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The Quality Pollution and Anomaly Anions and Cations Underground Water Resources in the South East of Tehran

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Tehran in a region where the organization is alluvial soil of the earth. On the north slopes of the Alborz Mountains to the south and the plain is limited. In the northern parts of the province because of the mountains and spread them wide plains as a reluctant but particularly in the Southern and Eastern provinces fertile lowlands southwest of Karaj and Varamin Ray there. The geographic area of Tehran, Karaj, the mountains and the plains by the river and Jajrood is limited. Jajrood center and source of the two rivers and mountains Karaj "Kharsang Mountain", which Dizin and Shemshak slopes on either side of it. Population growth and density per unit area, the development of services and educational institutions such as hospitals, universities, schools, offices and commercial centers and industrial production units and increasing the number of vehicles and traffic, a significant amount of pollutants and waste, and urban industry has brought, each in its own special despite the rocky bed of the northern highlands and altitude, East and South, as well as underground water bowl out and groundwater in the area is enclosed. Due to increasing population growth in recent years, the bulk of these waters with industrial and domestic waste water flows on the surface and deep in the Earth, the contamination of soil and water resources, environmental problems has doubled in Tehran and the entry of various pollutants in addition to the introduction of quality underground water sources with access to groundwater contamination that resources follow their use is necessary to protect health and the environment.

Key words: Water Resources, Tehran, Anions, Cations, The Quality Pollution.

Information to obtain a quality image of water resources in the south of Tehran. Depth qualitative studies include the following qualitative characteristics, temporal and spatial changes in underground water resources in the course of a year is considered stations. Identification of pollution sources and field visits have been conducted on the basis of available information.

1. Qualitative study to investigate the history of water resources and sanitation in Tehran; The main results of the studies based on existing studies have been summarized and evaluated.
2. Identification of pollution sources in the study area; Point and non-point pollution sources into three main groups: urban, industrial and agriculture have been identified and studied. The results of the studies as a sheet map(land use map and map pollution sources) with an appropriate scale in the study area is presented. In this map of urban and agricultural pollution sources as polygons and industrial pollution sources(including major industries, mines, urban wastewater treatment plants and industrial towns) will be presented as point pollution yet.
3. Assessing the quality of underground water resources and effluent wastewater treatment plants; Based on the results of the previous stage and quality monitoring program and implementation of the program was done. At this stage, based on the proposed monitoring program, a total of 39 stations, located on ground water, samples were taken at least six times

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during the year. Quality characteristics included physical properties(temperature, color, suspended solids, turbidity, ph, DO), chemical (Ec, anions and cations based, nutrients, BOD, COD), microbiological (total coliform, fecal coliform and nematode parasites), heavy metals(cadmium, chromium, lead, iron, zinc, manganese, mercury, aluminum, and, arsenic) is. In this part of the study, according to the various uses of water quality parameters including physical properties, chemical and biological classification of water for various uses has been defined. According to the criteria defined and qualitative results obtained, the qualitative changes of water resources(the infantry, ground) and to compare the quality of the water resources of different uses with quality standards, quality and appropriateness of each of these resource constraints, to the cost of the study. Finally, with regard to the quality of these resources in different groups(various applications) have been classified.

4. Zoning quality underground water resources and identify infected branches and evaluate the quality limitations of the study for various applications based on existing standards; The conclusion of the study is based on records of previous studies and the results obtained during the course of a year, the quality of underground water resources use zoning NSFWQI index and the EC and Fkal coliform. According to data quality based on the quality of existing zoning defined three scenarios(worst possible quality, medium quality conditions and the best possible quality). The output of a map is provided.
5. Providing and improving the quality of treatment guidelines for sustainable use of water resources with minimal adverse effects of environmental pollution; The main objective of the strategy to reduce pollution entering the water and provide a practical approach for improving quality ranks the sources of pollutants are received. The guidelines point and non-point pollution consists mainly of entering the water, isolation of infected branches and the provision of suitable methods for the treatment of resources. The quality of the plan include groundwater south of Tehran.

- The study of quality of underground water resources including rivers, streams and canals of the city and plant output in a range of studies.
- Zoning quality of underground water resources and identify infected branches.
- Examine the limits of quality study materials for different applications based on existing standards.
- Study the pollutants in the study area.
- Curative solutions and improving the quality of water resources for sustainable use, with minimal adverse effects of environmental contaminants. Water resources management and environmental monitoring programs.

The quality of underground water resources, according to the long-term hydrological stations, In the study area, 60 hydrometric stations were identified at the stations with relatively adequate statistics were used to analyze the quality of water is used. In the study of water quality stations in the study area, parameters and chemical properties of water such as acidity(pH), electrical conductivity(EC), total dissolved substances(TDS), sodium adsorption ratio(SAR), some of anions such as bicarbonate (HCO3), chloride (Cl), sulphate (SO4), and cations such as potassium (K +), magnesium (Mg ++), calcium (Ca ++) and sodium (Na +) are used. The results show that the quality of underground water resources downstream branches in Tehran, is reduced. The results are clear, except for the spa water stations that are toxic to plants and sensitive chloride is used in patients with severe limitations, none of the other stations are not in the group with severe limitations. Conclusion of the chemical quality of water resources, rivers, streams and canals in this area are summarized as following :

1. Water quality in sections of the stations measured in the upper branches of agriculture are highly desirable. Rivers leaves Karaj, Jajrood, me and all of the characters are imprisoned.
2. Water quality channels which are only contained in Tehran wastewater streams, such as channels and Firozabad(in sections Nazarabad stations and chivalrous butcher), are very undesirable.
3. Wastewater streams along the rivers and channels are added, gradually decreasing water quality are met.

