Facility Plan
for
New Lift Station L32A (Fridley)

METROPOLITAN COUNCIL

March 2021

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I hereby certify that this plan, specification,

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Executive Summary

Overview and Problem Statement

This Facility Plan addresses the provision of sufficient, reliable wastewater conveyance from Champlin, Anoka, Brooklyn Park, Maple Grove, Osseo and Fridley to the MCES conveyance system. Wastewater generated in Champlin, Anoka, Brooklyn Park, Maple Grove and Osseo is conveyed to L32 through a series of interceptor gravity pipes and forcemains, which then carry flow through Fridley and other downstream communities to the Metropolitan Wastewater Treatment Plant (Metro Plant) in St. Paul.

Lift station L32 is located on the west side of the Mississippi River on 7700 Mississippi Lane in Brooklyn Park. It was constructed in the 1970s as a wet well/dry well lift station with dual 42-inch force mains that cross the Mississippi River and discharge to MCES gravity interceptor 4-NS-521 on the east side of the river. The lift station is 50 years old and deteriorated. The wet well is corroded and has been repaired several times in the past. Most of the equipment, including the electrical, mechanical and pumping systems, is nearing the end of its useful life and needs to be replaced to maintain a reliable system.

Studies conducted in 2002 and 2004 determined that the current wastewater conveyance system in the northwest metropolitan area of the Twin Cities will be insufficient to meet the area's growing population needs in the future. Growth projections for the northwest portion of the seven-county metropolitan area indicated a near doubling of wastewater flows under the fully developed, ultimate build-out scenario. Studies and hydraulic modeling were completed for the northwest area system to reexamine the flow and to determine the upgrades required for the system to handle the ultimate flow.

Community efforts have occurred to reduce Inflow and Infiltration (I&I) and are expected to continue in the future. The I&I reductions are accounted for in future flow projections. Upgrades to the system over the last few years include the addition of two new forcemains across the Mississippi River to increase reliability, improved lift station L32 ventilation and odor control systems for safety, and interceptor system improvements upstream of lift station L32 in Brooklyn Park to increase the system capacity and response time. Improvements in Brooklyn Park also includes removal of direct local connections from the interceptor to reduce the likelihood of basement backups.

The existing lift station has a firm capacity of 43 million gallons per day (MGD). Recent peak flows through the lift station have reached 38 MGD, showing that lift station L32 is nearing its capacity and will need greater capacity to handle the flow in the near future.

The 2040 peak flow is projected to be 48 MGD and the ultimate peak flow is projected to be 67 MGD.

The following problem statement has been developed to support the alternatives identified and evaluated in this Facility Plan:

"Lift station L32 must be upgraded or replaced due to its age and also to provide sufficient future capacity and reliable wastewater conveyance for the community for the duration of the planning period."

L32 System Recommendation

The following list addresses the issues/concerns with the existing lift station:

1. Age of the lift station
    a. Existing lift station is 50 years old and deteriorated.
    b. The equipment has reached its useful life and requires complete replacement of all electrical, mechanical and pumping equipment.
    c. The wet well is corroded and had been repaired several times.
2. Lack of Resiliency
    a. Failures at the lift station in the past have resulted in back-ups into neighboring homes. Improvements are required to improve reliability and response time for the lift station.
    b. There is insufficient air flow in the lift station mechanical systems to address odors.
    c. Most of the equipment is older technology which restricts improvements and needs replacement.
3. Capacity Concerns
    a. The lift station is nearing its firm capacity and will need to be expanded in the near future to provide reliable service to the community.
    b. The ultimate capacity, defined as the complete development of the service area, is projected to almost double the flows to the lift station. Since the lift station needs to be upgraded, a new lift station is required to handle not just the near future flow but the ultimate flow.

It is therefore recommended that the facility improvements be made to L32 to upgrade the lift station as well as to increase the capacity for future growth.

Alternative Recommendation

The existing site for L32 in Brooklyn Park is not big enough to make all of the above upgrades without impacting the nearby properties or without acquiring additional properties.

It would be challenging to upgrade the existing lift station and build new structures while maintaining service to the community through the existing lift station.

MCES owns a 22-acre property on the east side of the Mississippi River in the City of Fridley. This site is large enough to build a new lift station with the required 67 MGD ultimate capacity, odor control system and other related structures to meet the future needs of the region. It is therefore recommended that the new lift station be constructed on the east side of Mississippi River in Fridley. This site will provide more room for the new larger lift station, allow adequate screening of the facility from its neighbors, and provide a long-term solution for conveying wastewater in the region.

Since the ultimate capacity is forecasted to occur more than 30 years from now, it is recommended that the lift station structures that are difficult to expand, including wet well, electrical room and other building elements, are constructed to meet the ultimate capacity of 67 MGD. However, the pumps, mechanical and electrical equipment inside the building should be designed to meet the interim 2040 capacity of 48 MGD and upgraded in the future as capacity increases. This will ensure that the new lift station equipment is not only properly sized for near future flows, but the lift station structure is large enough to upgrade in the future with minimal construction requirements.

Implementation Plan Summary

The recommended plan is to construct a new lift station on the east side of the Mississippi River in the City of Fridley. The new lift station should be constructed to meet the future area needs and will be a part of MCES's multiphase approach to preserve and improve wastewater assets in the Fridley area. The new lift station will be constructed to meet MCES and industry standards.

Considering the size of the new lift station, a request for proposal (RFP) will be issued to select the best consulting firm for the design of the lift station.

Proposed Project Schedule and Delivery

Below is the planned schedule for the new lift station L32A:

- Planning – 2018 to 2021
- Design – 2021 to 2023
- Construction – 2023 to 2026

The new lift station is planned to be online by the end of 2026.

Introduction and Background

The northwest area system includes a portion of the 7-county Twin Cities metropolitan area. The major interceptor systems in the area include:

1. Champlin-Anoka-Brooklyn Park Interceptor (CAB)
2. Brooklyn Park Interceptor (BPI)
3. Elm Creek Interceptor (ECI)
4. Coon Rapids Interceptor (CRI)
5. Fridley Interceptor

The flow from four of the above five major interceptors (all except the Fridley Interceptor) passes through lift station L32 and is pumped by L32 through a series of forcemains and interceptor gravity pipes, eventually passing through Fridley and other downstream communities before entering the Metropolitan Wastewater Treatment Plant (Metro Plant) in St. Paul.

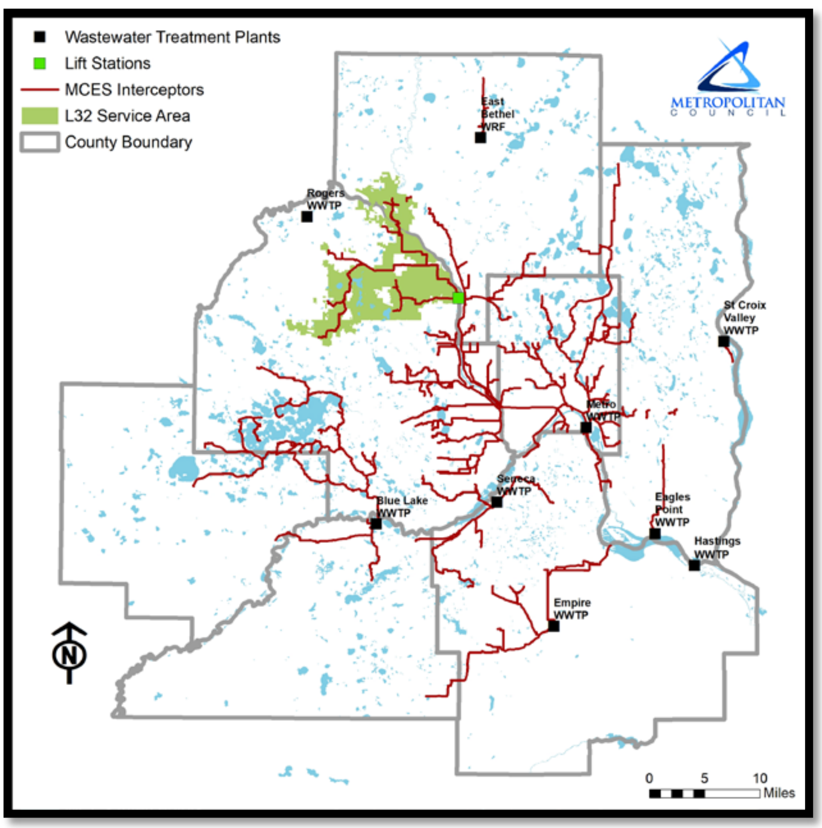

Figure 1 – Service Area Map for Lift Station L32

Previous Studies

Various studies were completed to evaluate the system's ability to meet future capacity needs.

- The studies conducted in 2002 (Interceptor Master Plan by CDM and Brown and Caldwell) and 2004 (Northwest Area Plan Report by Brown and Caldwell) determined that the current wastewater conveyance system in place in the northwest metropolitan area of the Twin Cities will be insufficient to meet the area's growing population needs. Growth projections for the northwest portion of the seven-county metropolitan area indicated a near doubling of wastewater flows by the year 2050.
- 2006 study (Draft Concept Plan for the Elm Creek Interceptor (ECI) by CDM and CH2MHill) was completed updating the trends in growth for the area and provided the recommended plan to serve the ultimate build-out conditions for the planning area.
- More studies were completed in 2010 (Champlin-Anoka-Brooklyn Park Diversion and Elm Creek Interceptor Relief (CAB-ECI) Project by CDM and CH2MHill) to determine the upgrades required to the system that could meet the incremental flow projections for service area flow. This approach allows for phased implementation of projects staged to meet projected growth scenarios.

The 2010 study identified several interceptor sewer components projected to have insufficient capacity to convey future peak flows in the Brooklyn Park Lift Station (L32) sewershed. These components include the ECI and CAB Interceptor. The study also determined that the existing reliability issues at L32 will be compounded as flows increase. The timing and extent of these capacity problems are dependent upon community development patterns and rates, service area, peaking factors, and available capacity. The study recommends a plan that identifies the range of growth that could occur in the CAB-ECI study area and the facility improvement options to accommodate this growth, while minimizing capital expenditures. This plan provided MCES with phased improvement options that can be selected based on updated wastewater flow and community planning information. Facility conditions, local/state corridor improvements, and downstream hydraulic constraints are considerations that must be updated as capital improvement options are selected in the future.

Since the CAB-ECI study, condition assessments were conducted for the existing lift station L32 and various upgrades were made to the Brooklyn Park system. Some of these improvements are currently under construction. The upgrades include:

- Two additional 42-inch DIP forcemains across the Mississippi River were installed in 2014 to increase conveyance reliability after one of the older pipes failed. The failed pipe was repaired.
- The HVAC and odor control system were replaced in 2018-2019 to provide a safe working environment in the existing wet well.

- Various improvements are underway or complete through a current capital project in Brooklyn Park area to improve the interceptor system upstream of lift station L32. Rehabilitation includes installing larger diameter pipe and removing local direct connections to the interceptor. The larger diameter pipe will increase response time and removing of direct local connections will prevent backups or flooding of homes in the area. Refer to the section below for repose time details.

Besides the above improvements, additional facility improvements are required at lift station L32 to increase station capacity, reliability and upstream storage capacity. The available response time for power outages or other station failures is very low, creating a risk of flooding homes that are upstream of the lift station and still connected directly to the interceptor. It is required that the lift station L32 be upgraded and/or rehabilitated.

Existing System

The existing system includes lift station L32 located on the west side of Mississippi River and the four forcemains discharging flow from L32 to the MCES interceptor on the east side of Mississippi River into interceptor 4-NS-521.

Description of Existing Facilities

Forcemains

The original 42-inch ductile iron pipe (DIP) and prestressed concrete cylinder pipe (PCCP) dual forcemains (Barrel A and B) were constructed in 1970 to convey flow from L32 on the west side of the Mississippi River and discharge into MCES interceptor 4-NS-521 on the east side of the river. The part of the dual forcemain under the Mississippi River is DIP and the part of the dual forcemain on east side of the River is PCCP. Due to interior corrosion, about 450 feet of the downstream end of each PCCP forcemain was lined with cured-in-place-pipe (CIPP) in 1996 reducing the inside diameter to 40-inches. These forcemains discharge into two sections of 42-inch fiberglass-reinforced mortar pipe (FMP) before combining into a 60-inch FMP where flow is by gravity to the Fridley Interceptor. The 42 and 60-inch pipes (69U1-70U2) were constructed in 2016 to replace existing deteriorated piping. MCES inspects FMP interceptors every 15-years for condition.

The additional two 42-inch high density polyethylene (HDPE) forcemains (Barrel C and D) under the Mississippi River were installed in 2014 to increase the reliability of the conveyance system. Under existing flow condition, Barrels C and D are primarily used to convey flow across the Mississippi River, with the Barrels A and B reserved for emergency flows.

Fridley Interceptor

The Fridley Interceptor (4-NS-521), which receives flow from the L32 forcemain discharge, is a 96-inch diameter gravity pipe. This pipe was rehabilitated in 2016 by lining with CIPP. Interceptors that are CIPP lined are inspected by MCES every 15-years.

Lift Station L32

L32 is the Metropolitan Council Environmental Services (MCES) owned pump station located on 7700 Mississippi Lane in Brooklyn Park serving areas of communities located in the northwest portion of the metropolitan area. Table 1 below shows the service area acreage for the communities that contribute to L32.

Table 1 - Service Area Acreage of Communities that Contribute to Lift Station L32

Community	Service Area Acreage (Acres)
Anoka	3,910
Brooklyn Center	64
Brooklyn Park	14,299
Champlin	4,146
Corcoran	592
Dayton	1,389
Maple Grove	15,263
Medina	2,815
Osseo	469
Plymouth	2,192
Ramsey	3,537
Rogers	319

The existing lift station L32, located on the west side of Mississippi River, was constructed in 1972 as a wet well/dry well lift station. Various upgrades have been made since it was constructed including adding more pump capacity, electrical and HVAC improvements, and odor control improvements. Currently, the lift station has total of 6 pumps and has firm capacity of 43 MGD.

In spite of the above upgrades, the 50-year-old lift station has continued to deteriorate and has reached the end of its useful life. The wet well is corroded and has been repaired several times in the past. More upgrades to the electrical, mechanical and pumping components and technology are required to maintain reliable service to the communities it serves.

Current and Future Flow Projections

The graph below shows the daily flow data in millions of gallons from the year 2000 to October 2020. The flow is based on meter M221 installed in the lift station L32. The average daily flow through this lift station in the last 20 years is about 15.6 MGD. The highest peak flow noticed was in September 2016 which totaled about 38.4 MGD (as shown in Graph 2 below), and the second highest peak was in Spring 2019.

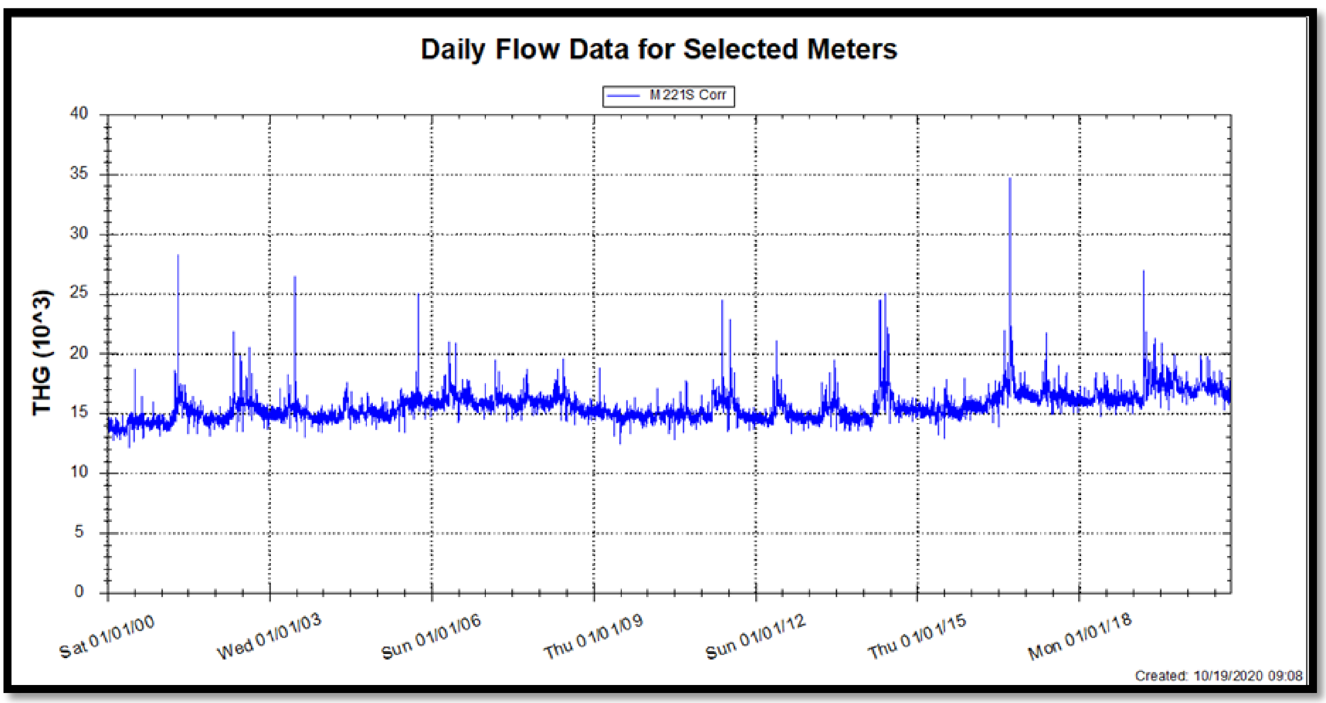

Figure 2: The daily flow data for the last 20 years for the lift station L32 in million gallons

The projected flows for L32 Service area are as shown in Table 2 below. The flow projection is based on 450 gallons/acre/day for the 2040 flow forecast and 600 gallons/acre/day for the ultimate flow forecast. The 2040 flows and ultimate flows are based on the assumption that the flow from Rogers and Corcoran will be diverted to the new Crow River Wastewater Treatment Plant (WWTP).

Table 2 – Existing and Future Flow Projections

	Average Day Flow (ADF) MGD	Peak Day Flow MGD
2016*	16.55	38.4
2019*	17.28	26.93
2040	25	50
Ultimate	34	67

Note: * The average daily and peak day flow is from the metered data.

Figure 3 below shows the map of the existing and future L32 service area.

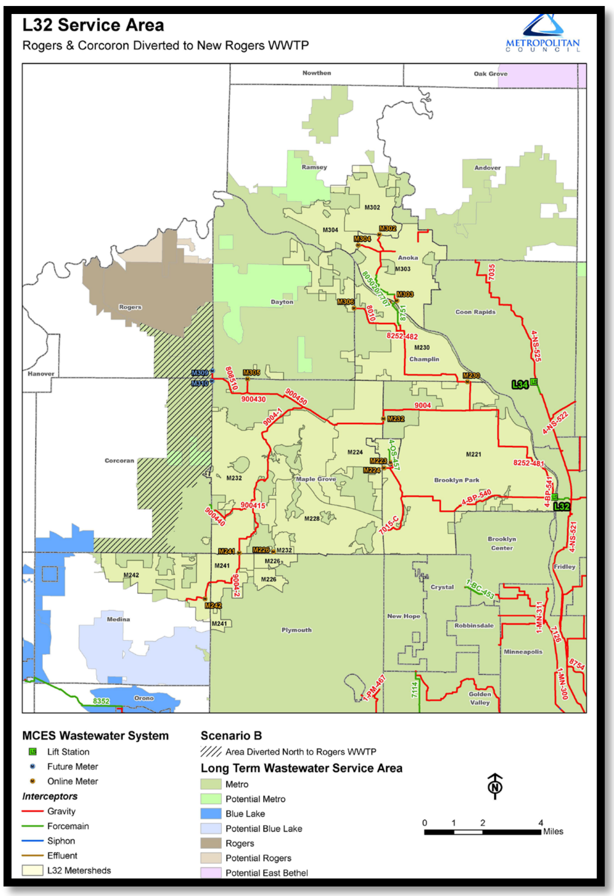

Figure 3 – Map of the Existing and Future Service Area for L32

Based on the flow data in Table 2, the exiting lift station L32, which has the maximum capacity of 43 MGD, is nearing its full capacity and will need to be upsized to meet the needs of the community in the near future.

Table 2 also shows the growth projections for the area that will double the wastewater flows by the ultimate growth period. The existing lift station L32 must be upgraded or replaced to provide sufficient capacity and reliable wastewater conveyance to the community for the duration of the planning period.

Issues and Concerns

It is required that the facility improvements be made to L32 to upgrade the lift station for the following reasons:

1. Age of the lift station
    a. Existing lift station is 50 years old and deteriorated.
    b. The equipment has reached its useful life and requires complete replacement of all electrical, mechanical and pumping equipment.
    c. The wet well is corroded and had been repaired several times.
2. Lack of Resiliency
    a. Failures at the lift station in the past have resulted in back-ups into neighboring homes. Improvements are required to improve reliability and response time for the lift station.
    b. There is insufficient air flow in the lift station mechanical systems to address odors.
    c. Most of the equipment is older technology which restricts improvements and needs replacement.
3. Capacity Concerns
    a. The lift station is nearing its firm capacity and will need to be expanded in the near future to provide reliable service to the community.
    b. The ultimate capacity, defined as the complete development of the service area, is projected to almost double the flows to the lift station. Since the lift station needs to be upgraded, a new lift station is required to handle not just the near future flow but the ultimate flow.

The lift station should be rehabilitated for the age related issues but should also be upsized to meet the ultimate demands of the community which is 67 MGD.

Alternative Evaluation for Lift Station L32

Various options were evaluated to upgrade and increase the capacity of the existing lift station. The alternatives include:

1. Do nothing
2. Increase the capacity or replace the existing lift station at the current location on the west side of the river with a new, larger lift station.
3. Construct a new larger lift station on the east side of the river

Several factors were reviewed that are common to all three alternatives and are discussed separately from the review of these alternatives. These factors include MCES Design Guidelines in all of the proposed alternatives, an evaluation of upstream and downstream system capacities, the inclusion of system improvements to prevent spills, resiliency and reliability improvements to manage risks associated with the failure of facility components, and rehabilitation of the four forcemain pipes that cross the Mississippi River.

Design Guidelines

The following guidelines were used for the planning of the lift station L32 upgrades.

1. Building Components - The lift station should be designed for the ultimate peak flow of 67 MGD. Since the ultimate flow is not anticipated for another 30-40 years, structural components that are difficult to expand such as wet well, electrical room, and other built element should be sized for the ultimate flow of 67 MGD. The mechanical and electrical equipment has life cycle of 20 years. Therefore, mechanical and electrical equipment should be designed for intermediate 2040 flow of 48 MGD and should be upgraded when higher flow is anticipated.
2. Generators – Standby generators sized to maintain continuous operation of the lift station will be included at the facility.
3. Pumps – Firm capacity is the station's capacity with the largest pump out of service. The station pumps will be selected for a firm capacity of 48 MGD.
4. Storage and Response Time – The new facility is required to provide response time for operators to come to the site during emergency events to fix the problem. This will include improvements to the facility such as back-up systems or storage that address its overall reliability as well as improvements that would help prevent spills. The response time required for any lift station is based on the location and amount of time it takes the operator to reach the site safely. A response time of 60 mins under peak flows is desired per MCES Design Guidelines.
5. Per MCES Design Guidelines, the inverted siphon should have firm capacity. Three of the four siphon pipes should be capable of conveying the peak flow.

Overall System Analyses

The following system analyses were performed to determine if the other systems around L32 are capable of handling the higher flow in the future. These analyses were conducted to determine if any other system upgrades are required beside upgrades at the lift station L32.

Downstream System Capacity Analysis

Downstream system modeling was completed to determine if there is enough capacity in the pipe downstream of L32 for the ultimate flow condition. The downstream system was modelled from existing L32 to meter M200 downstream. Figure 4 below shows the map of area analyzed.

The model result shows that there is sufficient capacity in the system downstream and there are no constraints downstream if flow increases to 67 MGD. The model results are available in Appendix A of the report.

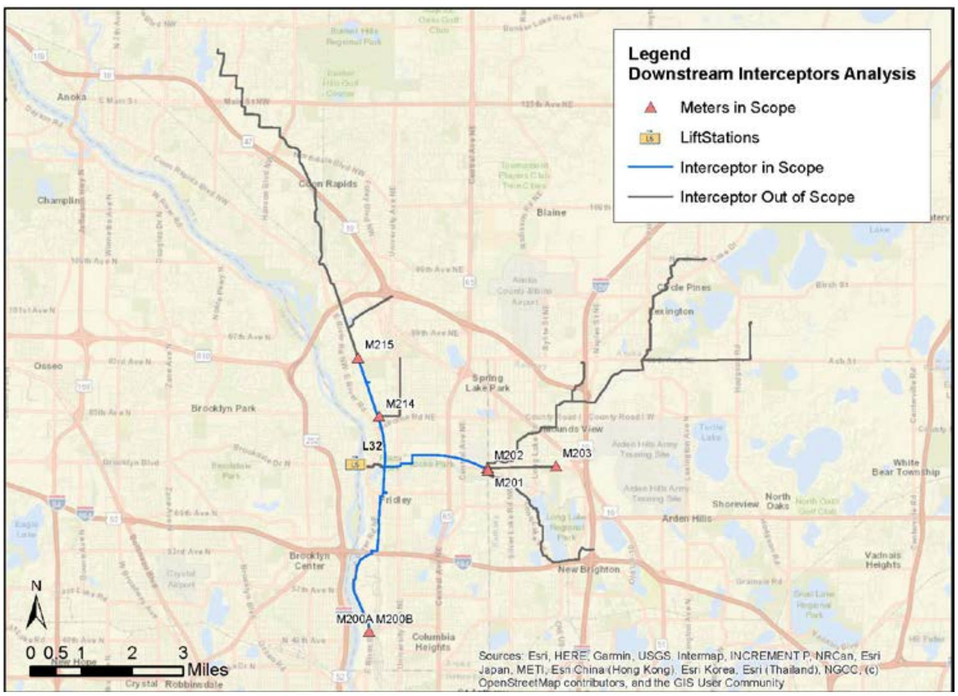

Figure 4 – Map of the Downstream System Area Analyzed

Upstream System Capacity Analysis

Storage volume available in the pipe upstream of the lift station is called in-line storage. This is the most convenient and cost-effective way of providing response time at any lift station.

The upstream system model was analyzed to determine if there is enough capacity in the upstream pipe and how much storage is available in the pipe leading to the lift station L32. Figure 5 below shows the area that was analyzed in the model.

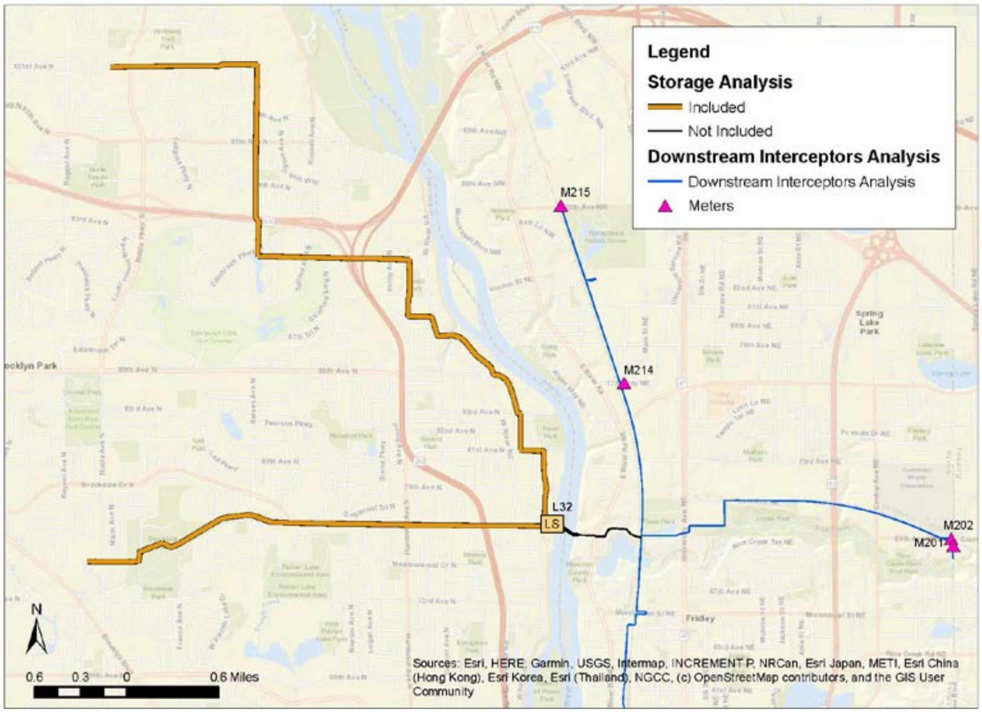

Figure 5 – Map of the Upstream System Area that was Analyzed

As discussed earlier, there is an existing project in Brooklyn Park currently under construction that will increase the diameter of pipe from 60-inch to 72-inch. The model analysis was completed using 72-inch diameter pipe. Table 3 below shows the model results of the available storage and response time for different flow scenarios. The storage and response time were calculated assuming the pipe is free of any debris or structural defects.

Table 3 – Available Storage and Response Time in Upstream Pipe

Peak Flows	Available Storage	Response Time
Existing Flows (38 MGD)	1.4 MG	53 minutes
2040 Flows (48 MGD)	~1.3 MG	41 minutes
Ultimate Flows (67 MGD)	1.1 MG	24 minutes

The model results show that there is enough capacity in the pipe upstream. There is about 1.4 MG of storage or 53 minutes of response time available in-line with the existing peak flow and about 1.1 MG of storage or 24 minutes of response time available for the ultimate peak flows. The model shows that, after the calculated response time, the pipe surcharged, and flow may back-up in the basements of the surrounding lower level houses. The model results are attached in Appendix A of the report.

To meet the design guidelines of 60 minutes of response time required for this lift station, an additional 30 mins of response time is required for the ultimate peak flow condition. As this is needed regardless of the improvements implemented as a part of the L32 project, the alternatives for providing this additional response time were evaluated separately.

Spill Prevention

Spills due to failures at the lift station can be prevented in various ways: addition of an onsite storage tank, providing in-line storage upstream of the lift station, and incorporating features within the lift station that can prevent system spills. The basic design criterion of the in-line storage or an on-site storage tank requires that it must be able to accept flow by gravity alone so that a power outage won't affect its ability to store water and provide time to correct or restore lift station functionality.

On-site Storage Tank

One option for providing an additional 30-minutes of storage would be the construction of a 1.5 million gallon (MG) storage tank. A 150 foot diameter circular tank will be required with an overall depth of 60-70 ft to meet the gravity inflow requirements. While flow will enter the tank by gravity, a pump-out system will need to be constructed to reintroduce any temporarily stored wastewater back into the system. Additionally, the storage tank will require a wash-down system which will be used to clean the tank with fresh water after each use.

An on-site tank can also generate additional odors due to the sewage being retained in the tank. Odor control facilities constructed as a part of the overall project will need to be sized for the air space added by including a storage tank. This larger odor control unit will have higher operation and maintenance costs, due to a larger quantity of filter media. Additional operation and maintenance costs for this option include maintenance of the additional pumps required to pump out the flow, and cleaning of the tank after flow backs up.

Considering the close proximity of the project to the Mississippi River, the size and depth of the structures required, and the types and characteristics of the natural site soils, construction of an additional storage tank will present significant challenges to the project, adding significant construction costs. The emergency situations that the tank would be used to mitigate high flows would occur infrequently. It is highly likely that if a new storage tank is constructed, it will be used only a few times during the life of the lift station.

In-line Storage

As discussed earlier, there will be 24 minutes of storage available in the upstream pipe for the ultimate peak flow condition. After 24 minutes, the flow will start backing up in the pipe and may flood the basements of the houses that are still directly connected to the interceptor pipe. Most of the directly connected houses on the upstream pipe will be removed from MCES interceptors with the completion of the current Brooklyn Park project, reducing the risks of basement flooding into those houses. Additional model analysis was completed to determine if it is feasible to increase the response time by removing the remaining direct connections and taking care of the houses that are at lower elevations than the interceptor pipe. Additional basement surveys determined that there are 2-3 additional locations on Brookdale Drive and 81st Ave N that are at lower elevations and prone to backups. This flooding issue can be taken care of by installing small lift stations near those locations. The smaller submersible lift stations can prevent back-ups resulting from a failure at L32 from impacting a connected home; hence, increasing the storage and response time within the system. More survey and analysis on the location and total number of lift stations would be conducted during design. Based on available survey data, this Facility Plan assumes that 2 additional lift stations will be required, one on Brookdale Drive near existing lift station L32 and another on 81st Ave N.

The increased response time achieved by adding two small lift stations under various peak flow scenarios are as follows:

Description	Response Time with Additional 2 Lift stations
Existing Flow (38 MGD)	103 min
2040 Flows (48 MGD)	68 min
Ultimate Flows (67 MGD)	49 min

The two new small lift stations will increase the response time from 24 minutes to almost 50 minutes under ultimate flow conditions. The additional 10 minutes of required response time can be achieved by adding resiliency to the new and upgraded lift station.

Independent Pumping System at the New Lift Station

Another option evaluated to increase the response time at the new lift station is to add an independently powered backup pump system with a dedicated generator in addition to what will be designed for the main lift station. The backup pumps, along with additional generator, would be sized to handle peak flow operations. The main generators will be diesel powered. The independent generator could be powered by natural gas to offset the possibility of diesel fuel problems. This system should be further evaluated during design.

This independent pump system could be plumbed directly into the wet well with independent sets of pump control float switches. If the sewage rises due to failure of the primary system, the independent system will continue to pump sewage. This system would protect against loss of power, transfer switch malfunction, primary control and pump failures providing resiliency to the lift station. This independent system should be designed to operate independently of the primary SCADA (supervisory control and data acquisition) system.

Under average flow condition, this independent system could maintain continuous service and provide additional response time. 2-12,500 gallons per minute (gpm) of pumps would pump 1.5 MG in 60 min.

Cost Estimate for Spill Prevention Options

Table 4 below shows the cost estimate for constructing different options to provide 30 minutes of additional storage and response time for this lift station.

Table 4 – Estimated Construction Cost for Different Spill Prevention Options

Sr. No.	Description	Cost	Cost with Contingency*
		(in 2020 dollars amount)	
1	On-site Storage Tank	$22,090,900	$37,996,348
2	Addition of 2 new smaller submersible pump station	$1,300,000	$2,236,000
3	Independent Pump System	$1,500,000	$2,580,000

Note: *The contingency includes 20% undeveloped design contingency, 22% engineering and administration cost and 30% construction contingency.

Present Worth Analysis

A present worth analysis of these three options was performed to determine which options provide the best long-term solution for reducing the risk of a spill at the new L32 facility. This analysis compares immediate construction costs, long-term operation and maintenance costs, and remaining value of each option at the end of a 20-year period. A 3% interest rate is used as a part of this analysis to compare future costs with present costs. Table 5 summarizes the present worth value of these three options.

Table 5 – Present Worth Costs for Different Spill Prevention Options

Description	On-Site Storage Tank	2 Smaller Submersible Pump Stations	Independent Pump System
Capital Costs	$37,996,348	$2,031,250	$2,580,000
Operational Costs (Annual O&M)	$35,609	$7,706	$2,960
Annual O&M Costs (20-yr Present Value)	$712,187	$154,112	$59,209
Salvage Value	-$4,680,000	-$325,000	-$375,000
Present Worth Value	$34,028,535	$1,860,362	$2,264,209

Based on the present worth cost of the on-site storage tank, construction challenges and the number of times the tank might be used during the useful life of the lift station, the on-site storage tank is not a recommended option. The option of adding two smaller submersible lift station and/or the independent pump system options which can provide similar response time will be use and evaluated further during the design.

Resiliency Addition

Resiliency means reducing or removing the risks of failure at the lift station. Adding redundancy and resiliency is invaluable for any lift station. The most common failures at any lift station are electrical power outages, pump failures, and buildup of grit or rags that restrict flow. Considering the location of this lift station closer to the Mississippi River, minimizing sewer overflows is extremely important to protect the environment and health and safety of people.

Split Wet Well System

For the new lift station, considering the size of the ultimate flow, it is anticipated that there will be a split wet well system with each wet well capable of managing firm capacity. The split wet well will have mirror image pumps and motor control rooms and separate generators for each control room. Each motor control room will have separate main circuit breakers and separate automatic transfer switches. The generators will be a diesel generator with exterior walk in sound enclosures to reduce noise. The diesel-driven generator will automatically start when power goes out. This solution has been used throughout the industry as a reliable backup in case of power failure.

