

A SYNERGISTIC APPROACH TO OVERALL PHOSPHORUS COMPLIANCE: THE VILLAGE OF SAUKVILLE PLAN

2019 Government Affairs Seminar

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Topics

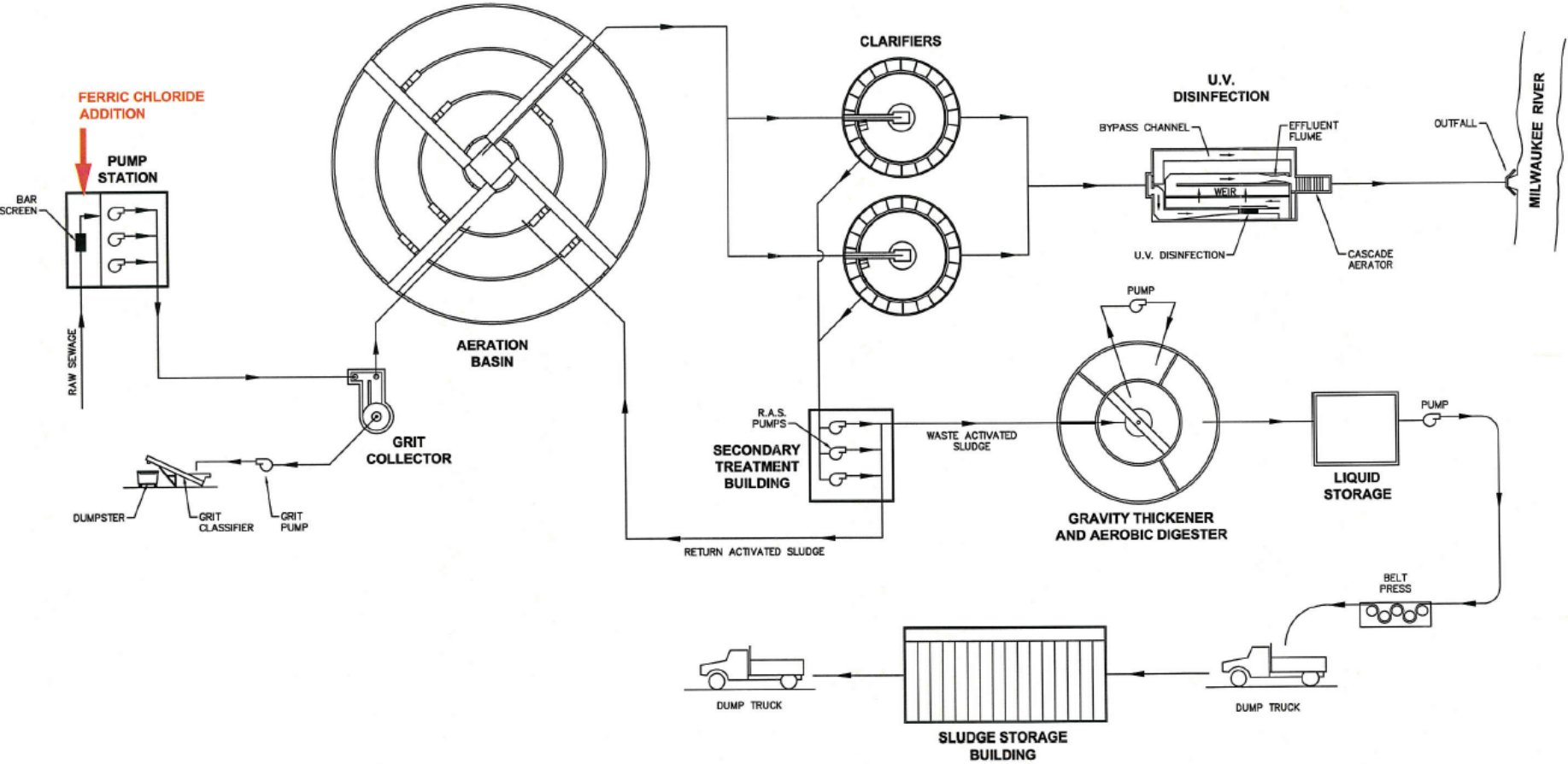
- Background
- Optimization Activities
- Alternatives Considered
- Selected Alternative
- Pilot Study
- Schedule for Implementation



Background

- Village Population: 4,419
- Activated Sludge
- Oxidation Ditch
- ADF: 1.0 MGD
- Discharge to Milwaukee River
- Milwaukee River Basin TMDL

