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Kansas
Susan Mosier, MD, Secretary | Department of Health & Environment | Sam Brownback, Governor

MEMORANDUM

DATE: February 1, 2016

TO: Ellis 2.1 File
KWPCRF Project No.: C20 1988 01

FROM: Rod Geisler, PE, Chief
Municipal Programs Section.

SUBJECT: Ellis, Kansas
Project to Upgrade Existing Wastewater Treatment Facility
EPA Green Project Reserve

The Federal Clean Water SRF funding provided in FFY 2012 and subsequent years requires a certain percentage of federal funding be targeted to provide for "Green Project Reserve" (GPR) designs. EPA wrote new guidance to define qualifying uses for the Green Project Reserve requirements for the FFY 2012 funding which has been carried forward through FFY 2015 program funding. As stated on page 1, paragraph "II. GPR Goals." The "intent" is "to guide funding toward projects that…enhance water and energy conservation…". The project at Ellis, Kansas, achieves this goal by substantially reducing energy usage in the wastewater treatment process by upgrading the existing treatment processes and infrastructure with SCADA controls, which will also enhance nutrient reduction. The loan agreement is dated Effective as of March 14, 2015.

The project being funded will construct a new SCADA system for the existing biological treatment process (extended aeration activated sludge basin with anaerobic and anoxic chambers designed for biological nutrient removal) with addition of a new climate controlled building to house the SCADA at the present facility. A review of the GPR guidance as presented below indicates this project meets the requirements to qualify as a Green Project Reserve project in accordance with these Federal guidelines.

0.1 All GPR projects must otherwise be eligible for CWSRF funding.

- The project at Ellis is eligible.

0.2 All Section 212 projects must be consistent with the definition of "treatment works" as set forth in Section 212 of the Clean Water Act (CWA).

- The project at Ellis is a "Section 212" project, the wastewater treatment plant is publicly owned, and the project will have a direct water quality benefit by improving the efficiency and nutrient reduction operations of the existing treatment process.

0.3 Eligible non-point source projects…

- NA. This is not a non-point source project.

0.4 Eligible projects under Section 320…

- NA. This is not a Section 320 project.

0.5 GPR projects must meet the definition of one of the four GPR categories.

- See below

0.6 GPR project must further the goals of the Clean Water Act.

- This project further the goals of the CWA.

CWSRF Technical Guidance

1.0 Green infrastructure
- NA

2.0 Water Efficiency

- NA

3.0 Energy Efficiency

3.1 Definition: Energy efficiency is the use of improved technologies and practices to reduce the energy consumption of water quality projects, use energy in a more efficient way, and/or produce/utilize renewable energy.

- The project at Ellis achieves this goal by reducing energy consumption in wastewater treatment and while improving nutrient reduction in the effluent.

3.2 Categorical Projects

3.2.1 Renewable energy projects such as wind, solar, geothermal, micro-hydroelectric, and biogas combined heat and power systems (CHP) that provide power to a POTW. (http:///www.epa.gov/cleanenergy). Micro-hydroelectic projects involve capturing the energy from pipe flow.

- NA

3.2.2 Projects that achieve a 20% reduction in energy consumption are categorically eligible for GPR[4]. Retrofit projects should compare energy used by the existing system or unit process to the proposed project. The energy used by the existing system should be based on name plate data when the system was first installed, recognizing that the old

system is currently operating at a lower overall efficiency than at the time of installation. New POTW projects or capacity expansion projects should be designed to maximize energy efficiency and should select high efficiency premium motors and equipment where cost effective. Estimation of the energy efficiency is necessary for the project to be counted toward GPR. If a project achieves less than a 20% reduction in energy efficiency, then it may be justified using a business case.

[4]The 20% threshold for categorically eligible CWSRF energy efficiency projects was derived from a 2002 Department of Energy study entitled *United States Industrial Electric Motor Systems Market Opportunities Assessment, December 2002* and adopted by the Consortium for Energy Efficiency. Further field studies conducted by Wisconsin Focus on Energy and other States programs support the threshold.
[5]A unit process is a portion of the wastewater system such as the collection system, pumping stations, aeration system, or solids handling, etc.

- The project at Ellis meets this GPR qualifying criteria as the consulting engineer has presented information in the Facility Plan which allows a comparison of energy use of the existing wastewater treatment facility processes and equipment to the treatment processes and equipment energy use with the SCADA system upgrade. A copy of the calculations memo as prepared by KDHE staff is attached to this memo. Excerpts from the Facility Plan are also attached.

