



THE CRITICAL ANALYSIS OF SEWAGE WATER OF CHITRADURGA CITY- SPECIAL REFERENCE TO JCR EXTENTION AND MALLAPURA TANK

H.M.MANJUNATHA SWAMY, M.Sc, M.Phil

*Assistant Professor, Department of Chemistry, S.J.M. Arts, Science & Commerce College
Chandravalli, Chitradurga-577501 Karnataka*

Abstract

Chitradurga features bold rock hills and picturesque valleys, huge towering boulders in numerous shapes. It is known as the "stone fortress" (*Kallina Kote*). According to the epic Mahabharata, It is confirmed about this story that a man eating Rakshasa named Hidimba and his sister Hidimbi lived on the hill. Hidimba was a source of terror to everyone around while Hidimbi was a peace-loving rakshasa. When the Pandavas came with their mother Kunti in the course of their exile, Bhima had a duel with Hidimba in which Hidimba was killed. **Sewage** (or **domestic wastewater** or **municipal wastewater**) is a type of wastewater that is produced by a community of people. It is characterized by volume or rate of flow, physical condition, chemical and toxic constituents, and its bacteriologic status (which organisms it contains and in what quantities). Rain water flows from surrounding hills (Chinmuladri hills) collect at Gopalaswamy honda in front of Palace area, and then in a cascading manner flows to Akka-Thangi honda, and finally to Santhehonda which is at the centre of Chitradurga city. There are many interconnecting ponds which are not mentioned here.

Key Words;- *Sewage water, JCR extention, Mallapura, tank, plantation, waste, dumping, millennium litters per day, flowing*

INTRODUCTION

Chitradurga features bold rock hills and picturesque valleys, huge towering boulders in numerous shapes. It is known as the "**stone fortress**" (*Kallina Kote*). According to the epic Mahabharata,

It is confirmed about this story that a man-eating Rakshasa named Hidimba and his sister Hidimbi lived on the hill. Hidimba was a source of terror to everyone around while Hidimbi was a peace-loving rakshasa. When the Pandavas came with their mother Kunti in the course of their exile, Bhima had a duel with Hidimba in which Hidimba was killed. Thereafter Bhima married Hidimbi and they had a son named Ghatotkacha who had magical powers. Legend has it the boulders were part of the arsenal used during that duel. In fact, the boulders on which major part of the city rests belong to the oldest rock formation in the country.

Timmana Nayaka, a chieftain under the Vijayanagar Empire, rose to the rank of governor of Chitradurga as a reward from the Vijayanagara ruler, for his excellence in military services,. This was the beginning of the rule of the Nayakas of Chitradurga. His son Obana Nayaka is known by the name Madakari Nayaka (1588 CE). Madakari Nayaka's son Kasturi Rangappa (1602) succeeded him and consolidated the kingdom to rule peacefully. As he had no heirs to succeed him, his adopted son, the apparent heir was enthroned but was killed in few months by the Dalavayis.

Chikkanna Nayaka (1676), the brother of Madakari Nayaka II sat on the throne, and his brother succeeded him with the title Madakari Nayaka III in 1686. The unwillingness of Dalawayis to accept Madakari Nayaka III's rule gave an opportunity to one of their distant relatives, Bharamappa Nayaka to ascend the throne in 1689. He is known as the greatest of the Nayaka rulers. The subjects of Chitradurga did not experience a good reign of the

successive rulers as they ruled on the throne for very brief periods. The Hiri Madakari Nayaka IV (1721), Kasturi Rangappa Nayaka II (1748), Madakari Nayaka V (1758) ruled this area but there is not much to mention of their rule

MEANING

Sewage (or **domestic wastewater** or **municipal wastewater**) is a type of wastewater that is produced by a community of people. It is characterized by volume or rate of flow, physical condition, chemical and toxic constituents, and its bacteriologic status (which organisms it contains and in what quantities). It consists mostly of grey water (from sinks, tubs, showers, dishwashers, and clothes washers), black water (the water used to flush toilets, combined with the human waste that it flushes away); soaps and detergents; and toilet paper (less so in regions where bidets are widely used instead of paper).

