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Evaluating salt Concentration and Exiting Sewage Electrical Directing of Isfahan Oil Refinery Company for Application in Green Environment

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ABSTRACT: Irrigation water quality has significant importance in dry region that have high temperature and low humidity. Mechanical properties and physical properties are stability, porous, soil structure and hydraulic directing relative to exchange ion in irrigation. We can control problem due to pollution in environment level and water resources and can increase products performance. Eatable vegetable are in border with respect to consumption process and should be evaluate because of gathering different elements such as heavy metal like sorb, calcium, corm, Niche, Mercury, Arsenic, cobalt. Model output is depending on application method and reuse method of effluent. Also filterable effluent volume, weather situation, cost and investment level and each value are other effective factors. Recommendation are filtration, Earth filter and soon. We can attribute part of filter to irrigation system trend. Also we can avoid of effluent mix apply or effluent alternative application. Najafi (2002) shows that subsurface drop irrigation filtration application has meaningful effect on complementary treatment and effluent pollution load decrease. Capra & Semicolon (2004) present best mods for drop irrigation filtration. The reaction is done until third equation if there are not sulfate-reducing bacteria. Sulfide ions produced strongly affect to anodize and catholic reactions. In this article we are evaluating salt concentration and exiting sewage electrical directing of Isfahan Oil Refinery Company for application in green environment.

KEYWORDS: Industrial Sewage, Sodium Absorption Ratio, Filtration, Exploitation, Environment.

1 INTRODUCTION

EXPLOITATION OF SEWAGE

Sewage origin around large cities are industrial and human-being water in industrial regions Industrial sewage divided to refinery industries, petrochemical industries, food industries, chemical industries, metal industries. Also sewage of other agricultural and activities such as veterinary and slaughter house have high pollution, that should manage properly. Extraction of urban sewage drainage is rich of food elements. That is useful for alkaline soil. Treatment level selection suggested for use of sewage quality correction. In this level we present different levels for use of sewage in agriculture. These levels are first treatment that includes physical treatment, second fast treatment such as active sledge, dropper filter and airing lagan. Slow treatment instead of fast treatment suggested base on situation for earth treatment that is for desert earths. In certain situation we can present higher level of treatment such as reverse osmosis. That is naturally with higher cost and technology. We should present Exploitation method base on treatment sewage quality. Exploitation method include kinds of vegetation, its frequency, hydraulic load level in surface with respect unit with respect to organic load in sewage, cleaning level with respect to mineral level and special ions and fresh water. For compensate dropping oil product quality.

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2 EFFECTIVE FACTORS IN IRRIGATION WATER EVALUATE

Irrigation water quality has significant importance in dry region that have high temperature and low humidity. Mechanical properties and physical properties are stability, porous, soil structure and hydraulic directing relative to exchange ion in irrigation. So we should several factors while we comfort with exploitation of sewage. Also we should attention to stratifying environmental command. Other issue relate to agriculture is solution material effects on vegetable grow. solution salts increase osmosis pressure of soil water and this increase lead to plant energy consumption increase. So we have more respiration and finally decrease their performance. Vegetable are sensitive to active salt in soil water that are effective on osmosis potential. Some ions are useful for vegetation in low concentration [9].

But are toxic in high concentration that can be toxic indirectly with effect on food material absorption and directly by involvement in metabolism A-salt concentration: salts concentration is one of the main parameters for recognizing agricultural water. solution salts in water is relate to soil salt and base on this grow plant affect by performance and quality of products. B-Electrical directing: We use of electrical directing for showing ions in water. Electrical direct is relate to anions and actions of chemical material resolution and is relate to all salts. Electrical direct is in 25˚c and is adjustable with other situation. Ewer shows water electrical direct and Eco is soil saturation extraction electricity and its electrical unit is ds/m and shows salt constituent in irrigation water and Relationship of salt conversion to electrical direct, several researches conducts about salt effects on plant grow [2]. FAO divided plant resistant relatives to saline to 4 categories such as: resistive, semi resistive, sensitive and semi-sensitive. C-Sodium absorption ratio: sodium is unique action because have effects on soil. Exchange sodium can change soil physical-chemical properties and structure. Exchange sodium tend to soil distribution and can decrease water and soil penetration speed. Also this particle distribution can make one shield layer on soil surface and prevent of seeding. Irrigation water considered as one source for increasing soil solution and evaluated for this. Table 1 shows salinity problems and sodium in soil and plant. certain parameter for determining irrigation eater effect on soil exchange sodium increase is sodium absorption ratio parameter or sirs that define as below [1]:

