# POLYMER APPLICATIONS & USE CASES

Webinar Series – June 19, 2025

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# RECAP OF FIRST WEBINAR

- What is a Polymer
  - A chemical additive used to improve the separation of solids from liquids
- Why Polymers are Used
  - Improves liquid/solid separation
  - Helps particles settle faster
  - Improves water clarity
  - Enhances treatment efficiency
- Types of Polymers
  - Solution
  - Mannich
  - Dry
  - Emulsion / Dispersions
- Types of Polymer Systems
  - Continuous
  - Batch
  - In-Line

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# RECAP OF FIRST WEBINAR – PROMINENT OFFERING

## Continuous

ULTROMAT ULFb

## Batch

ULTROMAT ULDa

ProMix M

PolyRex

## In-Line

ProMix H

ProMix S

ProMix M

ProMix L

# Overview of Industries and Applications

# PRIMARY INDUSTRIES FOR POLYMERS

- Municipal Water & Wastewater
- Mining and Mineral Processing
- Oil & Gas
- Food & Beverage Processing
- Pulp & Paper
- Industrial Wastewater
- Textile & Dye

Paper machine

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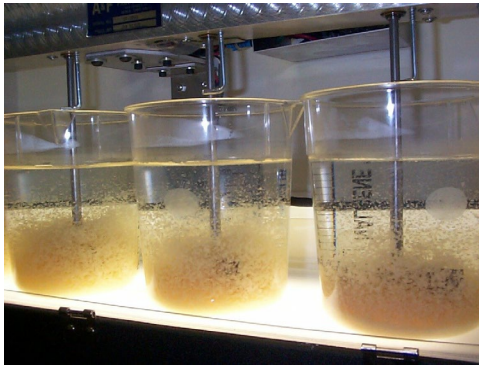
# MUNICIPAL WATER / WASTEWATER

- Common Applications:
  - Coagulation and flocculation of suspended solids (clarifiers, DAF)
  - Sludge thickening (gravity belt thickeners, dissolved air flotation (DAF))
  - Sludge dewatering (centrifuges, belt filter presses)

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# MINING & MINERAL PROCESSING

- Common Applications:
  - Tailings thickening
  - Clarification of process water
  - Dewatering of concentrate and tailings
  - Dust suppression


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# OIL & GAS

- Common Applications:
  - Produced water treatment
  - Sludge treatment in refineries
  - Drilling mud conditioning
  - Enhanced oil recovery

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# FOOD & BEVERAGE PROCESSING

- Common Applications:
  - Wastewater treatment from processing plants (dairy, meat, beverage)
  - Sludge dewatering
  - Clarification of wash waters

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# PULP & PAPER

- Common Applications:
  - Paper retention and drainage aids
  - Fiber recovery systems
  - White water clarification
  - Sludge dewatering

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# GENERAL INDUSTRY, CHEMICAL & PETROCHEMICAL

- Common Applications:
  - Process water clarification
  - Effluent treatment
  - Sludge dewatering

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# TEXTILE & DYE

- Common Applications:
  - Color removal from effluents
  - Sludge treatment
  - Clarification of dye-bath water

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# Municipal Applications

# CITY OF HELENA, MT – TEN MILE TREATMENT PLANT

## Application

- Filter Aid

## Problem

- Aged-out equipment, hydrodynamic mixing of the filter aid. Using higher amounts of the same filter aid polymer as comparable plants.

## Solution

- ProMix S Systems, along with heating of dilution water to optimize polymer activation.

## Result

- After one year of logging polymer consumption data, they reduced usage by 35-40%,
- Additionally, was an extension of their filter run times from ~100 hours to ~140 hours.


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# ANY LOCATION – WASTEWATER DEWATERING

## Application

- All dewatering (Commonly Centrifuge)

## Problem

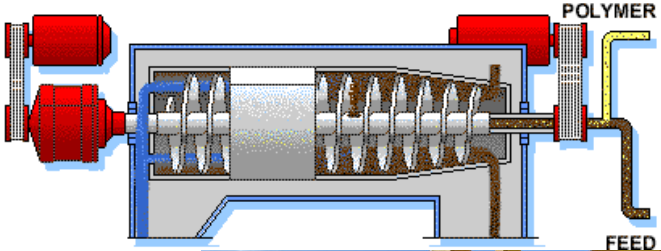
- Encountering a setup that feeds neat polymer directly into process, use of static based mixing systems constructed by plant personnel or sourced elsewhere due to low cost.
- This results in a large amount of inactivated and wasted polymer.