Sewage usually travels from a building's plumbing either into a sewer, which will carry it elsewhere, or into an onsite sewage facility (of which there are many kinds). Whether it is combined with surface runoff in the sewer depends on the sewer design (sanitary sewer or combined sewer). The reality is that most wastewater produced globally remains untreated causing widespread water pollution, especially in low-income countries: A global estimate by UNDP and UN-Habitat is that 90% of all wastewater generated is released into the environment untreated. In many developing countries the bulk of domestic and industrial wastewater is discharged without any treatment or after primary treatment only.

The term sewage is nowadays regarded as an older term and is being more and more replaced by "**wastewater**". In general American English usage, the terms "sewage" and "**sewerage**" mean the same thing. In common British usage, and in American technical and professional English usage, "**sewerage**" refers to the infrastructure that conveys sewage.

Chitradurga, known for its famous picturesque fort, is located on the valley of the **Vedavati river in Karnataka**. It is located about 200 km from the state capital Bengaluru.

The impregnable Chitradurga fort has an outstanding rain water harvesting mechanism which is still function. Rain water-harvesting structures were built in a cascading fashion, which ensured large storage of water in interconnected reservoirs. It is said that the fort precincts never faced any water shortage.



Characteristics of Wastewater

The three main characteristics of wastewater are classified below.

1. Physical Characteristics

- Turbidity
- Color
- Odor
- Total solids
- Temperature

2. Chemical Characteristics due to Chemical Impurities

- Chemical Oxygen Demand (COD)
- Total Organic Carbon (TOC)
- Nitrogen
- Phosphorus
- Chlorides
- Sulfates
- Alkalinity

- pH
- Heavy Metals
- Trace Elements
- Priority Pollutants

3. Biological Characteristics due to Contaminants

- Biochemical Oxygen Demand (BOD)
- Oxygen required for nitrification
- Microbial population

Wastewater characteristics, as well as water treatment processes, are important for environmental engineers to understand. Our FE Environmental exam review course thoroughly reviews the characteristics of wastewater.

Physical Characteristics of Wastewater

- **Color** - Fresh sewage is normally brown and yellowish in color but over time becomes black in color.
- **Odor** - Wastewater that includes sewage typically develops a strong odor.
- **Temperature** - Due to more biological activity, wastewater will have a higher temperature.
- **Turbidity** - Due to suspended solids in wastewater, wastewater will have a higher turbidity, or cloudiness.

Chemical Characteristics of Wastewater

- ❖ Wastewater contains different chemicals in various forms as mentioned below.
- ❖ Chemical Oxygen Demand (COD) - COD is a measure of organic materials in wastewater in terms of the oxygen required to oxidize the organic materials.
- ❖ Total Organic Carbon (TOC) - TOC is a measure of carbon within organic materials.
- ❖ Nitrogen - Organic nitrogen is the amount of nitrogen present in organic compounds.
- ❖ Phosphorous - Organic phosphorous (in protein) and inorganic phosphorous (phosphates, PO₄⁻)
- Chlorides (Cl⁻) · Sulfates (SO₄⁻²) · Heavy metals
 - Mercury (Hg)
 - Arsenic (As)
 - Lead (Pb)
 - Zinc (Zn)
 - Cadmium (Cd)
 - Copper (Cu)
 - Nickel (Ni)
 - Chromium (Cr)

Analyzing the physical and chemical characteristics of wastewater plays a critical role in the wastewater treatment process. Our FE Environmental review course greatly emphasizes wastewater treatment methods based on the physical and chemical characteristics of the water.

Biological Characteristics of Wastewater

Biochemical Oxygen Demand (BOD) - BOD is the amount of oxygen needed to stabilize organic matter using microorganisms.

Nitrogenous Oxygen Demand (NOD) - NOD is the amount of oxygen needed to convert organic and ammonia nitrogen into nitrates by nitrifying bacteria.

Microbial life in wastewater - Wastewater contains the following microbes:

- Bacteria
- Protozoa
- Fungi
- Viruses
- Algae
- Rotifers

➤ Nematodes

· Oil and Grease - Oil and grease originate from food waste and petroleum products. The amount of oil and grease in raw wastewater varies from 10 to 109 mg/L.

It is important that those who are striving to obtain their FE certification fully understand how to regulate the biological characteristics of wastewater through appropriate treatment methods.