Equation 1:

SAR=Na/√ (ca+mg)/2

In these equation ions concentration is based on meq/l

In addition we could determine irrigation water SAR value. Also we can obtain Exchangeable sodium percent (ESP) in one balance soil with irrigation water [3].

Equation 2:

ESP=y/tlf/if%5 SAR adj

In farm situation ESP value is more than Evaluate value, because in farm situation, salt concentration increase by steam. and SAR value predicted of sodium ion effect equation, Although SAR value change after entering water to soil, But capon concentration change after water to soil in relation to carbonate and B-carbonate onion in irrigation water and Co_2pressure in soil air. Ewer and scat (1989) present SAR for solve this problem that calculates according to equation 3.

Equation 3

SAR adj=SAR in [it (8.4-phc)]

SAR adj=Modified sodium absorption ratio

SAR iw=irrigation sodium absorption ratio

PHC=Calculate from this equation

In equation 3 8.4-phc values consider as saturation index (SI) [5].

This parameter is important in drip irrigation direct situation. And if this value is positive it present carbonates calcium penetration [8].

Table 1. Corrosion of Various Sulfides

Corrosion of Iron Sulfide	Percent Sulfur
1	46
0/3	44
0/2	44
0/12	37
0/07	37

3 US. EPA STANDARD

American environmental organizations present direction for use of affluent. In these direction feces coliform is less than 200 MPN/100ML, BoD5<30 mg/f, TSS<30 mg/l and Acidity between 6to 9 recommended, But in situation that use of affluent in green environment we recommend secondary filter, filtration and qualitative index are rigorous. And they recommend muddy less than NTU2 and clore less than 1 mg/l bus on BOD5<10 mg/l, FC<0, MPN/100ml. It's possible that city center indusustral & agricultural section affluent contain bacterial elements such as coliform and other bacteria and viruses. In addition mineral and organic elements lead to be more toxic elements in affluent. Although, they don't report one global standard for acceptable effluent quality for irrigation, but organizations such as (WHO), world bank, Nations organization environment, and present some biologic parameter for use of affluent. This parameter show that parameter is acceptable for irrigation and filter style. Standards are absent for heavy metal in irrigation water that is based on global business by passcode in 1992 (e.g. [2], [6], [7], [8], [11]).

Iron-Oxidizing Bacteria: These bacteria are usually found in fresh water and salt water occasionally. These bacteria are aerobic and enabling to grow in environment that amount of oxygen is 5/0ppm. They produce large amounts of sludge mass. Iron bacteria, use the iron soluble salts for their growing and deposited unsalable iron compounds as secondary products of metabolism, the reaction is as follows**:**

$$4FeCO_3 + O_2 + 6H_2O \rightarrow 4Fe(OH)_3 + 4CO_2 + 81000 calori$$

These reactions produce more energy and ultimately created a lot of ferric hydroxide which cause to bulk deposition, reduce heat transfer and corrosion such as smallpox. They often find in iron water pipes or wells if these resources are water of cooling tower; they entered to cooling system and can cause a lot of problems. These bacteria are heterotrophic, meaning that they required energy provide from organic sources such as alcohols and organic acids (e.g. [15], [19], [28], [38], [41]).