Sorkhehesar streams and relevant issue

Literature review indicates that the quality of the channel has been studied in recent years as follows:

1. Studies in 1374 during the seasonally at 18 stations(the four-way intersection with road Tehranpars to Varamin Islamabad) flow rate and quality have been studied. The results of these studies indicate that the maximum flow rate of 16,000 liters per second is measured in terminal. The most important watercourse pollution sources include sewage Sorkhehesar streets and houses, workshops molding, electroplating,

various shops on the road, mechanical workshops and changing the oil, sewage Zeinabieh corner, Terminal East, Sorkhehesar hospital, an industrial group based in Damavand Road, workshops killing Chicken and Sewerage Division 21 Air Force bases mentioned Hamza. In the way of the standard paper and application limits include ammonia and nitrate, suspended solids, fats and oils, detergents, based, iron, sodium, potassium, fluoride, chloride, and at some stations, BOD, COD.

2. Years of 1374-1378 during the years 1374 to 1378 Sorkhehesar river water quality stations(Paul Aminabad, three Afsariyeh and 17 September) were investigated. The results of this study indicate that in all stations of TSS in more than 8 months of the year exceeded for agriculture. September 17 was the minimum amount of DO in stations and in the 11 months of the year was less than 2 mg per liter. Fat and oil is excessive in all the stations. The amount of iron, nickel and manganese is excessive. So that the concentration of iron in the stations, bridges Aminabad, road Afsariyeh and 17 September respectively 4, 3 and 2 months and Mn respectively 4, 3 and 2 months, Ni respectively 10, 9 and 5 months excessive for agriculture.
3. Studies of water quality 1384-1382 Sorkhehesar during 1382 to 1384 to determine the concentration of heavy metals studied. The results show that the concentration of heavy metals cadmium, copper and zinc in the event of a limit for agriculture rape.

17 Shahrivar

Quantitative-qualitative literature review indicates that the situation along the canal in 1374 as a chapter in 4 stations(from parliament to mobilize right) were examined. The results of this study indicate that the maximum flow rate in the spring of 4400 liters per second and the most important limiting the use of qualitative indicators include: BOD and COD, fats and oils, suspended solids and iron in some cases. The major cause of pollution in this way can the sewer passages and houses, bathhouses, a number of mechanical and oil changes and more. Comparing the results with recommended standards for universal application shows that:

1. The concentration of oils and fats and iron parameters and detergents, aerosols and in some cases, BOD, COD and iron, more than adequate for irrigation of crops and therefore limits their use in irrigation.
2. The concentration of ammonia and nitrate parameters BOD and COD, too much iron is recommended for aquaculture purposes and therefore limits its use for fish farming.
3. The concentration of ammonia factors, oils and fats and iron and detergents, aerosols and in some cases, BOD, COD and iron, too much groundwater is recommended for discharge.

Yakhchi

The quantitative-qualitative literature review indicates that during the years 1374 to 1378 Yakhchiabadriver twice is studied.

1. Studies in 1374 over 1374 seasonally during the 2 stations(the beginning of the highway, cemetery, end Khaniabad, Chaharmahal and Bakhtiari) to flow rate and quality are discussed below. The results indicate that the maximum flow rate of 7,000 liters per second at station No. 2 is reported in the winter. Comparison of stream quality based Yakhchiabad stations and compare them with recommended standards for universal application shows that:

A. Concentration of lipid and oil, iron, suspended solids, BOD, COD and more detergent than recommended for irrigating crops and watering restriction of the use of these resources.
B. Factors concentration of ammonia and nitrate, suspended solids, fats and oils, detergents, BOD and COD and too much iron is recommended for aquaculture purposes and therefore limits its use for fish farming.

2. During the years 1374 to 1378 studies during the years 1374 to 1378 Yakhchiabad creek water quality have been studied and summarized the results as follows. In this channel the average BOD, TSS, COD least 9 months year more than the standard allowed for agricultural oils and fats year for agriculture excessive concentration of nickel in the 11 months of the year, iron and manganese in 2 months, 4 months, more than agriculture is the limit.

The study of groundwater contamination Tehran

Examine the records and results of qualitative studies of groundwater Tehran, show that the quality of information that indicate the status of pollutants in these resources is related to at least 5 years ago. Due to the lack of qualitative data collected to date and significant cost and quality testing, analysis of groundwater pollution Tehran made based on this information.

Evaluation of heavy metals

The study of heavy metals on the basis of the results of the analysis of heavy metals in surface reservoirs of water wells supplier Tehran

by processing the information contained in the minimum, maximum and average processed and results are presented below.

• Chromium

The results indicate that the maximum concentration of heavy metals chromium found in wells Tehran level lower than the limit and only one well located in Tehranpars Boulevard P. equivalent 168/0 ppm chromium concentration is much higher than is permitted. In other wells and tanks at low concentrations of heavy metals chromium or zero.

• Co

The results show that the cobalt concentration in the wells, water tanks zero and supplier of these sources for drinking problems and their infection is not expected. Based on the results available from wells located in the city, the concentration of the metal from 003/0 to 01/0 ppm ranges.

• Cadmium

Investigation showed that the cadmium concentration in wells 1 and 2 at the maximum reported maximum permitted levels(003/0 mg) and other wells and substandard drinking is zero. The results available from wells located in the city, cadmium concentrations in wells located in Kianshahr, the intersection of freedom and unity, cooperative housing estates gendarmerie well as the maximum allowed for drinking water have been reported in wells located in the palaces Air Force F above the standard level water(equivalent to 004/0 mg) have been reported.

• Copper

The results show that the maximum allowable concentration of 2 mg of copper, copper concentration in any of the samples tested from wells Tehran is not more than the standard limit for drinking in terms of the resources are not there.

• Lead

Lead concentrations in samples taken from the wells, the water utility zero cases have been reported in any of these sources for drinking quality is not limiting its concentration level. The highest concentration of lead found in the well water of 02/0 ppm Imam Khomeini hospital were reported.

• Nickel

The results of water quality supplier reservoir wells showed concentrations of nickel in the zero and substandard drinking(02/0 ppm) respectively. In a separate investigation, the case was taken from wells located in Tehran, which is equivalent to 02/0 ppm Ni concentration in only one case has been reported that the housing cooperative in the town gendarmerie was well.

