



KC WATER

Blue River Biosolids Facility Project

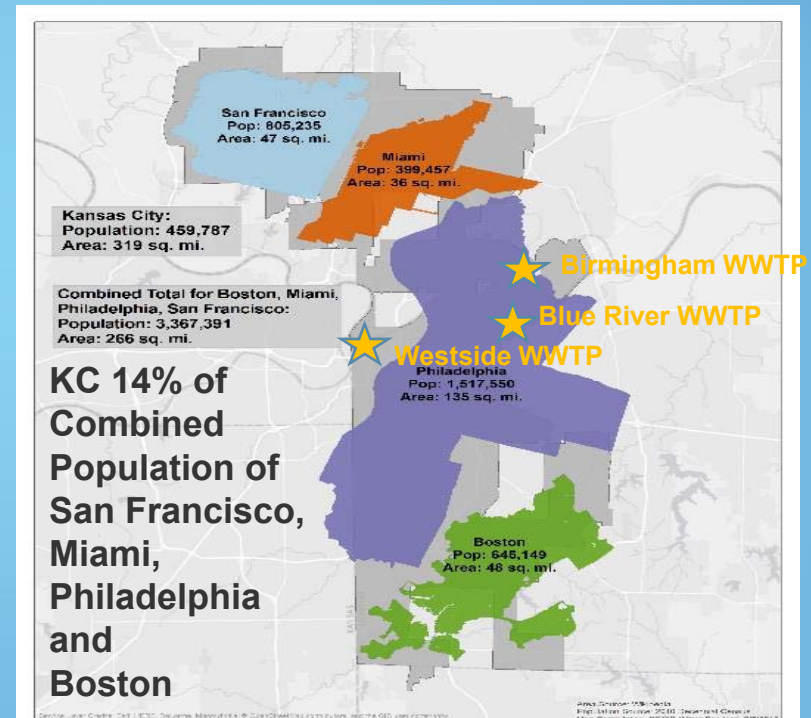
Matt Bond
Chief Engineering Officer

April 2019



Overview of KC Water Large Service Area-Relatively Small Population

- Combined water, wastewater, and stormwater utility
- \$409M Enterprise (FY19)
- 860+ Employees
- 470,000 residents served inside the city;
200,000 residents outside the city
- Over 2,800 miles of water mains and 2,800 miles of sewer mains in Kansas City across 318 square miles.
- Produces an average of 94 MGD

