

Water Recycling Evaluation

HIGHLIGHTS

- Planning for use of treated effluent for power generation operations.
- First water recycling project of this size in Nebraska.
- Collaborative effort between City and utility.
- Complex supply and treatment issues.

Prompted by the lack of an adequate water supply for cooling tower and boiler operations, the Lincoln Electric System (LES) approached the Lincoln Wastewater System (LWS) about the possibility of using treated wastewater effluent from the 8-mgd Northeast Wastewater Treatment Plant (NEWWTP) for process use at a future, LES-owned power generation station. The generation facility is currently under design and will be constructed in four, 150-MW phases. It will have an initial total water demand of 1.61 mgd with an ultimate need of 6.45 mgd.

LES's planned approach includes pumping conventionally-treated effluent from the NEWWTP to the power generating facility where it would be stored and used as required for power generation operations. In addition to the supply transmission system, a gravity sewer would serve as a return line to the plant for spent waste streams resulting from the power generating operations. These waste streams would then be reprocessed and/or discharged.

Carollo performed a preliminary evaluation of the planning project in order to identify elements warranting further study. This evaluation identified potential concerns relating to the supply of treated water to LES, the return of used water to the treatment facility, and stream discharge. The evaluation led to further investigation by both entities and resulted in the resolution of issues relating to:

- ▶ The impact of return flows from LES to the NEWWTP due to flow, biochemical oxygen demand (BOD), total suspended solids (TSS), and biostimulatory nutrients.
- ▶ The impact of biocidal and chemical additions in the return flows on treatment plant operations and/or effluent toxicity.
- ▶ Recirculation of total dissolved solids (TDS) within the LES-NEWWTP transmission and return systems.

As a result of the evaluation, Lincoln has determined that reuse is a viable alternative to discharge to Salt Creek and has initiated negotiations for an Agreement of Understanding with LES for use of NEWWTP

effluent. Lincoln has also initiated discussions with appropriate regulatory agencies and has identified other potential agricultural and landscape irrigation users.



The Lincoln water recycling evaluation considered reuse potential for power generation operations and irrigating soccer fields at the Abbott Sports Complex.