• on

The results show that the water quality of wells, tanks Tehran zinc concentration limit has been reported mainly in poor zero and therefore limit for drinking after results of tests performed on the wells of Tehran show that in all these cases the concentration limits and with no restrictions for drinking. The highest concentration of 74/2 on a milligram per liter of water is physical education in the field Afsariyeh.

•Iron

Considering the quality of existing wells, water tanks supplier located in Tehran observed that in some cases, excessive concentration of iron is allowed for drinking. Esfahanak so that its concentration in wells, wells Group A and Group 6(Gholghol), 15 tanks, cisterns and wells Moshirieh 7 more than the declared limit(3.0 ppm) respectively. Maximum iron concentration of 5.1 mg per liter in the wells Group 6(Gholghol) has been announced. According to a separate survey taken from wells located in the city, the iron concentration in the wells located in alstompower, water streets, town teachers(located in Sheikh Fadlallah), 502 Military Hospital, telecommunications(Shariati) and Imam Khomeini over the limit for drinking is declared based on the results of the highest iron concentrations equivalent to 46/3 ppm for water wells located in the street of the water.

• Manganese

Results of well water supplier Tehran and the results of water quality wells located in the city have shown that manganese concentration was desirable and in no case exceeded the limit but not for drinking.

Evaluation of nutrients

In this section, based on the results of the quality of groundwater, including wells, water utility tanks and wells scattered throughout the city, summing up the results of the qualitative parameters of the detergent, phosphate, nitrite, nitrate and ammonia have been studied and analyzed and below an explanation is offered:

• Detergents

The results of qualitative supplier of detergent in water tanks, wells indicate that the level of concentration in all of these restrictions limit and not for drinking.

• Phosphate

The results of testing the quality of water tanks supplier Tehran wells indicate that concentrations below the permissible limit and no limit for drinking as well.

• Ammonia

The results show that the amount of ammonia in wells under water tanks from zero up to 67/2 ppm (right-Khordad) fluctuate. The results showed that the concentration of ammonia in Tarasht wells, reservoir wells 56 and 502 military hospitals, water wells, wells of drinking water in the streets, and in other cases Harandi higher than the standard ammonia concentration limit for drinking and in this regard restrictions on drinking these resources are not there.

• Nitrate

The results show that in many cases the concentration of nitrate concentration of nitrate in well water utility water tanks for drinking is excessive. The results show that the water quality of wells with maximum nitrate concentration of 141 ppm Moshiriyeh the worst quality and has 34 storage wells with nitrate concentration of 8.2 ppm is the minimum.

• Nitrite

Nitrate concentrations in wells and reservoirs, many of these limits and in many cases was zero and no restrictions on drinking these resources are not observed. The results show that only in two cases (reservoir, pumping stations and wells Tarasht bed) nitrite concentration and excessive use of water for drinking limits. The maximum concentration of nitrite in the tank of 02/1, Tarasht 112/0 and the flat fields is equivalent to 33/0 ppm.

The quality of underground water resources and effluent treatment plant

In this section of the chemical quality and pollution of underground streams, rivers, streams and watercourses and wastewater treatment outcome study area based on a quantitative-qualitative results of the monitoring program has been presented and analyzed. Based on the results of qualitative, quantitative restrictions on the use of these resources is studied.

Streams and ravines leading to the South East of Tehran

In this system, in order from West to East, Velenjak river, Darband, canals Jamshidiyeh, Kashank rivers, streams Darabad, Sohanaki rivers, canals ten Narmak, Tehranpars canals, rivers and canals Sorkhehesar with Sh. The problem, from the most northern part of town, and after a large part of the northern, central and eastern Tehran and receives runoff, sewage and runoff from rainfall in the southeast and south road Varamin flows Qom. In addition to the above Velenjak areas, divine, Shemiranat, Niavaran, Department, Gheitarieh, Mahmudiyah, Iranian Revolutionary Guards, Lavisan, Ozgol, Sohanaki, Narmak, Tehranpars, Tehranno and Dolatabad, Imam Hossein Square, Enghelab Ave., 17 September and the southern part of the system is down. Flows in this section are as follows:

- River Velenjak and relevant issue
- Channel Mobarkabad
- River Sorkhehesar and relevant issue
- Channel 17 Shahrivar

Waterways and ravines leading to the South West of Tehran

The system is far less land from Tehran to the previous system, under the cover. It is important rivers, respectively, from West to East, River Darakeh, Farahzadrivers, streams and rivers BRENCH tell me which of your downstream of the rivers were called.

- River Darakeh and relevant issue
- River Farahzad and relevant issue
- River Brench and related issues
- Kan River and the corresponding issue

The rivers and canals of central and south Tehran

In this system, in contrast to previous systems, groundwater, rivers, mountains do not have any role, mostly in the north-south rivers system, underground runoff received and transferred to the southern streets. As a result of underground runoff in the main body of the city from north to south continually increased, and sections of the main channels of transmission, to gradually grow larger. The northern part of this system, from the intersection of Highway teacher begins to Azadeganexpressway in the south continues. This system covers the areas Seyedkhandan bridge to the right of Argentina,

near our house, Motahari, yousefabad, Amir Abad, Keshavarz Blvd, revolution, Imam, workers, Tarasht, Square, Apadana, Ekbatan, airports and regions Yaftabad, Javadiyeh, Nazi Abad, railways, treasury and all residential areas and industrial areas is higher than what the free highway. The main channels this section are as follows.

- Creek Firozabad
- Channel Yakhchiabad

Adjacent rivers in Tehran

This section contains Jajrood and Karaj rivers which were two separate systems of eastern and western parts of the studies have been limited. Karaj River is the main branches, namely VarangehRud and VelayatRud, respectively, of mountains and mountain battalion Columbus block originate. Above the dam reservoir is Amir whole system into Varian's branch of the left bank of the dam is. Between the outlet of the dam basin to place Bilqan two important branches and condor are also added to the system. Bilqan amount of water in the river to provide drinking water in Tehran part of the canal was removed and placed into operation. Excess water enters the plains Tehran. Following rivers Karaj in Fashapoyeh, the overall flow of the catchment it is inhibited by the dam Shahid police. The volume of Karaj River upstream dam after dam ShahidAlikhan police joined the salt River and into the river basin Qom Shahidpolice main source of water is Navab channel. The channel from the diversion dam Vice out in the village is split Kashank. Of rivers in the North East to East and South East of Tehran extends many branches such as starch, Maygoon, Fasham and Gndhrvd covers. On Latian of Rivers also been constructed that its main purpose is to supply water to Tehran. Damavand River of Rivers went on their way from the East received and then Jajrooddiversion dam irrigation network feeds plain and almost near Karaj dam Ali Khan rivers connected to it, and then flows into the salt lake.

