron.com

CALIBRATION CERTIFICATE

Certificate No. : SWAN/AAQMS/2024-25/1085 **Date of Issue :** 16.10.2024

Customer : M/s. ALLIED BLENDERS AND DISTILLERS LTD, Rangapur, Wanaparthy-509104.

Instrument Details:

Instrument : NOx Analyzer
Make : DKK, Japan
Model : APNA-370
Serial No. : PTGYYXYO

Station Name : ABD_ Rangapur
Date of Calibration : 14.10.2024
Due Date : 13.04.2025

Calibration Gas Details:

Calibration Dilute : AM5800

N_2 Gas : 99.999% purity
NO Gas : 48 PPM NO, Balance N_2

Serial No : YYDZ0029
Ratio : 1: 121

Calibration Equipment Details:

Details	NO Gas Cylinder
Serial Number	CSL- 49590

Calibration Details :

Parameter	Zero Calibration		Span Calibration		
	Standard Gas Concentration	Measured Value	Standard Gas Concentration	Measured Value	% Of Deviation
NO	0.0ppm	0.0ppm	0.4 ppm	0.3988 ppm	- 0.3%

Accepted Tolerance: ± 2 %

Result: The Calibration of above instrument is performed and it meets the acceptance criteria

Calibrated By:

Sk. Rafi
Service Engineer

Swan Technical Services Pvt. Ltd. Hyderabad

Reviewed By:

for

V. Pradeep
Manager - Service

SUNSHINE TECHNOLOGIES
AIR•WATER•ENERGY

CALIBRATION CERTIFICATE

Certificate Sr.No:SST/HYD/24-25/125

Calibration Certificate No :	M/s **Allied Blenders and Distillers ltd**
Equipment :	DCEM 21XX (Dust analyzer)
Location :	STACK
Serial No :	FMDCEM21XX20147
Customer :	M/s **Allied Blenders and Distillers ltd**
Date of Calibration :	28/11/2024
Next Calibration :	23/11/2025

TEST DATA:

- Zero Calibration of dust analyzer is performed using zero condition.
- Span verification checked by closing the ball valves.
- Reading are checked in actual plant operation & found satisfactory.

Calibration Result

Zero % opacity	100% Opacity
0.04%	99.5%

Operational and parameter setting checked for

Temp.	Ok	Alarm LED	Ok
Pressure	Ok	Alarm level	Ok
Water vapour	Ok	Plant status	Ok
Data valid	Ok	Current O/P	Ok

For Sunshine Technologies

Filed Support Engineer

Reg Address: # 4-7-83, Flat No. 403; Kalanjali Classic, Scientist Colony, Habsiguda, Hyderabad - 500 007.
GST No. : 36ACKFS4315E1Z7, Phone : +91-8801231166, +91-9133377854, +91-91333 77851, 852, 853.
Email: salish@sunshinetechno.com, sunshinetechnologies@yahoo.com, ● www.sunshinetechno.com

ABD/RANGAPUR/DISTILLERY/CPCB/2024-25/01
Date: 14.02.2025

Allied Blenders & Distillers

To,
The Chairman,
Central Pollution Control Board,
Parivesh Bhawan, East Arjun Nagar,
Delhi - 110032

Subject: Submission of compliance status with reference to the directions issued by CPCB for M/s Allied Blenders and Distillers Limited (ABDL) for Existing Grain Based Distillery180 KLPD (180 KL x 365 days = 65,700 KLPA) with Existing 6.5 MW Power Plant at Survey No. 690/AA, 691/AA2, 692, Village - Rangapur, Mandal - Pebbair, District - Wanaparthy, State - Telangana, Pin Code – 509104 - Regarding. -

Reference: B-505/IPC-III/Dist./2K18-19 Dated 17.09.2018.

Dear Sir,

With reference to the above, we are herewith submitting the current compliance status for the directions issued by CPCB and our compliance status is mentioned below.

Sr.No.	Directions	Compliance status
a)	It shall be ensured that the installed OCEMS devices are functionaing properly & continuously and that data from that device are uninterrutedly transferred to CPCB. Any failure in his regard shall be recitifed at the earlist.	Our OCEMS devices Installed and fuctioning peroperly and contniusouly the Equipmets are connected,the data is uninterrutedly transferred to the SPCB & CPCB servers.
b)	Unit shall ensure periodic calibration of the analyzers as per standard opearting procedure/recommendations of the suppier and submit the calibration results.	We are conducting periodic calibration of the analyzers as per the Standard Opearting Procedure.. AAQMS,EQMS &Stack Monitoring Equipments calibration Certifictes Enclosed as **Appendix - 1**
c)	The unit shall submit performance audit report of ETP system every year to CPCB from Govt. Expert institute.	We have conducted performance audit of our Effluent water treatment system (ZLD) through JNTUH and report is enclosed.as **Appendix - 2**