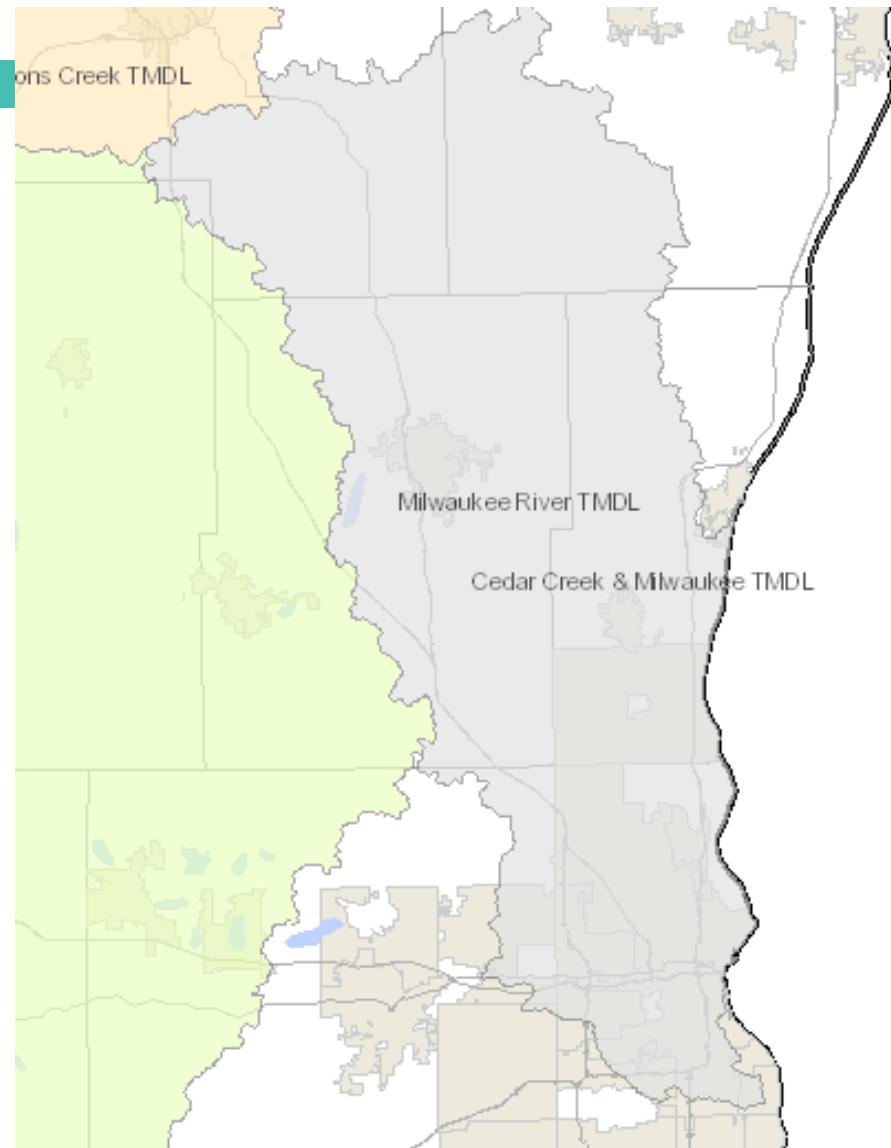




**VILLAGE OF SAUKVILLE WTF
FLOW DIAGRAM**

Background

- TP Permit Limits
 - WQBEL - 0.075 mg/L
 - Removed in Future
 - TMDL Mass Limits
 - 0.16 mg/L
 - Most Stringent at DAF



Background

- MS4
 - TP Add'l
Reduction Req'd
 - 291
Pounds/Yr.
 - TSS Add'l
Reduction Req'd
 - 55,077
Pounds/Yr.



Background

Phosphorus Compliance Schedule

OER	6/30/2016
Compliance Alternatives...	6/30/2017
Preliminary Compliance...	6/30/2018
Final Compliance ...	6/30/2019
Final Plans and Specifications	6/30/2021
Achieve Compliance	6/30/2024

Optimization Activities

- OER Reduction and Optimization Activities
 - Speciation (snrp)
 - Dose/Response (Lab and Plant-Wide)
 - New Chemical Injection Location
 - New Chemical



