

KWPCRF Cost and Effectiveness Supporting Information Form
(Mechanical Wastewater Treatment Svstems)
KWPCRF Project No. C20 1812 01

The Water Resources Reform and Development Act (WRRDA) includes the following Section 602(B)(13) applicable to the state Clean Water SRF beginning October 1, 2015

“Section 602 (B) (13) – beginning in fiscal year 2016, the State will require as a condition of providing assistance to a municipality or intermunicipal, interstate, or State agency that the recipient of such assistance certify, in a manner determined by the Governor of the State, that the recipient –

- (A) has studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is sought under this title; and
- (B) has selected, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account –
 - (i) the cost of constructing the project or activity;
 - (ii) the cost of operating and maintaining the project or activity over the life of the project or activity; and
 - (iii) the cost of replacing the project or activity”

This four page support memo provides the necessary certifications review statements as required by the KWPCRF to document this “cost and effectiveness” review requirement for the referenced project. In each case the City/Applicant must check the applicable statements as listed below, and indicate “NA” for any subjects Not Applicable to the KWPCRF project as funded.

1. Major Sewer Rehabilitation

X The project does not include any sewer line or manhole rehabilitation measures.

_____ The project includes sewer line and/or manhole rehabilitation. As per KDHE program direction, reducing sewage flows by reducing I/I in the collection system will inherently reduce energy use by reducing pumping costs and costs of treatment. A detailed analysis is not needed and was not prepared.

_____ There is no water use by gravity sewers. A detailed analysis is not needed and was not prepared.

2. Sewage Pumping Stations

X The project does not include any sewage pumping stations construction or rehabilitation. As per KDHE program direction the necessary capacity for pumping is determined by peak design sewage flow and the specific

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head conditions which then dictate energy use needs for pumping. A detailed analysis is not needed and was not prepared.

_____ The design is encouraged to incorporate VFDs on the pump motors. (Check the space if VFDs are included in the design.)

_____ The design is encouraged to incorporate high efficiency design motors (NEMA Premium Efficiency) (note, smaller Hp motors may not be available as high efficiency designs). (Check the space if high efficiency design motors are included in the design.)

_____ There is no potable water use at these sewage pumping stations, except perhaps wash down at larger stations. Wherever potable water supply is provided to a sewage pumping station, backflow prevention must be provided in the design and construction. (Check the space if potable water supply to a sewage pumping station with backflow prevention is included in the design.)

3. Regionalization

_____(NA)_____ The Preliminary Engineering Report (PER) must give serious consideration to abandoning the existing WWTP, if regionalization with a nearby wastewater treatment facility is at all feasible. A review has been completed and submitted to KDHE within the PER.

4. Mechanical Wastewater Treatment Systems (i.e., activated sludge) – There are many opportunities to conserve electricity, conserve natural gas for building space heating, maximize aeration efficiency, maximize nitrate oxygen recovery, and (at the larger flow facilities) provide non-potable reuse of effluent in the on-site processes or by off-site irrigation reuse, all while improving nitrogen removal and phosphorus removal. A somewhat lengthy presentation written analysis received and approved by KDHE will be required for mechanical plant designs including –

A. _____ Although natural gas and motor fuel have recently reduced in price, electricity is going up in price, and water is always a precious commodity in Kansas.

B. (NA)_____ The design has considered the use of VFDs for influent pumping, and reviewed the opportunity for variable influent pumping rates in the process design. (Check the space if VFDs are included in the design.)

C. X_____ The design is encouraged and has considered the use of high efficiency design motors (NEMA Premium Efficiency) (note, smaller Hp motors may not be available as high efficiency designs). (Check the space if high efficiency design motors are included in the design.)

D. (NA)_____ The opportunities to “re-purpose” any existing buildings into “cold storage”, without heat or potable water service has been reviewed.

E. (NA)_____ The opportunities to utilize and/or replace all lighting with LEDs and/or CFLs has been reviewed. The following lighting fixtures have not been replaced or converted to LED lighting with an explanation attached of why this improvement is not implemented. _____

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F. X The opportunities to provide the use of VFDs on all electric motors has been reviewed. The following electric motors do not include the use of VFDs with an explanation attached listing the motors and explaining why these do not have VFDs implemented into the design and use.
Recirculation Pump (Pump will not be replaced only rebuilt and reinstalled)

G. X The opportunities to replace motors with high efficiency design motors (NEMA Premium Efficiency) has been reviewed. The following electric motors do not provide NEMA Premium Efficiency design; an explanation is attached listing the motors and explaining why these do not have NEMA Premium Efficiency design implemented into the design and use.
(note, smaller Hp motors may not be available as high efficiency designs).
Recirculation Pump (Pump will not be replaced only rebuilt and reinstalled)

H. (NA) The need for potable water use in the treatment processes has been reviewed, versus the provision of non-potable effluent water re-use on-site.

I. X The design includes a new building(s). The justification for the need for the additional heated and air conditioned space (if provided) is attached, and the need for potable water service to the new building(s) (if provided) is attached.

J. (NA) The opportunities for off-site effluent irrigation reuse, or industrial non-potable reuse, have been reviewed in the PER. (Please list any off-site reuse opportunities that will be implemented. _____)

K. (NA) Implementation of de-nitrification biological treatment processes following nitrification to remove ammonia is required and has been provided in the design to recover the energy benefit of chemically bound oxygen within the nitrate (NO₃).

L. (NA) Computer controls for aeration and denitrification systems including DO probes, ORP probes, nitrate (NO₃) probes, etc., with SCADA, PLC, LC, or time clock controls to maximize the pollutant removal efficiency and energy efficiency of the treatment processes are required and provided in the design, as determined appropriate by the design engineer (a climate controlled room or small building may be required for the SCADA electronics and computer controls).

M. (NA) Computer controls for chemical feed systems (including flow measurement if needed) with SCADA, PLC, LC, or time clock controls to maximize the pollutant removal efficiency and energy efficiency of the treatment processes are required and provided in the design, as determined appropriate by the design engineer (a climate controlled room or small building may be required for the SCADA, electronics, computer controls, and chemical storage).

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N. (NA) A review of the cost and efficiency of phosphorus removal by pretreatment at any large discharge of phosphorus into the collection system versus “end-of-pipe” treatment at the municipal wwtp is required and has been provided in the PER. (Please list any phosphorus pretreatment opportunities that were considered, and identify those that will be implemented. _____).

O. (NA) A review of the cost and efficiency of bio-P versus chem-P phosphorus reduction processes to implement the most efficient combination of processes to reduce phosphorus in the effluent is required, including a 20 year cost-effectiveness analysis comparing the phosphorus treatment alternatives, is required. The cost and efficiency analysis was provided in the PER, or is attached.

P. (NA) Other concepts and considerations as proposed by the applicant and consulting engineer can be presented in the PER or the design for consideration. Those additional concepts and considerations that will be implemented are as follows: _____

Attachment(s)