2009-2011 INDIANA ENERGY MANAGEMENT PILOT

Valparaiso Elden Kuehl Wastewater Treatment Plant

United States Environmental Protection Agency

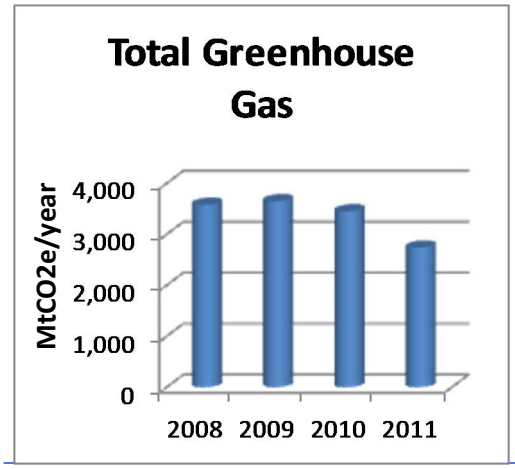
Who we are

The Valparaiso Elden Kuehl Pollution Control Facility (EKPCF) is a Class IV single-stage activated sludge wastewater treatment plant (WWTP) with a design average flow of 8.0 million gallons per day (MGD) and peak hydraulic capacity of 18.0 (MGD). In addition to the WWTP, the plant's three combined sewer overflow detention basins are large enough to capture and hold wet weather flows up to 4.5 MGD prior to treatment. Treated effluent discharges to Salt Creek, which is designated as a salmonid fishery and is a tributary to Lake Michigan.

Electricity Usage

2008: 4,367,920 kWh
2009: 4,727,040 kWh
2010: 4,425,600 kWh
2011: 3,976,440 kWh

Greenhouse gas (GHG) avoided:
437 metric tons carbon dioxide equivalent (2011 compared to 2009 baseline).*



Project Success Story

To further its goal of reducing energy inputs through optimization and improvement, in April 2010, the Valparaiso Water Reclamation Department applied for an Energy Efficiency and Conservation Block Grant (EECBG) through the Indiana Office of Energy Development. The EECBG project included installation of two 200-horsepower (HP) premium efficiency motors with variable frequency drives along with blower modifications. The grant was awarded in June 2010 for $240,160.

The project was successfully completed in December of 2010, and the WWTP continues to reduce its power consumption and energy costs while meeting stringent water quality objectives. Due to installation of new variable frequency drives and premium efficiency motors, the WWTP anticipates saving on average $30,000 per year for electricity or about 8 to10 % of its current electrical operating budget

Greenhouse gas emissions avoided are equivalent to

Removing 85.7 vehicles from the road for a year

Electricity for 54.5 homes for a year

2.4 Railcars of coal

1,016 Barrels of Oil

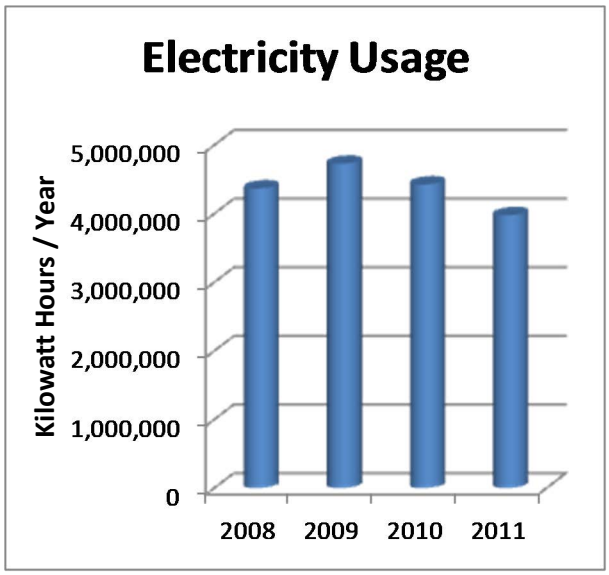
*Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

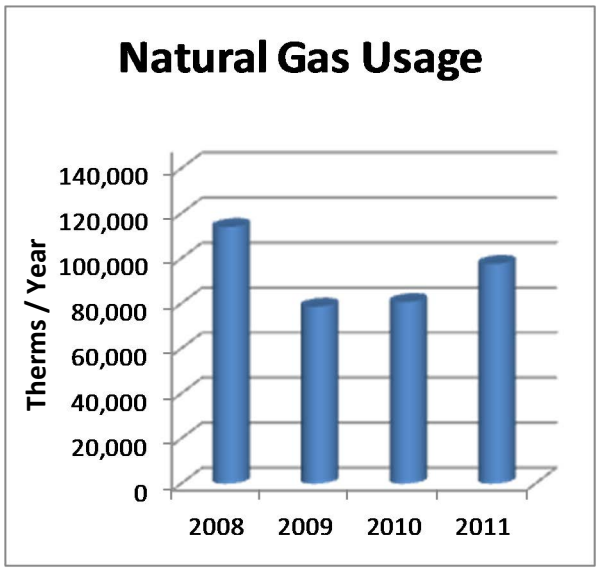
Documented Results

Previous/historic blower operation: 200 HP *0.746*24 hours/day =~ 3600 kWh/day
New Variable Frequency Drive Blower operation over the first 2 quarters of 2011 =

a. 12 hours * 130 amp/216 full load amp *200 HP *0.746 = 1080 kWh/day PLUS
b. 12 hours * 180 amp/216 full load amp *200 HP * 0.746 = 1500 kWh/day
c. Total kWh =~ 2600 kWh/day

Net savings as of June 30, 2011 = ~1000 kWh/day or 90,000 kWh per month
Using $0.08/kWh, net savings = ~ $14,000

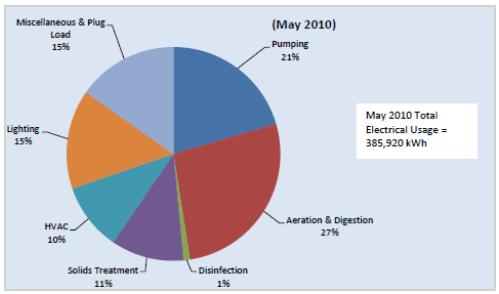




Key Improvements

Process Targeted / Goal	Improvement and estimated saving	Annual Energy Saving, kWh	Implementation cost, $$	Annual cost saving, $	Simple payback, years
Activated Sludge System	Optimize Multistage Blowers with VFD and high efficiency motor installation	360,000 kWh	$240,000 OED Grant	$30,000	8 Years 0 Due to Grant
Anaerobic Digestion Mixing	Reduce digester mixing cycles/ optimization via SCADA	113,880 kWh	$O-Internal Optimization	$9,000	0
Main Pumping Station	Exhaust Fans-Install PLC program to run fans when needed	TBD	TBD	TBD	TBD

Energy Snapshot



Valparaiso WWTP Electrical Usage
"Energy Snapshot" taken May 2010
by Purdue University, Technical Assistance Program