Pumps

MCES guidelines require firm capacity for pump design (one redundant pump available on site). The new lift station is anticipated to be designed for either 6 pumps (5 active and 1 stand-by) or 8 pumps (7 active and 1 stand-by) with variable frequency drives to maintain uniform pumping rates.

Automatic Bar Screen and Grinders

Automatic bar screens or channel grinders are industry standard. This will eliminate the need to clean the buildup of rags and debris on a daily basis. This will help reduce maintenance costs and help prevent flow restrictions due to plugged screens.

Other resiliency options beside what is discussed above will be evaluated during design.

River Crossing

The forcemain pipes at river crossing were modelled and evaluated. The four forcemain pipes crossing the Mississippi River could be converted into an inverted siphon. The two old pipes, Barrels A and B could be rehabilitated and could serve as backup siphons. This configuration would provide sufficient capacity for the forecasted ultimate flow rates in the service area. Each of the four forcemain pipes would include valves that will allow each to be taken out of service for cleaning and maintenance.

Due to the age of the two older forcemains (Barrel A and B) it is recommended that the two forcemain be rehabilitated if it is to be used in the future. Model analysis shows that due to the need to maintain a flushing velocity in the siphon system, it is proposed that while rehabbing the forcemains, the old forcemain pipes be reduced to smaller diameter from 42-inch to a 30-inch or a 24-inch size. The model analysis is attached in Appendix A of this report.

To rehabilitate the two older forcemain pipes to a smaller diameter, various options were reviewed including cured-in-place pipe (CIPP) lining, slip-lining and a spiral wound pipe. The rehabilitation method needs to be evaluated further during the design to accommodate bends in the pipes requiring lining. For the cost estimates, CIPP lining costs are used in the alternatives below.

Alternative 1 – Do Nothing

The alternative of do nothing will keep the existing lift station the same size and without upgrades. This lift station will not be able to handle the ultimate future flow.

The existing lift station is 50 years old and is nearing the end of its useful life. If the do nothing option is selected, it will continue to deteriorate and will require excessive maintenance and eventually lead to failure. The failure of the lift station would allow wastewater to back-up into residential basements and will create overflow/spill into the surrounding environment and into the Mississippi River. This would pose a threat to public health and safety, the environment, and private properties nearby.

Additionally, the do nothing alternative will still require improvements to the facility to mitigate existing deficiencies. These improvements would include the addition of two smaller lift stations and/or an independent backup pumping system to prevent system spills, as well as rehabilitation of the forcemain pipes that cross the Mississippi River. These improvements would only provide a temporary fix to the system; simply delaying the need to replace the lift station.

This option does not meet MCES Customer Level of Service goals. This alternative is not recommended per MCES policy of providing continued and best customer services to the communities they serve and to reduce the risk of spills and other environmental impacts to the Mississippi River and residential neighborhood.

Alternative 2 – New Lift Station on the West Side of River

This alternative includes building a new lift station at the current site on the west side of the river in Brooklyn Park. This includes

- New pump station to meet future flow and resiliency needs per MCES guidelines
- Adding two new smaller submersible lift station and/or Independent pump system to increase in-line storage and response time
- Upgrades to the existing odor control system

<u>Upgrades to the existing building</u>

A model was created to determine how much capacity can be gained by upgrading the pumps within the existing building and the results indicate that there is not enough space in the building to add additional pumps to meet the future ultimate peak flow capacity. Also, since the lift station is older and reached the end of its useful life, upgrades to the wet-well and the electrical and mechanical systems will also be required.

The upgrades to the pumps within the existing lift station will only incorporate higher interim capacity and will not solve the response time and resiliency issues required during an emergency. The existing lift station does not meet Hydraulic Institute (HI) standards for a self-cleaning wet well and will continue to suffer response time and resiliency issues in the future. Automatic bar screens or channel grinders are industry standard. The current station utilizes a manual bar screen that requires cleaning at least once daily. With the limited space available, this alternative is not likely to improve that situation if the upgrades are to be made within the existing building. Back-ups and other issues related to power outages have occurred at this lift station. Upgrading pumps within the existing building will not solve these issues.

The existing lift station is required to be in continuous operation during construction to allow for continued service to the residents. This makes it difficult if not impossible to construct all the required upgrades without constructing a larger separate lift station building.

New Lift Station

The existing property is not large enough to allow for building a new larger lift station while keeping existing building in place for continuous operation. Also considering the location of the site close to the Mississippi River, it is highly likely that the depth of groundwater will pose a greater challenge to the construction method selected for the new building. As the location is close to the Mississippi River, certain setbacks are required from the river and bluffs per the Department of Natural Resources (DNR) requirements further restrain the site.

Additional property will need to be purchased to complete all the construction work and to build a new lift station. For this alternative and cost estimate comparison, it is assumed that additional property north of the existing site will need to be purchased.

For the new lift station and to meet 67 MGD ultimate peak flow capacity, a 6 and 8 pump rectangular lift station or a 6 and 8 pump circular self-cleaning style lift station was considered. Detailed analyses on selecting the shape and the number of pumps to be used should be conducted during the design of the lift station. For a station of this size, variable frequency drives are recommended for pump starting and maintaining uniform pumping rates throughout the system.

Considering the depth of the lift station required and due to close proximity to the Mississippi River and high groundwater table, it is assumed that a caisson construction may be required. For the sizing and cost estimate purpose, a circular foundation lift station with 8 pumps (with 6 pumps operating at the firm capacity) is used. It is assumed that there will be circular shape foundation with rectangular building on top. Figure 6 below shows the site plan for this alternative.

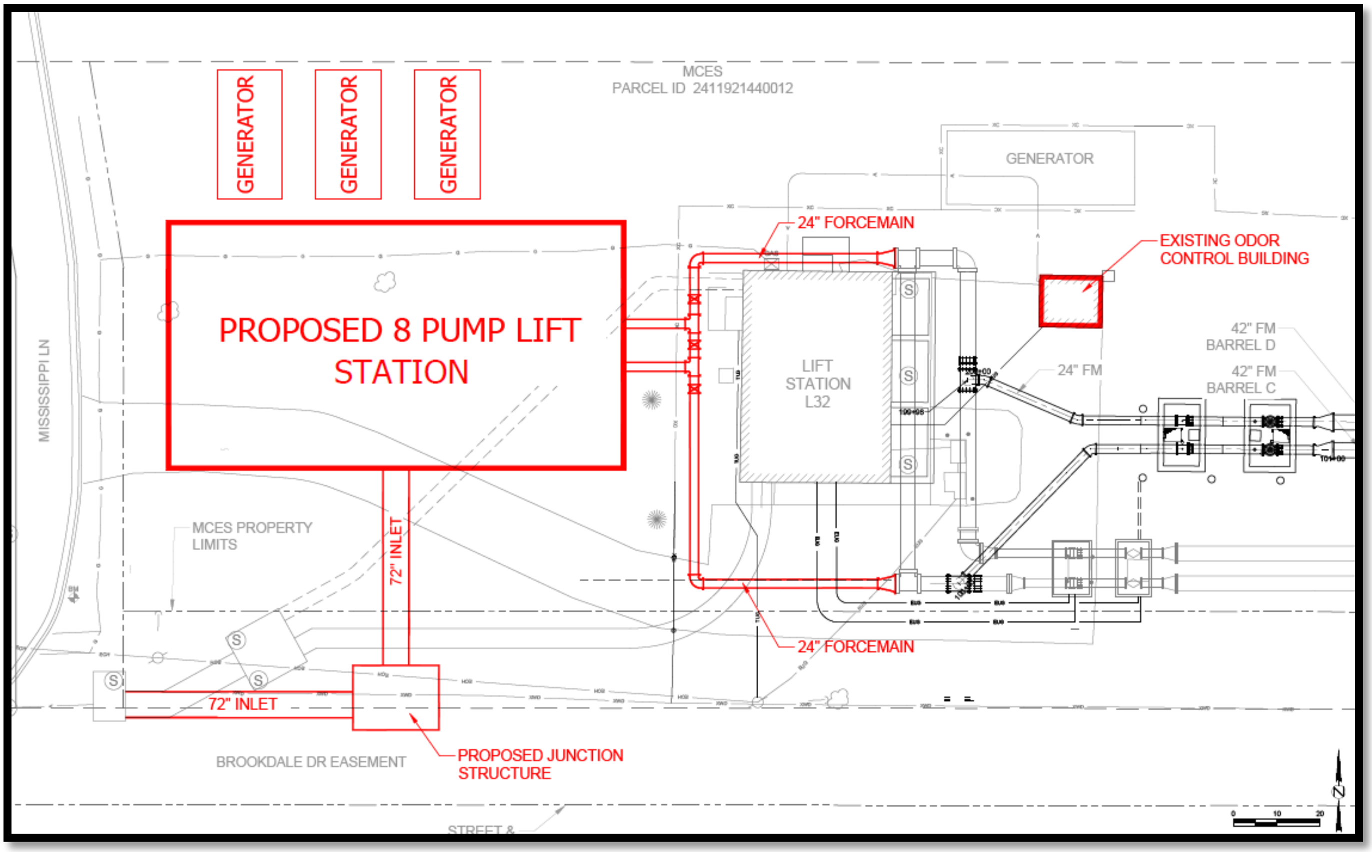

Figure 6 – Site Plan for Alternative 2: New Lift Station on West Side of River

The site plan shows confirms that if a new lift station is constructed while keeping the existing lift station in service, the existing site will be too small and will not be able to fit the new lift station without impacting the neighboring property or the street. Additional property purchase will be required.

Spill Prevention

As discussed earlier in this facility plan, the two new smaller submersible lift stations need to be constructed to reduce the chances of back-ups into basements and to increase the response time in the upstream pipe. In addition, the independent pump system should be installed to increase additional response time along with adding all the other resiliency factors inside the new lift station including split wet well, redundant pump system, automatic bar-screen and grinders, back-up generators, etc.

Odor Control System Upgrades

The existing equipment recently installed on the west side of the river has capacity for the existing flows as well as the ultimate peak wet weather flows projected. However, upgrades to the existing odor control system might be required in the future. The odor control upgrades that will be required include the following:

1. Reconfiguring the Existing Radial Carbon Unit
2. Installing new odor control ductwork to the siphon structure
3. Further investigation into odor issues that may result in additional modifications

Due to the potential presence of mercaptans and other reduced sulfide compounds in addition to the hydrogen sulfide in the existing sewer flow, more analysis will be required to determine if additional chemical addition or secondary treatment is necessary.

Preliminary Estimated Project Cost for Alternative 2

The preliminary estimated cost of project based on above discussion is shown in Table 6 below for Alternative 2.

Table 6 – Estimated Project Cost for Alternative 2

Sr. No.	Description	Cost
1	New pump station	$19,200,000
2	Addition of 2 new smaller submersible pump station	$1,560,000
3	Dedicated pumps at lift station	$1,800,000
4	Odor control upgrades	$240,000
5	Property Acquisition + Temporary easements	$960,000
	Subtotal	$23,760,000
	22% Engineering and Administration	$5,227,200
	30% Construction Contingency	$7,128,000
	Total Project Cost (in 2020-dollar amount)	$36,115,200

Limitations for Alternative 2

- To construct a new lift station while keeping the existing one in operation, additional property acquisition is required. Even with the purchase of additional property, due to proximity of the river, the site would be too tight with all the buffer and space requirement for a lift station.

- There is not enough room for all of the necessary construction activities onsite and therefore, relatively large temporary easements will be necessary and/or staging at a location nearby or offsite will be required. This will be on top of acquiring additional property.
- Considering the location of the lift station close to Mississippi River and depth of the lift station, the excavations will be relatively deep and may require caisson construction. Additional sheeting may be required to protect neighboring properties and the street.
- Due to residential proximity, screening is important for the lift station sites. Screening the lift station may not be possible due to space constraints at this location.

Alternative 3 – New Lift Station on East Side of River

The flow from the existing lift station L32 is pumped through a forcemain under the Mississippi River, and discharges into interceptor 4-NS-521 in Fridley. Along the way, it passes through an interconnection structure that is located on the south side of a 22-acre MCES property on 6900 E River Road.

In 2014, when MCES was planning the river crossing improvements, the Girl Scouts of Minnesota and Wisconsin River Valleys approached MCES with an offer to sell this property. The Metropolitan Council purchased this 22-acre property in 2016 with the intention of expanding the facility for future growth and rebuilding the new larger lift station on this site to avoid challenging site constraints on the west side of the river.

This alternative assumes a new lift station will be constructed on the east side of the Mississippi River in Fridley where there is ample space available for the construction of a larger lift station. The new lift station could be constructed while keeping the existing lift station in operation. The proposed new lift station L32A will be nearly completed prior to beginning demolition and construction activities on the west bank site of the existing L32 lift station. All four existing river crossing forcemain pipes will be utilized to maintain continuous flow of sewage through the system during and after construction. The proposed new system configuration is described in the sections below as East Side Facilities and West Side Facilities.

East Side Facilities

The proposed new lift station will be constructed on the south side of the property in Fridley, north of the existing forcemain pipes and interconnection structure. The building can be isolated from the neighbors with vegetation and/or fencing. Figure 7 below shows the site plan for the facilities on the East Side of river.

The following facilities will be constructed on the East Side:

- A pump station capable of handling 67 MGD future ultimate peak flow
- New odor control system
- Flow metering station

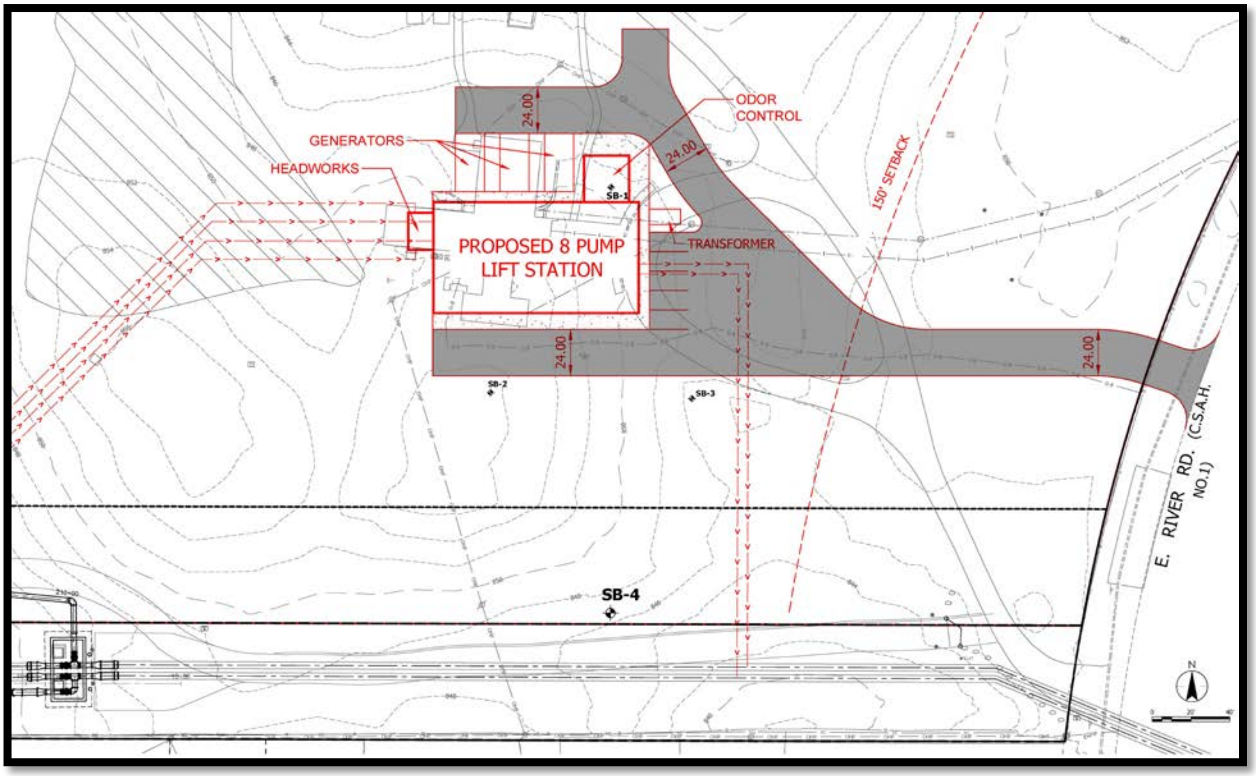

Figure 7 – Site Plan for Alternative 3 - East Side Facilities

<u>Pump Station</u>

A hydraulic model was created to design the pump station. Two lift stations shapes were analyzed to determine the footprints of the lift station consisting of a 6 and 8 pump rectangular lift station and a 6 and 8 pump circular self-cleaning style lift station. Detailed analyses on selecting the shape and the number of pumps to be used should be conducted during the design of the lift station. For a station of this size, variable frequency drives are recommended for pump starting and maintaining uniform pumping rates throughout the system.

The close proximity of the proposed lift station site to the Mississippi River, combined with the depth of the structures, presents significant challenges to the construction of the lift station. As described in the geotechnical report attached in Appendix B, due to the significant excavation depths required for the lift station, open cut excavation may not be feasible. Given the size and depth of the structures, open caisson construction methods may be possible in a dewatered condition. The construction method to be used should be evaluated during the design.

For the caisson construction, a circular shape foundation will be better suited for the depth of the lift station. It is assumed that there will be circular shape foundation with rectangular building on top as shown on the site plan above. More research and detailed analysis need to be completed to determine the final shape and size of the lift station.

For the sizing and cost estimate purpose, a circular foundation lift station with 8 pumps (with 6 pumps operating at the firm capacity) is used.

The new pump station will include the independent pump system to increase additional response time. Other resiliency factors including a split wet well, redundant pump system, automatic bar-screen and grinders, and back-up generators will also be added to reduce spills due to failures at the lift station.

Odor Control System

With the new lift station constructed on the East Side, a local odor control system will be necessary at the new lift station to provide safe worker access to areas exposed to odorous air as well as to prevent corrosion inside the lift station. Local odor control will also be necessary for structures immediately downstream of the inverted siphons. Installing odor control measures will help to prevent odors from escaping and causing odor complaints in the surrounding neighborhood.

The odor control technology to use depends on the compounds that need to be treated and the environmental conditions of the air flow to be treated. Based on the chemical compounds currently found in the air flow on the West Side, hydrogen sulfide is the main odor compound. Vapor and liquid phase treatment similar to the existing odor control on the West Side may be the most effective way of odor control under these circumstances. Based on the current air flow samples, the odor control facility with an air flow rate of 15,000 cfm minimum will be required.

The air flow sample on the west side of the river also shows the potential presence of mercaptans and other reduced sulfide compounds in the sewage at very low rates. More sampling and analysis would be required to determine if any secondary odor control be required in addition to vapor phase technology. The actual size of the odor control and selection of the treatment technology required will be determined during design after more sampling and analysis are performed.

Flow Metering Station

The existing electromagnetic sewage flow meters on the west bank should be relocated to the proposed new lift station on the east bank. Temporary meters could be installed upstream during the transition period.

West Side Facilities

With the new lift station construction on the East Side, the existing lift station will be demolished, however, some facilities will remain on the West Side. The West Side facilities include:

- Two new small submersible lift stations at locations west of the site
- Control building
- Siphon entrance structure (headhouse)
- Odor and corrosion control systems

Figure 8 below shows a site plan for the system that will remains on the West Side when the lift station is moved to the East Side in Fridley.

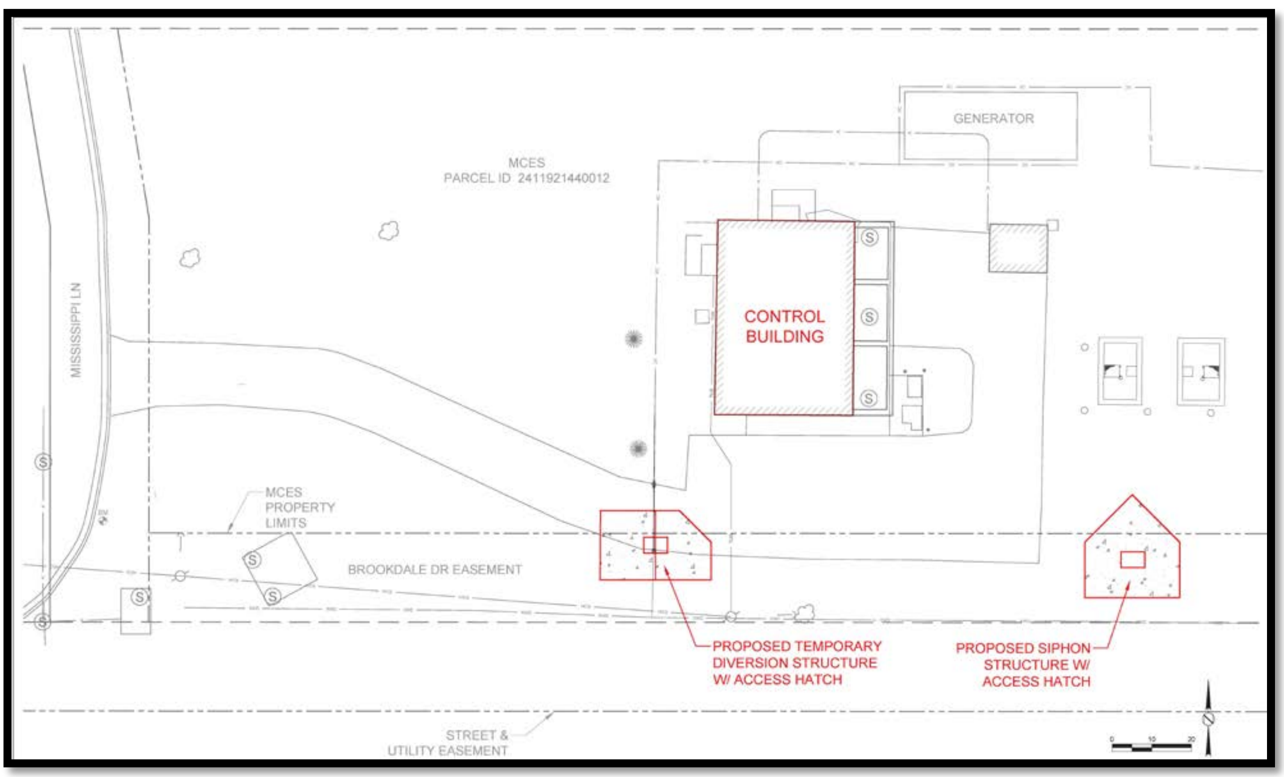

Figure 8 – Site Plan for Alternative 3 - West Side Facilities

Spill Prevention

As discussed earlier in this report, construction of two new smaller submersible lift stations is recommended to reduce the risk of back-ups into basements and to increase the response time in the upstream pipe. Two new smaller lift station will be constructed on the West Side.

Other spill prevention resiliency items will be added to the new lift station on the East side as discussed earlier.

Siphon Structure

When the new lift station is constructed on the East Side of river, the forcemain pipes will be converted to inverted siphons. The West Side Facility in Brooklyn Park will include a new siphon headbox to direct flow to the lead and lag barrels of the forcemain pipes. The siphon headbox will deliver flow to the existing forcemain pipes where they currently turn east from the discharge header on the East Side of the station. The four siphon forcemain pipes will all discharge at the new lift station. The two forcemain barrels on the east side of the river will be reconnected to the new station and will continue to direct flow to interceptor 4-NS-521. Figure 8 below shows the river crossing.

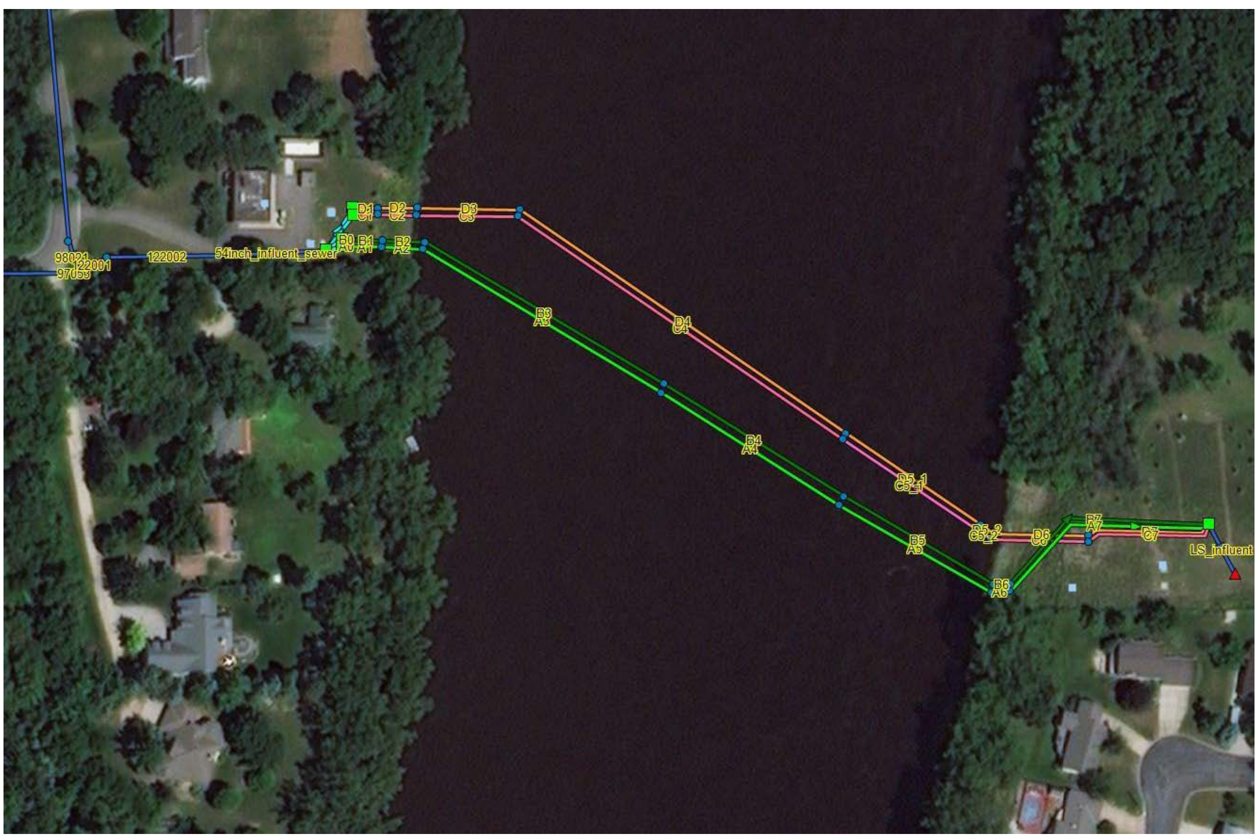

Figure 9 – Forcemain Pipes at the River Crossing

Hydraulic modelling was completed for the forcemain pipes under the river using various combinations of pipes and using reduced size forcemain for the two older pipes (Barrels A and B, see section above for more information). The results of the models show that the 67 MGD capacity can be obtained with several operating conditions and by reducing the old forcemain pipe size to 24-inches. More detailed analysis should be conducted when the inverted siphon system is designed. The model results are attached in Appendix A of this report.

<u>Odor Control System</u>

Odor control systems will be required on the west side of the river and on the east side of the river. The inverted siphon headbox on the west side of the river will create an air dam. Air flow to relieve pressure in the air space in the sewer on the west side of the river upstream of the inverted siphon will require treatment.

The existing odor control system recently installed on the west side of the river has capacity for existing flows and the ultimate peak wet weather flows projected. The existing system will stay in place and continue providing odor control on the West Side. Once the siphon structure is designed and further investigation into odor issues takes place, additional modifications might be required to the existing system.

The air flow sample on the west side of the river also shows the potential presence of mercaptans and other reduced sulfide compounds in the sewage at very low rates. More sampling and analysis would be required to determine if any secondary odor control be required in addition to vapor phase technology currently in place.

Preliminary Estimated Project Cost for Alternative 3

The preliminary estimated cost of project based on the discussion above is shown in Table 7 below for Alternative 3 both for East and West Side Facilities.

Table 7 – Estimated Project Cost for Alternative 3

Sr. No.	Description	Cost
1	New pump station (8-pump circular foundation)	$20,400,000
2	Addition of 2 new smaller submersible pump station	$1,560,000
3	Dedicated pumps at lift station	$1,800,000
4	New odor control system on East Side	$360,000

5	Flow metering	$36,000
6	Siphon system	$6,900,000
7	Odor control system modification on West side	$120,000
8	River Crossing forcemain pipe rehab	$2,400,000
	Subtotal	$33,576,000
	22% Engineering and Administration	$7,386,720
	30% Construction Contingency	$10,072,800
	Total Project Cost (in 2020-dollar amount)	$51,035,520

Limitations of Alternative 3

Construction Challenges

The close proximity of the proposed lift station site to the Mississippi River, combined with the depth of the structures, present challenges to the construction of the lift station. As described in the geotechnical report attached in Appendix B, due to the significant excavation depths required for the lift station, open cut excavation may not be possible. Given the size and depth of the structures, open caisson construction may be employed in a dewatered condition. The construction method to be used should be evaluated in depth during the design.

Higher construction cost

The estimated construction cost is much higher than Alternative 2.

Comparison of Alternatives

Table 8 below compares and summarizes three alternatives discussed in this Facility Plan.

Table 8 – Comparison Summary for Three Alternatives Discussed in the Report

Criteria	Alternative 1 - Do Nothing	Alternative 2 – New Lift Station on West Side of River	Alternative 3 - New Lift Station on East Side of River
Community Impacts	Higher impacts. Continued lift station deterioration could cause sewer backups and might flood basements of the nearby homeowners. This would negatively impact homeowners, and other community assets. Future community needs will not be met.	High community impacts due to extensive construction work required. Additional land will be required to construct new facilities while still maintaining the flow through the existing lift station. There will be large impacts to the streets and nearby properties during construction. Community on Mississippi Ln and Brookdale Dr will be impacted again after current interceptor reconstruction project. Adequate screening of the facility from its neighbors may not be possible.	Less community impacts compared to Alternative 2 as construction would be contained within the existing Met Council property. Adequate screening of the facility from its neighbors will be feasible.
Capacity Needs	Will not meet future capacity needs of the community.	Will meet the future capacity needs of the community.	Will meet the future capacity needs of the community.
Constructability and Ease of Integration	No construction impacts on the site but challenges with the potential for basement surcharging and lack of ultimate future capacity would exist. Some construction will still be required to build the two smaller lift station upstream of the lift station.	The existing site is small and would not be able to facilitate construction without getting additional temporary construction easements and another property acquisition. Even with additional property acquisition, the site will be small for the size of the lift station. Adequate screening of the facility from its neighbors may not be possible due to space limitations.	The site is large and therefore would be able to facilitate construction within the existing property. No additional easements required.
Operability	Lack of future ultimate capacity would still exist and would still have concerns with aging infrastructure. Operation and maintenance cost will keep going up as facility ages and will eventually lead to failure.	Improved operations and meet the future ultimate capacity needs of the community.	Improved operations and meet the future ultimate capacity needs of the community.

Criteria	Alternative 1 - Do Nothing	Alternative 2 – New Lift Station on West Side of River	Alternative 3 - New Lift Station on East Side of River
Sustainability	Challenges with flooding and lack of ultimate flow capacity would still exist.	New LS would meet all the requirements including high energy efficiency and reduced energy costs.	New LS would meet all the requirements including high energy efficiency and reduced energy costs. This alternative will allow for more sustainable lift station with better use through the years due to additional space available on the site.
Costs			
Capital (Total Project)	N/A	High	Highest
O & M	Since the lift station will be continue aging, the O&M cost keep increasing over the period of time and will be highest then other Alternatives.	Lift station will be constructed new and with better technologies, it is assumed that the O&M cost will be similar to Alternative 3.	Lift station will be constructed new and with better technologies, it is assumed that the O&M cost will be similar to Alternative 2.
Life Cycle	It is not possible to estimate costs due to the unknown impacts of doing nothing. Likely this alternative would be higher because it delays dealing with problems, leading to higher operation and maintenance costs, and increased emergency repairs.	Life cycle will be similar to Alternative 3.	Life cycle will be similar to Alternative 2.
Recommendations	**Not recommended**	**Not a preferable option due to space limitations and proximity to the neighboring properties.**	**Recommended and preferable option.**

Recommendations

The existing site for L32 in Brooklyn Park is not large enough to make all the upgrades to meet future flow and response time needs. In order to meet all the requirements, a new larger building will be required to construct. It would be challenging to construct a new larger lift station on the existing property while keeping the existing lift station running due to space constraints. Additional property next to the lift station site will need to be purchased.

MCES already purchased a 22-acre property on the east side of the river in Fridley (which was formerly known as Girl Scout Camp Lockeslea) due to a willing seller in 2016. This site is large enough to build a new lift station with a 67 MGD ultimate peak capacity and response time requirements, odor control system and other related structures to meet the future need of the service area and have less construction impacts due to all construction activities will be mostly constraints inside the property.

Due to limited space available on the existing lift station property; constraints with the construction methods; proximity to the neighboring property and the street; and, the need to purchase additional property (which is not for sale currently), MCES recommends Alternative 3 to construct a new lift station on the east side of the Mississippi River on MCES owned property. The new lift station will be able to meet the future community flow needs and will be constructed to meet MCES standards of resiliency and required response time. With Alternative 3, most of the construction activities will be contained within the existing MCES owned property reducing the community impacts during construction. This site will provide more room for the new larger lift station, allow adequate screening of the facility from its neighbors, and provide a sustainable long-term solution for conveying wastewater in the region.

Since the ultimate capacity is 30-40 years in the future, it is recommended that the lift station structure be constructed to meet the ultimate capacity of 67 MGD, however the pumps, mechanical and electrical equipment which has life of about 20 years be designed to meet an interim capacity. The lift station equipment should be upgraded in the future as capacity increases. This will ensure the lift station is not oversized right now and it is still feasible to increase the capacity in the future when required with minimal construction impacts.

Environmental Review

This section addresses the recommended Alternative 3 where it is assumed a new lift station will be constructed on the east side of the Mississippi River in Fridley on MCES property. Environmental impacts on site in Fridley are discussed in this section.

Wetland Delineation

Wetland determination and delineation was performed for the Camp Lockeslea site to identify the extent and spatial arrangement of wetlands and waterways within the property. Two wetland areas and four streams were identified on the property. The report of the findings was submitted to the Local Governmental Unit (LGU), Coon Creek Watershed District and U.S. Army Corps of Engineers (USACE) for approval. The wetland delineation report was approved in April 2019 for the wetland boundaries and types shown on the report. The report is attached in Appendix C of this Facility Plan under EAW report.

The new facilities and all construction activities will be outside the wetland boundaries identified.

Archeological and Historic Sites

Archeological Phase I was completed on the site in Fridley to determine whether the study area contained any archeological sites. Phase I investigation identified one precontact site (21AN0185) and therefore Phase II assessment was completed by 106 Group to determine whether 21AN0185 was eligible for listing in the National Register of Historic Places (NRHP). Phase II investigations recommends site 21AN0185 not eligible for listing in the NRHP. 106 Group recommends no further archeological work required.

The Minnesota Historical Society State Historic Preservation Office (SHPO) will be contacted regarding the report prepared by 106 Group and for their recommendations and the response received from SHPO will be documented. Refer to EAW attached in Appendix C for more information on archeological and historic sites.

Environmental Assessment Worksheet (EAW)

Since we are expanding the lift station (which is a part of a collection system) above 2 MGD threshold, a mandatory EAW was prepared to review project’s potential environmental effects on the site and ways to avoid or minimize them. A copy of the EAW is attached in Appendix C of this Facility Plan.

Project Delivery Schedule

The recommendation is to plan for the design of the new lift station on the east side of the Mississippi River in Fridley. The new lift station should be constructed to meet the future area needs and will be a part of MCES's multiphase approach to preserve and improve wastewater assets in the Fridley area. The new lift station will be constructed to meet MCES and industry standards.

Proposed Lift Station L32A in Fridley is programmed as a six year project, with the planning phase occured in 2020 and design beginning in 2021. Construction is anticipated to start in 2023 and be completed by 2026. The new lift station is anticipated to be in operation by end of 2026.

