



City of Lawrence

KANSAS RIVER WASTEWATER TREATMENT PLANT IMPROVEMENTS AND NUTRIENT REMOVAL

Leah Morris
Engineering Program Manager

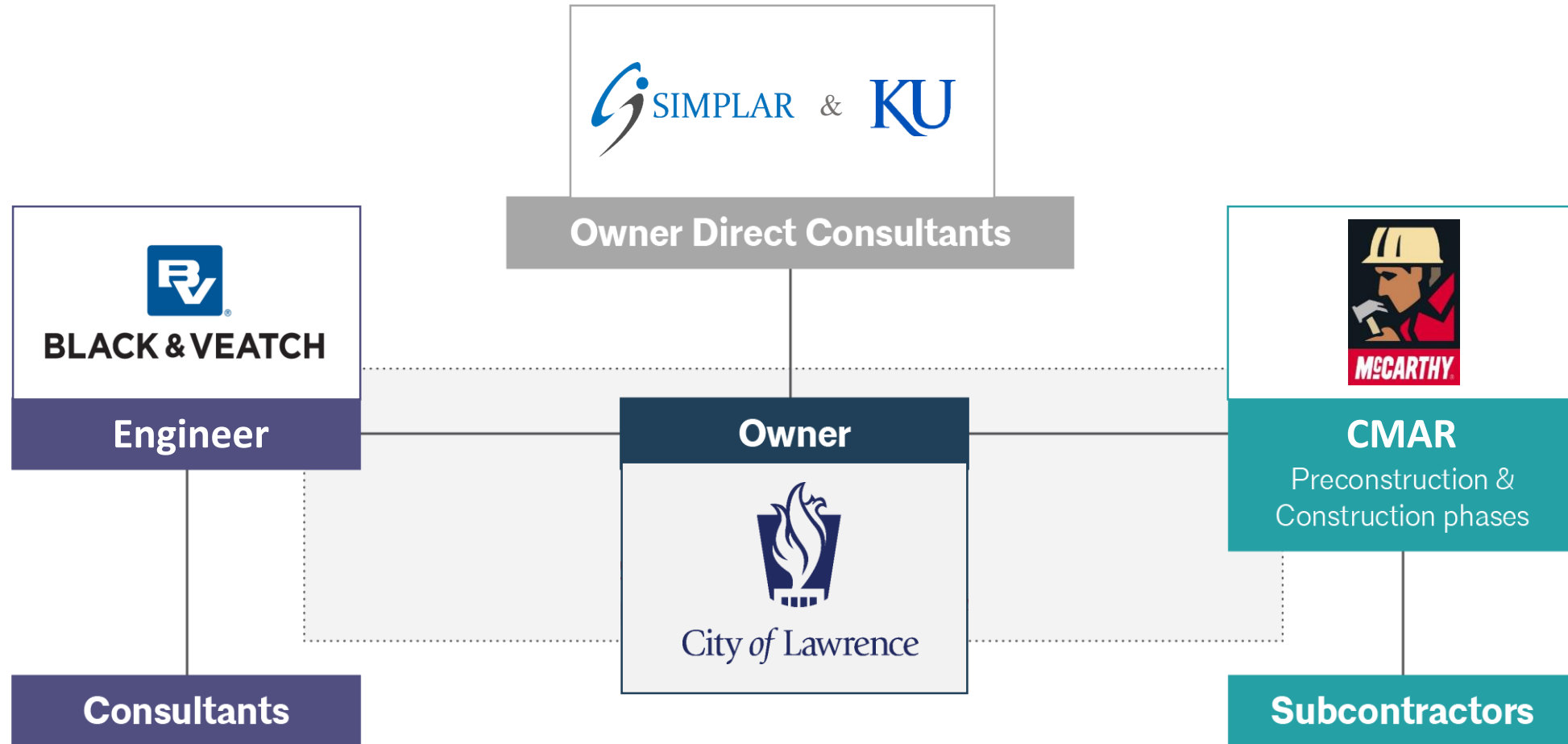
Omar Maali
Project Engineer

Project Scope

- Regulatory driven upgrades to target phosphorous removal.
- Renovations of existing infrastructure for asset management.
- Upgrades to existing technologies to align with City's Strategic Plan.