The consulting engineer has compared energy use in the form of electricity by the "common denominator" of KWH per MGD of sewage treated. The current treatment system blowers use 156,285 KWH of electricity per year, costing $39,796 per year. The upgraded treatment process is designed and estimated to reduce electricity use by 62,514 KWH per year, saving $11,940 per year. By these numbers, the project at Ellis will reduce energy usage costs for aeration and mixing by 30%, which exceeds the minimum 20% threshold in the EPA guidance for a "categorical" GPR project determination.

3.2-3 Collection system Infiltration/Inflow (I/I) detection equipment

- NA

3.2.4 POTW energy management planning…

- NA, although the cost of Facility Planning is an allowable cost of the KWPCRF funded project.

3.3 Projects that do not meet the definition of Energy Efficiency.

- NA

3.4 Decision Criteria for Business Cases

- NA

3.5 Examples of Projects Requiring a Business Case

- NA

4.0 Environmentally Innovative

- NA

Therefore, the project at Ellis meets the EPA definition of being “categorically” green. The estimated construction cost of the energy reducing SCADA portions of the project is $520,000, and a copy of the cost estimate from the Facility Plan is attached. Only the SCADA portions of the entire project cost are considered as qualifying costs under the EPA Green Project Reserve.

Attached
1 pp Calculations Memo
3 pp of the Preliminary Engineering Report
6 pp of the 2012 EPA GPR Guidance

Pc: Frank Weinhold
Rod Geisler

2/1/16

2/15 GAR

SCADA Capital Costs $880,110 (need bldg)

$39,796 Elec Bill for year Jan 2014 WSU Report

SCADA Blower Oper - Reduce Elec Use Est $5,970

X2 = $11,940

11,940/39,796 = 30.00%

~~Est~~ TN 13.84 mg/L ann. ave. prior year

Big Oxpor Density here

VFD's + SCADA

Nat Gas Heat new Bldg (good!)

Constr Cost Est - $520,000

Rod Larson

2/1/16

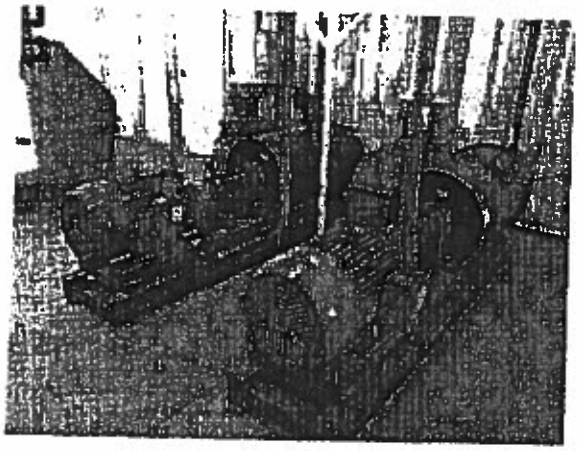
PRELIMINARY ENGINEERING REPORT

City of Ellis, Kansas

Wastewater Treatment Facility Study

October 2014
14-600-513-00

and a SCADA system, or at least a PLC, to monitor changes in DO and to modify the amount of air supplied to the basins.



Two 60 hp Blowers

The opportunity for energy savings is by providing computerized operational controls to both reduce unnecessary dissolved oxygen in the basin, and also to "recover" oxygen from nitrate (NO3), which is formed as a result of the oxidation of ammonia (NH3). Please note one pound of NO3 is the functional equivalent of 2.9 pounds of D.O. in the activated sludge mixed liquor. A summary of effluent data from this facility for ammonia (NH3), nitrate + nitrite (NO3 + NO2), and total nitrogen (TN) is attached for information. The average TN in the effluent over the past two years is 13.84 mg/l. Please note that at the average daily actual flow of 0.136 MGD this calculates to 15.2 pounds per day of TN, and an equivalent of 45.5 pounds per day of D.O. Effluent total phosphorus (TP) information is also provided. In similar design wastewater treatment systems in Kansas, optimization of computerized operational controls have not only reduced energy usage but also reduced effluent nitrate to less than 3 mg/l and reduced total nitrogen to less than 5 mg/l, while some systems also significantly reduce total phosphorus.

It is estimated that each blower uses approximately 156,285 kWh per year, and has an operational cost of approximately $14,925 per year. It is estimated that equipping the blowers with VFDs would reduce energy consumption of the blowers by 40%, for a reduction of 62,514 kWh per blower, or a savings of approximately $5,970 per year per blower.

