



AQUA-AEROBIC SYSTEMS, INC.  
A Metawater Company

# AquaPrime® Cloth Media Filtration for Advanced Primary Filtration

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# Presentation Outline

- Primary Treatment
- Advanced Primary Treatment
- Pile Cloth Media Filtration Operation
- PCMF Application Locations
- Project Profiles
- Conclusions



# Classical Primary Treatment

Conventional: Initial Settling Step

Circular or Rectangular Clarifiers

Parameter	Conventional % Removal
TSS	40 - 60%
BOD5	25 - 40%
TP	10 - 30%
TKN	10 - 30%

CEPT (Chemically Enhanced Primary Treatment)  
– 60 to 85% TSS Removal





# Why Advanced Primary Treatment?

## AquaPrime<sup>®</sup> PCMF Benefits

Improved  
Removal  
Efficiencies



- TSS - >80%
- BOD - > 50%
- Coagulant = < TP

Energy Savings



- Lower air flow – 20% to 30% less
- Reduces BOD to aeration
- Increased capacity

Energy  
Production

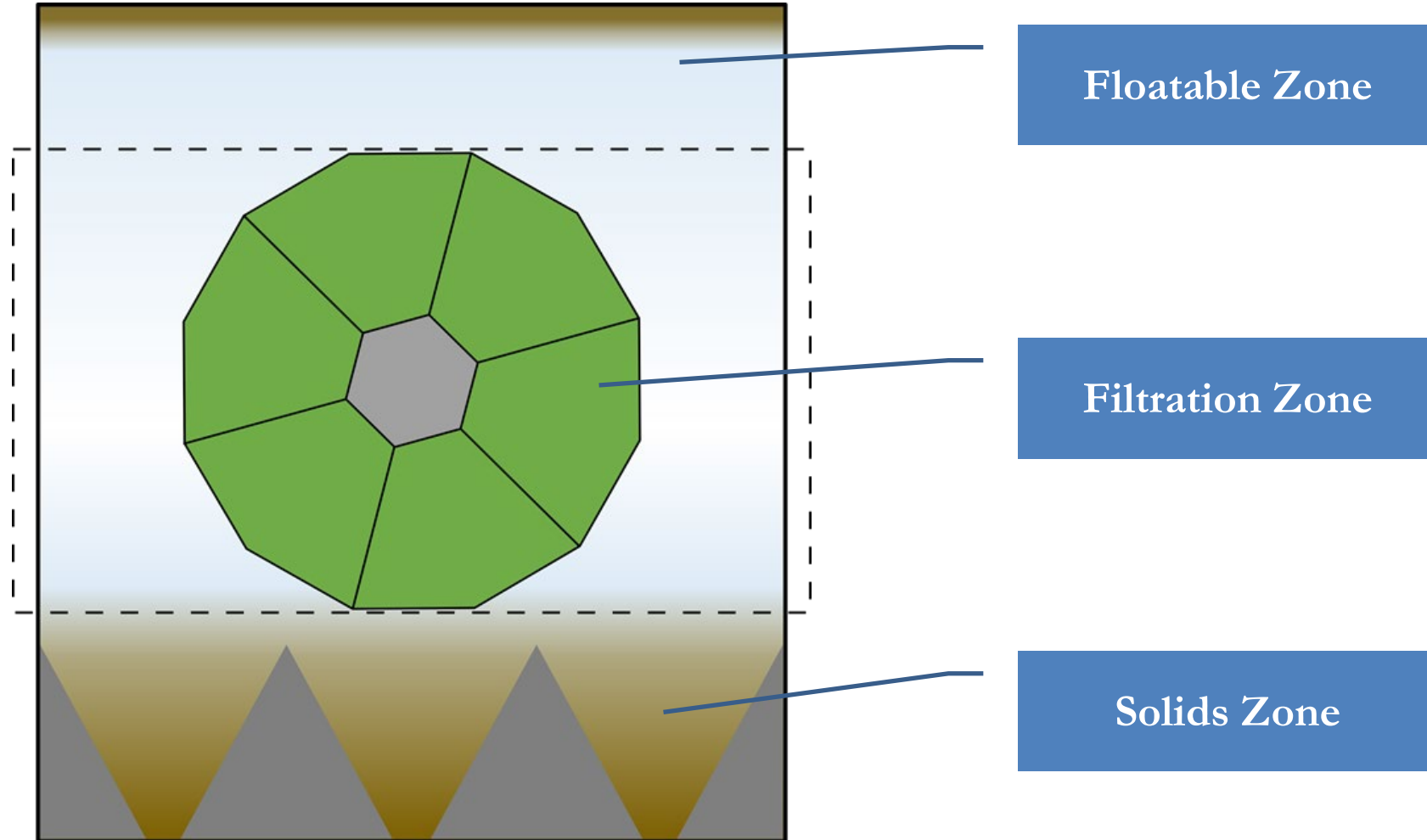


- PS : WAS ratio – 60% PS to 40%
- Diverts digestible material
- Higher biogas yield – 30% to 40% more