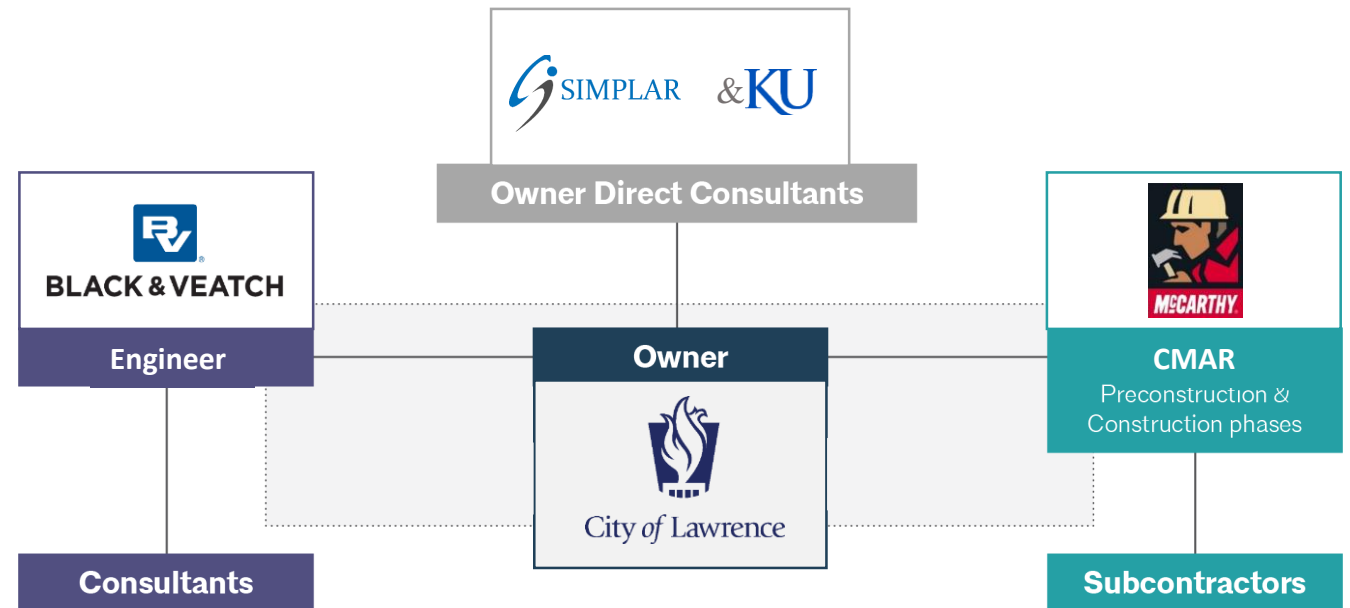
Project Team



AIA Contract Relationship Diagrams

Project Timeline

- July 2020:
Engineering Design Services Approved
- April 2021:
Construction Manager at Risk (CMAR) delivery method approved
- April 2021 – August 2021:
CMAR Request for Proposals and Additional Engineering
- October 2021 – December 2022:
Design and CMAR Services with GMP 1 awarded in October 2022