It is estimated that purchasing two VFDs for the blowers would cost approximately $6,600 each, plus installation costs. To optimize the treatment process, it is also recommended that DO probes be installed in each of the five basins that utilize aeration. The cost of installing each DO probe is estimated to be $1,500, for a total of cost of $7,500 if DO probes are placed in all five basins, plus installation and programing. An additional PLC may also be required to provide programming for the VFDs and valves. If one is needed, it is estimated to cost $1,200. An optimized system utilizing VFDs on the blowers and DO probes is estimated to cost approximately $21,900, plus installation and programming costs. With an estimated savings of $11,940 per year, the payback period for these improvements would only be 1.8 years. In order to fully optimize treatment and DO levels, it might also be necessary to install control valves on the aeration header in order to direct the location where air is supplies. The city may need to hire a consulting engineer to complete the design and provide installation oversight.

first stage aeration. It is assumed that if the DO requirements of the first stage aerator were met,

Table 5.1 Capital Costs

Description	Qty	Unit	Unit Price	Extension
General Improvements				
Mobilization & Construction Staking	1	L.S.	$25,000.00	$25,000
Site Piping	1	L.S.	$18,000.00	$18,000
Site Electrical	1	L.S.	$44,000.00	$44,000
Electric Utility Upgrades	1	L.S.	$15,000.00	$15,000
Relocation of Existing Piping & Appurtenances	1	L.S.	$17,000.00	$17,000
Site Demolition	1	L.S.	$12,000.00	$12,000
Coordination of Facility during Construction/Startup	1	L.S.	$9,500.00	$9,500
Nutrient Discharge Compliance / Energy Savings with the Aeration System Blowers				
Aero-Mod Aeration Equipment	1	L.S.	$78,000.00	$78,000
Aero-Mod Electrical & Controls Equipment	1	L.S.	$87,000.00	$87,000
Aero-Mod Curtain Wall - First Stage Aeration Basin	1	L.S.	$35,000.00	$35,000
Pre-Engineered Metal Covering for Aeration Equipment	1	L.S.	$10,000.00	$10,000
Concrete for Aeration Equipment	1	L.S.	$8,500.00	$8,500
Piping Modifications for Aeration Equipment	1	L.S.	$5,500.00	$5,500
Chemical Feed Addition	1	L.S.	$25,000.00	$25,000
Existing Blower Removal/Demolition	1	L.S.	$18,500.00	$18,500
Eliminate Constant Holding Basin / Final Clarifier Overflow to Influent Pumping Station				
Holding Basin / Final Clarifier Improvements	1	L.S.	$14,000.00	$14,000
Actual Effluent Discharge Quantity Measurement				
Flow Metering Structure	1	L.S.	$15,000.00	$15,000
Flow Metering Equipment	1	L.S.	$11,000.00	$11,000
Electrical & Controls	1	L.S.	$3,200.00	$3,200
SCADA System Implementation				
Supervisory Control Data Acquisition (SCADA)				
Existing Pump House Control Modifications	1	L.S.	$17,500.00	$17,500
Pre-negotiated SCADA Equipment	1	L.S.	$85,000.00	$85,000
Pre-negotiated Equipment Installation	1	L.S.	$20,000.00	$20,000
Office/Laborartory				
Pre-Engineered Metal Building/Foundation	825	S.F.	$50.00	$41,250
Doors, Masonry, Painting, Etc.	825	S.F.	$27.00	$22,275
Plumbing, HVAC, Electrical, Laboratory Equipment	825	S.F.	$47.00	$38,775
Office Furniture	1	L.S.	$12,500.00	$12,500
Utility Service (Water, Sewer, Communication, Etc.)	1	L.S.	$4,500.00	$4,500
TOTAL Estimated Construction Cost				$693,000
Contingency				$69,300
Bonds & Insurance				$13,860
Engineering, Legal, Admin., etc.				$103,950
TOTAL Estimated Project Cost				$880,110

C. Operation and Maintenance Costs

Table 5.2 outlines the estimated annual operation and maintenance costs for the improvements recorded in Table 5.1.

2012 Policy

ATTACHMENT 2

2012 Clean Water State Revolving Fund
10% Green Project Reserve:
Guidance for Determining Project Eligibility

I. Introduction: The Fiscal Year (FY) 2012 Appropriation Act (P.L. 112-74) included additional requirements affecting the Clean Water State Revolving Fund (SRF) program. This attachment is included in the *Procedures for Implementing Certain Provisions of EPA's Fiscal Year 2012Appropriation Affecting the Clean Water and Drinking Water State Revolving Fund Programs*. This attachment includes the details for determining green project reserve (GPR) eligibility for the Clean Water SRF program.