Optimization Activities -sNRP

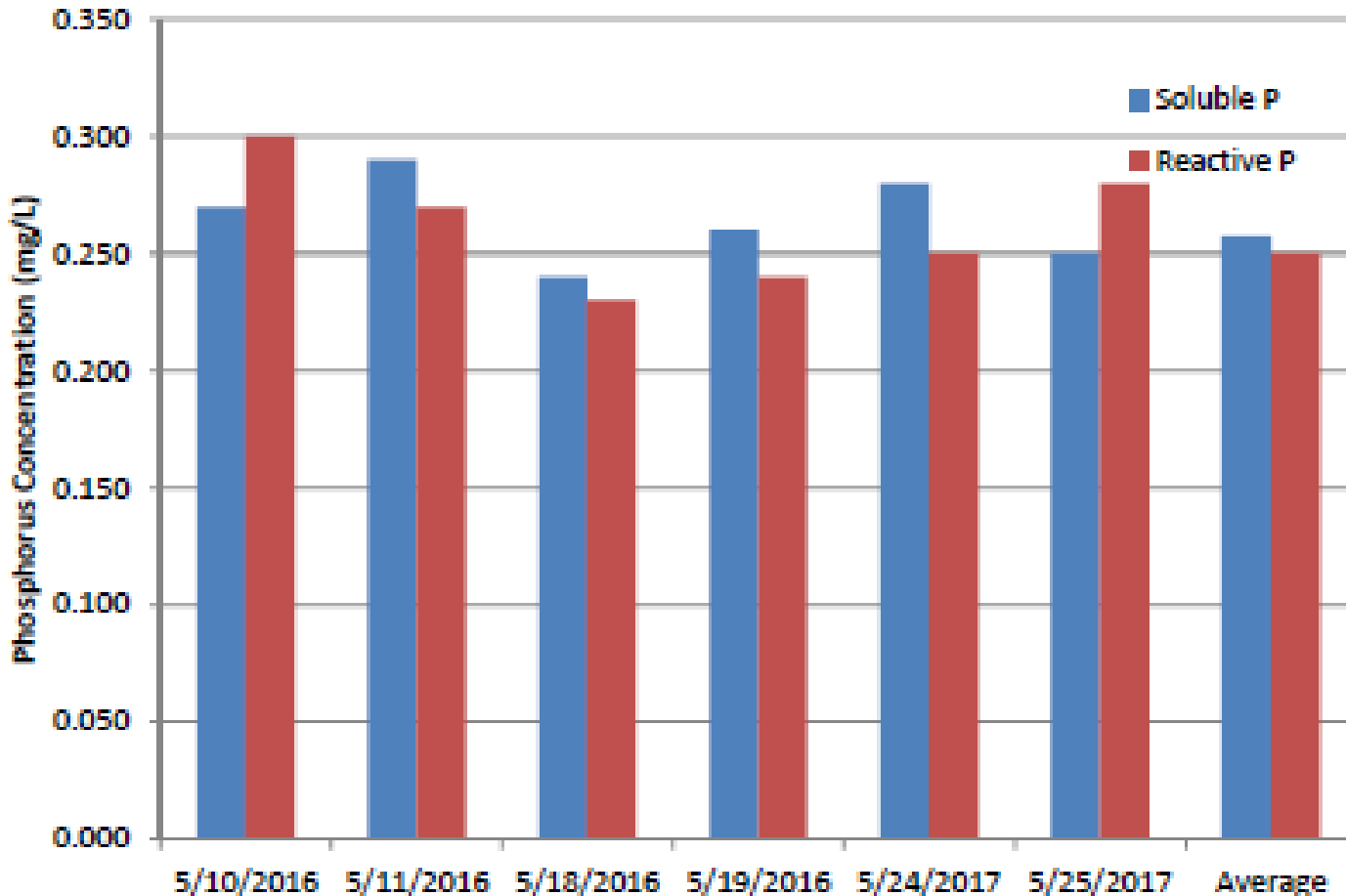


Figure 1 – Portions of Soluble and Reactive Phosphorus

Optimization Activities

Dose-Resp.