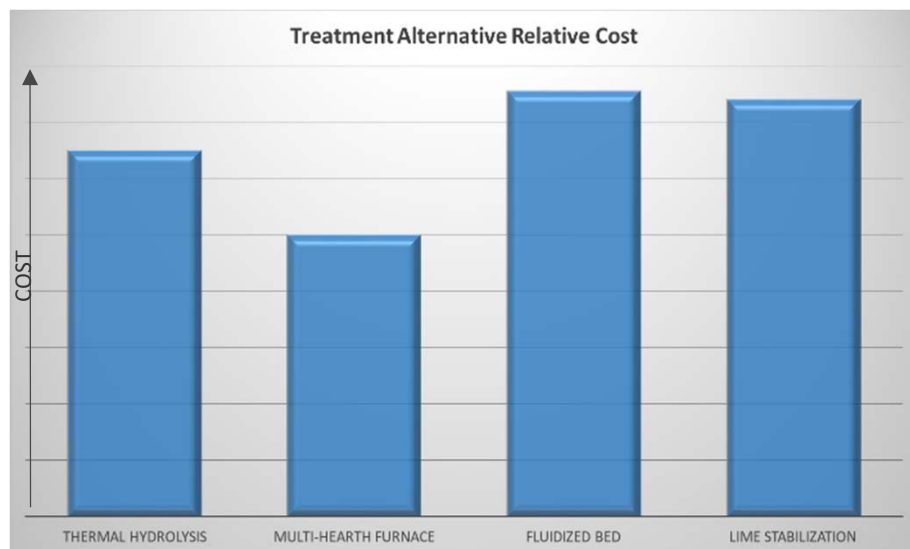


DETERMINING THE NEED

FOR A BIOSOLIDS IMPROVEMENT PROJECT



DETERMINING THE NEED

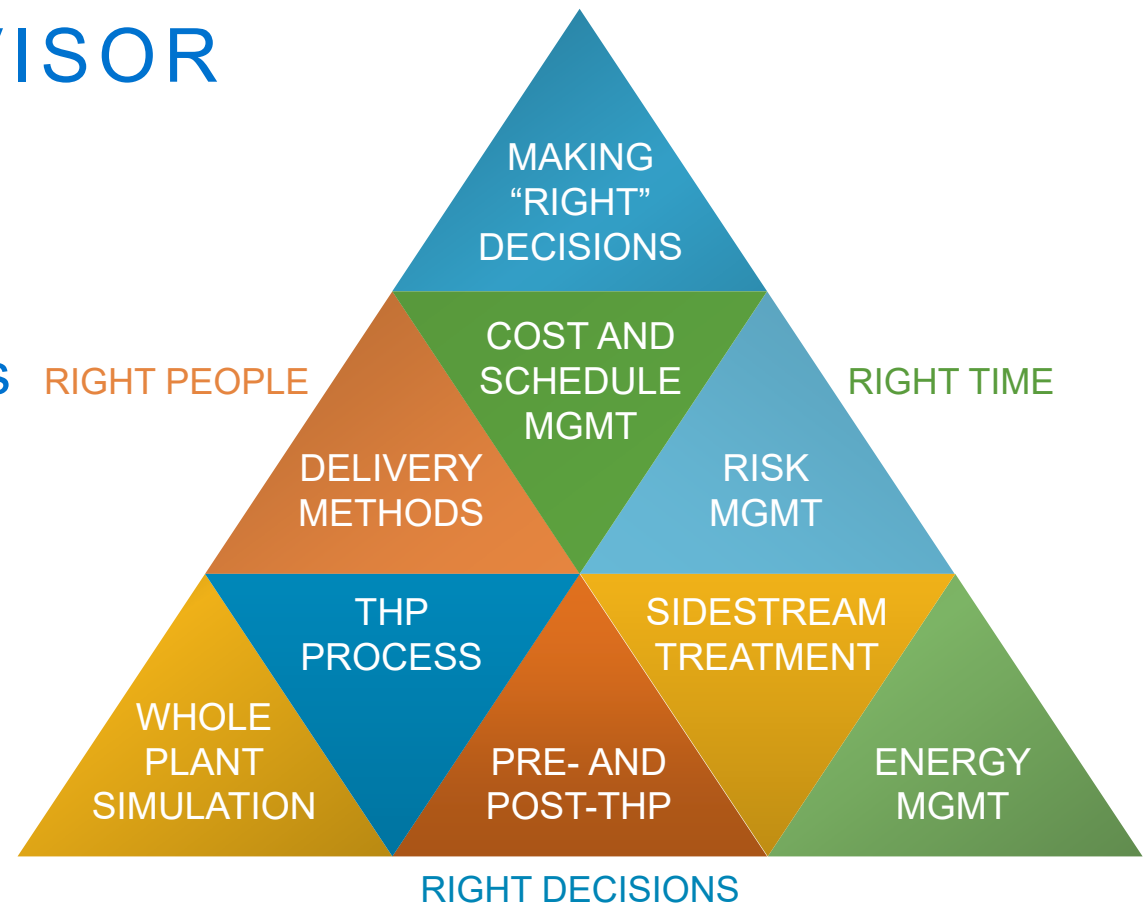


- Costly incinerator upgrades
- Air emissions challenges
- Landfills not available, no longer a viable option
- Class A product for beneficial reuse



OWNER'S ADVISOR

- Staff augmentation
- Technical guidance
- Delivery method analysis and recommendation
- Risk identification and analysis support
- Support to achieve desired outcome
- BIM Development



OPTIONS CONSIDERED

SUSTAINABLE DECISIONS PROCESSES



OPTIONS CONSIDERED



Photo Credit: Shaun O'Kelley, Blue River WWTP

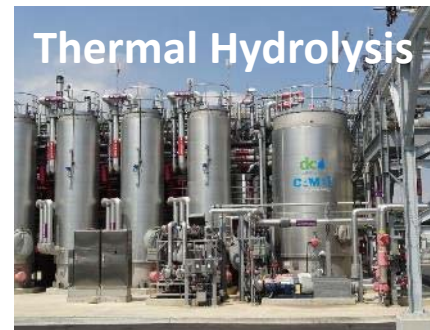


Photo Source: Wikimedia, THP - <https://commons.wikimedia.org/w/index.php?curid=50970357>

