

Thank you to our Patrons



Geosyntec
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We will begin our presentation in a few minutes...





Long-Term Vision to Fight Advancing Water Challenges

Todd Creek WWTP Design





AGENDA

Introductions (5min)

History and Drivers (10min)

Technology Evaluation and Selection (15 min)

Deeper dive in AGS (7 min)

Facility Design Review(8 min)

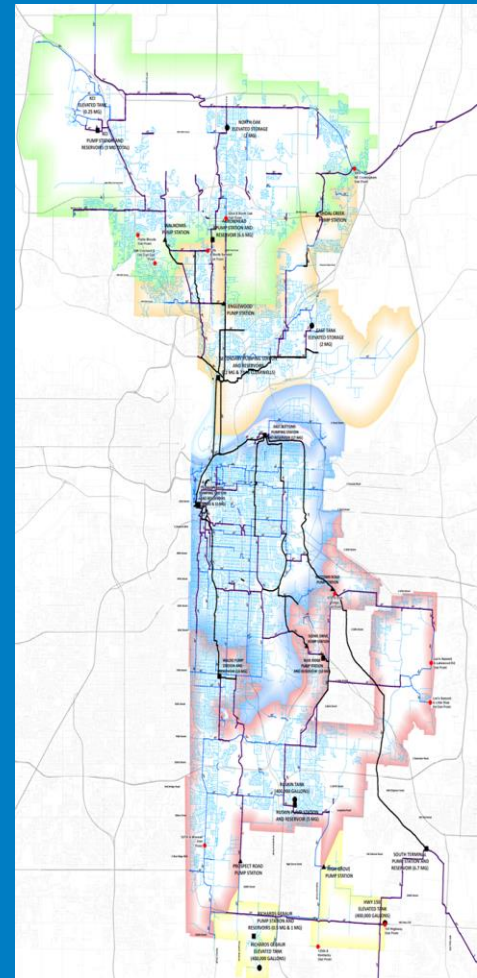
Schedule and Cost(3min)

Wrap up (2min)



KC Water

- 318 square mile City
- KC Water operates three utilities
 - Water
 - Wastewater
 - Stormwater
 - 2,800 miles of water distribution and wastewater collection system
 - 1 water treatment plant, pump stations
 - 6 wastewater treatment plants, pump stations
 - 15 stormwater pump stations
- Each utility is a separate enterprise fund
- Source of revenue is customer payments
- Budget: >\$400 million
- Approximately 168,000 accounts
- 32 wholesale customers
- Approximately 600,000 customers



Burns & McDonnell

- 100% Employee-Owned
- Top 5% Design Firm
- \$7.4B
- AEC firm covering 12 major industries
 - 75 offices worldwide
 - 12,000 employee-owners
- Began in 1898 serving municipal water and power

