INPLANT TRAINING REPORT

Submitted By: - *SARIKA S SHINDE .*

M.sc SY (2018-2019)

DEPARTMRNT OF ENVIROMNENTAL SCIENCE .

DR.BABASAHEB AMBEDKAR MARATHWADA *UNIVERSITY*

Under the guidance of

Prof : Dr. S.S . Patil Sir . and *MR. Nandu Shinde .*

03/05/2019

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June 22th, 2018

CERTIFICATE

This is to certify that **Ms. Sarika S. Shinde**, Student of Department of Environmental Science Dr. Babasaheb Ambedkar Marathwada University, **Aurangabad** has completed her In-plant Training in our plant. The in-plant training was successfully completed under our Technical Team's guidance and supervision from the 16th May 2018 to 18th June 2018 where she studied "Waste Water Treatment" of our plant.

I hereby convey my best wishes to her for all future endeavors.

For Varroc Engineering Ltd. (VEL-V),

VARROC ENGINEERING LIMITED
Plant-V
L-6/2, MIDC,
WALUJ
AURANGABAD

Nandu Shinde
Asst. Manager – HR

INDEX

Visited Venue : Varroc L-5 MIDC Industerial Area , Waluj
AURANGABAD Maharashtra . 431136 .

Varroc is a global automotive component manufacturer and supplier of engine and chasis parts , gears and shafts to passenger car and motorcycle segment world wide . The compony was founded by Tarang jain in 1990 and is currently headqartered at Aurangabad in Maharashtra India with 35 manufacturing facilities and 11 engineering centers in 10 countries across Three continents .

The compony is one of the leading global automotive component supplier in India . Varroc offers best design solutions that give customers a competative edge in their market .

Address :- L-5 , MIDC Industerial Area , Waluj
Aurangabad Maharashtra 431136

1 . Vision :- To be an INR200 Billion supplier of innovative solution for innovative solution for Transportation and allied Industry in 2020

2. Mission :- Bring leading edge Technologies to the mainstream markets with high quality , coast competative solutions :- By delevering customised solutions with superior service , with speed, agility and crativity and fostering an environment that enpowers employes and encourage the parsait of excellence .

3 . Core values :-

- *SINCERITY* :- To speak and Act from the Heart .
- *HUMILITY* :- To walk with everyone .
- *INTEGRITY* :- To do what is right .
- *PASSION* :- To go to the distance against all odds .
- *SELF DICIPLINE* :- To make it happen .

1 *SAFETY*

Mr.Nandu Shinde (HR) . Represents about compony profile , compony production and general information as well as they instructed Safety rules and Regulations of compony . The production of compony is :- Manufacturing gear and shafts of motorcycles and Transportation vehicles .

Mr.Nandu Shinde intoduce to Mr. Umesh Dhumal . (S.H.E. Officer). They gives the proper information about Effulent Treatment Plant . (E.T.P) and Sewage Treatment Plant (S.T.P) of the compony .