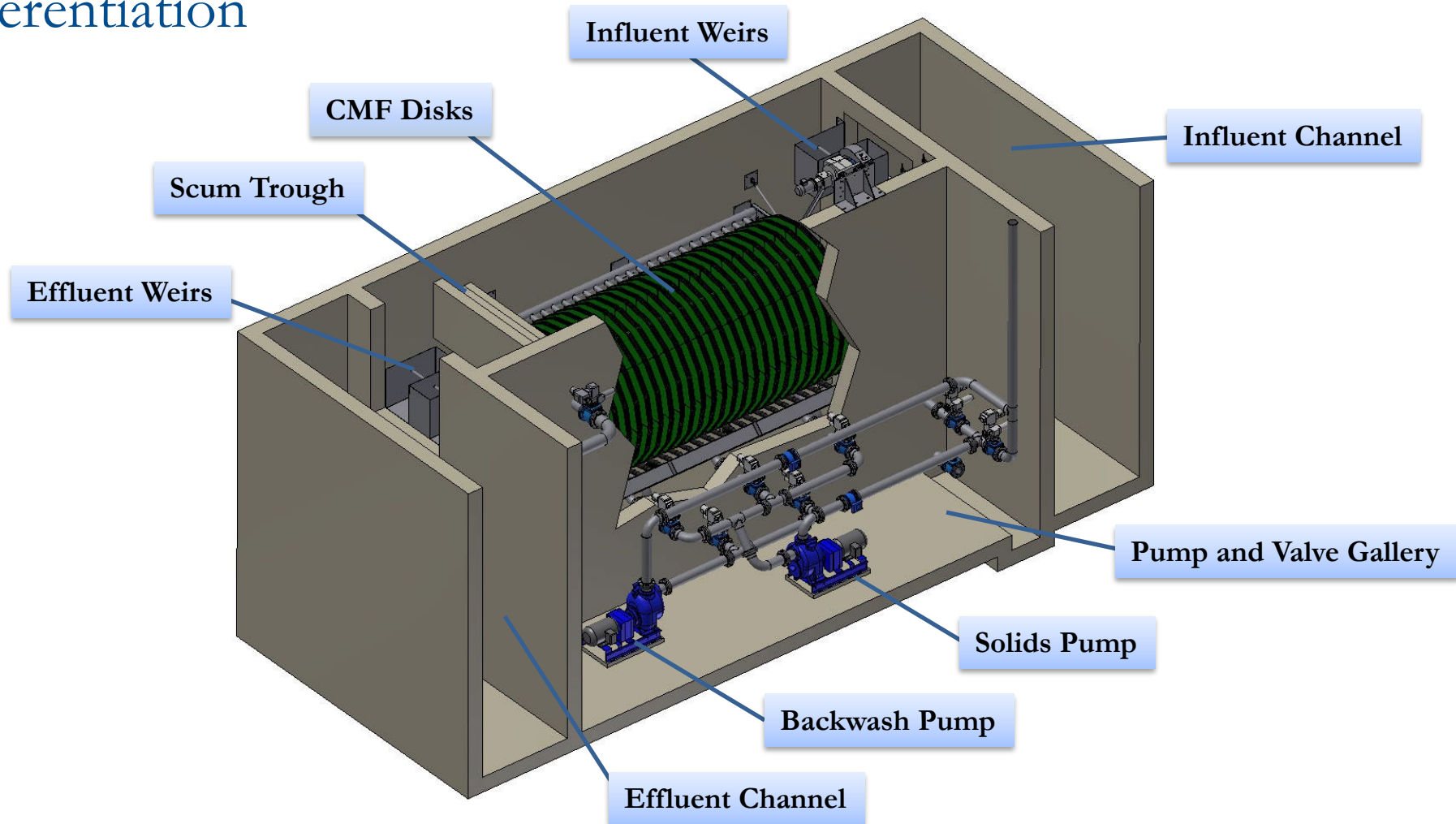
# AquaPrime®

## Basics - Differentiation



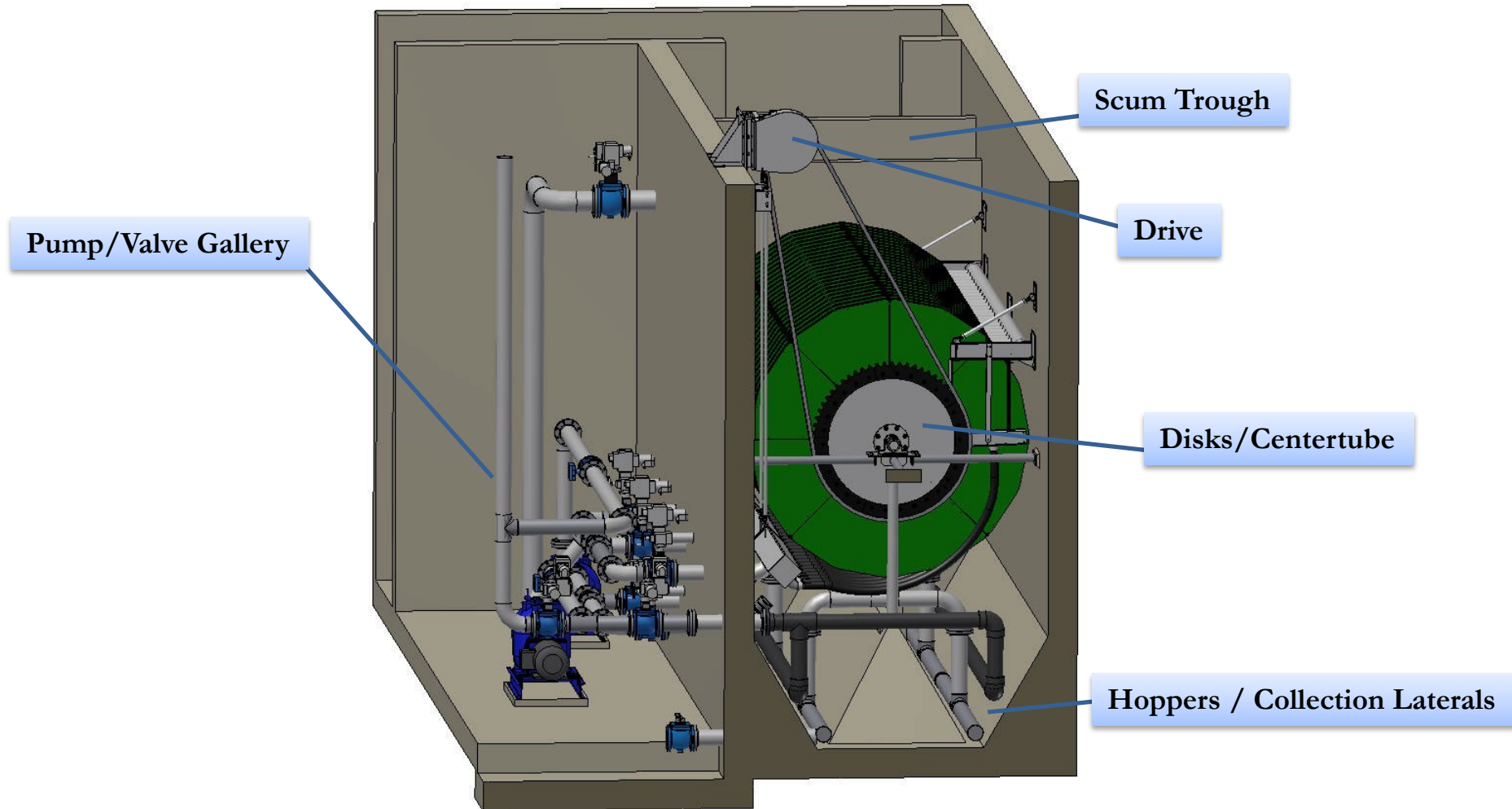
# AquaPrime®

## Basics - Differentiation



# AquaPrime®

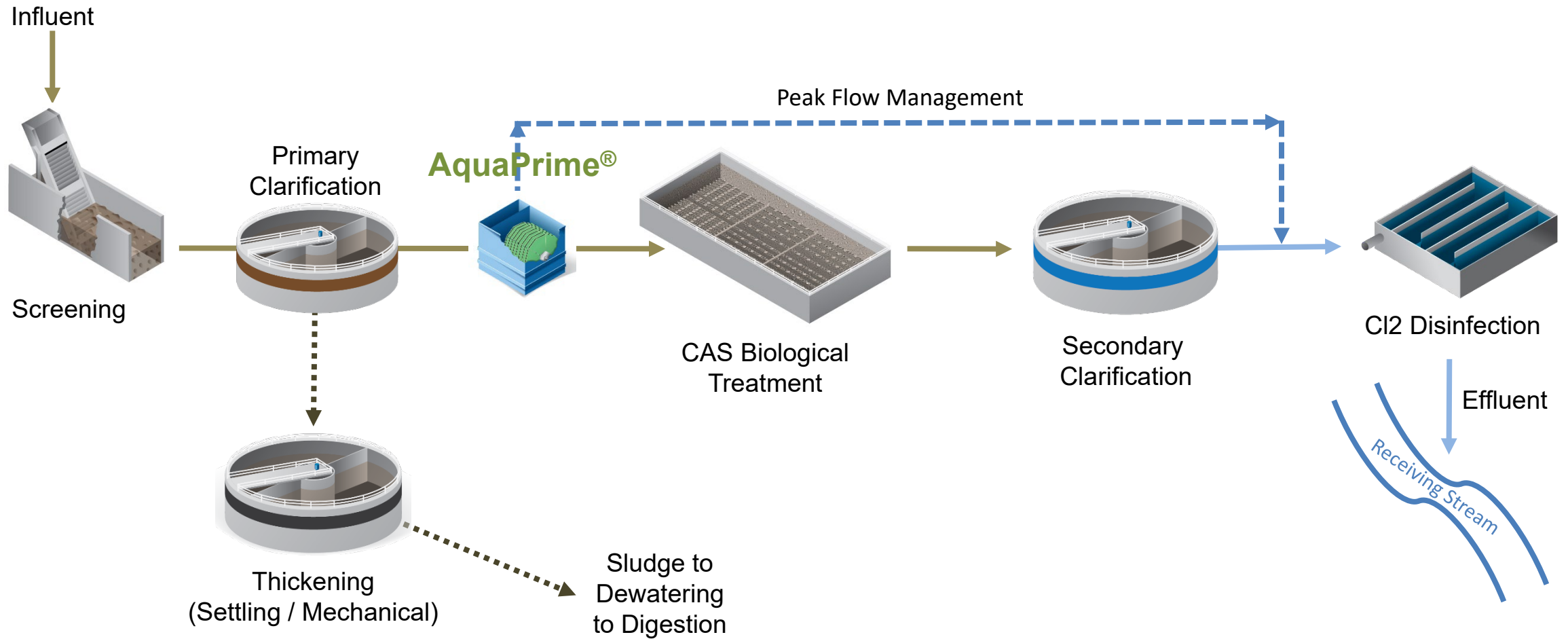
## Basics - Differentiation





# AquaPrime® Location

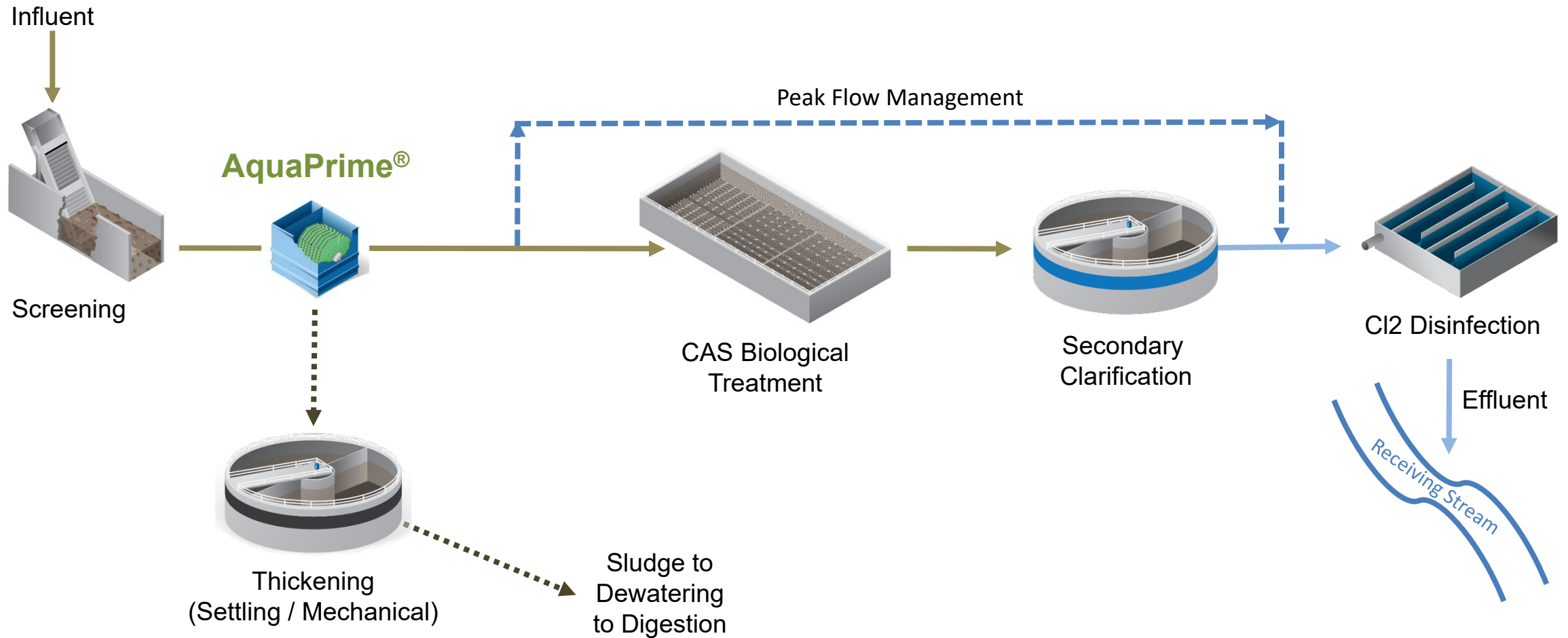
## Primary Influent / PC Replacement





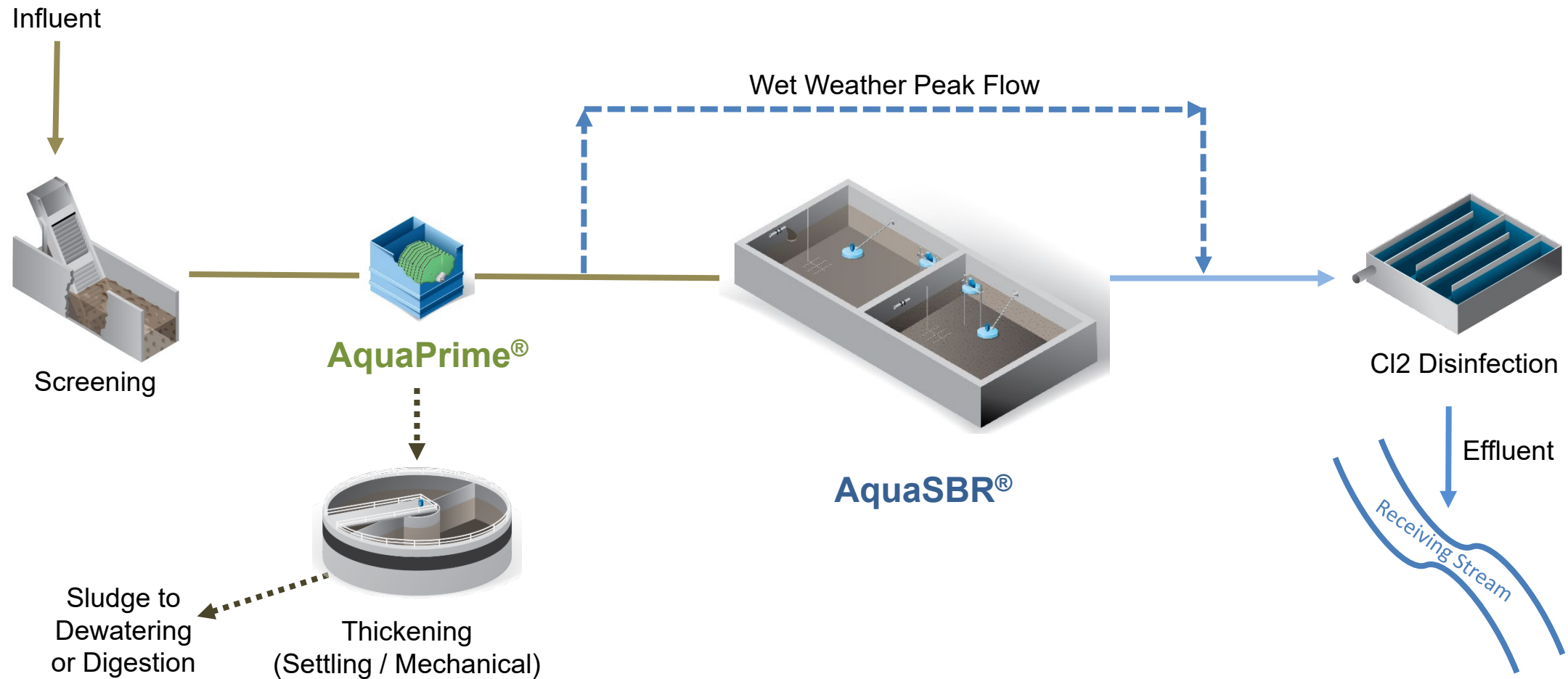
# AquaPrime® Location

## Primary Influent / PC Replacement



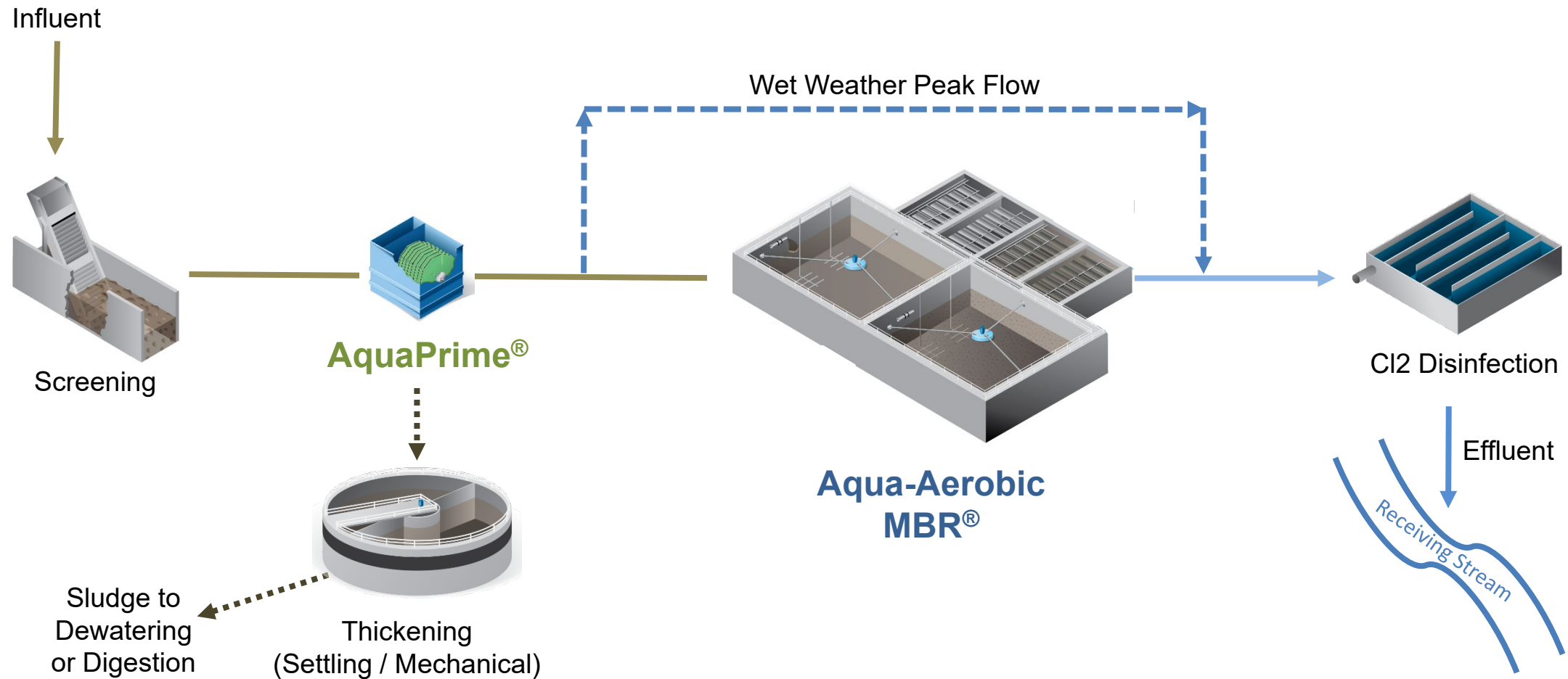
# AquaPrime® Location

## Dual – Primary / Wet Weather



# AquaPrime® Location

Dual – Primary / Wet Weather