## Solution

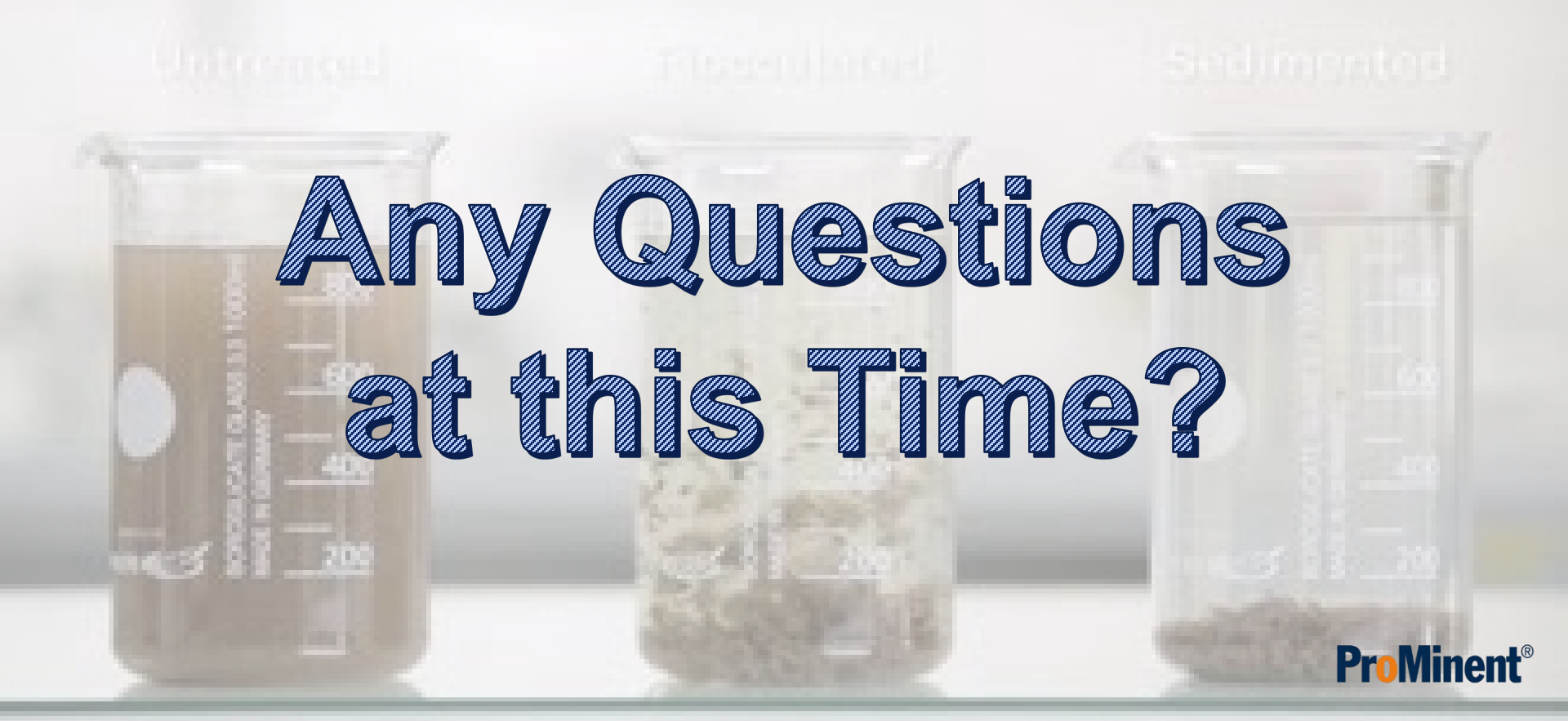
- Offer consumption/savings tables and a timeline for ROI based on chemical cost and other criteria provided to you by the end user.

## Result

- It is not uncommon in these direct feed or static based mixing system situations to see polymer usage reduction in the range of 60-70%
- For dewatering applications, if a plant is spending $500K-$750K a year on polymer, the equipment will pay for itself in short order.