Water treatment plants and sewerage

Wastewater treatment plants included Hanh treatment of Pharmacology, Gheitarieh, Sahebgharaniye, Shahid town neighborhoods, Cui Nasr City West, Ecbatana, Susa, Town flat, Zea, south of Tehran(Rey) and the water treatment plant and is Tehranpars.

River water quality analysis sorkhehesar

On river quality monitoring stations Sorkhehesar location is as follows :

•First station

Watercourse SorkhehHesar paint factory. The results indicate that water quality stations Sorkhehesar before entering the city and the influence of urban pollution.

• The second station

Sorkhehesar channel - to connect to the channel, Abuzar, the station on channel A. Sorkhehesar to connect to the channel, in order to evaluate the effect of the residential urban areas and between the first station to the second location. The most important watercourse pollution sources include sewage Sorkhehesar streets and houses, workshops molding, electroplating, various shops on the road, mechanical workshops and changing the oil, sewage Zeinabieh corner, Terminal East, Sorkhehesar hospital, an industrial group based in Damavand Road, workshops killing Chicken and waste air force army barracks Hamza 21 points average quality parameters studied along Sorkhehesar according shows that the concentration of all the factors in the second station to the first station increases and the increase in iron and aluminum, manganese, biological indicators, BOD, COD and color is evident. High opacity Sorkhehesar the first station despite its low contamination BOD and COD and nutrients, the construction work that was done on the river and river pollution was physical. Increasing concentrations of aluminum and iron, as well as color and opacity the second station is largely related to the disposal of waste water(washing the filter plant) Water Treatment Plant is Tehran Pars, in which iron and aluminum compounds for coagulation and flocculation water results of water quality monitoring Sorkhehesar in maximum cases, minimum, and average and compare it with the standards for agricultural use and discharge to groundwater show that the first station which is only beginning to Sorkhehesar quantitative limits for various applications due to high turbidity and suspended particles and the number of coliforms and Fkal coliform during the year. Other factors at the beginning of the restriction to use it will have. The second station in addition to the high microbial parameters,

turbidity and color over the years BOD and COD in terms of mean and maximum for the intended uses a limitation.

West channel, manouchehri is salty

This way the assembly line canals, rivers, is a large part of Tehran. This path eventually discharge as Raziabad paragraph and paragraph Khan reached the salt lake move. After the junction of two canals Sorkhehesar and west, the canal with Manouchehri(Channel A.) flows in the direction of Iran Abuzar. Manouchehri channel went on their way from the East, the channel receives wastewater caravan and its suburbs and its lower town area Dolatabad drainage channel from the West to be connected. A. canals or rivers Sorkhehesar went on its way and shifted to the southeast across the road and get Aminabad of Rivers called the Salt River, the area to the south continues .Raziabad continue its path upstream diversion dam, the river is joined me. Salt River more available and passing through the intersection of Varamin road to Qom, in Charmshahr industrial town of Varamin, Karaj river in this location is a small river turned into a party. Salt River continues its course near the village of Khan paragraph abandoned due to low land slopes spread over a great area as wetland and swamp has become. On this route five quality monitoring station location is as follows :

• First station

Bakhtar- channel to connect with Darabad channel that reflects the results of the resultant water quality stations Jamshidiyeh channel, the captive, Velenjak and is Mobarkabad, which together form the East that channel.

• The second station

Bakhtar- channel before Sorkhehesar called the station to determine the effect of Darabad River, East Branch, River Sorkhehesar residential and urban areas and between the two was selected.

• The third station

Shurabad village, which is the lower station of the second station, after receiving branches Sorkhehesar, Fajr and she has been selected.

• The fourth station

Shur-e-Razi clause is going to the station, after receiving Creek Firozabad and is now before the connection location is passion.

• Fifth Station

Shur-industrial park is expected Charmshahr the station and near the industrial town Charmshahr after paragraph Razi selected.

The mean quality parameters according study shows that water pollution along the route of the first station(Bakhtar channel to channel connection with e) to the third station(the time Shur Abad village), the increased which was received by contaminated branches like Scheherazade, Fajr, Firozabad and East channel and more. Following the route of the infection, which reduced by decreasing emissions and the effect of self-purification during the route. During the color change indicates that the average amount of color along with more than 50 units and a maximum of 186 units is measured passion Charmshahr station. EC along the growing trend of 4800 and the average of 866 in the first station to the third station and about 6,800 in the third station and the station has more than 15,000 cm. Dissolved oxygen during the reduction process and a maximum of 10 mg per liter in the first station to about 2 mg per liter in the fourth station(the Shur-paragraph Raziabad) is reached. In the course of the turbidity of the water was high and maximum passion in Zamanabad station, which is equivalent to 1000 units. In this section of the heavy metals cadmium, chromium, lead, mercury, arsenic and metals, iron, aluminum, manganese and been detected. The highest concentrations of cadmium, chromium and lead, respectively 47, 215 and 220 ppb in the last station(industrial Charmshahr is salty) and the iron concentration of 5.7 mg per liter in the fourth station(the salt - before paragraph Raziabad) is. The highest mercury concentration of 125 ppb in the fourth station(the salt - before paragraph Raziabad) were measured. The entire route of microbial contamination is high and very high levels of coliform, coliform Fkal enjoys. During the course of parasite nematodes observed that the increasing amount of them to the south and end.

