

## **The operation assessment of Alborz industrial city wastewater treatment plant for reuse of effluent**

### **Abstract**

**Background:** Our country due to the low rainfalls and unfavorable spatial and temporal distribution among the countries located in the arid and semi-arid. In this situation demand for water is increasing day by day because of population growth, urbanization and the development of agriculture and industry sectors. The use of treated wastewater has increased as an alternative or independent source of water supply in many countries. This global approach is the increasing use of this source of water supply in developing countries and developed.

**Objective:** In this study, the performance of the wastewater treatment plant in Qazvin, Alborz industrial city, was investigated in order to evaluate the quality effluent of wastewater and its re-usability.

**Method:** This study was completed during a nine-month period from November 2015 to July 2016. Ninety samples of wastewater were collected. The values of parameters BOD<sub>5</sub> (using the manometric method), COD (using the closed reflex method, colorimetry with the DR6000 spectrophotometer), TSS (vacuum filtration), TC and FC (by multi-tube fermentation) and heavy metals (Pb, Co, Zn and Cd) were analyzed using atomic absorption spectrometry in accordance with standard methods. The levels of pollutants were evaluated according to the standards of Iran Environmental Protection Agency for discharge to the environment and reuse.

**Results:** The mean concentration of COD in the effluent during autumn, winter and spring were 145.20±52.66 mg/L, 316.50±279.80 mg/L, and 177.00±124.2mg/L, respectively. The average concentration of BOD<sub>5</sub> were found to be 79.40±26.76 mg/L, 154.25±122.86 mg/L, and 72.00±13.74 mg/L. The values of TSS were found in autumn, winter and spring, 68.75±41.45, 106.25±79.86 and 200±31.24 mg/L, respectively. The mean values for total coliform and fecal coliform were 6×10<sup>2</sup> MPN/100 mL and 6.21×10<sup>2</sup> MPN/100 mL, respectively. The average lead and cobalt concentrations were found to be 0.21±0.11 mg/L and 0.004±0.003 mg/L, respectively. The cadmium concentration was reported to be minimal.

**Conclusion:** Current results showed that the wastewater effluent quality the exception of fecal coliform in all seasons and TSS in some months, conformed with EPA's standards for reuse, but the use of wastewater for agriculture, due to the biological and cumulative effect of some elements, should be done based on health principles.

**Keywords:** effluent, industrial wastewater treatment plant, reuse, agriculture, irrigation