# Four Rivers Sanitation Authority, IL



## Location / Startup

- Rockford, IL/ June 2024

## Capacity

- ADF – 15 MGD, MDF – 30 MGD; Site ADF- 30 MGD, MDF- 80 MGD, PHF- 115 MGD

## Consultant

- Donohue & Associates, Inc.

## Overview

- Retrofit, Built in the area of Primary Clarifiers

## Keys to Success

- Pilot Testing, Footprint, Impact on Secondary Capacity, Increase in Biogas



# Four Rivers Sanitation Authority

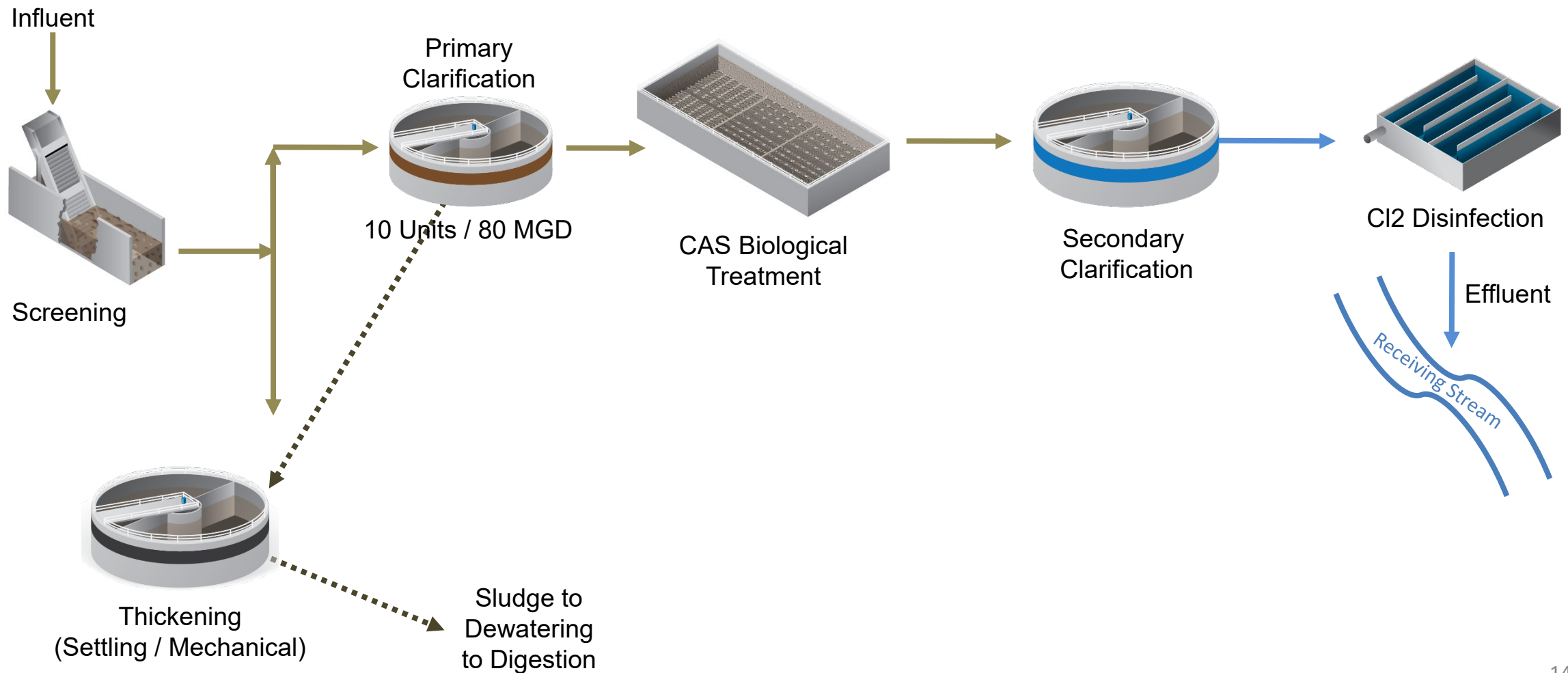
## AquaPrime® Installation Objectives

- Replace aging infrastructure
- Provide flexible capacity to enable sustainable growth by increasing BOD<sub>5</sub> removal
- Increase biogas production by carbon diversion



