



TDI 2025 Award Entry

Groundwater Treatment Project

Castaic Creek Bridge
California



Castaic Creek - Project Summary

- This project supported the construction of a new bridge over Castaic Creek in California, where groundwater management was a critical challenge. The primary concern involved dewatering for two bridge foundations (Piers 2 and 3), which required excavations 21–24 feet below grade within the active creek channel. With groundwater encountered at approximately 10 feet below grade, the project demanded a drawdown of 11–14 feet to allow safe construction.
- Discharge from the dewatering system was regulated under the General NPDES Permit for Dewatering Discharges to Surface Waters, which imposed strict water quality standards. Griffin conducted multiple rounds of groundwater sampling to confirm contaminants of concern and their concentrations. Key constituents included 2,3,7,8-TCDD, trace metals (chromium, copper, zinc), and nuisance parameters such as iron and manganese.
- To meet both hydraulic and regulatory demands, a high-capacity temporary treatment system was designed and implemented to handle flows of up to 1,000 gallons per minute. The system operated continuously for approximately four months, ensuring compliant discharge and safe construction conditions throughout pier installation.

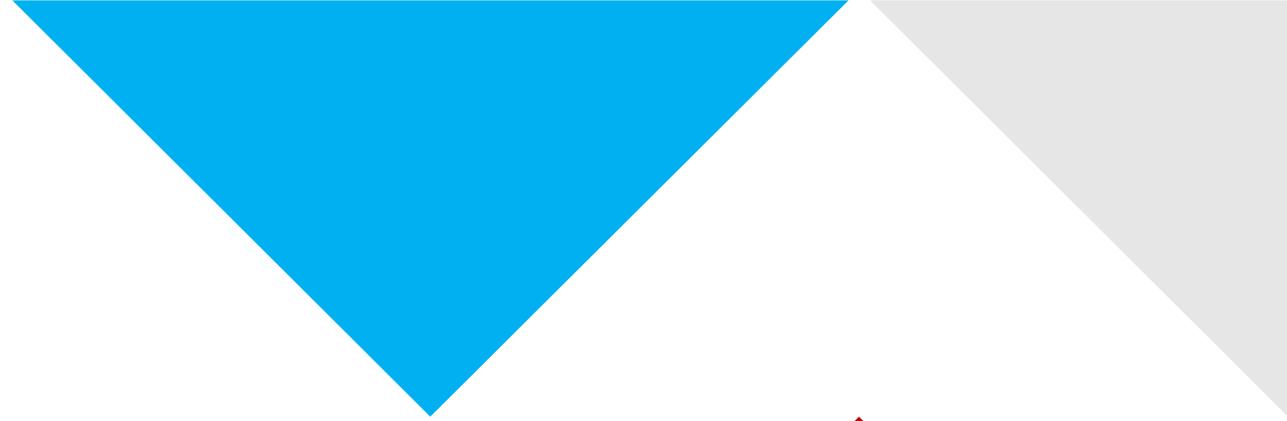
The Challenge

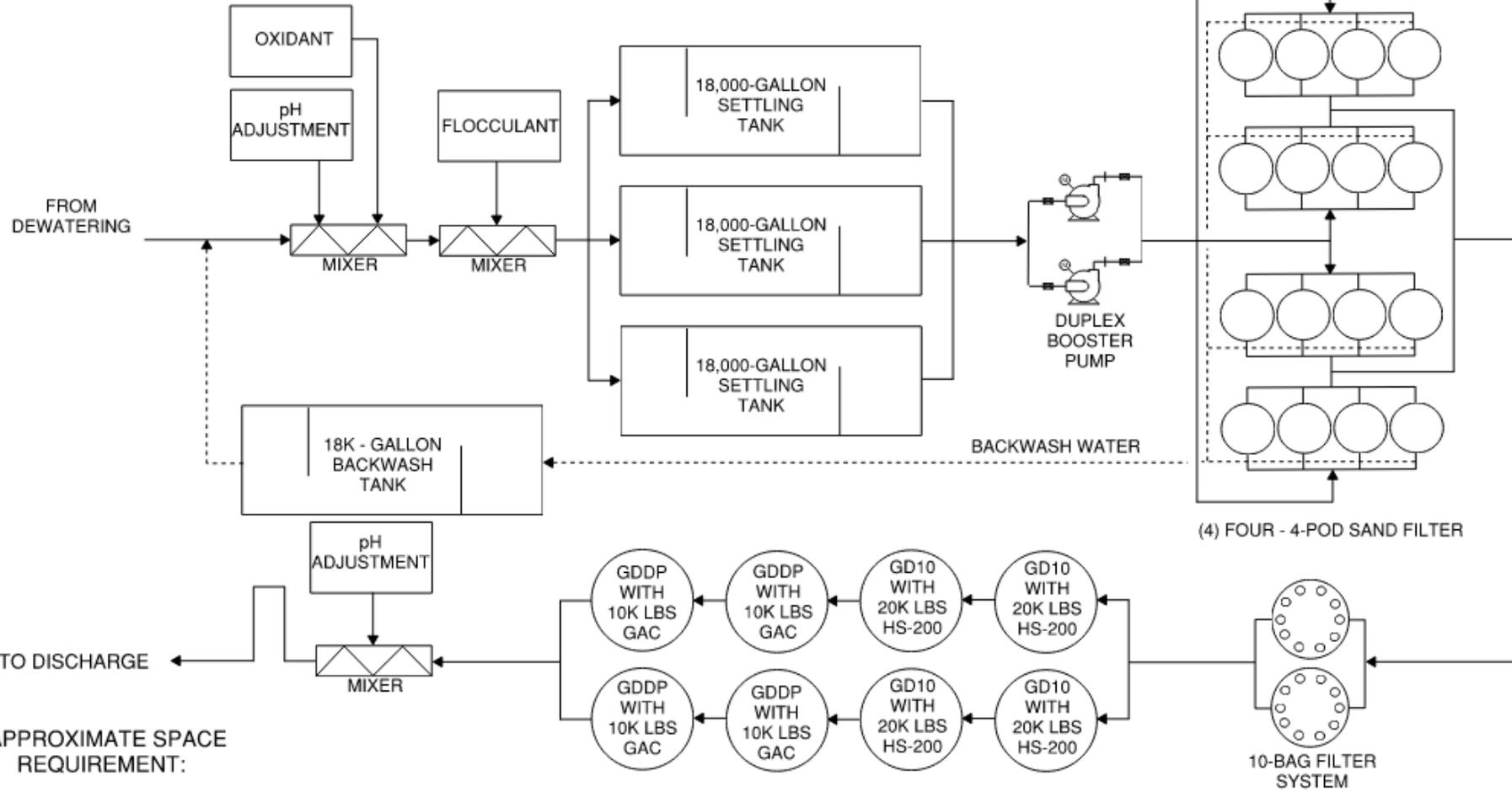
- The project presented several interrelated challenges driven by the high dewatering flow rate and the strict regulatory discharge requirements. The treatment system had to be sized to reliably handle flows approaching 1,000 gallons per minute, necessitating oversized treatment vessels, multiple settling tanks, and large-diameter interconnecting piping.
- The hydraulic demands also placed pressure on the chemical treatment process. High-volume injection required careful system design and the constant availability of large chemical inventories on-site, with frequent replenishment to ensure uninterrupted performance.
- Site logistics added another layer of complexity. The treatment system's extensive footprint had to be carefully configured within tight construction constraints, balancing the need for capacity with the realities of limited staging space in and around the active creek channel.
- In addition to these physical and operational constraints, the project team faced the challenge of meeting stringent NPDES discharge standards in a sensitive waterway. The discharge limitations on some constituents required single-digit pg/L effluent concentrations. This required not only robust system design, but also continuous monitoring and adjustment to ensure compliance under variable flow and water quality conditions.