The draft Facility Plan was made available for public review in early December 2020, and a public hearing was conducted on December 17, 2020. Following the public hearing, all the comments were incorporated into report and the copy of the public hearing record including the summary of the public hearing, powerpoint slides for the presentation, any comments received during the public review period and other items related to the public hearing process are all attached in Appendix D of this report. The plan was reviewed and adopted by the Metropolitan Council in February 2021 before it was submitted to the MPCA for review in conjunction with an application for placement on the Project Priority List for funding through the Clean Water Revolving Loan Fund beginning in fiscal year 2022. The Council resolution for the adoption of the Facility Plan is included in Appendix E of this report.

Appendix

Appendix A

Facility Plan Support Documents

L-32 Lift Station – Phase 2

Facility Plan Support

Prepared for:

Metropolitan Council Environmental Services MCES

Prepared by:

Stantec Consulting Ltd.

November 2020

This document entitled L-32 Lift Station – Phase 2 was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of MCES (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by Daryl Kirschenman
(signature)

Daryl Kirschenman

Reviewed by Mark R. Rolfs
(signature)

Mark Rolfs

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LIST OF APPENDICES

L-32 Facility Plan Support Introduction

Stantec has completed various phases of the Phase 2, L-32 Lift Station facility Plan Support proposal. A summary of the work completed to date and key findings from each work task is provided below. Additional detail information about various tasks can be found in the Appendix as independent reports and task memos. The Archeological investigation and EAW are ongoing activities. Separate documents will be prepared for the Archeological investigation and the EAW.

For the purposes of the facility plan support, the following assumptions and tasks have been reviewed.

- Current flows at L-32 range from 11,300 gpm to 25,000 gpm (16.28 mgd to 36.11 mgd) based on 2018 and 2019 meter information. The current peak flow factor was 2.2 in 2018 and 2.1 in 2019.
- The existing lift station pumps have been modeled hydraulically. Utilizing 5 pumps and one forcemain, L-32 currently has a capacity of 37.0 MGD. The existing lift station is currently at capacity if only one forcemain is considered. The original two 42-inch DIP barrels are not utilized in this analysis. If two forcemains are operational the existing lift station has a theoretical capacity of 50.1 MGD if the pumps used the full-size impellers. Actual total capacity is 30,200 gpm for a current firm capacity of 43.5 MGD. The existing pumps may have had impellers trimmed based on information received from MCES.

  Replacing the existing pumps with 150 Hp. or 200 hp pumps to meet the revised design flow has been previously reviewed as a west side option.
- MCES has project the ultimate Peak Wet Weather Flow is currently projected to be 46,500 gpm or 67 mgd. This exceeds the firm capacity of the station by approximately 30 MGD. Firm capacity is defined as one forcemain out of service and one pump out of service.
- Four barrels cross the river. Barrels A and B are the original 42-inch barrels are to be re-sized by CIPP lining or other methods. Barrels C and D are newer 42-inch HDPE, DR-17 and were installed in 2015. Siphon hydraulics have been verified.
- Preliminary Report Drawings identifying project schematic design concepts.
- A site survey and tree survey have been completed.
- The lift station is to be re-located on the East Side of the Mississippi River based on limited space on the west side of the river.
- Pump Hydraulics have been reviewed for a six pump or eight pump station.
- Storage Options on East and West side of river have been reviewed.
- Downstream Sanitary Sewer capacity has been reviewed.
- Future flow metering is to be completed utilizing 24-inch Mag Meters on the East Side of the River, to allow the upstream gravity system to surcharge. Parshall Flumes on the West side of the River are not feasible as part of the siphon headworks design. Parshall flumes on the West side

of the river at design capacity would require an 84-inch flume throat and limit the capacity of the proposed siphon system.

- Prepare an Environmental Assessment for this site.
- Prepare an Archeological phase 1 and phase 2 investigation for this site.

1.0 L-32 LIFT STATION FACILITY PLAN SUPPORT – PHASE 2

1.1 PRELIMINARY REPORT DRAWINGS

Stantec has completed preliminary report drawings to review modifications on the East and West side of the River. Report drawings have been prepared to facilitate discussions with staff and may be incorporated into the facility plan as needed. Preliminary report drawings as listed below are attached as Appendix A.

Figure C1: Vicinity & Location Map.

Figure C2: Overall Site Plan.

Figure C3A: Site Plan – West Side.

Figure C3B: Site Plan – West Side Storage Tank.

Figure C3C: Site Plan – West Side – Above Grade Plan.

Figure C3E: Site Plan – West Side - Above Grade Plan – Larger Text.

Figure C4: Existing Conditions – East Side - with Wetland delineation and Archeological study area.

Figure C5: Soil Boring Plan & Profile - barrels C and D.

Figure C6: West Side Plan & Profile.

Figure C7: East Side Plan & Profile and Profile Record Plan.

Figure C8: East Side Lift Station - Option A, 6 pump rectangular lift station.

Figure C9: East Side Lift Station - Option B, 6 pump circular self-clean style lift station.

Figure C10: East Side Lift Station - Option C, 8 pump rectangular lift station.

Figure C10A: East Side Lift Station - Option C, above grade plan.

Figure C10B: East Side Lift Station - Option C, above grade plan.

Figure C10C: East Side Lift Station - Option C Profile.

Figure C10D: East Side Lift Station - Option C Profile.

Figure C10E: East Side Site Plan – Option C – Larger Text.

Figure C11: East Side Lift Station - Option D, 8 pump circular self-clean style lift station.

Figure LS1: Option A, 6 pump rectangular plan.

Figure LS2: Option A, 6 pump rectangular section

Figure LS3: Option B, 6 pump circular plan.

Figure LS4: Option B, 6 pump circular section.

Figure LS5: Option C, 8 pump rectangular plan.

Figure LS6: Option C, 8 pump rectangular section.

Figure LS7: Option D, 8 pump circular plan.

Figure LS8: Option D, 8 pump circular plan.

Figure LS9: Option E, 8 pump plan with 2 hydraulic pumps.

Figure LS10: Option E, 8 pump plan with 2 hydraulic pumps.

Preliminary site drawings identify the proposed headworks structure locations, proposed piping alignments, along with lift station locations on the east side of river.

1.2 SITE SURVEY

Stantec has completed a topographical site survey. Existing utilities were located and incorporated into the site survey. The topo information is included on Figure C-4. This detail survey was completed for the southern 14 acres of the 22-acre site. Stantec had previously completed a wet land delineation. The wet land delineation is included on plan sheet C-4. CAD files of the survey information are available upon request.

1.3 TREE SURVEY

Stantec has completed a tree survey for the site. A detailed list of trees and tree symbols has been included. The Tree survey is included as report Figure T-1 through T-5. T-1 identifies all 14 acres. Sheets T2 through T-5 subdivides the site into quarter to make the tree identification numbers more legible. The tree survey results are included in Appendix I. Each tree is identified by common name, species, diameter at breast height (4.5 feet), condition, latitude, and longitude.

1.4 SIPHON HYDRAULIC ANALYSIS

Stantec has completed a model of the four - barrel siphon system.

The results of the models show that the 67 MGD capacity can be obtained with several operating options and based on various combinations of operating weir levels. The capacity of siphons can reach 75 MGD at full capacity with one 42-inch barrel out of service. The existing model can be adjusted based on the final headworks structure design. Weirs may be modified by length and elevation to modify flows and control the flushing velocities through the four- barrel system.

The Siphon model and results are included in Appendix B consisting of the following information. Additional models can be run for surcharging upstream pipes and lowering inverts on the east side of the river. Final invert elevations will be reviewed during design.

Figure 0 Model overview.

Figure 1 Configuration summary.

Figure 2 Hydraulic Grade line summary Option 1A, Barrel A & B.

Figure 3 Hydraulic Grade line summary Option 1A, Barrel C & D.

Figure 4 Siphon Velocity Curve Option 1A.

Figure 5 Hydraulic Profile-Option 1B.

Figure 6 Hydraulic Profile Option 2, Barrels C & D.

Figure 7 Velocity Curve-Option 1B.

Figure 8 Hydraulic Profile, Option 2, Barrels C & D.

Figure 9 Hydraulic Profile, Option 2, Barrels C & D.

Figure 10 Siphon Velocity Curve-Option 2.

Figure 11 Hydraulic Profile Option 3, Barrels A & B.

Figure 12 Hydraulic Profile Option 3, Barrels C & D.

Figure 13 Velocity curve- Option 3.

Figure 14 Hydraulic Profile Option 4, Barrels A & B.

Figure 15 Hydraulic Profile Option 4, Barrels C & D.

Figure 16 Velocity Curve Option 4.

Figure 17 Hydraulic Profile Option 5 Barrels A & B.

Figure 18 Hydraulic profile Option 5, Barrels C & D.

Figure 19 Velocity Curve Option 5.

1.5 RIVER CROSSING

The original forcemain barrels A and B were constructed in 1970 and consist of two 42 inch DIP installed across the Mississippi river. Due the age of these barrels and the need to maintain a flushing velocity in the siphon system. It is proposed that both barrels A and B, be reduced to 30 inch inside diameter from 42 inch.

The record plans indicate that the existing pipe were installed with 5 feet of cover over the existing pipes. As part of the lift station design, the bottom of the river elevation needs to be verified to make sure this is still true. If the River bottom matches the original profile and five feet of cover still exits, there is adequate cover on the pipes and the pipes will not float when dewatered for installation of a reduced diameter system.

Several alternatives have been reviewed for the reduction in pipe diameters to 30 inches. The portion of forcemain to be reduced under the river consists of approximately 830 feet of pipe. This will require the pipes to be dewatered, all sediments removed, and the pipes to be televised to confirm the conditions of the existing pipes.

Option No. 1 was to install a CIPP lining. We found no suppliers willing to reduce the size from 42 inch to 30 inch. Another sub option was to reduce in multiple linings, from 42 inch to 39 inch to 36 inch to 33 inch to 30 inch. This option is also not feasible, and suppliers have not previously attempted this method of reduction and did not recommend this option.

Option No. 2 reviewed consisted of slip lining a fusible PVC pipe through the existing 42 inch pipes, the problem with this option is the 45 degree bends. The fusible PVC pipe is too stiff and will not make the radius required to fit through the bends.

Option No. 3 reviewed consisted of HDPE slip lining. The minimum bending radius for HDPE is 40 Diameters, so this option will also not work through a 45 degree bend.

Option No. 4 reviewed consisted of fold and form PVC which can be inserted and placed but there is no way to control expansion to ensure adequate wall thickness is maintained. This option is not recommended to the uncertainty of the finished wall thickness.

Option No. 5A and 5B reviewed is a Woven hose. These two sub-options are described below.

5A by Primus Line is a flexible slip lining solution for trenchless rehabilitation of pressure pipelines consisting of a seamless woven fiber (Kevlar). This is an ideal product for this application but is only available in sizes to 20 inches. This option does not achieve the desired diameter.

5B by Aqua Pipe is a woven fiberglass liner impregnated on site with resin and is then pulled in place through the host pipe. The Aqua pipe liner is shaped by pushing a pig through the liner using water pressure and then cured with circulating hot water. (CIPP for pressure applications) a possible candidate technology, but currently is only available up to 24 inch diameters.

Option No. 6 is the installation of a new 30 inch directionally drilled pipe crossing the river. This alternative may be an option to be considered in design but poses risks such as fracking below the river and may possibly add significant time to the project due to permit requirements.

Option No. 7 consists of floating new 30-inch PVC or 30-inch HDPE pipe across the river similar to existing barrels C and D. This option would disturb the bottom and would definitely add significant time to the project due to permit requirements.

Option No. 8. consists of excavating down to the 45-degree bends on the East side of the River. Cut these bends off, and drill from the bank using directional drilling pipe through the horizontal section of the existing pipe and pull back a 30-inch HDPE from the surface, grout the pipe in place and backfill. This option maybe possible if the excavation can be successful down to the 45-degree bends. Draining the pipe and televising to verify bend locations is recommended. Difficult excavation and sheeting at the river's edge may be necessary with this alternative. The cost estimate for the river crossing is currently based on Option 8 but will vary depending on the field verified location of the existing bends. The bend excavation may possibly add significant time to the project due to permit requirements.

Option No. 9. Consists of installing two 24-inch siphon barrels if the existing 45-degree bends are located to close to the river's edge to remove. Weir elevations and inverts would need to be revised to verify final capacity of the 24-inch barrels.

1.6 PUMP HYDRAULIC ANALYSIS EXISTING LIFT STATION EXPANSION

As part of the phase 1 study in 2019, Stantec had previously reviewed the existing lift station capacity.

The site on the west side of the River is extremely congested with existing piping and construction of a new lift station on this site is not possible. The expansion of the lift station capacity is reviewed based on replacing existing pumps and controls within the existing building.

The phase one study reviewed replacing the six existing 100 Hp pump with six 150 Hp pumps. The results indicated that with five pumps and two forcemains available, the existing lift station capacity can be increased to 64 MGD. This is short of the desired design flow of 67 MGD. The results below are based on Aurora model 16x16x20, 150 HP, 900 rpm, with an 18.8125-inch impeller.

Table 1 – Proposed Future Pump Results

Pump Condition	Pump Flow	Pump Head	Station Total
One Pump, One FM	10,935 gpm	43.9 ft	15.7 MGD
Two Pumps, One FM	9,635 gpm	50.4 ft	27.7 MGD
Three Pumps, One FM	8,200 gpm	56.2 ft	35.4 MGD
Five Pumps, One FM	1,2,3: 4,930 gpm 4 & 6: 6,750 gpm	64.7 ft 60.8 ft	40.6 MGD
Five Pumps, Two FMs	1,2,3: 8,860 gpm 4 & 6: 8,940 gpm	53.7 ft 53.4 ft	64.0 MGD

To meet the design flow of 67 MGD, the existing pumps will need to be replaced with six 200 HP. pumps.

To facilitate construction and installation of the new pumps, it is proposed that the floor of the motor room be modified, the existing pump bases be removed and a new opening be created to allow each pump to be installed from a vertical position. The new opening required at each pump location would consist of a 54” x 54” hatch or curb with removable grating. A new hatch through the main level floor and roof would also be required to facilitate pump removal and installation.

A detailed design could investigate a combination of the following modifications to the existing lift Station and forcemain to reduce the total dynamic head for this lift station modification.

- Investigate other pump models, horsepower, and pump speeds.
- Investigate opening three barrels under the river to serve as forcemains to reduce headloss and increase capacity. Using three forcemains would be more comparable to the proposed East side lift station which requires three barrels to function properly. The primary difference would be that that under this case, the pipes would be under forcemain pressure, whereas for the East Side Option they are only under siphon head pressure.
- Investigate replacing the existing 24-inch forcemains with 30-inch forcemains to reduce headloss and increase capacity.
- Model the existing lift station with six pumps running and three forcemains open. Install a smaller twenty-minute response tank which consists of a gravity in, pump out design. The pumps could be sized to provide firm capacity for this lift station.

1.7 PUMP HYDRAULIC ANALYSIS EAST

Stantec has completed a new hydraulic model of a 6 and 8 pump lift station to be located on the East side of the river. Hydraulics were based on five pumps, six and seven pumps operational to provide firm capacity with one pump out of service for each review. Two styles of lift stations have been evaluated based on a rectangular layout and circular lift station design. The style of lift station did not affect the hydraulic pump performance, only the number of active pumps.

The basis of the Pump Model elevations and layout are shown in the report figures Appendix A.

- A 6 pump station, (5 active pumps), Design condition = 9306 gpm @ 60.8 feet. Based on 80 percent Eff. = 179 HP. Preliminary review of pump selections indicate that a six pump station will require six 200 Hp. pumps. A single pump operating of this size will produce 10,808 gpm @ 51.6 feet TDH.
- An 8 pump station, (7 active Pumps), Design Condition = 6647 gpm @ 54.7 feet. Based on 80 percent Eff= 115 Hp. Preliminary review of pump selections indicate that an eight pump station will require eight 150 Hp. pumps. A single pump operating of this size will produce 8,265 gpm @ 44.4 feet TDH.
- An 8 pump station, (6 active Pumps), Design Condition = 7,755 gpm @ 57.0 feet. Based on 80 percent Eff = 140 Hp. Preliminary review of pump selections indicate that an eight pump station will require eight 150 Hp. pumps. A single pump operating of this size will produce 8,265 gpm @ 44.4 feet TDH.
- Detail design, pump selection and pipe sizing would be conducted during a final design.
- For a station of this size, Variable Frequency Drives, are recommended for pump starting and maintaining uniform pumping rates throughout the system.

Based on these initial calculations, several pump selections have been made using Cornell pumps. Pumps were selected with 900 RPM motor Initial pump selections are included in Appendix C. The cost estimates have been based on 900 RPM motors.

In addition to the primary 6 or 8 pumps to be installed in the lift station, supplemental hydraulic pumps were reviewed which could be installed in a circular storage tank or lift station to supplement pumping in the event of a station failure. Mixed flow or hydraulic pumps were added to Report figure LS 9 and LS10. Information on mixed flow and hydraulic pumps has been included at the end of Appendix C. Two back up pumps with 12,500 gpm at 56 ft. TDH capacity is equivalent to 1.5 MG of storage in a 60 minute time frame. Two by-pass pumps would provide another layer of redundancy and eliminate or reduce the need for an additional storage tank.

1.8 ODOR CONTROL ANALYSIS

Stantec has reviewed the existing odor control equipment and has provided recommendations for the existing and proposed equipment required to be incorporated as part of the New L-32 project.

The existing equipment recently installed on the west side of the river has capacity for existing flows and the ultimate peak wet weather flows projected. However, upgrades up-grades to the existing West River odor control will be required.

Localized odor control for the new lift station on the East side of the river will be required for the new wet well.

A summary of the odor control review has been added as Appendix D.

1.9 DOWNSTREAM SANITARY SEWER CAPACITY

Stantec has completed a model to analyze the capacity of the gravity sewer at the downstream discharge from L-32. The capacity study assumed future L-32 to design flow of 67 MGD downstream of L-32. Two storm events were reviewed from May 2017 and March 2019. Information from Meters M201, M202, M203, M214 and M215 were analyzed. These flows were then increased by 20 percent and 50 percent to review hydraulics of existing piping system.

The models assumed no additional infiltration into the system, not recorded in previous storm events. No downstream constraints and Arch pipe dimensions based on standard pipe dimensions.

The model results indicate that the interceptor has sufficient capacity for all scenarios analyzed. If there is any evidence of surcharging in the system, it is due to a partially obstructed pipe or sediment within the existing pipes. Cleaning of the existing gravity system might be necessary in the future if a blockage is observed, but, the replacement of the downstream piping should not be required from a capacity perspective.

Appendix E includes the following information related to the downstream capacity.

Figure No. 1 Downstream L-32 Interceptor Analysis.

Lift Station downsteam capacity analysis.

List of downsteam pipes in the study area.

1.10 UPSTREAM SANITARY SEWER CAPACITY

Stantec has utilized the upstream pipe modeling information to verify the storage capacity upstream of existing L-32. The current critical basement elevations are approximately 825 and are located on Mississippi Lane South of Brookdale Boulevard.

The following potential upstream storage volumes are available based on a Peak Incoming flow rate of 67 MGD.

- Elevation 825 provides 1.1 MG available storage which is equivalent to 24 Minutes storage.
- Elevation 826 provides 1.68 MG available storage which is equivalent to 36 minutes of storage.
- Elevation 827 provides 2.29 MG available storage which is equivalent to 49 minutes of storage.

The following potential upstream storage volumes are available based on a current peak Incoming flow rate of 36 MGD.

- Elevation 825 provides 1.4 MG available storage which is equivalent to 56 minutes storage.
- Elevation 826 provides 1.97 MG available storage which is equivalent to 79 minutes of storage.
- Elevation 827 provides 2.29 MG available storage which is equivalent to 103 minutes of storage.

Appendix F includes the following information related to the upstream storage capacity.

Figure 1 Upstream L-32 interceptor analysis, study area, estimated storage and response times, potential storage current vs. peak, critical basement elevations, critical contours, and surveyed homes and homes to be surveyed, and pipe data.

Storage volumes at elevations above 825 can be achieved by the installation of a duplex submersible lift station on Mississippi Lane south of Brookdale. The approximate location of a Mississippi Lane lift station is shown on the C drawings of Appendix A. A complete survey of upstream houses will be required to make a final determination of possible up-stream storage. If the Mississippi Lane Lift Station is installed, it appears that elevation 826 is the next critical basement.

Other measures to increase the upstream storage may include the installation of check valves in critical upstream laterals or individual service.

1.11 RESPONSE TANK SIZING WEST RIVER

Stantec has reviewed response tank sizing on the west side of the river. A 70-foot diameter tank would fit on the west side adjacent to the existing lift station. Approximate location is shown in Appendix A, figure C3B. Due to limited space required to construct a storage tank on the West Side of the river will be extremely difficult. Soil borings in the proposed location need to be completed for design. The storage tank will need to be built as a caisson with all excavated material removed from site as the excavation proceeds as there is no room to stockpile soils on site. Approximately 8500 cubic yards will need to be excavated as the caisson proceeds.

A 70-foot diameter tank, gravity in and pump out, would provide 20 minutes of storage at a Peak Flow of 67 MGD. If the allowable bounce in the tank is a minimum of 32 feet. A tank with a rim elevation of 830 and bottom tank elevation of 790 will provide for a 20 minute storage tank. Each additional foot of depth would provide an additional 40 seconds of storage.

It is anticipated that two pumps will be installed in the storage tank to pump out the overflow wastewater. Figure C3B, shows a valve vault and a permanent connection to the existing forcemain.

An independent control panel and generator could be installed to provide a redundant pumping system at L-32. Pumping directly into the forcemain system during a flood event will increase response time.

1.12 LIFT STATION AND RESPONSE TANK SIZING AND CONSTRUCTABILITY CHALLENGES EAST RIVER

Stantec has reviewed the two lift station options and multiple size storage tanks diameter to provide one half hour and one hour of storage on the east side of the river. A response tank of 3.0 MG is required to provide a one-hour response time at peak flow. A response tank of 1.5 MG is required to provide one half hour of storage response time on the east site of the river.

The two lift stations shapes consisted or a 6 and 8 pump rectangular lift station and a 6 and 8 pump circular self-cleaning style lift station.

Option A and C Wet Wells: The wet wells on the East side of the river for a six pump rectangular station and 8 pump rectangular station provides approximate 50,000 and 68,000 gallons of storage. These wet wells only provide approximately one minute of storage at a peak flow of 67 MGD, before overflowing into an additional response tank.

Option B and D Wet Wells: The wet wells on the East side of the river for a six pump and 8 pump circular self-cleaning wet wells provides approximate 16,000 and 22,0000 gallons of storage. These wet wells only provide approximately one half minute of storage at a peak flow of 67 MGD, before overflowing into an additional response tank.

Additional response tank for a peak flow of 67 MGD results in a one hour storage requirement of 3 MG. Several 3 MG response tank sizes were evaluated ranging from 100-foot diameter to 200-foot diameter.

Additional response tank for a half peak flow of 33.5 MGD results in a 1.5 MG response tank. Several 1.5 MG response tank diameters were evaluated ranging from 100 foot to 200-foot diameter.

The smaller the diameter of the response tank the deeper the resulting tank. Appendix G has been included to provide initial calculations on tank diameters, excavation, helical pile, and concrete quantities. Additional items required for all tanks include dewatering, submersible pumps to pump out the response tank, a wash down system, fiberglass liner and an aluminum domed roof.

The close proximity of the proposed L-32 site to the Mississippi River, combined with the depth of the structures, present significant challenges to the construction of the lift station and storage tank. In addition, the types and characteristics of the natural site soils add to these challenges, as is described below. These challenges impact the project by increasing the risk of construction-related problems and adding to the overall cost.

Open Caisson Construction

As described in the geotechnical report, due to the significant excavation depths required for the Storage Tank and Lift Station, open cut excavations are not practical, and may not be feasible. Instead, open caisson construction is recommended. The high-permeability soils with high groundwater, at the level of the river, make the “wet method” of caisson construction appear to be preferred.

This method involves constructing the concrete “cutting shoe” and lower level pump station walls above grade, then removing the interior soil, causing the structure to sink. Instead of dewatering the interior, however, the groundwater is allowed to remain at its natural level. This way, the groundwater is equalized between the interior and exterior. Once the groundwater level is reached, the submerged interior soils must be excavated without being able to see them. Removing the perimeter soil, beneath the sloped cutting shoe, is especially difficult without visual guidance.

The caisson can sink only if the weight of the concrete overcomes the combined resistance of the soil bearing pressure beneath the driving shoe and the soil skin friction against the side walls. Sidewall friction can be overcome with lubricants, such as bentonite slurry. The bearing resistance can only be overcome by removing the soil that the driving shoe is sitting on. Knowing where the soil is supporting the shoe is much more difficult if it cannot be seen directly.

The geotechnical report indicated that groundwater was encountered at two elevations: a perched table at approximately elevation 836, sitting on top of the glacial till, and a permanent table, believed hydraulically connected to the river, at approximately elevation 811. It is groundwater at 811 that will likely pose a greater challenge to sinking the caisson.

Once the caisson reaches the terminal elevation, a “plug” of tremie concrete, several feet thick, placed under water, will seal the base. The interior water can then be pumped out and construction can continue the dry interior. However, the high hydrostatic pressures exerted on the bottom face of the unreinforced concrete plug require that the distance between supports cannot be large.

Depending upon the depth, the walls for a rectangular-shaped caisson can span clear interior dimensions of 20’-30’ or more without intermediate support. As the size increases beyond these dimensions, however, the need for support of the straight walls increases quickly. Spreader beams, at the driving shoe level, and often at intermediate heights, are required. These beams, in turn, create more soil bearing area and difficulty for the contractor to excavate soil from around and below the beams.

Circular caissons, due to their inherent compression-ring strength, are better suited for deeper depths and larger interior spans. Without the need for spreader beams, their unencumbered interior spaces can more easily be excavated. However, depending upon the hydrostatic pressures and diameter, even tremie concrete plugs several feet thick don’t have the strength to span tens of feet without steel reinforcement. It is partially due to this limitation, though not solely, that our recommendation is to dewater the excavation during construction.

Unfortunately, the soils that must be excavated are dense and granular. They are highly permeable and have high bearing capacity and high skin friction. The borings indicate that several feet have blow counts of high double-digits. This soil will likely have to be “carved” out, and the little soil remaining may have sufficient strength to support the (buoyant) weight of the caisson walls.

Storage Tank

The basic design criterion of the Storage Tank requires that it must be able to accept inflow by gravity alone, so that a power outage won’t affect its ability to store water and will provide time to correct or restore lift station functionality. A 3.0MG storage capacity is projected to provide 60 minutes of storage, and a 1.5MG tank will provide capacity to store 30 minutes of inflow.

Given an existing ground surface elevation = 850, and a design HWL = 816, the top of the water surface is 34 feet below grade. From there, the tank depths plunge to as much as 85 feet below grade for the 100-foot diameter tank. Working at increased depths increases the risks of construction problems.

Since an unreinforced tremie concrete plug cannot span even the minimum 100-foot diameter, the excavation must be dewatered, and a reinforced structural slab constructed. Though even the reinforced slab cannot span 100 feet or more under the hydrostatic pressures anticipated.

In addition, none of the storage tanks have adequate weight to meet the minimum safety factor (1.5) against flotation during a flooding event. The tank must be held down with helical pile anchors. The helical piles, however, will also provide the distributed support the base slab requires, so it must only span the distance between piles.

While the helical piles solve the slab strength and uplift issues, they can only be constructed in a dewatered condition. This adds cost to the project.

The 1.5 MG gallon, 150-foot diameter storage tank was selected as the most likely candidate for construction. This seemed to provide a solution that had the highest likelihood of being constructible. This alternative was also selected for increased scrutiny for the cost analysis. All of the base cases used a dome style roof for the cost estimate. Based on the potential for objection to this structure, a further buried tank cost estimate was considered. This would include the addition of many support columns and a concrete roof buried slightly below grade.

<u>Lift Station</u>

As mentioned above, rectangular-shaped caissons of the size proposed will require spreader beams. The spreader beams will create more difficulty in these soils to excavate sufficiently to enable the caisson to sink – in the wet or dry. The inability to get a caisson to sink can cause months'-long delays. To avoid this risk, a circular-shaped caisson seems preferable.

As discussed, a circular caisson is inherently stronger in compression, when loaded from the exterior. No spreader beams are required to support the walls. However, since the unreinforced tremie concrete plug/slab is inadequate to span the full diameter under high hydrostatic pressures, beams are required to support the plug. Difficult wet excavation is still required.

As with the Storage Tank, the circular shape is more efficient and less concrete is needed for strength, it also weighs less and doesn't meet the minimum safety factor against buoyancy during flood conditions. Additional wall thickness can be added for ballast, but the amount needed is disproportionate.

To make up the uplift resistance needed, helical piles can be installed and embedded throughout the area of the base slab, both to support the slab under hydrostatic pressures, and to hold down the structure during flood.

As with the Storage Tank, helical piles can only be installed in a dewatered condition. Therefore, a placeholder cost was included for dewatering in each of the design options presented.

<u>Conclusion</u>

Given the size and depth of the structures, the presence and elevation of groundwater anticipated during construction, and the types of soils that will be encountered, combined with the need for supplemental base slab support and uplift resistance, we recommend that open caisson construction be employed in a dewatered condition. Modifications to this approach may be evaluated, but they should be justified with careful consideration of their merits.

1.13 ELECTICAL SERVICE AND GENERATOR SIZING

Stantec has reviewed the electrical service size for the proposed 6 - 200 HP station and the 8 - 150 HP. Station. It is anticipated that there will be on electrical service to the building. Motor controls would be split into two control rooms after the service entrance panel with separate main circuit breakers and separate automatic transfer switches.

Preliminary service size for a six-200 hp pumps or 8 -150 Hp. pumps and other loads results in a 2000-amp service. Preliminary service size for 6 -150 Hp. pumps and other loads results in a 1600-amp service.

Generators have been sized based on utilizing variable frequency drives. It is also anticipated that two generators will be supplied to run either half of the lift station and sized for 3 or 4 pumps, respectively. The proposed generators will be diesel generators with exterior walk in sound enclosures.

Generator selection is based on firm capacity of the lift stations. Each design will have 6 or 8 pumps. The firm capacity was based on five pumps active and six pumps active. However, for the generator design, six 200Hp. five pumps are active, but all six pumps need to be connected to a generator. For the eight pump station, six pumps are active. The generator will be sized for three active pumps per wet well.

Two generators for 6-200Hp. pumps, six active pumps, results in a generator size of 650 KW.

Two generators for 8-150 Hp. pumps, six active pumps, results in a generator size of 550 KW.

1.14 COST ESTIMATES

Several cost estimates have been prepared and are included in Appendix H.

Lift Station Summary: A lift station summary cost estimate page has been included to summarize lift station options and possible response tank sizing.

Lift Station Option A Cost Estimate: Six Pump Rectangular lift station, with common wet well and split drywell. The control room will also be split into two separate spaces. This design will be based on 5 active pumps, with one pump serving as firm capacity.

Lift Station Option B Cost Estimate: Six Pump Circular self-cleaning lift station, with common wet well and split drywell. The control room will also be split into two separate spaces. This design will be based on 5 active pumps, with one pump serving as firm capacity.

Lift Station Option C Cost Estimate: Eight Pump Rectangular lift station, with common wet well and split drywell. The control room will also be split into two separate spaces. This design will be based on 6 active pumps, with two pumps serving as firm capacity.

Lift Station Option D Cost Estimate: Eight Pump Circular self-cleaning lift station, with common wet well and split drywell. The control room will also be split into two separate spaces. This design will be based on 6 active pumps, with two pumps serving as firm capacity.

River Crossing Estimate E: The river crossing, west side modifications and gravity piping to the lift station has been estimated separately from the lift station options. These modifications will be required regardless of which lift station option is selected. The river crossing estimate includes the headworks inlet structure and tail works structure which is required to join flows immediately in front of the lift station regardless of lift station style selected.

Response Tank Estimate F: The option to construct a storage response tank has been estimated separately as it is independent of which lift station option is selected. This cost estimates for various diameter storage tanks are included in Appendix G.

West Side Lift Station Expansion Estimate G: A cost estimates is included to expand the west lift station with 150 hp. pumps. This option could provide a capacity of 64 MGD, but still has minimal wet well capacity.

West Side Lift Station Expansion Estimate H: A cost estimate is included to expand the west lift station with 200 Hp. pumps. This option could provide a capacity of 67 MGD, but still has minimal wet well capacity.

West Side Storage Tank Estimate I: A west side storage tank is also included with 20 minute storage is included as Estimate I.

Mississippi Lane Lift Station Estimate J: An estimate is provided to install a duplex lift station on Mississippi land to increase the available storage volume in up-stream piping.

Hydraulic Pumps East Side Estimate K: An estimate has been provided to add two 12,500 gpm back up pumps to the East side lift station. These back up hydraulic or electric pumps would produce 1.5 MG per hour back up pumping capacity to be installed in lieu of installing the underground storage tank. This option would provide a back-up station capacity of 36 MG, which would be independent of the primary pumping options.

Storage Tank Operation Cost Estimate L: A cost estimate was prepared to facilitate the business case analysis of the storage tank options. This summary has been included at the end of Appendix H which identifies response time gained by various storage options. The capitol costs of various diameter tanks and underground storage tanks were included in Appendix G.

1.15 EAW

Stantec has prepared an Environmental Assessment Work for the L-32 site. A copy of the EAW will be provided as a separate document. A draft EAW has been submitted.

1.16 ARCHAEOLOGICAL ASSESSMENT

Stantec subcontracted the 106 Group to complete an archaeological site assessment. The archaeological assessment included a physical site field investigation on the southern 14 acres of the 22 acre site. Shovel testing was conducted, and results have been compiled into an assessment report summarizing methodology and recommendations for this site.

The results of the phase 1 investigation concluded that there are signs of Archeological artifacts. A resulting Phase 2 study was been authorized.

The phase 2, field work consisted of 12 close-interval shovel test and three 1x1 meter excavations. As a result, a total of 11 lithic (stone) artifacts and 4 ceramic sherds were discovered. No subsurface features were identified. The site does not appear to be eligible for the National Register of Historic Places and no further archaeological work is necessary.

The 106 group is finalizing their report for review and submittal to SHPO and OSA for their review and concurrence. The complete report will be submitted as a separate document.

APPENDIX A – REPORT DRAWINGS

PROJECT LOCATION

VICINITY MAP

NO SCALE

END PROJECT

BEGIN PROJECT

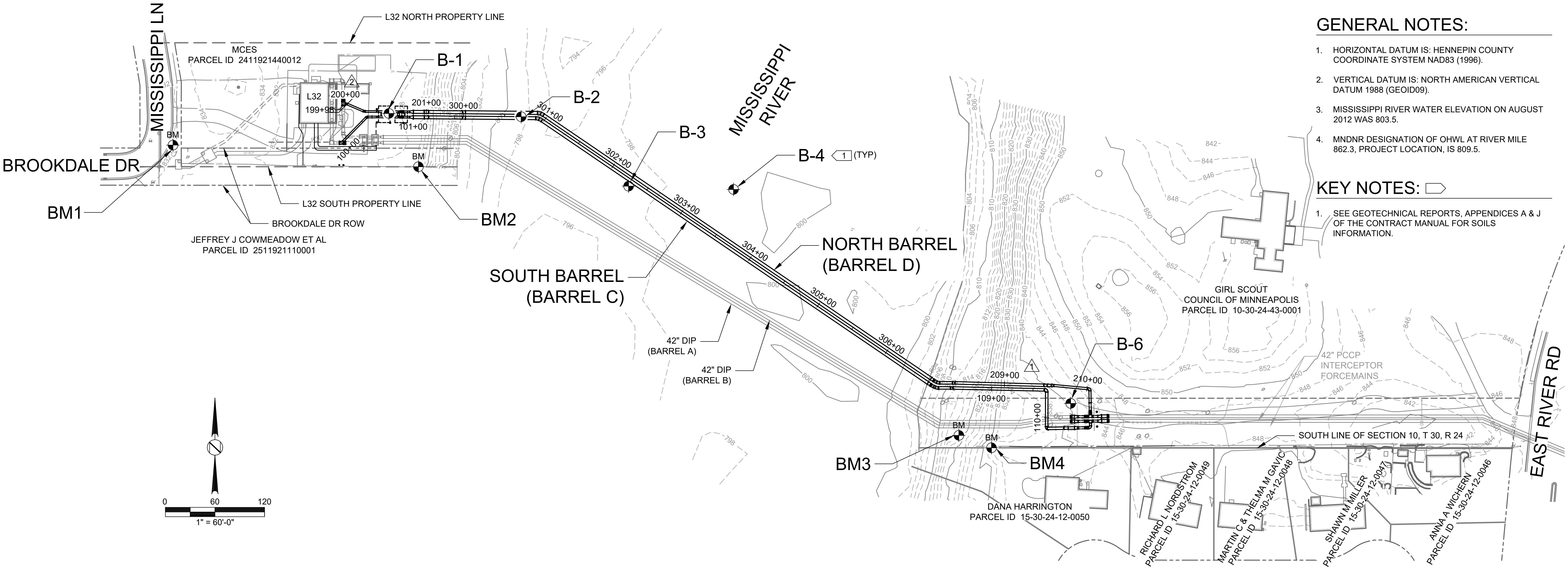
LOCATION MAP

NO SCALE

VICINITY & LOCATION MAP

L32 RIVER CROSSING

FIGURE C1



GENERAL NOTES:

1. HORIZONTAL DATUM IS: HENNEPIN COUNTY COORDINATE SYSTEM NAD83 (1996).
2. VERTICAL DATUM IS: NORTH AMERICAN VERTICAL DATUM 1988 (GEOID09).
3. MISSISSIPPI RIVER WATER ELEVATION ON AUGUST 2012 WAS 803.5.
4. MNDNR DESIGNATION OF OHWL AT RIVER MILE 862.3, PROJECT LOCATION, IS 809.5.