WASTE WATER TREATMENT

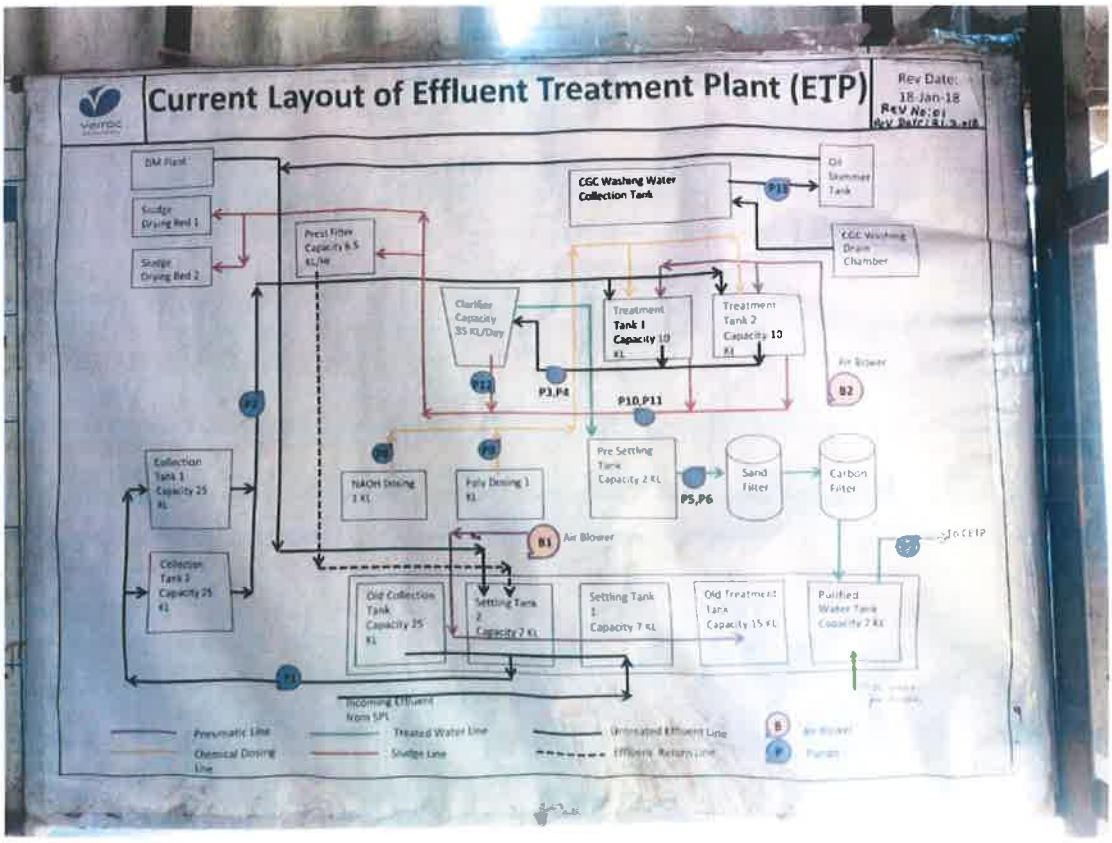
A) Effulent Treatment Pant . (E.T.P)

The primary purpose of the Treatment of Effulent is to prevent the pollution of the recieving water . Many techniqes have been devised to accomplish this aim for both small and large quantities of Effulent . ETP is a process design for treating the Wastewater for its reuse or safe disposal to the Environment .

Need Of ETP

- To Clean Industry Effulent and recycle it for further use
- To reduce the usage of fresh/portable water in industries .
- To meet the standards for emission or discharge of in Environment pollutants from various industries set by the Government and avoid hefty penalties .
- To safeguard Environment against pollution and contributing sustainable development .

ETP Plant Operation



1) Collection system

The purpose of Effulent collection system is to remove wastewater from points of origin to a treatment facility or place of disposal. The collection system consist of sewers (pipes and conduits) and plumbing necessary to convey Effulent from the point of origin to the treatment system.

Pumping is necessary where the sewer does not produce the reuired minimum velocity of 0.03m or where Effulent must be lifted to a higher elevation. Effulent can be pumped from pumping stations through pressure lines (force mains) regardless of their slope, or it can be raised to a higher elevation of pumping stations (lift stations). so, that gravity flow will again produce the reuired velocity.

2) Screen Chamber

Removes relatively large solids to avoid abrasion of mechanical euipments and clogging of hyadraulic system.

3) Primary setting Tank

These are useally large tanks in which solids. settle out of water by gravity. and where the settleable solids are pumped away as sludge.

4) Collection Tank

The collection Tank collects , The effulent water from the Settling Tank , Stores and then pump it to the Treatment Tank or Equilization Tank .

5) Treatment Tank

- The collection tank collects The effulent water from the seltting Tank stores and then pump it to the treatment tank or Equilization Tank.

- The effulent do not have similar concentration at all the time; The pH will vary Time to Time.
- Effulent are stored in the treatment Tank resulting in a homogenous mixing of effulent and helping in neutralization.
- It eliminate shock loading on the subseuent treatment system.
- Continious mixing also eliminates seltting of solids within the eualization Tank.
- Reduce ss, Tss.

6) Flash mixer

Coagulants were added to the Effulent.

1) caustic soda:- To correct the pH to 7(neutral)

2) Poly electolyte:- To settle the suspended matters and reduce SS. TSS

The addition of above chemical by efficient rapid mixing facilitates homogeneous combination of flocculates to produce microflocs .Polyelectrolyte stored tank reuires continious stirring by a mechanical stirrer otherwise Lumps of polyelectrolyte forms in polyelectrolyte Tank.

7) Clarifier

i. After the mixing of coagulants the Effulent water is collected in a clarifier. In the clarifier the coagulated solid particles and precipitate settled down. The settle down sludge is collected separately on drying beds.

ii. This reduces ss, Tss.

iii. Flocculation provides slow mixing that lead to the formation of macro flocs, which them settle out in the clarifier zone.

iv. Over flowed water is taken out to the preselting Tank.

v. The seltted solids i.e primary sludge are pumped into sludge drying beds for drying the sludge.