# PAUSE FOR QUESTIONS




## Any Questions at this Time?

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# Industrial Applications

# COAL-FIRED POWER PLANT – (3) 800MW UNITS

## Application

- Flue Gas Desulfurization Wastewater Treatment

## Problem

- Renting polymer make down units at $2,400/month.
- Polymer usage seemed high.

## Solution

- ProMix S System

## Result

- Integration was easy.
- Using considerably less polymer than the rented system


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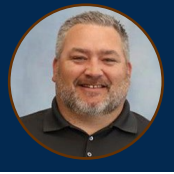
# BASIN ELECTRIC POWER COOPERATIVE



## Application

- Wastewater dewatering from (6) basin clarifiers

## Problem

- High maintenance hours on existing system required to clean injection valve and change seals.
- Polymer feed pumps not sized appropriately.
- Static mixer did not yield peak efficiency.

## Solution

- (8) ProMix S Systems with gamma/ X pumps

## Result

- Approximate 25% savings on polymer.
- Went from weekly maintenance to zero in a six-month period.
- Improved polymer activation means less polymer and recover an upset clarifier in less time.

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# ACID MINE DRAINAGE SITE – PA

## Application

- Treatment of acid mine drainage.

## Problem

- Acid mine run off into local stream.
- Particles needed to be removed.

## Solution

- PolyRex

## Result

- Clean water released into stream
- Regularly tested

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# AMERICAN ORGANIC ENERGY – NY

## Application

- Sludge dewatering for anaerobic digester.
- Transforms food waste into renewable natural gas (RNG), fertilizer, and nutrient-rich water.

## Problem

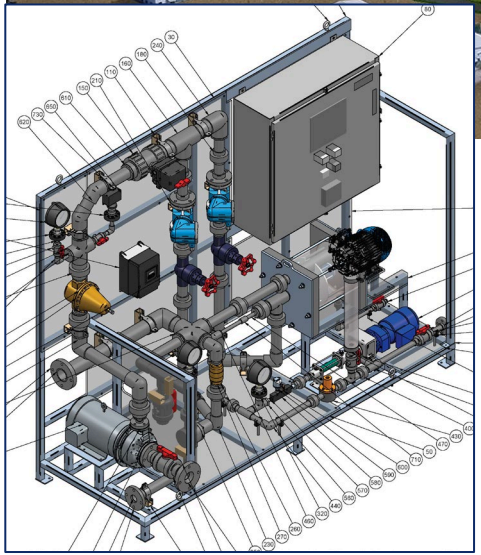
- Waste sludge with high water content (93 to 95%) is a byproduct of digestion process.
- 380,000 ton/year of waste sludge produced

## Solution

- (2) ProMix L 3000x2-30PB + Booster Pump

## Result

- Waste sludge volume reduced to 68,000 tons/year.
- From 4% to 5% waste sludge to 26% sludge.
- Disposal and transportation costs reduced by a factor of 5 to 6.
- Client saved $200,000 in capital cost from value added option.



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# LINDEN BIOSOLIDS GASIFICATION FACILITY – NJ

## Application

- Sludge dewatering for anaerobic digester.
- Diverts up to 130,000 tons of biosolids from landfills annually.

## Problem

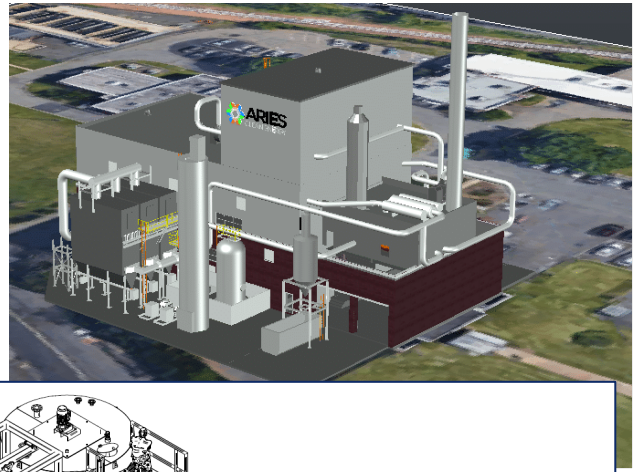
- Waste sludge with high water content (93 to 95%) is a byproduct of digestion process.
- 800,000 ton/year of waste sludge produced.