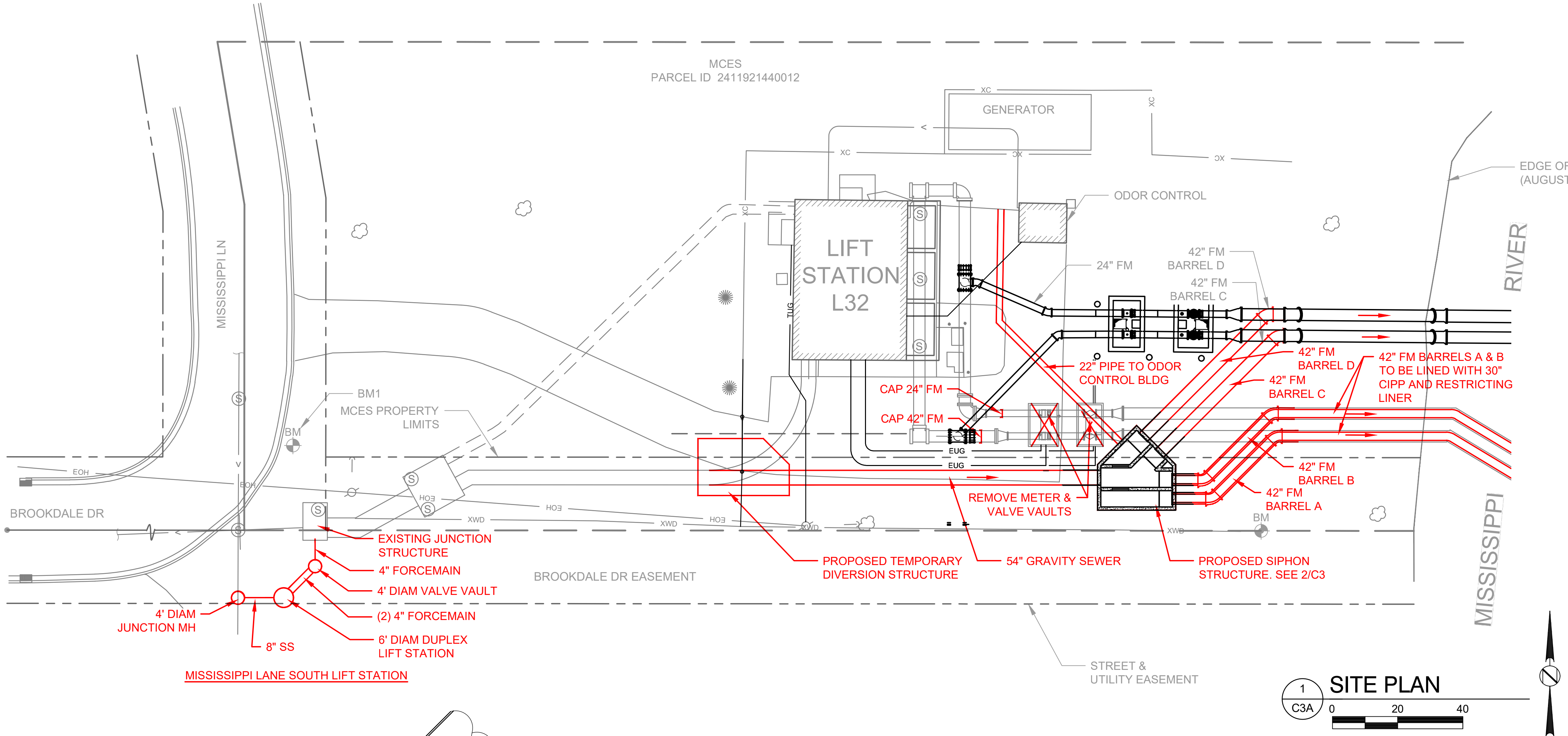
KEY NOTES:

1. SEE GEOTECHNICAL REPORTS, APPENDICES A & J OF THE CONTRACT MANUAL FOR SOILS INFORMATION.

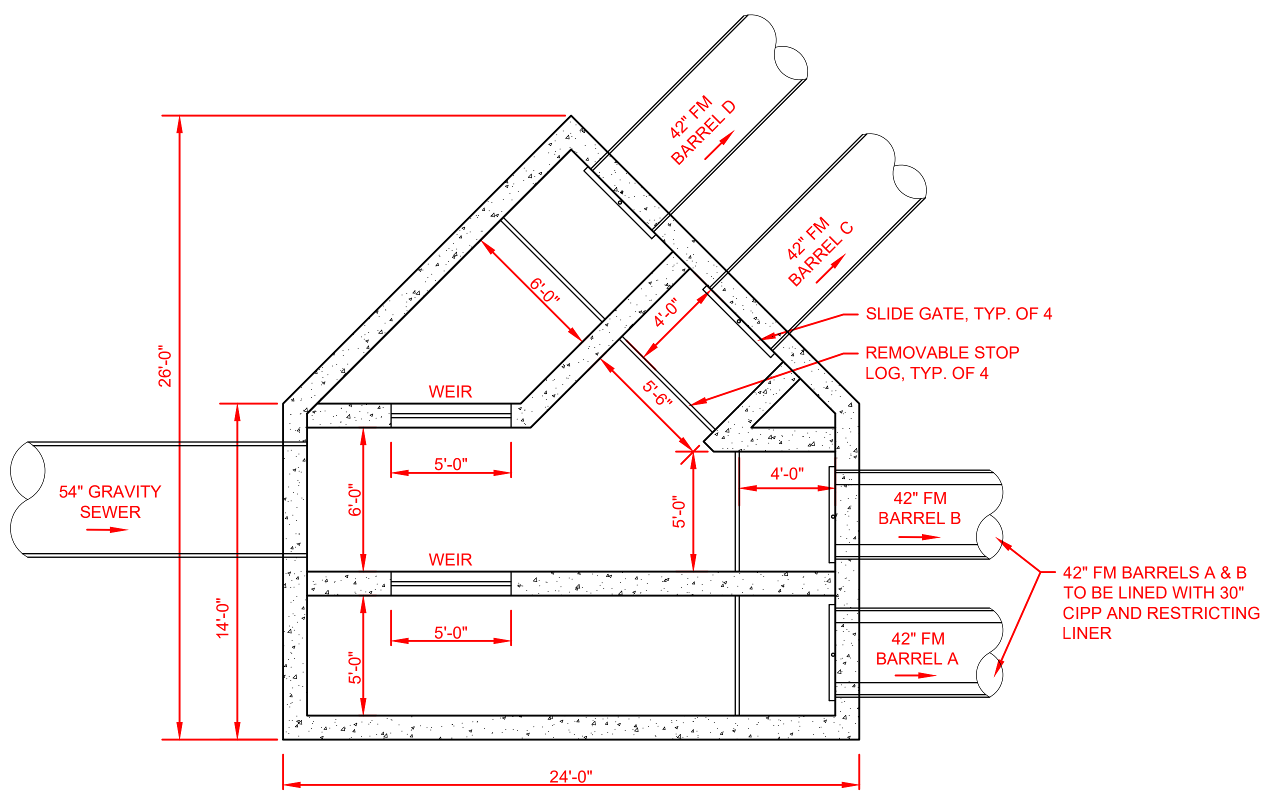
OVERALL SITE PLAN

L32 RIVER CROSSING

FIGURE C2



1 C3A SITE PLAN
0 20 40

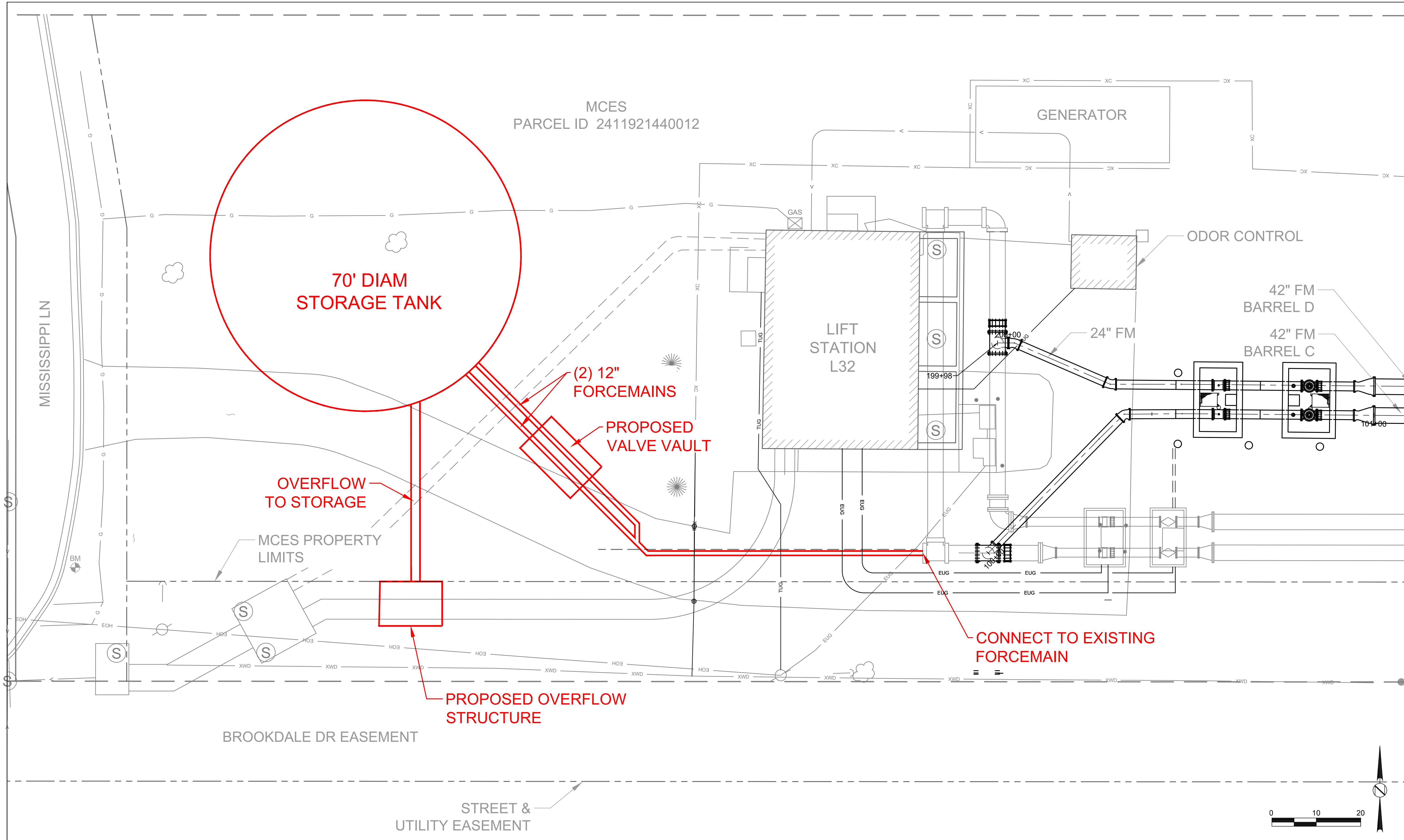


2 C3A PROPOSED SIPHON STRUCTURE
0 4 8

SITE PLAN - WEST SIDE

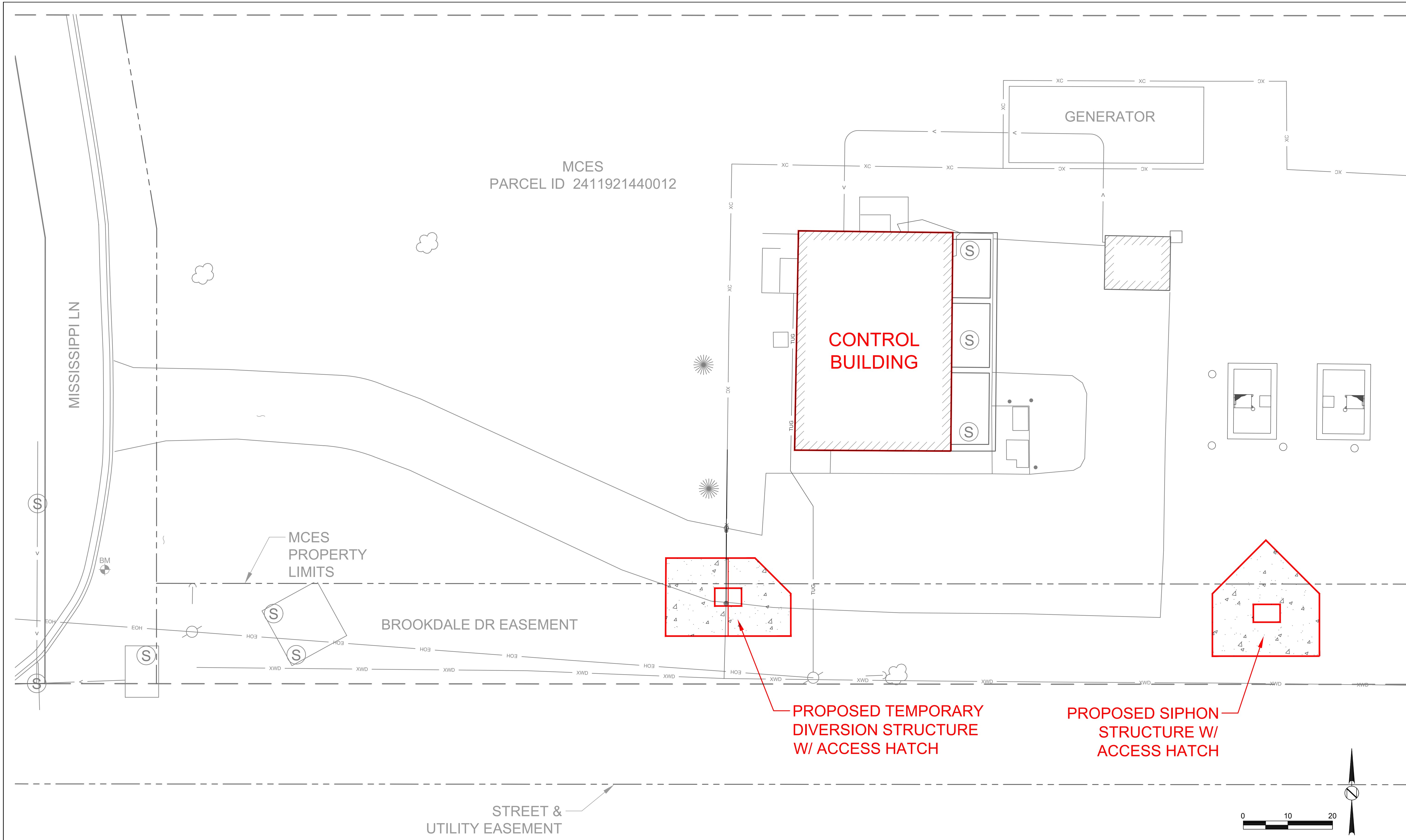
L32 RIVER CROSSING

FIGURE C3A



SITE PLAN - WEST SIDE STORAGE TANK
L32 RIVER CROSSING

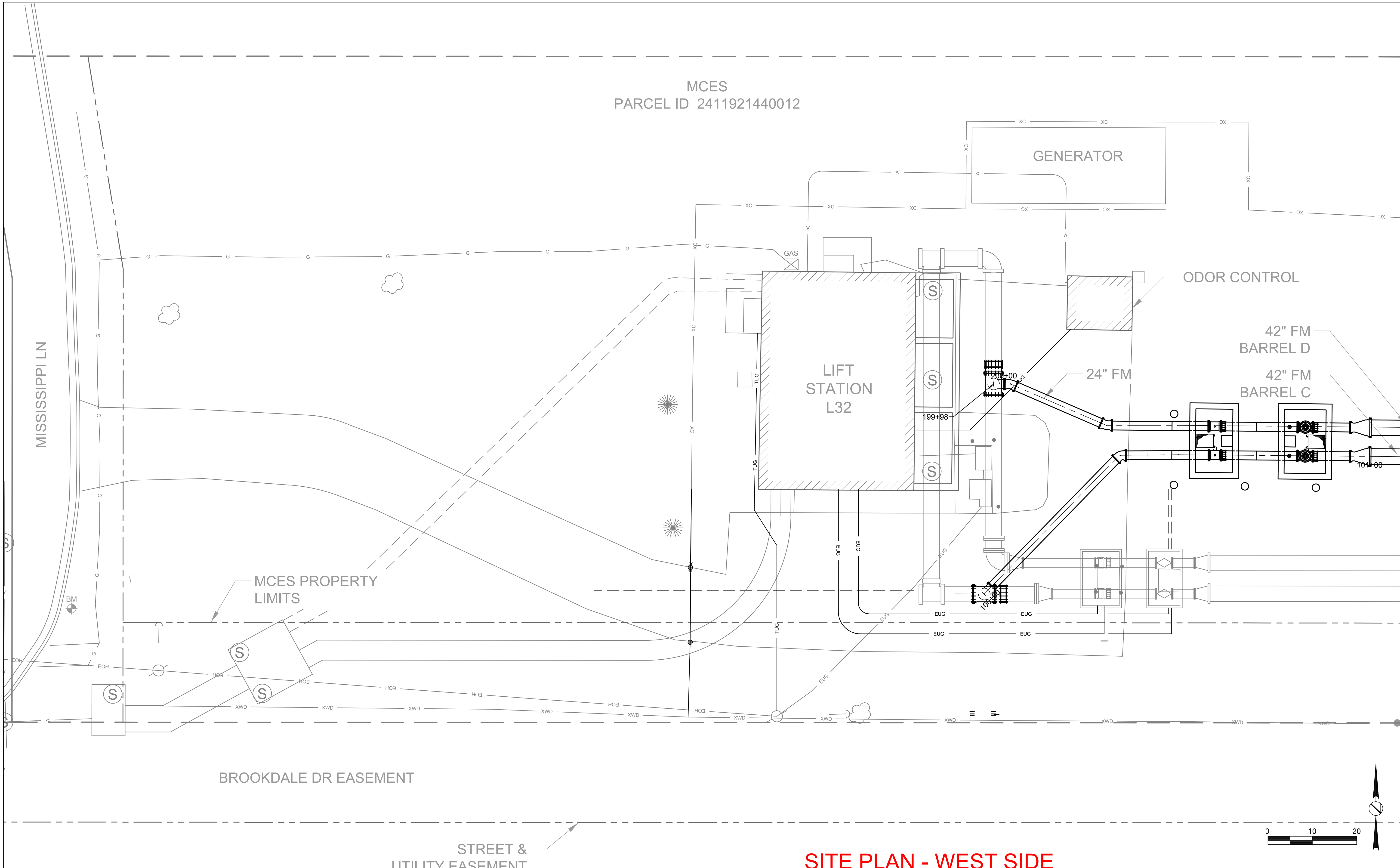
FIGURE C3B



SITE PLAN - WEST SIDE-ABOVE GRADE PLAN

L32 RIVER CROSSING

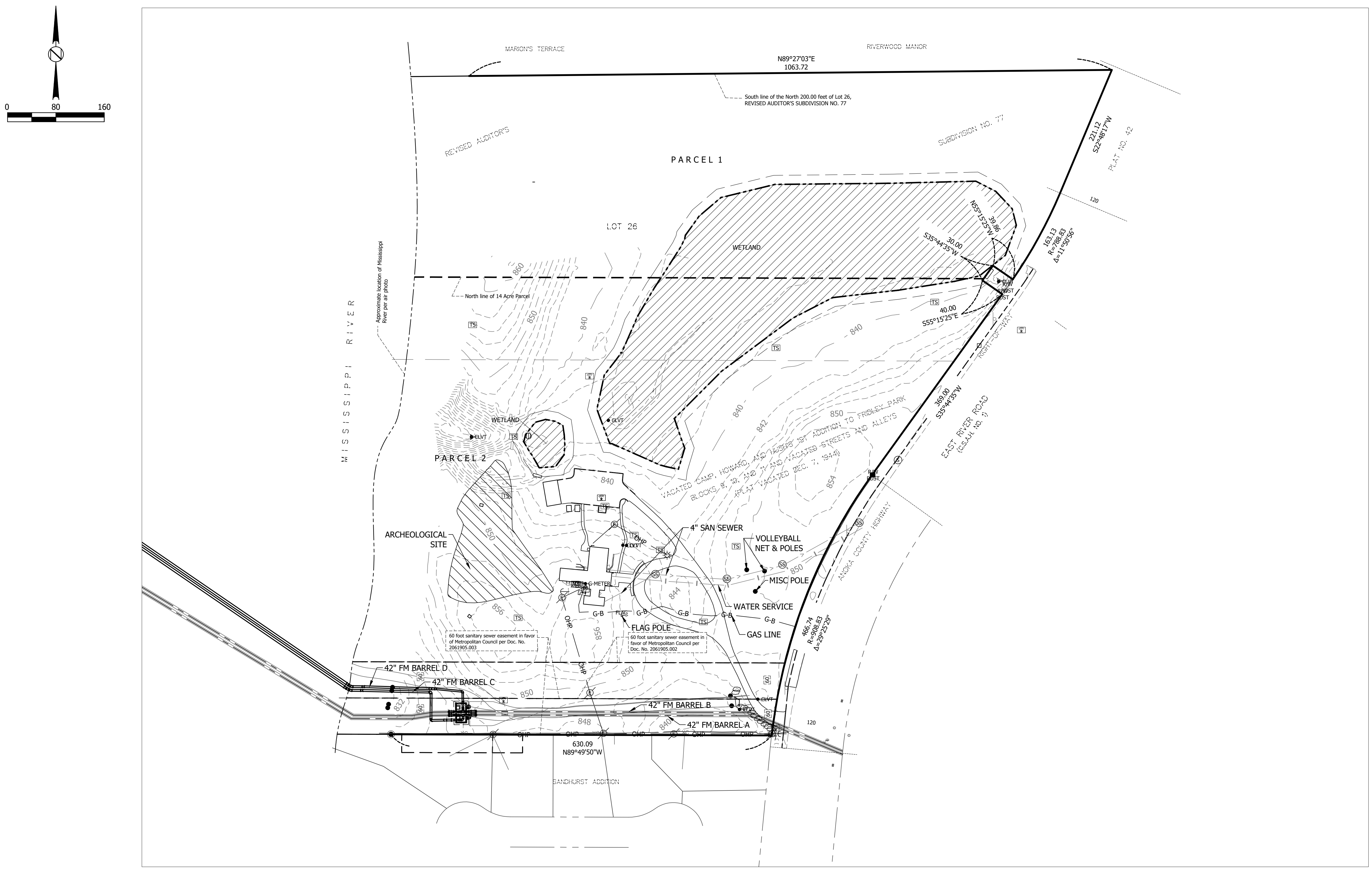
FIGURE C3C



SITE PLAN - WEST SIDE

L32 RIVER CROSSING

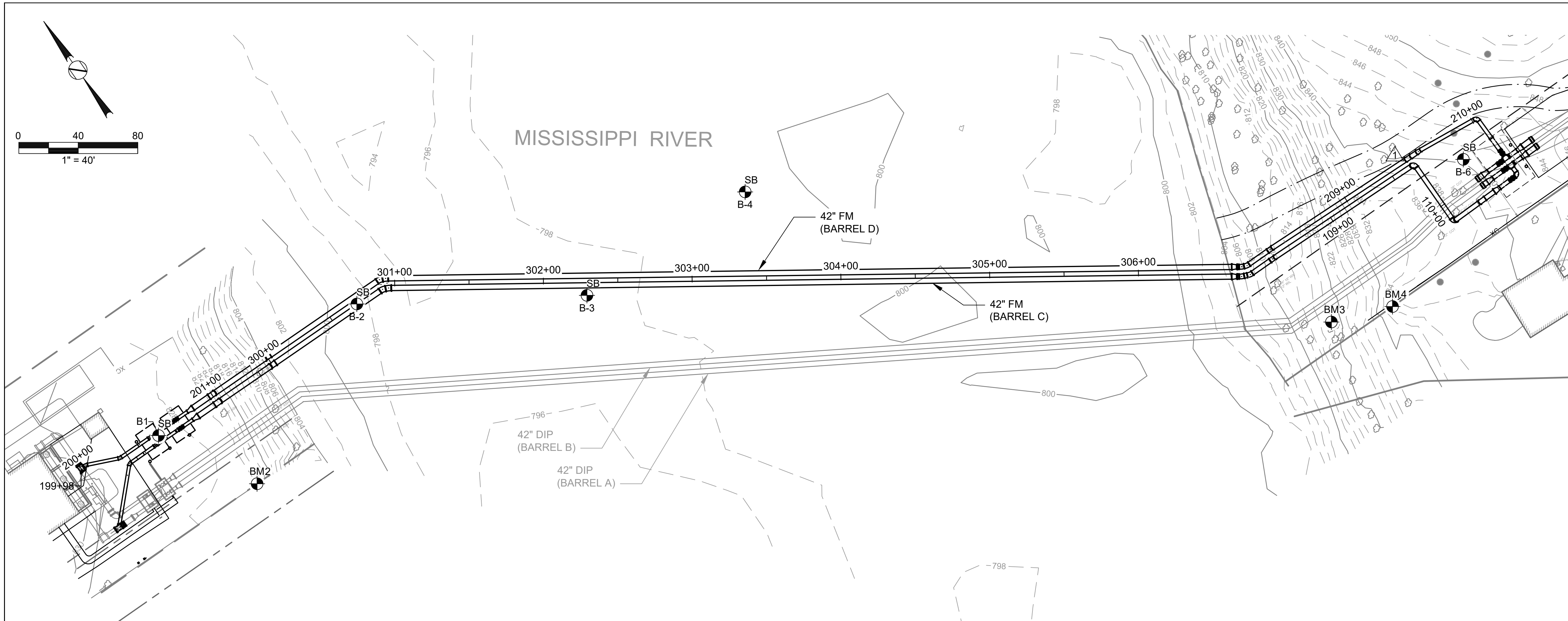
FIGURE C3E



EXITING CONDITIONS - EAST SIDE

L32 RIVER CROSSING

FIGURE C4

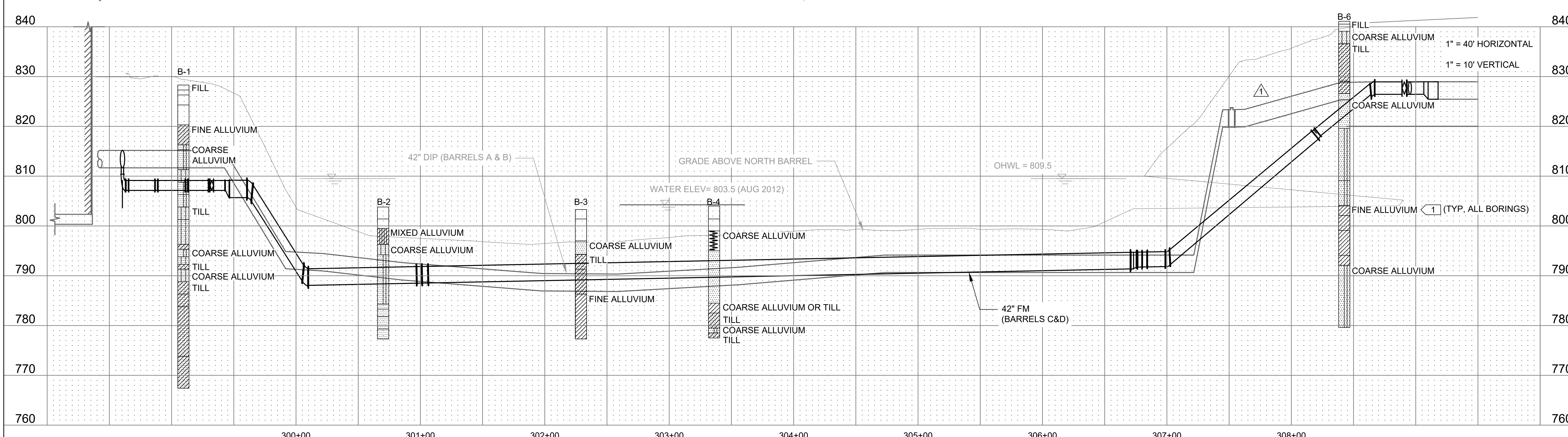


GENERAL NOTES:

1. BM REPRESENT BENCHMARK LOCATIONS PER SHEET G5.
2. B-3 REPRESENT SOIL BORING LOCATIONS.
3. SEE THE ADDITIONAL INFORMATION IN THE CONTRACT MANUAL FOR ADDITIONAL HISTORICAL SOIL BORINGS IN THE AREA.

KEY NOTES:

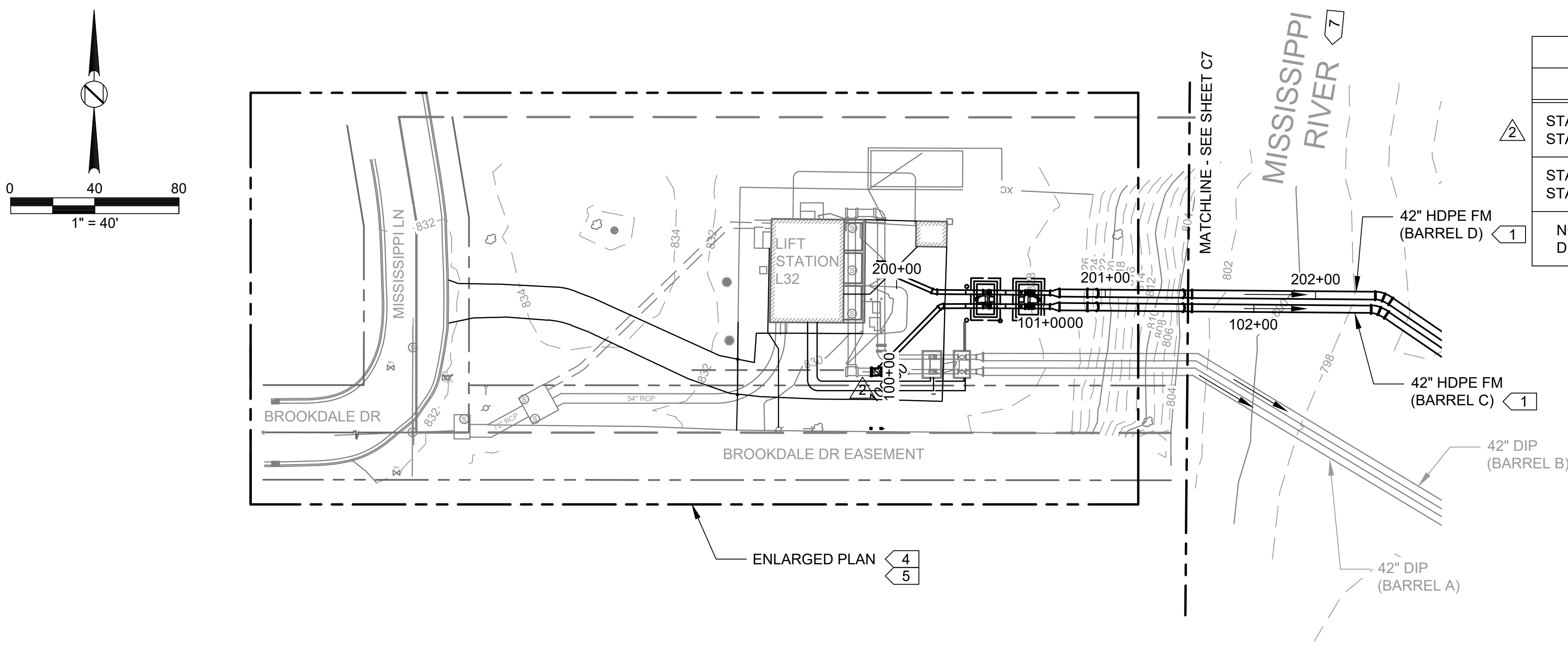
1. SOILS DESCRIPTIONS PROVIDED HEREIN ARE FOR GENERAL INFORMATION ONLY. CONTRACTOR TO REFER TO THE ADDITIONAL INFORMATION IN THE CONTRACT MANUAL FOR DETAILED BORING INFORMATION.



SOIL BORING PLAN & PROFILE

L32 RIVER CROSSING

FIGURE C5



PIPE MATERIALS & TRENCH TYPE TABLE

LOCATION	ALLOWABLE PIPE MATERIAL	TRENCH TYPE
STA 100+02 TO 101+04 STA 199+93 TO 200+75	DI 24"Ø 350 PSI	DET 1/C3
STA 101+04 TO 101+68 STA 200+75 TO 201+39	DI 42"Ø 250 PSI HDPE 42"Ø DR17 (DIPS)	DET 1/C3

NOTE:
DUCTILE IRON INSTALLED ON WEST AND EAST BANKS.

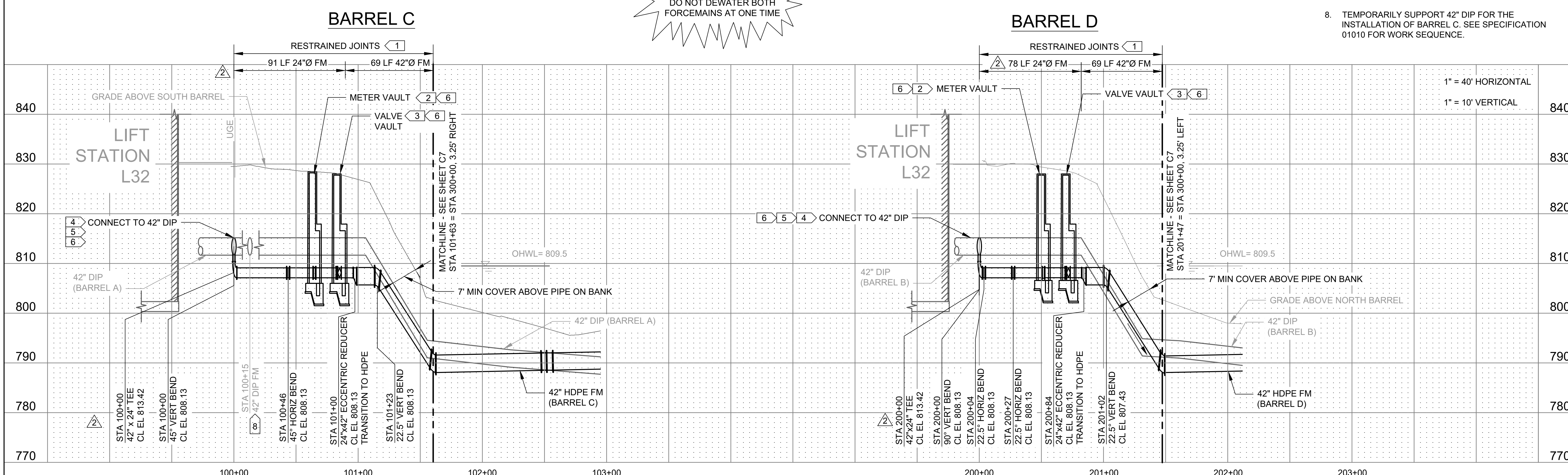
GENERAL NOTES:

1. NO NAVIGATION CHANNEL IS AVAILABLE IN THE VICINITY OF THE PROJECT. CONTRACTOR TO ACCESS WORK AREA IN THE RIVER FROM LAND.
2. MAINTAIN ACCESS TO LIFT STATION, GENERATOR, & ODOR CONTROL BUILDING AT ALL TIMES.
3. MNDNR DESIGNATION OF OHWL AT RIVER MILE 862.3, PROJECT LOCATION, IS 809.5.
4. CONTRACTOR SHALL CONTACT COAST GUARD 24 HOURS BEFORE STARTING WORK WITHIN THE RIVER. A BROADCAST NOTICE WILL BE SENT TO MARINERS, LOCAL SHERIFFS, AND BOATING LAW OFFICE. SEE SHEET G2 FOR CONTACT INFORMATION.