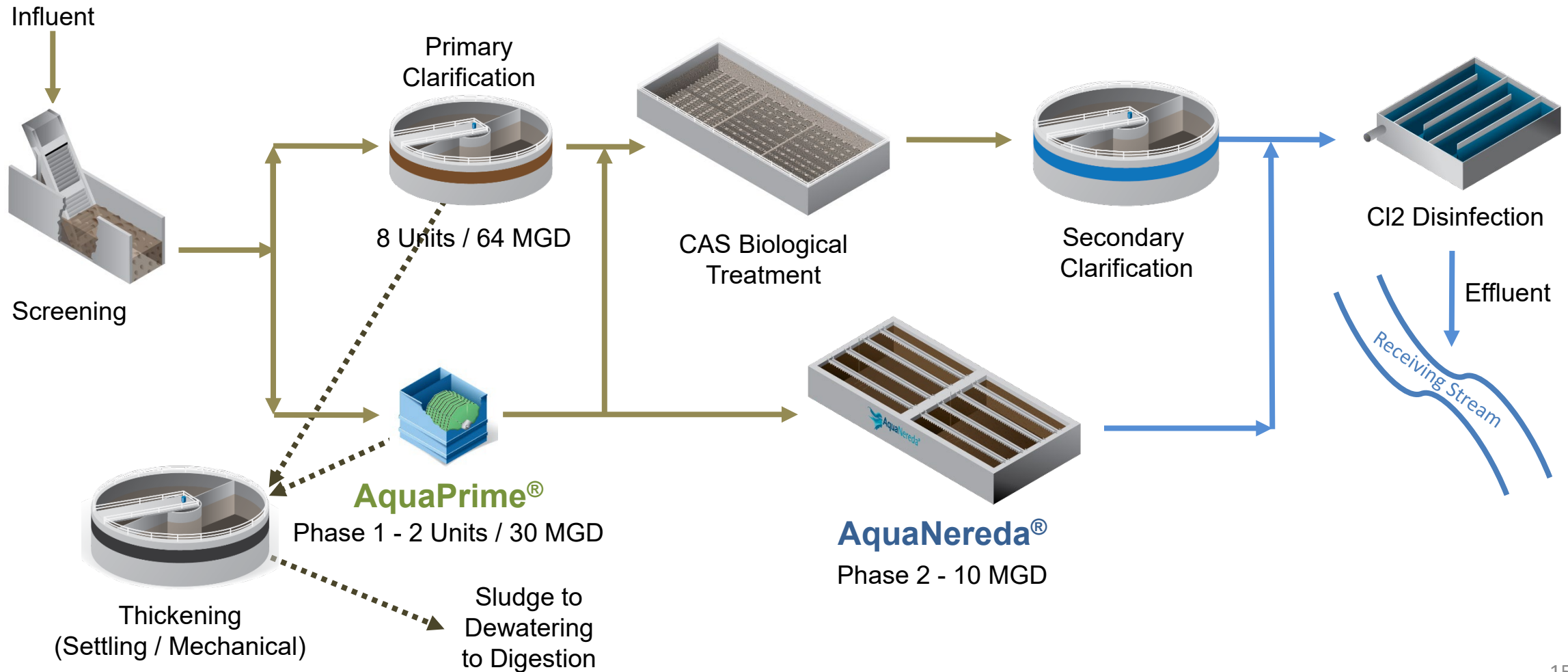
# Four Rivers Sanitation Authority

## Flow Diagram



# Four Rivers Sanitation Authority

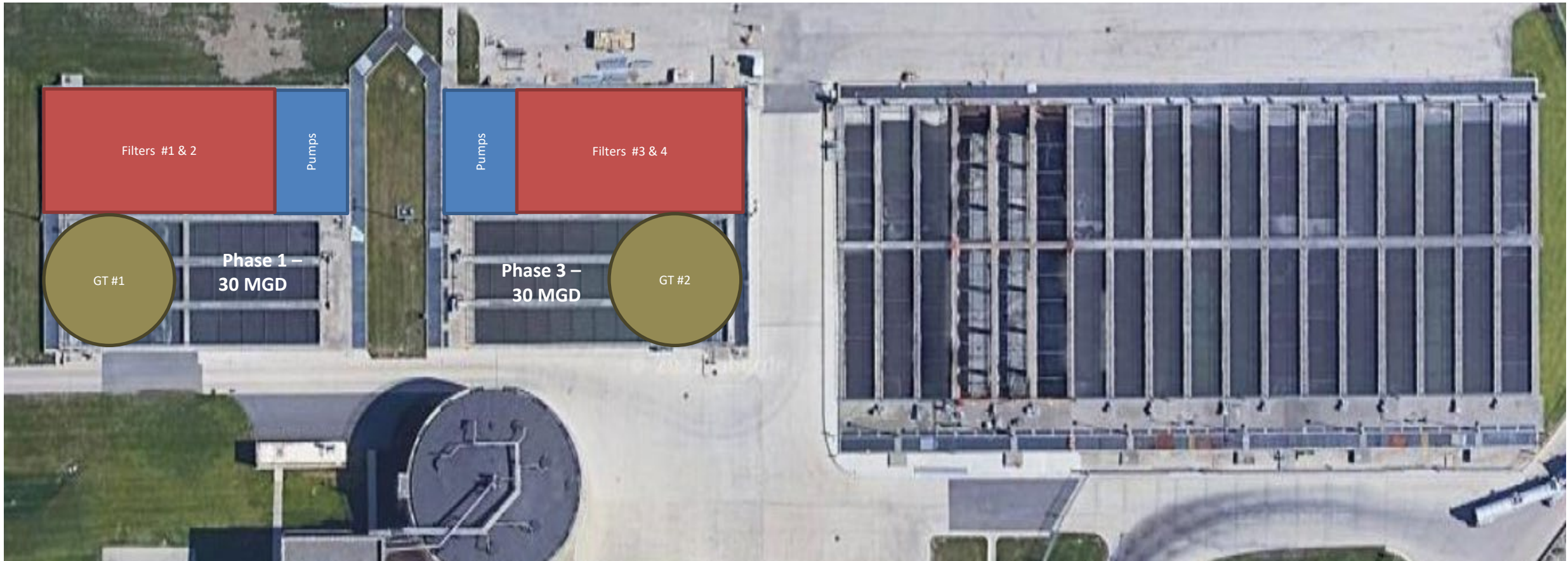
## Flow Diagram





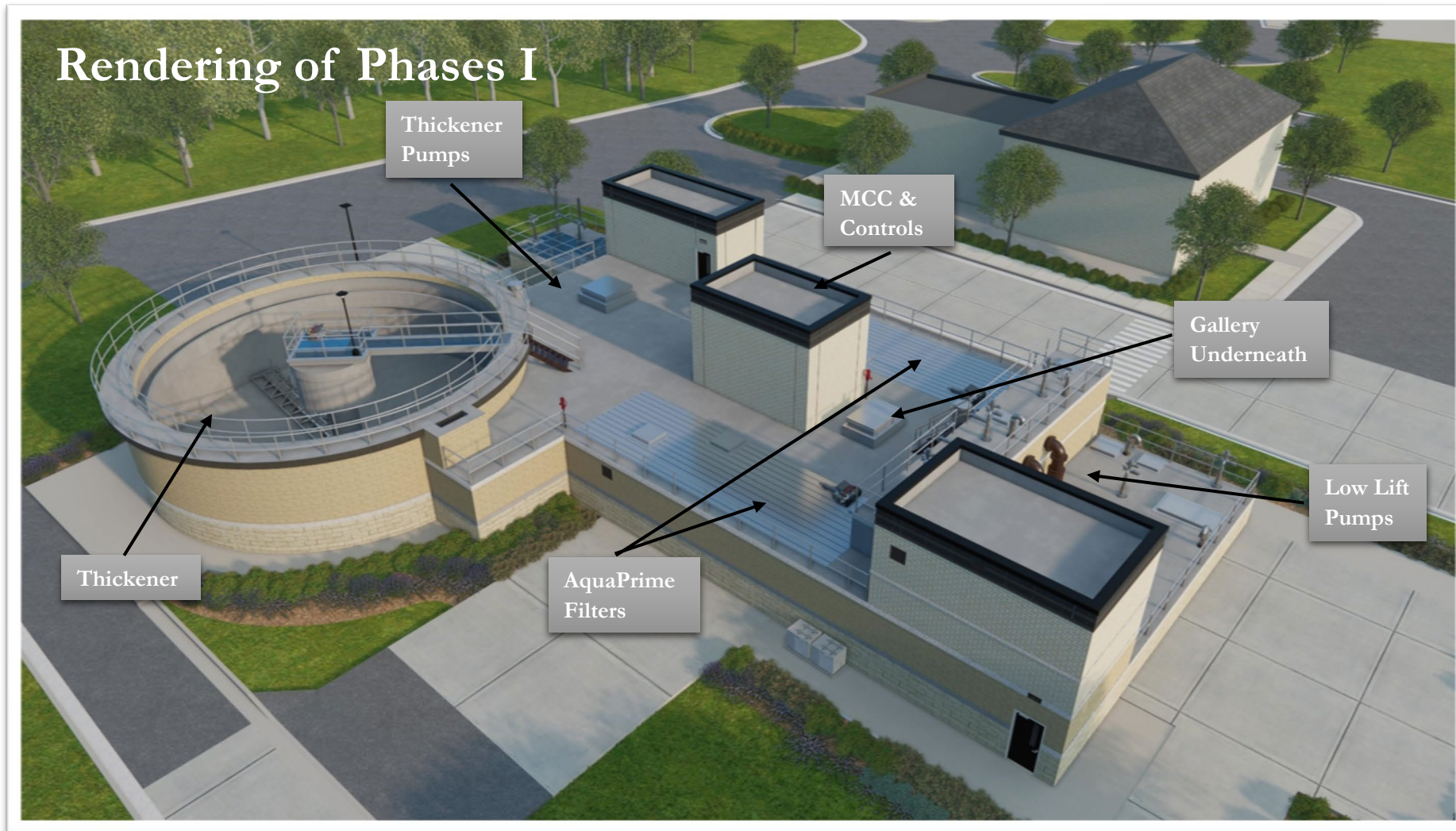
# Four Rivers Sanitation Authority

## Rockford, IL



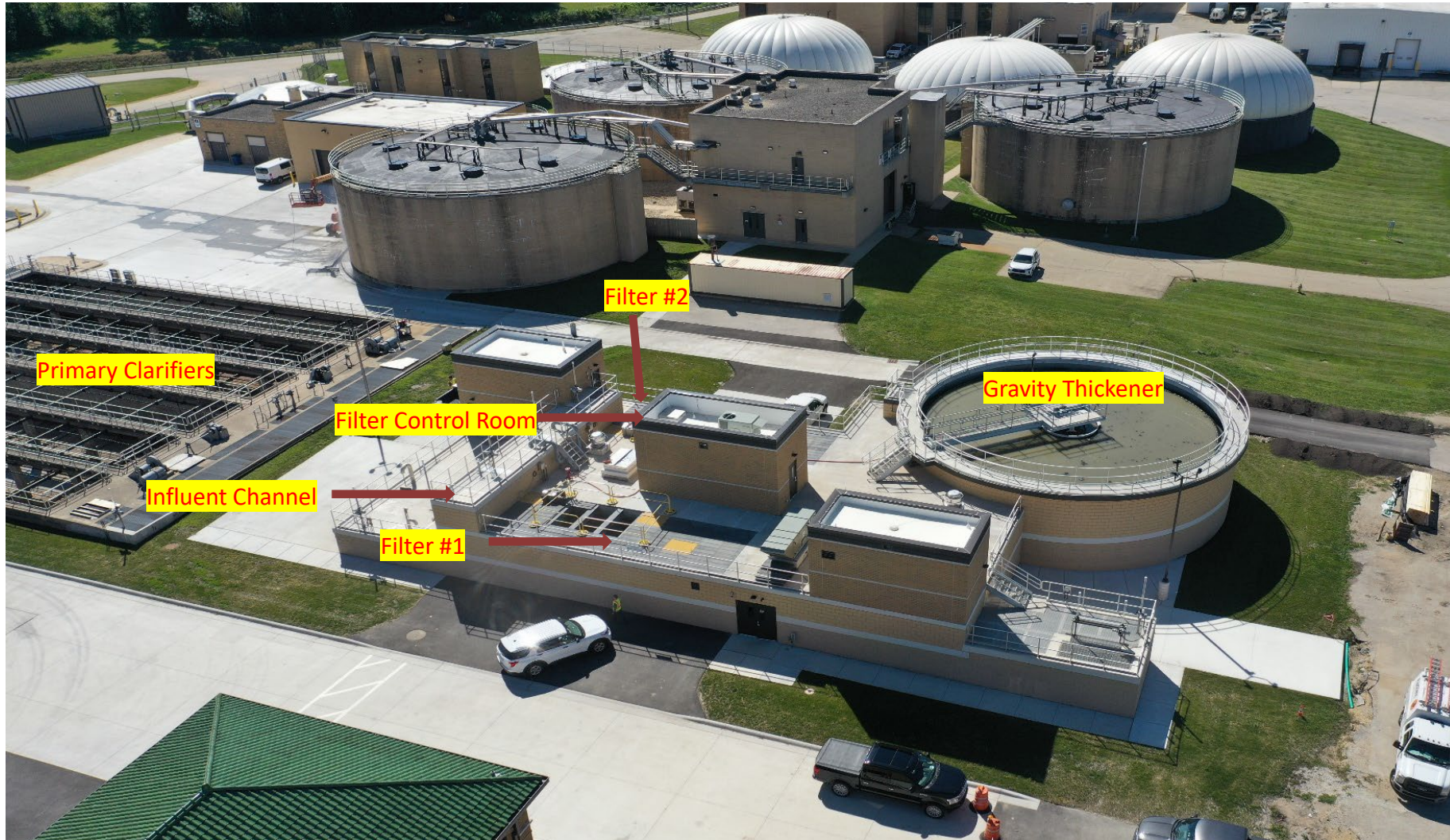


# Four Rivers Sanitation Authority (FRSA)





# Four Rivers Sanitation Authority (FRSA)



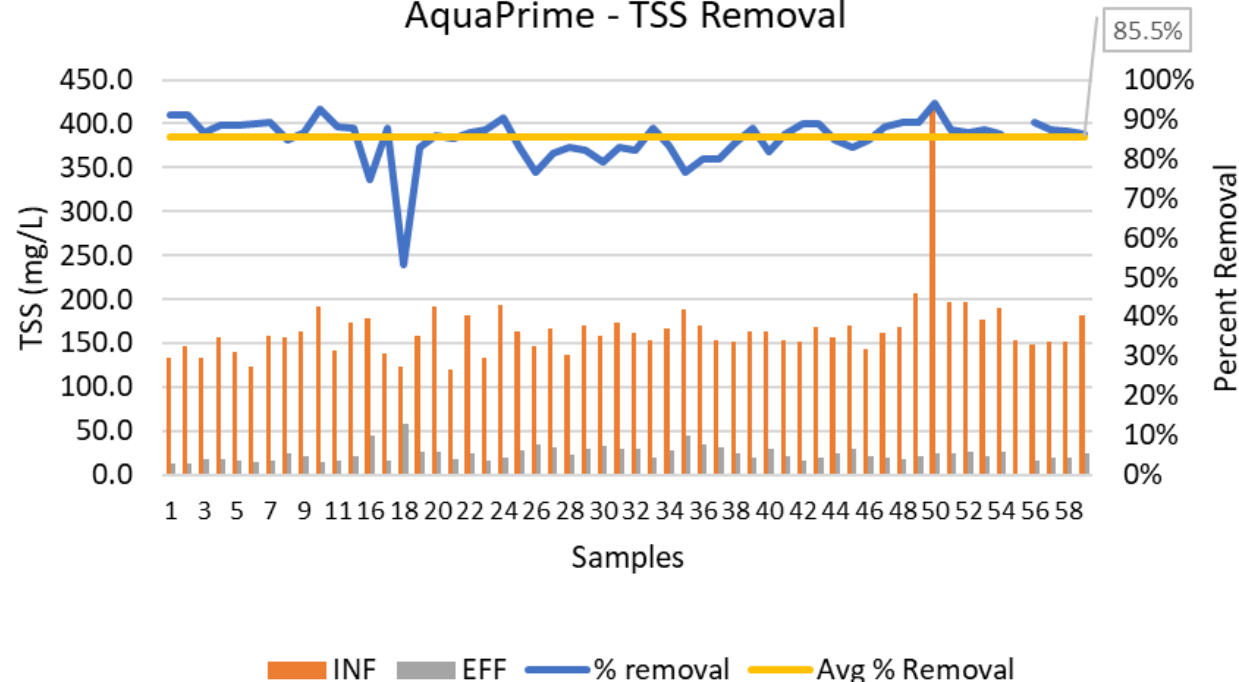