Project Timeline

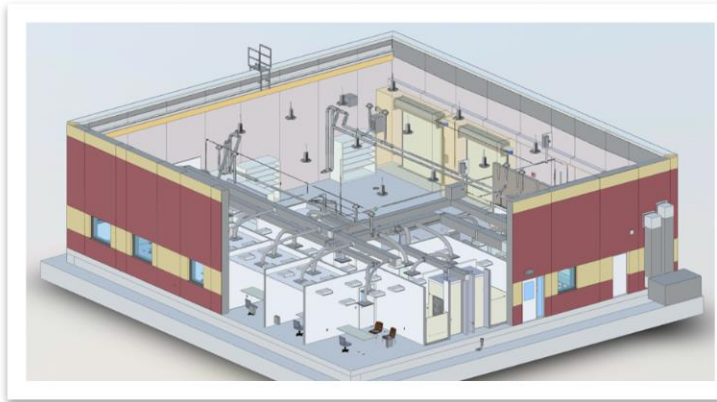
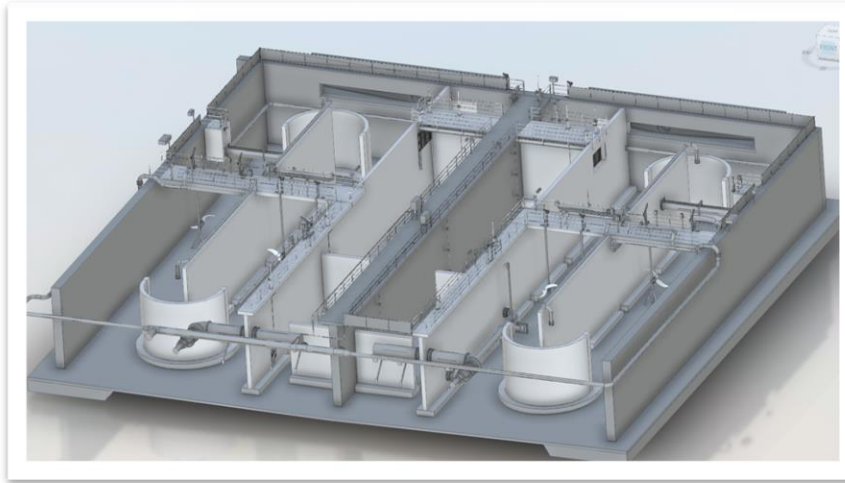
- March 2023 – Additional Engineering Services with BV to:
 - Perform Construction Engineering Services and Project Controls.
- May 2023 (*Present*) – Work packages are out for advertisement with McCarthy.
- July 2023 – Anticipated award of Final Guaranteed Maximum Price.
- January 2023 to December 2026 – Construction Activities.



Project Scope

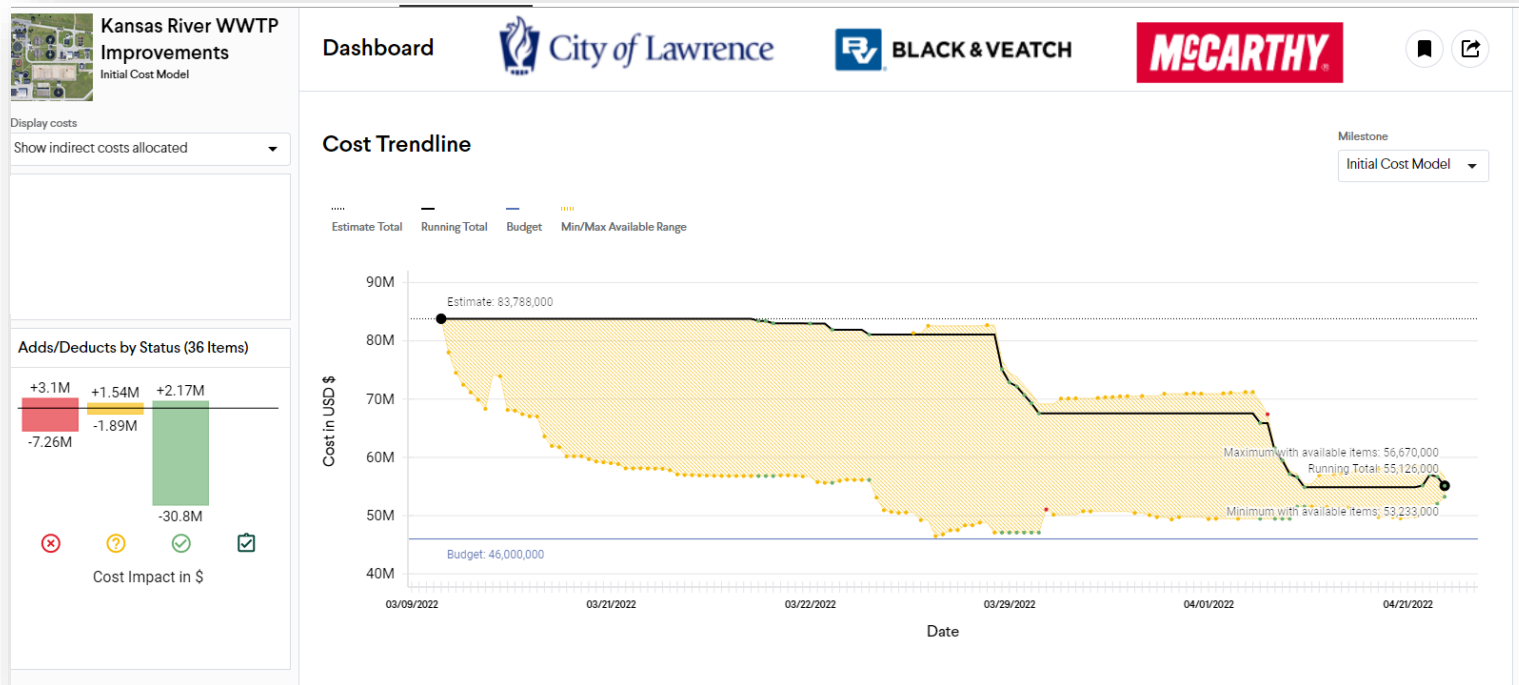
The plant improvement project includes upgrades to the following areas:

- Converting four Aeration Basins to BNR Basins.
- Addition of Recycled Activated Sludge (RAS) fermentation tank.
- Conversion of a Chlorine Basin to an Ultraviolet Disinfection system.
- New SCADA/Server Facility.
- Upgrades to pump/valve structures.
- Replacement of Grit Equipment.
- Influent Splitter Structure.



Cost Model/ Development

- Collaborative Cost Model
- Cost Estimates with higher accuracy

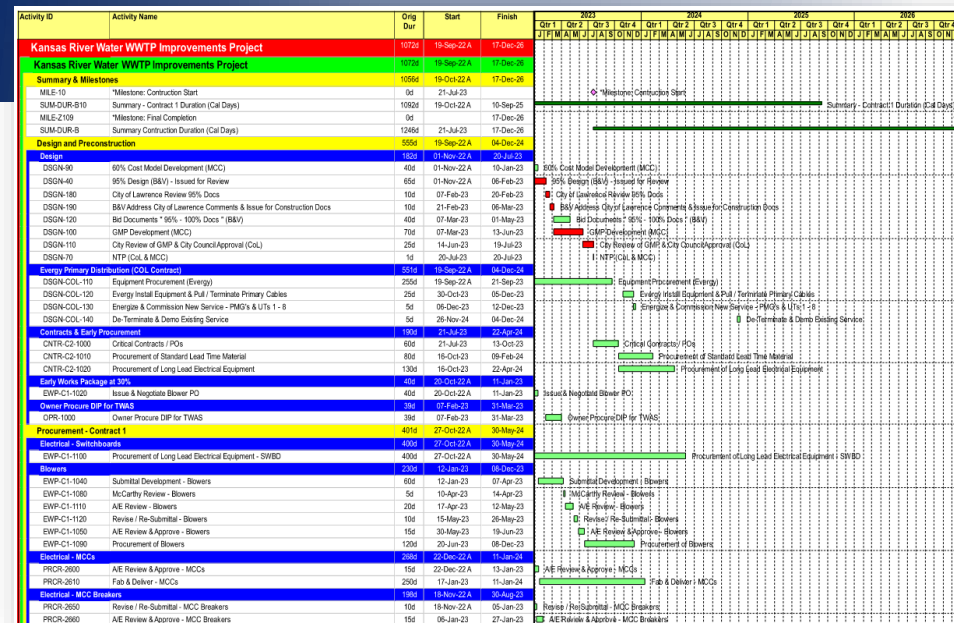


39 of 43 items and options shown, total: -\$30,620,000

✓	#13: Electrical Modifications (Complete)	Creator: Don Rainey (03/08/2022) Last updated: 04/28/2022 1 2 options (#13.2 accepted) 2
✓	#10: Eliminate Surface Waste Pump Station & Add New PS Inside Basin (Complete)	Creator: Don Rainey (03/08/2022) Last updated: 04/28/2022 2
✓	#5C: Addition of FRP Compressor Building & Air Mixing System (Complete)	Creator: Don Rainey (03/30/2022) Last updated: 04/28/2022 1
✓	#3B: Addition of Carbon Tote System (Complete)	Creator: Don Rainey (03/24/2022) Last updated: 04/28/2022 1
?	#16: BFP Feed Tank - Change to 560,000 Gallon Tank (In Progress)	Creator: Don Rainey (03/08/2022) Last updated: 04/26/2022 2
?	#8C: Install New Junction Structure - LA Conduit and Outfall at River (Complete)	Creator: Don Rainey (03/08/2022) Last updated: 04/21/2022 1
?	#17: Eliminate CEPT Polymer Improvements (Complete)	Creator: Don Rainey (03/08/2022) Last updated: 04/20/2022
?	#18: Modify CEPT Ferric Improvements (Complete)	Creator: Don Rainey (03/08/2022) Last updated: 04/20/2022
?	#15: Convert BNR Basin Nos. 3 & 4 from 5-Stage to 3-Stage (Complete)	Creator: Don Rainey (03/08/2022) Last updated: 04/18/2022 1