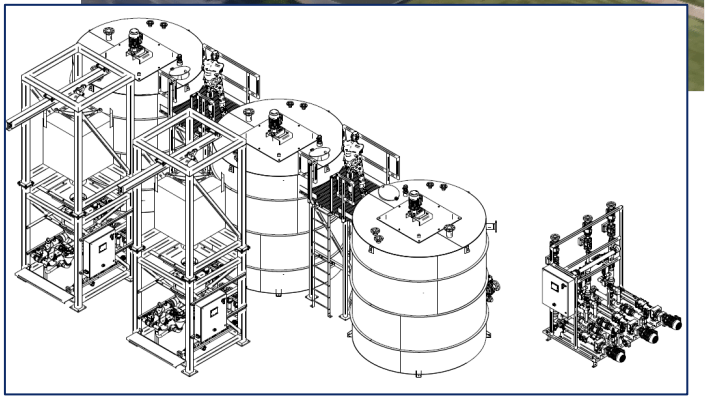
## Solution

- (2) PolyRex Maxi 23 PLUS Systems
- Three-Pump Dosing Skid
- Value added - 3 flip-flop tanks (sequencing batch)

## Result

- Waste sludge volume reduced to 150,000 ton/year.
- From 4% to 5% waste sludge to 26% sludge.
- Disposal and transportation costs reduced by a factor of 5 to 6.
- Client saved $90,000 in capital cost from value added option.



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# JUNGBUNZLAUER – PORT COLBORNE

## Application

- Coagulation/Flocculation, Sludge Thickening, Sludge Dewatering
- Wastewater treatment in citric acid production
- 10 to 15 times stronger than domestic WW

## Problem

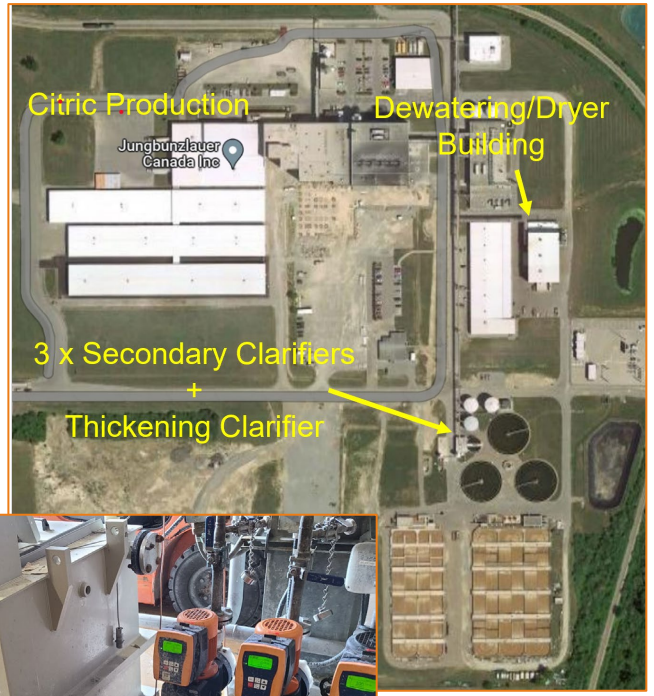
- Effluent discharges to Welland Canal
- Activated sludge does not settle in clarifiers without polymer and ferric addition

## Solution

- (3) ULTROMAT ULFa-4000

## Result

- Waste sludge reduced to 125 yd3 per day (25,000 GPD) from 1% to 26% solids
- Disposal and transportation costs reduced by a factor of 26

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# Food & Beverage Applications

# ANY LOCATION – SUGAR INDUSTRY

## Application

- Solids removal via Polymer and Coagulant dosing.
- Polymer is typically dosed at 4 – 7 ppm into the decanters to remove dust and clarify the juice before the crystallization process.
- Polymers can also be dosed in the sludge from the decanters before the press filters.

## Problem

- Many industries prepare the solution manually (inefficiently), using 2 large tanks with mixers.
- Need to protect retention ponds from excess mud build up in the wastewater.

