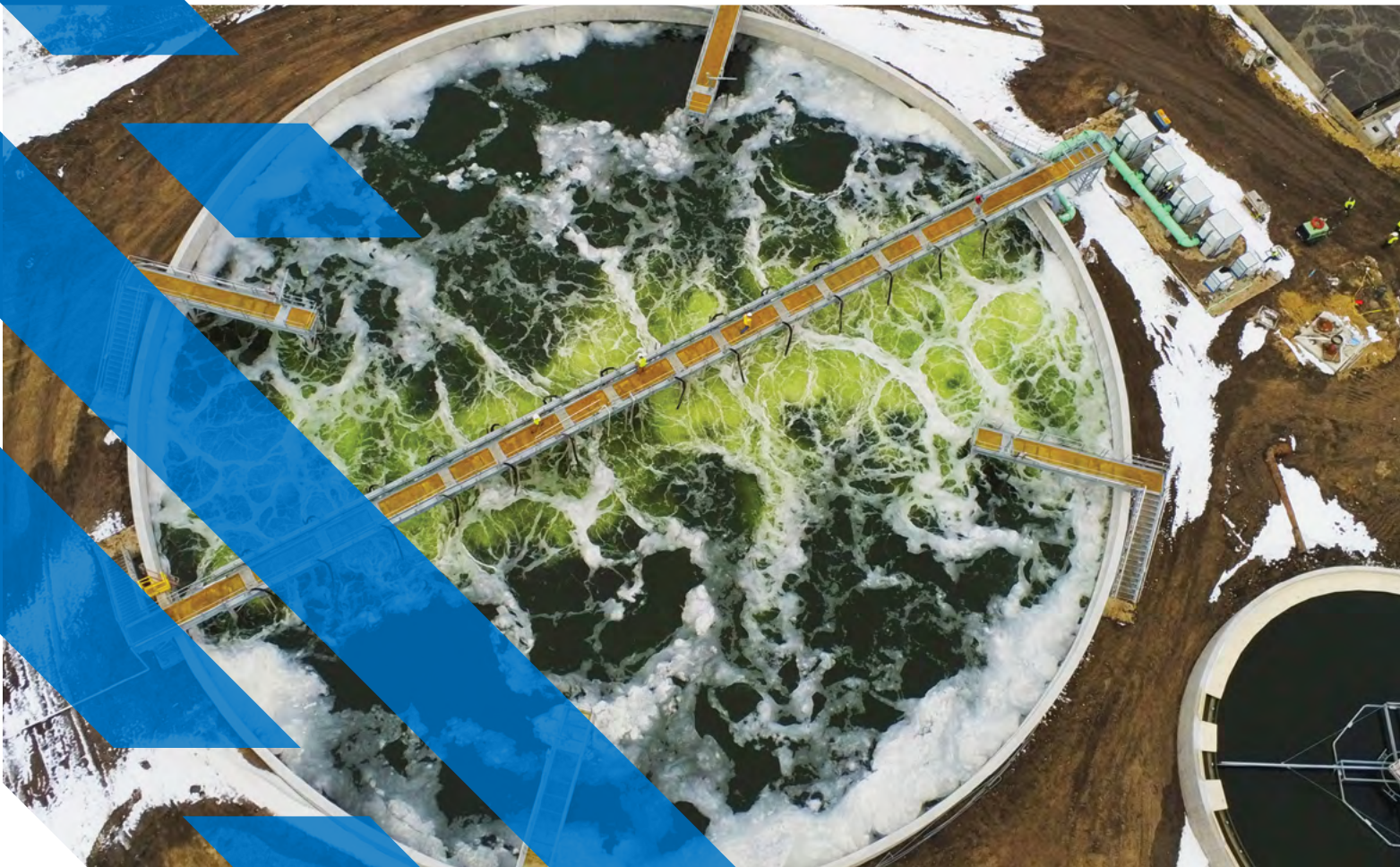


CASE STUDY / HAYS WASTEWATER TREATMENT PLANT IMPROVEMENTS

COLLABORATIVE TREATMENT PLANT RETROFIT GOES ABOVE AND BEYOND

With new, strict water quality requirements looming over the City of Hays, the race was on to upgrade its wastewater treatment plant to meet the impending regulations. Using the design-build delivery method, the city was able to meet the upcoming nutrient limits ahead of schedule.



DESIGN-BUILD DELIVERS COST-EFFECTIVE RESULTS

With innovative technology and construction processes offered by the joint venture team, project costs and project time were reduced.

PROJECT STATS

CLIENT

City of Hays, Kansas

LOCATION

Hays, Kansas

COMPLETION DATE

May 2019

\$2M

SAVED IN
PROJECT COSTS

2

MONTHS SAVED
IN PROJECT TIME

21%

REDUCTION IN
POWER CONSUMPTION

CHALLENGE

The original Chetolah Creek treatment plant in Hays, Kansas, was constructed in 1953. After more than 60 years, the plant faced impending effluent water quality requirements — 8 milligrams per liter total nitrogen and 1.5 milligrams per liter total phosphorus — that the existing trickling filter and aeration basin process could not properly address. To implement the needed improvements within a tight budget and schedule, the city decided to procure the project using a design-build delivery method.



Our community is proud of the project delivered by the team and will continue to be proud for generations to come.

JEFF CRISPIN
HAYS DIRECTOR OF
WATER RESOURCES

SOLUTION

Hays turned to a joint venture of Burns & McDonnell and CAS Constructors to find major areas for reducing project cost. With a new budget-friendly direction in place, the scope of the project included all new facilities for both liquids and solids processing, a new SCADA and communications system, and a new administration space.

Two unique components devised and implemented by the joint venture team contributed heavily to maintaining the city's budget and schedule for the project.

The first — used to help minimize site disruption and keep the plant operational — is the sunken caisson construction method, which was utilized for the new influent lift station. This technique is useful for projects, such as this one, where space is constricted by other structures in proximity. During this process, instead of a large excavation, the circular structure is formed and sinks into the ground under its own dead weight using special construction methods.

The second component is a biological treatment system designed with separate mixing and aeration within a single large basin. Biological treatment





is provided by a cyclic aeration system to create the necessary anoxic and aerobic conditions to promote nitrogen reduction. Phosphorus removal is achieved through a combination of biological and chemical means. Before implementation, dynamic modeling was used to simulate the conditions at the plant and predict effluent quality and chemical demands.

RESULTS

While the complex project affected virtually every process in the facility, the joint venture team worked closely to plan and coordinate each

task to make sure the plant could continue serving the community's needs throughout the construction process.

Not only was the project completed \$2 million under budget and two months early with no surprises or change orders, the city was able to achieve reuse quality water to provide additional value to the community, including irrigation for the local golf course and sports complex.

In addition, the new systems in place allow the plant to meet much more

stringent effluent water quality requirements. Testing has shown total nitrogen and total phosphorous averaging well below the limits established for the project.

"Being able to maintain operations of the plant during construction was a major benefit of using the Burns & McDonnell and CAS Constructors joint venture team," says Jeff Crispin, the city's director of water resources. "Our community is proud of the project delivered by the team and will continue to be proud for generations to come."





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