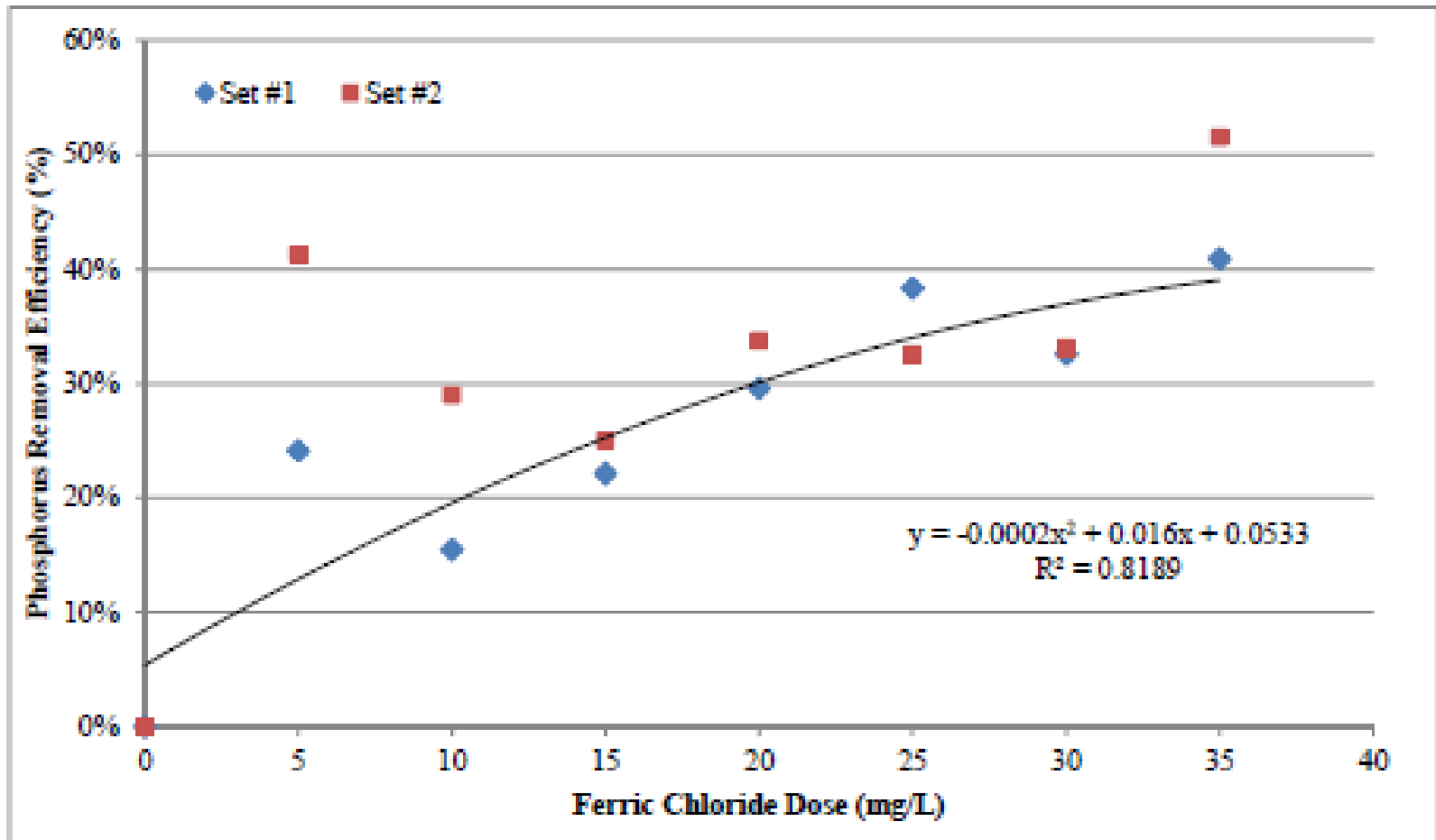
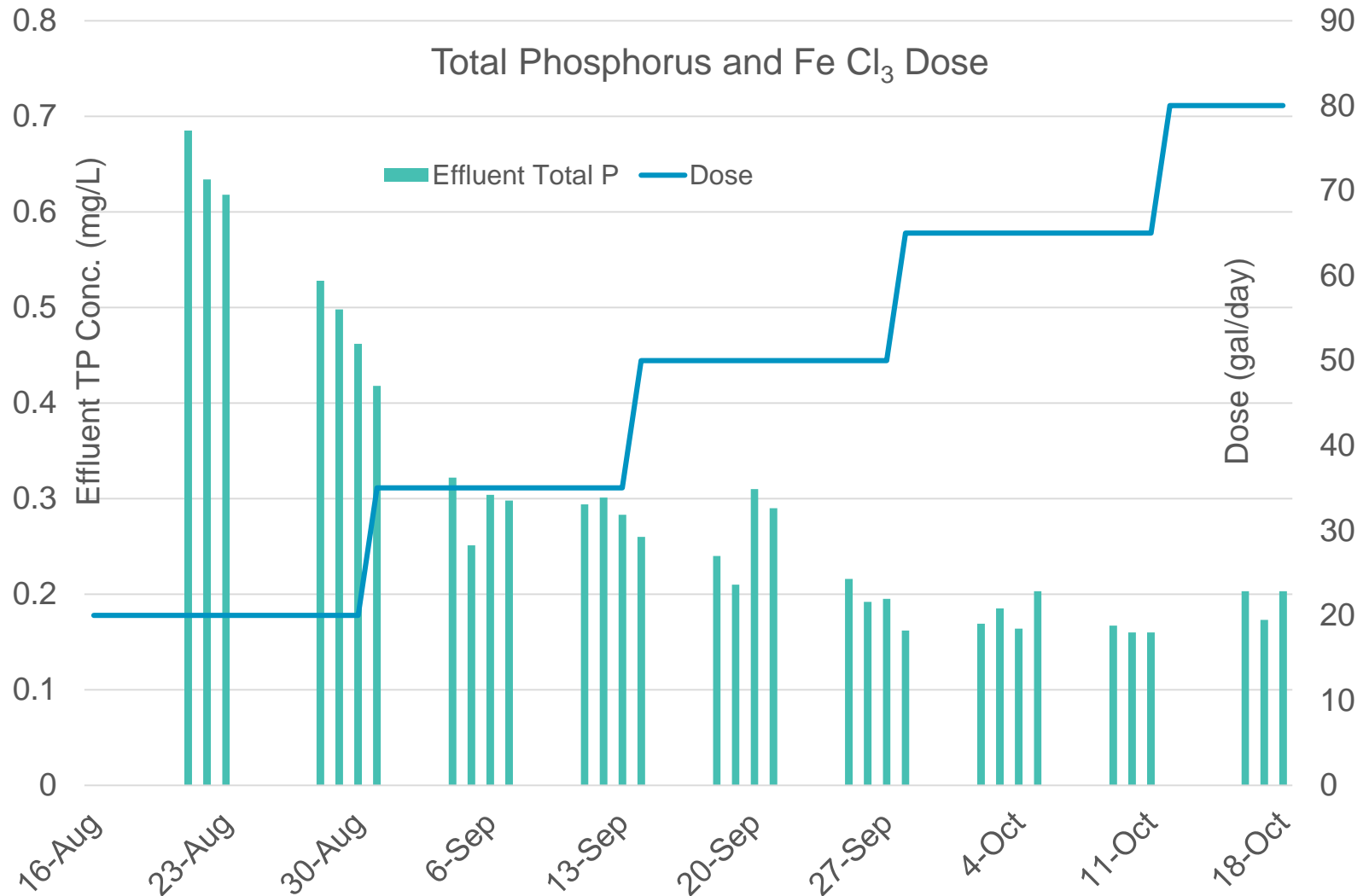
