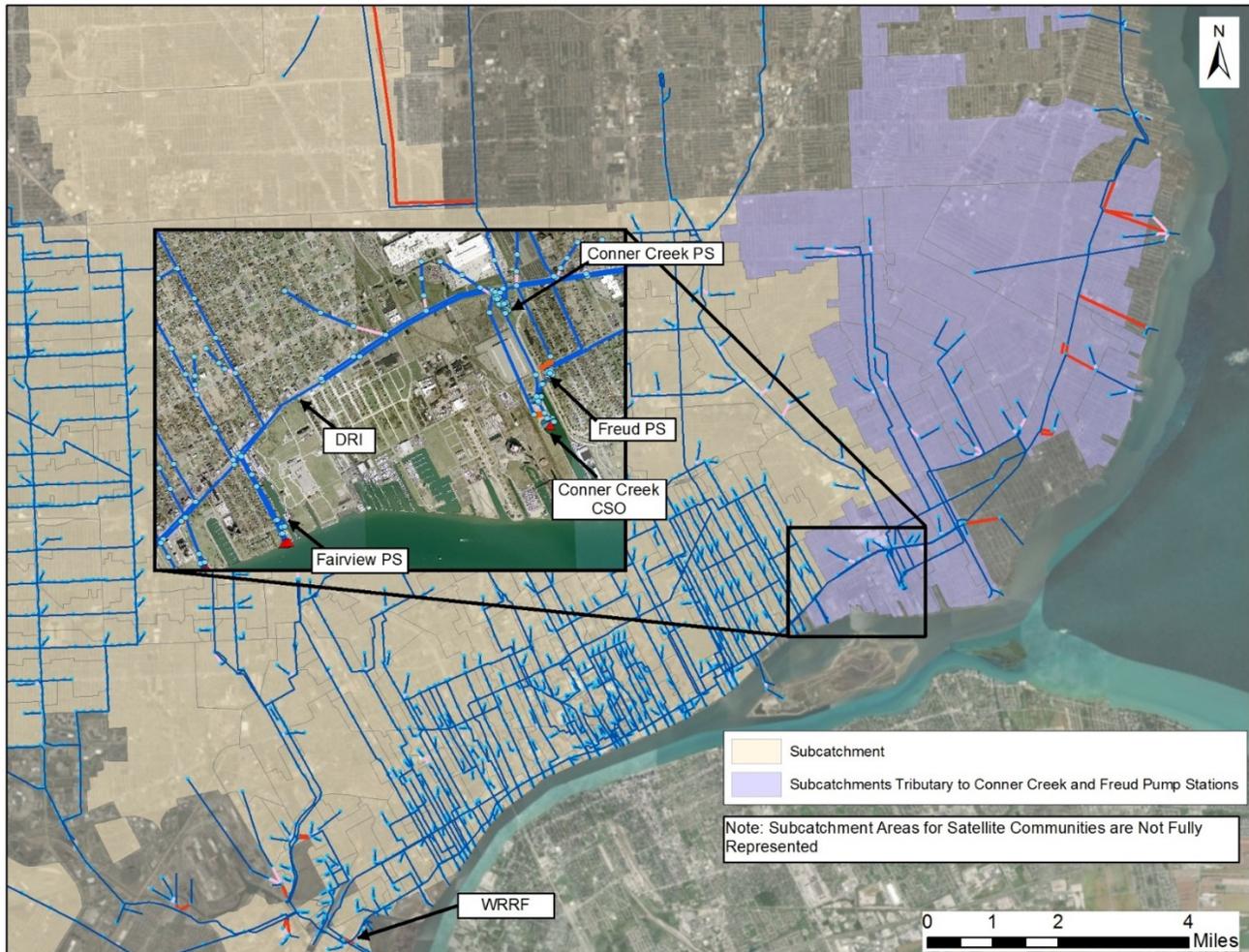


GREAT LAKES WATER AUTHORITY

Freud Pump Station Improvements Project

Project Plan
May 25, 2022





Proposed Improvements

The Freud and Conner Creek pumping systems are key components in relaying wastewater and storm water generated in the eastern portion of Detroit. The dry weather flow is conveyed to the Fairview Sewage Pump Station, and ultimately, to the Detroit Water Resource Recovery Facility (WRRF), while wet weather flow is conveyed to the Conner Creek CSO facility. The operation of these facilities is critical to prevent flooding of stakeholders' premises, but they also protect the water quality in the Detroit River and ultimately the drinking water supply for Detroit. The conveyance system is very complex involving at least eight interceptors/sewers, multiple regulating structures, three large pump stations, and a CSO treatment system. The conveyance system has grown and been modified numerous times over the past 100-years with the last major improvement being the construction of the Conner Creek CSO Basin and Treatment Facility which was placed into operation in 2005. The Freud Pump Station (FPS) was constructed in the mid-1950s primarily to handle the overflows from the

Conner Creek Pump Station (CCPS). When the capacity of the CCPS is exceeded, the East Jefferson Relief Sewer overflows to the Fox Creek and Ashland Relief Sewers. The original concept was for the FPS and the Fox Creek and Ashland Relief Sewers to store approximately 20 million gallons for return to the CCPS through the East Jefferson Relief sewer when the CCPS could handle the flow. The operation concept of Freud was changed when the Conner Creek CSO Facility was placed into operation. The Freud Pump Station has eight storm water pumps with a firm storm pumping capacity of 2,030 million gallons per days (MGD). The station also includes two pumps in the center of the wet well that were originally intended for dewatering. These two pumps currently pump dry weather sanitary flow. Storm pumps convey flow to the Conner Creek CSO Basin and Treatment Facility for screening, settling and disinfection prior to discharge to Conner Creek and the Detroit River.

The purpose of the Freud Pump Station Improvements Project is to make modifications and improvements to enhance protection of the health, safety and welfare of residents served by the pump station for the next 50+ years. The focus of the project is to improve operability,