# Four Rivers Sanitation Authority

## Performance

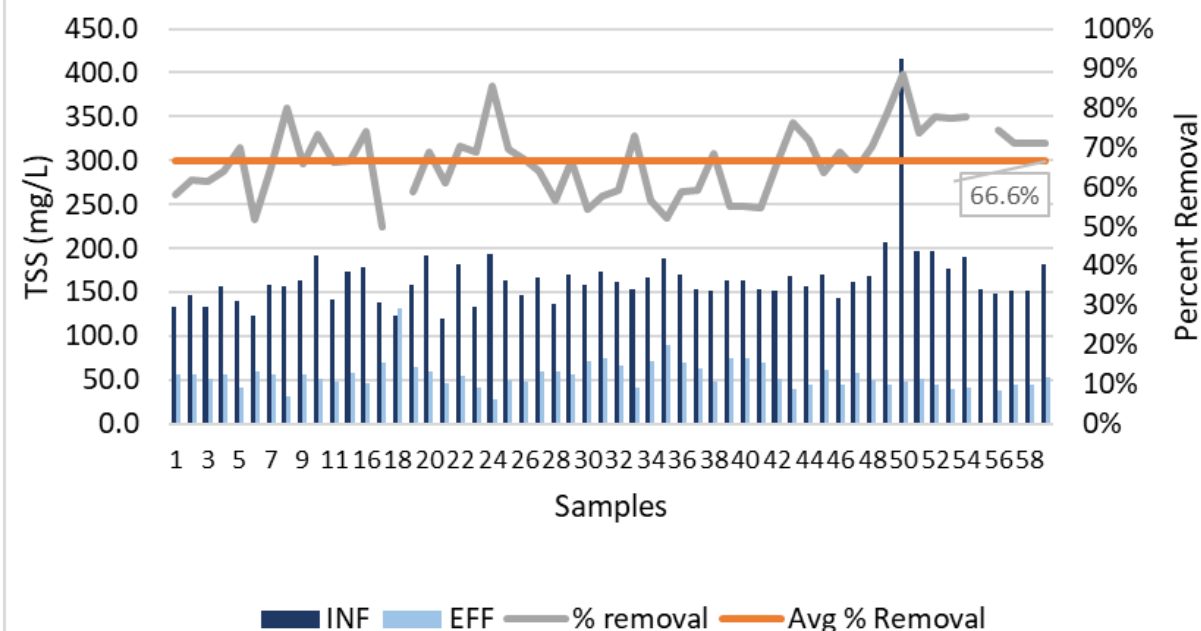


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### AquaPrime - TSS Removal



### Primary Clarifier - TSS Removal





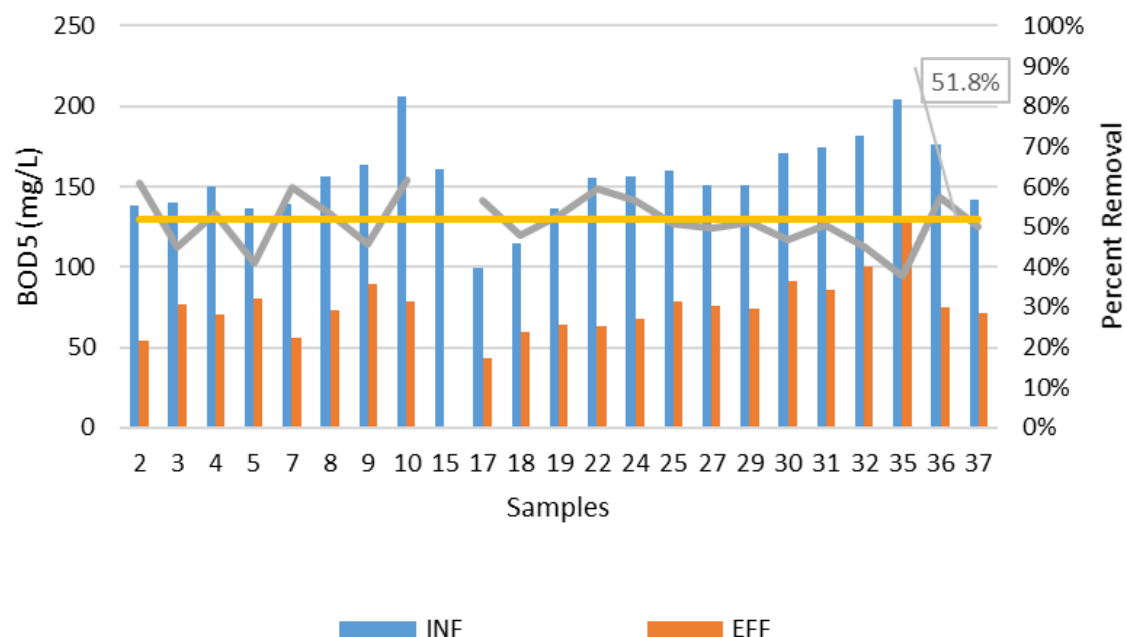
# Four Rivers Sanitation Authority

## Performance

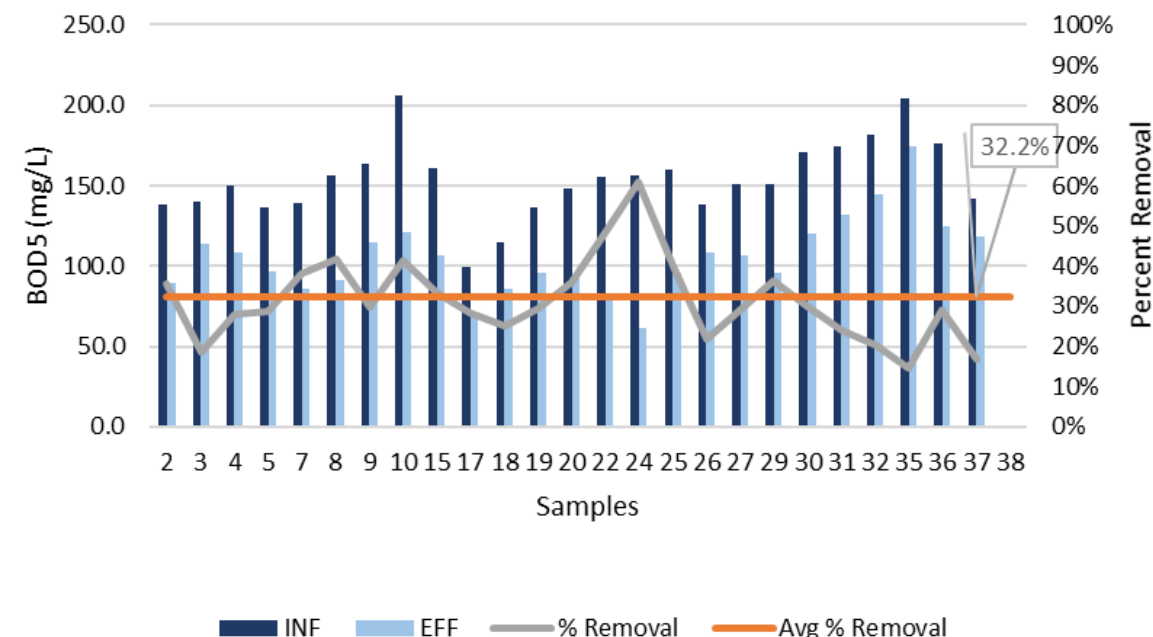


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### AquaPrime- BOD5 Removal