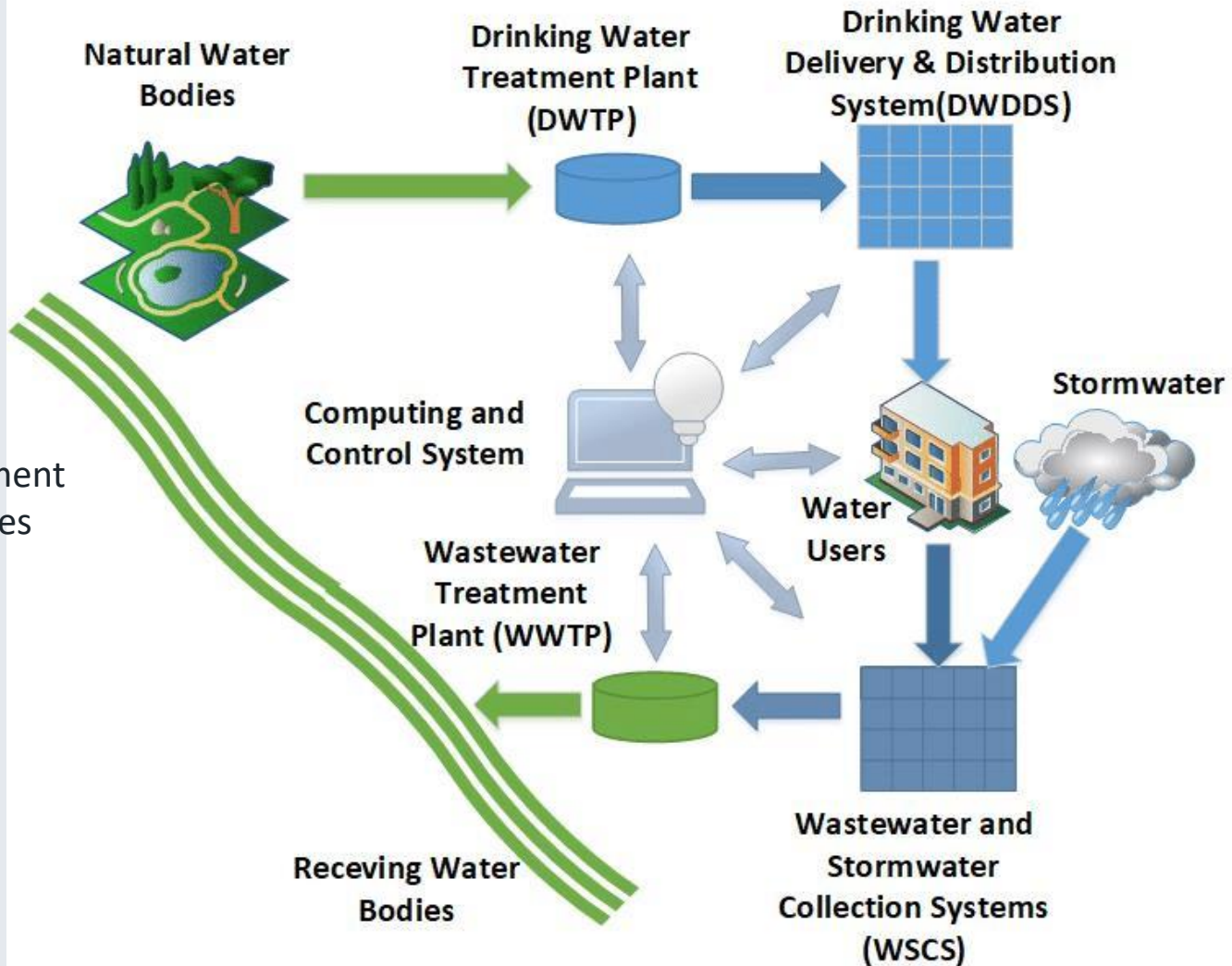




Wastewater 101

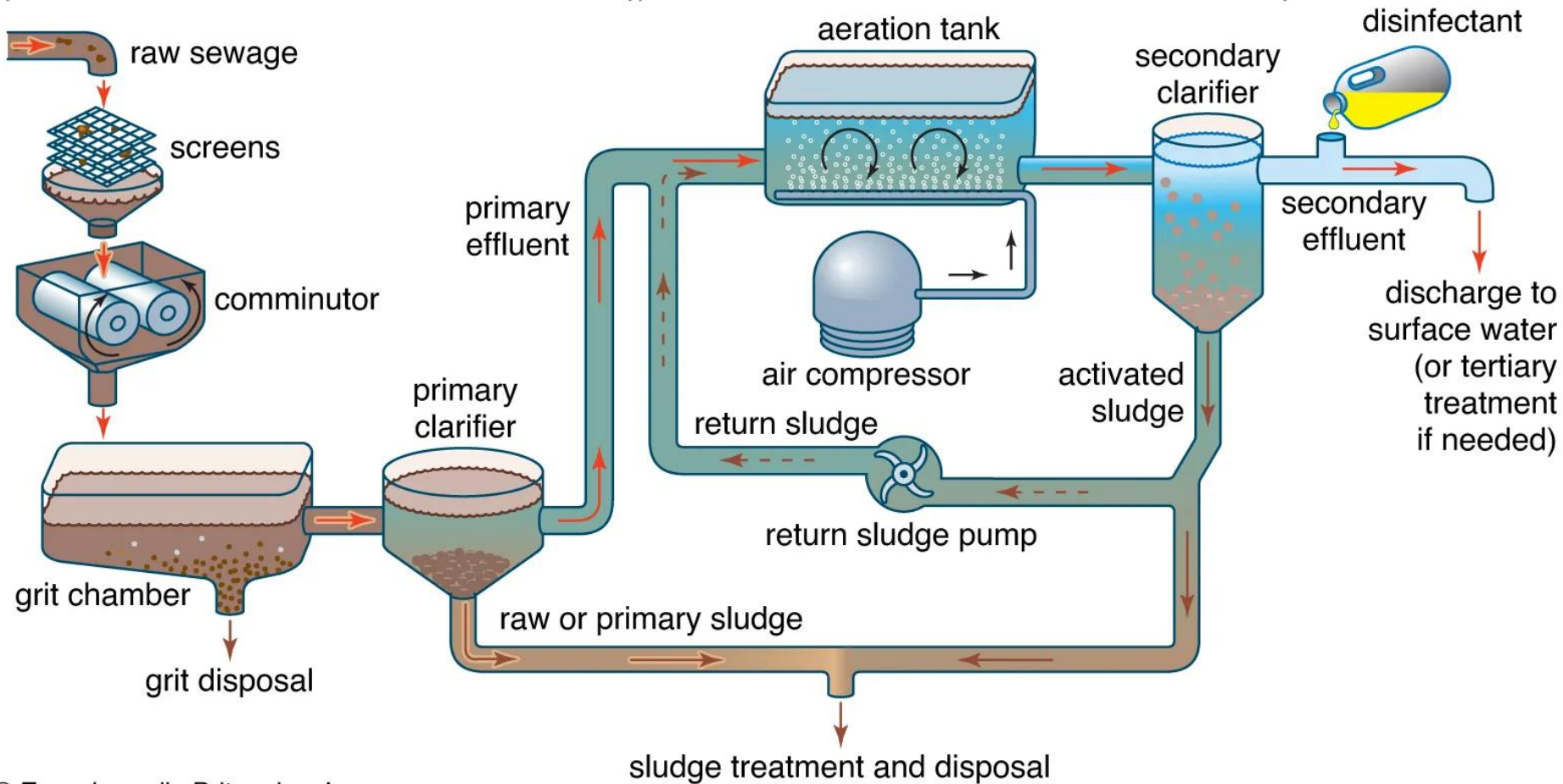
Wastewater 101

Protecting the environment
AND drinking water supplies



primary treatment

secondary treatment





Background



History of Todd Creek WWTP

Serves 2 sewersheds, approx. 32 square miles

WWTP built in 1967, expansions in 1990s.