Pseudomonas type hydrocarbons as an energy source are used. They can because problems include: the electrochemical cell, clogging of pipes and pumps, clogging of injection wells and oil and filter clogging. These bacteria are able to live in salt water. Only one type of bacteria that can grow in aerobic systems, whereas some anaerobic systems can also provide growth and proliferation, which are being Facultative, under of the bulk deposition that produces by Construction sediment bacteria, due to not reach oxygen break the aerobic bacteria. This is a good food source for anaerobic bacteria that reduce sulfate. If there are chloride and bacterial oxidant iron such as gallinsela in system together, they produce FeCl3 ferric chloride is a strong acid that occur frequently will accelerate metal corrosion. Aerobic baggily Bacteria produce sediment. Bacteria and other organisms that are correct shield compared with baggily Bacteria make less sediment. Sheathed bacteria growth that leads to the deposition of high sticky to the surface, especially occurs in the heat transfer and suspended matter in water, such as mud, sand, gravel, soil and corrosion products on the network interconnected with the sediment and make the sediment is more bulky. The experiments show that small part of the weight of sediment is microbial organic matter. It should be noted that almost 90 percent of the volume of sediment is the biological material (e.g. [14], [19], [27], [28], [29]).

Acid Bacteria Causing: Two major types of acid-producing bacteria are: aerobic sulfur bacteria capable to oxidize sulfur and sulfate into vitriol (sulfuric acid) and another type of bacteria which are able to produce organic acids.

Corrosion of Organic Acids: The process of metabolism produces the anaerobic bacterial of organic acids such as lactic acid. Except of bacteria, some fungi effect of your metabolism produce organic acids such as acetic acid and formic acid. The acid in the presence or absence of oxygen leave negative effects on metal corrosion and material. High temperature and humidity conditions that are produced by fungi cause to corrosion electronics in stores. Table 2 shows the severity of soft iron corrosion is caused by organic acids under massive microorganisms 5mm thickness (e.g. [21], [26], [37], [38], [39]).

Table 2. The Severity of Soft Iron Corrosion Is Caused by Organic Acids under Massive Microorganisms 5mm Thickness

(mm/yr) Pitting Corrosion Rate	(mdd) Weight Reduction	Acid
2	730	Formic
0/8	140	Acetic
0/7	130	Propionic
0/6	100	Butyric
1/2	225	Citric
1	190	Lactic

Sulfate-Reducing Bacteria: The most common bacteria involved in the biological corrosion are sulfate reducing bacteria (SRB). Usually these bacteria are abundant in the environment in soil and water. In general, the sulfate reducing bacteria called which are able to regenerate inorganic sulfate to sulfide. These bacteria are anaerobic and in the environment that there is no oxygen able to grow and multiply. Of course, there are other species aerobic bacteria and anaerobic that able to regenerate sulfur compounds to sulfide and the importance of bacterial sulfate reduction (mineral) desulfurize kens bacteria from caste idem family. These bacteria are able to consume hydrogen and some other organic material and reducing sulfate ions to sodium sulfite gain energy needed for their growth. Sulfide ion induced adverse effects on steel corrosion. The presence of these bacteria is characterized by the deposition of iron sulfides. Sulfide compounds produced by the bacteria are deposited on surfaces compared to steel; the situation is more cathodes and accelerated corrosion to the steel (e.g. [11], [16], [24], [35], [40]). Some anaerobic bacteria each of them have different types able to feed organic materials such as private choline and lactate and grow on their even in situations that is no ambient sulfate ions in the environment. the main role of sulfate-reducing bacteria give electron from organic and inorganic substances present in the environment (oxidized to them) and deliveries to sulfate as the final receiver of electrons (reducing them). Several mechanisms have been suggested for the corrosion of sulfate-reducing bacteria witch the most important mechanism of formation of cathode depolarization and galvanic couple iron sulfide with Fe. In mechanism polarization of iron corrosion is considered to be a thin layer of hydrogen on the surface that it is polarized. SRB bacteria removing hydrogen cathode by hydrogenated enzymes from itself that are able to spend it for regenerate sulfate ions and thus cathode region are depolarized that lead to increase metal corrosion. For example, the corrosion of steel, the following reactions have been reported:

Anodic reaction 1) $4Fe \rightarrow 4Fe^{+2} + 8e^-$

Water Analysis 2) $8H_2O \rightarrow 8H^+ + 8OH^-$

Cathode reaction 3) $8H^+ + 8e^- \rightarrow 8H^0$

Cathode depolarization 4) $SO_4^{-2} + 8H \rightarrow S^{-2} + 4H_2O$

Corrosion product 5) $Fe^{+2} + S^{-2} \rightarrow FeS$

Corrosion product 6) $3Fe^{+2} + 6\,OH^- \rightarrow 3Fe\,(OH)_2$

Final reaction 7) $4Fe + SO_4^{-2} + 4H_2O \rightarrow 3Fe\,(OH)_2 + FeS + 2OH^-$

