IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)
e-ISSN: 2278-1684, p-ISSN: 2320-334X, Volume 16, Issue 3 Ser. II (May. - June. 2019), PP 46-48
www.iosrjournals.org

Treatment of Wastewater from the Car Service Centre and Washing Facility

Prajoyt Tarale[1],PranavJain[1], AdinathDhande[1],Dilip Ade[1] T. S. Khambekar[2]
1 (Student, Department of Civil Engineering, Pimpri Chinchwad College of Civil Engineering, Pimpri Chinchwad College of Engineering, Pune – 411044, Maharashtra,India)
2(Assistant Professor, Department of Civil Engineering, Pimpri Chinchawad College of Engineering, Pune-411044, Maharashtra, India)
Corresponding Author: PrajoytTarale

***Abstract**:The number of car service stations and washing facility is increasing significantly all around the world as the number of vehicles is increasing.As water is becoming a rare resource, the reuse and recycling of car wash wastewater must be practiced for sustainable solution to reduce the overall demand of water. The study deals with the treatment of wastewater from car service station from car service station and washing facility for its reuse. The wastewater samples were collected from two different car service station to find characteristics like Total solids, Biochemical Oxygen Demand (BOD) Chemical Oxygen Demand (COD). The study deals with finding various characteristics of wastewater from the facility and to study the existing treatment methods for its disposal and reuse. The project work include experimentation which will help in reducing the pollutants from the wastewaterfor its safe disposal and reuse.*

***Keywords:**Car service station, wastewater, pollutants, treatment*

Date of Submission: 16-05-2019 Date of acceptance: 01-06-2019

I. Introduction

A car wash is defined as an undomestic installation for external cleaning of cars. All the polluted sediments will flow to the gutter system and go into storm water system without undergoing treatment. Hence, it endangered the ecosystem when washes away to the drainage system, streams and to the receiving waters, leads to the increased environment pollution. According to the reports provided by International Car Wash Association, a home car wash can go through 80 to 140 gallons (300 to 530 litres) of water, whereas a wash at one of the garages will take about 30 to 45gallons (115 to 170 litres) and after the wash of vehicles, some water will also be used to wash floors and washing equipment's. Lot of water is wasted daily for the vehicle washing and servicing. Generally, public perceived that the waste water from car washing is not severely contaminated compared with other industrial waste waters. Hence, little attention is given to the car wastewater industry.

Water scarcity will be a key issue for the sustainable development of a country in future. According to NITI Aayog, India will face water crisis by 2030 if the steps are not taken. Huge quantity of water is wasted in service stations during the washing of vehicles. Possibilities of recycle or reuse of the wastewater generated from automobile service stations needs to be considered. Reclaimed water or recycled water from service station waste water treatment is getting popularity to the fact that water saving will be benefit to both business and environment for instance.

1.1 Objectives of the Research Work

1. To study the characteristics of the effluents from the car servicing & washing facility and study the existing treatment method.
2. To decide the treatment process & flow diagram for the waste water from car washing and servicing facility.
3. To carry out experimentation to reduce the pollution characteristics of the waste water from the car servicing and washing facility.

II. Experimentation

2.1. Collection of Sample

In this experimentation grab sampling was done at two places from the collection tank of the car service station. A total of 15-liter sample was collected in a plastic container from the individual car servicing station.

2.2. Initial Characterization of Wastewater

Different parameters like Total Solids, Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) of the samples were measured. The result of characterization of both the samples is given in Table 1

Fig No.1. Test of Total Solids, BOD, COD

Table No.1. Characteristics of Water Sample before treatment

SR.NO.	SAMPLE DESCRIPTION	TOTAL SOLIDS (mg/l)	BOD (mg/l)	COD (mg/l)
1	SAMPLE NO-1	530	45	535
2	SAMPLE NO-2	520	37	326

2.3. Lab Scale Experimentation

The treatment system consists of four units i.e. collection tank, settling tank, filtration, cartridge filter. The proposed treatment plant is design in such a way that the water moves from one unit to other unit with the help of gravity. In this system 15 lit of water was transported manually in the collection tank and then it moves to settling tank in which alum is added and for proper mixing of dose agitator is provided which helps to form the flocs. After this it is allowed to settle for 30 minutes so that the flocs can settle down. The supernatant is allowed to pass through dual media filter in which the remaining small impurities are removed and then it is passed through the cartridge filter in which micro particles are removed. The proposed model is shown in fig.2

Fig No.2. Layout of proposed model

2.4 Result and Discussion

Test of total solid, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) were conducted on the outlet of the treatment plant. The result is shown in the Table 2

Table No.1. Characteristics of Water Sample after treatment

Sr.No.	SAMPLE DESCRIPTION	TOTAL SOLIDS (mg/l)	BOD (mg/l)	COD (mg/l)
1	SAMPLE NO-1	60	7.2	59.4
2	SAMPLE NO-2	70	6.3	68.5

1. The total solid removal efficiency was about 88.67%.
2. The removal efficiency of Biochemical Oxygen Demand was 84%.
3. The removal efficiency of Chemical Oxygen demand was 88.89%

III. Conclusion

Based on the experimental work carried out in the present study the following conclusions are drawn

1. A development in washing technology provides better quality of wash increasing the consumption of water; therefore, there is demand for treatment plant compact in size.
2. With increase in cost of water, increasing water demand it makes sense to setup water recycling plants.
3. Treatment of waste water reduces pollution it as it will be beneficial for environment as well as economic point of view.

Acknowledgement

On the very outset of this we would like to extend my sincere and heartfelt thank towards all the persons who have helped us in this endeavor without their active guidance, help, cooperation and encouragement, in theproject. We would like to thankProf. Mrs. T. S. Khambekar for conscientious guidance and encouragement to accomplish this project. Again, we take the opportunity to express our gratitude to Dr. S. T. Mali for the valuable guidance.We extend our gratitude to Pimpri Chinchwad College of Engineering and Department of Civil Engineering for giving us this opportunity.

References

[1]. Deniz Ucar, *Membrane Processes for the Reuse of Car Washing wastewater, Journal* of Water Reuse and Desalination, Vol.8, Issue 2, 02 April2014
[2]. Paradkar A,NanivadekarR, GharadP,*Treatment of Automobile Service Station Wastewater by Coagulation and Activated Sludge Process, International*, Journal of Environmental Science and DevelopmentISSN:2010-0264
[3]. Jisha.T. J&M.A. Chinnamma, *Effect of Natural Coagulant on the Treatment of Automobile Service Station Waste Water,* International Journal of Science and Research, ISSN:2010-0264
[4]. Dr. I.Mohammad,*Study of Car Wash Wastewater by Adsorption*, International Conference of Engineering, Information Technology.
[5]. Dr. M.Krishna & A.Siddiqa, *Treatment of Service Station Wastewater Using Electrocoagulation Process,* ISSN:2350-0530, Vol5, Issue2.

PrajoytTarale. "Treatment of Wastewater from the Car Service Centre and Washing Facility" IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) , vol. 16, no. 3, 2019, pp. 46-48.