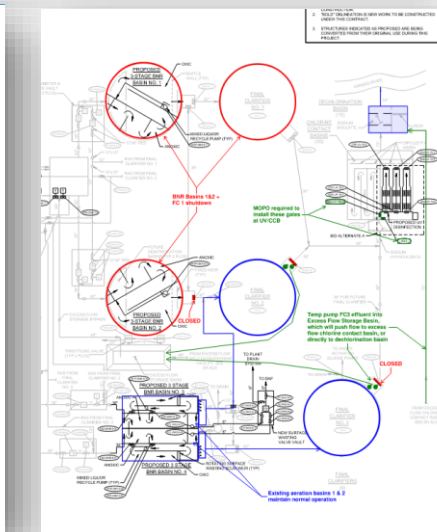
Scheduling & MOPO

- Collaborative Construction Sequencing
- Maintenance of plant operations (MOPO) to coordinate & combine shutdowns whenever possible.
- Plant remains in operation
- Numerous process start-ups during construction



KRWWTP - Blower MOPO Sequence

DESCRIPTION	RESP	DUR	START	END
(MOPO Prerequisites)				
1. Procurement/delivery of new blowers		12/15/23		
2. Procurement/delivery of new SWBD-1 breakers		10/18/23		
3. Decommissioning of existing aeration basins 1 and 2		10/18/23		
Phase 1				
6. F&S new concrete blower pad	CONC	0d	12/15/23	12/15/23
7. Install new blower, BLWR-#1 & #2, discharge flexible connector, check valve, and butterfly valve	MECH	20d	12/22/23	01/18/24
8. Close isolation valve on existing header between blower #1 and #2	CMAR	1d	01/19/24	01/19/24
10. LOTO valve in closed position	CMAR	1d	01/19/24	01/19/24
11. Temporary shutdown blower #1 (air to basins 3&4)	CMAR	1d	01/19/24	01/19/24
12. LOTO blower #1	CMAR	1d	01/19/24	01/19/24
13. Remove 14" blind flange on existing header and tie-in new blower to 14" flange	MECH	1d	01/19/24	01/19/24
14. Remove LOTO on blower #1	CMAR	1d	01/19/24	01/19/24
15. Install new control panel, CP-#1 & #2, and run new conduits between SWBD, CP, and BLR	ELEC	8d	01/19/24	01/25/24
16. Pull terminate wire between BLR, CP, and SWBD	ELEC	2d	01/25/24	01/26/24
17. Temporary shutdown SWBD-1 (New Breaker)	COL	1d	01/26/24	01/26/24
18. Install new breaker, SWBD-1, in available space (~1 hour)	ELEC	1d	01/26/24	01/26/24
19. Reenergize SWBD-1 (Terminations)	COL	1d	01/26/24	01/26/24
20. BLWR-#1 & #2 startup services (local controls only)	BLWR	3d	01/29/24	01/31/24
21. Set up temp blower at Aerated Grit & temp power	CMAR/ELEC	3d	01/22/24	01/24/24
22. Pre-assemble stainless tee and butterfly valve	MECH	1d	01/22/24	01/22/24
23. Permanent shutdown blowers #2 and #3	COL	1d	01/25/24	01/25/24
24. LOTO blower #2 and blower #3	CMAR	1d	01/25/24	01/25/24
25. Cut out stainless air piping and weld flanges at Aerated Grit	MECH	1d	01/25/24	01/25/24
26. Bolt up pre-assembled stainless tee and butterfly valve	MECH	1d	01/25/24	01/25/24
27. Tweak temp blower to start flow	MECH	1d	01/25/24	01/25/24
28. Close new butterfly valve upstream of stainless tee	CMAR	1d	01/25/24	01/25/24
29. LOTO butterfly valve in closed position	CMAR	1d	01/25/24	01/25/24
30. Start up temp blower feeding Aerated Grit	CMAR	2d	01/25/24	01/26/24
Phase 2				
31. Demo existing blowers 2 & 3, associated electrical, and piping up to isolation valve in header	DEMO	0	01/29/24	01/29/24
		12d	01/29/24	02/14/24