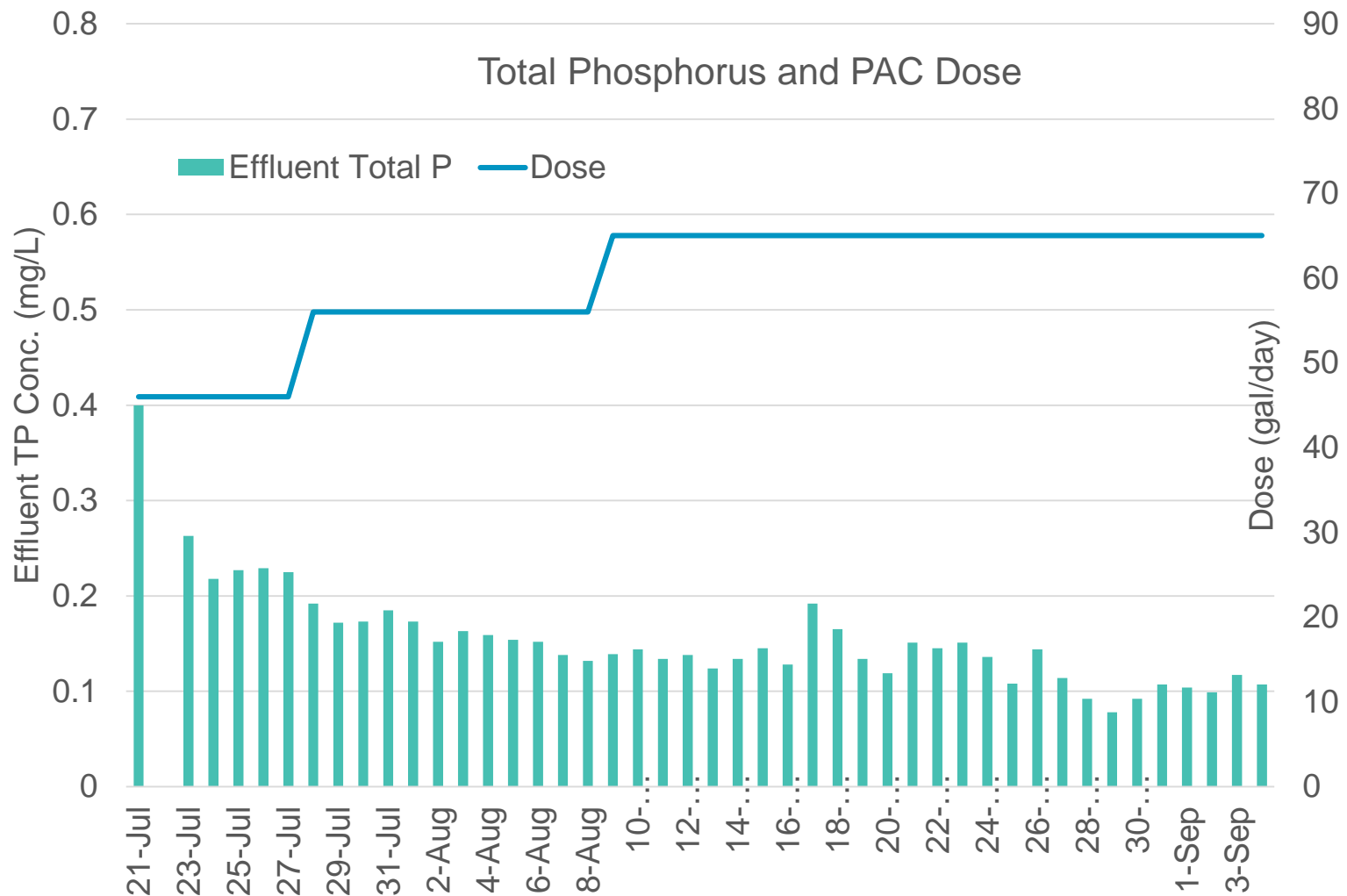