The results of water quality monitoring on the state of the maximum, minimum, and average and compare it with the standards for agricultural use and discharge to groundwater show that the factors turbidity, total coliform, Fkal coliform and nematode parasites of the year and the total route for use in agriculture and discharge to groundwater

is limited. The EC and its sulfate, the station number three(Shur village Zamanabad) exceeded the intended uses and utilization of the limited returns for farmers and increase the limit on the length of the path. The amount of BOD and COD at Station Number Three(Shur village Zamanabad) to the extent allowed more than standard agricultural use and for this purpose has been to restrict them. This restriction is due to the continued improvement in water quality and biological degradation of organic matter is resolved. Despite the presence of heavy metals, most of them along the way, they are less than the standard recommended for agricultural use or discharge of groundwater.

Creek water quality analysis Yakhchi Abad

River quality monitoring station on the No. 2 location is as follows:

• First station

Yakhchiabad channel called the station at the beginning of the Yakhchi East Saleh Abad Abad, before receiving a heavenly channel location and shows the quality of water in the farms of the region.

• The second station

Yakhchiabad- channel to channel connection out of the station at the end of Yakhchiabad, before connecting to the river now shows the location and quality of water from the canal to the river is now.

The mean quality parameters studied along Yakhchiabad channel shows that the water quality was poor in both stations and concentration of many factors including color, turbidity, BOD, COD, suspended solids, nutrients(including phosphorus, ammonia and total nitrogen), the biological indicators(coliform, Fkal coliform and nematode parasite eggs) at a high level and quality of the water unsuitable for many uses returns. Yakhchiabad channel high concentrations of heavy metals in particular, for the purposes of limitation. Cr, Cd and Fe including metals that are in these two streams at a high level. There tank Salehabaad improve water quality and reduce the relative concentration of some factors such as turbidity, color, BOD and COD is. In general, the same channels Yakhchiabad channels Firozabad, 17 September, and channel representatives from contaminated streams and is central to ensuring the sustainable use measures required to improve the quality of some of the results of monitoring water quality YakhchiNahr-e at the end and beginning of the route, in states the maximum, minimum, and average and compare it with the standards for agricultural use and discharge to groundwater show that the most important factors causing limitation to the above expenses, primarily consisting of microbial parameters(coliforms, coliforms and parasite nematodes Fkal) Secondly, high levels of BOD and COD, turbidity and suspended particles of heavy metals in the end. The EC and the anions and cations in solution for various uses, there is no restriction based. High levels of nutrients, however, will have restrictions for agricultural use of these resources, but because of the significant role they are receiving nutritious water resources is very important.

The quality of underground water resources according to input upper, central and parts of consumption and output from the basinZoning quality of underground water resources Tehran and identify infected branches

One of the important points to protect underground water resources determine the status of river quality. In the past, the water quality of a stream based solely on the parameters of physical, chemical and biological in it was measured, but the water quality on the basis of these parameters are defined in relation to environmental, human and operational purposes it is founded. Thus, numerous studies by scientists and academic institutions to develop and provide new methods, varied and more reasonable to define and explain the concept of ongoing and expanding. Different types of water quality index (WQI) and water pollution index (WPI) with the removal of large amounts of water quality parameters and the various methods that have been developed based on genetic algorithms and neural networks are mathematical, statistical, or have been used to to assess the quality of their waters. Since the use of water quality parameters broader use than the other methods mentioned above and the other methods such as the use of genetic algorithms and neural networks in the initial stages of the application and the hand methods used less gradually Several monitors by taking along a stream at different times carried out, basic information to assess water quality conditions produced. The raw data can be subject to different methods of water quality status

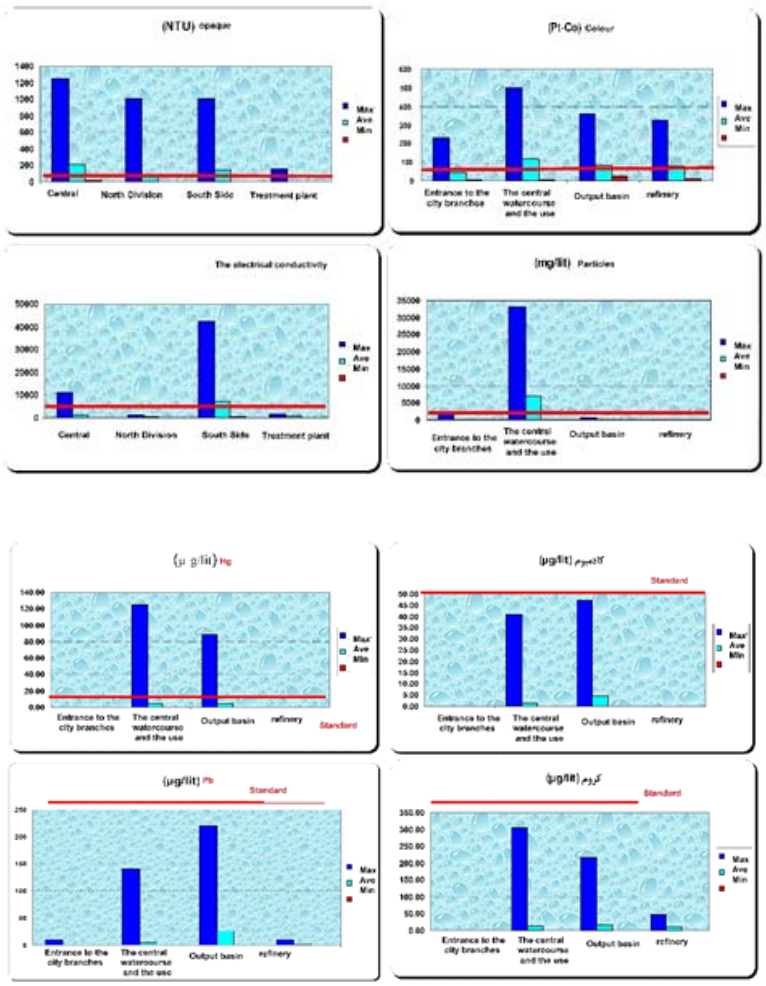
report. One way of analyzing the quality conditions of the river that simply shows the perspective of the quality of river water quality parameters are. Indicators of water quality and simple tool to determine the condition of water quality is good. Several applications for environmental indicators, including groundwater quality parameters are listed as follows:

1. The use of biological decision makers to allocate resources and capital to help managers determine the actions and priorities of the program.
2. By comparing quality conditions in different locations or different geographical conditions, the implementation of standards.
3. River qualitative trend analysis in time and space.
4. Report to the public and scientific research.