Public Law 112-74 states: "*Provided*, That for fiscal year 2012, to the extent there are sufficient eligible project applications, not less than 10 percent of the funds made available under this title to each State for Clean Water State Revolving Fund capitalization grants shall be used by the State for projects to address green infrastructure, water or energy efficiency improvements, or other environmentally innovative activities." These four categories of projects are the components of the Green Project Reserve (GPR).

II. GPR Goals: Congress' intent in enacting the GPR is to direct State investment practices in the water sector to guide funding toward projects that utilize green or soft-path practices to complement and augment hard or gray infrastructure, adopt practices that reduce the environmental footprint of water and wastewater treatment, collection, and distribution, help utilities adapt to climate change, enhance water and energy conservation, adopt more sustainable solutions to wet weather flows, and promote innovative approaches to water management problems. Over time, GPR projects could enable utilities to take savings derived from reducing water losses and energy consumption, and use them for public health and environmental enhancement projects. Additionally, EPA expects that green projects will help the water sector improve the quality of water services without putting additional strain on the energy grid, and by reducing the volume of water lost every year.

III. Background: For the FY 2010 GPR Guidance, EPA used an inclusive approach to determine what is and is not a 'green' water project. Wherever possible, this guidance references existing consensus-based industry practices to provide assistance in developing green projects. Input was solicited from State-EPA and EPA-Regional workgroups and the water sector. EPA staff also reviewed approaches promoted by green practice advocacy groups and water associations, and green infrastructure implemented by engineers and managers in the water sector. EPA also assessed existing 'green' policies within EPA and received input from staff in those programs to determine how EPA funds could be used to achieve shared goals.

The FY 2012 SRF GPR Guidance provides States with information needed to determine which projects count toward the GPR requirement. The intent of the GPR Guidance is to describe projects and activities that fit within the four specific categories listed in the FY 2012

2012 Policy

CWSRF Eligibility Principles

State SRF programs are responsible for identifying projects that count toward GPR. The following overarching principles, or decision criteria, apply to all projects that count toward GPR and will help states identify projects.

0.1 All GPR projects must otherwise be eligible for CWSRF funding. The GPR requirement does not create new funding authority beyond that described in Title VI of the CWA. Consequently, a subset of 212, 319 and 320 projects will count towards the GPR. The principles guiding CWSRF funding eligibility include:

0.2 All Sec 212 projects must be consistent with the definition of "treatment works" as set forth in section 212 of the Clean Water Act (CWA).

- 0.2-1 All section 212 projects must be publicly owned, as required by CWA section 603(c)(1).
- 0.2-2 All section 212 projects must serve a public purpose.
- 0.2-3 POTWs as a whole are utilized to protect or restore water quality. Not all portions of the POTW have a direct water quality impact in and of themselves (i.e. security fencing). Consequently, POTW projects are not required to have a direct water quality benefit, though most of them will.

0.3 Eligible nonpoint source projects implement a nonpoint source management program under an approved section 319 plan or the nine element watershed plans required by the 319 program.

- 0.3-1 Projects prevent or remediate nonpoint source pollution.
- 0.3-2 Projects can be either publicly or privately owned and can serve either public or private purposes. For instance, it is acceptable to fund land conservation activities that preserve the water quality of a drinking water source, which represents a public purpose project. It is also acceptable to fund agricultural BMPs that reduce nonpoint source pollution, but also improve the profitability of the agricultural operation. Profitability is an example of a private purpose.
- 0.3-3 Eligible costs are limited to planning, design and building of capital water quality projects. The CWSRF considers planting trees and shrubs, purchasing equipment, environmental cleanups and the development and initial delivery of education programs as capital water quality projects. Daily maintenance and operations, such as expenses and salaries are not considered capital costs.
- 0.3-4 Projects must have a direct water quality benefit. Implementation of a water quality project should, in itself, protect or improve water quality. States should be able to estimate the quantitative and/or qualitative water quality benefit of a nonpoint source project.
- 0.3-5 Only the portions of a project that remediate, mitigate the impacts of, or prevent water pollution or aquatic or riparian habitat degradation should be funded. Where water quantity projects improve water quality (e.g. reduction of flows from impervious surfaces that adversely affect stream health, or the modification of irrigation systems to reduce runoff and leachate from irrigated lands), they would

be considered to have a water quality benefit. In many cases, water quality protection is combined with other elements of an overall project. For instance, brownfield revitalization projects include not only water quality assessment and cleanup elements, but often a redevelopment element as well. Where the water quality portion of a project is clearly distinct from other portions of the project, only the water quality portion can be funded by the CWSRF.