Critical Analysis

Rain water flows from surrounding hills (Chinmuladri hills) collect at Gopaldaswamy honda in front of Palace area, and then in a cascading manner flows to Akka-Thangi honda, and finally to Santhehonda which is at the centre of Chitradurga city. There are many interconnecting ponds which are not mentioned here.

The point here is, Chitradurga fort, with roughly annual rainfall of < 60cms and during 12 years of successive drought, didnt suffer from water shortage during 17-19th century when this rain water harvesting system was functional. (couldnt find citation)

Chitradurga as well as many districts in Karnataka have many small ponds throughout their district. Almost every village has a pond. Shanthi sagara near Davanagere-Channagiri is one of the largest lakes in Asia. Ponds/lakes were a sheer necessity then for the people and those have served people by providing enough water for drinking, cleaning and for agriculture etc.

After that, as population grew and ponds neglected to rot, Chitradurga suffered from water scarcity badly. People started depending on groundwater for drinking and tank water supply was a necessity sometimes. Even Municipal administration was clueless about drinking water issue.

This became a hindrance for development of this semi-urban town. Davangere which was a Taluk under Chitradurga grew lot faster as it had a good water supply system, sourced from Shanthi Sagara and Kunduvada kere, both are near to the Davangere town and became a separate district. Now it has gone far ahead of Chitradurga.

Drinking water problem was resolved finally when the Shanthi sagara was used to supply water to Chitradurga too. People of durga, who were highly dependent on hard ground water could finally taste sweet soft water after decades. Now, this is not the end.

Why did Chitradurga's people suffer for so long?

We will get the answer if you see the conditions of local ponds/lakes.

Rain water harvesting system of the fort is filthy now, though I think it can be revived. The google map image shows many ponds/lakes around Chitradurga. One of them is Mallapura TANK near Pillekarenahalli.

Heavy rain, accompanied by gusty winds, lashed all the six taluks of Chitradurga district. Owing to blocks in the storm-water drains, rainwater accumulated on roads and low-lying areas causing severe inconvenience to people on JCR Extention, Stadium Road, Yallamma Devi temple, Jogmatti Road, Saraswathipur and Kelagote.

It started raining at around 7.45 p.m. on Friday continued till 4 a.m. on Saturday in all the six taluks of the district. Almost all water sources in the district, including Gayatri Reservoir, Chandravalli tank, Mallapur tank, tanks on either side of the Burhanmutt and Kathral tank are full.

Almost all roads in the city have been suffered damage owing to heavy rainfall. local MLA visited various affected areas on Saturday afternoon and said that suitable compensation would be provided to the affected people in the city.





This particular lake is the largest one near the town with circumference of around 3kms. It has the potential to meet the needs of a major part of population without compromising on its ecological function and fishermen. With the presence of birds and by its location which is 1-2 kms from the town, it can be used for aesthetic purposes also. If boating is allowed, local people can earn their livelihood and public too can spend their time aesthetically.

But right now, it is left to rot. This picture of lake is nothing when compared to Sewage Rivers of Mumbai, Chennai, Bengaluru, Delhi. Yamuna river has been converted to sewage river. Mallapura tank is just a microcosmic picture of the macrocosmic problem.

Water bodies have self cleansing capacity. But for that, large amount of water must be present in the water body relative to amount of sewage and flowing. But since most of the sewage water of Chitradurga goes to this lake, gradually pollution picture is increasing (according to locals). Pollution control board officials and Municipalities are not concerned and they casually say, there is no other way. In turn they ask where they should let sewage then. That is true. They are helpless and people too.

The larger picture as shown by Central Pollution Control Board report in 2005 is as follows. "In India, all Class I cities and Class II towns together generate an estimated 29129 MLD (million liters per day) sewage. Against this, installed sewage treatment capacity is only 6190 MLD. There remains a gap of 22939 MLD between sewage generation and installed capacity"

The solution is to connect all sewage systems to underground drainage (UGD) in all towns and cities and connect them to a sewage treatment plant. The treated water can be reused again or supplied for agriculture.