The index structure can be divided into two parts. The structure of the following chemical and physical parameters and microbiological quality of water and the mathematical structure which includes discussions are mathematical functions and operate on quality parameters. Extensive studies have been conducted to examine the water quality parameters. The first one was launched in 1965 by Horton. Chemical and physical parameters have been introduced in various articles and studies that generally can be grouped under four categories that:

• Water indices, such as indices Horton, National Water Quality Index Health Organization(NSFWQI), non-specific pollution index (Prati), river pollution index (McDuffie).

• Indicators of water use, such as indices O'connor,



index PWS, index Walki&Parker(holiday), the index of Stoner.

• Design indexes such as index MITRE, a system of environmental assessment Dee, pollution potential index Zoetwan .

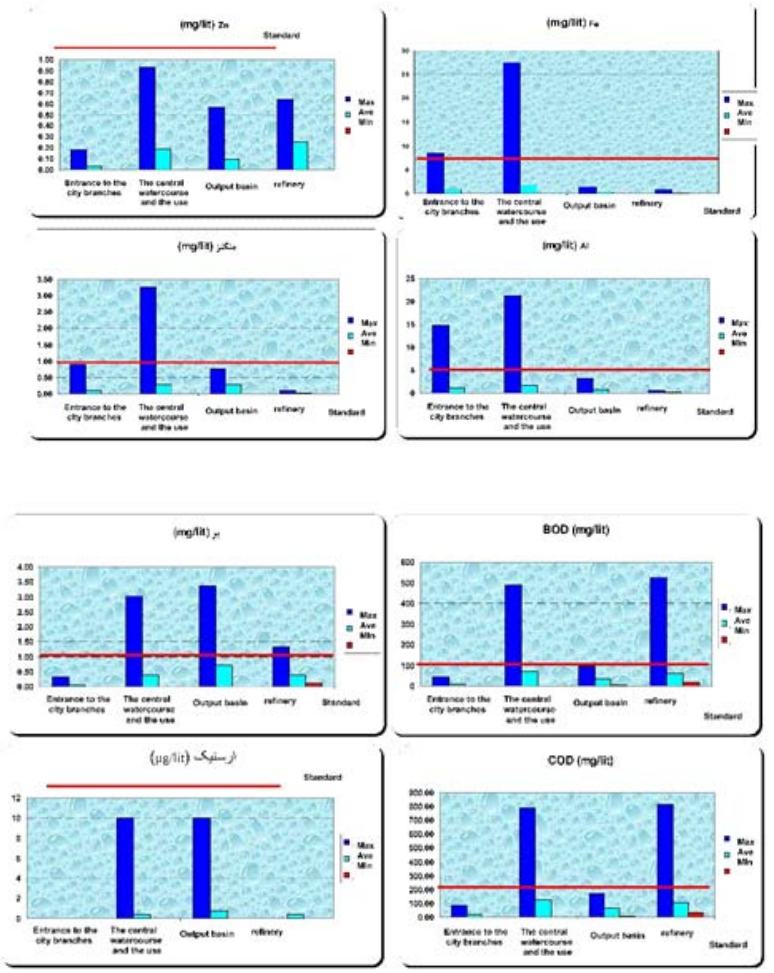
• Statistical indicators, such as indicators and beta Harkins.

The qualitative indicators of significant differences in the number of parameters, parameter type, scale and range changes can be seen. Each method has its own mathematical structure and how to reach the weighting factors and sub-criteria from method to method varies transfer functions.

General and special purpose indices basically have two common properties are, firstly, both of which are good indicators have been used in different studies around the world and secondly, both in free use of broad underground flows. NSFWQI index when the decisions were taken very sensitive to the influence of one or more specific parameters exist, due to the direct intervention of parameters and indicators of the sub-structure and taking into consideration the weight of the This sensitivity is preferred. How to apply, as NSFWQI OWQI index, is the same that all of the parameters of the effect and importance of decision making based on the index.

Application quality based on different scenarios

In this section, using qualitative zoning index NSFWQI(National Sanitation Foundation Water Quality Index) and the Tehran underground water quality conditions in the study area is



measured and zoning. According to the results of monitoring the quality of underground water resources in six innings during a seasonally from selected stations in the watershed study area is taken, zoning quality of water in rivers, watercourses and canals were. According to the statistical analysis of qualitative results obtained, zoning action based on defined quality three scenarios for different water quality conditions, is done as follows.

Tehran zoning status of underground water resources in the first scenario

This scenario is based on the worst possible quality, based on qualitative data obtained from laboratory analysis was conducted. In this scenario NSFWQI index is calculated based on the worst quality parameters and represents the worst quality of underground water resources during the sampling period is one year. The results of the first scenario were to fall quality index at selected stations of the study area is presented. Individual study stations in the minimum water quality index shows that Jamshidiyeh channel stations - Jamshidiyeh, Farahzad village Farahzad and the Hesark- Jannat Abad North with indices 53, 52 and 50 in the middle range and the station Yakhchi tunnel built to connect to cannes with indices in the range of 24 was very bad and the rest of the index in this scenario, the quality of the stations within the range of the weak.

Tehran zoning status of underground water resources in the second scenario

This scenario represents the average quality conditions based on the average results of the qualitative data obtained during the sampling period is one year. In this scenario NSFWQI index based on the average quality conditions and parameters indicative of quality that is likely in most years the river is in this case. The results of the second scenario were to fall in quality index at selected stations of the study area is presented. As seen in the table changes in the quality average quality index of the 68 channels in station Jamshidiyeh to the intersection of highways 51 and 32 on channel 17 Shahrivar- mission is in swing. In this case, according to the first except that in the case of medium quality classified, the remaining stations zoning status indicates poor quality of water resources.