0.3-6 Point source solutions to nonpoint source problems are eligible as CWSRF nonpoint source projects. Section 319 Nonpoint Source Management Plans identify sources of nonpoint source pollution. In some cases, the most environmentally and financially desirable solution has point source characteristics and requires an NPDES discharge permit. For instance, a septage treatment facility may be crucial to the proper maintenance and subsequent functioning of decentralized wastewater systems. Without the septage treatment facility, decentralized systems are less likely to be pumped, resulting in malfunctioning septic tanks.

0.4 Eligible projects under section 320 implement an approved section 320 Comprehensive Conservation Management Plan (CCMP).

0.4-1 Section 320 projects can be either publicly or privately owned.

0.4-2 Eligible costs are limited to capital costs.

0.4-3 Projects must have a direct benefit to the water quality of an estuary. This includes protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife, and allows recreational activities, in and on water, and requires the control of point and nonpoint sources of pollution to supplement existing controls of pollution.

0.4-4 Only the portions of a project that remediate, mitigate the impacts of, or prevent water pollution in the estuary watershed should be funded.

0.5 GPR projects must meet the definition of one of the four GPR categories. The Individual GPR categories do not create new eligibility for the CWSRF. The projects that count toward GPR must otherwise be eligible for CWSRF funding.

0.6 GPR projects must further the goals of the Clean Water Act.[1]

[1] Drinking Water Utilities can apply for CWSRF funding

2.2-5 Water audit and water conservation plans, which are reasonably expected to result in a capital project.

2.2-6 Recycling and water reuse projects that replace potable sources with non-potable sources,

2.2-6a Gray water, condensate and wastewater effluent reuse systems (where local codes allow the practice)

2.2-6b Extra treatment costs and distribution pipes associated with water reuse.

2.2-7 Retrofit or replacement of existing landscape irrigation systems with more efficient landscape irrigation systems, including moisture and rain sensing equipment.

2.2-8 Retrofit or replacement of existing agricultural irrigation systems with more efficient agricultural irrigation systems.

2.3 Projects That Do Not Meet the Definition of Water Efficiency

2.3-1 Agricultural flood irrigation.

2.3-2 Lining of canals to reduce water loss.

2.3-3 Replacing drinking water distribution lines. This activity extends beyond CWSRF eligibility and is more appropriately funded by the DWSRF.

2.3-4 Leak detection equipment for drinking water distribution systems, unless used for reuse distribution pipes.

2.4 Decision Criteria for Business Cases

2.4-1 Water efficiency can be accomplished through water saving elements or reducing water consumption. This will reduce the amount of water taken out of rivers, lakes, streams, groundwater, or from other sources.

2.4-2 Water efficiency projects should deliver equal or better services with less net water use as compared to traditional or standard technologies and practices

2.4-3 Efficient water use often has the added benefit of reducing the amount of energy required by a POTW, since less water would need to be collected and treated; therefore, there are also energy and financial savings.

2.5 Examples of Projects Requiring a Business Case.

2.5-1 Water meter replacement with traditional water meters (see AWWA M6 *Water Meters – Selection Installation, Testing, and Maintenance*).

2.5-2 Projects that result from a water audit or water conservation plan

2.5-3 Storage tank replacement/rehabilitation to reduce loss of reclaimed water.

2.5-4 New water efficient landscape irrigation system (where there currently is not one).

2.5-5 New water efficient agricultural irrigation system (where there currently is not one).

3.0 ENERGY EFFICIENCY

3.1 Definition: Energy efficiency is the use of improved technologies and practices to reduce the energy consumption of water quality projects, use energy in a more efficient way, and/or produce/utilize renewable energy.

3.2 Categorical Projects

3.2-1 Renewable energy projects such as wind, solar, geothermal, micro-hydroelectric, and biogas combined heat and power systems (CHP) that provide power to a POTW. (http:///www.epa.gov/cleanenergy). Micro-hydroelectric projects involve capturing the energy from pipe flow.

3.2-1a POTW owned renewable energy projects can be located onsite or offsite.