## Solution(s)

- Dry Polymer makedown system (e.g. PolyRex / Ultromat)
- Dosing skid to meter polymer solution
- Liquid Polymer Blending System (e.g. ProMix / Ultromat)

## Results

- Improves product quality
- Reduces product losses by 25%
- Saves energy, water and chemical usage
- OPEX reduction

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# ANY LOCATION – SUGAR INDUSTRY

## Installations…

**Feeder with Super Sac**


**ULTROMAT Systems**

**Progressive Cavity Pump Dosing Skid**

# ANY LOCATION – WASTEWATER TREATMENT

## Application

- Solids removal, e.g. fats, oils, dirt / debris etc.

## Problem

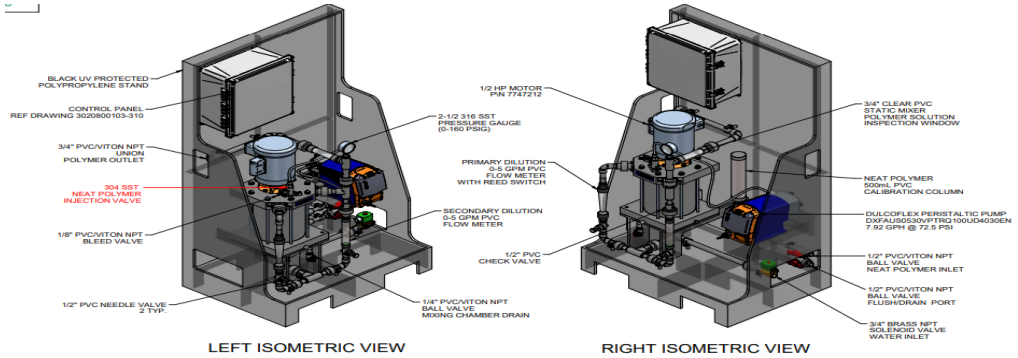
- Manual dosing – inefficient, not blended well, overdosage, not effectively activating

## Solution

- Primary and backup Promix-S systems for feeding emulsion polymer into DAF

## Result

- Reduced polymer usage
- Improved efficiencies

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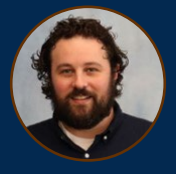
# ANY LOCATION – WASTEWATER TREATMENT



## Application

- Dairy, Brewing, Meat Processing, Food & Beverage Packaging

## Problem

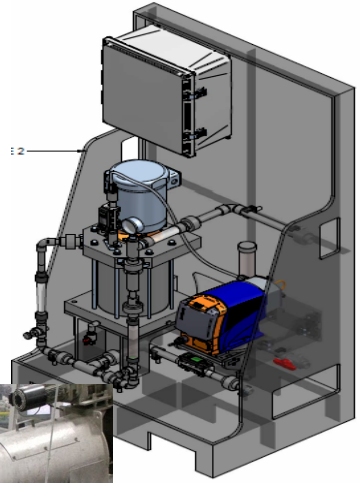
- Beverage Can Manufacturer with aluminum shavings, particles and oils from can cutting / forming process that needed to be removed from Wastewater

## Solution

- Custom Promix-S with clamp on flow meter for Polymer injection metering

## Result

- Reduced polymer usage
- Improved efficiencies



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# UTZ QUALITY FOODS

## Application

- Wastewater treatment – sludge reduction

## Problem

- Old system had broken, turning the unit into a static mixer.
- Using higher levels of MU water and polymer as it was not fully activated when fed to system.
- This also caused thinner/watery sludge and increased hauling costs.

## Solution

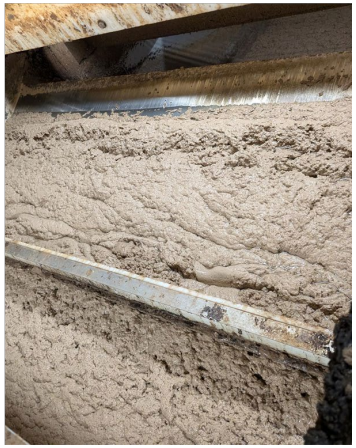
- ProMix S System

## Result

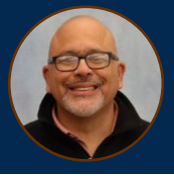
- 1 million gallons/year fresh water saved, $170k saved in sludge hauling costs.