CPCB report says, "With the increasing population as well as all round development in the country, the competing demand for water for irrigation, domestic use and power generation sectors are exerting enormous pressure on our water resources as utilization of water has also been consequently increasing at a fast pace. In 1951, the actual utilization of surface and ground water was about 20% and 10%, respectively, of the utilizable potential. In 1997 – 1998, the utilization of surface and ground water increased to about 57.8% (329 bcm) and about 53.2% (230 bcm), respectively, of the utilizable potential. The precarious balance between growing demands and supplies brings forth the importance of recycling and reuse of water so that same water can be used for multiple uses one after the other thereby reducing demand for fresh supplies"

"Disposal of about 29000 MLD domestic sewage from cities and towns is the biggest source of pollution of water bodies in India. A large number of rivers stretches are severely polluted as a result of discharge of domestic sewage. Treatment of domestic sewage and subsequent utilization of treated sewage for irrigation can prevent pollution of water bodies, reduce the demand for fresh water in irrigation sector and result in huge savings in terms of nutritional value of sewage in irrigation." It is another important task to connect ALL UGD pipelines to sewage treatment plants (STP) and make sure no water goes to water bodies untreated, which is not at all done in India. In Delhi there are many STPs constructed but no sewage goes there for treatment and instead let into Yamuna river. (Why do they do like this, I can't understand.)

After all rivers are contaminated/ polluted, then they bring out projects like Ganga Action Plan/Yamuna Action Plan which involves thousands of crores and without any substantial improvement in the condition of water bodies.

Interpreter linking projects to fulfill water needs, or water lifting projects or groundwater are not the solutions for safeguarding future water needs. Groundwater aquifers are either getting empty without sufficient recharge or already polluted with Arsenic, fluoride and even Uranium in some parts of the country.

It is not just the question of available safe drinking water and for other uses but also question of health. Sanitation is the most important determinant of health. With open drainages and polluted water bodies in our neighbourhoods, people are threatened with diseases. It affects right to health, right to access to safe drinking water and ultimately right to life itself which is guaranteed under the Article 21 of Indian constitution.

Water security will depend heavily on how sustainably we use our local surface water sources. Our people should be aware of this inevitable situation and become as wise as our ancestors who constructively built the rain water harvesting systems of Chitradurga fort as well as those who built a pond in almost every village and protected those. We (people and the state) just have to revive it and protect it before things go out of hand. Our past should be guiding our future.

Suggestions

Sewage Water Treatment Plant (Waste Management) providers in Chitradurga. Get your life back on track in no time so you can continue focus on the important things. Here are a few reasons to use QuikrEasy to connect with Sewage Water Treatment Plant (Waste Management) providers: - A huge selection of top Sewage Water Treatment Plant (Waste Management) service providers in Chitradurga - Connect instantly with Sewage Water Treatment Plant (Waste Management) service providers - Service quotes from various Sewage Water Treatment Plant (Waste Management) providers before choosing one that suits our requirements the best - Avail the best deals within your budget with minimal effort How can helps you by doing away with the need to locating the right technician to address your problem. Our service partners must adhere to certain standards of quality and punctuality. When it comes to Sewage Water Treatment Plant (Waste Management) professionals, fill up the online form with relevant details and we will put you in touch with good Sewage Water Treatment Plant (Waste Management) expert near you from Chitradurga. Then, simply schedule the times and dates as per your convenience. The immense network of service providers on helps you connect with a suitable professional in as little as 15 minutes. You will receive multiple quotes and you can zero in on the right technician after comparing these.

Conclusions

Sewage Water Treatment Plant (Waste Management) providers before choosing one that suits our requirements the best - Avail the best deals within your budget with minimal effort How can helps you by doing away with the need to locating the right technician to address your problem. Our service partners must adhere to certain standards of quality and punctuality. When it comes to Sewage Water Treatment Plant (Waste Management) professionals, fill up the online form with relevant details and we will put you in touch with good Sewage Water Treatment Plant (Waste Management) expert near you from Chitradurga. Then, simply schedule the times and dates as per your convenience. Water security will depend heavily on how sustainably we use our local surface water sources. Our people should be aware of this inevitable situation and become as wise as our ancestors who constructively built the rain water harvesting systems of Chitradurga fort as well as those who built a pond in almost every village and protected those. We (people and the state) just have to revive it and protect it before things go out of hand. Our past should be guiding our future.

References

- **Chitradurga water supply department sources**
- Chitradurga Munipal corporation sources
- Chitradurga Revenue Department sources
- Daily Mgzins
- Chitradurga Zilla panchayath sources
- Mass Media, websites