



# A Novel Consideration Towards Heavy Metals in the Environment

**B J PRAVEENGOUDA**

B.Tech Student

Department of Civil Engineering  
 Guru Nanak Institute of Technology  
 Hyderabad, T.S, India

**G VEERALOKESWARREDDY**

B.Tech Student

Department of Civil Engineering  
 Guru Nanak Institute of Technology  
 Hyderabad, T.S, India

**E MALLIKARJUN**

B.Tech Student

Department of Civil Engineering  
 Guru Nanak Institute of Technology  
 Hyderabad, T.S, India

**A NARESH**

B.Tech Student

Department of Civil Engineering  
 Guru Nanak Institute of Technology  
 Hyderabad, T.S, India

**N NARESH**

Assistant Professor

Department of Civil Engineering  
 Guru Nanak Institute of Technology  
 Hyderabad, T.S, India

**Abstract:** For the past few years, there was an increased global concern on public health impacts attributed to environmental pollution. In the recent times, concentration was focused mostly on declining of atmospheric ozone layer as well as environmental pollution. Improper managing of solid waste is one of the most important reasons of environmental pollution as well as degradation in most of the places. Heavy metals are natural components of Earth's crust which cannot be destroyed and these are found from anthropogenic source. Hence, heavy metals when not checked properly might lead to most important health problems. In high quantities, these metals are extremely toxic for human. In our work we therefore aim at evaluation of implication of heavy metals on groundwater.

**Keywords:** Environmental pollution, Heavy metals, Groundwater, Humans, Toxic, Ozone layer, Solid waste, Degradation.

## INTRODUCTION

Heavy metal refers to any of the metallic chemical element that contains a comparatively high density and is toxic at small concentrations. To a little point they enter human bodies by means of food, drinking water and air. Some of the heavy metals as trace elements are necessary to keep up the human body metabolism [1]. On the other hand, at high concentrations they may lead to poisoning. Heavy metals are hazardous since they have a tendency to bio-accumulate that is an increase in a chemical concentration within a biological organism over time, when compared to concentration of chemical within the environment. Heavy metal pollution is a difficulty connected with areas of severe industry, areas of dumpsites as well as automobiles and uncontrolled discharge of these into environment has caused danger to man and other life forms and moreover to the environment itself. Some of the examples of heavy metals comprise mercury, lead, arsenic, thallium, chromium and cadmium. Arsenic, cadmium along with lead might be present in the toys of children at levels that go beyond regulatory standards. Lead is used within toys as a stabilizer, colour enhancer, or else anti-corrosive agent. Cadmium is occasionally employed as a stabilizer [2]. Arsenic is used with colouring dyes. Lead is the most common heavy metal contaminant, and it gradually collects at contaminating local environment and revealing range employees to a danger of lead poisoning.

## AN OVERVIEW OF COLLECTION AND PRESERVATION OF SAMPLES

Sampling process collects representative sample by a sample in which relative proportions of the entire applicable components are the same as in material being sampled. Due to the increasing placed on verifying accurateness of data, better importance is placed on appropriate sample collection, tracking, as well as preservation techniques. Laboratory personnel assist in planning of a sampling program; in discussing with the user of test results. The methods of sampling are Manual sampling: which involves minimum equipment but may be unduly expensive and lengthy for large-scale sampling programs. It needs trained field technicians and is frequently essential for regulatory as well as research study for which important assessment of field conditions as well as complex sample collection methods are necessary. Manually gather assured samples, such as waters containing oil as well as grease. Automatic sampling: In these process, automatic samplers removes human errors within manual sampling, and decreases labour costs, provides means for more regular sampling. Sorbent sampling: In this method, usage of solid sorbents, mainly membrane-type disks, is frequently used. These provide advantages of speedy and reasonably priced sampling when analytes of interest are adsorbed as well as desorbed resourcefully and water matrix is with no particulates that plug sorbent. For minimizing potential for volatilization or else biodegradation

between sampling as well as analysis, maintain samples as cool as feasible with no freezing. Avoid usage of dry ice since it will freeze samples and might cause breaking of glass containers. One of the most essential features of analysis is preparation of reagent water used for dilution of reagents as well as for blank analysis. Reagent water is with no visible concentration of compound to be analyzed at detection level of analytical technique. Any technique of preparation of reagent water is satisfactory provided that requisite quality should be met. Numerous guidelines in support of reagent water quality, based on contaminant levels, are obtainable, but final test is suitability for the analysis. Inappropriately maintained systems might include contaminants. Colour method is useful within field by means of comparing colour of sample by means of a comparator [3][4]. Colour is separated to make water appropriate for general as well as industrial applications. Measurement of pH is important used tests, as each phase of water and waste quality managing is pH dependent. Solids might have an effect on water or effluent quality negatively in several ways. Analysis of total solids is significant to make a decision upon a variety of unit operations in physical as well as biological wastewater treatment.