The reaction is done until third equation if there are not sulfate-reducing bacteria. Sulfide ions produced strongly affect to anodic and catholic reactions. Some investigators have proposed another mechanism is the formation of iron sulfide with iron galvanic couple. In the mechanism composed thin layer of iron sulfide by sulfate-reducing bacteria absorb hydrogen cathodic.in thin layer sulfide acts as the cathode and with steel form a galvanic couple and cathode dipolarization function is performed by sulfate-reducing bacteria is done on the sulfide layer and thus increases the corrosion of steel (e.g. [22], [34], [36], [17], [39]).

4 CONCLUSION

EFFECTIVE FACTOR ON ONE EXPLOITATION MODEL:

Input data: one of the main input data is effluent qualitative properties before reuse in irrigation. These properties divided to 3 chemical, physical and biologic groups. Chemical factors contain Ec, SAR, PH, and COD. Nitrate, Nitrite, phosphate, sulfur phenol, saner concentration and biologic properties contain BOD5, coliform, feces coliform, No mated, Bacterizes and physical properties such as Do, TSS, turbidity, organic matter and color. But factors value are variable depend on effluent origin. And because this we can change input parameters effluent origin Weather situation is one of the main input in recommended model Temperature is effective on BOD3 value, Microorganisms in effluent and some of organic matter and mineral matter such as nitrate. Temperature, day brightness hours, relative's humidity and wind blow are important because of effect on evaporation and sweat. Also blowing speed is important for irrigation method select in reuse situation of effluent. Also Geographical with and altitude of sea level, effective rain level and irrigation time are necessary for input data to calculate vegetable water need. Soil texture is effective on application situation (e.g. [12], [13], [23], [22], [25]).

Physical features such as soil structure and soil texture are more while in decreasing effluent earth filter, pollution indexes are high penetrability is effective on waste water due to Hydro intensity and application. Plant vegetable divided in to raw vegetable, industrial vegetable and not-useful vegetable. Eatable vegetable are in border with respect to consumption process and should be evaluate because of gathering different elements such as heavy metal like sorb, calcium, corm, Niche, Mercury, Arsenic, cobalt. Another parameter is vegetable persistent border to effluent chemical parameter that are salinity, sodium penetration ratio, chloride, sodium, and beer. Also we should pay attention to some of vegetable sickness on the other hand some of vegetables which have important role in absorb pollution elements and are effective in polluted soil filter. Surface method such as basin irrigation and border irrigation lead to prevalence microbial pollution for water distribution, but we should less use of them because of farm worker direct contact and we should use of high level of filtering. But among surface methods furrow irrigation with wide jibe, better, we recommend surface methods such as basin and border if this be in dry and semi-dry regions and we should manage in vegetable plant and irrigation method if we use of furrow irrigation. But raining irrigation is not acceptable in low chemical and microbial quality until it has high cost of microbial and chemical filtering. that are not cost effective. Crop irrigation method is the best method for use of affluent in agriculture, especially then they use subsurface drop irrigation. In this method microbial pollution decrease by effluent injection in soil subsurface. And we should install wide dripper that reach to soil surface temperature we can calculate wide model base on this relation and Philip relation is one of the simple equations (e.g. [4], [10], [20], [30], [41]).

Model output: Present recommendation for effluent modify deform use. This recommendation is depending on application method and reuse method of effluent. Also filterable effluent volume, weather situation, cost and investment level, and each value are other effective factors. Recommendation are filtration, Earth filter and soon. We can attribute part of filter to irrigation system trend. Also we can avoid of effluent mix apply or effluent alternative application. Najafi shows that subsurface drop irrigation filtration application has meaningful effect on complementary treatment and effluent pollution load decrease. Capra & Semicolon (2004) present best mods for drop irrigation filtration (e.g. [19], [29], [31], [32], [33]).

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