Tehran zoning status of underground water resources in the third scenario

This scenario is based on the best possible quality conditions based on qualitative data has been available. In this scenario NSFWQI index is calculated based on the results of the qualitative parameters of the index during the period were taken. This is the scenario that reflects the favorable conditions of the river, in certain cases, particularly in times of high water on the rivers and streams studied was the governor. The results of the third scenario declining quality index at selected stations in the study area provided. The results of qualitative In this scenario, the selected stations in the study area in the quality of good, fair and poor are. As in good condition Chitgar- station mountainous area quality index and channel stations Navab- village Kashank index, respectively, are the best and worst quality. So that the situation in the middle of the industrial town of Karaj station Charmshahr Quality Index in the watercourse SorkhehHsar- paint factory decreases. Saleh Abad Abad channel stations Yakhchi East, Vlnjk- intersection of law channel 17 Shahrivar- highway intersection mission (code 29) with the Quality Index 50, 50, 40 in poor condition in terms of quality In this scenario, with NSFWQI

Tehran zoning status of underground water resources in the first scenario

This scenario is based on the worst possible quality, based on qualitative data obtained from laboratory analysis was conducted. In this scenario NSFWQI index is calculated based on the worst quality parameters and represents the worst quality of underground water resources during the sampling period is one year. The results of the first scenario were to fall in Jdvl3-25 quality index at selected stations of the study area is presented. Individual study stations in the minimum water quality index shows that Jamshidiyeh channel stations - Jamshidiyeh (code 5), Farahzad village Farahzad (code 14) and the Hesark- Jannat Abad North (code 16) with indices 53, 52 and 50 in the middle range and the station Yakhchi tunnel built to connect to Cannes (code 30) with indices in the range of 24 was very bad and the rest of the index in this scenario, the quality of the stations within the range of the weak.

Tehran zoning status of underground water resources in the second scenario

This scenario represents the average quality conditions based on the average results of the qualitative data obtained during the sampling period is one year. In this scenario NSFWQI index based on the average quality conditions and parameters indicative of quality that is likely in most years the river is in this case. The results of the second scenario were to fall in quality index at selected stations of the study area is presented. As seen in the table changes in the quality average quality index of the 68 channels in station Jmshydyh- Jamshidiyeh (code 5) to the intersection of highways 51 and 32 on channel 17 Shahriyvar-mission (code 29) is in swing. In this case, according to the first except that in the case of medium quality Jdvl3-26 classified, the remaining stations zoning status indicates poor quality of water resources.

Tehran zoning status of underground water resources in the third scenario

This scenario is based on the best possible quality conditions based on qualitative data has been available. In this scenario NSFWQI index is calculated based on the results of the qualitative parameters of the index during the period were taken. This is the scenario that reflects the favorable conditions of the river, in certain cases, particularly in times of high water on the rivers and streams studied was the governor. The results of the third scenario declining quality index at selected stations in the study area provided. The results of qualitative In this scenario, the selected stations in the study area in the quality of good, fair and poor are. As in good condition Chytgr- station mountainous area (code 23) with 84 quality index and channel stations Nvab- village Kashank (code 37) with 72 quality index, respectively, are the best and worst quality. So that the situation in the middle of the industrial town of Karaj station Charmshahr 70 Quality Index (code 21) 52 in the watercourse SorkhehHsar- paint factory (code 10) decreases. Saleh Abad Abad channel stations Yakhchi East (code 19), Vlnjk-intersection of law (code 2), channel 17 Shhryvr-highway intersection mission (code 29) with the Quality Index 50, 50, 40 in poor condition in terms of quality In this scenario, with NSFWQI.

Use SALEHABAD tank as part of the aerated lagoons for treatment of infected

Now the river channel overflow Firozabad Tehran through third output channel with Iran and representatives through a tunnel with a diameter of 3 meters after the highway cemetery tank SALEHABAD 600000 cubic meters underground in Tehran as flows are moderating. The reservoir has an area of about 17 hectares and using several for mechanical, eliminates some of the waste flow. The water reservoir by an underground tunnel is transferred to the river now. Figures 5-7 and 5-8 show the development of this reservoir.

The ideal geographical location and characteristics of the hydraulic reservoir to the conditions provided facilities that use of the tank as aerated lagoons for treatment of infected branches is possible.

Environmental considerations of the proposed stabilization ponds plan

Stabilization pond treatment method is inexpensive and suitable with regard to the allocation in the implementation and governance of the study area is suitable. The location and the construction and operation of attention to environmental considerations such as the following :

• According to the selected location and proper interval according to human settlements (urban and rural) at least 500 meters away

• Observance of the prevailing winds, as far as possible to be tried in the place where the pond prevailing wind carries the smell of it is residential centers.

• Be considered in the construction of the underground runoff not transferred into the lagoons and ponds output of these sources to be disposed of.

• Vernal pools are properly insulated to prevent infiltration to groundwater and waste water and prevent groundwater contamination.

• Install safety warning signs to prevent their use for drinking and recreation

• Qualitative assessment of the input and output control and filtration systemperformance and efficiency and effluent quality

Consideration of salt water

Since the EC is one of the major limitations of the use of these resources, especially at the end

of the basin is in this context it is necessary to pay attention to the following points.

•Complete or near complete crop production potential in the case where the salinity of less than 7.0 dS m, respectively.

•Monitoring of product in salt production, in the middle (between 7.0 to 3 dS m) is possible. The leaching of soil conservation is necessary. Usually effluent fits into this group.

•For water with high salinity (more than 3 dS m) and sensitive plants, increased leaching is not possible because a large amount of water is required. In this case, the product should be changed to adapt to water.

•Very salty water may still be used, but requires a very good permeability soil, plants with very high salt tolerance and high water is necessary for continuous leaching. Large samples in the area around the Persian Gulf Arab states that the method used drip irrigation and leaching by high water salinity is compensated to some extent.