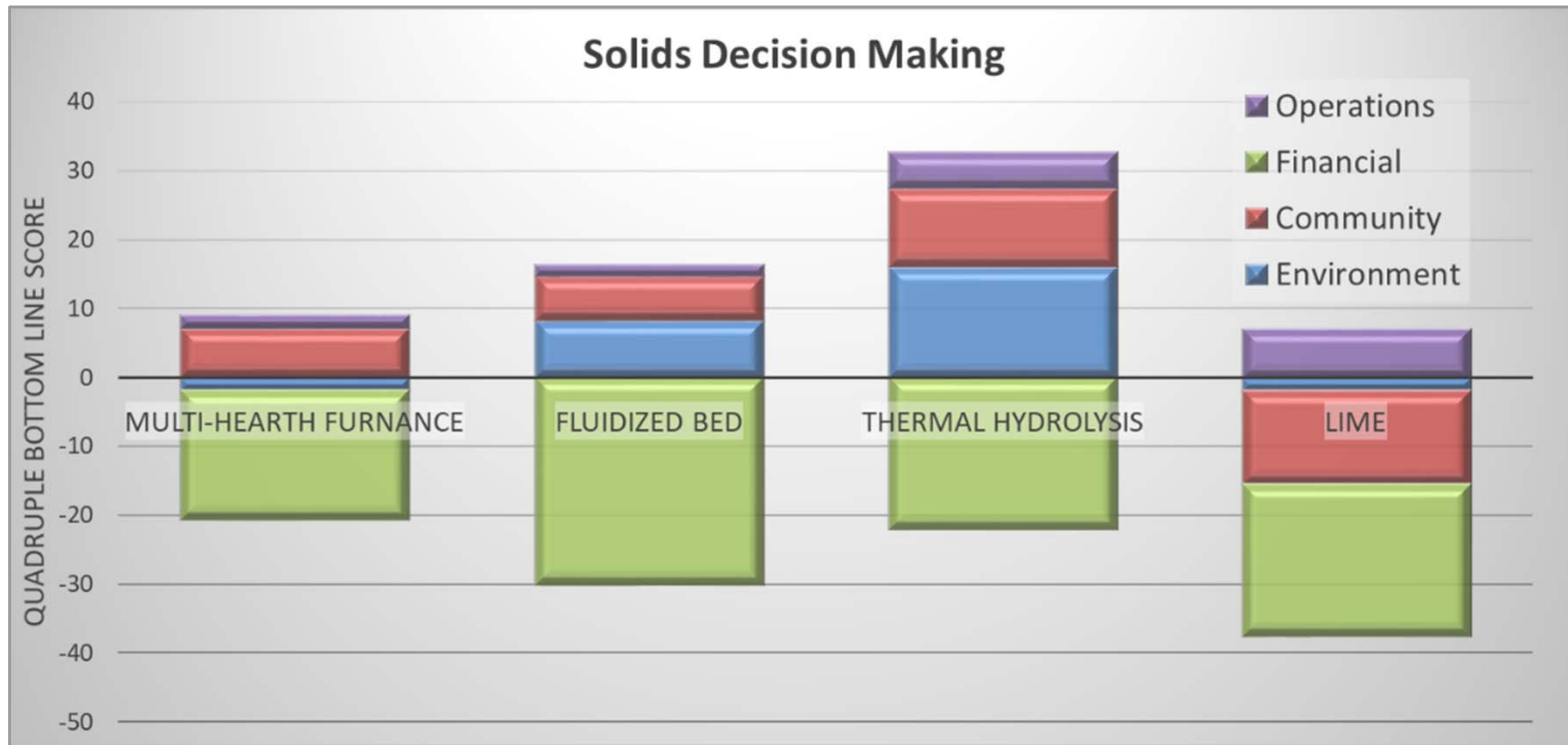


Photo Source: Kuzu Grup, Fluid Bed - <http://www.kuzugrup.com/en/proje/buski-fluidized-bed-sludge-incineration-and-energy-production-plant/>