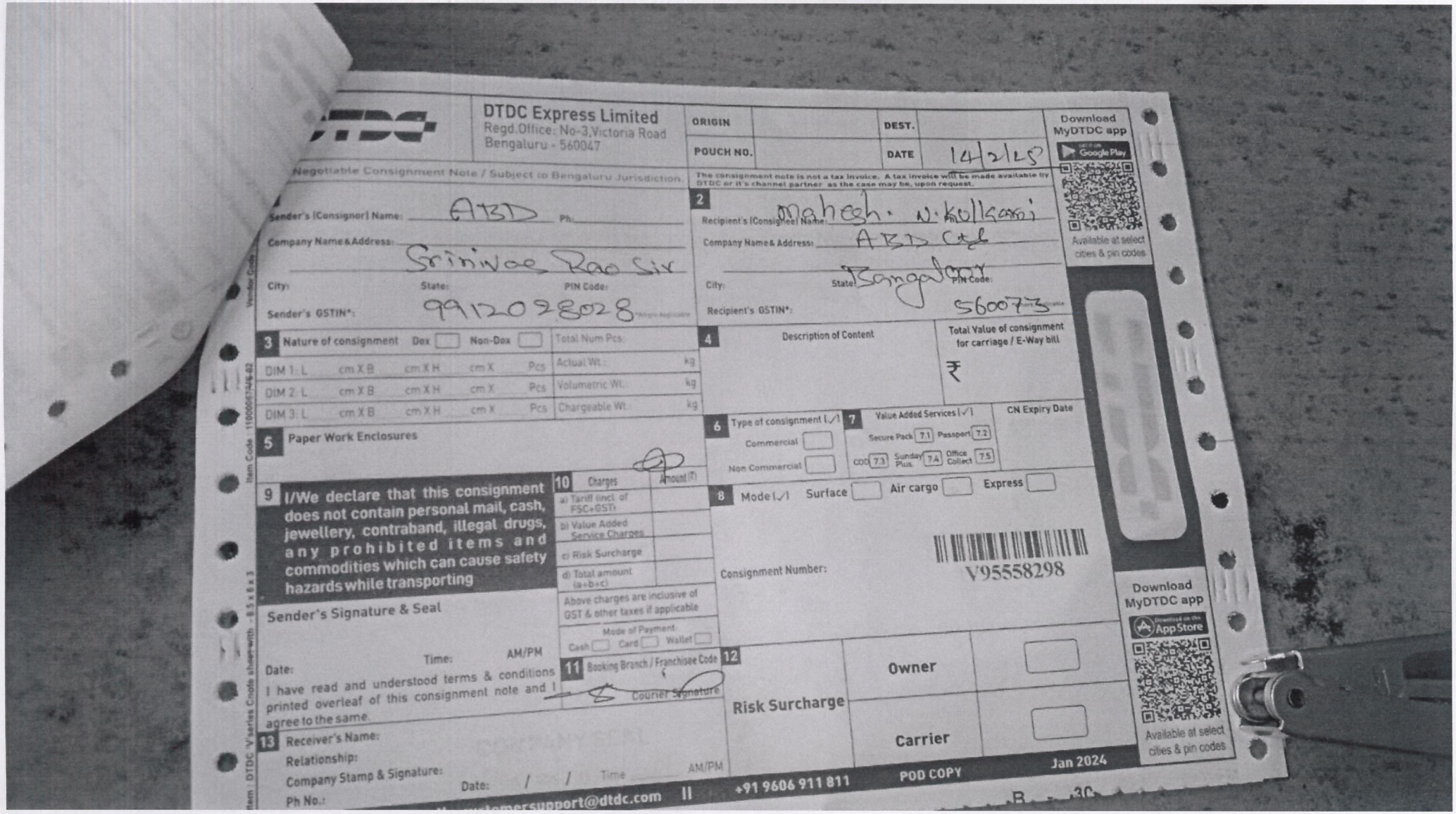
Thanking you.

For Allied Blenders and Distillers Limited,

Sudhansu Sekhar Rout
Head Distillery
Enclosure: As above
CC:

1. Regional Director – CPCB and MoEF&CC, ~~Bangalore~~ Chennai
2. Regional Office – TGPCB, Hyderabad
3. Member Secretary – TGPCB, Hyderabad

G. Ezhilarasi



DTDC Express Limited
Regd.Office: No-3,Victoria Road
Bengaluru - 560047

ORIGIN | DEST.
POUCH NO. | DATE 14/2/25

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Negotiable Consignment Note / Subject to Bengaluru Jurisdiction

The consignment note is not a tax invoice. A tax invoice will be made available by DTDC or it's channel partner as the case may be, upon request.