### Primary Clarifier - BOD5 Removal





# California Energy Commission Project

## CEC Phase 2



Linda County Water District, CA



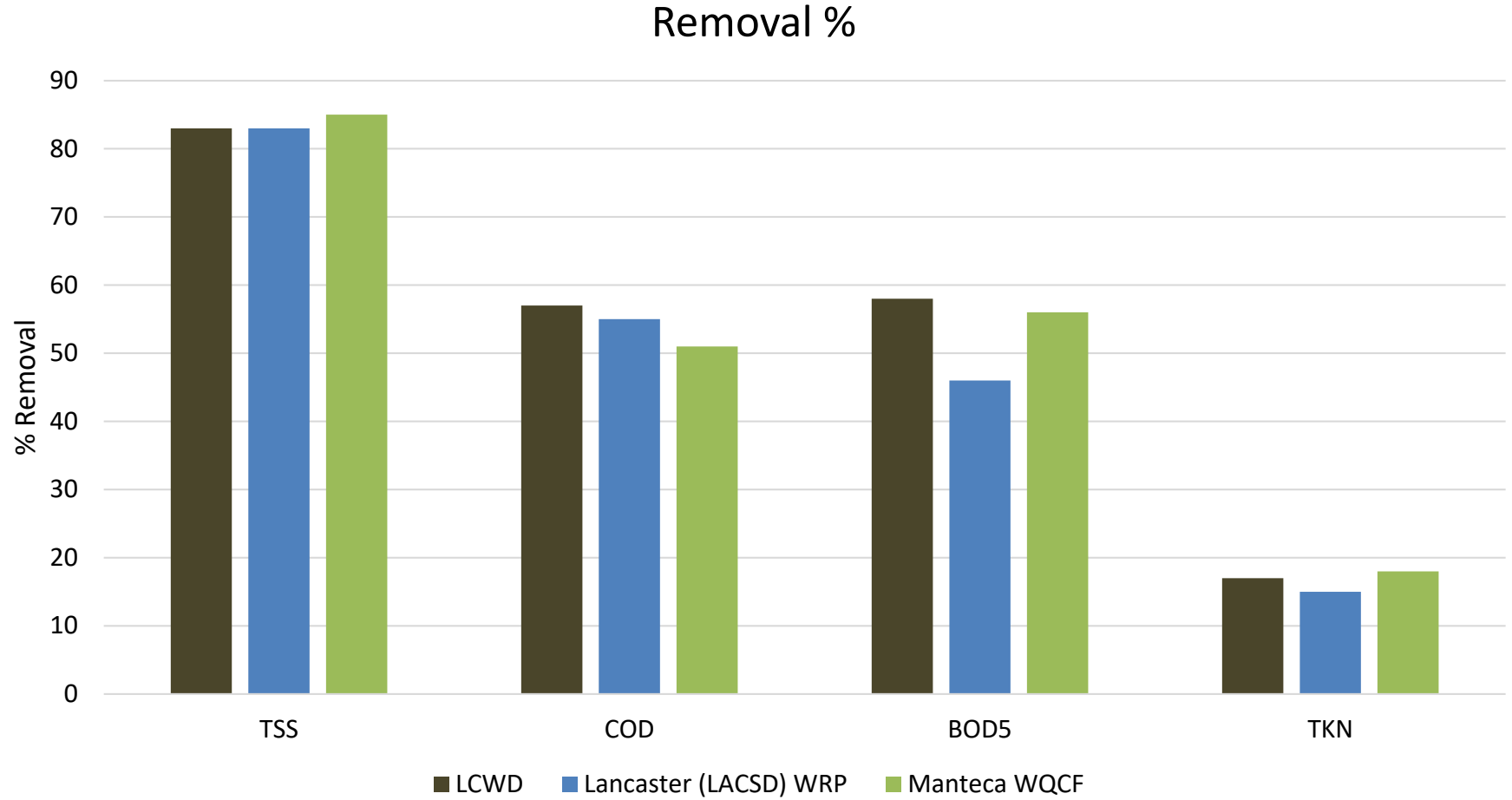
Lancaster (LACSD), CA



Manteca, CA

# CEC Project

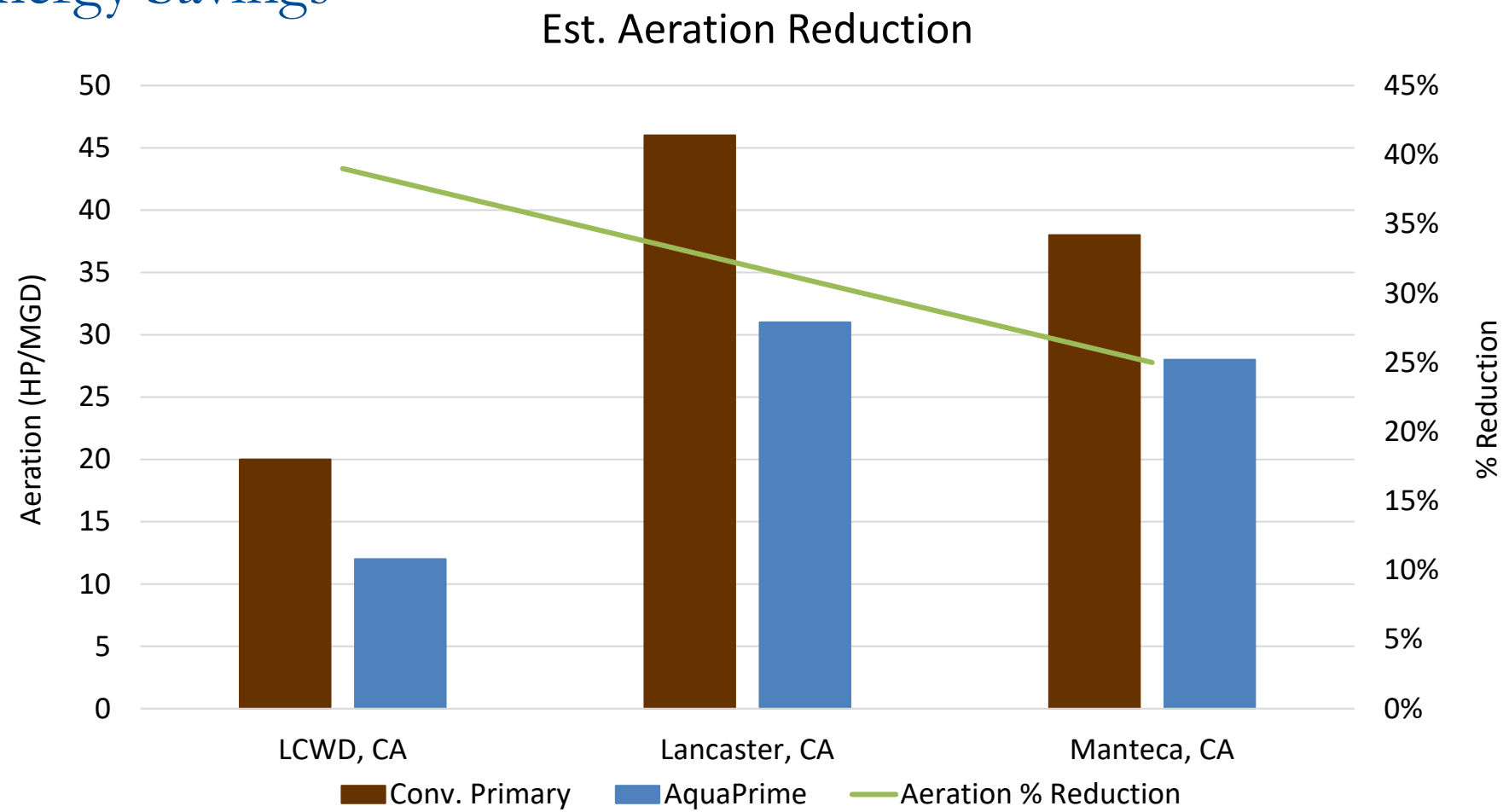
## % Removal Performance



Source: WER Journal 2020 – Performance Evaluation of the First Full-Scale Primary Filtration Using a Fine Pore Cloth Media Disk Filter, Onder T. Caliskaner