Survey results show that the EC water quality in the usage (farmlands south of Tehran) consists of three categories as follows:

- Between 7.0 to 3 dS m main part includes land south of Tehran.
- More than 3 dS m land area in extreme southern Tehran included.
- Water that is too salty, and the output end of the basin.

It concerns regarding toxic elements

The most important toxic ions present in irrigation, chloride, sodium, and are all found in contaminated water and unconventional. Damage is possible exclusively by one of these or a combination of them take place. Not all products have the same sensitivity to toxicity. The sensitivity of some products in terms of sodium, chloride, and on the steps to be introduced. If the concentration is Smybala plant will be revealed. The problem saline poisoning vary. Plant poisoning in relation to water scarcity does not arise. Poisoning usually occurs when ions are absorbed by the plant with water on their leaves. During transpiration, water is taken and remains ions and these ions gradually accumulate and their toxicity. The degree of damage depends on the time, the concentration of toxic elements, sensitive species and the amount of water used. If enough damage is reduced product consist sprinkler irrigation sodium and chloride ions are absorbed directly by leaves. The risk is when the high temperature and low humidity occur. Speed up and quickly leaves absorb toxic ions, and the ions gather at the source of the poisoning can be taken into account. In addition, sodium, chloride and metals Smybh elements are considered rare component. Urban runoff may be due to urban and industrial waste water received, they contain heavy metals. In the continuation of irrigation water, heavy metals accumulate in the soil and reduced or non-production or cause production to be contaminated products. Examples exploitation of these resources in different areas shows that 85% of heavy metals have accumulated in the soil during tillage operations a year later transferred to the root zone and cause adverse effects on the plant. In any case, every project should be irrigated with contaminated water concentrations of these elements in water and according to the standards presented in the previous chapters, proportional to the concentration of these elements is plants. If the concentration of ions in the water over standards, the need to cultivate inedible species (industrial, commercial and transporters) Grdd.tvjh action results indicate that only in case of heavy metals concentration of one or Two more heavy metal than standard long-term costs of an average, less than is recommended for agricultural use. Thus, according to the Environmental Protection Agency, the restriction of heavy metals for agricultural use these resources not to be found, but whereas the values of the references to international standards (FAO and WHO) investigation is standard, limits for some metals such as cadmium, mercury and chromium were observed.edible for humans, especially vegetables and summer crops (due to the strong desire to heavy metals) is ruled out.

RESULT

The literature review of qualitative studies conducted in the study area is obtained results are as follows :

1. Studies have been mainly on rivers, streams or specific area done.
2. Few studies have been conducted on specific parameters and quality parameters have not been studied comprehensively.
3. Studies conducted in certain time periods (ten years ago) and due to land use changes in Tehran, the results can not be generalized to the status quo.

4. Studies of the distribution of time and therefore not in continuity with previous studies.
5. Case studies demonstrate adverse effects on water resources and soil pollution and contaminated products.
6. The official correspondence and personal visits to departments and public organizations concerned (Organization of Tehran Province Water and Environment) indicates the lack of quality and lack of reliable quantitative monitoring of pollution sources in the area studied.

According to the determined quality of underground water resources in the study area, only relying on existing studies are not possible because of the importance of qualitative research in water resources planning and organizing underground waters south of Tehran, offering a program of regular biopsy , to determine the quality of these water resources is essential. With planning and implementation of a monitoring program to determine the water quality and flows underground branches in Tehran and studied temporal and spatial changes from the starting point to the point of consumption, we can offer appropriate management control, purification of resources (in the required) or planning when and where to use these waters (according to their quality) health and environmental effects. At least be relevant.

The quality standards provided by the use of polluted water sources and results of monitoring the quality of underground water resources Tehran final conclusions regarding the proposed cropping pattern with the limitations of Tehran quality of groundwater resources is as follows :

- The use of this resource for irrigation of green spaces and parks, given the high levels of coliform Fkal (during the year) and the presence of nematode eggs (in the event of the year in some stations) limited quality and safe to use and sustainability of these resources, it is necessary to disinfect and improve the quality of health indicators.
- Due to the high number of Fkal coliform and nematode parasites, the use of these resources for vegetable products and products that are eaten raw in any way not recommended.
- The concentration of heavy metals and heavy metals, according to the EPA mercury, iron, aluminum and manganese in some cases beyond the limit for irrigation of crops and their use should be undertaken with caution and more study .
- used for industrial species forage crops and fruit trees and other fruit is not restricted.
- Due to the increase in salinity at the end of the basin, in the use of resources and attention to the selection of appropriate salt tolerant or irrigation is necessary.

The creation of quality monitoring stations On Line

According to the objectives defined by the qualitative studies organizing groundwater south of Tehran, as well as to ensure the quality of water in the network of rivers and streams this area, particularly in the areas of consumption, the establishment of stations to monitor quality On line as follows the study area is recommended.

First station: Canal Fyrvzabad- Dolatabad Rey

This station is indicative of the quality of irrigation water at the creek Firozabad. The station on the river near the village of Dawlat Abad Firozabad location and average the equivalent of 127 million cubic meters of the creek Firozabad station is estimated.

Second stop: the Shur village Zmanabad

The station after crossing branches VELENJAK, Mqsvdbyk, Jmshdyh channel, Darabad, Eastern Channel, the Sorkhehesar, channel and channel Fajr she has been selected. This point indicates the quality of water in the farmlands south of Tehran salted water right on the river and is near the city of Rey. The average flow rate of 180 million cubic meters Abad took the passion of the proposed station is estimated in the year.

The third station: Ken-tunnel after Yakhchiabad

The station after Diversion Dam Navab and receive e Yakhchi been selected channel. Flow rate is now around 60 million cubic meters per year was estimated in the proposed station Ast.paramtrhay proposed to test the quality of the station are: turbidity, electrical conductivity (EC); heavy metals mercury (Hg), cadmium (Cd), chromium (Cr), lead (Pb) and arsenic (As); organic matter (BOD and COD); nutrients, including total nitrogen (TN) and total phosphorus (TP).

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