

Characteristics of Leachate from Municipal Solid waste Land filling Site of Kalaburgi

Shilpa¹, Dr. Shashikanth R. Mise²

P.G. Student, Department of Environmental Engineering, PDA Engineering College, Kalburgi, Karnataka, India¹

Professor, Department of Environmental Engineering, PDA Engineering College, Kalburgi, Karnataka, India²

ABSTRACT: This work focuses on monitoring the general characteristics of leachate under controlled conditions. The paper leachate is taken from municipal solid waste disposal site in Gulbarga. Leachate samples were collected and analysed for various physico-chemical parameters such as pH, Total solids, Suspended solids, total dissolved solids, Total hardness, Chloride, Chemical oxygen demand, Biochemical oxygen demand, Nitrate, Sulphate, Phosphate, Iron, Lead, Copper, Nickel to estimate its pollution potential.

KEYWORDS: Land filling, Leachate, Organic and inorganic constituents.

I. INTRODUCTION

With the rapid industrialization and population growth, the status of our environment is degrading day by day. As the limits of urbanization are extending to far flying areas in India, the problem of solid waste management is causing a great concern to our environment. MSW generation, in terms of kg/capita/day, has shown a positive correlation with economic development at world scale. Due to rapid industrial growth and migration of people from villages to cities, the urban population is increasing rapidly. Waste generation has been observed to increase annually in proportion to the rise in population and urbanization. The per capita generation of MSW has also increased tremendously with improved life style and social status of the population in urban centers. As more land is needed for the ultimate disposal of these solid wastes, issues related to disposal have become highly challenging. Seeing this scenario of increase in generation, improper utilization and disposal of waste in the country, the Ministry Of Environment And Forest (MOEF) has municipal solid waste rules 2000, which states that municipal solid waste is commercial and residential wastes generated in a municipal or notified areas in either solid or semi solid form, excluding industrial hazardous wastes but including treated bio medical waste. These solid wastes are generally disposed of in low laying area called sanitary landfill area by the municipal authorities. These rules have specified many complains for the management of solid waste for the state committee and pollution board, which includes proper segregation of solid waste into biodegradable waste, recyclable and others that is non recyclable wastes are stored in colored bins at the source of generation and properly treated, recycled and disposed to landfill areas.

A. SOURCE OF LEACHATE: Leachate generation processes is as shown in Figure-1

- Precipitation falls on landfill and some of it becomes runoff.
- Some of the precipitation infiltrates the surface.
- Some of infiltrates evaporates from the surface and transpires through the vegetative cover if its exits.
- The remainder of the infiltration, remaining after evaporation, and the storage water moves downward was forming percolate arid which eventually becomes Leachate as it reaches the base of the landfill.

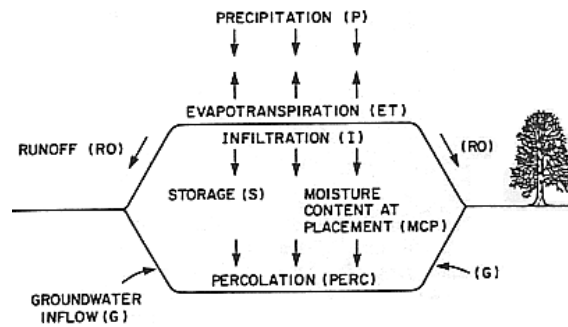


Fig.1: Leachate generation process

II. METHODOLOGY

The study was conducted under ambient environmental conditions. Grab sampling method was used while sampling. Characteristics were tested as per methods prescribed by central pollution control board (CPCB) for the examination of water and wastewater (21st edition 2012). The characteristics of the Leachate such as pH, Total solids, Suspended solids, total dissolved solids, Total hardness, Chloride, Chemical oxygen demand, Biochemical oxygen demand, Nitrate, Sulphate, Phosphate, Iron, Lead, Copper, Nickel had been analyzed. The Characteristics of both the Leachate are conducted at ambient temperature the results obtained during the study are presented in Table-1.

Table 1: Characteristics of Leachate

SI NO	Properties	Leachate
1	pH	7.4
2	TS(mg/L)	8490
3	SS(mg/L)	1990
4	TDS(mg/L)	6250
5	TH(mg/L)	2936
6	Chloride(mg/L)	1613
7	COD(mg/L)	16248
8	BOD(mg/L)	9748
9	Nitrate(mg/L)	14.2
10	Sulphate(mg/L)	31
11	Phosphate(mg/L)	42
12	Iron(mg/L)	4.82
13	Lead(mg/L)	0.1
14	Copper(mg/L)	0
15	Nickel(mg/L)	5.2
16	BOD/COD	0.63

III. EXPERIMENTAL RESULTS

Leachate had black color respectively so while discharging treatment required removing colour. Leachate characterized higher BOD₅ 9748mg/L. COD of leachate is 16248 mg/L. pH value of leachate is 7.4 indicates basic in nature. Nitrate of leachate is 14.2mg/L respectively. Total Solids of leachate is 8490mg/L. Suspended solids of leachate is 1990mg/L. Total dissolved solid of leachate is 6250mg/L. Chloride of Leachate is 1613mg/L. phosphate of leachate is 42mg/L, Sulphate of leachate is 31 mg/L. Iron content of leachate is 4.82mg/L. Lead of leachate is 0.1, copper of leachate is 0. Nickel of leachate is 5.2mg/L. and Leachate had BOD₅/COD ratio 0.63. It indicates this Leachate can be treated by biological treatment.

IV. CONCLUSION

- 1] The concentration of heavy metals is high in leachate sample and the leachate contains more contaminants than domestic waste water and thus needs efficient treatment process before disposal.
- 2] Leachate samples of landfilling sites were collected and analyzed for various physico-chemical parameters to estimate its pollution potential. It has been concluded that leachate samples contain high concentration of organic and inorganic constituents.
- 3] Leachate is basic in nature. Leachate can be treated biologically as BOD/COD ratio is greater than 0.63.

REFERENCES

- 1] Abhinav Krishna Singh “Characterization of Leachate from Municipal Solid Waste (MSW) Land filling Sites of Kuberpur, Agra” GRD Journals- Global Research and Development Journal for Engineering , Volume 2, Issue 6, ISSN: 2455-5703, May 2017, pp:233-236.
- 2] Barjinder Bhalla, M.S. Saini, M.K. Jha “Characterization of Leachate from Municipal Solid Waste (MSW) Landfilling Sites of Ludhiana, India: A Comparative Study” International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622 www.ijera.com Vol. 2, Issue 6, November- December 2012, pp.732-745
- 3] Caturwati Ni Ketuta, Agung Sudrajada, Mekro Permana, and Heri Haryantob “Experimental Study of Anaerobic Digester Biogas Method Using Leachate from Landfill Municipal Waste” International Journal of Applied Engineering Research ISSN 0973-4562 Volume 12, Number 19 (2017) pp. 9112-9115
- 4] The environment (protection) rules, 1986 ministry of environment and forests.