reliability, integrity, and maintainability of the station over the life of the facility. Primary scope items include rehab of the eight storm water pumps including replacement of the pump rotating assembly, line shafts, and concrete pump supports; installing new dewatering pumps inside the Freud Pump Station with an approximate 10.8 MGD firm capacity, providing dedicated access to the Freud Pump Station wet well to allow draining, cleaning, inspections, and maintenance; and construction of a new Freud Sanitary Pump Station approximately 1.5 blocks east of the existing storm pump station. The sanitary pump station will be constructed over the two 16-ft diameter tunnels that convey flow to the existing Freud Pump Station. The structure includes provisions to add stop logs in the two 16-ft tunnels to isolate Freud Storm Pump Station. The stop logs, along with the improved access to the wet well at the existing Freud Pump Station, will enable Great Lakes Water Authority (GLWA) to inspect, clean and maintain the wet well. The proposed structure will include a sanitary pump station with a firm capacity of 30 MGD to manage dry weather flows. Sanitary pumps will discharge to a proposed 36-inch force on Navahoe Street that will connect to the existing 9-ft diameter Detroit River Interceptor (DRI) on East Jefferson.

The proposed project will improve the reliability of the station and reduce the risk of collection system surcharging and combined sewage backups into basements. The pump station improves water quality during storm events by conveying flow to the Conner Creek CSO Facility for treatment prior to discharge to the Detroit River.

Summary of Project Needs

The Freud Pump Station is a key component in relaying wastewater and storm water generated in the eastern portion of Detroit. The operation of the facility is critical to prevent flooding of stakeholders' premises. The Freud Storm Pump Station has a firm capacity of 2,030 MGD and this must be maintained.

The purpose of the Freud Pump Station Improvements Project is to make modifications and improvements to the pump station to protect the health, safety and welfare of residents served by improving operability, reliability, integrity, and maintainability. Primary scope items include rehab of the storm water pumps including replacement of the pump rotating assembly, line shafts, and concrete pump supports for managing the station capacity of 2,030 MGD, design of a single isolation shaft

with a 30 MGD firm sanitary capacity to manage dry weather flow conditions, installing new dewatering pumps inside the Freud Pump Station to provide access to the Freud Pump wet well to allow draining, cleaning, inspections, and maintenance.

Operation reliability and resiliency are project drivers for the Freud Pump Station Improvements. The Freud Sanitary Pump Station is needed to allow for safe isolation of the Freud Storm Pump Station for inspection, repairs as needed to ensure proper functionality. The existing Freud Storm Pump Station dewatering pumps were never intended to operate as daily sanitary service. The current Freud Storm Pump Station dewatering pumps are operating outside the allowable operating range which requires the pumps to be repaired and serviced yearly.