Serves one of the fastest undeveloped areas of the KCWater service area



History of Todd Creek WWTP



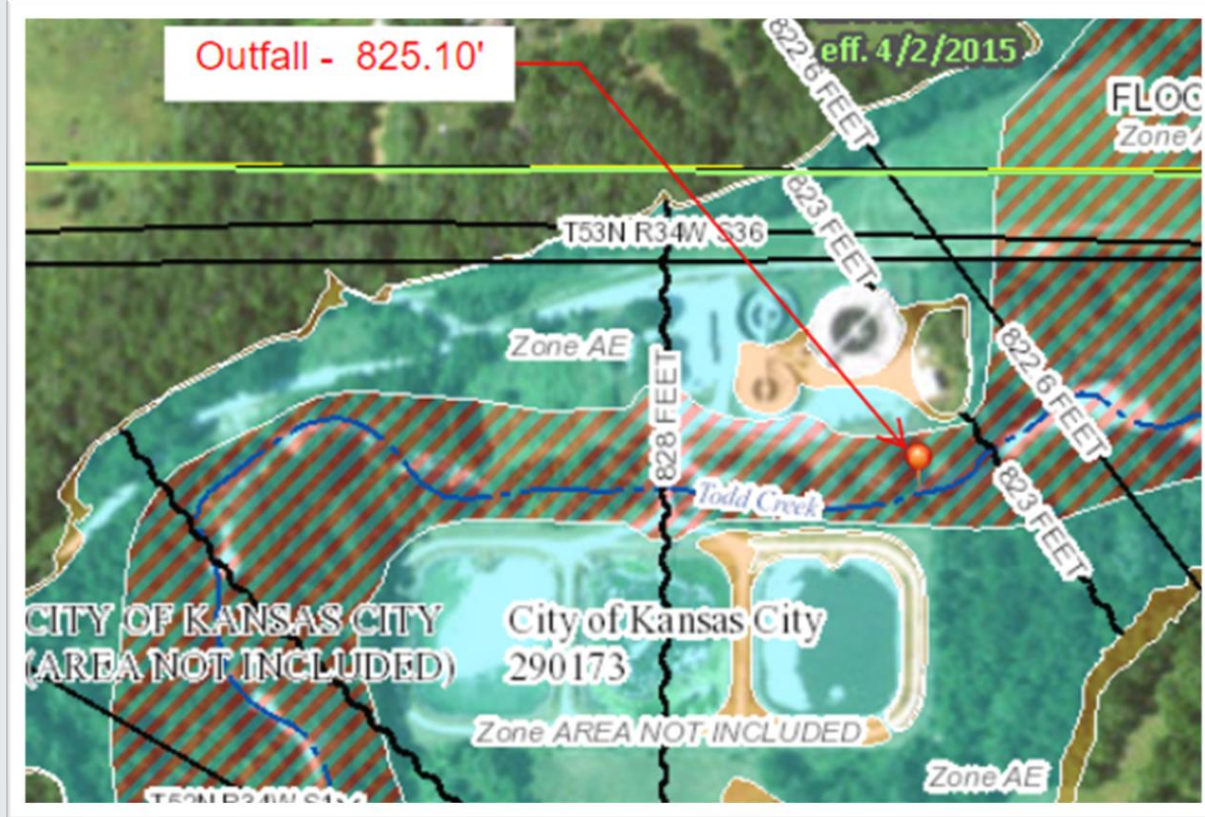


Project Drivers

Project Drivers

FEMA Floodplain Revisions

- ▶ Submergence of Plant Infrastructure
- ▶ Flooding of Access Road
- ▶ No Ability to Expand Plant



