

Heavy Metals in Ground Water Analysis of Hyderabad Industrial Area

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Abstract

In current years, the brand new environmental trouble are bobbing up because of business danger wastage, worldwide weather change, floor water infection and etc., offers an interest to guard environment. One of the most important supply of infection of floor water is incorrect discharge of business effluents those effluents incorporates such a lot of heavy metals which can be motive extra consequences the human life. The gift look at approximately infection of floor water because of hint metals in and across the Hyderabad. 60 samples are amassed business region across the Hyderabad. The look at region divided into 5 zones relying on the character of industries are gift within side the look at region .The following hint metals are analysed Al, As, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Ni, Se, and Zn had been analysed in all of the pattern. In a few floor water pattern are observed to be extra attention of metals are exceeds most limits values of WHO, ISI standards.

Keywords: Trace Analysis, Heavy metals, Ground water, Industrial

Introduction:

Water is the essential aid which impacts the human existence. Generally water acquired from sorts of herbal resets floor water (lakes, ponds, rivers, streams etc.) and floor water (bore holes and properly water). Water performs an essential function domestic, business supply, irrigation in all around the world. But growth of populace, industrialization and urbanization are reasons infection of floor water. The infection floor water isn't always smooth to restore. Hence it's far vital to guard best of floor water. According to WHO 80% of illnesses are arises because of infection floor water¹. As the floor water flows from recharge location to discharge location the floor water best will lower because of chemical reactions. heavy steel are essential environmental pollution which accelerated with the aid of using human sports like mining, discharging business effluents containing metals without giving any remedy from industries like metal flowers, battery, thermal energy flowers and over utilization of fertilizers containing heavy metals in agriculture are the principle cause to infect the floor water ². In the arena business, agriculture, and municipal sports are consequences floor water infection. Specially the hint steel infection in floor water indicates severe fitness troubles ³. Generally metals consisting of copper, iron, manganese, zinc and cobalt are crucial however growing concentrations reasons the extreme fitness problems. The strains of steel

ions play an essential function in human existence a few those are very poisonous consisting of Fe, Ni, Pb which impacts the primary fearful system. Further greater diverse techniques are used to evaluate the end result after the evaluation completed at the attention metals statistics. Variogram is used to separation of statistics depend on the attention of heavy steel to the geology and land use location 4. The disparity of attention of heavy metals five. Gives so as course on environment evaluation. the goal of this look at is 1) to assess the dissolved heavy metals within side the floor water 6 2) to offer tremendous relationships among hint metals. 3) to offer right steering to manipulate pollution. Study Area Hyderabad is the one of the principal metropolis in Telangana. The metropolis placed at 16.52° North Latitude 80.62° East Longitude. And it's far gift at forty five ft above the ocean level. The metropolis carries with a place of 281.88 km². The metropolis municipal limits have a populace of 1,048,240 (2012 Census), even as the populace of the metropolitan location is 1,491,202. The topography is maximum essential to the geography of the Hyderabad. The look at location marked with small and medium sized hill rocks with undeniable land among them Krishna river is the dominant a part of the look at location and additionally it carries the charter of Japanese Ghats chain, those Ghats are have low elevation in comparison with relaxation of the Ghats. The Musiriver runs at some stage in the metropolis. Hyderabad is well-known for agro industries, car constructing units, hardware, textile, chemical and energy flowers are the principal industries. The metropolis has properly ready business estates Kranthi Nagar and Nacharam. The waste substances that are coming from those industries are principal supply of infection of the floor water⁷. Hyderabad metropolis. The recharging of floor water in look at location is because of Musiriver . The Musiriver passing from the south aspect and from the north east of the look at location. The look at location discover at north east aspect south west and north west aspect Hyderabad metropolis. Materials and Methods the floor water samples are accrued from the bore wells withinside the look at location the sampling area are given in desk 1 . The samples are accrued in HDPE bottles. The bottles are pre washed with laboratory detergent and rinsed with de ionized water. Two samples are accrued in every area. The samples are dealt with with 1.5 ml of nitric acid. The samples are saved at 4°C till evaluation is done. The general steel attention of aluminum, cadmium, copper, chromium, iron, lead, manganese, mercury, lead, nickel, selenium, silver and zinc withinside the filtered and digestive samples⁸ are decided in ppm with the aid of using the usage of Atomic Absorption Spectrophotometer (AAS, Shimadzu AA-6300). Analysis changed into completed in triplicate and common values are reported. The AAS changed into calibrated with applicable Shimadzu AAS spectroscopic grade standards. Flame atomic absorption spectrophotometer.