1 Sender's (Consignor) Name: ABD Ph:
Company Name & Address: Srinivas Rao Sir
City: State: PIN Code:
Sender's GSTIN*: 9912028028

2 Recipient's (Consignee) Name: mahesh. N. kulkarni Ph:
Company Name & Address: ABD Cafe
City: Bangalore State: PIN Code: 560073
Recipient's GSTIN*:

3 Nature of consignment: Dox ☐ Non-Dox ☐ | Total Num Pcs:
DIM 1: L cm X B cm X H cm X Pcs | Actual Wt.: kg
DIM 2: L cm X B cm X H cm X Pcs | Volumetric Wt.: kg
DIM 3: L cm X B cm X H cm X Pcs | Chargeable Wt.: kg

4 Description of Content | Total Value of consignment for carriage / E-Way bill ₹

5 Paper Work Enclosures

6 Type of consignment [✓]: Commercial ☐ Non Commercial ☐

7 Value Added Services [✓]: Secure Pack 7.1 Passport 7.2 COD 7.3 Sunday Plus 7.4 Office Collect 7.5

CN Expiry Date

8 Mode [✓]: Surface ☐ Air cargo ☐ Express ☐

Consignment Number: V95558298

9 I/We declare that this consignment does not contain personal mail, cash, jewellery, contraband, illegal drugs, any prohibited items and commodities which can cause safety hazards while transporting

Sender's Signature & Seal

Date: Time: AM/PM

I have read and understood terms & conditions printed overleaf of this consignment note and I agree to the same.

10 Charges | Amount (₹)
a) Tariff (incl. of FSC+GST)
b) Value Added Service Charges
c) Risk Surcharge
d) Total amount (a+b+c)

Above charges are inclusive of GST & other taxes if applicable

Mode of Payment: Cash ☐ Card ☐ Wallet ☐

11 Booking Branch / Franchisee Code

Courier Signature

12 Risk Surcharge | Owner | Carrier

13 Receiver's Name:
Relationship:
Company Stamp & Signature:
Date: / / Time AM/PM
Ph No.:

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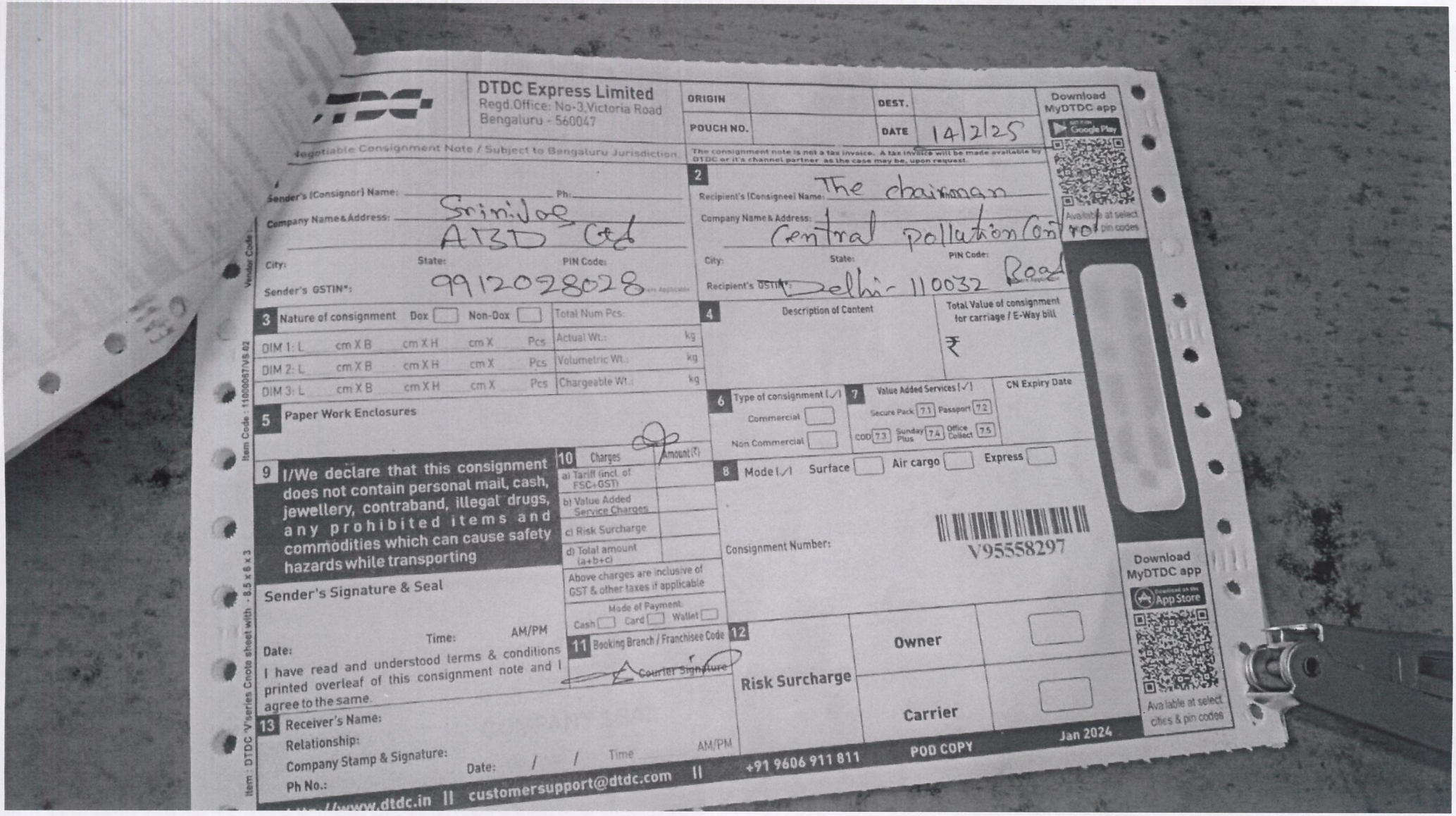
customersupport@dtdc.com || +91 9606 911 811 POD COPY Jan 2024