Project Drivers

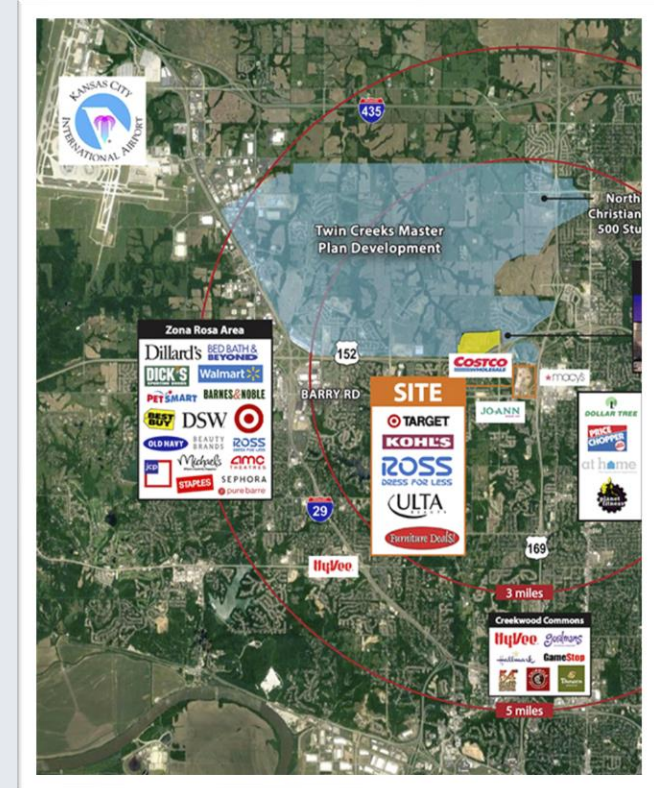
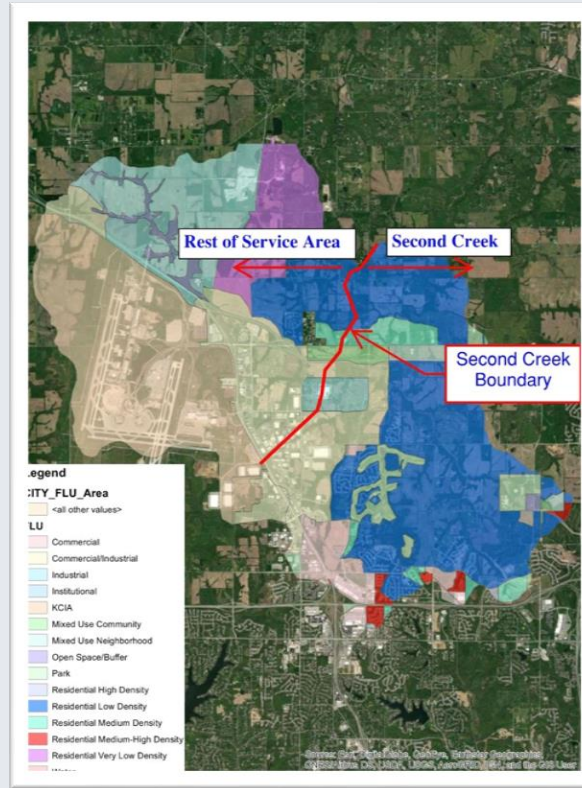
Service Area Growth



Project Drivers

Service Area Growth

Full buildout approx.
69,000



Project Drivers

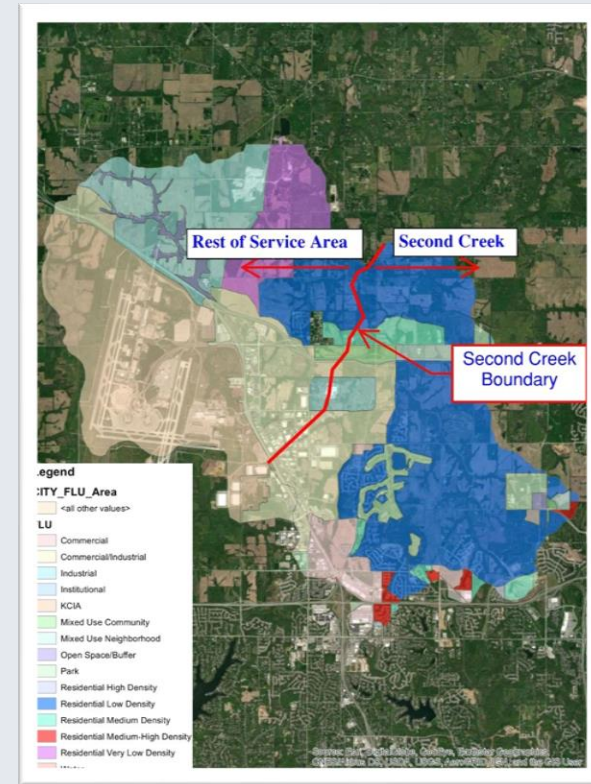
Service Area Growth

Design Flows

Parameter	Current	2042
Flow, Million Gal per Day		
<i>Average Day</i>	2.31	4.67
<i>Maximum Month</i>	3.79	8.10
<i>Peak Hour</i>	5.68	12.48