Experimental:

Aluminum:

Aluminum is the 0.33 maximum considerable detail withinside the earth crust. Aluminum is the maximum considerable metallic and the 0.33 maximum considerable detail withinside the earth's crust, it gift 8.8% with the aid of using weight. It is determined in Free State. It enters into surroundings from the rocks and minerals, waste water effluents and strong waste of industries and human activities⁹. We aren't determined any exceed stage of aluminum in our

samples in line with WHO and ISO standards. Arsenic is clearly taking place detail. It is Odourless and tasteless. It is to be had in inorganic shape in withinside the surroundings. It enters into floor water thru underground rocks, soil and commercial human activities. Increase awareness of arsenic can motive troubles to the pores and skin, circulatory and fearful system. If the arsenic shares in human frame reasons the most cancers, neural disorders. Daily intake of water with extra than 0.01 mg/l of arsenic, much less than 0.2 % of the deadly dose, can on long time cause troubles with the pores and skin in addition to circulatory and fearful systems. If arsenic builds up withinside the human frame, open lesions, organ¹⁰ The most proper awareness of arsenic in ingesting water endorsed with the aid of using the World Health Organization is 10µg/l In our look at not one of the pattern are exceeds the WHO and ISO standards.

Cadmium:

Cadmium is the only maximum usually determined metallic. It determined with zinc, carbonate and sulphide ore. It is likewise determined as a by product withinside the refining of different metals. it input into floor water with the aid of using special reassets One supply is ingestion of grown foodstuffs, particularly grain and leafy vegetables, which with no trouble soak up cadmium from the soil. The cadmium might also additionally arise in groundwater clearly or as a contaminant from sewage sludge, fertilizers, polluted groundwater or mining and commercial effluents¹¹ Increase of Cd can be modifications the pH of the water. Cadmium may be found in groundwater from a extensive style of reassets in the environment and from industry. In our gift look at all samples are exceeding the WHO standards.

Chromium :

Chromium is one of the heavy metallic found in nature however it happens in most effective in mixed state. It exists as trivalent and hexavalent states. Trace quantity of Chromium compound are found in water. It discharged into groundwater or floor water thru metallic refinery industries and alloy industries. Hexavalent chromium enters into water from commercial waste water that are in particular discharge shape paints and tanning. Trivalent chromium is vital hint detail for human. It performs essential position elimination of glucose from blood with assist of insulin. Chromium trioxide dirt in paintings vicinity might also additionally reasons most cancers and damages the respirational system. Whereas hexavalent chromium¹² is incredibly toxic. It reasons allergic and asthmatic reaction. It is extra carcinogenic than trivalent chromium.

Copper:

Copper is not unusualplace heavy metallic determined in surroundings and unfold thru the herbal phenomenon it's far broadly utilized in industries and agriculture. It input into floor water due commercial wastage comprise copper, agriculture insecticides and launched into ingesting water thru corrosion of copper pipes. It is hint vital detail for human fitness. But huge awareness of copper can motive eminent fitness problem. High tiers of copper in ingesting water¹³has have been determined to motive kidney and liver harm in a few people.

Children beneath Neath three hundred and sixty five days of age are extra touchy to copper as it isn't without problems eliminated from their system. People with liver harm or Wilson's sickness are incredibly at risk of copper toxicity. Our gift look at 10% of the pattern are exceed the most limits of WHO standards.

Iron:

Iron is evidently going on metallic in nature withinside the shape of magnetite hematite etc. It input into water withinside the extraction of metallic from its ore. It additionally input into the water aluminum waste merchandise which can be incorporates iron are discharged into water. Iron critical detail for nutritional requirement for maximum of organisms, and it's miles valuable atom in haemoglobin and useful to move the oxygen in to numerous organs thru the blood. Iron¹⁴ content material withinside the frame exceed and saved in liver, pancreas, and coronary heart, harm those organs. It defects leads anemia. In our gift observe all of the samples are exceeds the max awareness consistent with WHO and ISI standards.

Lead:

Lead is a poisonous metallic which takes place evidently withinside the surroundings. It is used in lots of merchandise determined in and round homes. But the awareness of lead can be will increase because of human sports, it input into surroundings thru the exhaust of cars. It enters into water thru the corrosion of pipes. Small quantities of lead it reasons many fitness problems, in particular withinside the case kids under six-year-vintage are maximum risk. Lead¹⁵ can motive disruption of the biosynthesis of hemoglobin, upward push in blood stress kidney harm etc. In our gift observe all of the samples are exceeds the max awareness in accordance t WHO and ISI standards. Manganese Manganese is one of the maximum ample metals in earth crust it gift withinside the shape of oxides and hydroxides. It is one of the not unusualplace critical hint detail and poisonous. It input into atmosphere. Suspended particulates as a result of commercial emissions, soil erosion, volcanic emissions and the burning human sports also are chargeable for a great deal of the manganese infection in water in a few areas. Manganese¹⁶solids might also additionally shape deposits inside pipes and wreck off as black debris that supply water an unsightly look and taste. And it will increase the boom of undesirable micro organism that shape a slimy coating in water pipes .in our gift observe best samples are exceed the WHO and ISI standards.

