

# Efficiency of the Technological Scheme of Wastewater at a Machine-Building Plant

Sarvarjon Botirjon Ugli Abduraimov

Specialist of the Technology Department of East West Engineering LLC, Uzbekistan

## ABSTRACT

The switchgear ensures the flow of waste water into the settling zone at low speeds. It is a peripheral annular tray with a toothed spillway or slotted bottom holes and a semi-submerged partition.

**KEYWORDS:** *modifications, central pipe, floating substances, projected, sewer*

**How to cite this paper:** Sarvarjon Botirjon Ugli Abduraimov "Efficiency of the Technological Scheme of Wastewater at a Machine-Building Plant" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-5 | Issue-6, October 2021, pp.798-800, URL: www.ijtsrd.com/papers/ijtsrd47512.pdf



Copyright © 2021 by author (s) and International Journal of Trend in Scientific Research and Development Journal. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0) (<http://creativecommons.org/licenses/by/4.0>)



In sewage systems, radial settling tanks of three design modifications are used: with a central outlet, with a peripheral outlet and with rotating prefabricated distribution devices. The most widespread are settling tanks with a central release of liquid.

The most important feature of the settling tanks is the lower supply of wastewater. Waste water is supplied through the central pipe, and clarified water is discharged into a circular peripheral tray through toothed weirs.

Primary radial settling tanks are equipped with silt scrapers that shift the precipitated sediment to a silt pit located in the center, from which the sediment is removed by pumps or under hydrostatic pressure. The surfaced substances are discharged into float fat collectors, which are submerged under water using a lever mechanism when the mud scraper farm approaches.

Settling tanks with peripheral water discharge with the same settling duration have a 1.2-1.3 times greater cleaning effect than conventional radial settling tanks;

with the same cleaning effect, their throughput increases by 1.3-1.6 times, depending on the concentration of the source water.

The switchgear ensures the flow of waste water into the settling zone at low speeds. It is a peripheral annular tray with a toothed spillway or slotted bottom holes and a semi-submerged partition, forming an annular zone with the side of the sump, in which the energy of incoming jets is quickly extinguished, the release and retention of floating substances occurs. The diameter of the discharge wall based on the calculation of the waste water load is not more than 20 m<sup>3</sup>/h per 1m<sup>2</sup> of the surface area of the ring zone. For the collection and removal of floating coarse impurities, two bunkers are provided, one of which is installed in the central part of the sump, and the second – in the annular zone. Clarified water is discharged from the central annular tray with a two-way spout or through slotted holes in the central pipe.

The estimated duration of water stay in the sump is taken on the basis of the kinetics of precipitation of suspended substances, but not less than 1 h. According to calculations at the Machine-building

Plant, the residence time of wastewater in the sump storage is 1-1.5 hours.

After cleaning in the primary radial sump, the waste water is fed into the oil trap. Oil traps are used for mechanical wastewater treatment from petroleum products capable of gravitational separation (surfacing), and from precipitating solid mechanical impurities.

Oil traps of the following types are designed: horizontal, multi-tiered (thin-layer) and radial. It is planned to install a horizontal oil trap in the projected cleaning scheme. The horizontal oil trap is a settling tank divided by longitudinal walls. Waste water from a separately located chamber through independent pipelines enters through a slit partition into each section of the oil trap. The water released from oil at the end of the section passes under the flooded oil retaining wall, through the spillway into the discharge tray and then into the pipeline. To reduce the viscosity of oil in winter, heating of the liquid surface (with a coil) is provided.

The pop-up oil, as it accumulates, is driven by a scraper conveyor to the slotted rotary pipes and is removed from the oil trap through them. The sediment falling to the bottom is raked by the same conveyor to the pit, from where it is periodically removed through the bottom valves or hydraulic elevators through the silt pipeline.

The efficiency of the oil traps also depends on the reliability of the oil and sludge removal devices. If the parallelism of the drive and driven shafts is not observed during the installation of the scraper mechanism, or the tension of the right and left chains is different, emergency situations arise that can lead to the rupture of the chains and the failure of the scraper conveyors, which will entail a complete shutdown of the oil trap section and quite complex repair work. To avoid such situations, some refineries use air to move floating petroleum products to rotary tubes. However, in this case, periodic shutdown and emptying of its section from the precipitated sediment is required. The period and sequence of forced disconnection of the section are determined during operation.

One of the disadvantages of the existing structures of oil traps is that their distribution devices in the form of slotted partitions are usually made of reinforced concrete and are rigidly connected to the walls. This significantly complicates their adjustment during commissioning.

For a more uniform distribution of the working flow over the live section of the section, it is advisable to install an additional perforated partition at the

beginning of it with holes with a diameter of 20-30 mm, evenly distributed over the area of the partition. The number of holes is determined from their total area, equal to 6-8 % of the area in which the partition is installed. The partition can be made of light film materials, dacron, nylon, etc. A prerequisite for the applicability of materials for the manufacture of a partition is their resistance to oil

Subsequent clarification of water is carried out in horizontal, radial and vertical settling tanks.