8) *Drying bed*

Digested sludge is placed on drying beds where the liuid may evaporate or drain .

The dried sladge is a porous humus like cake. which is press out in pressing machine and disposed.

9) Pre-settling Tank

Overflowed water from the clarifier is collected in a Pre-settling Tank and remaining any residual is settle down in a presettling Tank. From the presettling Tank the water is pumped toward Rapid sand filter and activated carbon filter.

10) Rapid Sand Filter (Rapid-Gravity) (R.S.F)

Rapid sand Filtration is purely physical water purification method. R.F.S ic=provides rapid and efficient removal of relatively large suspended particles.

11) Activated Carbon filter (ACF)

- Activated carbon Filter is used to adsorb chlorine, organics, Tri Halo methane (TCH), taste, odour and colour. From water & wastewater. activated carbon is highly effective at adsorbing impurities from water.
- It is low coast, reliable and efficient way to purify water.

- ACF is an adsorptive process in which the contaminant is attracted to and adsorbed on to the surface of the carbon particles.

The water from the ACF is called as treated effulent and disposed out. The outlet water quality is checked to be within the acceptable limit as delineated in the norms of the norms of The Bureau of Indians Standards & MPCB . Through piplines, The treated water is disposed. into the environmental river water etc

Parameters of Treated Water

Sr no .	Parameter	Checking frency	Limits As per MPCB Consent	Actual
1	pH	Monthly	5.5 To 9.0	6.12
2	TDS	Monthly	< 2100	1294
3	BOD	Monthly	<30	23
4	COD	Monthly	<250	66

If the TDS level is higher than **2100** then the MIDC water is add in a Treated water for dilution and maintain **TDS** level. No any Reagent or chemical procedure for maintain TDS level.

Quntity of coagulants .

Caustic soda - 50 Kg - 1 KL water . (1000 L)
Polyelectrolyte - 1.5Kg - 1KL water .

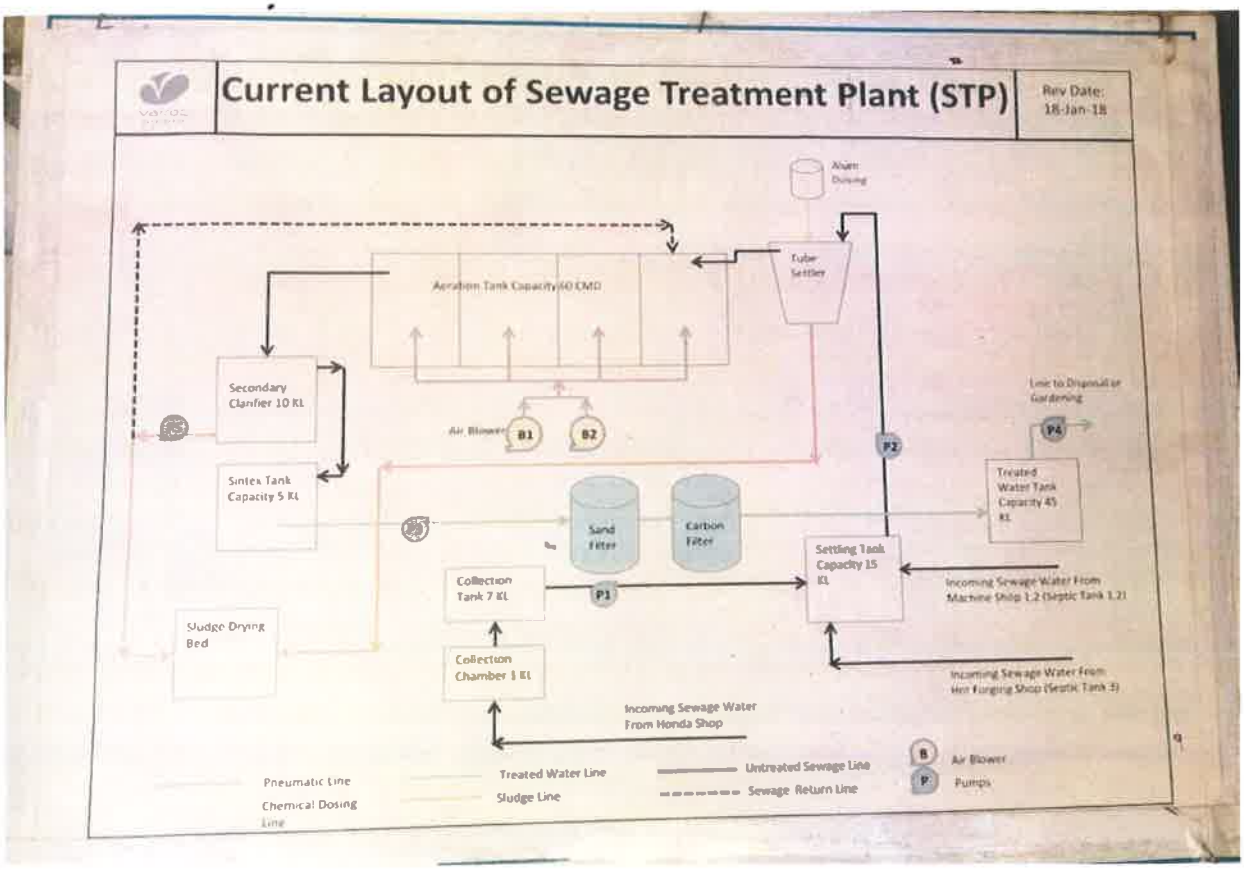
Daily Inlet of Effulent Waste Water - *30* KL
Daily Outlet of Treated Water - 27 KL .