- Together, these challenges demanded a solution that blended large-scale engineering with precision operation, making the success of this project a notable achievement in groundwater treatment and construction support.

The Griffin Difference

- Griffin delivered a fully integrated groundwater management solution that combined high-capacity dewatering with advanced treatment to support construction of the new Castaic Creek bridge. The challenge required more than just lowering groundwater; it demanded a treatment system capable of managing high flows while meeting stringent NPDES discharge standards in a sensitive aquatic environment. During the project, it is estimated that Griffin treated over 165 million gallons of water!
- The temporary treatment train featured a multi-barrier design: settling tanks for solids removal, chemical injection for metals control and pH adjustment, sand filtration and bag filters for fine particulates, and two specialized media types—granular activated carbon and organoclay—to address both regulated contaminants and nuisance parameters. Griffin refined this system through multiple rounds of pre-construction groundwater sampling, ensuring treatment performance was optimized for site-specific water quality.
- At flows approaching 1,000 gallons per minute, system complexity and reliability were critical. Griffin personnel operated and maintained the system around the clock, safeguarding performance and compliance throughout construction. This turnkey approach not only enabled safe pier installation on schedule, but also protected downstream water quality in Castaic Creek—demonstrating Griffin’s ability to combine technical innovation, operational discipline, and environmental stewardship in a single solution. This project exemplifies the innovation and adaptability required for groundwater treatment at scale. By delivering a custom-built, continuously operated system that met stringent regulatory standards under difficult site conditions, Griffin ensured construction success while safeguarding a sensitive natural resource. The project stands out as a model for how engineering ingenuity and environmental responsibility can work hand in hand.

Project Photos





APPROXIMATE SPACE
REQUIREMENT:

40' W x 130' L.



5306 CLINTON DRIVE
HOUSTON, TX 77020
TEL (713) 676-8000

WWW.GRIFFINFLUIDMANAGEMENT.COM

REV.	DESCRIPTION	DATE	BY	APPVD.

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CASTAIC CREEK
BRIDGE

CASTAIC, CA

1,000 GPM SYSTEM

DRAWN: IZA

SCALE: NA

DATE: 05/20/2024

DWG: 1 OF 1