BEFORE

AFTER



# PROFLOW PUMPING SOLUTIONS – NESTLE



## Application

- Wastewater treatment

## Problem

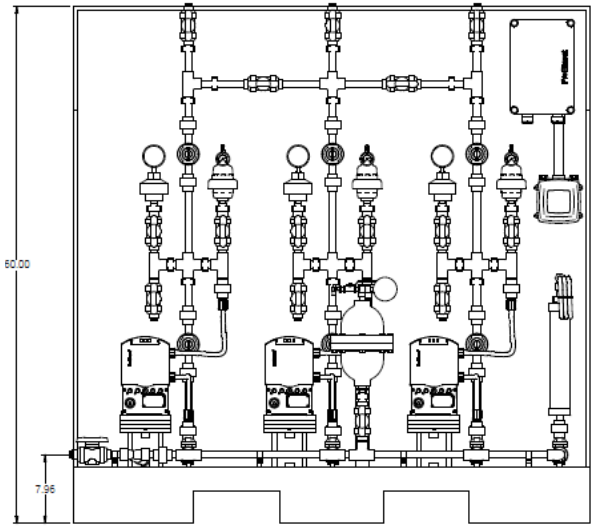
- Nestle needed a solution to high costs in the wastewater application.

## Solution

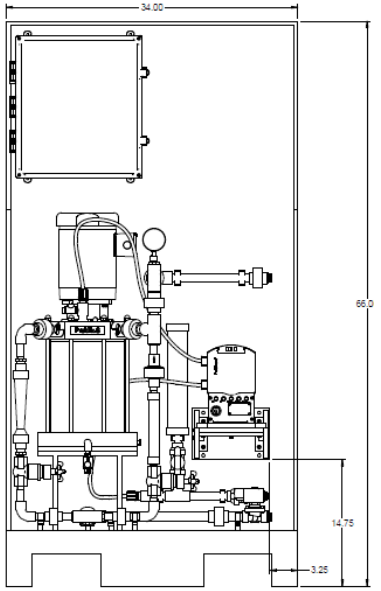
- Coagulant 3-pump DFXa skid
- (2) Cationic + Anionic (ProMix S) Polymer Units

## Result

- System has been used for the past 5 months with reported savings of 30% on polymer use.



FRONT VIEW



FRONT VIEW

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# Summary

# SUMMARY

- Polymers are used in a variety of industries mainly as a quick and efficient way to remove solids from liquids
  - To help reduce disposal costs
  - Improve water treatment processes
- Polymers can be expensive and companies would welcome ideas to lower usage
- Many companies use inefficient methods and may not realize other alternatives exist or the potential for cost savings

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# QUESTIONS TO ASK

- How old is the current system?
- Are you experiencing frequent mechanical or electrical failures?
- Is the system providing consistent polymer solution quality (no lumps, fish eyes, or incomplete dissolution)?
- Are there any issues with dosing accuracy or feed pump reliability?
- Does your current system keep up with changes in flow rates or solids loading?
- How much manual intervention or operator time does the system require?
- Are you satisfied with the performance of your dewatering or clarification equipment?
- Do you see fluctuations in cake dryness, filtrate clarity, or sludge volume?
- Are maintenance costs for the current system rising?
- How often do you replace pumps, mixers, or other critical parts?
- Are you looking to reduce polymer waste or overdosing?

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# WE ARE HERE TO HELP

- Let our team help…
- Our experience:
  - Sales Team
  - Application Engineers
  - Technical Team
- Our capabilities:
  - All systems manufactured by ProMinent:
    - ProMix in Pittsburgh
    - ULTROMAT in Czech Republic
    - PolyRex in Sweden
    - Custom system designs/built in Pittsburgh and Canada
  - In-house knowledge
- Need more info on these applications or support?

# Trainings

### Overview of Polymers and ProMinent System Offerings

**Date:**
May 15, 2025

**Location:**
Online Webinar

Go to recording

### Applications and Use Cases of Polymers

**Date:**
June 19, 2025

**Location:**
Online Webinar

Register Now

### How to Select and Quote the Right Polymer System

**Date:**
July - TBD

**Location:**
Online Webinar

Coming Soon


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THANK YOU FOR YOUR ATTENTION
Any Questions?
The ProMinent Team