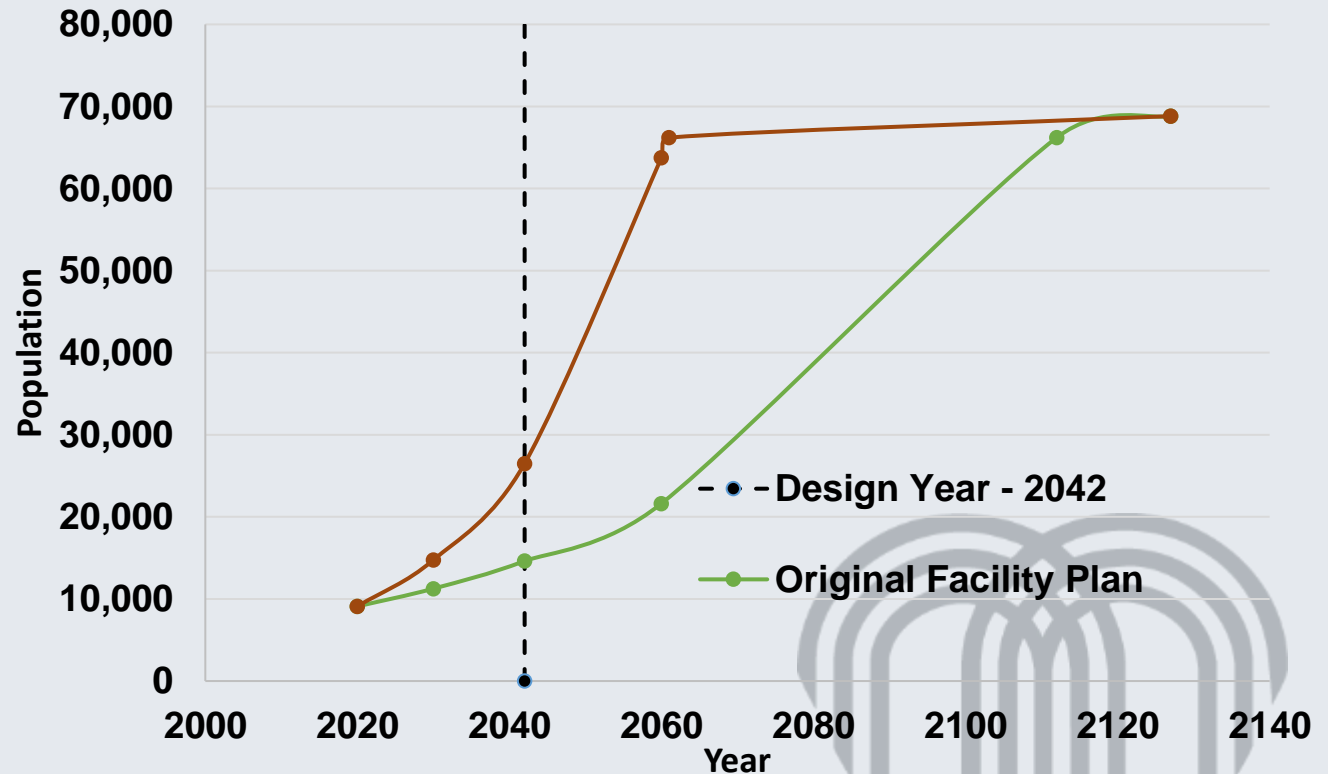
Population Equivalent

Population Scenarios	2042
Projected	~25,000
Pop. Equivalent – Flow Basis	~42,000
Pop. Equivalent – BOD Basis	~45,000



Project Drivers

Service Area Growth



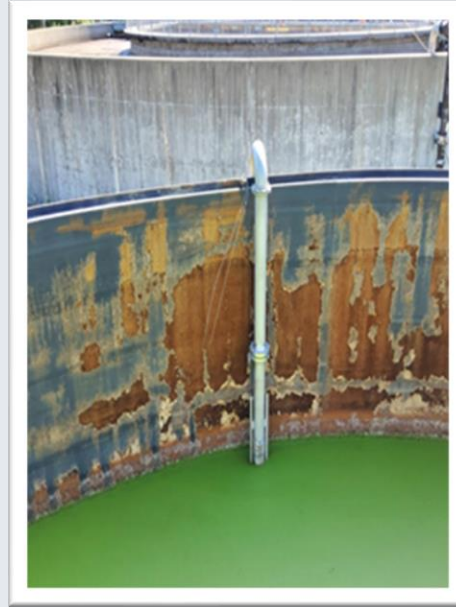
Project Drivers

Facility Condition



Project Drivers

Facility Condition



Project Drivers

Water Quality Permit



Ammonia Now
Phosphorus 2035
Future TN
MCI SADF

Project Drivers

Water Quality Permit

Hydraulic Capacity

Organic

Commercial and Residential

Seasonal Glycol Loadings



Selection and Facility Plan

- SRF Loan Program requires Facility Plan with alternatives analysis
- Also best practice to define scope, capacity, costs
- Technology evaluation
 - **Alternative 1 – Onsite A2O with MBR**
 - **Alternative 2 – Conventional A2O**
 - **Alternative 3 – Oxidation Ditch / A2O**
 - **Alternative 4 – Aerated Granular Sludge**



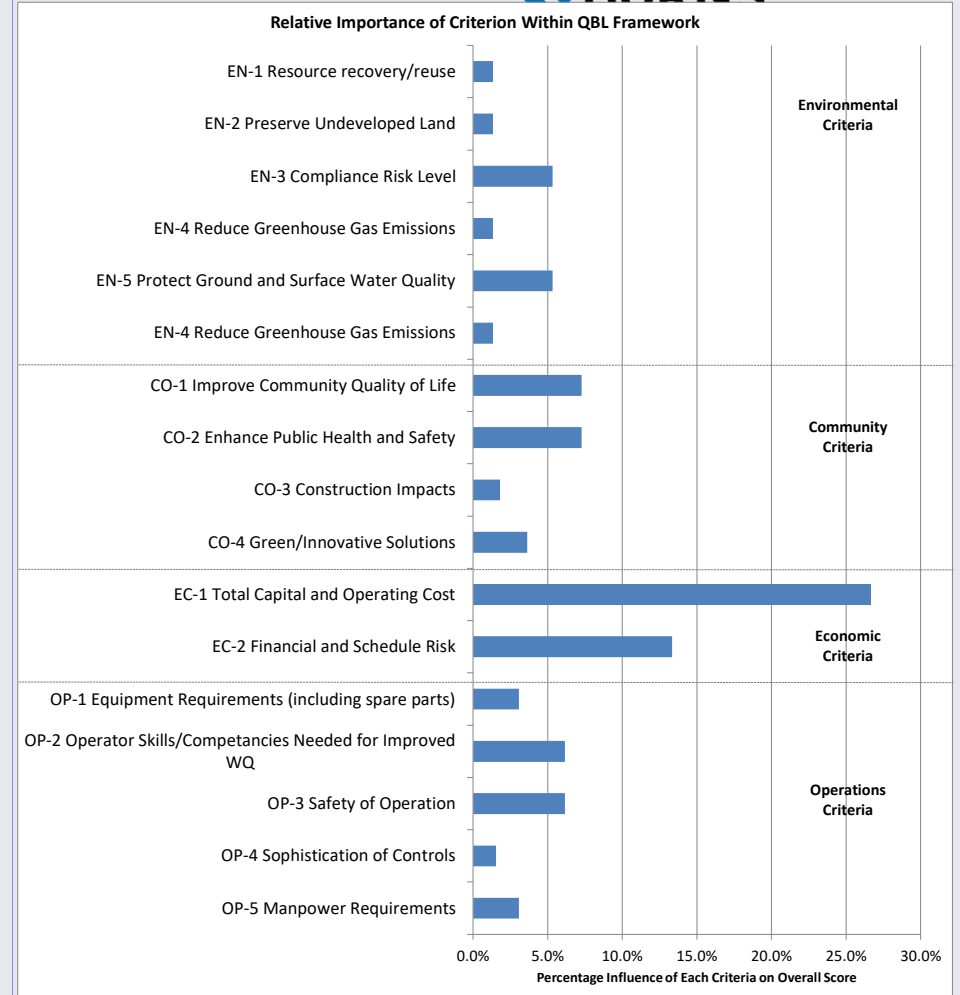
Quadruple Bottom Line Analysis - Framework