# CEC Project

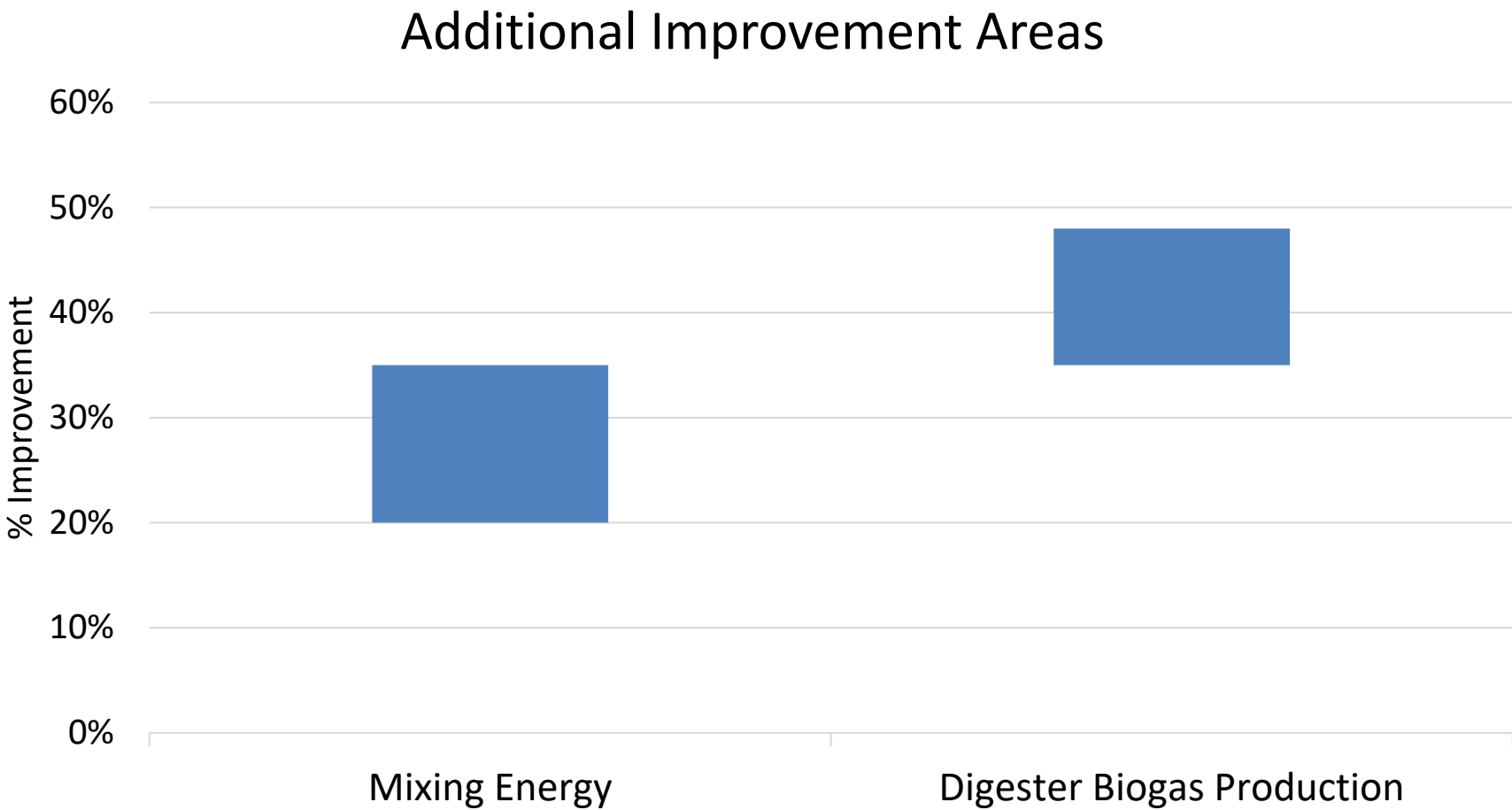
## Aeration Energy Savings



Source: WEFTEC 2019 – Long Term Operational and Performance Evaluation of Primary Filtration Technology for Carbon Diversion, Onder T. Caliskaner

# CEC Project

## Addition Energy Savings

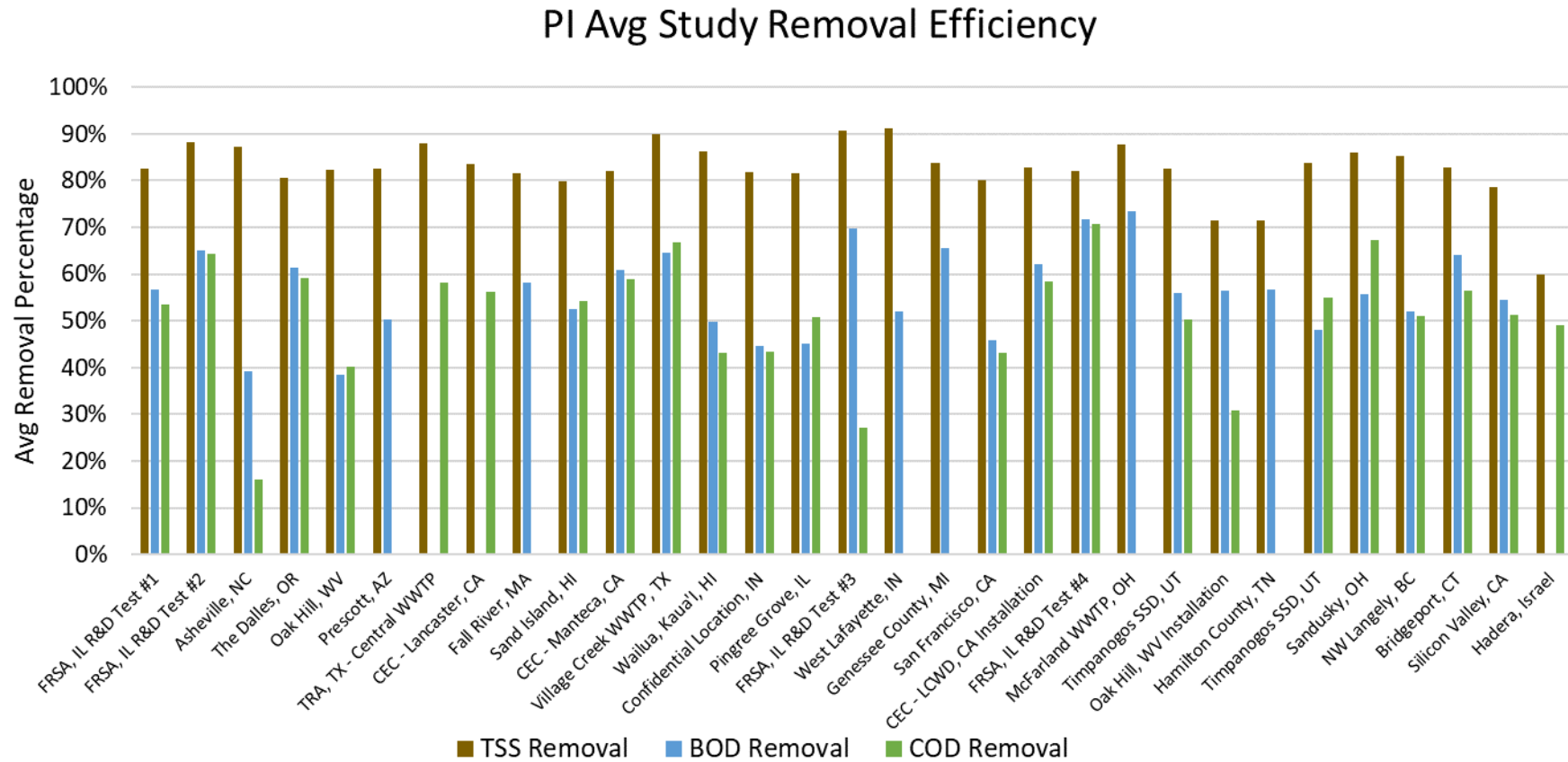


Source: WEFTEC 2019 – Long Term Operational and Performance Evaluation of Primary Filtration Technology for Carbon Diversion, Onder T. Caliskaner