Figure 6 – Phosphorus Removal Efficiency (%) vs. Ferric Chloride Dose Level

Optimization Activities



Optimization Activities



Alternatives Considered

- Water Quality Trading
 - Farmers
 - Streambank Stabilization (Village land)
- Adaptive Management
- MDV
- Traditional Variance
- WWTF Upgrade



Selected Alternative

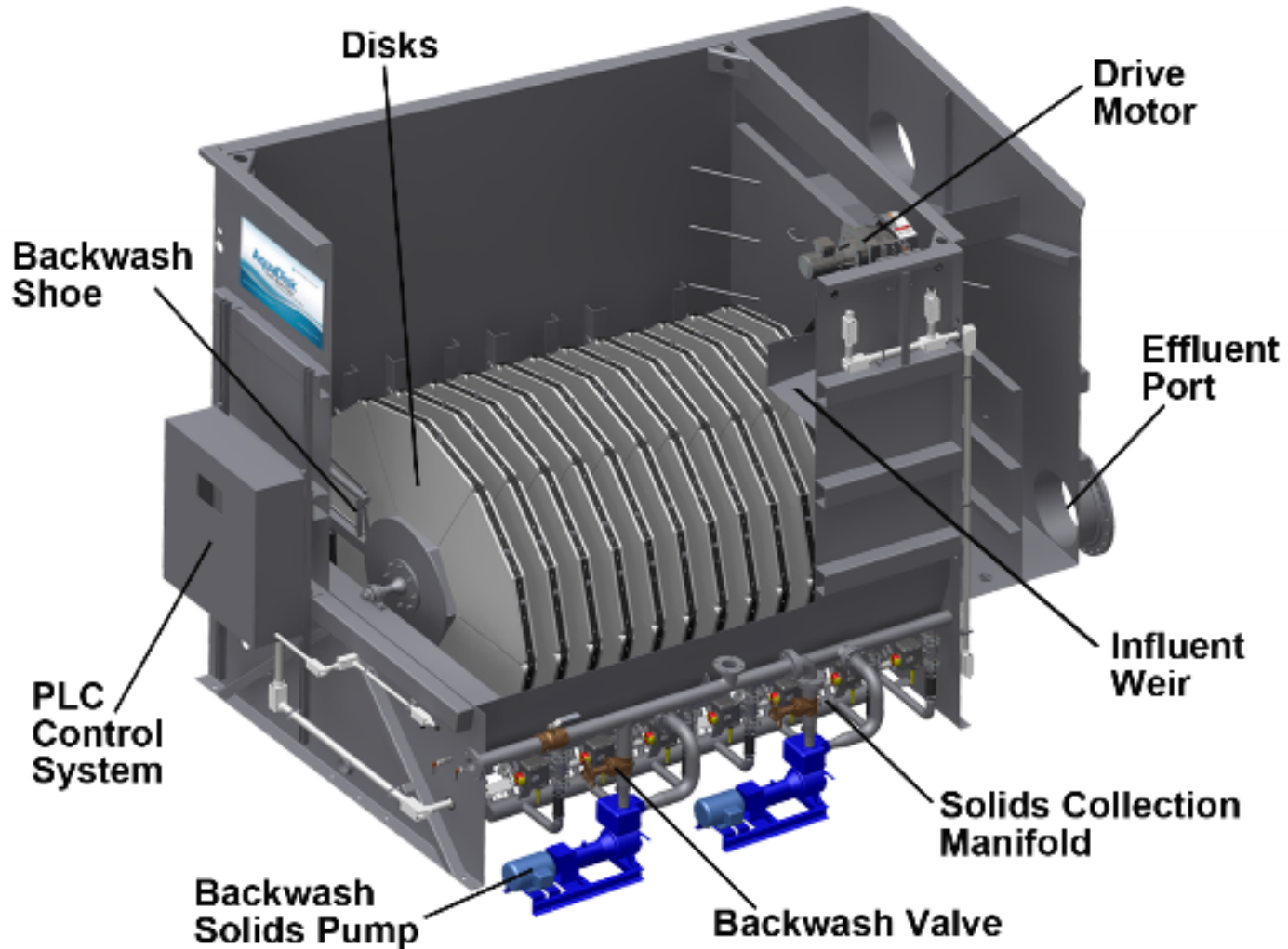
- WWTF Upgrade
 - Control
 - Certainty
 - Long Term Solution
 - Economical
 - Second Pump Station Not Needed
 - Fit in Hydraulic Profile
 - Extra Credits to MS4
 - TP 516 Lbs./Yr.
 - TSS 28,110 Lbs./Yr.