KEY NOTES:

1. SEE PIPE MATERIALS & TRENCH TYPE TABLE, THIS SHEET. HDPE WAS INSTALLED IN RIVER.
2. CONSTRUCT METER VAULT PER DETAILS, SHEET S4.
3. CONSTRUCT VALVE VAULT PER DETAILS, SHEETS S5 & S6.
4. SEE SHEET C9 FOR SITE PREPARATION & DEMOLITION.
5. SEE SHEET C11 FOR SITE LAYOUT & RESTORATION.
6. SEE MECHANICAL PLAN & SECTIONS, SHEET M2.
7. ALL WORK WITHIN RIVER SHALL CONFORM TO MNDNR, MPCA & USACE PERMITS. REFER TO THE ADDITIONAL INFORMATION IN THE CONTRACT MANUAL.
8. TEMPORARILY SUPPORT 42" DIP FOR THE INSTALLATION OF BARREL C. SEE SPECIFICATION 01010 FOR WORK SEQUENCE.

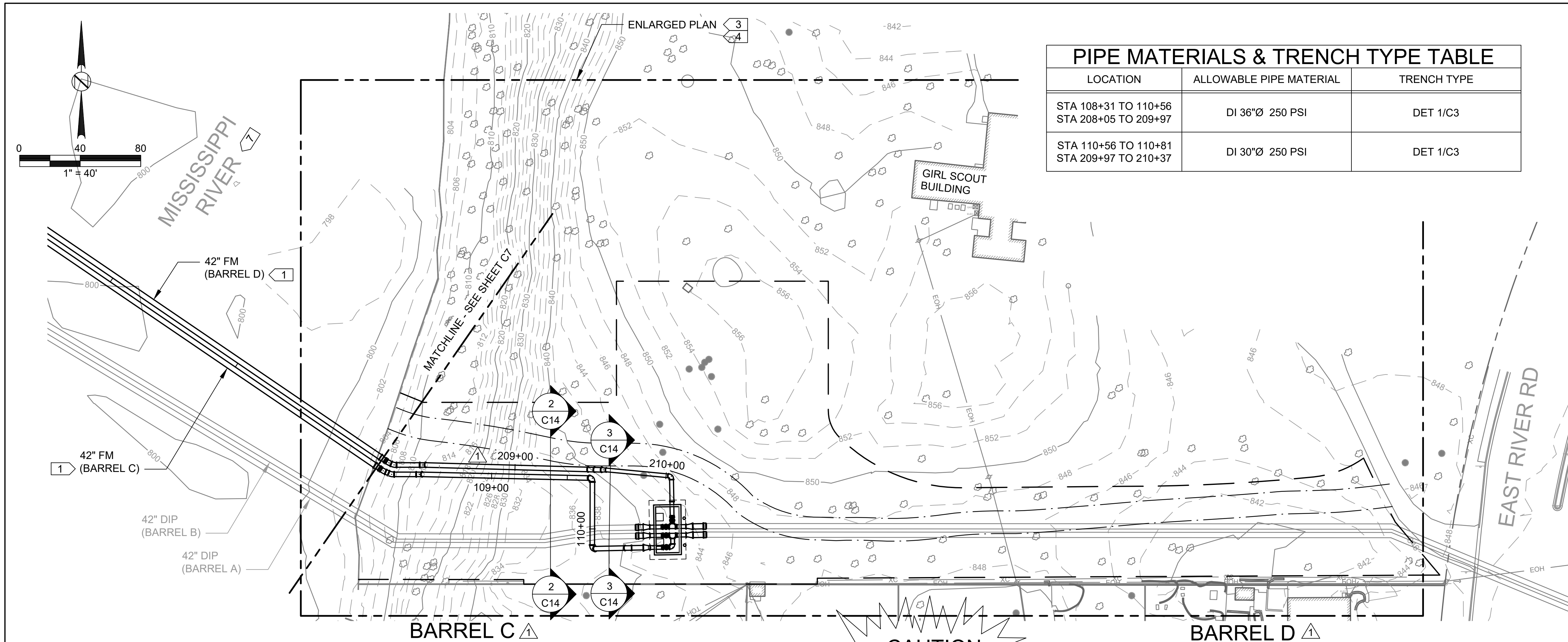
CAUTION:
DO NOT DEWATER BOTH FORCEMAINS AT ONE TIME



WEST SIDE PLAN & PROFILE

L32 RIVER CROSSING

FIGURE C6



PIPE MATERIALS & TRENCH TYPE TABLE

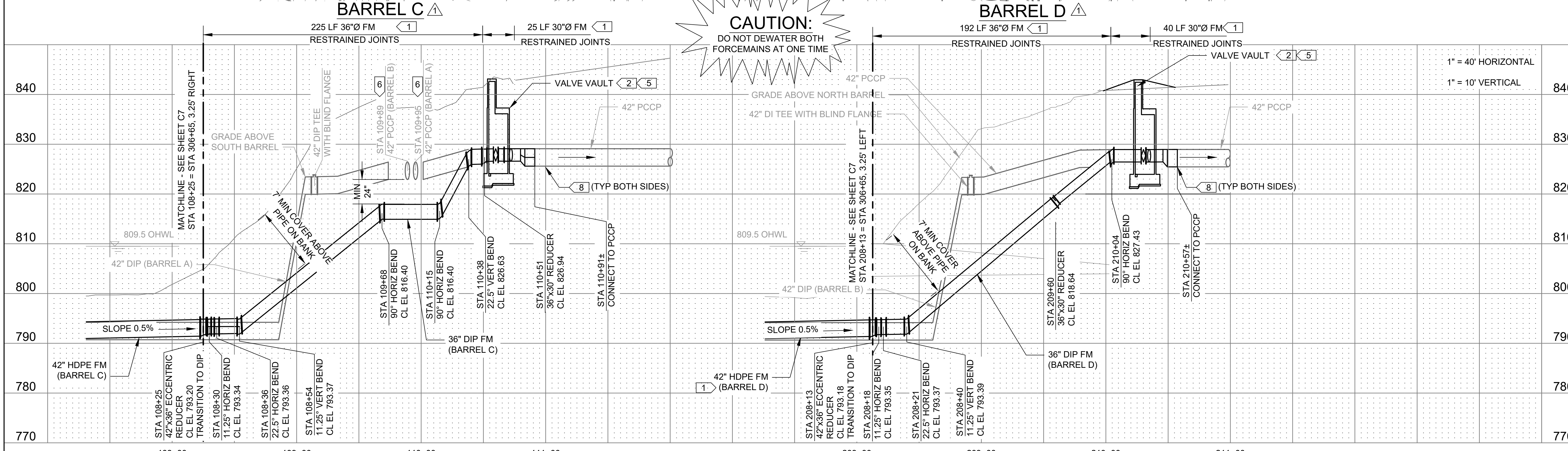
LOCATION	ALLOWABLE PIPE MATERIAL	TRENCH TYPE
STA 108+31 TO 110+56 STA 208+05 TO 209+97	DI 36"Ø 250 PSI	DET 1/C3
STA 110+56 TO 110+81 STA 209+97 TO 210+37	DI 30"Ø 250 PSI	DET 1/C3

GENERAL NOTES:

1. NO NAVIGATION CHANNEL IS AVAILABLE IN THE VICINITY OF THE PROJECT. CONTRACTOR TO ACCESS WORK AREA IN THE RIVER FROM LAND.
2. MNDNR DESIGNATION OF OHWL AT RIVER MILE 862.3, PROJECT LOCATION, IS 809.5.
3. CONTRACTOR SHALL CONTACT COAST GUARD 24 HOURS BEFORE STARTING WORK WITHIN THE RIVER. A BROADCAST NOTICE WILL BE SENT TO MARINERS, LOCAL SHERIFFS, AND BOATING LAW OFFICE. SEE SHEET G2 FOR CONTACT INFORMATION.

KEY NOTES:

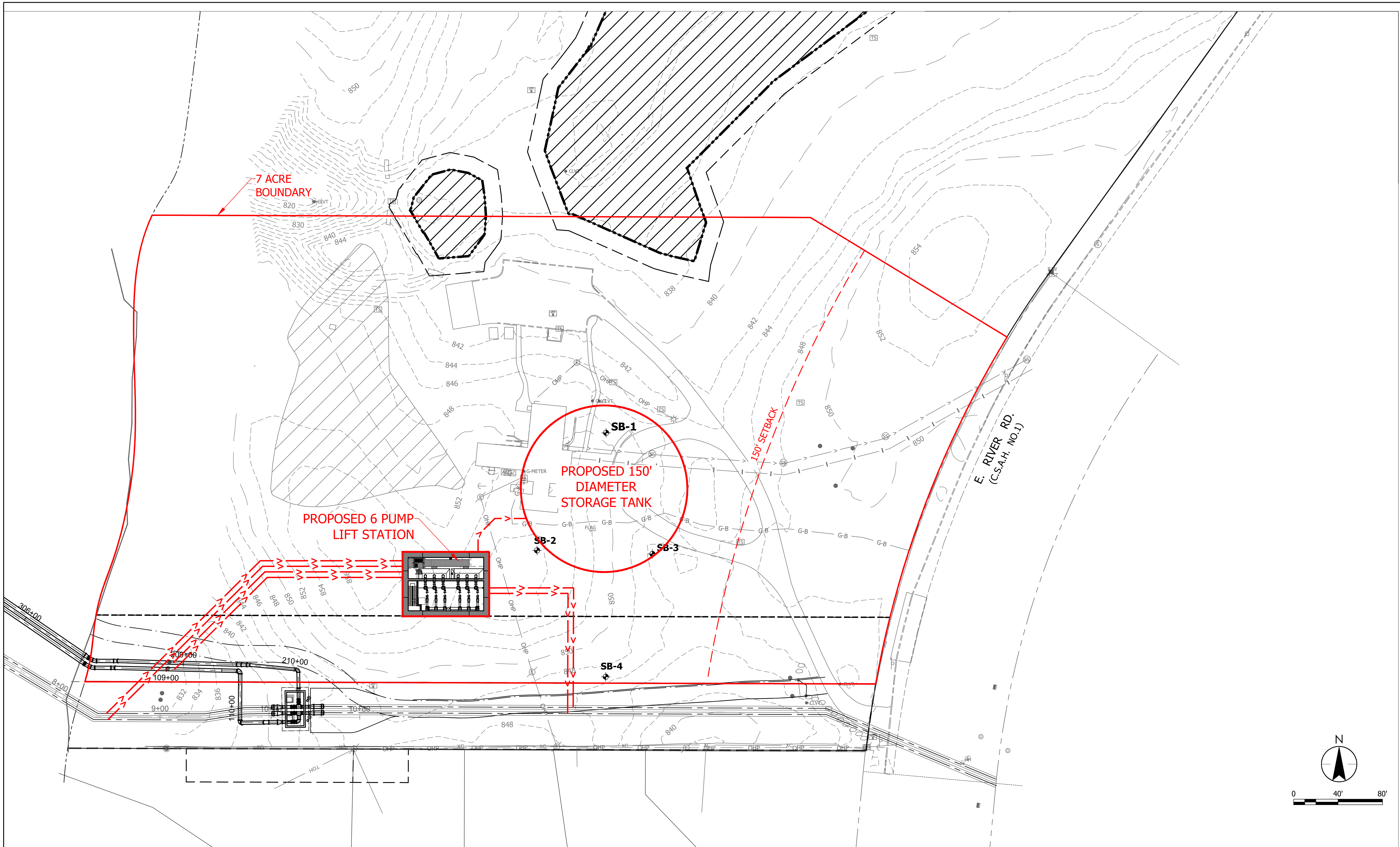
1. SEE PIPE MATERIALS & TRENCH TYPE TABLE, THIS SHEET. HDPE WAS INSTALLED IN RIVER.
2. CONSTRUCT VALVE VAULT PER DETAILS, SHEET S7 & S8.
3. SEE SHEET C10 FOR SITE PREPARATION & DEMOLITION.
4. SEE SHEET C12 & C13 FOR SITE LAYOUT & RESTORATION.
5. SEE MECHANICAL PLAN & SECTIONS, SHEET M3.
6. TEMPORARILY SUPPORT 42" DIP FOR THE INSTALLATION OF BARREL C. SEE SPECIFICATION 01010 FOR WORK SEQUENCE.
7. ALL WORK WITHIN RIVER SHALL CONFORM TO MNDNR, MPCA & USACE PERMITS. REFER TO THE ADDITIONAL INFORMATION IN THE CONTRACT MANUAL.
8. CONNECT TO PCCP PER DETAIL 1/C4.