Photo Source: www.irishwaste.net/service/industrial-services/mobile-lime-stabilisation-plants/

QUADRUPLE BOTTOM LINE



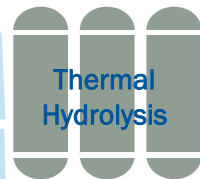
Positive Impacts of Thermal Hydrolysis on Digester Biology, Rheology, Capacity and Up/Downstream Processes

Rheological Properties

- Reduced viscosity (easier to pump)
- 10 percent sludge readily flows
- Reduced pumping and mixing requirements

Increase Digester Capacity

- > 2 times the loading of conventional digestion
- Reduced tankage install



“Pressure Cook”
20 minutes
at 320 °F

Mesophilic Anaerobic Digestion

Hygienization

- Class A sterilization
- Makes mesophilic digestion more robust

Biosolids Characteristics

- >30 percent TS cake typical
- Stackable cake
- Low odor product

Biogas Production

- Increased yield
- Higher methane content in gas

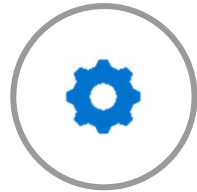
BENEFITS



BENEFITS



Elimination of incineration and emissions



All solids processed through existing digesters



Class A product, beneficial use of biosolids



Energy recovery



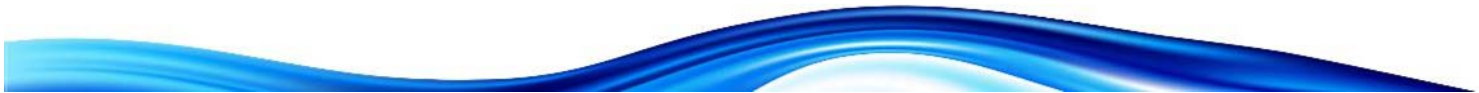
Odor reduction

DESIGN SUMMARY

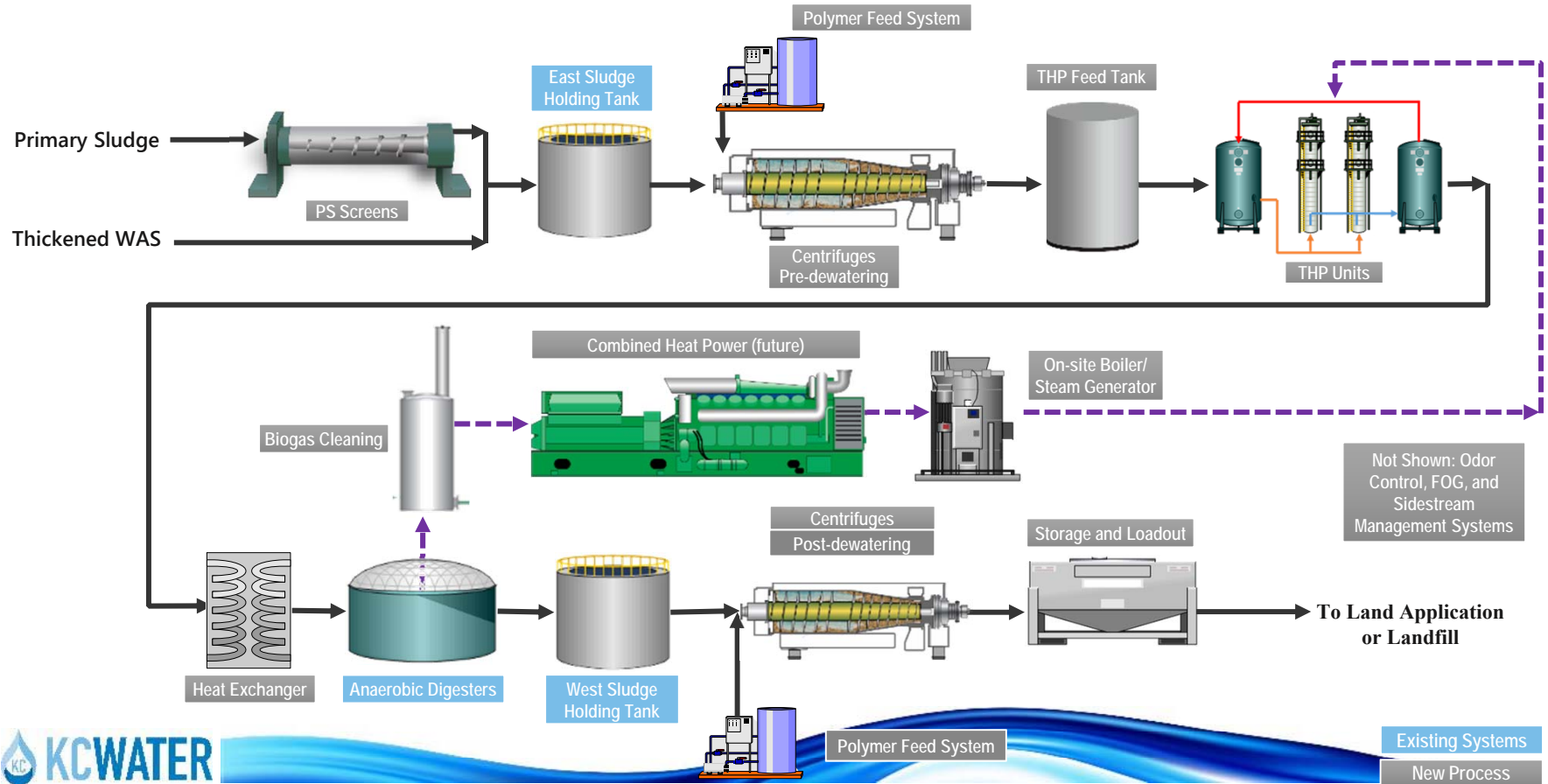


Proposed Solids Loadings—Including Westside WWTP

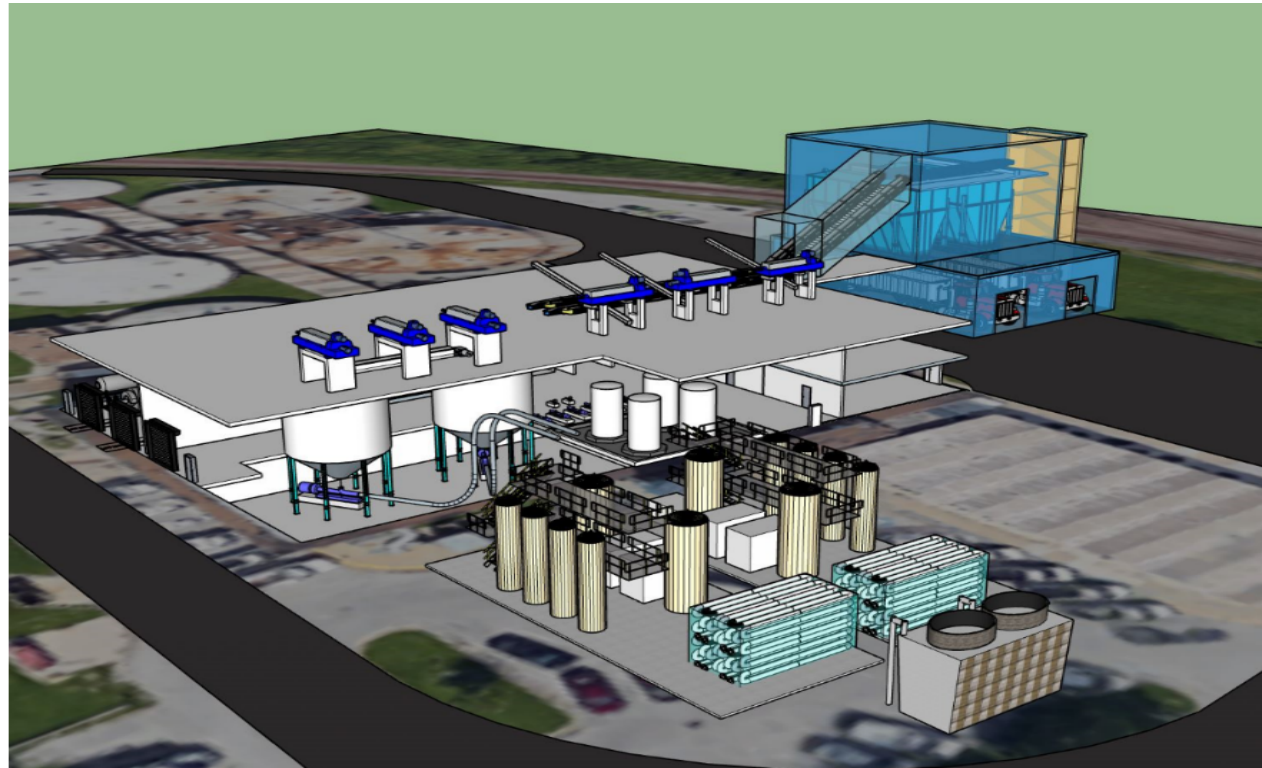
Parameter	2025		2035	
	Annual Average	Max Month	Annual Average	Max Month
Primary Sludge, Tons DS/day	45.5	59.0	45.2	58.6
Secondary Sludge, Tons DS/day	22.8	28.7	28.3	37.1
Total Sludge, Tons DS/day	68.3	87.7	73.5	95.7
Pre-dewatered Sludge, % TS (diluted < 18% before AD)	20% - 24%	20% - 24%	20% - 24%	20% - 24%
Total Sludge to THP, Tons DS/day	66.9	85.9	72.0	93.7
Volatile Solids, % VS/TS	72% - 76%	72% - 76%	72% - 76%	72% - 76%