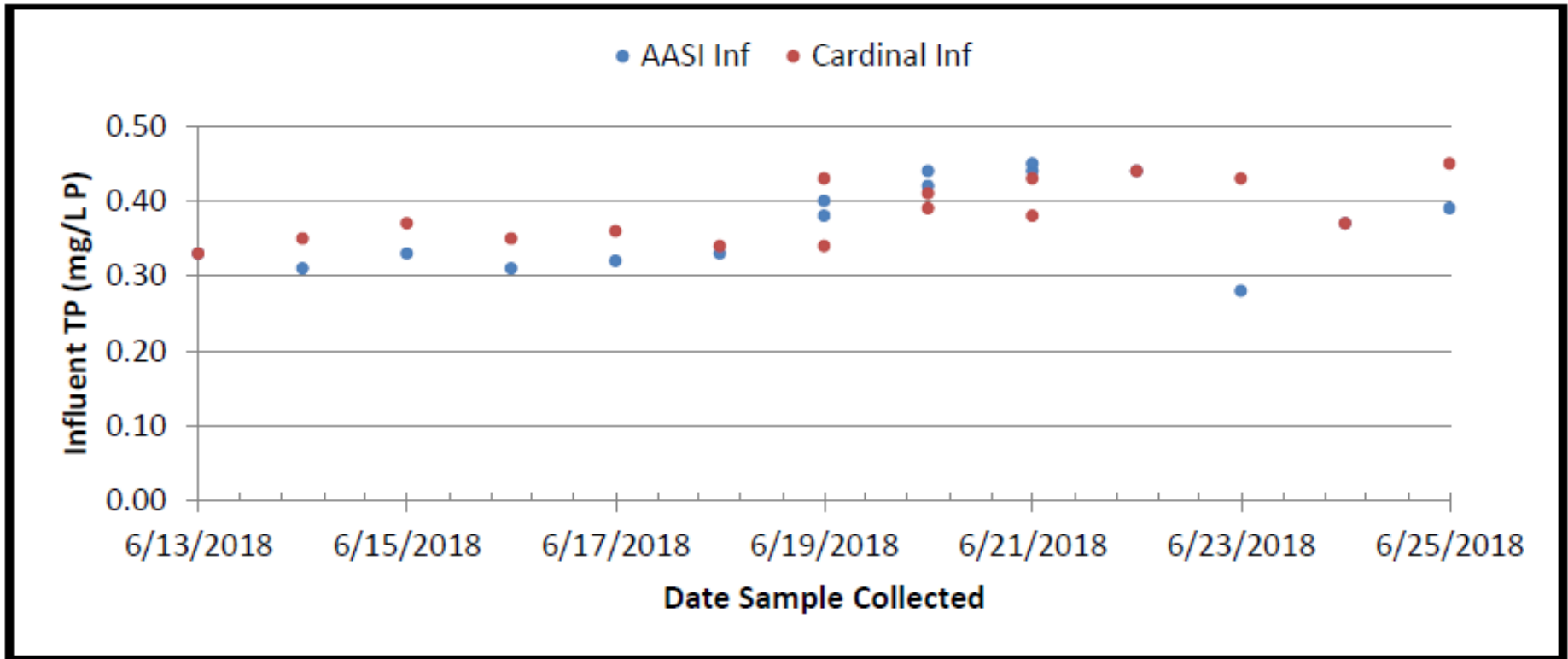
Selected Alternative

Design Flow (MGD)		1.6		
Treatment Level (mg/L)		0.09		
Phosphorus				
Month	Allocation (pounds per day)	Allocation (pounds)	Actual (pounds)	Pounds Below Allocation
Jan	2.83	88	37	51
Feb	3.11	87	34	53
Mar	2.40	74	37	37
Apr	2.76	83	36	47
May	2.35	73	37	36
Jun	3.04	91	36	55
Jul	2.55	79	37	42
Aug	2.50	78	37	40
Sep	2.53	76	36	40
Oct	2.05	64	37	26
Nov	2.82	85	36	49
Dec	2.52	78	37	41
total				516

