International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 3 Mar 2022, pp: 1233-1235 www.ijaem.net ISSN: 2395-5252

"Implementation of Non-Potable Water by Using New Generation Packaged Sewage Treatment Plant"

Miss. Pooja S. Pathak, Prof. Dr. S. B. Thakare
Research Scholar, Department of Civil Engineering, Anantrao Pawar College of Engineering and Research, Pune, India.

Submitted: 20-03-2022 Revised: 27-03-2022 Accepted: 30-03-2022

ABSTRACT
Sewage treatment plant is a facility designed to receive waste from domestic, commercial and industrial sources and to remove materials that damage water quality and public health as well as safety when discharged into water receiving systems. NGP STP is all in one package, approximately most compact compared to other plants, very simple to operate as well as to maintain. Its operating cost is low as it has got modular design which results in simple maintenance.

Key words: NGP STP, compact, modular, easy to operate, low maintenance.

I. INTRODUCTION

Sewage treatment is a multi-stage process designed to treat sewage and protect natural water bodies. Domestic sewage contains various wastes. If improperly collected and improperly treated, this sewage and its related solids could hurt human health and the environment. A treatment plant's primary objectives are to clean the sewage and meet the plant's discharge standards The treatment plant personnel do this by reducing the concentrations of solids, organic matter, nutrients, pathogens and other pollutants in sewage. This type of STP can operate plants in low temperature areas and reduce bulking problem in existing treatment plants.

II. OBJECTIVES

- To Reuse treated water for toilet flushing and gardening purpose.
- To protect public health
- To prevent disease causing environment
- To prevent pollution of water bodies into which sewage is being discharged
- To reuse treated sewage there by reducing the requirement of fresh water

III. SCOPE

- Waste water treatment is a unique technique to make optimum use of
- water for flushing and gardening purpose and to avoid wastage of water.
- It can prevent the diseases causing environment in the society
- It can help to protect the public health
- This STP can be useful to prevent pollution of water bodies into which sewage is being discharged.

IV. PROBLEM STATEMENT

- Availability of required land can be an issue in certain cases.
- Sludge management Facility is required for this STP.
- Preferably location of STP is to be provided at lowest land elevation highly susceptible to flooding.

V. METHODOLOGY

Primary Settlement: Sewage enters the primary settlement tank. The tank incorporates lamella parallel plates which aid in reducing the suspended solids by 75% and the BOD by 25%. This zone is relatively maintenance-free and contains no moving mechanical or electrical devices.

Aerobic Treatment: The effluent then enters the aerator bio-zone which is a combined fixed film reactor and active aeration system mounted on a horizontal shaft. The aerator provides a solid surface area for micro-organisms to attach themselves; these then feed on the organic matter present in the effluent. Rotation of the drums

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 3 Mar 2022, pp: 1233-1235 www.ijaem.net ISSN: 2395-5252

aerates the liquid. The bio-zone is self-cleansing and does not require extraneous pumping or sludge return.

Final Settlement: The treated effluent then moves to the settlement area. This area contains a lamella parallel plate assembly for settling finer particles. The submersible pump removes sludge to the sludge storage compartment on a regular timed basis.

Following are the proposed components of STP with their sizing:

- Bar Screen of 10mm opening size will be provided.
- Common Equalisation tank of 35 Cu.m capacity is proposed for present and future development, which is about 8 hrs retention time at average final flow rate.
- For each unit Two (1W+1S) number Feed Pumps of 1.5 Cu.m/hr capacity and 10m head for each RBC unit. Excess flow will be recalculated back to equalisation tank.
- Secondary packaged treatment unit's tentative size will be about 7m (L) x 3m (W) x 3.5m (H).
- For each unit Sludge Holding Tank of 8 Cu.m capacity is proposed.
- For each unit Filter feed tank of 8 Cu.m capacity is proposed.
- Filter Press is proposed to be provided for sludge drying.
- Effluent will pass through Multi Grade Filter by using pumps of
- 2.5 Cu.m/hr capacity and 30m head. To reduce the fouling smell after filtration effluent will pass through Active Carbon Filter.
- After filtration water will pass through UV radiation and will be disinfected by ozone treatment.
- Disinfected water will be stored in 50 Cu.m capacity tank and will be pumped for flushing and gardening.

It is expected that treated effluent will have

- BOD: 5 ppm
- COD : <30 ppm (Bio degradable)
- pH: 6.5 – 8.0
- Total Suspended Solids : <5 ppm

VI. SCHEDULE OF EXECUTION

Table-1 Project completion schedule(Duration 12Month)

Month / Task	June 2021	July 2021	August 2021	September 2021	October 2021	November 2021	December 2021	January 2022	February 2022	March 2022	April 2022	May 2022
Basic about topic and discussion with guide												
Study / collection of research paper												
Finalization of aims and objectives												
Collection of samples/test												

International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 3 Mar 2022, pp: 1233-1235 www.ijaem.net ISSN: 2395-5252

Finalizing methodology												
Preparation of specimen												
Test result												
Conclusion												
Report writing / final submission												

REFERENCE

[1]. https://ionindia.com/productServices/sewage-treatment-plant.asp.
[2]. R.D. Aga Research, Technology and Innovation Centre, Thermax Ltd., Pune, India
[3]. Environmental Engineering Laboratory, Department of Civil Engineering, Pondicherry Engineering College, Pondicherry, India
[4]. Chemical Engineering and Process Development Division, CSIR-National Chemical Laboratory, Pune, India
[5]. Department of Chemical Engineering, National Institute of Technology, Warangal, Andhra Pradesh, India