Proposed THP System



Biosolids Facility Conceptual Design



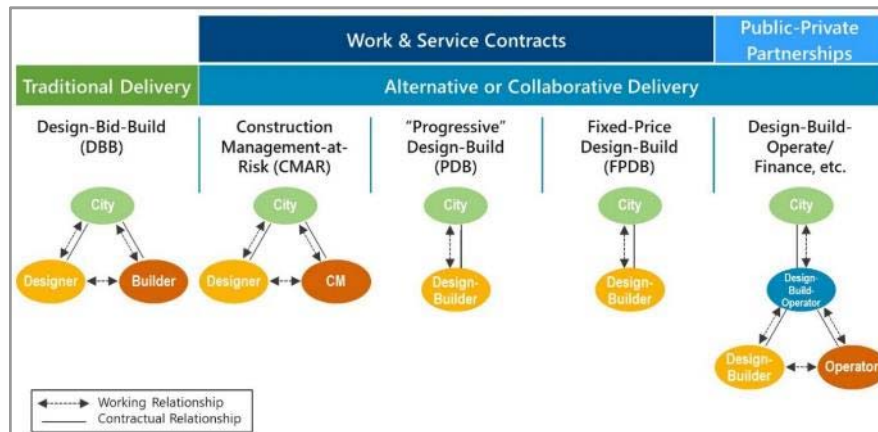
DRIVING INNOVATIONS



DRIVING INNOVATIONS

WIFIA
PROGRAM

The Water Infrastructure Finance and Innovation Act (WIFIA) program accelerates investment in our nation's water infrastructure by providing long-term, low-cost supplemental loans for regionally and nationally significant projects.



KANSAS CITY MISSOURI WATER SERVICES DEPARTMENT

PROJECT NAME: Blue River Wastewater Treatment Plant (WWTP) Biosolids Facility Project

LOCATION: Kansas City, MO

INVITED WIFIA LOAN AMOUNT: \$51 million

POPULATION SERVED BY THE PROJECT: 631,000

PROJECT TYPE: Wastewater

PROJECT DESCRIPTION: The Blue River WWTP Biosolids Facility Project will replace and rehabilitate the existing facility constructed in the 1960s. The improvements to the solids management processes will meet anticipated solids capacity, reliability, and regulatory requirements through 2035. The purpose of the project is to: (1) improve the overall condition and capacity of the current facilities; (2) comply with new effluent discharge permit limits, solids management requirements, and potential future permit requirements and land application site limitations; (3) improve treatment efficiency and reliability; and (4) optimize operational improvements to reduce operation and maintenance costs or provide more reliable and consistent operation.

FY 2018 SELECTION ROUND

NUMBER OF PROJECTS SELECTED: 39

TOTAL LOAN AMOUNT: \$5 billion to public and private entities

TOTAL WATER INFRASTRUCTURE INVESTMENT SUPPORTED: Over \$26 billion

NUMBER OF PEOPLE IMPACTED: 22 million in 15 states and Washington, D.C.