In the presented scheme of wastewater treatment at a machine-building plant, wastewater treatment is carried out in a vertical mixer. Then the water is fed into the flocculation vortex chamber. After that, the waste water is fed into a vertical sump for its clarification. After all these processes, the waste water meets the requirements of receiving waste water from the city collector.

All the equipment is selected in accordance with the capacity of the devices.

The initial waste water is fed into the primary radial sump for accumulation, since the discharge of waste water is salvo, as well as for cleaning from coarse impurities.

One of the disadvantages of the existing structures of oil traps is that their distribution devices in the form of slotted partitions are usually made of reinforced concrete and are rigidly connected to the walls. This significantly complicates their adjustment during commissioning.

For a more uniform distribution of the working flow over the live section of the section, it is advisable to install an additional perforated partition at the beginning of it with holes with a diameter of 20-30 mm, evenly distributed over the area of the partition. The number of holes is determined from their total area, equal to 6-8 % of the area in which the partition is installed. The partition can be made of light film materials, dacron, nylon, etc. A prerequisite for the applicability of materials for the manufacture of a partition is their resistance to oil. Subsequent clarification of water is carried out in horizontal, radial and vertical settling tanks.

In the presented scheme of wastewater treatment at a machine-building plant, wastewater treatment is carried out in a vertical mixer. Then the water is fed into the flocculation vortex chamber. After that, the waste water is fed into a vertical sump for its clarification. After all these processes, the waste water meets the requirements of receiving waste water from the city collector.

All the equipment is selected in accordance with the capacity of the devices.

The initial waste water is fed into the primary radial sump for accumulation, since the discharge of waste water is salvo, as well as for cleaning from coarse impurities.

These settling tanks have some advantages in comparison with horizontal ones: simplicity and reliability of operation, cost-effectiveness, the possibility of building high-performance structures. The disadvantage is the presence of a movable truss with scrapers.

### Literature

- [1] Ecology of wastewater treatment by physico-chemical methods: N. S. Serpokrylov, E. V. Wilson, S. V. Getmantsev, A. A. Marochki-St. Petersburg, Association Publishing House, 2009
- [2] Vetoshkin, A. G. Engineering protection of the hydrosphere from wastewater discharges A. G. Vetoshkin. Infra-Engineering, 2016
- [3] Khodjayeva N. S., Mamurova D. I., Nafisa A. IMPORTANCE IN PEDAGOGICAL TECHNIQUES AND EDUCATIONAL ACTIVITY //International Engineering Journal for Research & Development. – 2020. – Т. 5. – №. CONGRESS. – С. 5-5.
- [4] Olimov, Shirinboy Sharofovich. "THE INNOVATION PROCESS IS A PRIORITY IN THE DEVELOPMENT OF PEDAGOGICAL SCIENCES." (2021).
- [5] Мамурова Д. И., Мамурова Ф. И. Соотношения навыков черчения с опытом психологического исследования //Вестник по педагогике и психологии Южной Сибири. – 2015. – №. 1.
- [6] Islomovna M. D., Ruziboevich S. A. SCIENTIFIC AND METHODOLOGICAL BASES OF DEVELOPMENT OF CREATIVE ACTIVITY OF STUDENTS IN DRAWING ON THE BASIS OF COMPUTER ANIMATION MODELS //International Journal of Psychosocial Rehabilitation. – 2020. – Т. 24. – №. 4.
- [7] Mamurova D. I. Application of Advanced Information Technologies of Training at Drafting Lessons //Eastern European Scientific Journal. – 2018. – №. 6.
- [8] Islamovna M. D. The value of using the autocad program in the works of machine-building drawings for building fastening parts //Proceeding of The ICECRS. – 2019. – Т. 3.
- [9] Aminov, A. S., Shukurov, A. R., & Mamurova, D. I. (2021). Problems of Developing the Most Important Didactic Tool for Activating the Learning Process of Students in the Educational Process. *International Journal of Progressive Sciences and Technologies*, 25(1), 156-159.
- [10] Aminov, A. S., Mamurova, D. I., & Shukurov, A. R. (2021, February). ADDITIONAL AND DIDACTIC GAME TECHNOLOGIES ON THE TOPIC OF LOCAL APPEARANCE. In *E-Conference Globe* (pp. 34-37).
- [11] Islamovna M. D., Gulhumor M. PRINCIPLE OF TEACHING DRAFT GEOMETRY AND COMPUTER GRAPHICS //World Bulletin of Social Sciences. – 2020. – Т. 1. – №. 1. – С. 30-31
- [12] Мамурова Ф. И., Мамурова Д. И. КОМПЬЮТЕР ГРАФИКАСИ ФАНИНИ ЎҚИТИШ ҲОЛАТИ //TULAGANOV AA. – С. 145.
- [13] Islomovna M. D. DIDACTIC CONDITIONS FOR ACHIEVING STUDENTS' SELF-EFFICACY THROUGH THE USE OF ICT IN DRAWING LESSONS //European Journal of Research and Reflection in Educational Sciences Vol. – 2019. – Т. 7. – №. 12.