Item | DTDC 'V' series Code sheet with - 8.5 x 8 x 3 | Vendor Code - 11000067746-82



DTDC Express Limited
Regd.Office: No-3,Victoria Road
Bengaluru - 560047

ORIGIN | DEST.
POUCH NO. | DATE 14/2/25

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Negotiable Consignment Note / Subject to Bengaluru Jurisdiction.

The consignment note is not a tax invoice. A tax invoice will be made available by DTDC or it's channel partner as the case may be, upon request.

Item : DTDC 'V'series Cnote sheet with - 8.5 x 6 x 3 | Item Code : 11000087/V8.02 | Vendor Code

Sender's (Consignor) Name: Ph:
Company Name & Address: Srinivas AIBD Ltd
City: State: PIN Code:
Sender's GSTIN*: 9912028028

2 Recipient's (Consignee) Name: The chairman
Company Name & Address: Central pollution Control Board
City: State: PIN Code: Delhi - 110032
Recipient's GSTIN*:

3 Nature of consignment: Dox ☐ Non-Dox ☐	Total Num Pcs:	
DIM 1: L cm X B cm X H cm X Pcs	Actual Wt.:	kg
DIM 2: L cm X B cm X H cm X Pcs	Volumetric Wt.:	kg
DIM 3: L cm X B cm X H cm X Pcs	Chargeable Wt.:	kg

4 Description of Content

Total Value of consignment for carriage / E-Way bill ₹

5 Paper Work Enclosures

6 Type of consignment [✓]: Commercial ☐ Non Commercial ☐

7 Value Added Services [✓]: Secure Pack 7.1 ☐ Passport 7.2 ☐ COD 7.3 ☐ Sunday Plus 7.4 ☐ Office Collect 7.5 ☐

CN Expiry Date

8 Mode [✓]: Surface ☐ Air cargo ☐ Express ☐

9 I/We declare that this consignment does not contain personal mail, cash, jewellery, contraband, illegal drugs, any prohibited items and commodities which can cause safety hazards while transporting

Sender's Signature & Seal

Date: Time: AM/PM

I have read and understood terms & conditions printed overleaf of this consignment note and I agree to the same.

10 Charges	Amount (₹)
a) Tariff (incl. of FSC+GST)	
b) Value Added Service Charges	
c) Risk Surcharge	
d) Total amount (a+b+c)	

Above charges are inclusive of GST & other taxes if applicable

Mode of Payment: Cash ☐ Card ☐ Wallet ☐

11 Booking Branch / Franchisee Code

Courier Signature

Consignment Number: V95558297

12

Risk Surcharge	Owner	
	Carrier	

13 Receiver's Name:
Relationship:
Company Stamp & Signature:
Ph No.:
Date: / / Time AM/PM

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