Project Budget

Approved CIP

	2020	2021	2022	2023	<u>TOTAL</u>
MS-200013 Kansas River WWTP Improvements	\$662,000	\$2,500,000	\$7,900,000	\$59,700,000	<u>\$70,762,000</u>

Authorized Contracts to Date

Professional Services	Engineering Design	Preconstruction	Construction Inspection	GMP 1 Construction	<u>TOTAL Authorized Contracts</u>
\$59,750	\$5,113,029	\$250,000	\$5,029,453	\$8,162,752	\$18,614,984

Value Engineering

30% Cost Model

- September 2022
- Construction Duration – November 2022 – October 2026
- Estimated CMAR Costs - \$63,300,000
- Estimated Construction Phase Services Cost - \$5,500,000

60% Cost Model

- Construction Duration – November 2022 – June 2026
- Estimated CMAR Costs - \$63,100,000
- Estimated Construction Phase Services - \$5,200,000



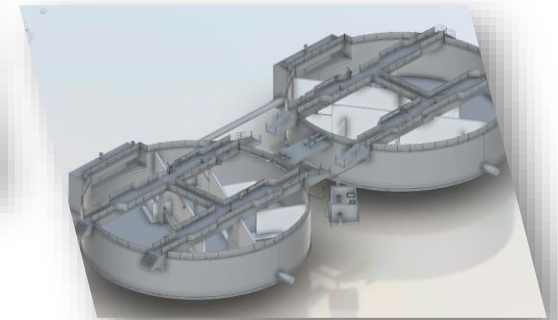
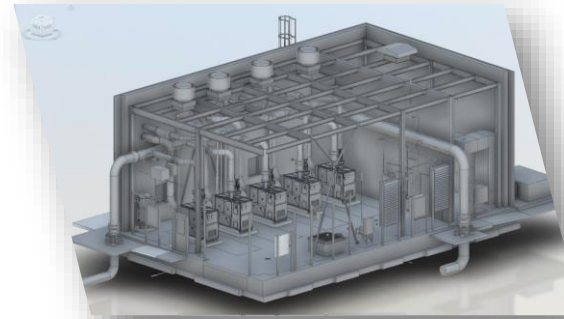
Value Engineering & Bid Alternatives

Value Engineering Items

- Construction Sequencing
- Construction Materials Alternatives
- Building Materials Alternatives
- Electrical Conduit Trenching
- Compressed Air System and Mechanical Mixing Evaluation

Bid Alternates

- Grit Equipment Replacement
- Ultraviolet (UV) Disinfection Complex
- SCADA/Server Building Shell



Sustainable Infrastructure



- City's Strategic Plan; Commitments to how we do our work in.
- Envision framework is being used to provide the guidance needed to build sustainable and resilient infrastructure.
- It helps the City to optimize project resilience for both short-term and long-term impacts.
- Team collaboration to make more informed decisions about the sustainability of infrastructure