B) Sewage Treatment Plant

The STP is concerned with liquid wastes as found at permanent locations. Although field-type wastes are included . The wastewater included in STP is predominantly of domestic origin. Varying amounts of industrial and laboratory wastewaters can be collected and treated with the sanitary sewage. The primary purpose of the treatment of sewage is to prevent the pollution of the receiving waters.

In general, these processes are divided into three stages: preliminary (physical), primary (physical) treatment and secondary (biological) treatment. wastewater should receive primary (physical removal/settling) and secondary (biological) treatment, There are many basic types of sewage treatment plants employing both primary and secondary treatment stages that are in use today for treating large quantities of sewage.

STP Plant Operation



1) Primary Settling Tank .

These are usually large tanks in which solids settle out of water by gravity , where the settle-able solids are pumped away (as sludge), . It operates by means of the velocity of flow is reduced to about 0.005 m so that the suspended material (organic settleable solids) will settle out.

Longer periods usually result in depletion of dissolved oxygen and subsequent anaerobic conditions. Removal of suspended solids ranges from 50–65 % , and a 30–40 % reduction of the five-day biochemical oxygen demand (BOD) can be expected.

2) Tube Settler

Tube settler system for Clarification .

Tube settlers and parallel plates increase the settling capacity of circular clarifiers and/or rectangular sedimentation basins by reducing the vertical distance a floc particle must settle before agglomerating to form larger particles.

Tube settlers use multiple tubular channels sloped at anangle of 60° and adjacent to each other, which combine to form an increased effective settling area.This provides for a particle settling depth that is significantly less than the settling depth of a conventional clarifier .

Alum is added in Tube settler to reducing settling times.

Tube settlers capture the settleable fine floc that escapes the clarification zone beneath the Tube settlers and allows the larger floc to travel to the tank bottom in a more settleable form. The tubesettler's channel collects solids into a compact mass which promotes the solids to slide down the tube channel.

Advantages of Tube Settlers

The advantages of tubesettlers can be applied to new or existing clarifiers/basins of any size:

i. Clarifiers/basins equipped with tubesettlers can operateat 2to4 times the normal rate of clarifiers/basins without tubesettlers.

ii. It is possible to cut coagulant dosage by upto half while maintaining a lower influent turbidity to the treatment plant filters.

iii. Less filter back washing equates to significant operating cost savings for both water and electricity.

iv. New installations using tubesettlers can be designed smaller because of increased flow capability.

v. Flow of existing water treatment plants can be increased through the addition of tube settlers.

vi. Tube settlers increase allowable flow capacity by expanding settling capacity and increasing the solids removal rate in settling tanks.

3) Areation Tank

Activated Sludge is a multi-chamber reactor unit that makes use of (mostly) aerobic microorganisms to degrade organics in wastewater and to produce a high-quality effluent. To maintain aerobic conditions and to the keep the active biomass suspended, a constant and well-timed supply of oxygen is required.

Different configurations of the Activated Sludge process can be employed to ensure that the wastewater is mixed and aerated (with either air or pure oxygen) in an aeration tank. The microorganisms oxidize the organic carbon in the wastewater to produce new cells, carbon dioxide and water. Although aerobic bacteria are the most common organisms, aerobic, anaerobic, and/or nitrifying bacteria can be present.