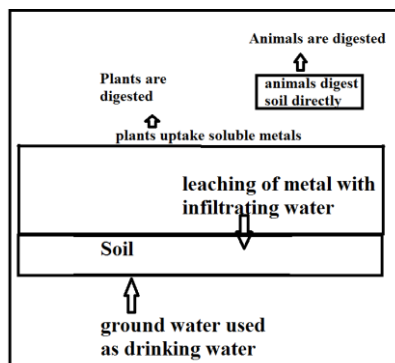


Fig1: An overview of heavy metal cycle

### METHODOLOGY OF GROUND WATER TREATMENTS

Various works in literatures sort out heavy metals contamination of ground water were considered. Contamination assessment has revealed heavy metals to be tremendously contaminated within groundwater. These metals enter water supply by means of industrial as well as consumer waste and releases heavy metals into streams, lakes as well as groundwater. These metals are found within earth, and become concentrated due to the activities caused by humans. These are dangerous since they have a tendency to bio-accumulate that is an increase in a chemical concentration within a biological organism over time, when compared to concentration of chemical within environment. Groundwater is underground water that occurs within saturated zone of earth surface. This water is

utilized all the way through wells as well as tube wells. Cracks as well as pores in existing rocks will make the ground water reservoir. Groundwater remediation process removes pollution from groundwater. Contaminants and pollutants are removed from groundwater by means of application of a variety of techniques thus making groundwater safe for usage. Methods of groundwater remediation are mostly categorized as two technologies such as: Ex-Situ Technology: which involves treating of groundwater by means of de-watering the polluted aquifer, subsequently treating water on surface by means of Physical, chemical or else biological technology and finally re-injection of treated water to aquifer. In-Situ Technology involving treatment of groundwater within aquifer by means of usage of thermal, chemical as well as biological treatment knowledge. The various methods of Groundwater treatment include rain garden method for the process of recharging ground water: It is considered to hold rain water overflow from roof tops or else lawns. This method filters out pollutants. Each time it rains, water runs off water-resistant surfaces. Rain gardens gather rainwater excess, allowing water to be filtered by means of vegetation and penetrate into soil boosting groundwater aquifers. Phyto-remediation process for recharging of Ground water: Cultivation of trees improves water quality and moreover raises ground water table. They eliminate, remove and wipe out contaminants that are present within soil as well as in ground water. This process of cleaning pollution of ground water and maintaining water table as well as soil contaminants by means of various plants species is low cost, environmentally effective for an extensive range of chemicals. Resources of ground water have to be recharged synthetically, but resourcefully. People have to be appropriately educated in various methods of harnessing, preserving and cleaning ground water resources. If water resources are not preserved correctly and come under danger, then the total planet as well as its biodiversity will be threatened. Artificial recharge process by Injection Well technique: Injection wells are related structures to a tube well but with the purpose of enhancing ground water storage of restricted aquifer by means of pumping in water of treated surface under pressure. Here water is directed directly into depleted aquifers and hence this technique is effective since the recharge of ground water is immediate as well as there is no water loss due to evaporation. In both of the above techniques ground water purity is assured.

### CONCLUSIONS AND FUTURE WORKS

Groundwater is underground water that occurs within saturated zone of earth surface. Contaminants of groundwater are of industrial and

sewage origin. Inappropriate managing of solid waste is one of the most important reasons of environmental pollution as well as degradation in most of the places. The chemical pollutants which are released from industries have to be treated appropriately prior to disposing it to the land or else water bodies. The chemical pollutants when not checked properly might lead to most important health problems and in high quantities, these metals are extremely toxic for human and other life forms and moreover to the environment itself. Excess usage of harmful chemicals must to be replaced by other chemicals. Programs of Environmental Awareness that includes groundwater prevention have to be put into practice for Community. Innovative methods are obtainable for groundwater remediation, for quite a lot of general contaminants.

### REFERENCES

- [1] Abdullahi, K. and Rooye (1972): Heavy Metal Contamination of Rivers. Bulletin Geology, vol.22 (1 and 2)
- [2] Nowierski, M.; Dixon, D. G.; Borgmann, U., (2006). Lac Dufault sediment core trace metal distribution, bioavailability and toxicity to *Hyalella azteca*. Environ. Pollut.,
- [3] W. H. O (World health organization) (1993). Guidelines for drinking water quality 2nd edition, Vol. 1, Recommendations.
- [4] Zurbrugg C, SANDEC, EAWAG (2003). Solid Waste Management in Developing Countries, SWM introductory text on [www.sanicon.net](http://www.sanicon.net)

### AUTHORS PROFILE

**B J Praveen Gouda** was born on 1992 at **Rangareddy** district, telengana. He is pursuing his Bachelor of Technology degree in Civil Engineering from Guru Nanak Institute of Technology, Jawaharlal Nehru Technological University Hyderabad. At present he is Final year student in civil department from Guru Nanak Institute of Technology, JNTU Hyderabad



**G VEERALOKESWAR REDDY** was born on 1995 at **kadapa** district, Andhra Pradesh. He is pursuing his Bachelor of Technology degree in Civil Engineering from Guru Nanak Institute of Technology, Jawaharlal Nehru Technological University Hyderabad. At present he is Final year student in civil department from Guru Nanak Institute of Technology, JNTU Hyderabad



**Embadi mallikarjun** was born on 1994 at **Rangareddy** district, telengana. He is pursuing his Bachelor of Technology degree in Civil Engineering from Guru Nanak Institute of Technology, Jawaharlal Nehru Technological University Hyderabad. At present he is Final year student in civil department from Guru Nanak Institute of Technology, JNTU Hyderabad



**Atheni Naresh** was born on 1995 at **vemulawada** district, telengana. He is pursuing his Bachelor of Technology degree in Civil Engineering from Guru Nanak Institute of Technology, Jawaharlal Nehru Technological University Hyderabad. At present he is Final year student in civil department from Guru Nanak Institute of Technology, JNTU Hyderabad



**AST PROF. N NARESH** received his master degree in environment management from JNTUH in 2011. He joined Gurunanak Institute of Technology as a ast Professor 2012. He is guiding B.tech environment Engineering. He has papers published in National Conferences and International Journals.