Potential Alternatives

The following alternatives were analyzed in the project plan. The no-action alternative; Alternative 1 - minimum improvements the existing Freud Pump Station; Alternative 2 – storm water pump improvements and New Freud Sanitary Pump Station; and Alternative 3 – is combining the existing Freud and Conner Creek Pump Stations.

As stated in the previous section, the Freud Pump Station was originally constructed about 70 years ago and the operational reliability of Freud Pump Station is critical to health and welfare of the public. As such, Alternative 2 was selected. Therefore, Alternatives 1 and 3 are not recommended due to increased cost and longer service interruptions with Alternative 3, and Alternative 1 will not provide a safe means to isolate the Freud Pump Station wet well for maintenance and inspections.

Environmental Evaluation

Short-term and long-term impacts due to construction activities such as noise, dust and traffic disruption cannot be avoided.

In areas where there will be construction activities above ground, efforts will be made to minimize the adverse impacts by use of thoroughly designed and well-planned construction sequencing. Noise from equipment cannot be avoided, but hours of work will be controlled. Dust and soil deposits on the streets will be controlled through watering and frequent street sweeping. Construction area footprints will be minimized, and traffic control measures will be necessary. Site restoration will minimize the adverse impacts of construction, and the implementation

of a Soil Erosion and Sedimentation Control program will minimize the impacts due to ground disturbance, when such disturbance is found to be necessary. Specific techniques will be specified in the construction contract documents.

Estimated Project Cost

Item	Estimated Cost (\$)
Design	\$ 3,600,000
Construction Admin	\$ 3,500,000
Construction	\$ 75,000,000
Total	\$ 82,100,000

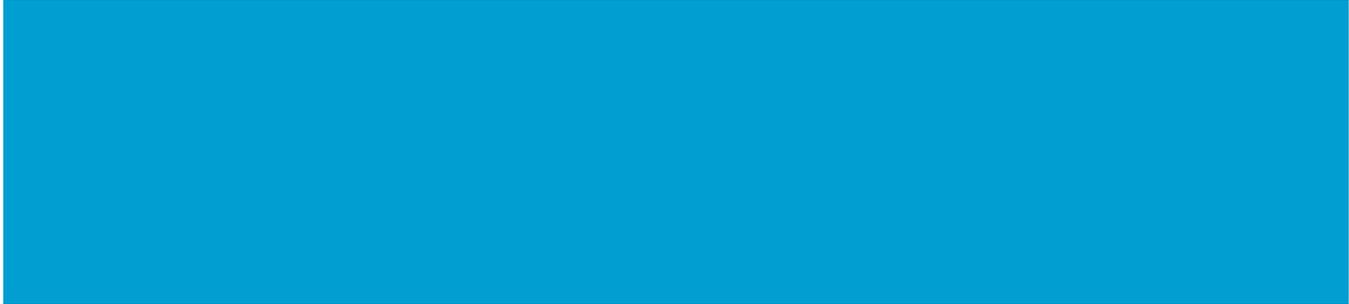
Estimated User Cost Impact

Assuming a funding term of 20 years and a loan interest rate of 1.875 percent, the total project cost has an equivalent annual cost of \$4,960,603. According to the 2020 GLWA Wastewater Master Plan, there is approximately 2.8 million residents between 2018 and 2045 in the GLWA regional service area. The number of persons per household in Michigan was estimated by the U.S. Census Bureau as 2.45 between 2016 - 2020. The estimated number of households that will be impacted by this project is estimated to be 1.14 million.

The per household user cost is \$4.34 per year.

Proposed Implementation Schedule

Item	Date
Design Notice to Proceed	January 2020
50% Design	November 2021
90% Design	May 2022
100% Design	June 2022
Bid Opening	January 2023
Construction Notice to Proceed	April 2023
Construction Substantial Completion	June 2026
Construction Final Completion	December 2026



Arcadis of Michigan, LLC
607 Shelby Street, Suite 400
Detroit
Michigan 48226
Phone: 313 694 8436
www.arcadis.com