Mercury:

Mercury is the liquid metallic. Mercury is a unprecedented detail in Earth crust. It is found in water and soil. It gives in numerous shape they're elemental mercury inorganic mercury and natural mercury. It launched into the surroundings through burning of coal in energy plants, burning risky waste, generating chlorine, breaking mercury merchandise, and spilling mercury flawed remedy and disposal of merchandise waste containing mercury. Ground water infection with Hg from each inactive and lively commercial sodium hydroxide the use of Hg-mobileular era have proven to make a contribution Hg to floor water, soils and groundwater¹⁷. Increase awareness mercury might also additionally motive pores and skin discoloration, swelling and desquamation profuse sweating, tachycar (faster-than-everyday

coronary heart beat), elevated salivation, and excessive blood stress. In kids it outcomes lack of hair tooth and nails transient, hypertonia and kidney etc. In our gift observe not one of the pattern are exceeds the WHO and ISI standard.

Nickel :

Nickel is one of the critical heavy metallic gift withinside the earth crust. It is determined in sand stone and slate, specifically gift as pentIndate, detail accumulates in sediments of organic cycles. It enters into water from energy plants, waste incinerator and metallic industries. It additionally enters thru flawed diffusion of nickel cadmium batteries Nickel compounds can also be determined in sludge, and in slags and fly ashes from waste incinerators. Increased awareness of nickel in floor water¹⁸ nickel is a nutritional detail required for plenty organisms, however growth awareness leads many chance impact like tertogenic and carcinogenic to mammals. In our gift observe not one of the pattern are exceeds WHO and ISI standard.

Selenium:

Selenium is the hint metallic. The predominant reassets of selenium in consuming water are erosion of herbal deposits; discharge from mines and discharge from petroleum and metallic refineries; it's miles an critical nutrient meals fish, birds and animals, and humans. One of the maximum vital capabilities of selenium is the very excessive quantities of selenium are determined to motive toxicity in natural world Increase the awareness selenium¹⁹can motive nausea vomiting, nail change, lack of energy. Hair loss, white horizontal streaking on fingernails, nail inflammation, fatigue, irritability, , garlic breath odor, etc. In our gift observe None of the pattern exceeds the WHO and ISI standards

Zinc:

Zinc is an critical hint metallic. It enters into water on places wherein zinc ore are determined. It is used remedy and prevention of zinc deficiency and its consequences, along with stunted boom and acute diarrhea in kids, and sluggish wound healing. Zinc boosting the immune system, treating the bloodless and recurrent contamination in ear, and stopping decrease respiration infections. It additionally enters into from Industrial wastewaters galvanic industries, battery production, etc., zinc oxide is a constituent of salves, paints and catalysts, and Zinc leaks from zinc pipes and rain pipes, consequential to movement of carbon wealthy water. Increase awareness zinc²⁰ can be reasons the toxicity main to belly aches and vomiting colics, fevers and diarrhea. In our gift observe not one of the pattern are exceeds WHO and BSI standards

Conclusions:

Ground water is the primary supply of consuming water in across the Hyderabad city. Its pleasant is getting destroyed because of discharge of commercial effluents with out right remedy. The city populace is likewise counting on wells, bore wells hand pumps for all their floor water requirements. The out of control utilization of insecticides fertilizers are the

number one reasons of floor water infection. The outcomes of this observe remember the floor water in quarter -1 incorporates excessive tiers of Cd, Cu, Fe and Pb consistent with WHO and ISO standards. In Zone-2 it incorporates Cd, Fe and Pb are above the permissible tiers set through WHO and ISO, on this quarter the excessive awareness of those metals is due energy plants. In quarter -three the water is greater infected on this region Cd, Cr, Cu, Fe, Pb and Ni. In Zone-four Cd, Cr, Cu, Fe, Pb and Mn are above the permissible tiers given through WHO and ISO, the excessive awareness of those metallic is because of electroplating and alloy industries. In quarter-five Cd, Cr, Cu, Fe, and Mn are gift excessive awareness as per WHO and ISO standards. In this study the concentration of following metals are present as follows Al, As, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Ni, Se, and Zn are identified concentrations.

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