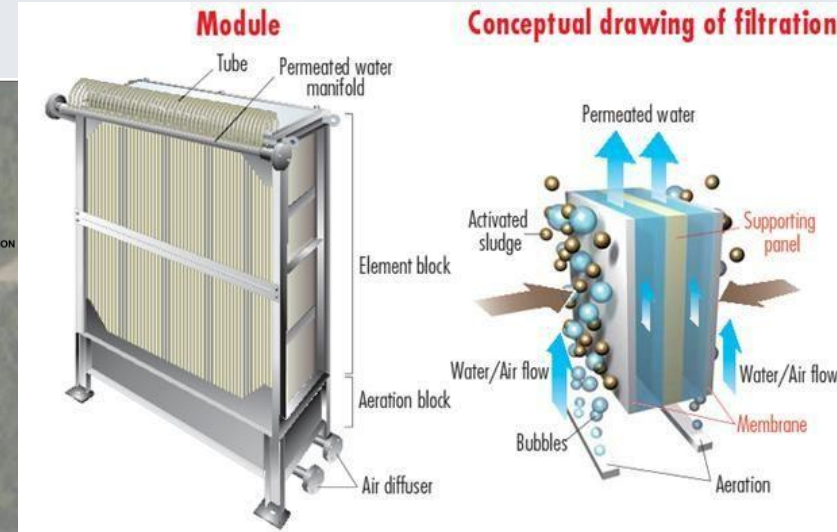
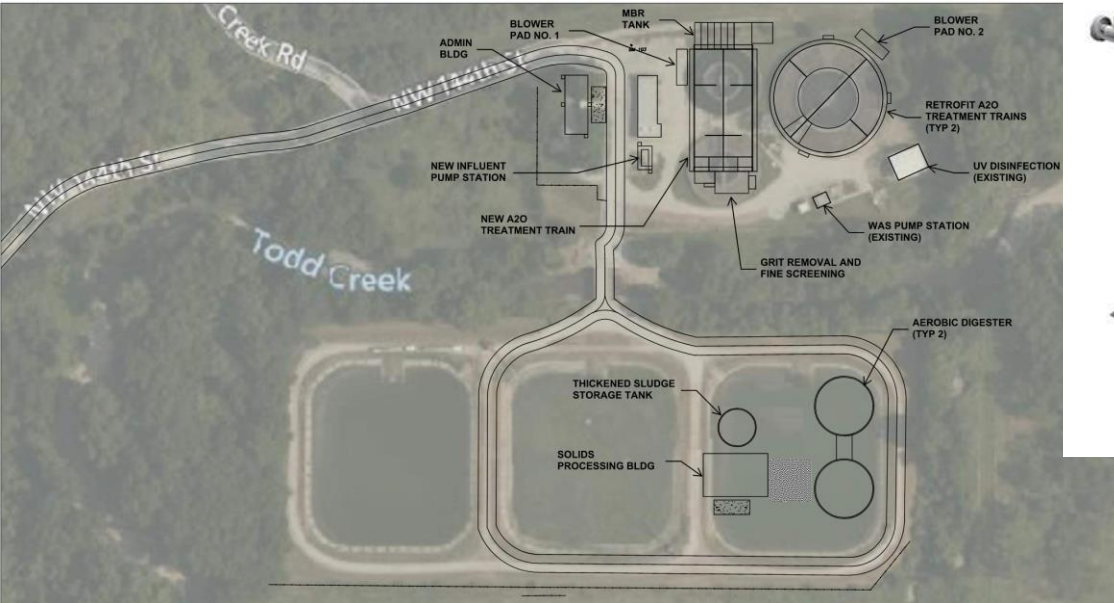
QBL – Criteria

- ▶ Initial Scoring from Design Team
- ▶ Workshop #1 - Discuss and perform sensitivity analysis
- ▶ Workshop #2 – Present Final Results



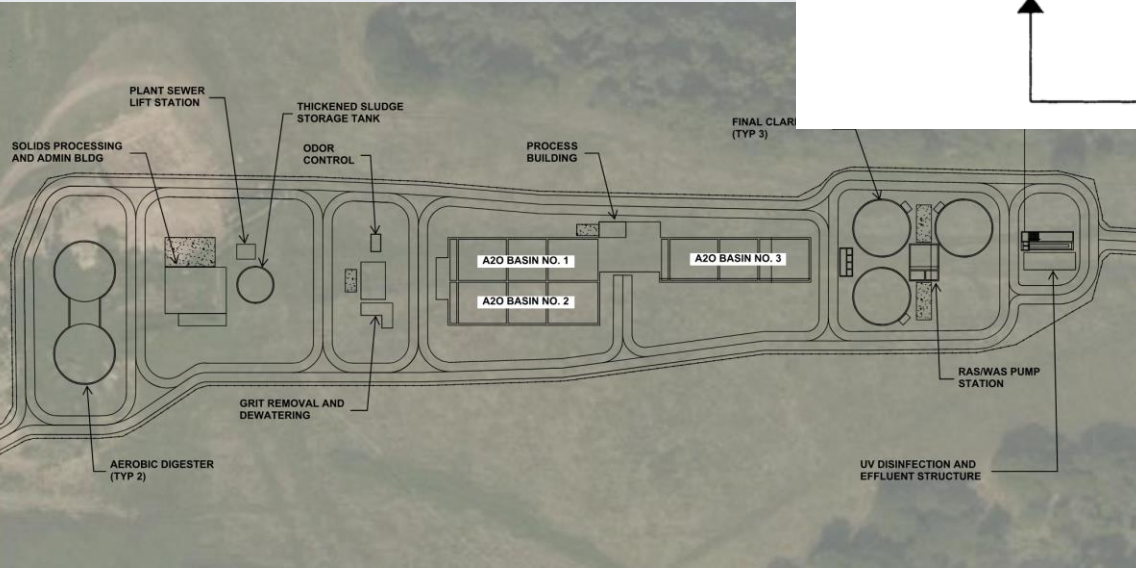
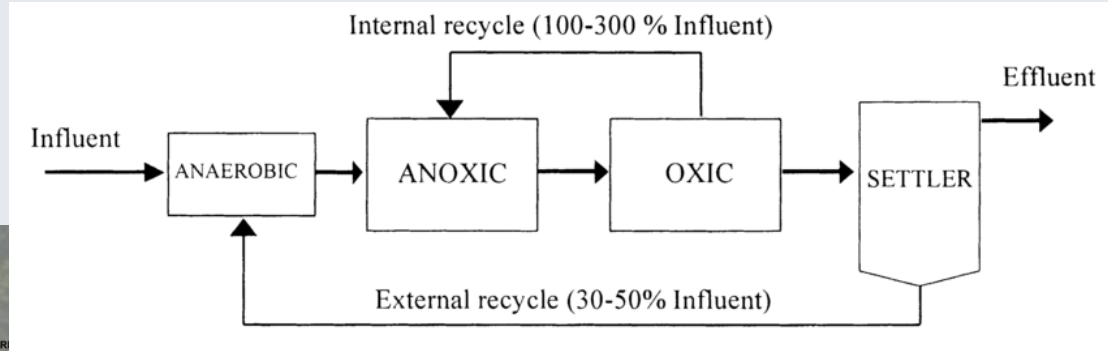
Technology Evaluation