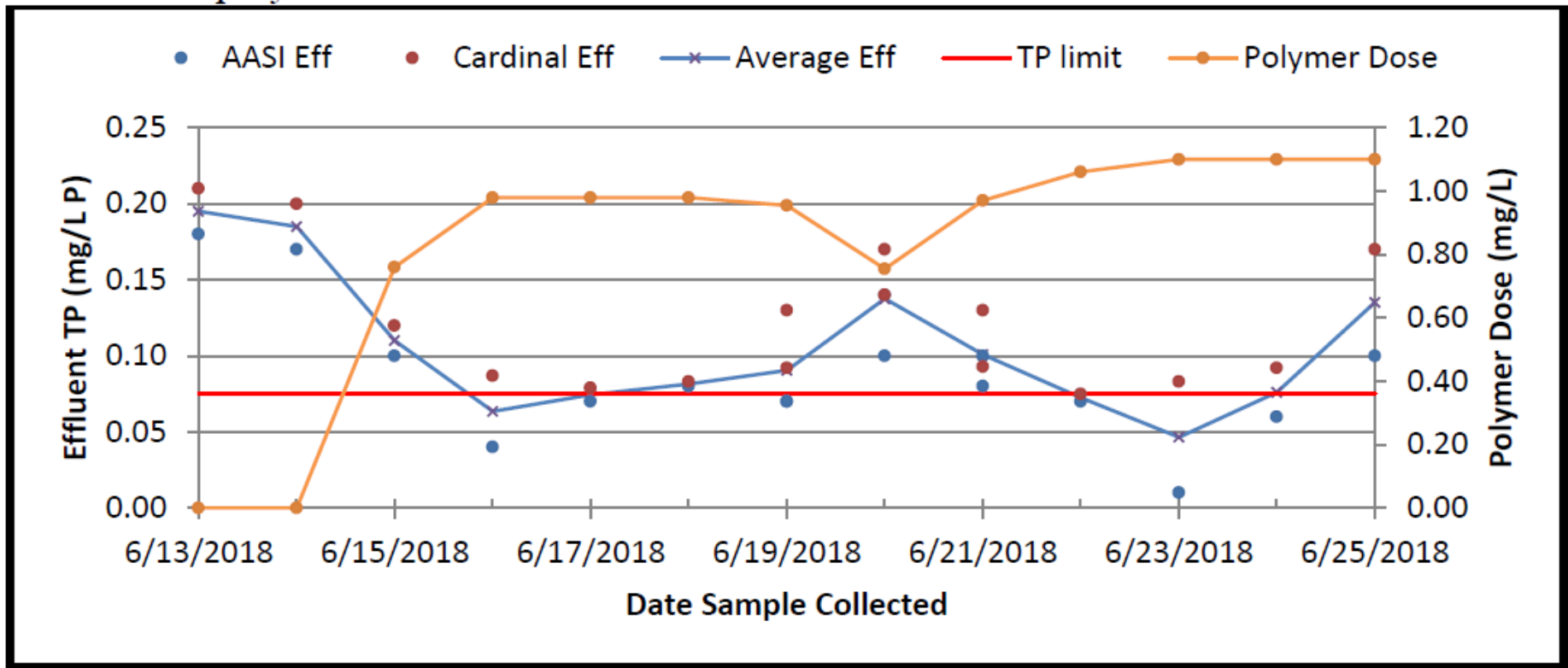
Pilot Study



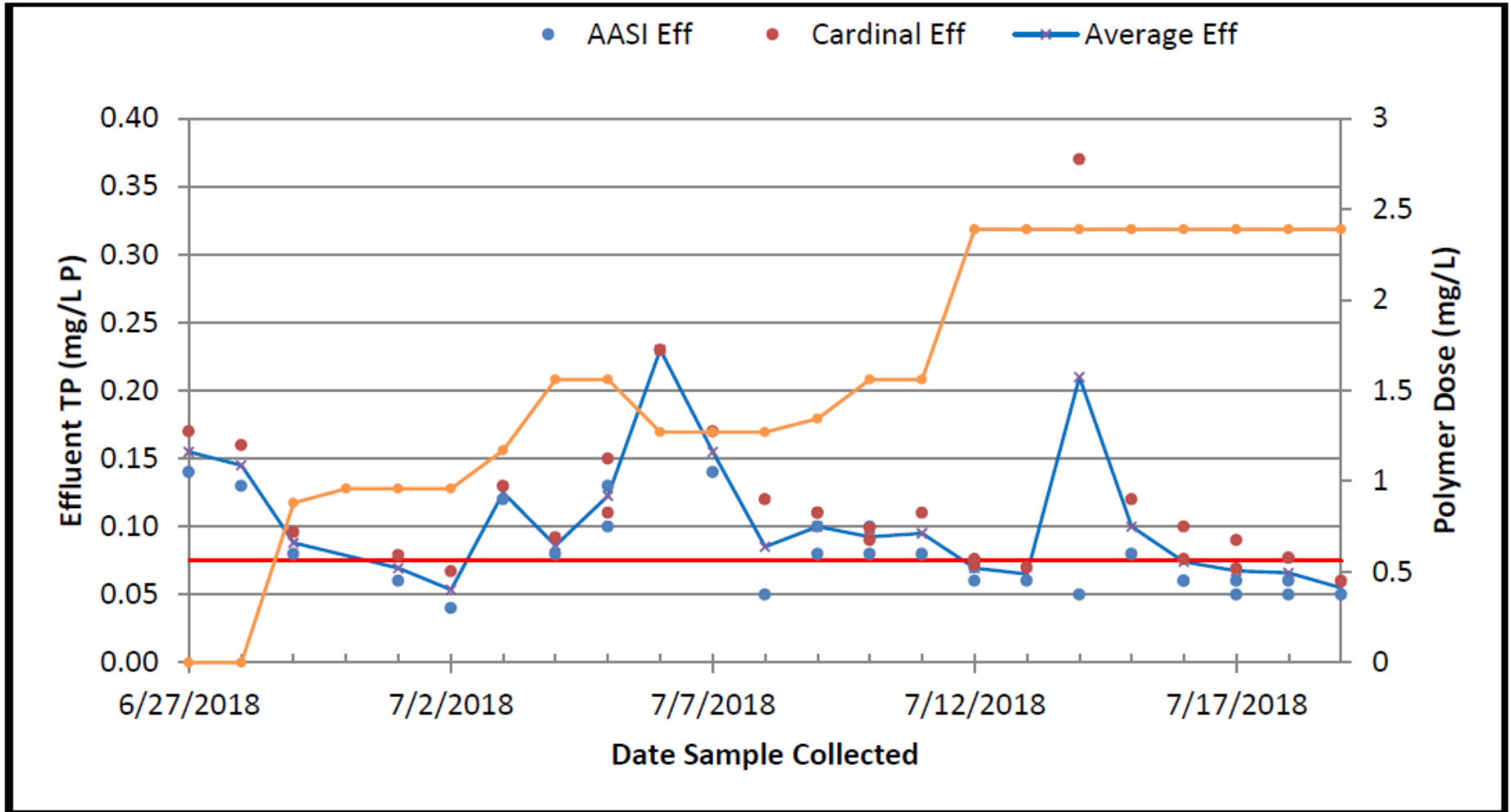
Pilot Study



Pilot Study



Pilot Study



Schedule for Implementation

Schedule	
USDA Grant Coordination	Summer 2019
Final Comp. Alt. Plan	June 2019
Start Design	May 2020
Complete Design	June 2021
WDNR Approval	August 2021
Bidding	August 2021
Start Construction	September 2021
Complete Construction	September 2022

Questions

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