

Selenium Removal from Wastewater

CASE STUDY:

SYSTEM PROFILE

A large refinery with a capacity of more than 160,000 barrels of crude oil per day, and a product line including gasoline, diesel, jet fuel, residual fuels and petrochemical feedstocks.

The refinery has a large wastewater treatment system that treats up to 4,500 gallons per minute of general wastewater with a National Pollutant Discharge Elimination System (NPDES) permit through the Ohio Environmental Protection Agency.

OPERATIONAL CHALLENGE

Under the permit, discharged selenium levels into surface water must be less than 12 parts per billion (ppb). Despite a large, complex wastewater treatment system, the refinery was not consistently able to meet this standard.

As an interim step, the refinery rented additional treatment equipment that was expensive to operate and inconsistent in meeting the discharge limit. The situation presented a two-fold need:

- To consistently meet the selenium level concentration of 12 ppb; and
- To determine whether a selenium abatement process could be found that would reduce costs to operate the wastewater treatment system.

CHEMICAL SOLUTION

Kroff Facilities Services, Inc. (KFS) engineered a treatment program to remove selenium via an absorption process. The goal of the program was to either eliminate or significantly minimize the use of treatment chemicals, thereby reducing operating costs.

- Laboratory bench test results indicated that selenium removal was adequate and on-site pilot testing would be appropriate. The onsite test demonstrated that selenium removal was effective to concentrations well below the discharge requirements and well below the current method.

BOTTOM-LINE RESULTS

- Following these successful phases of testing, KFS was able to construct a cost-effective operating package that ensures selenium concentrations in discharged water meet acceptable EPA levels.



Kroff Facilities Services, Inc. enables plant managers to place the responsibility for water treatment and environmental compliance into the hands of water treatment experts for professional management.

Plant managers who outsource to the KFS team of consultants and engineers can focus on core competencies and remain confident that water and wastewater treatment facilities are expertly managed.

Beyond providing chemicals, KFS offers clients the knowledge and experience to design, build, own, operate and maintain water and wastewater treatment and to recycle industrial byproducts, including waste oil.