Compressed air is continually diffused into the sewage as it flows through the aeration tank. This provides both a source of oxygen for the aerobic bacterial floc that forms in the tank and the turbulence necessary to bring the waste and the bacteria into contact. Aerobic bacteria attack the dissolved and finely divided suspended solids not removed by primary sedimentation

During aeration Media is added in water , the bacteria form small clusters, or flocs attached with media degrades organics in wastewater , after the treatment mixture is transferred to a secondary clarifier the media is trap using Bar screens .

Photograph Of Media

3) Secondary Clarifier

In secondary clarifier the flocs are allowed to settle out and the effluent moves on for further treatment. The sludge is then recycled back to the aeration tank, where the process is repeated. The liquid portion then flows over a weir at the surface of the Secondary Clarifier is pumped to the

4) Sintex Tank

When sewage enters in a sintex tank an equal volume of liquid is discharged from the tank. The primary purpose of the sintex tank is to condition the sewage so that the discharged liquid will not clog the disposal system.

As sewage water from Secondary Clarifier enters in a syntex tank, its rate of flow is reduced so that the remaining heavier solids sink to the bottom and the lighter solids including fats and grease rise to the surface. These solids are retained in the tank, and the clarified effluent is treated. With good care and efficient operation, removal of solids maybe as high as 60 % .

5) Rapid Sand Filter (R.S.F)

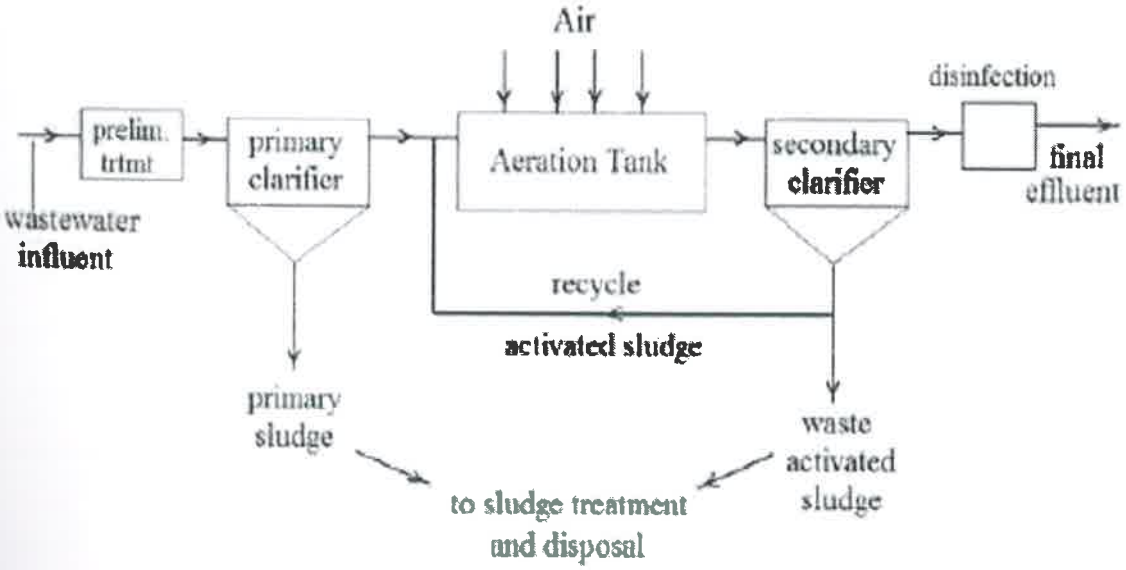
Rapid sand Filtration is purely physical water purification method. R.F.S ic=provides rapid and efficient removal of relatively large suspended particles.

6) Activated Carbon filter (ACF)

Activated carbon Filter is used to adsorb chlorine, organics, Tri Halo methane (TCH), taste, odour and colour. From water & wastewater. activated carbon is highly effective at adsorbing impurities from water.It is reliable and highly efficient way to purify water.

The water from the ACF is called as treated effulent. Through piplines, The treated water is stored in Garden Tank and utilize in Garden .

Daily Inlet of Sewage Waste Water - *65* KL
Daily Outlet of Treated Water - 50-55 KL



Conclusion

- The company is Neat and Clean .
- The staff is very Co-operative and provide all Information .
- Surrounding premises , Garden and Zero discharge is well maintained .
- Treated water is used for Garden and Washing purpose.