Selected borrowers must apply for a WIFIA loan, pass a final creditworthiness assessment, negotiate a mutually agreeable term sheet, and execute a credit agreement to receive WIFIA financing. An invitation to apply indicates that EPA believes the selected projects will be able to obtain WIFIA loans.



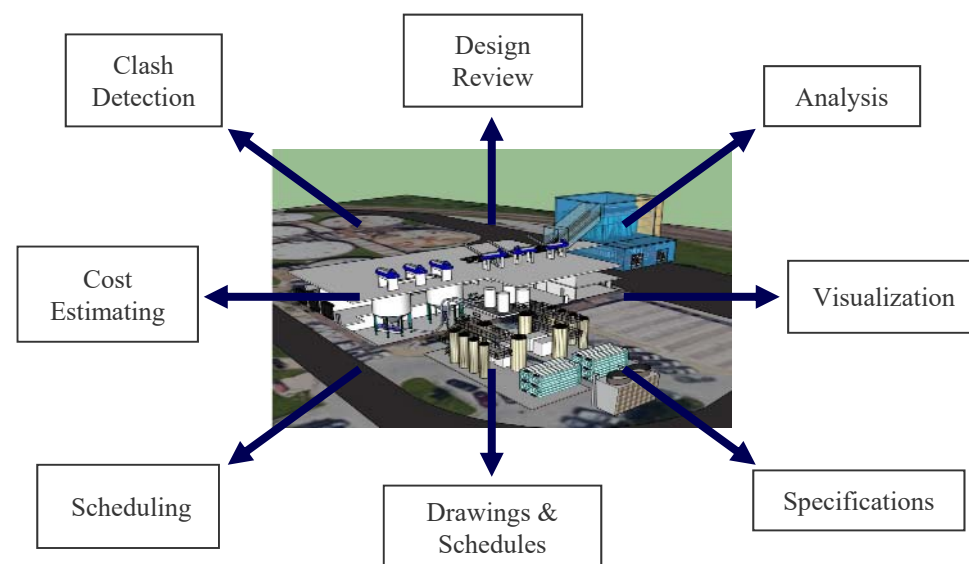
WIFIA: www.epa.gov/wifa
 Email: wifa@epa.gov



- Approved Financing
 - Water Infrastructure Financing and Innovations Act (WIFIA) - 2018
 - Clean Water State Revolving Fund (SRF)
- Risk Management
- Collaborative Project Delivery (Design/Build)
- Building Information Model (BIM)

Defining KC Water's BIM Program

- 3D based design
- Automated interference detection
- Design and constructability reviews
- Contractor schedule/budget management, phasing scenarios
- Whole-life asset management
- Defined protocols for future BIM

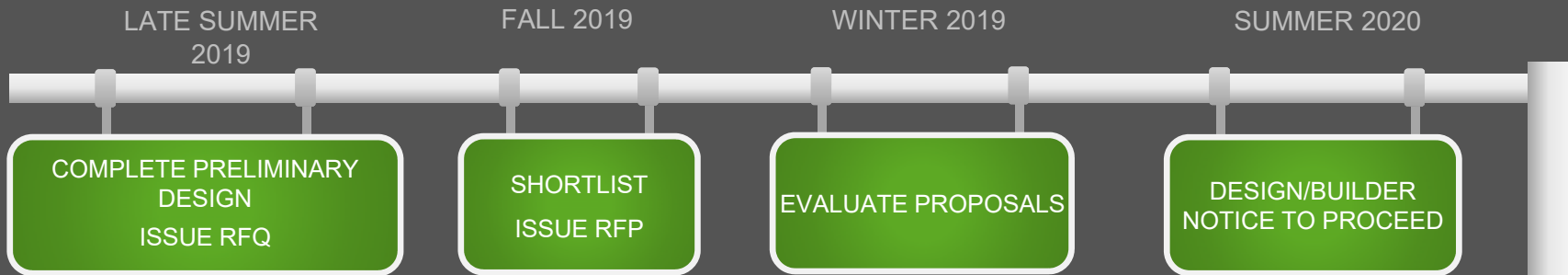


BIM—Building Information Model

SCHEDULE



SCHEDULE





QUESTIONS?

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Matt Bond

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April 2019

