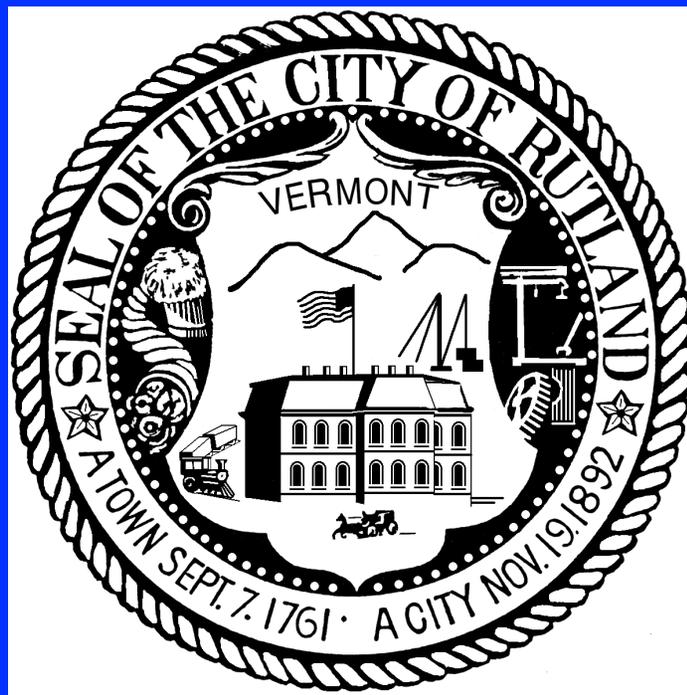


CITY OF RUTLAND WASTEWATER TREATMENT PLANT ENERGY EFFICIENCY IMPROVEMENTS



MULTIPLE FUNDING SOURCES

- PRIVATE CONSULTANT
- CLEAN ENERGY
DEVELOPMENT FUND
- DEPARTMENT OF ENERGY
- LOCAL FUNDING
- EFFICIENCY VERMONT

MULTIPLE SOURCES OF KNOWLEDGE

- WE DID NOT HAVE THE ANSWERS
- EFFICIENCY VERMONT – ENERGY SURVEY
- PLUMBERS
- PROGRAMMING AND CONTROLS EXPERTS
- CONSULTANTS

PRIVATE CONSULTANT

- OFFERS TO STUDY POSSIBLE PROJECTS (COMBINED HEAT AND POWER)
- BALANCE RISK AND REWARD

CLEAN ENERGY DEVELOPMENT FUND

- THROUGH DEPARTMENT OF PUBLIC SERVICE
- WESTON AND SAMPSON LOOKED AT SOLAR THERMAL AND MICRO HYDRO
- PAYBACK PERIOD OF 44 AND 36 YEARS RESPECTIVELY
- DID NOT PURSUE FURTHER

DEPARTMENT OF ENERGY

- INSTALL TURBO BLOWER IN 2012
- CALCULATED SAVINGS OF 206,000 KW*HR/YEAR
- PAYBACK AFTER INCENTIVES:
+/- 1 YEAR



LIGHTING IMPROVEMENTS

- EFFICIENCY VERMONT INCENTIVES
- TWO PROJECTS
 - 175 NEW LIGHT FIXTURES – STANDARD INCENTIVE AND INTERFUND BORROWING
 - 157 NEW LIGHT FIXTURES – 4X STANDARD INCENTIVE



LIGHTING IMPROVEMENTS

- INSTALLED 26 OCCUPANCY SENSORS



LIGHTING IMPROVEMENTS

- REPLACED 43 LED BUILDING LIGHTS
 - OLD: 125 W HIGH PRESSURE SODIUM
 - NEW: 10 W LED



LIGHTING IMPROVEMENTS

- REPLACED 20 PARKING LOT LIGHTS
 - OLD: 175 W HIGH PRESSURE SODIUM
 - NEW: 75 W LED



LIGHTING IMPROVEMENTS

- EXPLOSION PROOF LIGHT UPGRADE
 - 100 W INCANDESCENT
 - 26 W COMPACT FLUORESCENT
- EFFICIENCY VERMONT HARDWARE STORE COMPACT FLUORESCENT