3.2-1b Includes the portion of a publicly owned renewable energy project that serves POTW's energy needs.

3.2-1c Must feed into the grid that the utility draws from and/or there is a direct connection.

3.2-2 Projects that achieve a 20% reduction in energy consumption are categorically eligible for GPR[4]. Retrofit projects should compare energy used by the existing system or unit process[5] to the proposed project. The energy used by the existing system should be based on name plate data when the system was first installed, recognizing that the old system is currently operating at a lower overall efficiency than at the time of installation. New POTW projects or capacity expansion projects should be designed to maximize energy efficiency and should select high efficiency premium motors and equipment where cost effective. Estimation of the energy efficiency is necessary for the project to be counted toward GPR. If a project achieves less than a 20% reduction in energy efficiency, then it may be justified using a business case.

3.2-3 Collection system Infiltration/Inflow (I/I) detection equipment

3.2-4 POTW energy management planning, including energy assessments, energy audits, optimization studies, and sub-metering of individual processes to determine high energy use areas, which are reasonably expected to result in a capital project are eligible. Guidance to help POTWs develop energy management programs, including assessments and audits is available at http://www.epa.gov/waterinfrastructure/pdfs/guidebook_si_energymanagement.pdf.

3.3 Projects That Do Not Meet the Definition of Energy Efficiency

3.3-1 Renewable energy generation that is *privately* owned or the portion of a publicly owned renewable energy facility that does not provide power to a POTW, either through a connection to the grid that the utility draws from and/or a direct connection to the POTW.

3.3-2 Simply replacing a pump, or other piece of equipment, because it is at the end of its useful life, with something of average efficiency.

3.3-3 Facultative lagoons, even if integral to an innovative treatment process.

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[4] The 20% threshold for categorically eligible CWSRF energy efficiency projects was derived from a 2002 Department of Energy study entitled *United States Industrial Electric Motor Systems Market Opportunities Assessment, December 2002* and adopted by the Consortium for Energy Efficiency. Further field studies conducted by Wisconsin Focus on Energy and other State programs support the threshold.

[5] A unit process is a portion of the wastewater system such as the collection system, pumping stations, aeration system, or solids handling, etc.

3.3-4 Hydroelectric facilities, except micro-hydroelectric projects. Micro-hydroelectric projects involve capturing the energy from pipe flow.

3.4 Decision Criteria for Business Cases

3.4-1 Project must be cost effective. An evaluation must identify energy savings and payback on capital and operation and maintenance costs that does not exceed the useful life of the asset. http://www.epa.gov/waterinfrastructure/pdfs/guidebook_si_energymanagement.pdf

3.4-2 The business case must describe how the project maximizes energy saving opportunities for the POTW or unit process.

3.4-3 Using existing tools such as Energy Star's Portfolio Manager (http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager) or Check Up Program for Small Systems (CUPSS) (http://www.epa/cupss) to document current energy usage and track anticipated savings.

3.5 Examples of Projects Requiring a Business Case

3.5-1 POTW projects or unit process projects that achieve less than a 20% energy efficiency improvement.

3.5-2 Projects implementing recommendations from an energy audit that are not otherwise designated as categorical.

3.5-3 Projects that cost effectively eliminate pumps or pumping stations.

3.5-4 Infiltration/Inflow (I/I) correction projects that save energy from pumping and reduced treatment costs and are cost effective.

3.5-4a Projects that count toward GPR cannot build new structural capacity. These projects may, however, recover existing capacity by reducing flow from I/I.

3.5-5 I/I correction projects where excessive groundwater infiltration is contaminating the influent requiring otherwise unnecessary treatment processes (i.e. arsenic laden groundwater) and I/I correction is cost effective.

3.5-6 Replacing pre-Energy Policy Act of 1992 motors with National Electric Manufacturers Association (NEMA) premium energy efficiency motors.

3.5-6a NEMA is a standards setting association for the electrical manufacturing industry (http://www.nema.org/gov/energy/efficiency/premium/).

3.5-7 Upgrade of POTW lighting to energy efficient sources such as metal halide pulse start technologies, compact fluorescent, light emitting diode (LED).

3.5-8 SCADA systems can be justified based upon substantial energy savings.

3.5-9 Variable Frequency Drive can be justified based upon substantial energy savings.

4.0 ENVIRONMENTALLY INNOVATIVE

4.1 Definition: Environmentally innovative projects include those that demonstrate new and/or innovative approaches to delivering services or managing water resources in a more sustainable way.