		Improved	Enhanced	Se			
 Quality of Life	Wellbeing	QL1.1 Improve Community Quality of Life	2	5			
		QL1.2 Enhance Public Health & Safety	2	7			
		QL1.3 Improve Construction Safety	2	5			
		QL1.4 Minimize Noise & Vibration	1	3			
		QL1.5 Minimize Light Pollution	1	3			
		QL1.6 Minimize Construction Impacts	1	2			
 Collaboration	Mobility	QL2.1 Improve Community Mobility	1	3			
		QL2.2 Encourage Sustainable Transportation	---	5			
		QL2.3 Improve Access & Wayfinding	1	5			
 Leadership	Community	QL3.1 Advance Equity & Social Justice	3	6	10	14	18
		QL3.2 Preserve Historic & Cultural Resources	---	2	7	12	18
		QL3.3 Enhance Views & Local Character	1	3	7	11	14
		QL3.4 Enhance Public Space & Amenities	1	3	7	11	14
 Resource Allocation	Collaboration	LD1.1 Provide Effective Leadership & Commitment	2	5	12	18	---
		LD1.2 Foster Collaboration & Teamwork	2	5	12	18	---
		LD1.3 Provide for Stakeholder Involvement	3	6	9	14	18
		LD1.4 Pursue Byproduct Synergies	3	6	12	14	18
 Natural World	Planning	LD2.1 Establish a Sustainability Management Plan	4	7	12	18	---
		LD2.2 Plan for Sustainable Communities	4	6	9	12	16
		LD2.3 Plan for Long-Term Monitoring & Maintenance	2	5	8	12	---
		LD2.4 Plan for End-of-Life	2	5	8	14	---
 Climate and Resilience	Economy	LD3.1 Stimulate Economic Prosperity & Development	3	6	12	20	---
		LD3.2 Develop Local Skills & Capabilities	2	4	8	12	16
		LD3.3 Conduct a Life-Cycle Economic Evaluation	5	7	10	12	14
		LD3.4 Support Sustainable Procurement Practices	3	6	9	12	---
 Material Allocation	Materials	RA1.1 Support Sustainable Procurement Practices	3	6	9	12	---
		RA1.2 Use Recycled Materials	4	6	9	16	---
		RA1.3 Reduce Operational Waste	4	7	10	14	---
		RA1.4 Reduce Construction Waste	4	7	10	16	---
		RA1.5 Balance Earthwork On Site	2	4	6	8	---
	Energy	RA2.1 Reduce Operational Energy Consumption	6	12	18	26	---
		RA2.2 Reduce Construction Energy Consumption	1	4	8	12	---
		RA2.3 Use Renewable Energy	5	10	15	20	24
	Water	RA2.4 Commission & Monitor Energy Systems	3	6	12	14	---
		RA3.1 Preserve Water Resources	3	5	7	9	12
		RA3.2 Reduce Operational Water Consumption	4	9	13	17	22
		RA3.3 Reduce Construction Water Consumption	1	3	5	8	---
 Siting	Siting	RA3.4 Monitor Water Systems	1	3	6	12	---
		NW1.1 Preserve Sites of High Ecological Value	2	6	12	16	22
		NW1.2 Provide Wetland & Surface Water Buffers	2	5	10	16	20
		NW1.3 Preserve Prime Farmland	---	2	8	12	16
	Conservation	NW1.4 Preserve Undeveloped Land	3	8	12	18	24
		NW2.1 Reclaim Brownfields	11	13	16	19	22
		NW2.2 Manage Stormwater	2	4	9	17	24
		NW2.3 Reduce Pesticide & Fertilizer Impacts	1	2	5	9	12
		NW2.4 Protect Surface & Groundwater Quality	2	5	9	14	20
		NW3.1 Enhance Functional Habitats	2	5	9	15	18
		NW3.2 Enhance Wetland & Surface Water Functions	3	7	12	18	20
		NW3.3 Maintain Floodplain Functions	1	3	7	11	14
Ecology	NW3.4 Control Invasive Species	1	2	6	9	12	
	NW3.5 Protect Soil Health	---	3	4	6	8	
	Emissions	CR1.1 Reduce Net Embodied Carbon	5	10	15	20	---
		CR1.2 Reduce Greenhouse Gas Emissions	8	13	18	22	26
		CR1.3 Reduce Air Pollutant Emissions	2	4	9	14	18
		CR2.1 Avoid Unsustainable Development	3	6	8	12	16
CR2.2 Assess Climate Change Vulnerability		8	14	18	20	---	
CR2.3 Evaluate Risk and Resilience		11	18	24	26	---	
Resilience	CR2.4 Establish Resilience Goals and Strategies	---	8	14	20	---	
	CR2.5 Maximize Resilience	11	15	20	26	---	
	CR2.6 Improve Infrastructure Integration	2	5	9	13	18	
					Maximum TOTAL Points	1,000	