EAST SIDE PLAN & PROFILE

L32 RIVER CROSSING

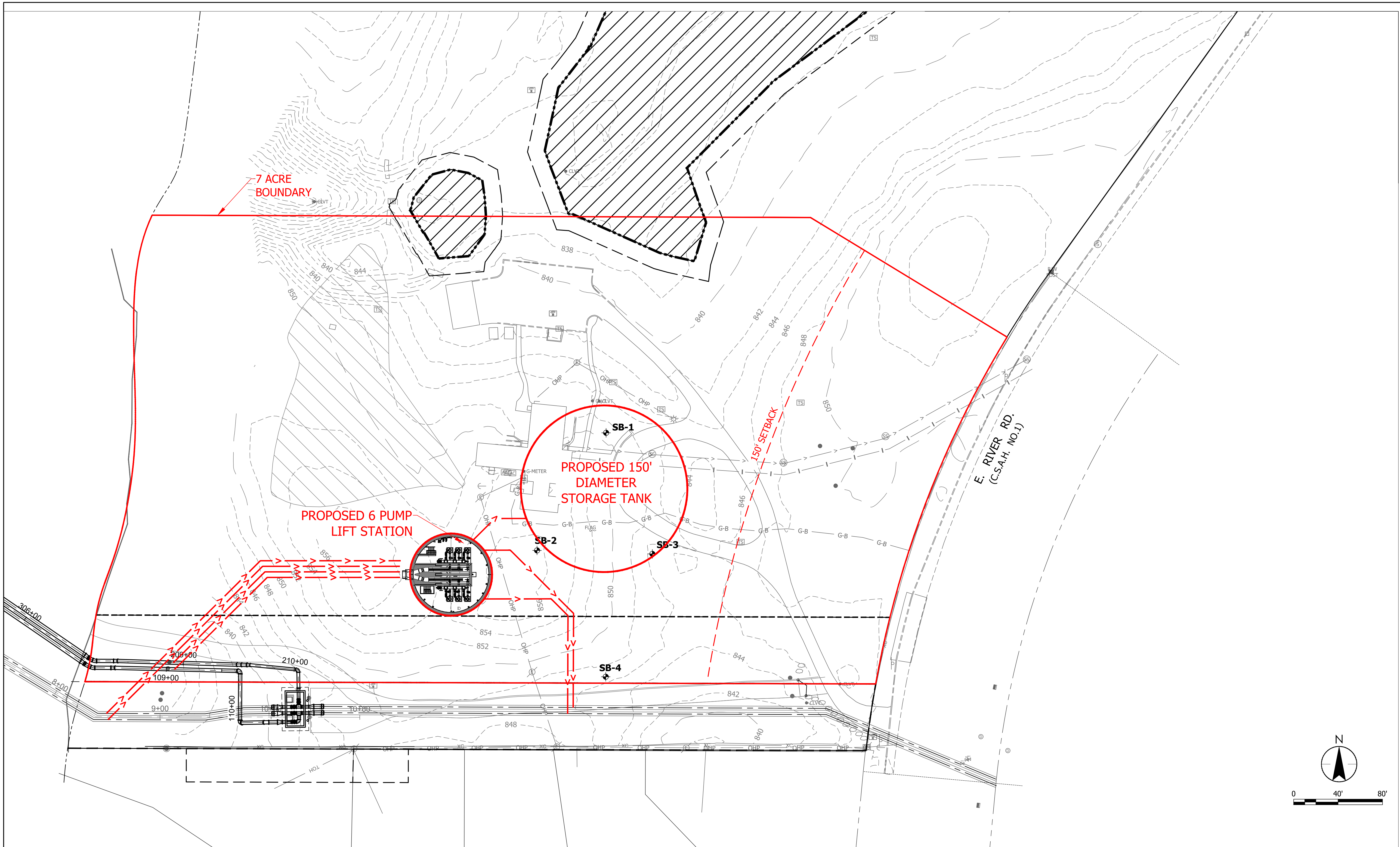
FIGURE C7



EAST SIDE LIFT STATION OPTION A

L32 RIVER CROSSING

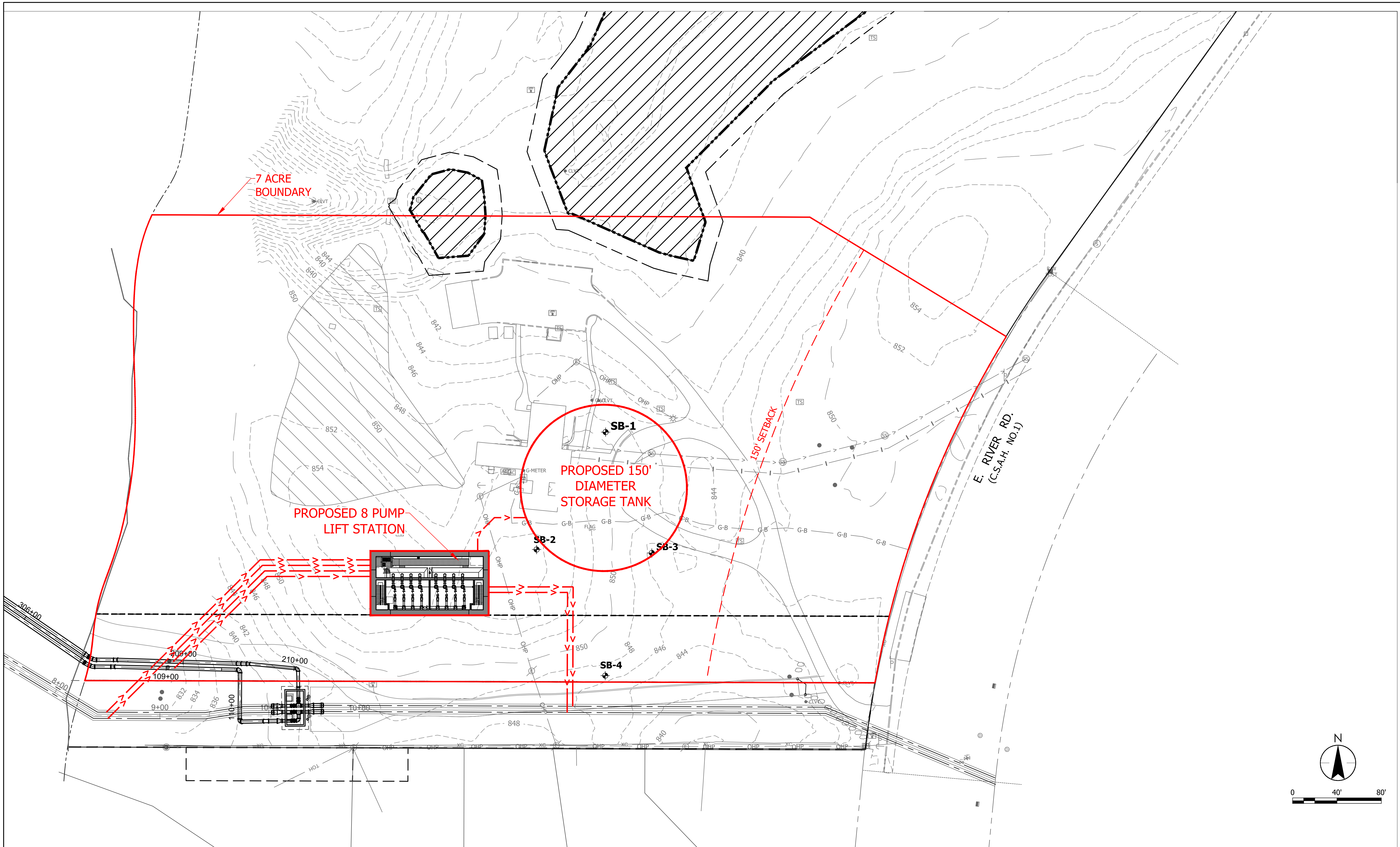
FIGURE C8



EAST SIDE LIFT STATION OPTION B

L32 RIVER CROSSING

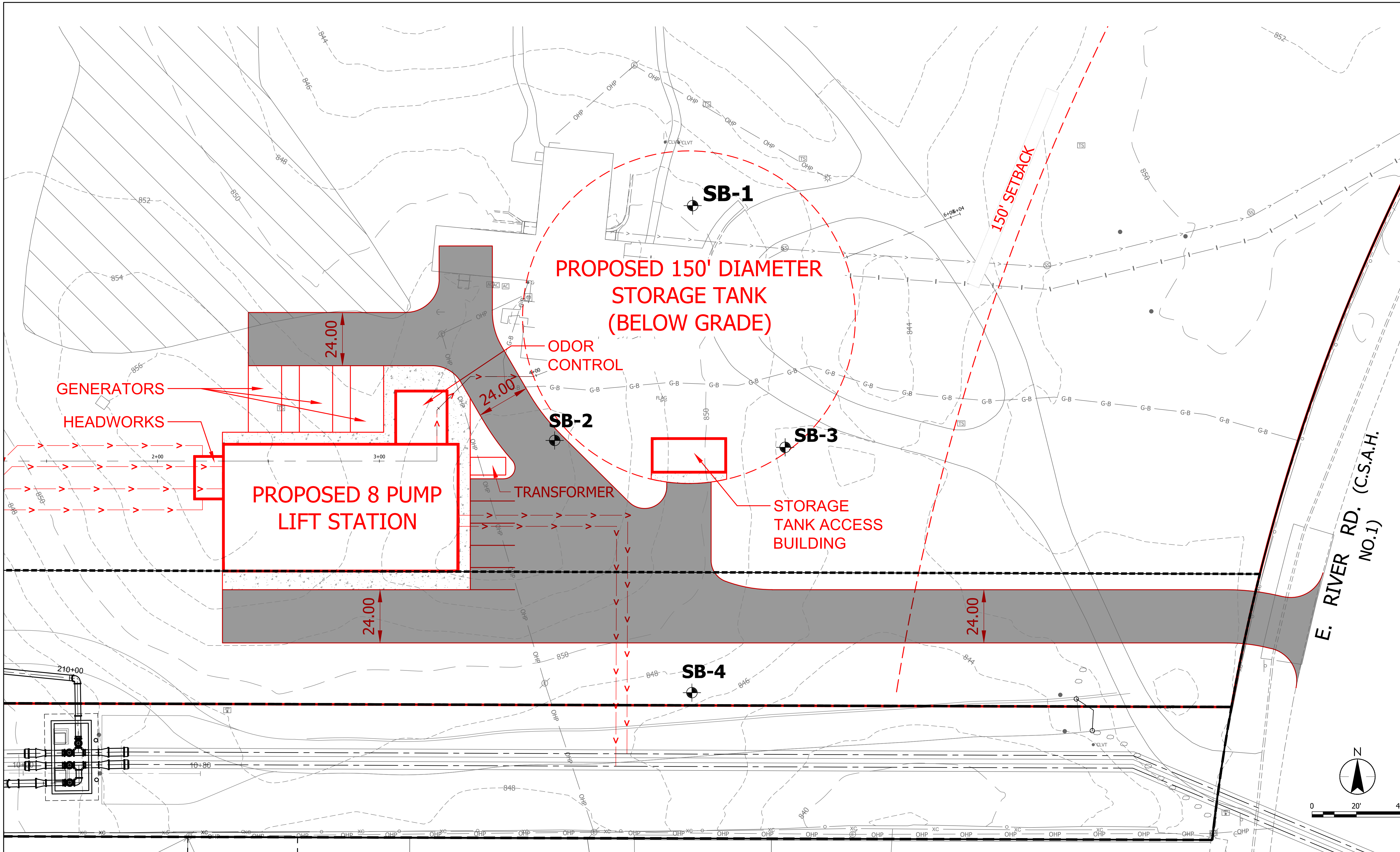
FIGURE C9



EAST SIDE LIFT STATION OPTION C

L32 RIVER CROSSING

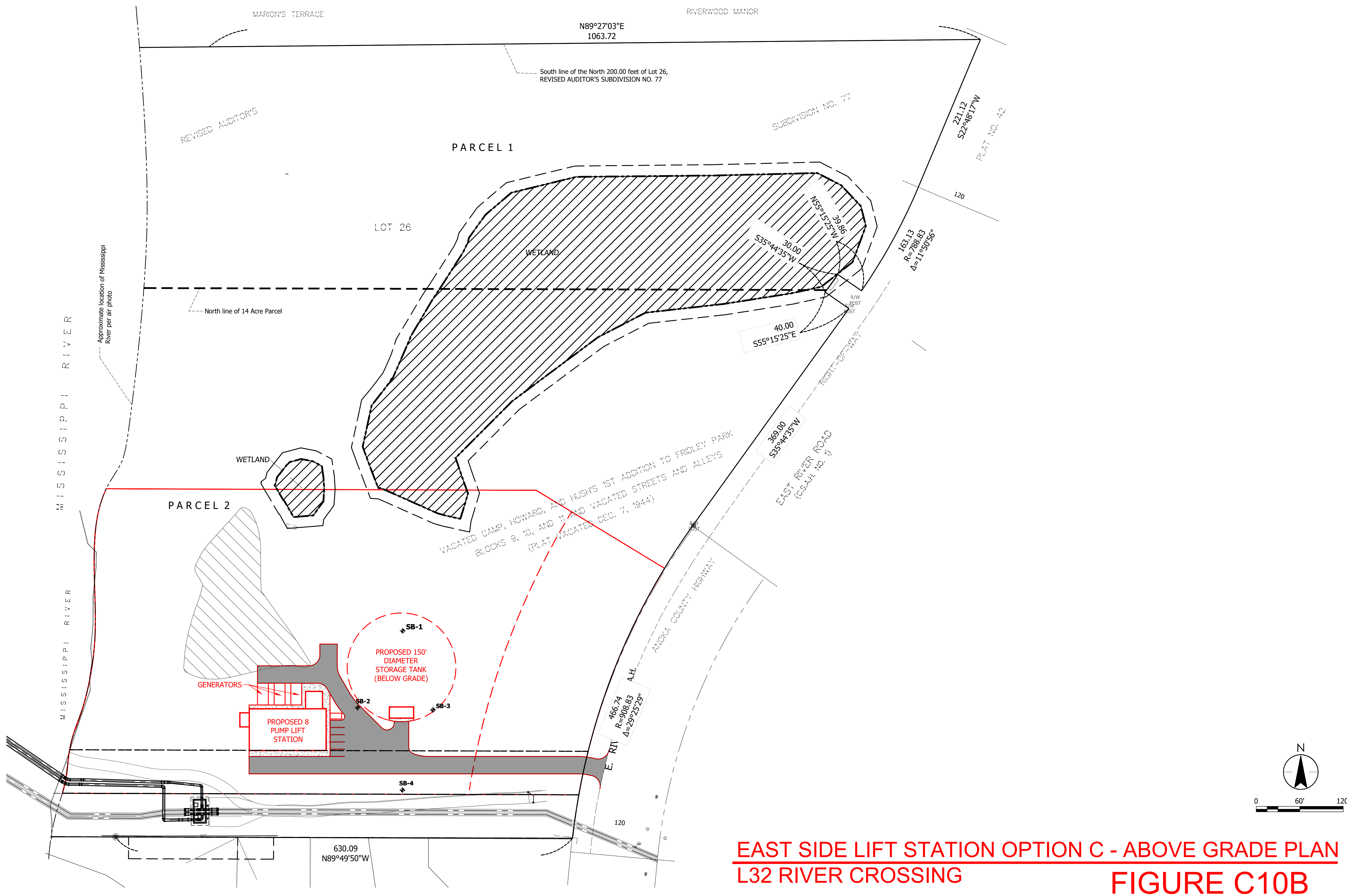
FIGURE C10



EAST SIDE LIFT STATION OPTION C - ABOVE GRADE PLAN

L32 RIVER CROSSING

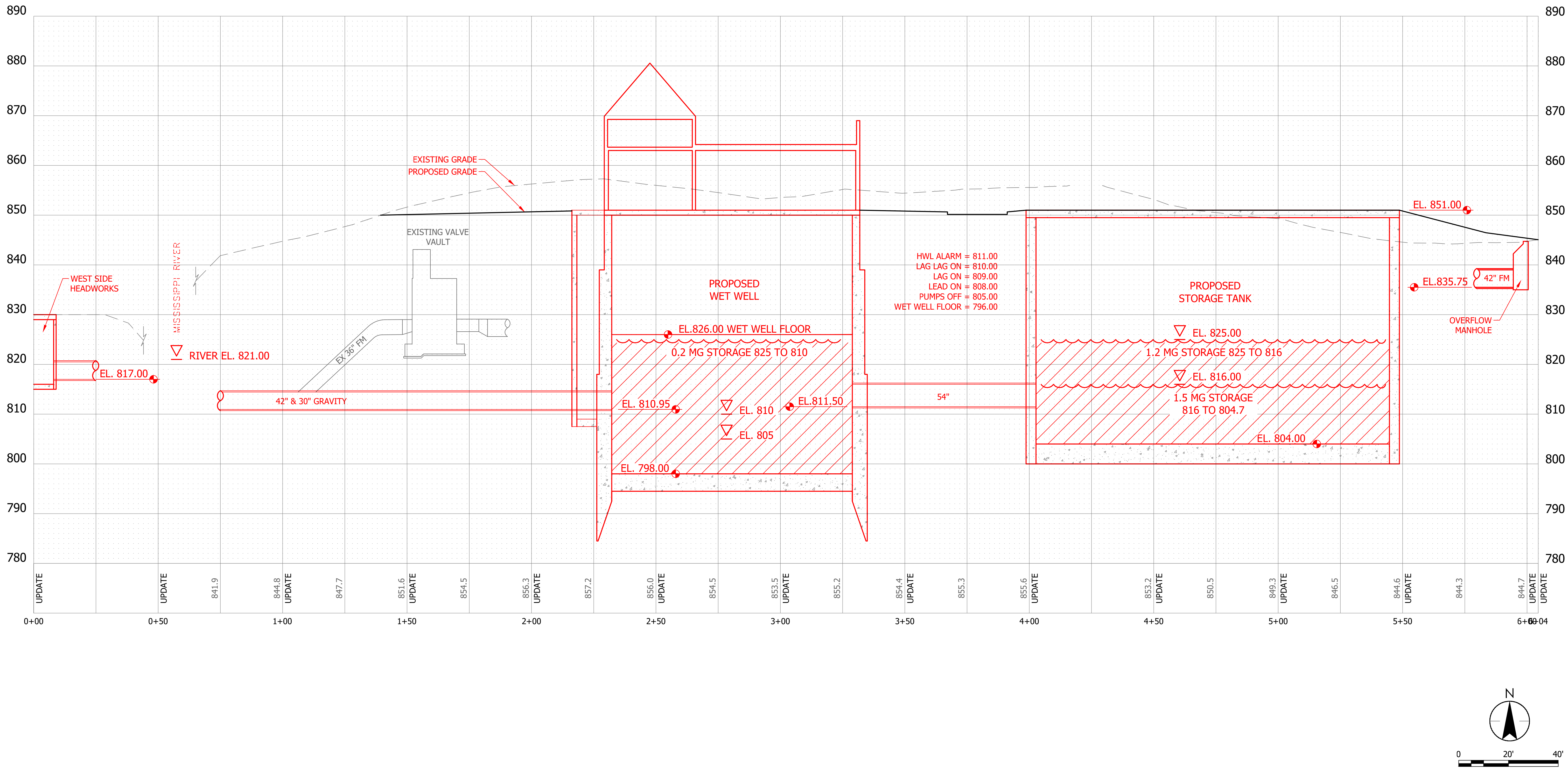
FIGURE C10A



EAST SIDE LIFT STATION OPTION C - ABOVE GRADE PLAN

L32 RIVER CROSSING

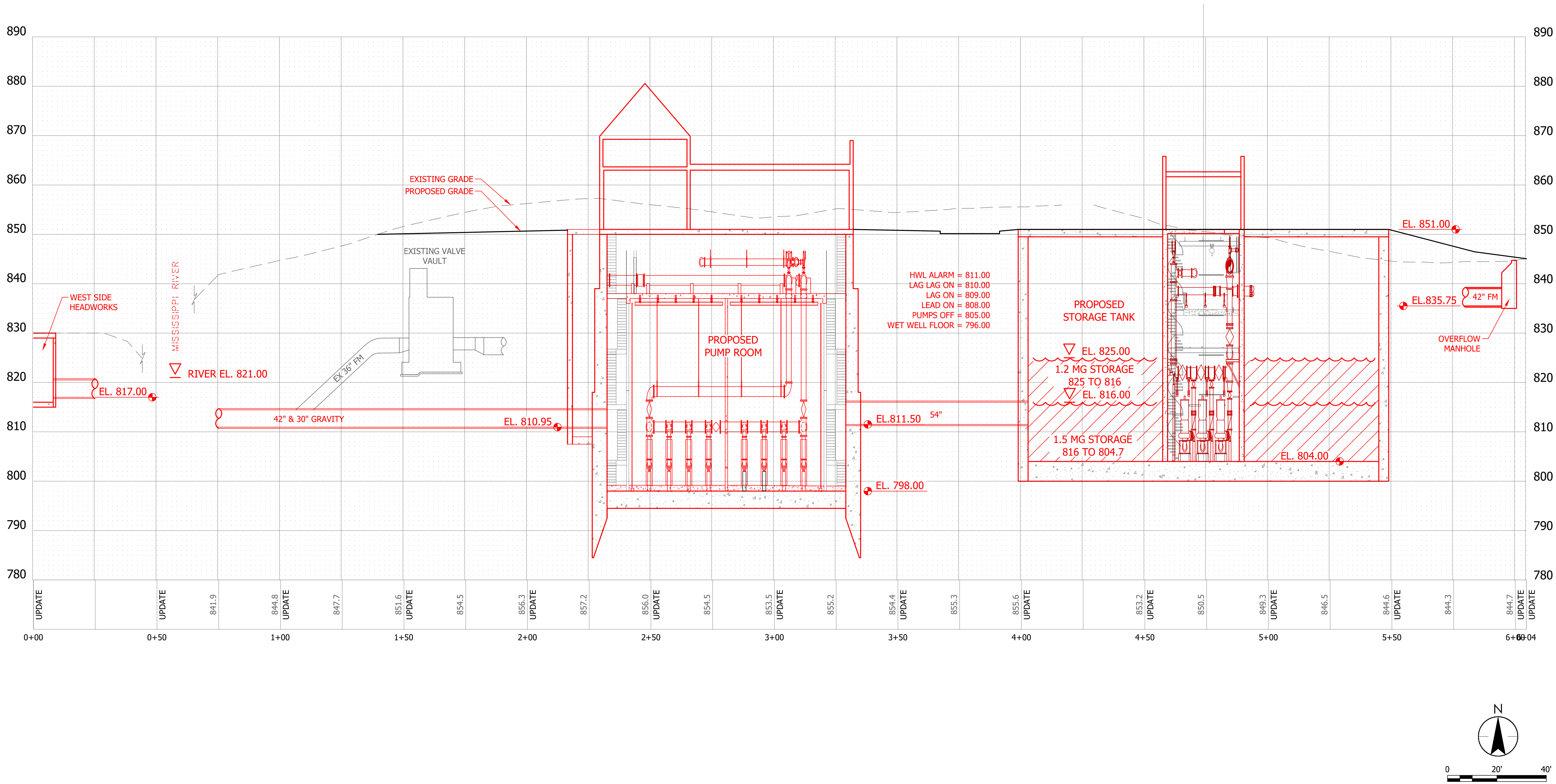
FIGURE C10B



EAST SIDE LIFT STATION OPTION C - PROFILE

L32 RIVER CROSSING

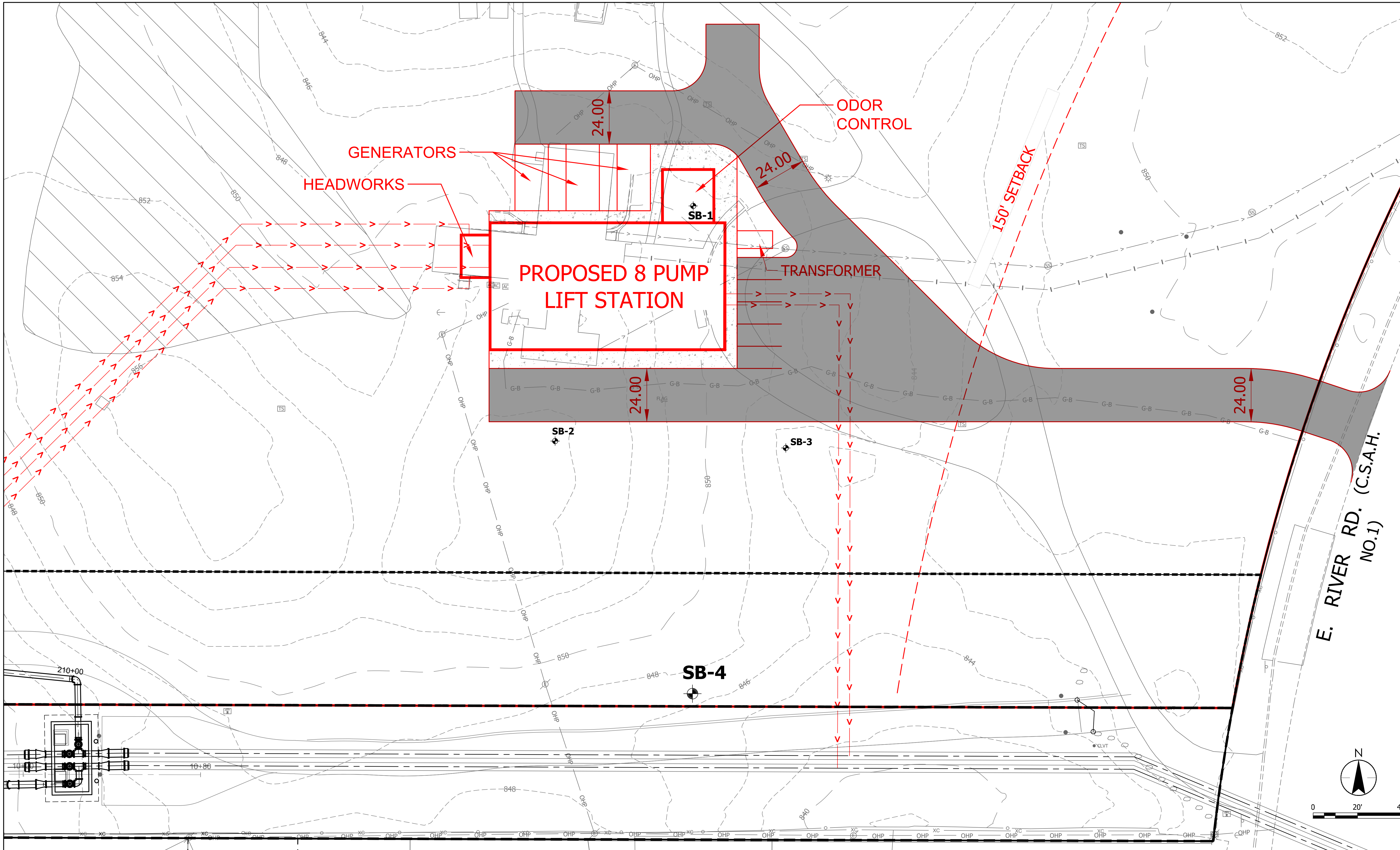
FIGURE C10C



EAST SIDE LIFT STATION OPTION C - PROFILE

L32 RIVER CROSSING

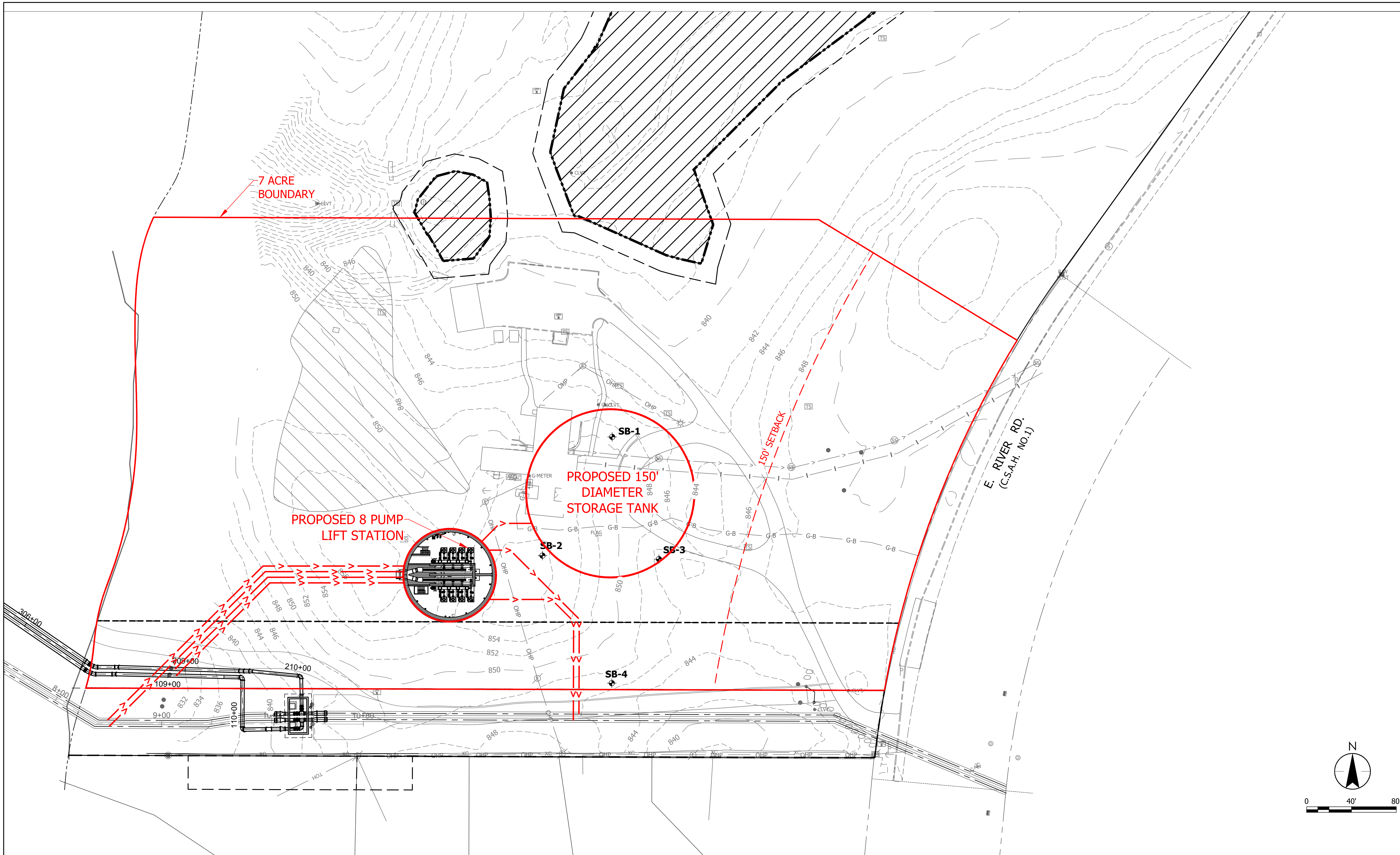
FIGURE C10D



EAST SIDE LIFT STATION OPTION C - ABOVE GRADE PLAN

L32 RIVER CROSSING

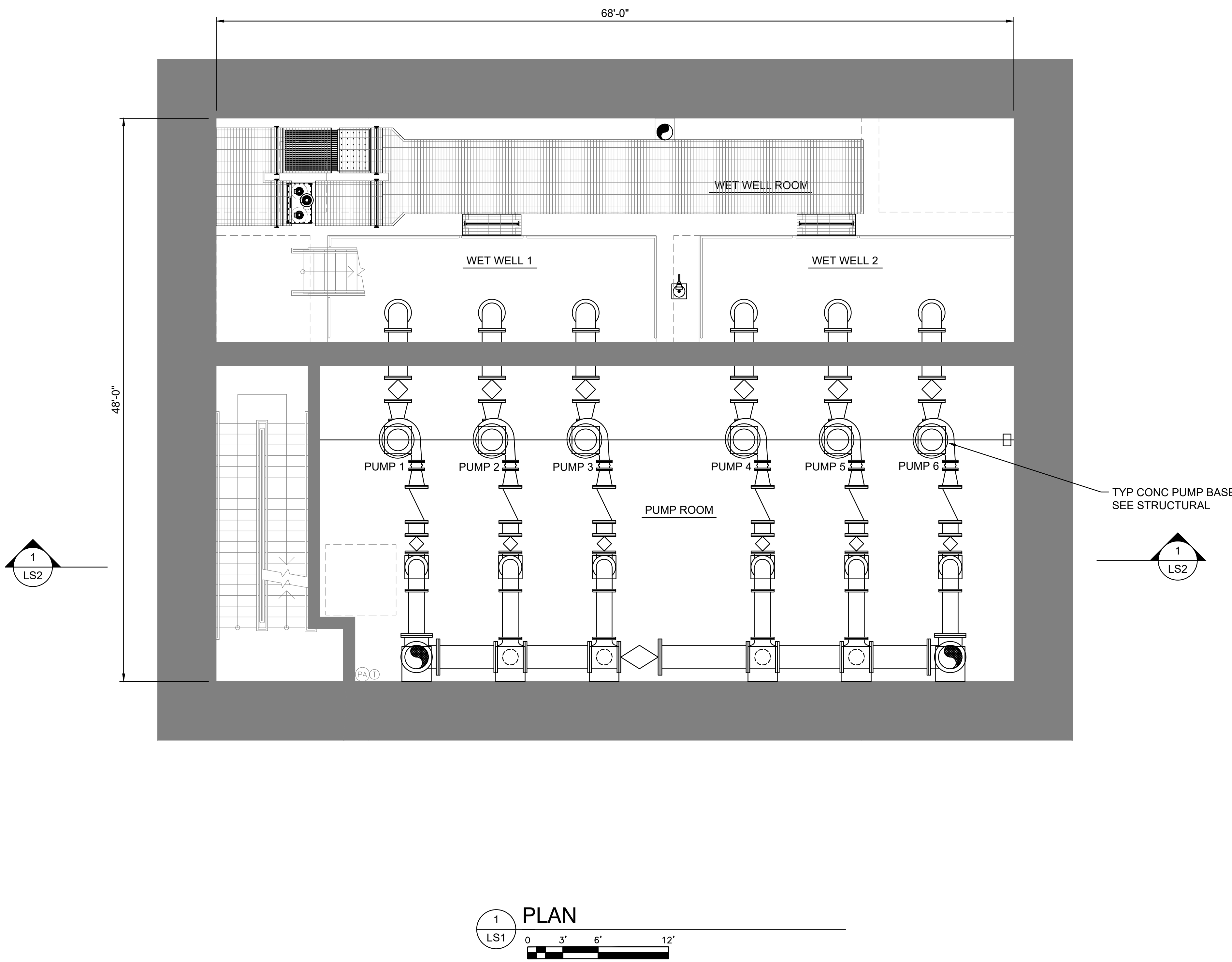
FIGURE C10E



EAST SIDE LIFT STATION OPTION D

L32 RIVER CROSSING

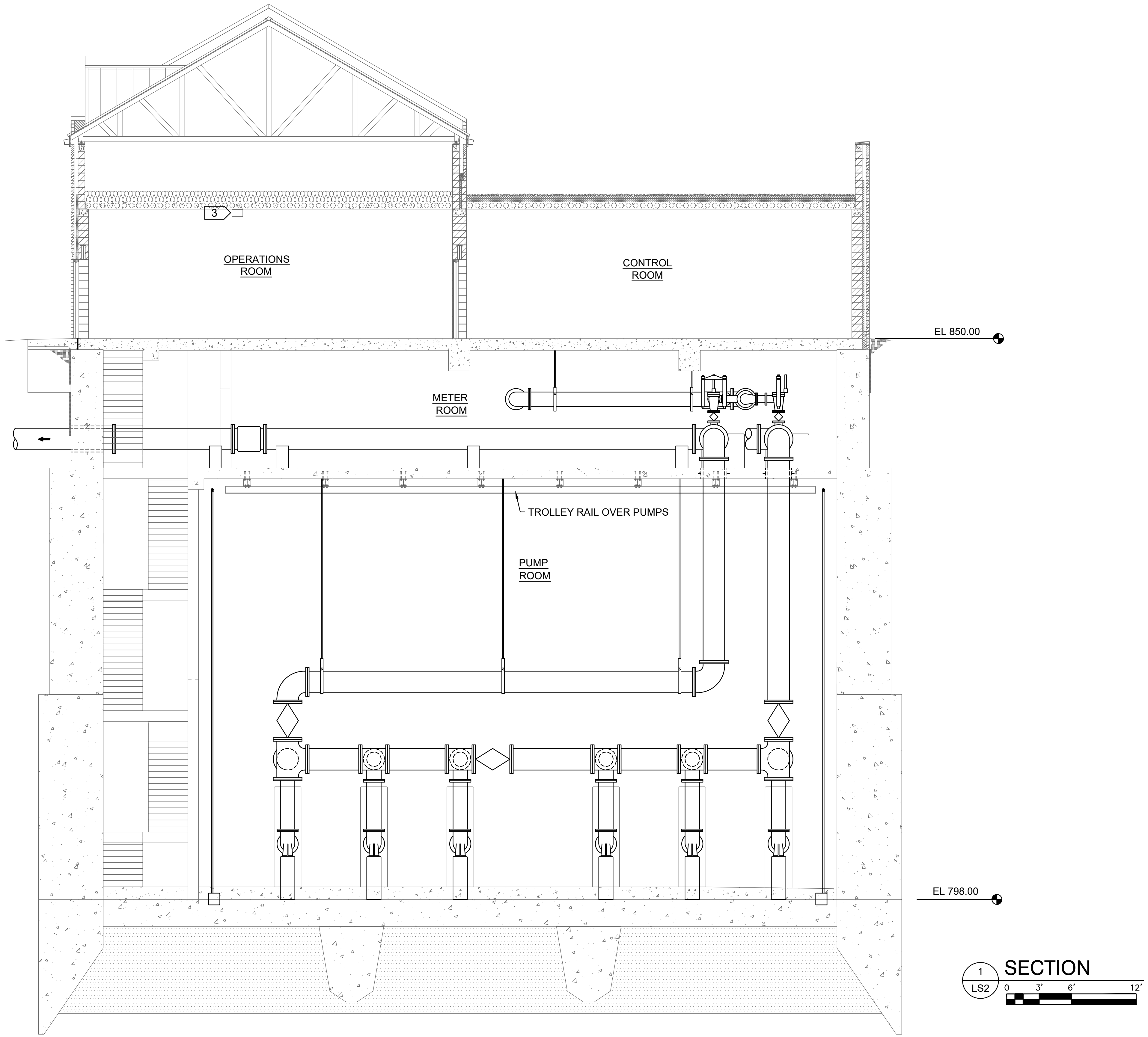
FIGURE C11



OPTION A: SIX PUMP PLAN

L32 RIVER CROSSING

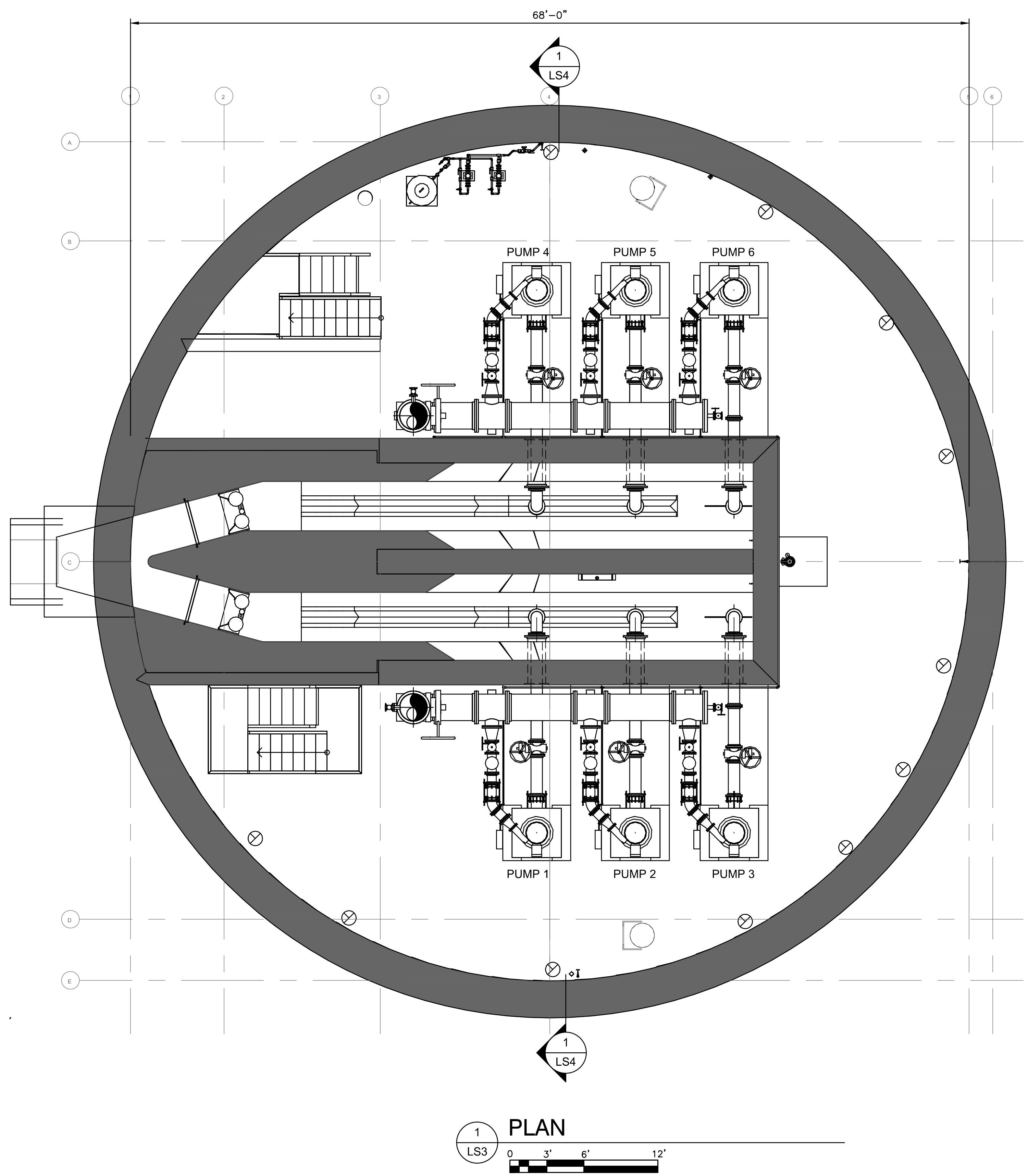
FIGURE LS1



OPTION A: SIX PUMP SECTION

L32 RIVER CROSSING

FIGURE LS2

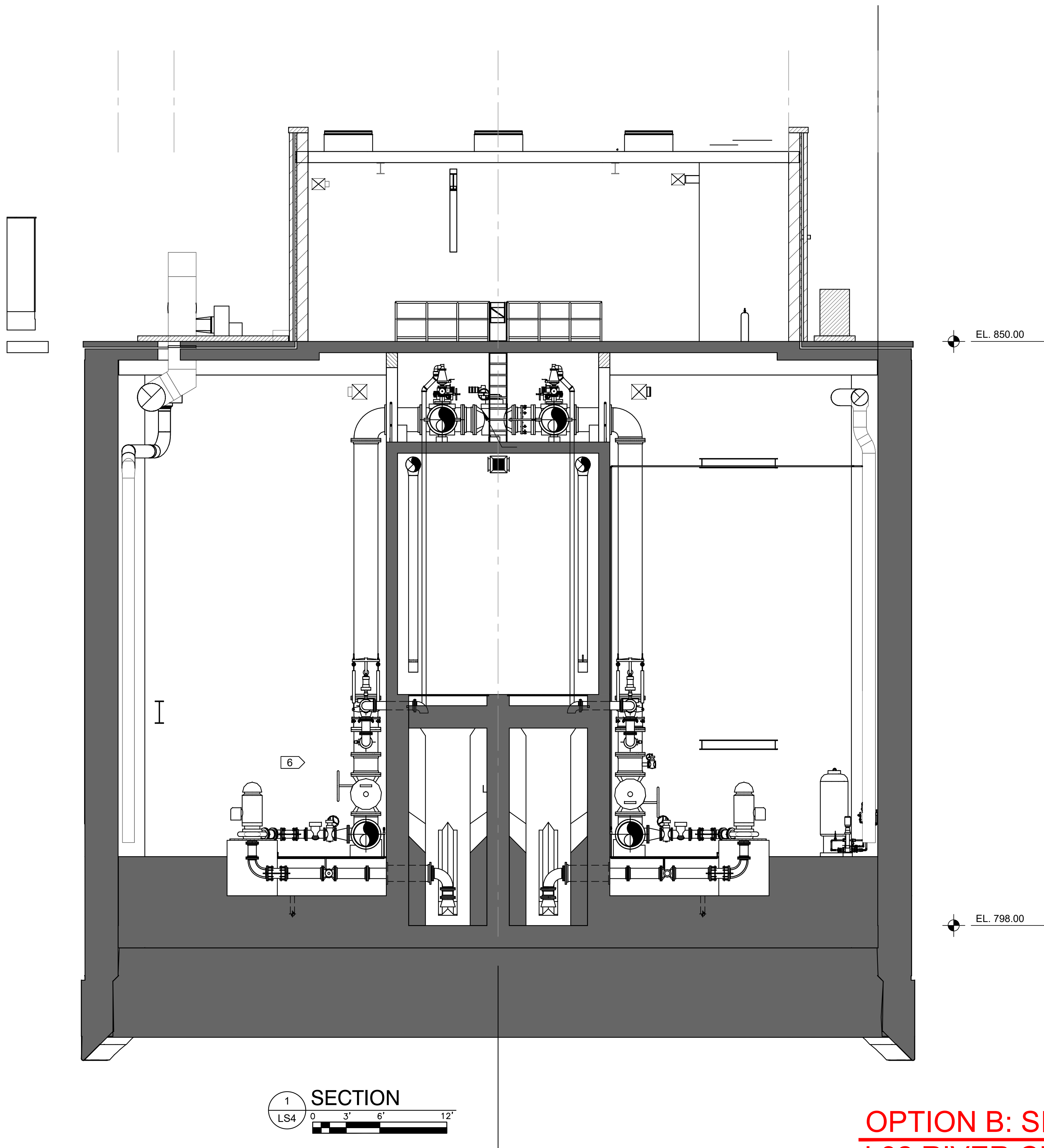


1 LS3 PLAN

OPTION B: SIX PUMP PLAN

L32 RIVER CROSSING

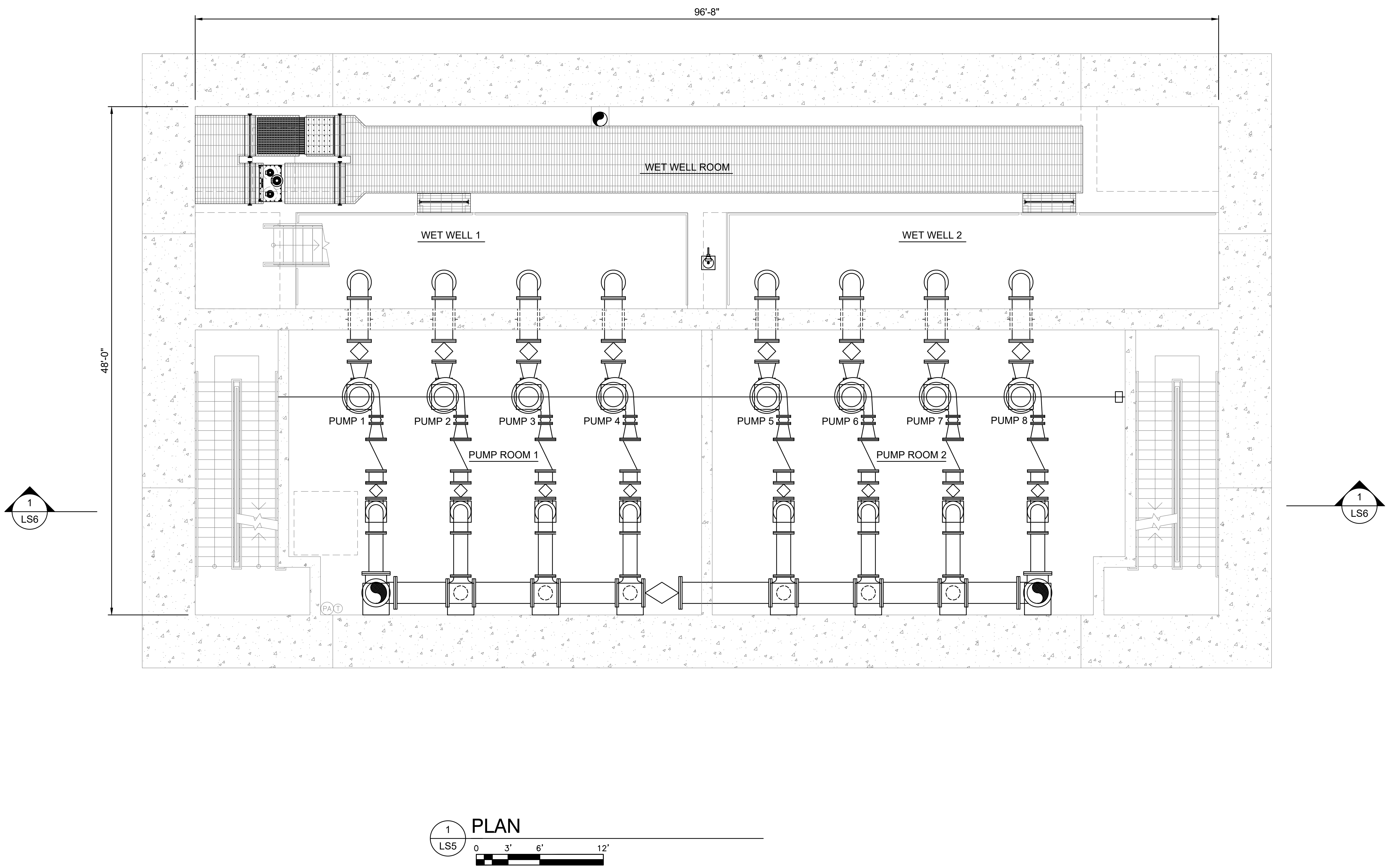
FIGURE LS3



OPTION B: SIX PUMP SECTION

L32 RIVER CROSSING

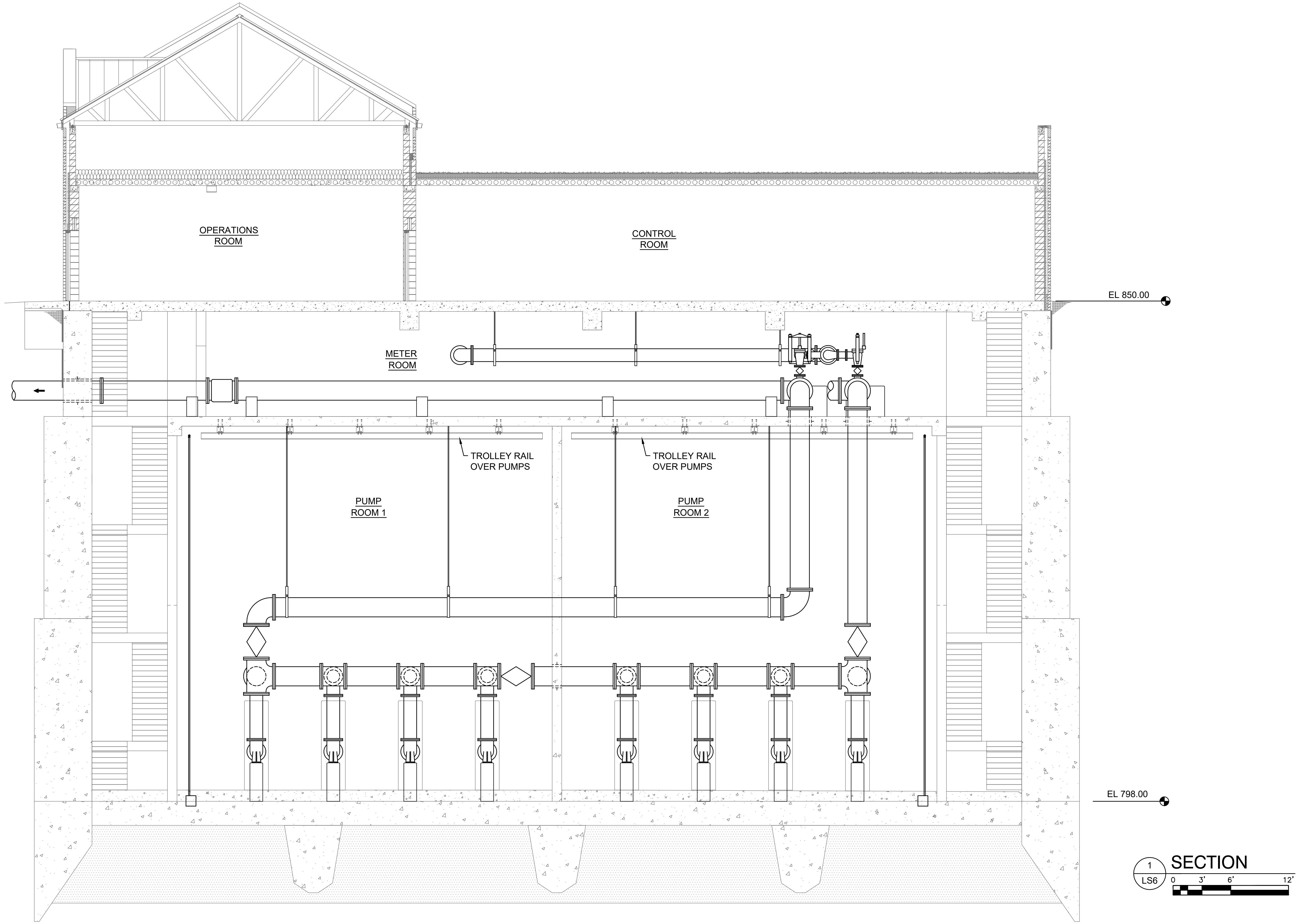
FIGURE LS4



OPTION C: EIGHT PUMP PLAN

L32 RIVER CROSSING

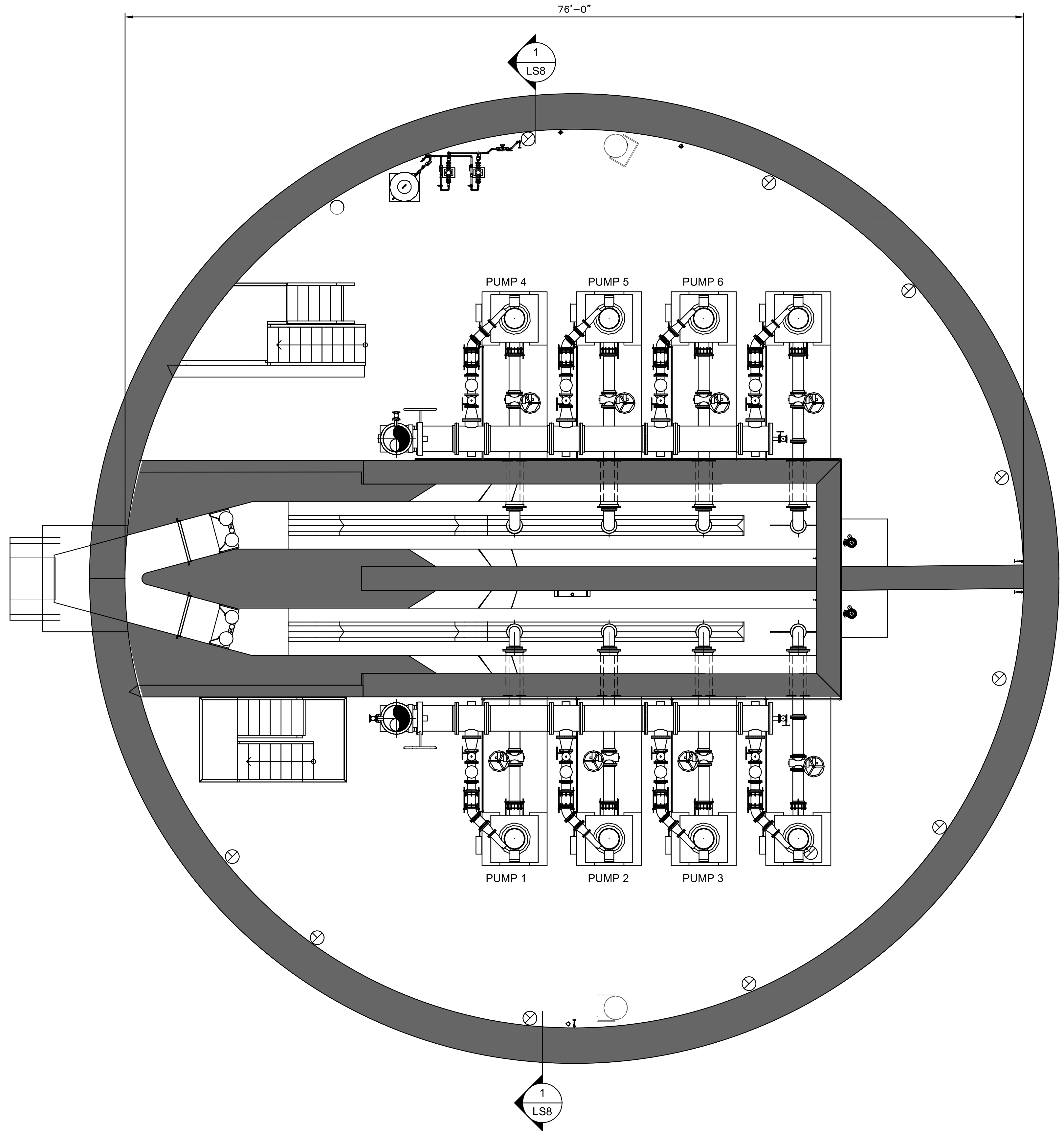
FIGURE LS5



OPTION C: EIGHT PUMP SECTION

L32 RIVER CROSSING

FIGURE LS6



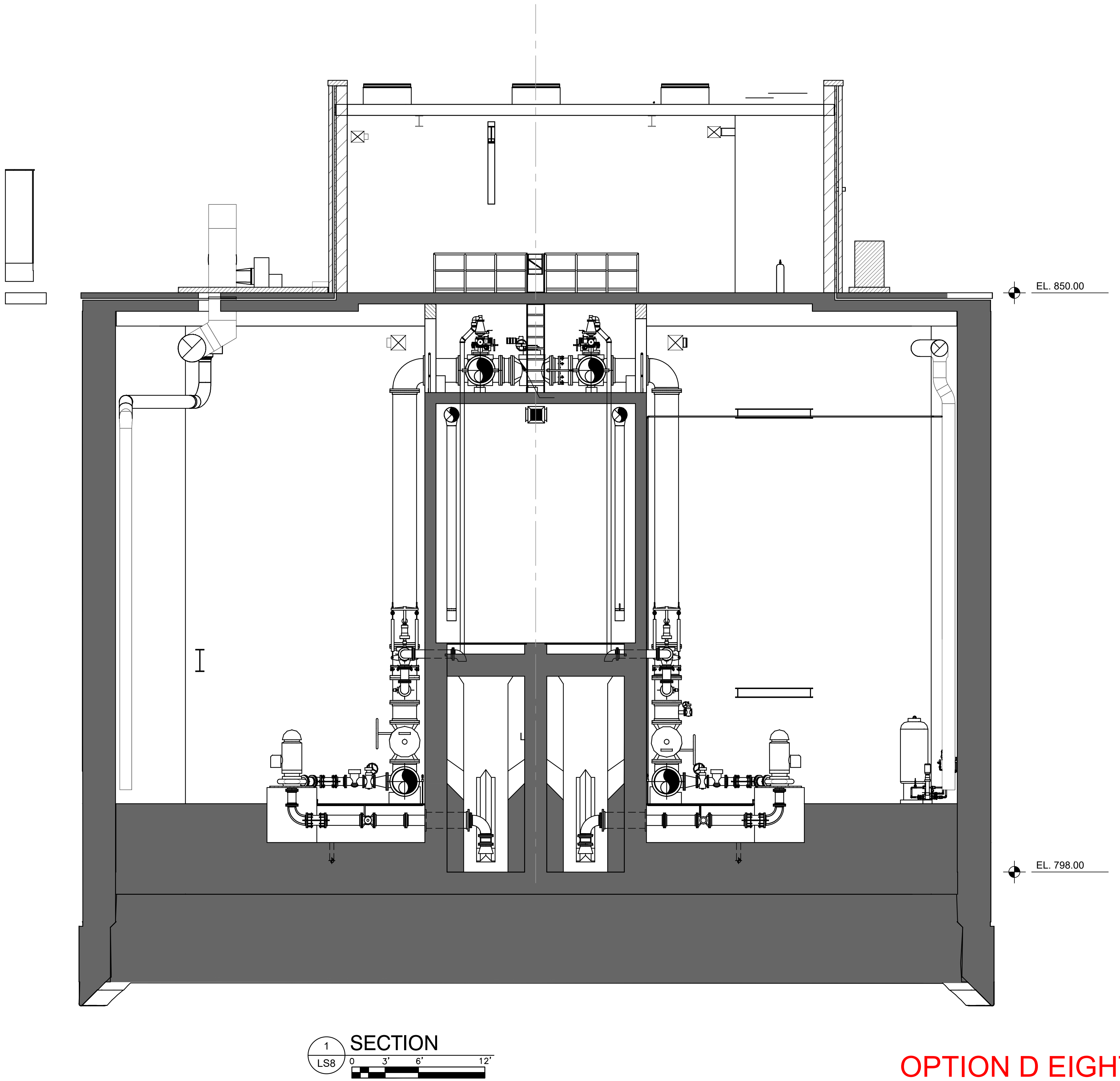
1 LS7 PLAN

0 3' 6' 12'

