

LEWISTOWN WWTP

LEWISTOWN, PA

OPERATIONAL EFFICIENCY CASE STUDY

LEWISTOWN WWTP

- Design Flow:
..... 2.8 MGD
- Average Daily Flow:
.....1.8 MGD
- Activated Sludge Treatment Process
- Solids Dewatered by:
.....Belt Filter Presses
- 3 Anaerobic Digesters

IMPROVING SLUDGE & SECONDARY CLARIFIER SETTLING PERFORMANCE



TREATMENT OVERVIEW

The **Lewistown WWTP** was originally constructed from 1949 -1954 as a Primary Treatment Facility. From 1979-1981 the plant expanded to treat 2.82 MGD and upgraded to a Secondary Treatment Facility utilizing the complete mix activated sludge process. From 1995-1996 a new headworks facility was constructed. Removal of inorganics and grease is accomplished by utilizing a Rotomat and a Schreiber grit/grease basin. In 2008, the entire anaerobic digester system was upgraded to include a new methane/natural gas boiler.

In November 2011, construction started for a new upgrade at the plant. This upgrade will incorporate an updated treatment process to meet the nutrient reduction requirements as required by the Chesapeake Bay Nutrient Reduction Act.

PROJECT INTRODUCTION

Like other wastewater treatment facilities across the country, Lewistown WWTP is faced with challenges during heavy rain events. They were introduced to **BAE®** (*Biological Activity Enhancer*), an organic liquid derived from peat and used in wastewater treatment facilities to improve operational efficiency, as well as increase biogas production when applied in anaerobic digesters.



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EVALUATION RESULTS

DAY 14

- Lower life forms appear in larger quantities
- Polymer and bacteria reduced by 25%

DAY 30

- Lower life forms plentiful
- Higher life forms growing
- Application of imported bacteria eliminated

DAY 45

- Lower life forms in abundance
- Higher life forms stalked ciliates
- Polymer reduced by 75%

DAY 60

- Microorganism population rebuilt and in complete order
- Polymer discontinued



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A JSH international™ Company

PROJECT OVERVIEW

Lewistown WWTP had a particular challenge during heavy rain events, which included the possible loss of solids from the final clarifiers due to high plant influent flow conditions. Filamentous bacteria had overwhelmed the treatment biology during late winter and early spring as the wastewater temperature began to increase. To compensate for the possible loss of solids, polymer was added to the secondary clarifiers and bacteria were added to the primary clarifier effluent.

Due to the lack of naturally forming bacteria in the system, the plant experienced a biological disruption. Upon looking under the microscope 60 days later, the MLSS (*Mixed Liquor Suspend Solids*) was extremely underdeveloped, and the higher strains of bacteria were almost nonexistent.

BAE® has the unique ability to improve a plant's biology, therefore a protocol was designed to add 1 gallon of **BAE**® to the primary clarifier effluent in an effort to establish higher life forms in the microbiology that could withstand shock loads and filamentous. Application of the polymer and bacteria continued for the next 4 weeks and were slowly eliminated over a 60 day period.

RESULTS SUMMARY

After the first 14 days of adding **BAE**®, the lower life strains began to appear in larger quantities. Polymer and bacteria applications had been reduced by 25%.

By the end of the first month of utilizing **BAE**®, the lower life forms were more plentiful and the higher life forms were building in population. The need for imported bacteria was eliminated entirely.

By the end of 45 days of adding **BAE**®, the lower life forms were more abundant than the operator of the plant had seen during his lifelong career working at the facility, and the higher life forms were plentiful. The addition of polymer was reduced by 75%.

At the conclusion of the 60 day cycle, both polymer and bacteria were discontinued and the microorganism population was in complete order.

Gross savings as a result of using BAE are estimated to be: ANNUALLY

Polymer	\$13,140
Bacteria	\$8,760
Gross Savings	\$21,900