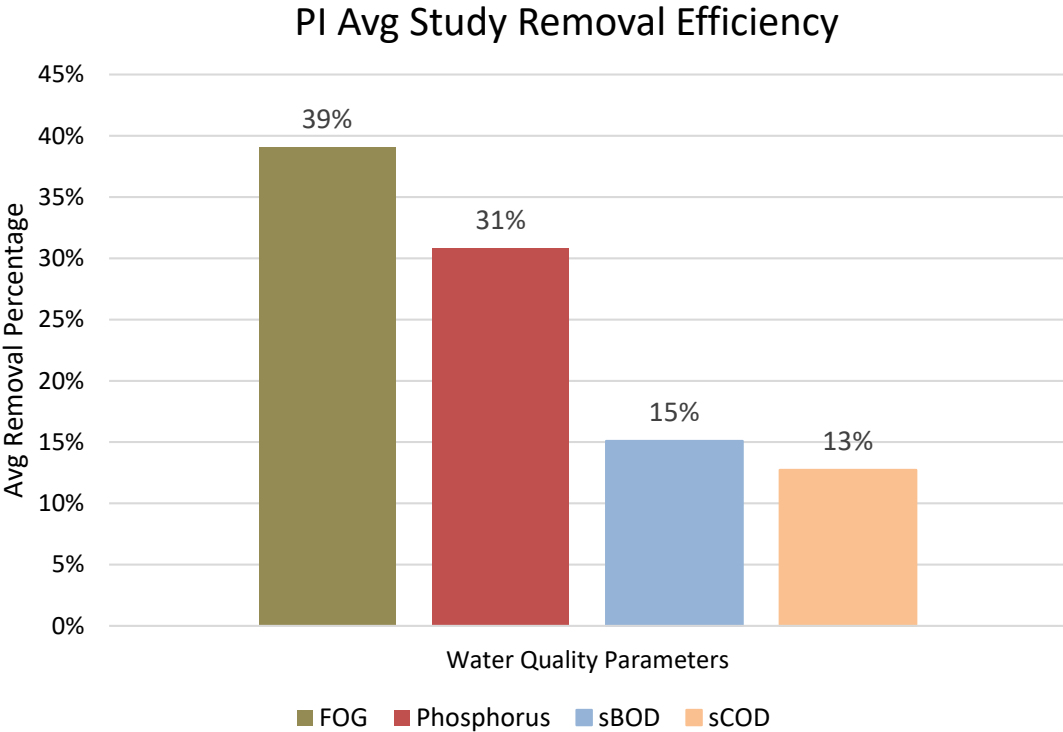
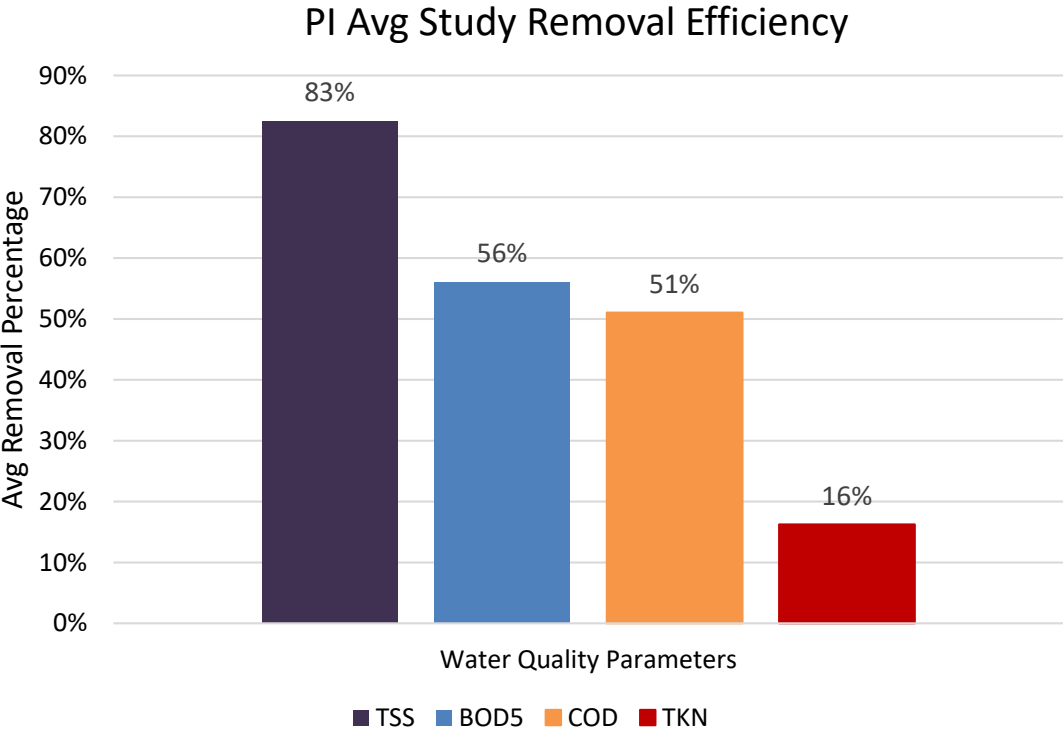
# Pilot / Installation Performance

## Water Quality Parameters



# Pilot / Installation Performance

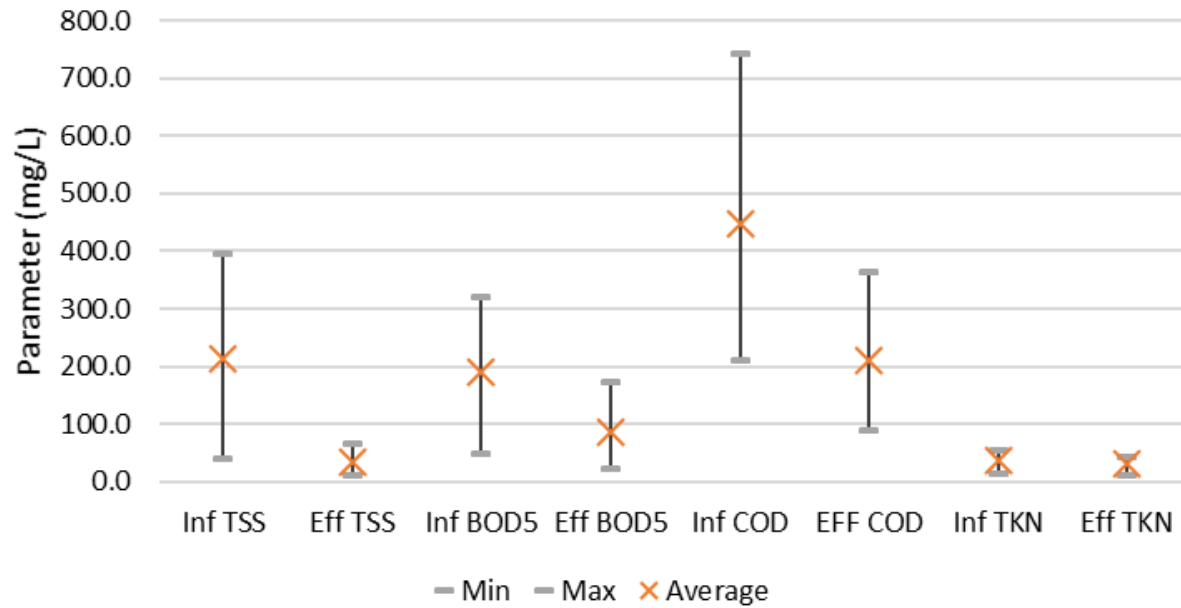
## Water Quality Parameters



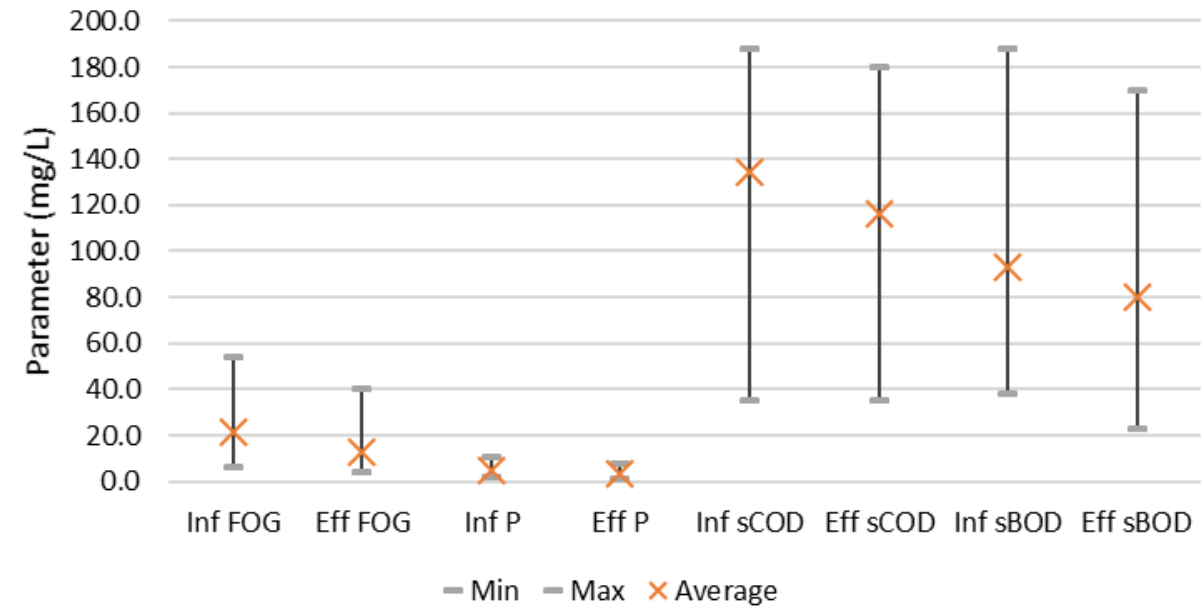
# Pilot / Installation Performance

## Water Quality Parameters

PI Avg Study Range



PI Avg Study Range





# Conclusion

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# AquaPrime® PCMF

## Conclusions



Footprint  
Savings



High Quality  
Effluent



Increased  
Secondary  
Capacity



Energy  
Savings



Biogas  
Production



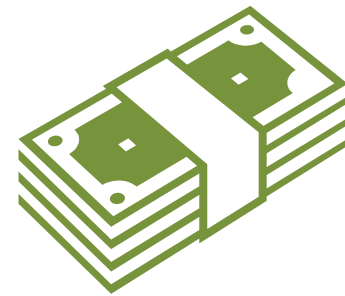
Simple  
Operation



Wet Weather  
Treatment



Dual  
Treatment



Net Present  
Value



# AquaPrime® Cloth Media Filtration for Advanced Primary Filtration

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