

# **A Study on the Origins and Effects of Urban and Industrial Sewages Flowing into the some Villages of Tehran Southern Frontage**

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Received: 20/5/2014      Accepted: 11/8/2014

## **Extended abstract**

### **Introduction**

Growth of population in big cities has enforced their expansion into surrounding lands, often orchards, agricultural fields and natural landscapes. The population growth has inevitably increased demand for drinkable water and has re-directed agricultural waters to counterbalance the shortages. The resultant often untreated sewage, receives other dangerous wastes in its stream to the cities surroundings, endangering life of people residing in outskirts of such big cities. Tehran, Iran as one of these big cities hasn't spared such adverse impact on its surrounding environment.

There has also been an upward trend in demand for clean water in Tehran due to rapid growth of its population. In Tehran province, daily consumption of water reaches to approximately 703 million (M) cubic meters (m<sup>3</sup>). Tehran alone, uses 400 M litres of water daily from which 90 % ends in sewage.

This study was carried out on a section of the lands in Southern part of Tehran along the Rey to Varamin road to evaluate the impact of Tehran sewage on this area. Numerous laboratory reports, performed to measure contamination of underground water, soil and agricultural products were analyzed in this study. Additional information and statistical data, received from Tehran Water and Sewage Organization and Tehran Council, were also included in this analysis.

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### Findings

The study showed that each year over 60M m<sup>3</sup> of raw and 50M m<sup>3</sup> of treated sewage are produced in Tehran. Numerous canals originate locally or from far distances in the city transfer the sewage to the study area. During rainfalls, 7 canals, reaching a length of 25,424 meters, transfer 143 m<sup>3</sup> per second sewage from North Tehran higher grounds to the area. Sixteen smaller canals, each reaching a length of 594 meters, also transfer 13.5 m<sup>3</sup> and 5 m<sup>3</sup> per second sewage in rainy and dry days respectively. In addition, 42 other local canals, each estimated to have a length of 820 meters, carry 8 m<sup>3</sup> per second sewage to this area. Firooz Abad sewage canal, with an output of 6 m<sup>3</sup> per second, stretches from the west, North West, south and south west regions of Tehran to agricultural grounds of Rey province. This canal transfers 210M m<sup>3</sup> of polluted domestic and industrial sewage for irrigation of 7,200 acres of agricultural lands in this area. Tehran oil refinery sewage is also poured into the Firooz Abad sewage canal increasing its pollution. It is estimated that almost near to 46 m<sup>3</sup> of oil leak from Tehran Refinery into ground.

Since the decades that dams were constructed on the rivers of Jajrood and Karaj and many flumes of the area were dried as Tehran and Rey have spread on flumes basic wells, most amount of the polluted water flow to the area is being used for irrigating farmlands. It causes to many health and environmental problems.

### Discussion and conclusion

Expansion of canebrake lands and rise in underground water level are the consequence of uncontrolled release of swage in this area. The level of underground water rise to near the earth surface. The sewage, often untreated, is being used for irrigation of agricultural lands resulting in contamination of the lands, its products and those animals using the lands as grazing grounds. Only in the villages of Najmabad, Nazarabad, Eshabad, Chaltarkhan, Dehkheir and Esmailabad polluted sewage water irrigating more than 3500 hectares of farms for cultivating Corn, wheat, grain, alfalfa and vegetables. Laboratory reports from the cases of water in 34 wells show that only 20 of the cases had the level of pollution less than allowable limit. Study on the soils show that the density of lead and nickel in many parts are 2

times and the density of cadmium is more than 2.5 times more than standard level. For the corns irrigated by sewage in the area, cumulated amount of heavy metals were 5.1 times more than the same corns were irrigated by safe water. In ground waters around the refinery the density of oil measured to 408 mg/l, MTBE to 95 mg/l and COD to 9240 mg/l. Heavy metals remain in soils for years and plants absorb them from soils. They could be transformed to our bodies when we feed from them or from the animals have eaten this polluted grasses. In addition, cultivating of lands endangering health of farmers working on the lands or those living in the surrounding villages. Deterioration of tourist absorbing capacities, changing in cultivated products and in social structure of the population and polluting soils, animals and agricultural products are some important consequences of flowing and using swages in the region.

In conclusion, countries like Iran in which drinkable water resources are scarce and population growth strains the available water resources further, a comprehensive management of waste water should be considered. It is advisable to treat and recycle sewage waters to compensate for shortages of agricultural waters diverted for human consumption.

**Keywords:** Environment, Sewage, Pollution, Irrigation, Rey.

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