OPTION D: EIGHT PUMP PLAN

L32 RIVER CROSSING

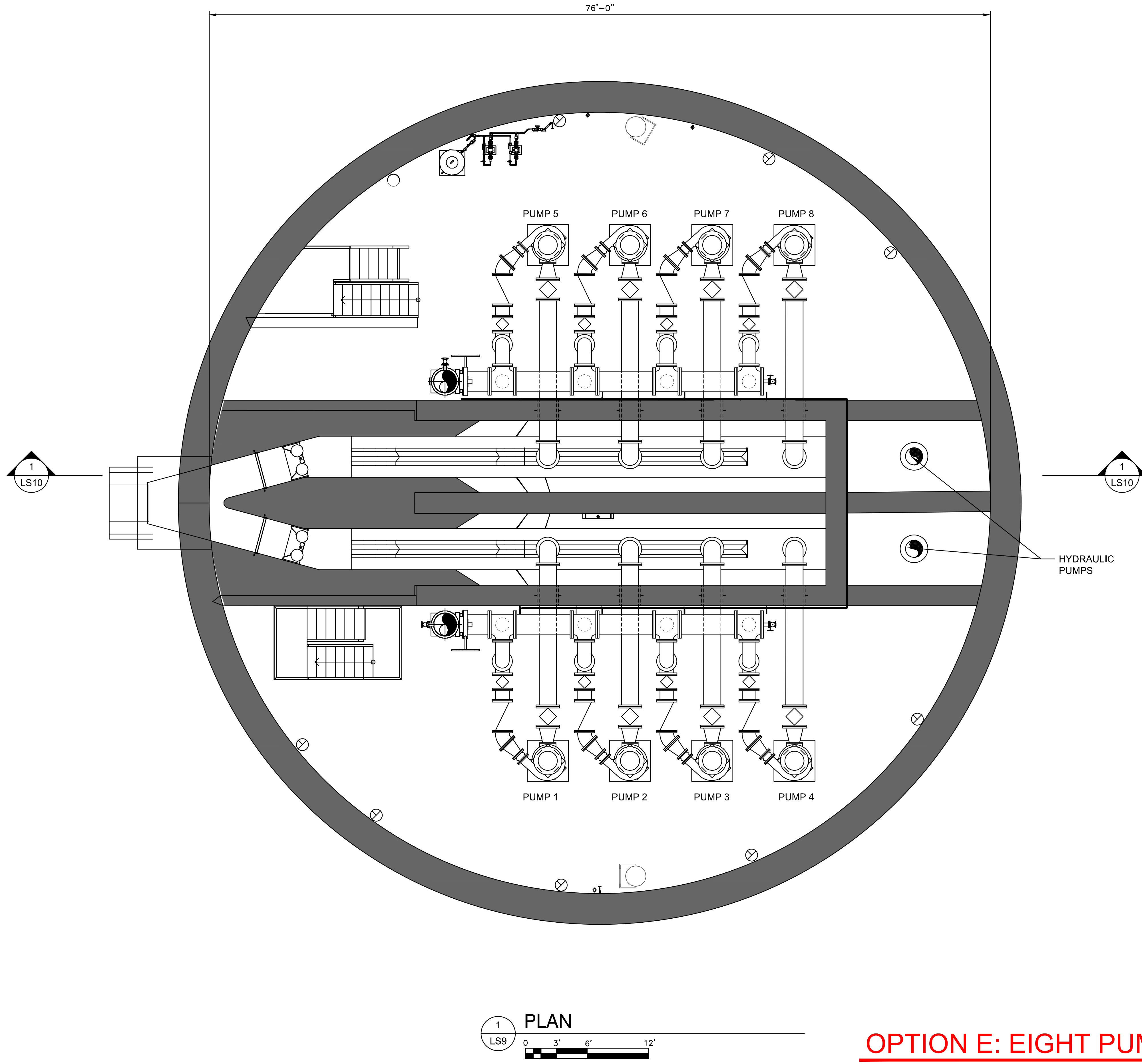
FIGURE LS7



OPTION D EIGHT PUMP SECTION

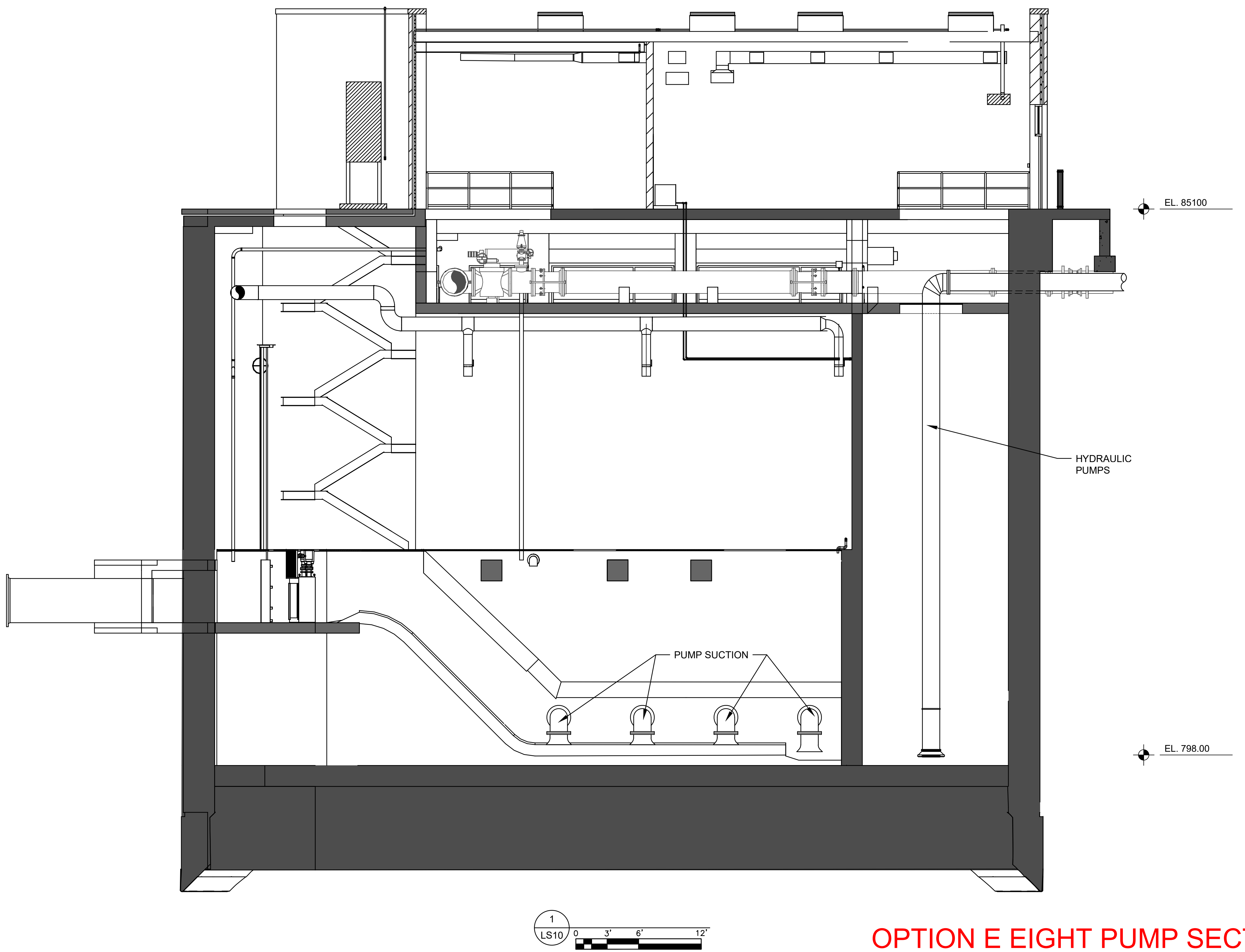
L32 RIVER CROSSING

FIGURE LS8



OPTION E: EIGHT PUMP PLAN W/ (2) HYDRAULIC PUMPS

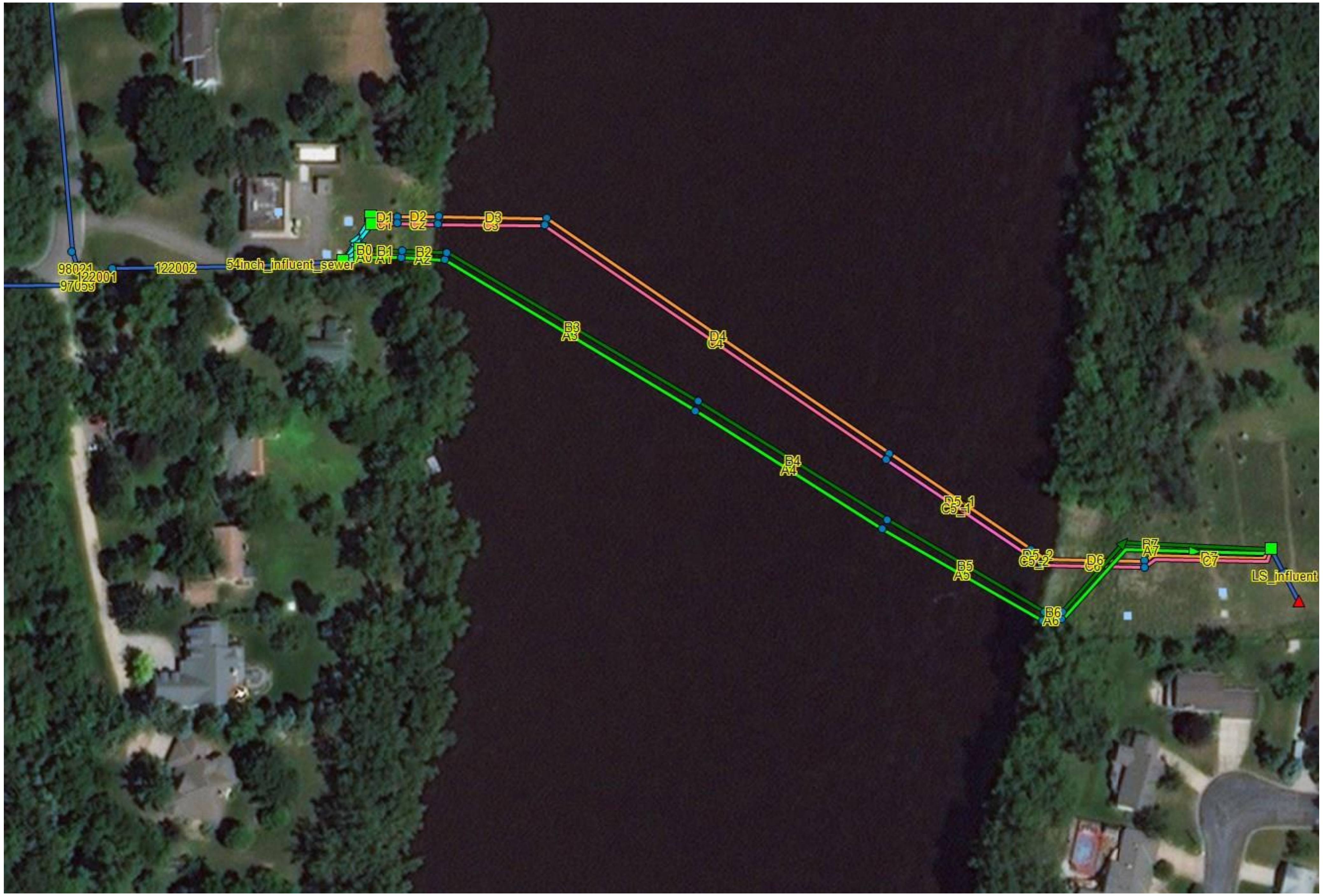
FIGURE LS9



OPTION E EIGHT PUMP SECTION W/ (2) HYDRAULIC PUMPS

FIGURE LS10

APPENDIX B – SIPHON ANALYSIS MAX FLOW FIGURES



Name	Inlet Node	Outlet Node	Size	Length (ft)
54inch_influent_sewer	1220020	INLET_0	54in	98.8
A0	INLET_A	A-00	30in	9.0
A1	A-00	A-01	30in	30.9
A2	A-01	A-02	30in	42.6
A3	A-02	A-03	30in	282.0
A4	A-03	A-04	30in	213.6
A5	A-04	A-05	30in	177.7
A6	A-05	A-06	30in	18.7
A7	A-06	Wetwell	30in	233.1
B0	INLET_B	B-00	30in	9.4
B1	B-00	B-01	30in	31.5
B2	B-01	B-02	30in	43.8
B3	B-02	B-03	30in	282.0
B4	B-03	B-04	30in	214.9
B5	B-04	B-05	30in	175.3
B6	B-05	B-06	30in	17.2
B7	B-06	Wetwell	30in	232.2
C1	INLET_C	C-01	42in	25.4
C2	C-01	C-02	42in	38.8
C3	C-02	C-03	42in	103.2
C4	C-03	C-04	42in	400.1
C5_1	C-04	J-02	42in	166.0
C5_2	J-02	C-05	36in	14.8
C6	C-05	C-06	36in	98.8
C7	C-06	Wetwell	36in	133.3
D1	INLET_D	D-01	42in	26.0
D2	D-01	D-02	42in	39.5
D3	D-02	D-03	42in	104.9
D4	D-03	D-04	42in	400.6
D5_1	D-04	J-01	42in	165.0
D5_2	J-01	D-05	36in	16.6
D6	D-05	D-06	36in	95.8
D7	D-06	Wetwell	36in	128.0

Stantec

Date: April 30, 2020

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure	Title
0	**Model Overview**

Option	1A	1B	2	3	4	5
Barrel A	30	30	24	30	30	
Barrel B	30	30	30	30	30	
Barrel C				30		42
Barrel D	42	42	42	30	30	42
Capacity*	76 MGD	76 MGD	68 MGD	75 MGD	57 MGD	74 MGD

Yellow Highlight indicates Primary Barrel

Flows (MGD)

Option	1A	1B	2	3	4	5
Barrel A	14.6	18.7	11.2	19.0	20.8	0.0
Barrel B	18.5	16.0	19.5	19.4	21.1	0.0
Barrel C	0.0	0.0	0.0	10.4	0.0	32.6
Barrel D	34.5	33.0	36.5	18.8	21.2	35.1
Total	67.6	67.6	67.2	67.6	63.1	67.6

Velocity (fts)

Option	1A	1B	2	3	4	5
Barrel A	4.6	5.9	5.5	6.0	6.6	0.0
Barrel B	5.8	5.0	6.1	6.1	6.6	0.0
Barrel C	0.0	0.0	0.0	3.3	0.0	5.2
Barrel D	5.6	5.3	5.9	5.9	6.7	5.6

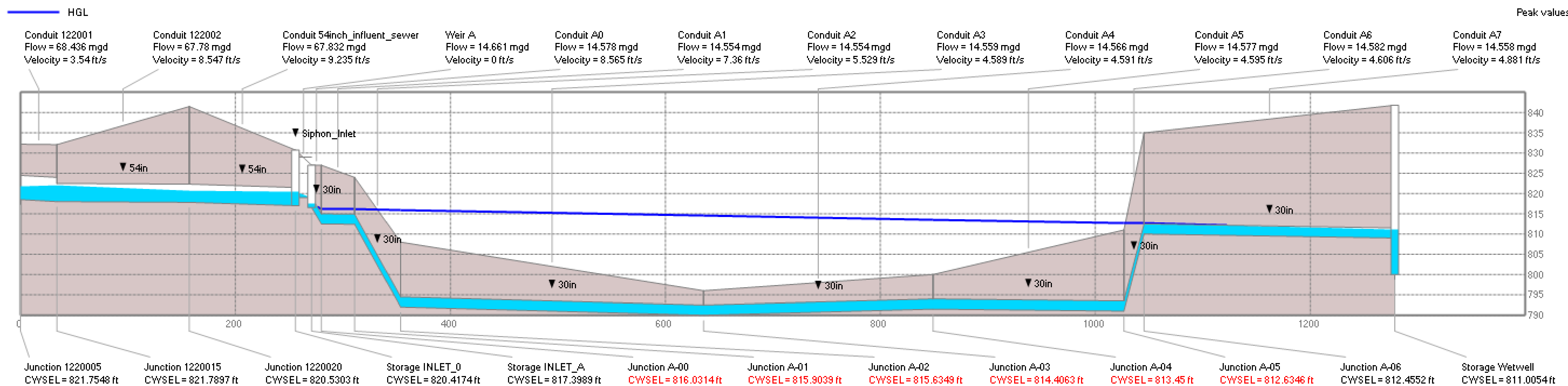
** Capacity based on max flow in upstream 54" Sewer before surcharging occurs*

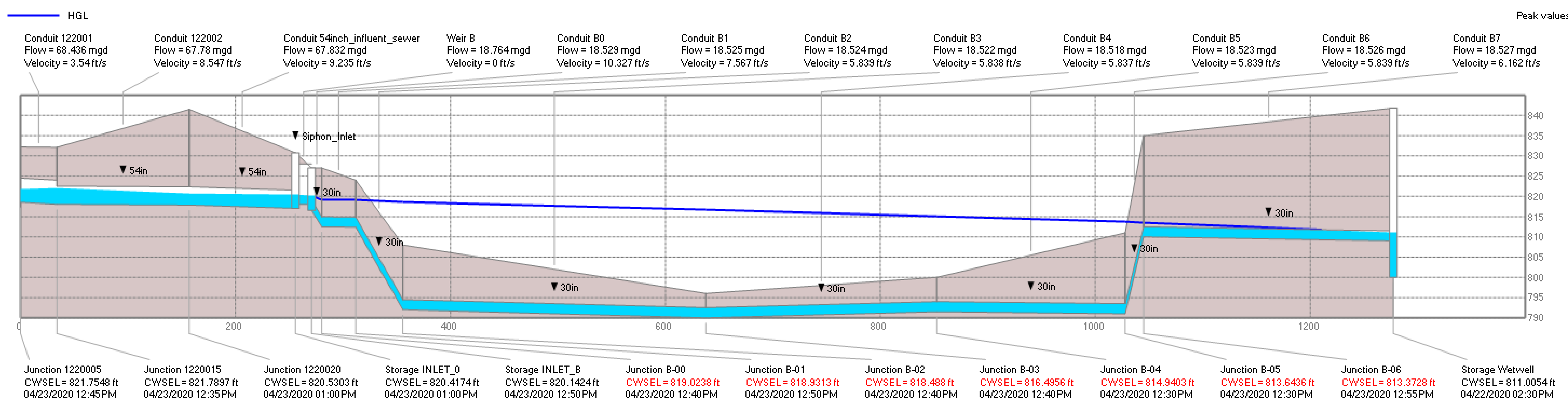
Stantec

Date: April 30, 2020

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure 1
Title **Configuration Summary**





Stantec

Date: April 30, 2020

Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	2	62	5.8
Barrel B	30	1	37	5.4
Barrel C	42	Closed	0	0.0
Barrel D	42	0	18	5.2

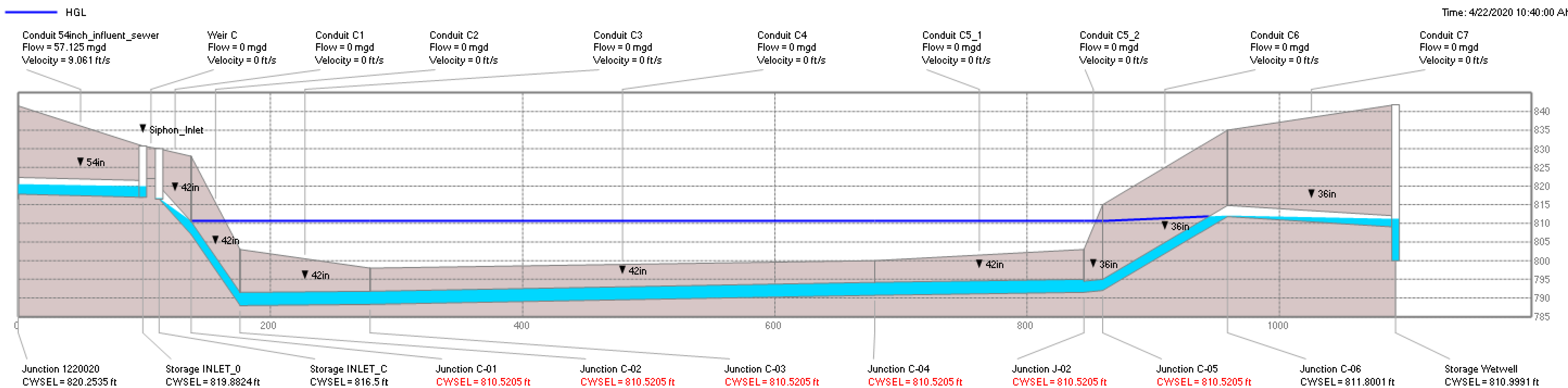
Sufficient Capacity for 67 MGD

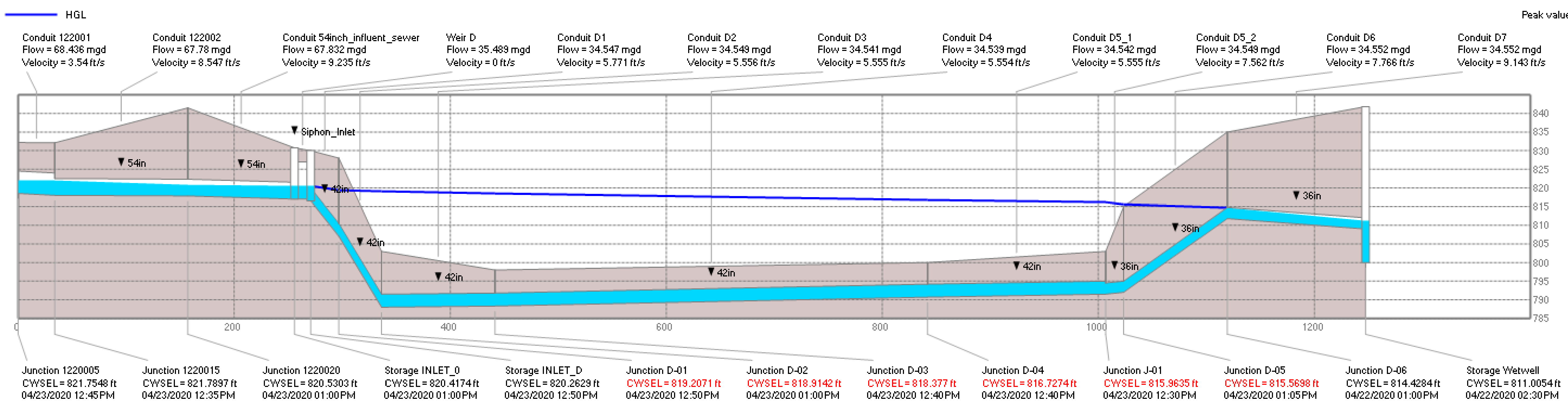
Velocity for Barrel A meets minimum only > 60 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure: 2

Title: **Hydraulic Gradeline Profile – Option 1A Barrels A & B**





Stantec

Date: April 30, 2020

Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	2	62	5.8
Barrel B	30	1	37	5.4
Barrel C	42	Closed	0	0.0
Barrel D	42	0	18	5.2

Sufficient Capacity for 67 MGD

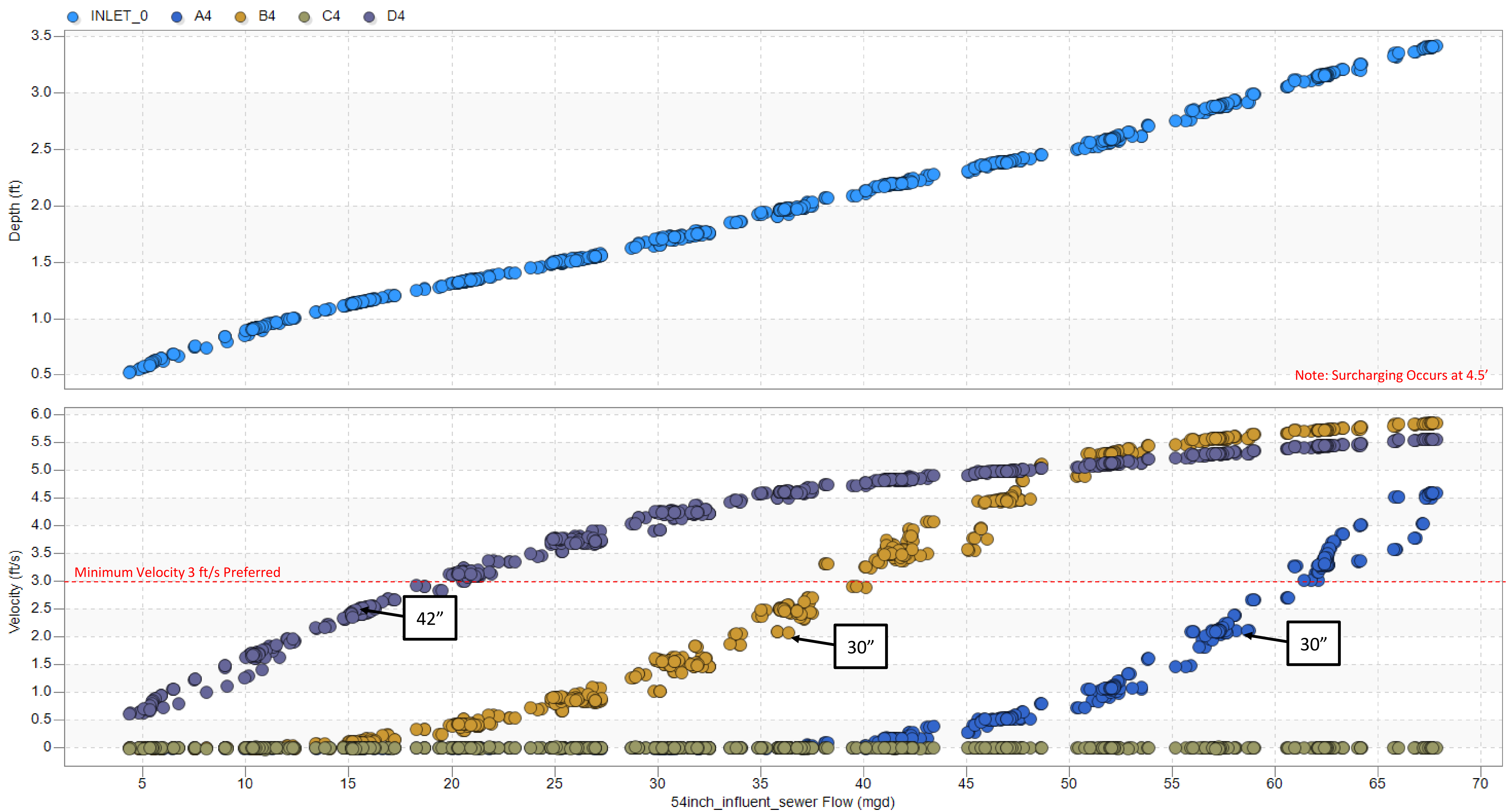
Velocity for Barrel A meets minimum only > 60 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure 3

Title

Hydraulic Gradeline Profile – Option 1A
Barrels C & D



Stantec

Date: April 30, 2020

Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	2	62	5.8
Barrel B	30	1	37	5.4
Barrel C	42	Closed	0	0.0
Barrel D	42	0	18	5.2

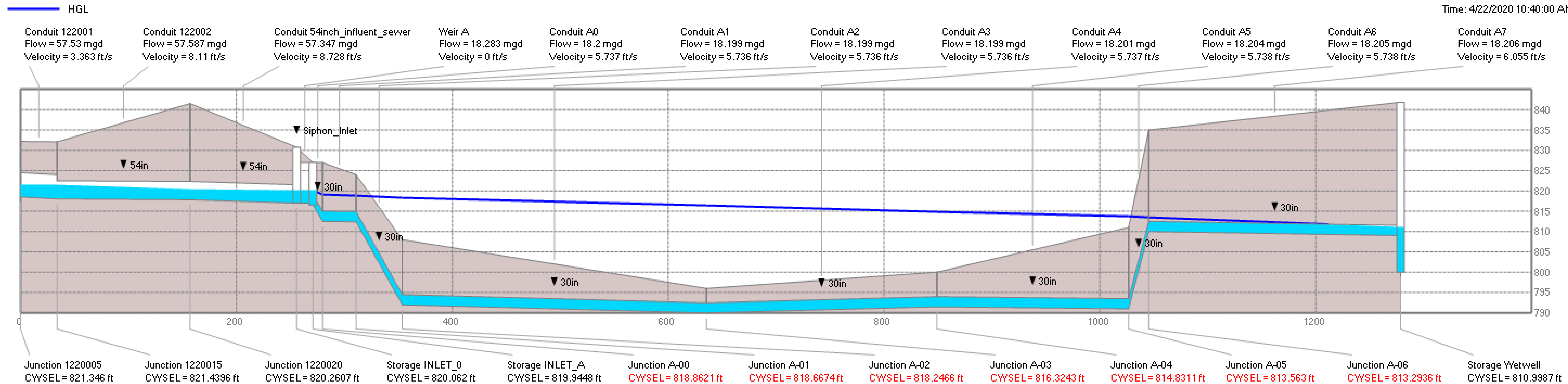
Sufficient Capacity for 67 MGD

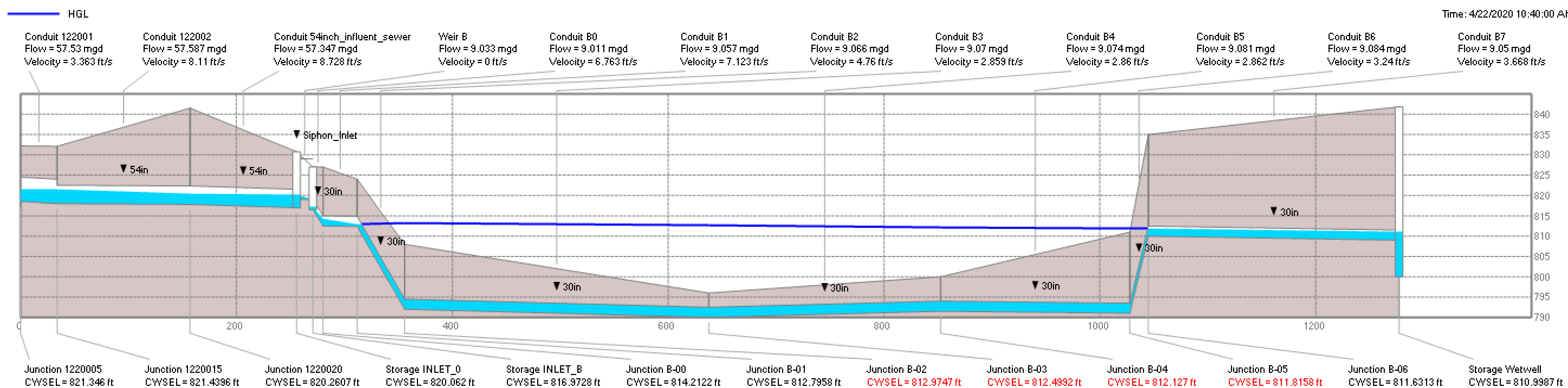
Velocity for Barrel A meets minimum only > 60 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure 4

Title **Siphon Velocity Curve – Option 1A**





Stantec

Date: April 30, 2020

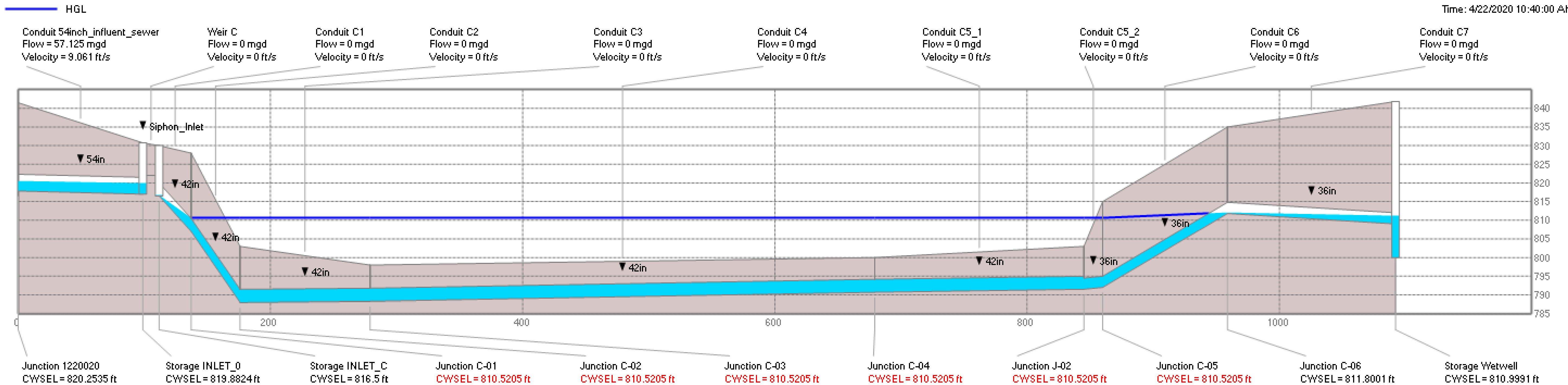
Option	Diameter	Weir Height	Q (MGD) @ 3ft/s	V (ft/s) @ 67 MGD
Barrel A	30	0	10	5.9
Barrel B	30	2	58	5.0
Barrel C	42	Closed	0	0.0
Barrel D	42	1	38	5.3

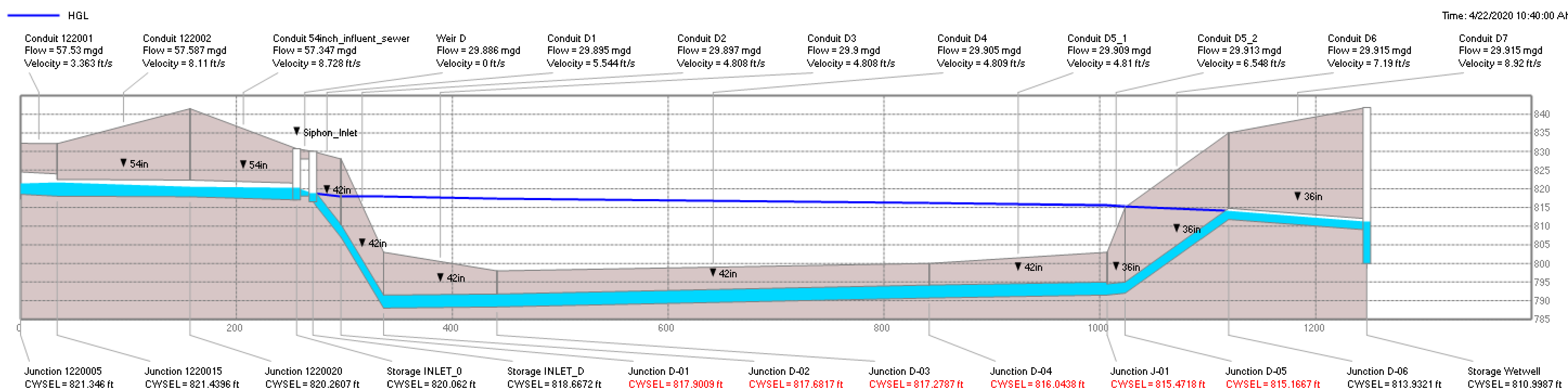
Sufficient Capacity for 67 MGD

Velocity for Barrel B meets minimum only > 58 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure	Title
5	**Hydraulic Gradeline Profile – Option 1B Barrels A & B**