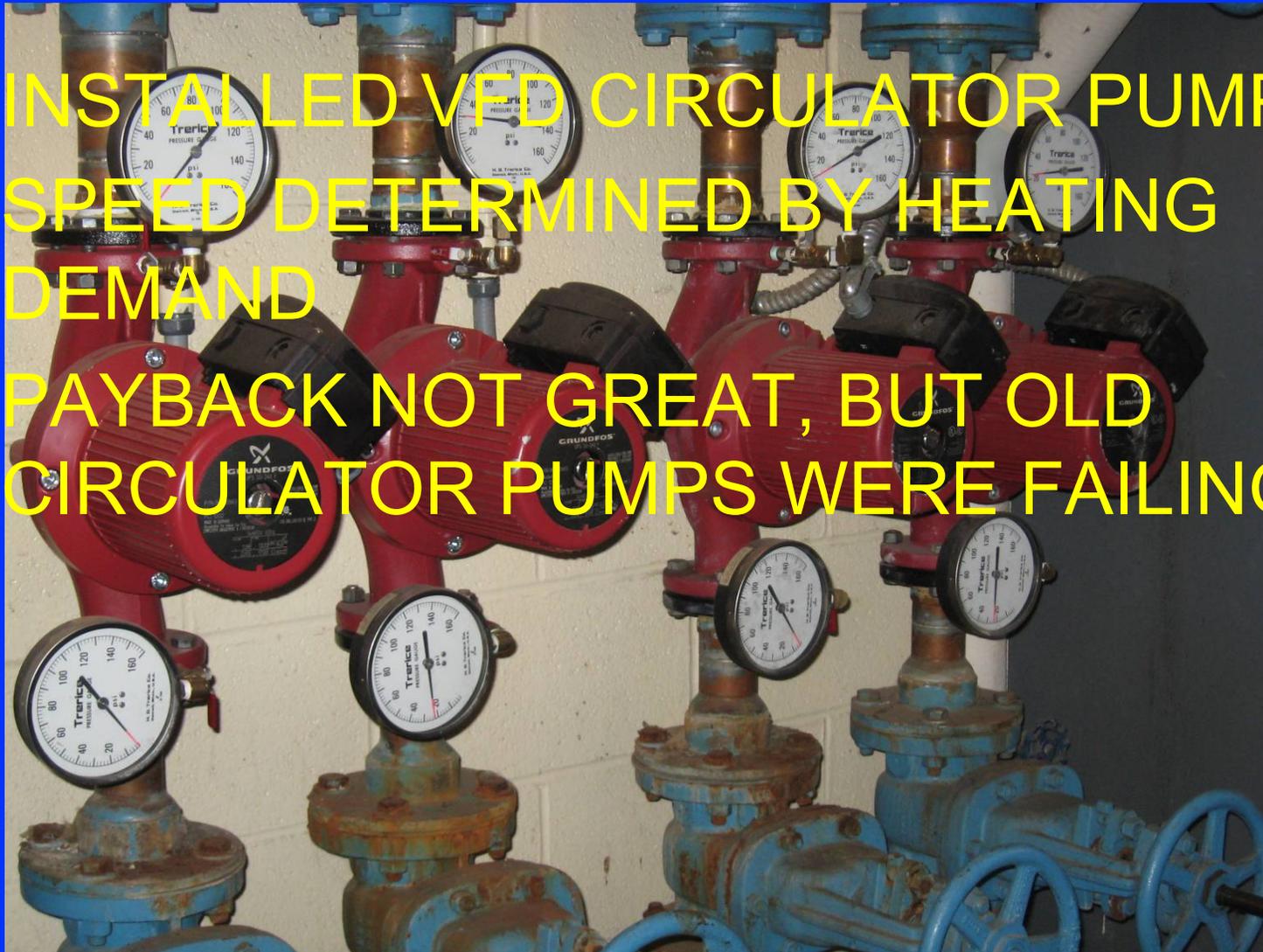
EMERGENCY LIGHTS

- EXIT LIGHTS REPLACED
 - OLD: 30 W
 - NEW: 6 W LED



HEATING SYSTEM

- INSTALLED VFD CIRCULATOR PUMPS
- SPEED DETERMINED BY HEATING DEMAND
- PAYBACK NOT GREAT, BUT OLD CIRCULATOR PUMPS WERE FAILING



HEATING SYSTEM



HEATING SYSTEM



HEATING SYSTEM



HOT WATER



ELIMINATE HOT WATER
TANKS WHERE POSSIBLE

OPERATIONAL PUMPS

- VFD INSTALLATION ON SLUDGE PUMPS
- GAINED OPERATIONAL FLEXIBILITY
- AT THE END OF THE USEFUL LIFE, INSTALL MOST EFFICIENT PUMP