Option 1 – MBR Hybrid



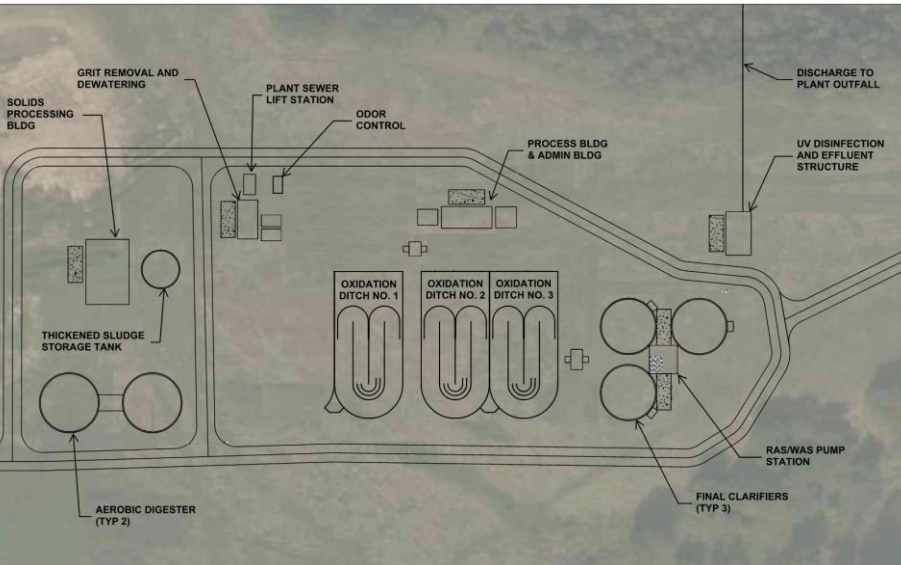
Technology Evaluation

Option 2 – A2O

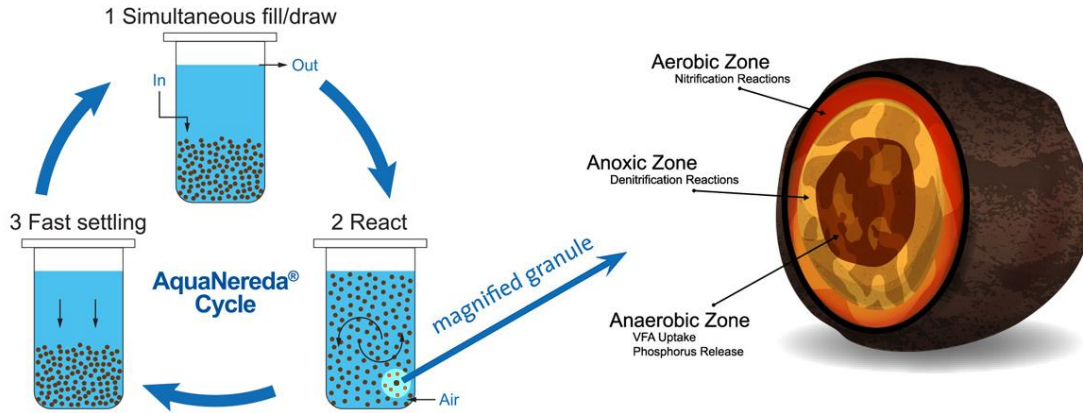


Technology Evaluation

Option 3 – Oxidation Ditch



Aerobic Granular Sludge



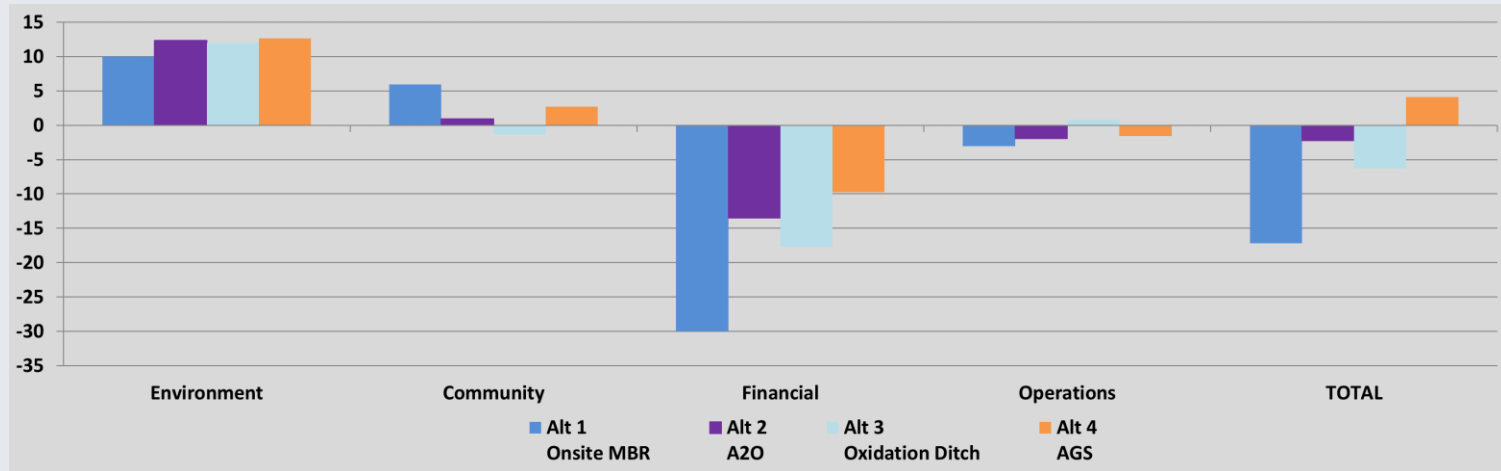
Courtesy of Aqua-Aerobics



Riviera Utilities at Wolf Creek Alabama

QBL – Results

Category	Alt 1 Onsite MBR	Alt 2 A2O	Alt 3 Oxidation Ditch	Alt 4 AGS
Environment	10.0	12.3	12.0	12.7
Community	5.9	0.9	-1.4	2.7
Financial	-30.0	-13.5	-17.7	-9.7
Operations	-3.1	-1.9	0.8	-1.5
TOTAL	-17.2	-2.2	-6.3	4.1



Why Aerated Granular Sludge?

CAPEX

- Lowest of all

OPEX

- No IR, no clarifiers, lowest of all

Performance

- TN 5-8 mg/l
- TP 0.5-1

Phasing

- Allows for smaller jumps in capacity

Operability

- SBR approach
- Simpler, but more instruments

Aesthetics

- Smallest footprint

Permitting AGS



Direct Approval

- 3 sites x 12 mo
- Similar
 - Size
 - Influent
 - Climate

Pilot Project

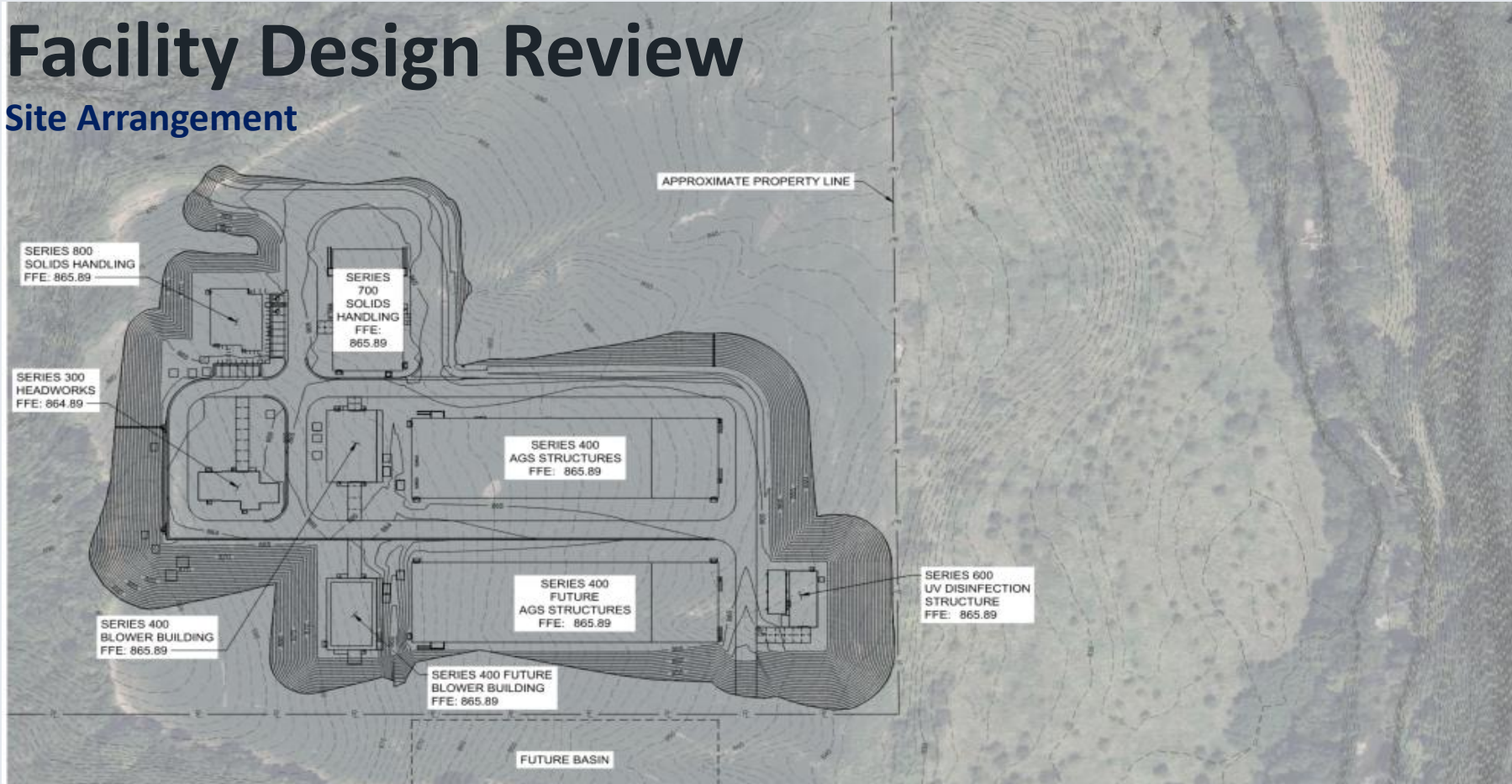
- Return to WWTP
- 1 Year
- Approved testing plan
- 10 CSR 20-6 and 20-8

