Clean Water
State Revolving Fund

CITY OF NORMAN, OKLAHOMA WATER RECLAMATION FACILITY
LAND APPLICATION OF BIOSOLIDS AND YARD WASTE COMPOST DEMONSTRATION PROJECT

Emerging Contaminants:
Pharmaceuticals and personal care products (PPCPs), microplastics, and PFAS

Project Type:
Biosolids demonstration

The City of Norman Water Reclamation Facility (NWRF) serves a population of over 100,000 including the University of Oklahoma and can treat 17 million gallons per day of wastewater for discharge to the North Canadian River. NWRF's current wastewater treatment consists of fixed film and activated sludge processes followed by secondary clarification. For solids treatment, NWRF uses a series of anaerobic digestors followed by centrifuges for dewatering. Digested and dewatered biosolids are then hauled to locations to be land-applied. The City also operates a yard waste recycling program for leaves, grass clippings, and tree branches.

The City conducted multiple sampling campaigns between 2016 and 2022 in which they detected several pharmaceuticals and personal care products (PPCPs, including ibuprofen, acetaminophen, and DEET), microplastics, and PFAS in NWRF's liquid treatment processes. These contaminants are likely present in NWRF's biosolids, which are currently land-applied in fields within the watershed of the City's drinking water supply. The City of Norman is interested in strategies to reduce the presence of emerging contaminants in runoff and groundwater near the land application sites and is considering the benefits of co-composting the biosolids with yard waste from a City-owned recycling facility adjacent to NWRF.

The City is seeking to use Clean Water State Revolving Fund (CWSRF) emerging contaminants funding to conduct a 12-month study of emerging contaminants through the wastewater treatment process. This effort will include a mesocosm study to evaluate the fate and transport of the emerging contaminants after simulated land application of three different materials. The materials include dewatered, digested biosolids, composted yard waste, and co-composted biosolids and yard waste. Weekly sampling will evaluate the presence of PPCPs and microplastics in the test bed soil, vegetation, and runoff. The study's findings will help NWRF determine whether co-composting can be an effective means to reduce potential contamination of the City's drinking water supply or whether additional solids treatment is merited before land application to reduce emerging contaminants.

Eligibilities:

Per Section 603(c)(1) of the Clean Water Act (CWA), the construction of a capital project at a publicly owned treatment works is eligible. The proposed project is to evaluate the disposal of biosolids at the treatment facility in collaboration with the yard waste recycling program and to determine whether further solids treatment is required.

To be eligible for the CWSRF emerging contaminants funds:

1. The presence of an emerging contaminant(s) needs to be confirmed. Previous monitoring campaigns detected PPCPs and microplastics in NWRF's liquid treatment processes.
2. A capital project needs to be identified. The proposed biosolids study will help the City understand the fate of emerging contaminants in the solids treatment process to inform the need for additional solids treatment and future capital projects.
3. Monitoring proposed as part of a project needs to be integral to capital project development. The project monitoring will help the City understand the concentration and occurrence of the emerging contaminants and help to properly design improvements to the solids treatment process.

All of the above make the proposed project eligible for CWSRF emerging contaminants funds.