OPERATIONAL PUMPS



OLD

OPERATIONAL PUMPS

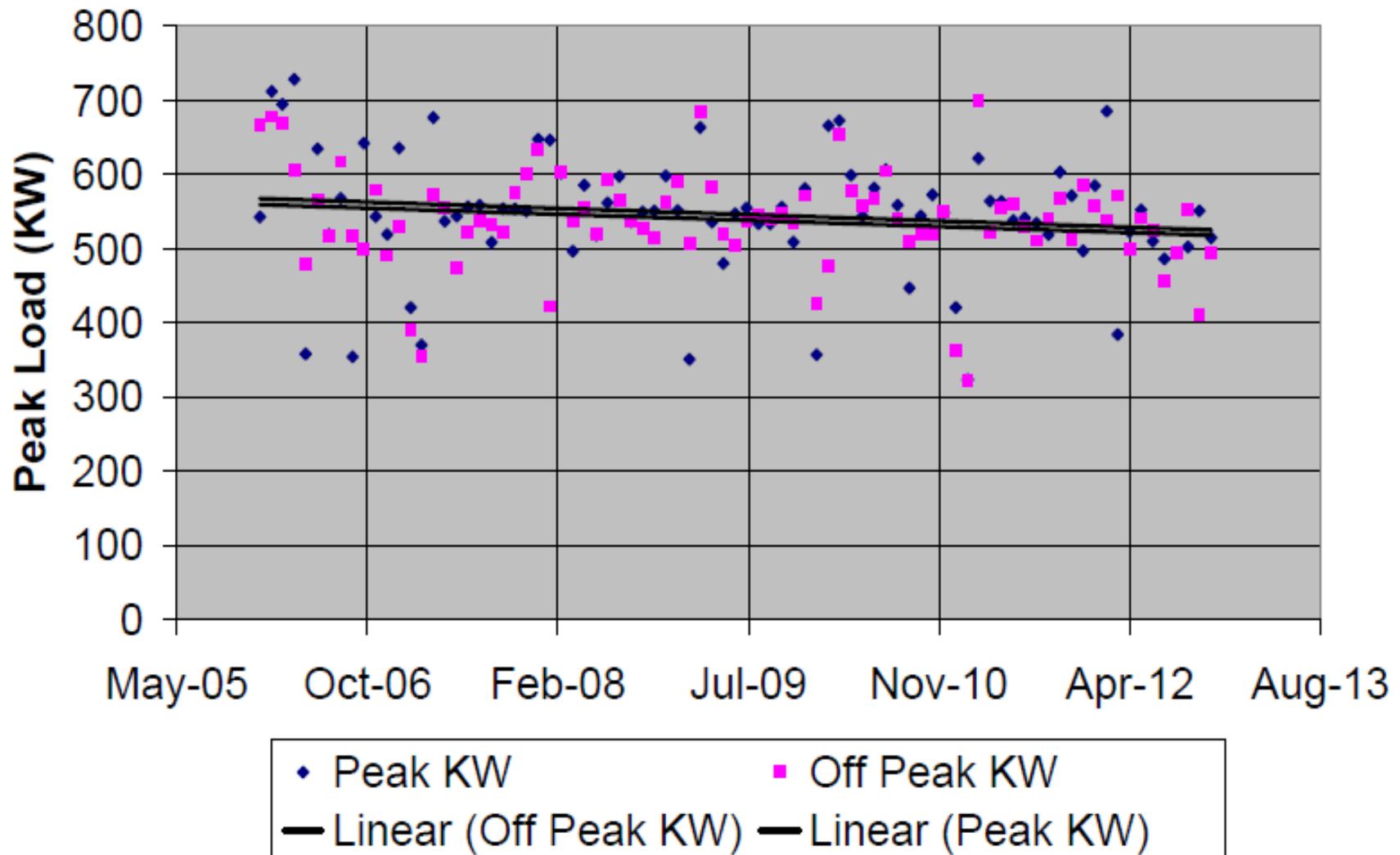


OPERATIONAL PUMPS



3 OF THESE PUMPS RUN 24 HOURS A DAY

Wastewater Treatment Plant Peak Load



KWH Per Million Gallons Treated