Demonstration Project

- Regular rules apply
- 1 Year
- Enhanced testing and reporting
- 10 CSR 20-6

Facility Design Review

Site Arrangement



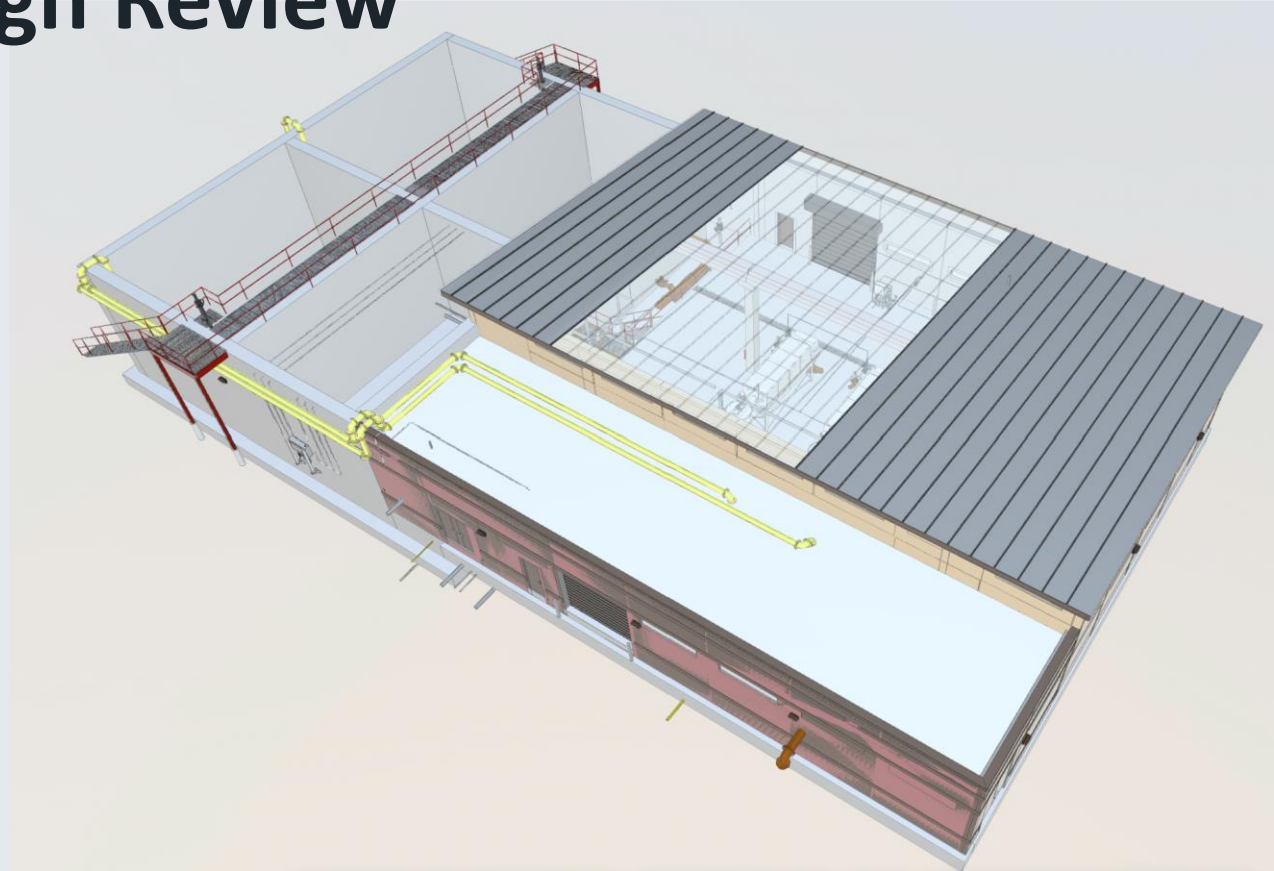
Facility Design Review

AGS Basin



Facility Design Review

Solids Handling





Facility Design Review

Disinfection



Facility Design Review

Admin and Lab
Facility



Budget and Schedule

Construction Cost

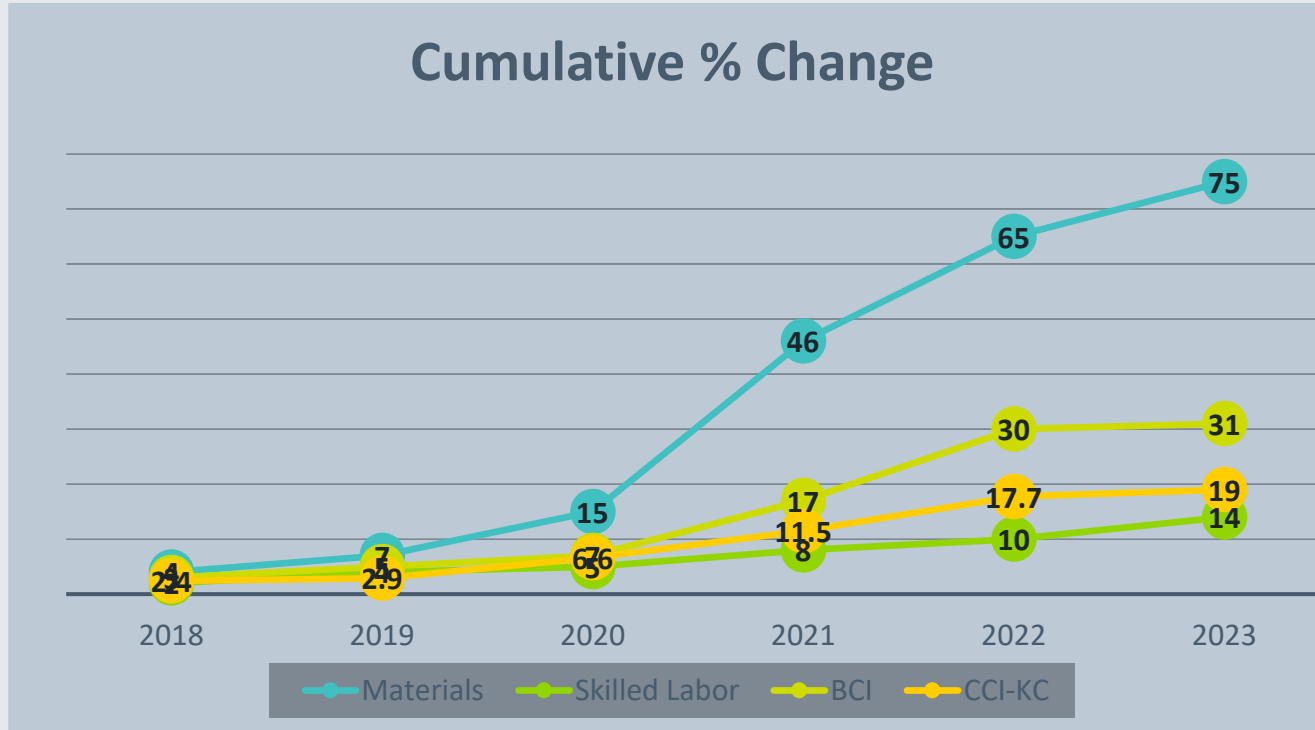
Original Budget: \$60 - 80M

Current Budget: \$108M



Budget and Schedule

Construction Cost



Budget and Schedule

Project Schedule

ITEM	Schedule
Facility Plan	June 2020-July 2021
Design	December 2021-April 2023
Construction and Existing Site Restoration	July 2025 -January 2028



THANK YOU

A decorative graphic at the bottom of the slide consisting of several overlapping, wavy bands of blue in various shades, from light to dark, creating a sense of movement and water.

Thank you for attending our event today.

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We have several webinars happening in the near future. Go to <https://www.aaees.org/events> to reserve your spot.

Would you like to watch this event again?

A recording of today's event will be available on our website in a few weeks.

Need a PDH Certificate?

You will be emailed a PDH Certificate for attending this event within the next week.

Questions?

Email Marisa Waterman at mwaterman@aaees.org with any questions you may have.