182

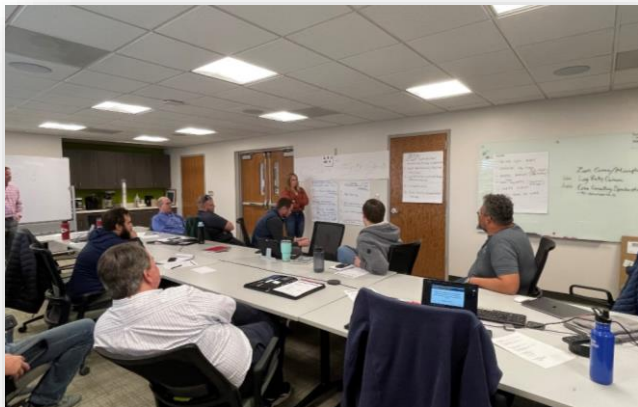
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Partnering Meetings & Outreach

- Partnering Meetings
 - Build trust and transparency
 - Create an environment of collaboration and teamwork
 - Align our common goals
- Contractor Outreach
 - Clarify roles and responsibilities
 - Make it more appealing for competitive bids.



Partnering Kick-Off Meeting Feb 8, 2022 Kansas River WWTP Improvements

GOALS & OBJECTIVES

- Build trust and transparency
- Create the foundation for an environment of collaboration and teamwork
- Align our common goals
- Clarify roles and responsibilities and agree to lines of communication
- Review and discuss issues that require planning

AGENDA



KANSAS RIVER WASTEWATER TREATMENT PLANT IMPROVEMENTS REQUEST FOR SUBCONTRACTORS

Melinda/Trevor, Derek & Walt
Brian & Jeff
Brian & Jeff
All
All

This is a request for subcontractors to prequalify to bid. Subcontractors are invited to a Project Introduction on February 9, 2023. This event will showcase the needed subcontractor work with McCarthy representatives there to answer questions.

Kansas River Wastewater Treatment Plant Improvements SUBCONTRACTOR PROJECT INTRODUCTION

WHEN:
FEBRUARY 9, 2023 - 10AM TO 12 PM
(check in starts at 9:30 AM)

WHERE:
DoubleTree by Hilton
200 McDonald Drive
Lawrence, KS

PLEASE RSVP/REGISTER BY FEBRUARY 7, 2023
[TO RSVP CLICK HERE](#)

NOTE: You can register the at the event, pre-registration is preferred.

GO TO: prequalification.McCarthy.com
To Begin the Prequalification Process

Project Background: The Kansas River treatment plant improvement project will upgrade

Public Information




The screenshot shows the City of Lawrence website's public information page for the Kansas River Wastewater Treatment Plant Improvements Project. The page features a dark blue header with the City of Lawrence logo and a menu icon. Below the header is a banner image of the wastewater treatment plant with the project title. The main content area includes an aerial photograph of the plant, a 'Project Overview' section with descriptive text, and a right-hand sidebar with navigation links and news items.

City of Lawrence KANSAS

Menu

Kansas River Wastewater Treatment Plant Improvements Project



Project Overview

The Kansas River Wastewater Treatment Plant is slated to receive an impressive array of upgrades as the City of Lawrence continues its mission towards increased sustainability. This \$70M project will address further nutrient removal limits that are set forth by the local regulating agency. In addition, these upgrades will also assist the plant as they do increased asset management and work to upgrade aging infrastructure. This project marks the city of Lawrence's second largest funded wastewater project.

- MUNICIPAL SERVICES
Visit the homepage
- CONTACT MSO
Reach out to MSO
- SERVICE REMINDERS
Know your pickup days
- RECYCLABLE DIRECTORY
Find out where to recycle

MSO NEWS

- City of Lawrence selected for LEED for Cities Local Government Leadership Program
- Lawrence joins National Mayor's Challenge for Water Conservation
- Weekly Traffic Update: March 28, 2023
- Weekly Traffic Update: March 21, 2023

MORE NEWS

TRASH & RECYCLING NEWS

- Traffic Impacts for Compost Facility
- Extreme weather affecting solid waste collection

Project Website: <https://lawrenceks.org/mso/krwwtp-improvements/>

Safety First

- Participated in Construction Safety Week – All teams are presenting each morning.
- Participate in OSHA's National Safety Stand-Down to Prevent Falls in Construction by taking a moment mid-day Thursday.
- Safety Innovation: Suggestion Box will be introduced to the project.



Next Steps & Questions