Stantec

Date: April 30, 2020

Option	Diameter	Weir Height	Q (MGD) @ 3ft/s	V (ft/s) @ 67 MGD
Barrel A	30	0	10	5.9
Barrel B	30	2	58	5.0
Barrel C	42	Closed	0	0.0
Barrel D	42	1	38	5.3

Sufficient Capacity for 67 MGD

Velocity for Barrel B meets minimum only > 58 MGD

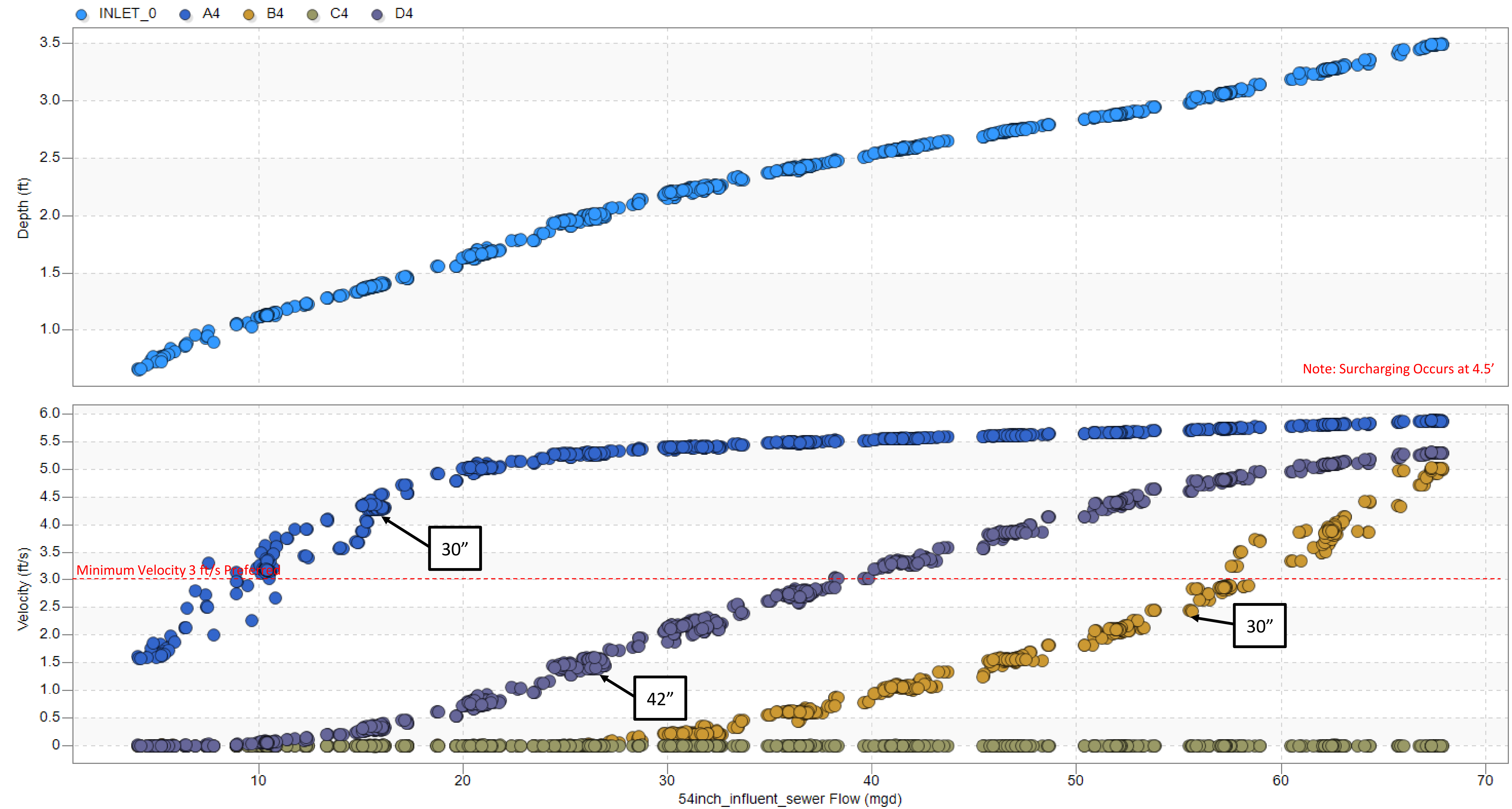
Client/Project

Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure 6

Title

Hydraulic Gradeline Profile – Option 2 Barrels C & D



Stantec

Date: April 30, 2020

Option	Diameter	Weir Height	Q (MGD) @ 3ft/s	V (ft/s) @ 67 MGD
Barrel A	30	0	10	5.9
Barrel B	30	2	58	5.0
Barrel C	42	Closed	0	0.0
Barrel D	42	1	38	5.3

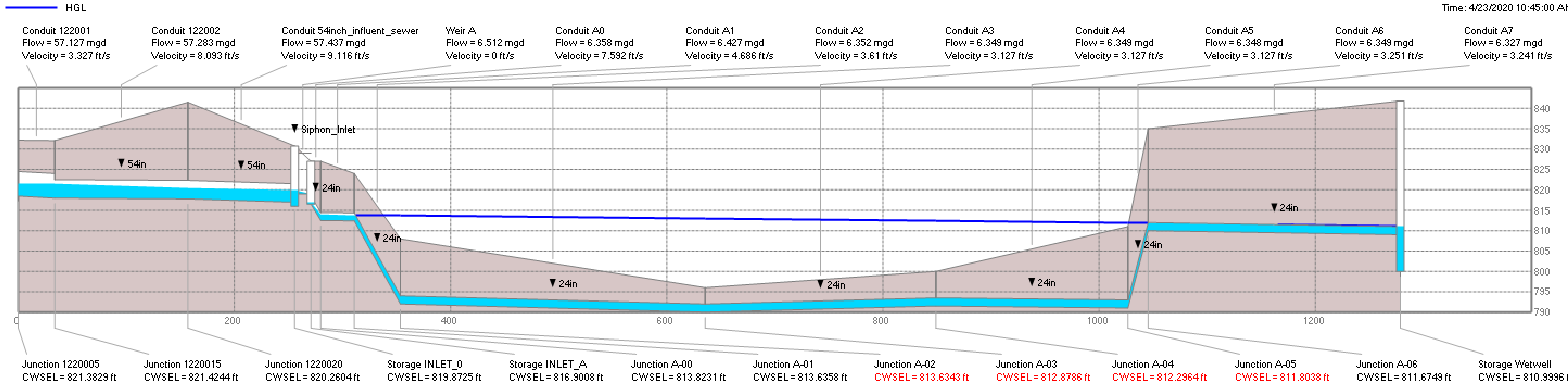
Sufficient Capacity for 67 MGD

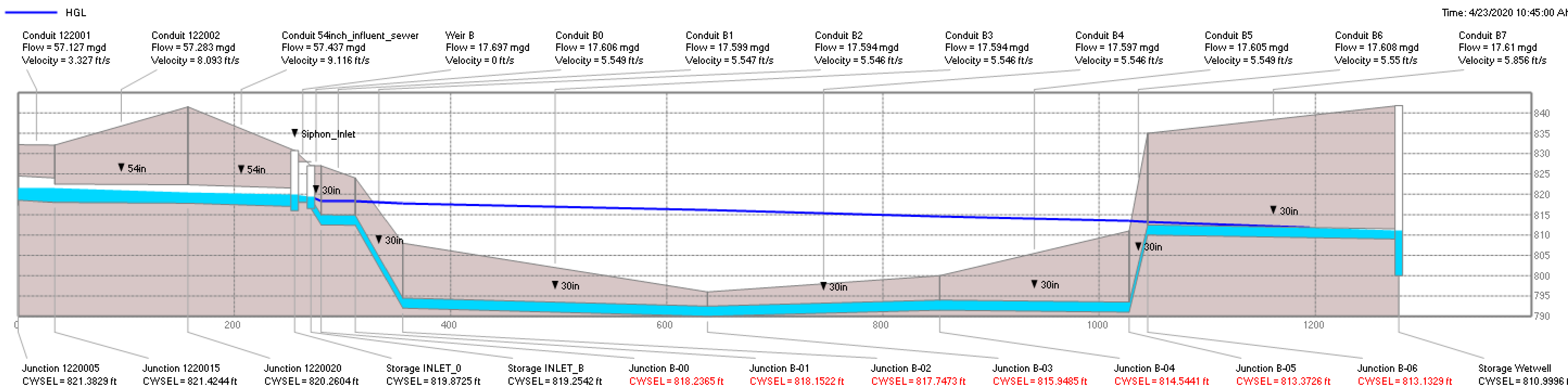
Velocity for Barrel B meets minimum only > 58 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure 7

Title **Siphon Velocity Curve – Option 1B**





Stantec

Date: April 30, 2020

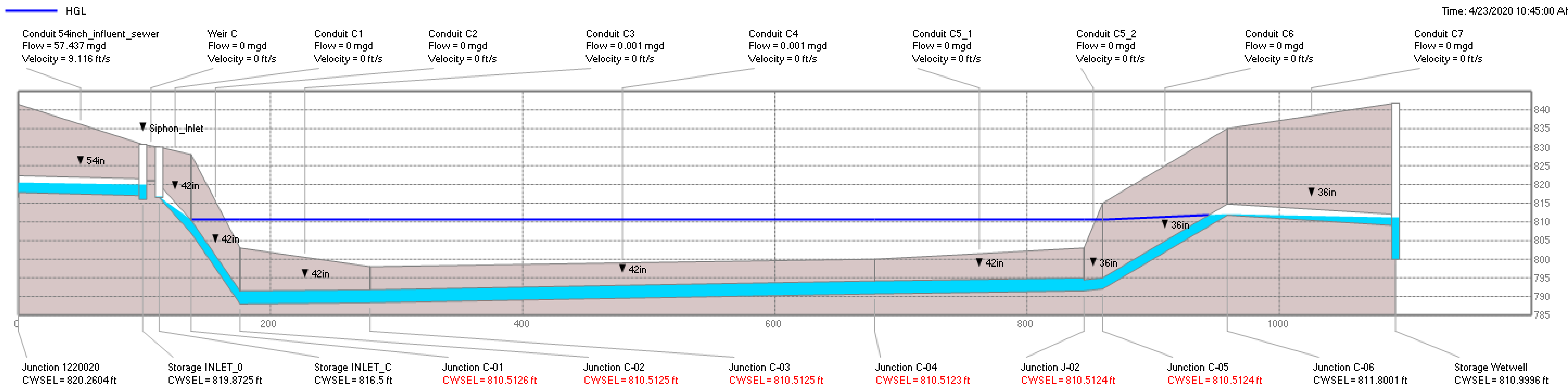
Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	24	2	57	5.5
Barrel B	30	1	37	6.1
Barrel C	42	Closed	0	0.0
Barrel D	42	0	18	5.9

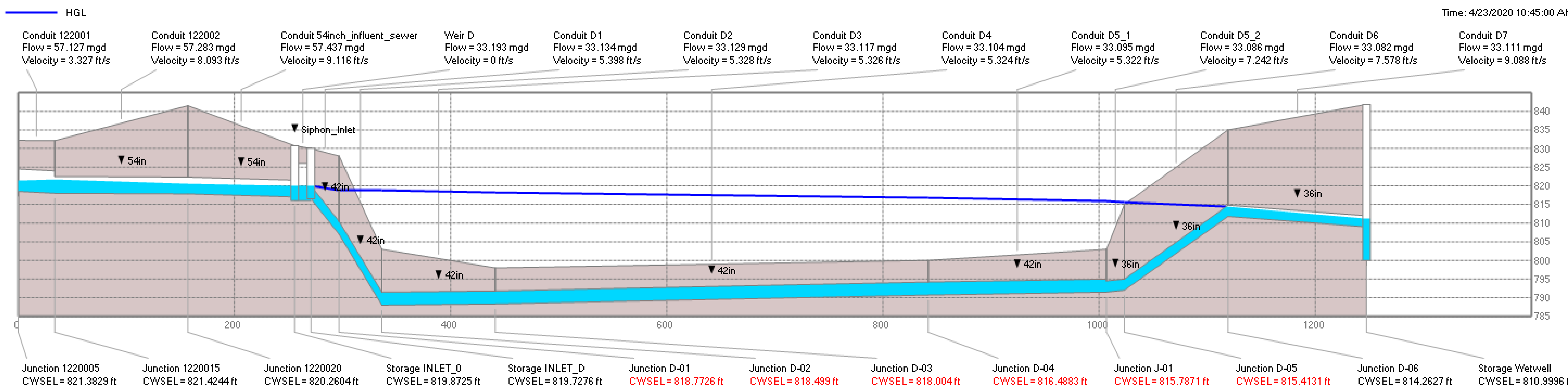
Sufficient Capacity for 67 MGD

Velocity for Barrel A meets minimum only > 57 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure	Title
8	**Hydraulic Gradeline Profile – Option 2 Barrels A & B**





Stantec

Date: April 30, 2020

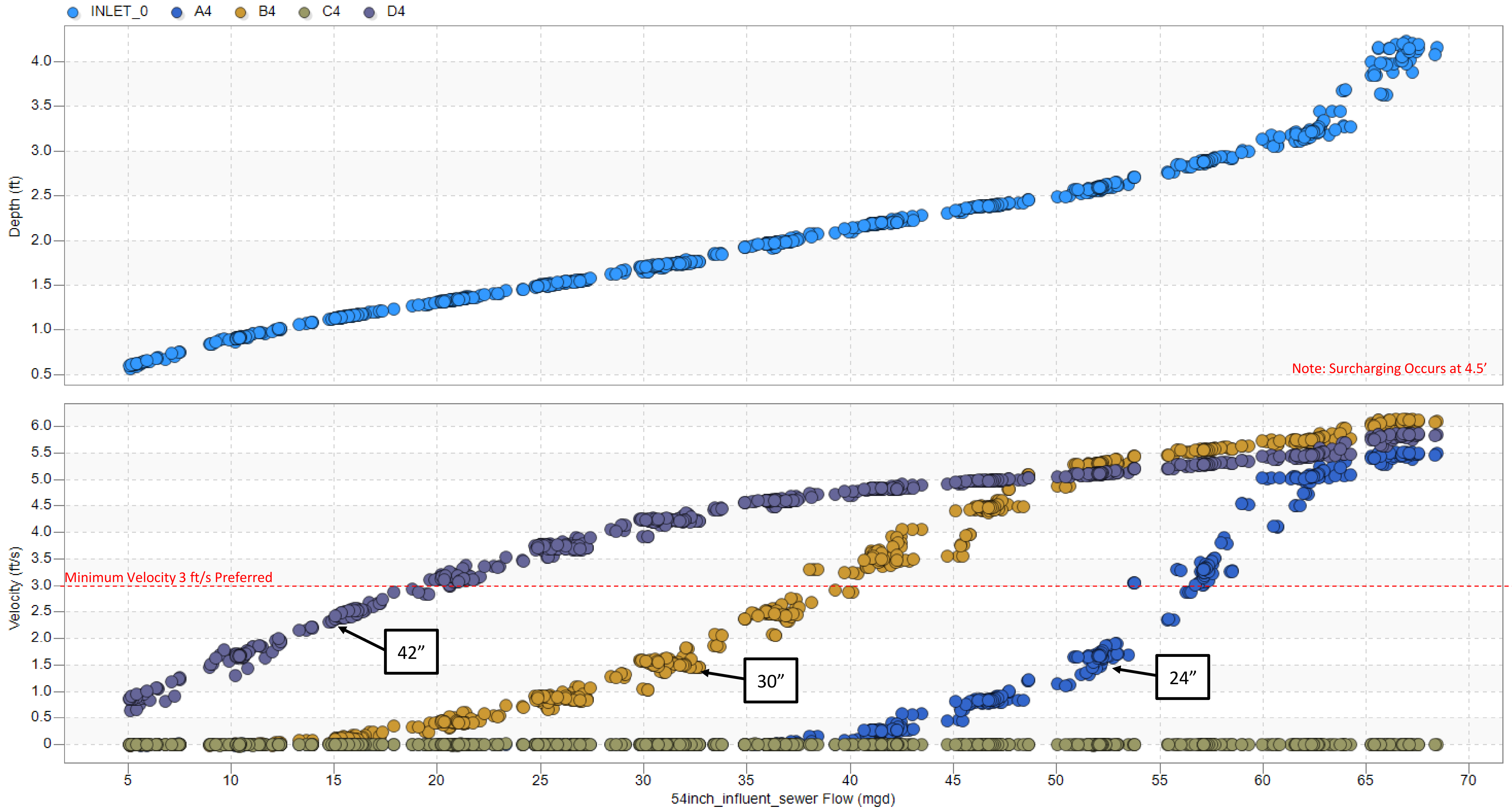
Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	24	2	57	5.5
Barrel B	30	1	37	6.1
Barrel C	42	Closed	0	0.0
Barrel D	42	0	18	5.9

Sufficient Capacity for 67 MGD

Velocity for Barrel A meets minimum only > 57 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure	Title
9	**Hydraulic Gradeline Profile – Option 2 Barrels C & D**



Stantec

Date: April 30, 2020

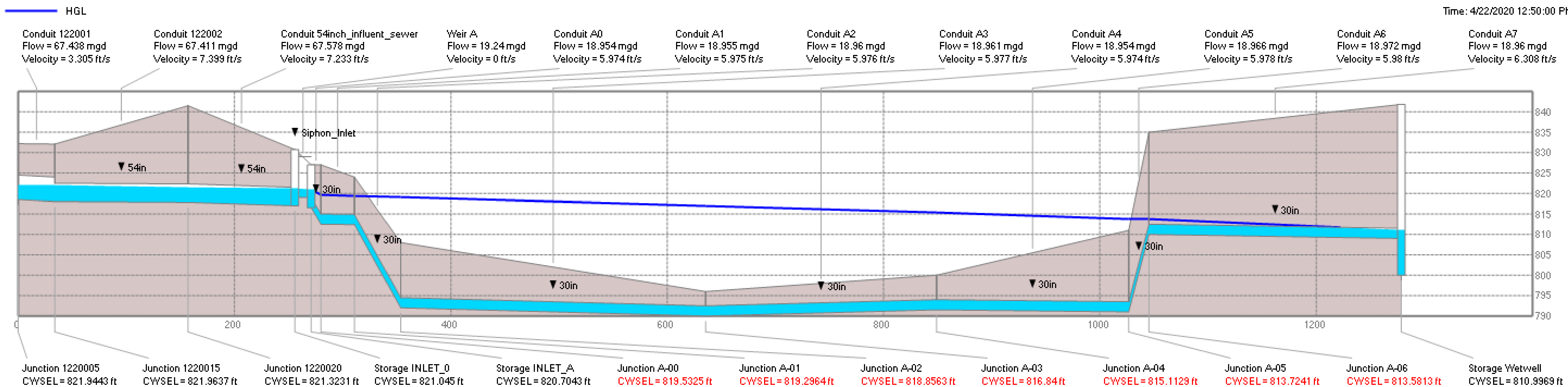
Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	24	2	57	5.5
Barrel B	30	1	37	6.1
Barrel C	42	Closed	0	0.0
Barrel D	42	0	18	5.9

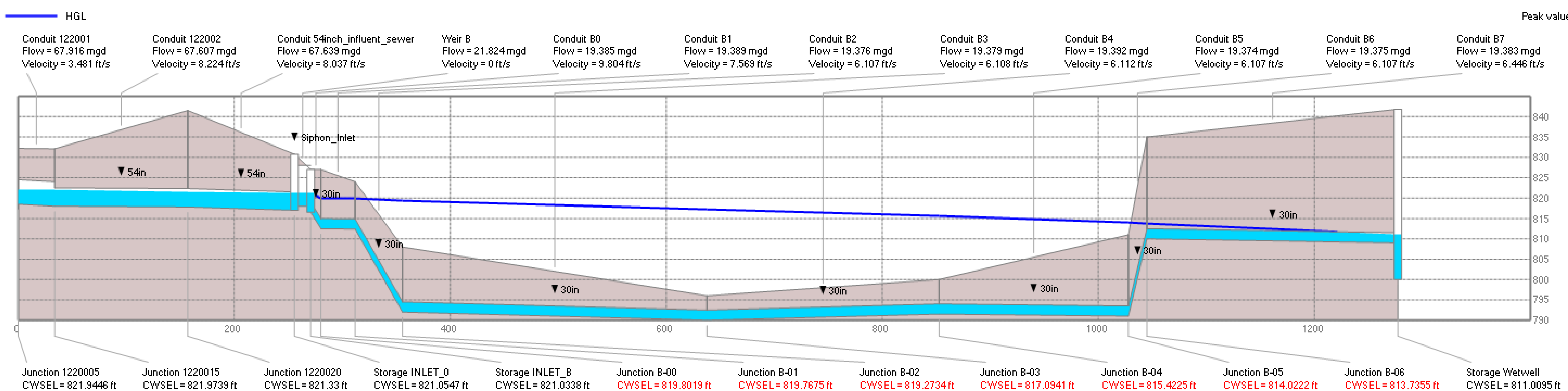
Sufficient Capacity for 67 MGD

Velocity for Barrel A meets minimum only > 57 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure: **10**
Title: **Siphon Velocity Curve – Option 2**





Stantec

Date: April 30, 2020

Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	2	46	6.0
Barrel B	30	1	25	6.1
Barrel C	30	3	65	3.3
Barrel D	30	0	10	5.9

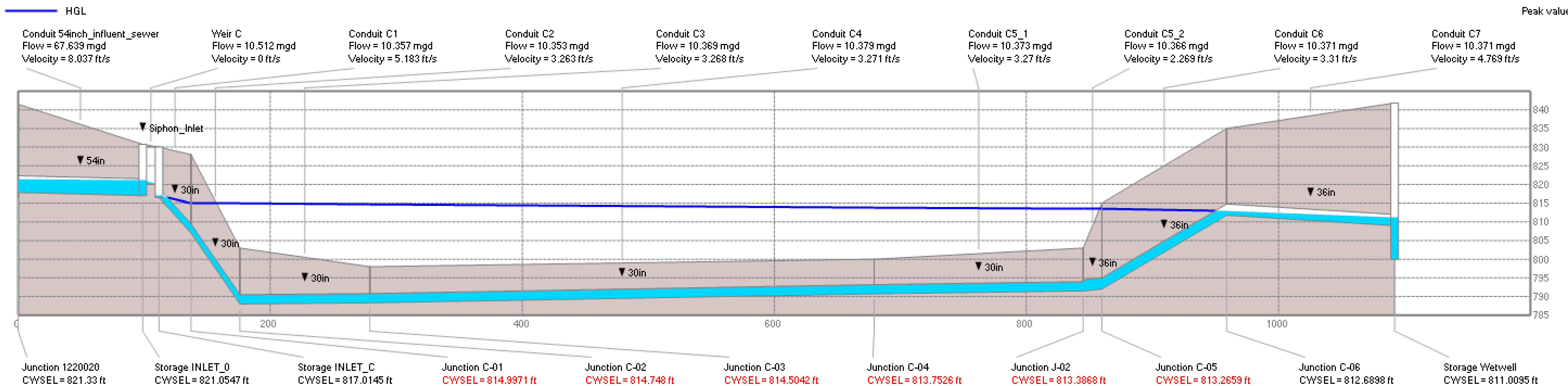
Sufficient Capacity for 67 MGD

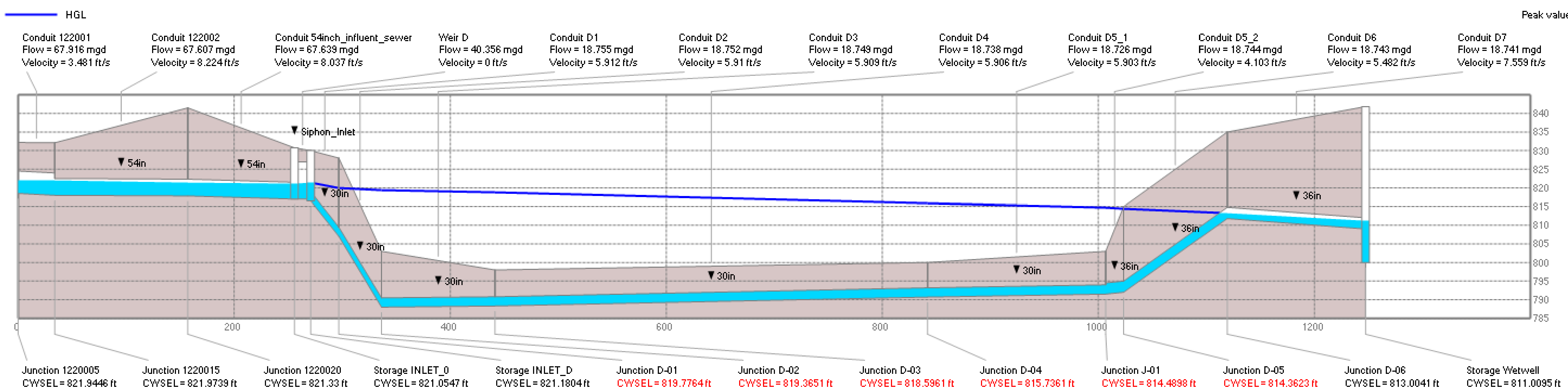
Velocity for Barrel C meets minimum only > 65 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure 11

Title
Hydraulic Gradeline Profile – Option 3
Barrels A & B





Stantec

Date: April 30, 2020

Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	2	46	6.0
Barrel B	30	1	25	6.1
Barrel C	30	3	65	3.3
Barrel D	30	0	10	5.9

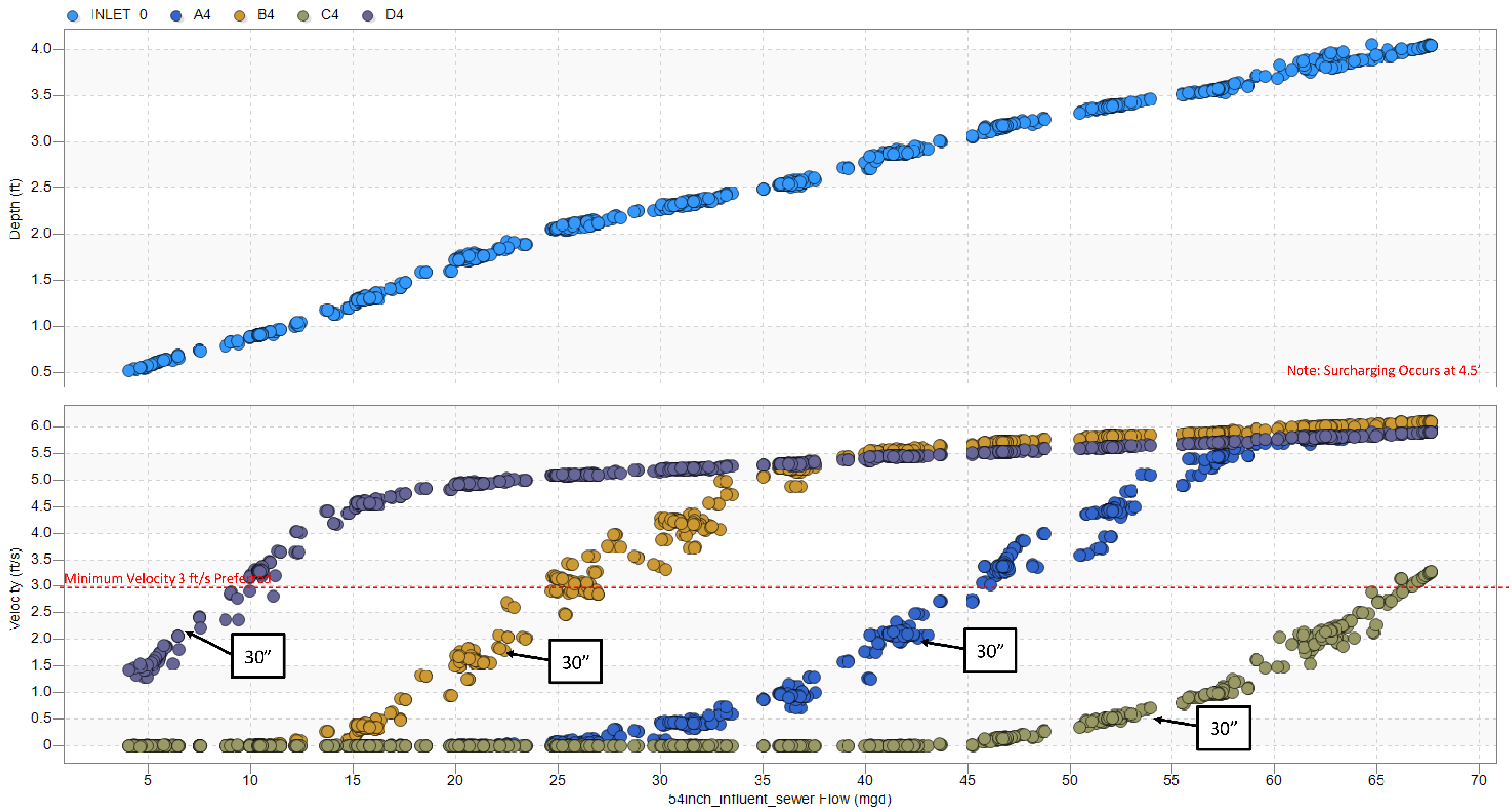
Sufficient Capacity for 67 MGD

Velocity for Barrel C meets minimum only > 65 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure **12**

Title
Hydraulic Gradeline Profile – Option 3
Barrels C & D



Stantec

Date: April 30, 2020

Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	2	46	6.0
Barrel B	30	1	25	6.1
Barrel C	30	3	65	3.3
Barrel D	30	0	10	5.9

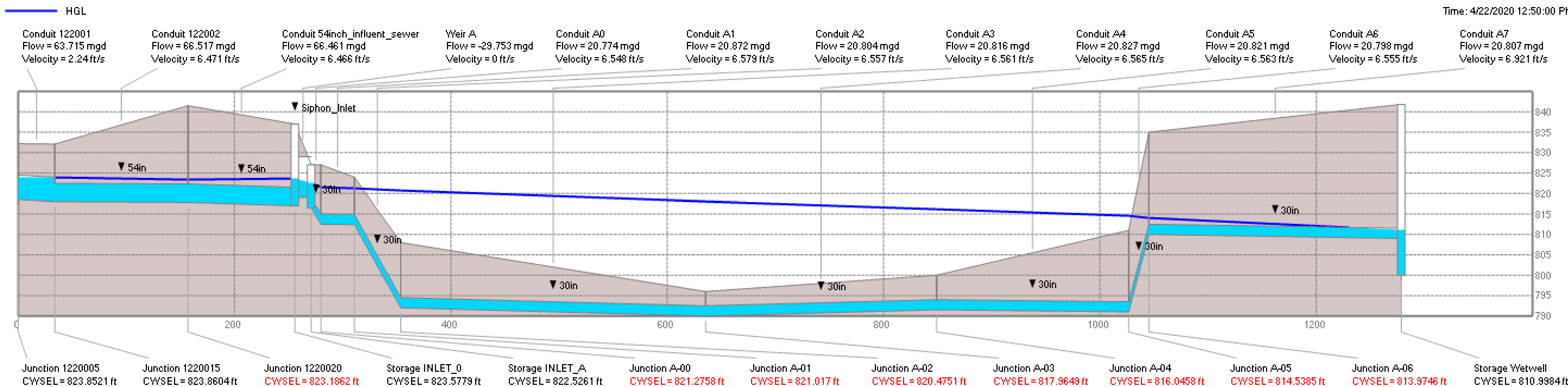
Sufficient Capacity for 67 MGD

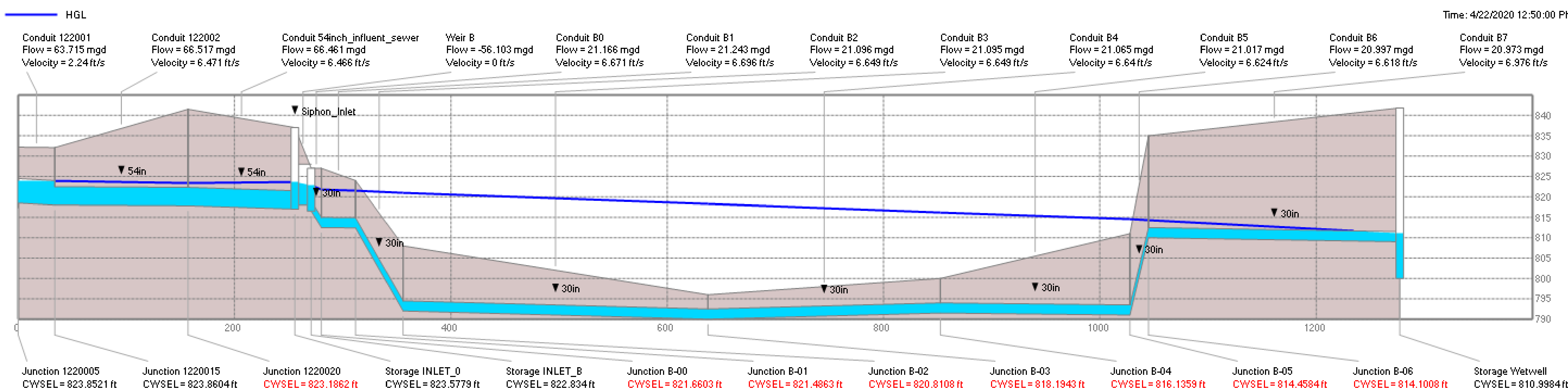
Velocity for Barrel C meets minimum only > 65 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure 13

Title **Siphon Velocity Curve – Option 3**





Stantec

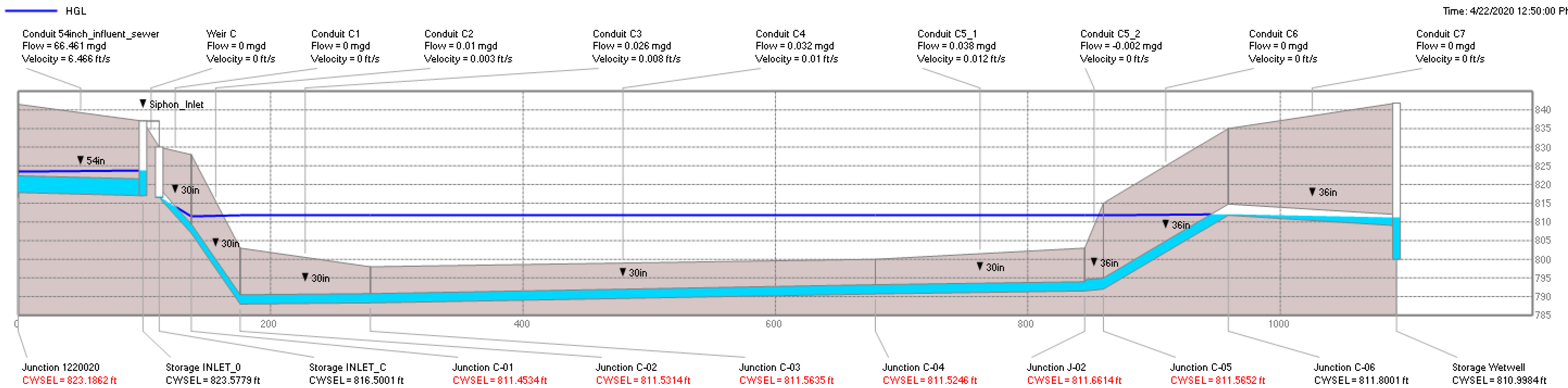
Date: April 30, 2020

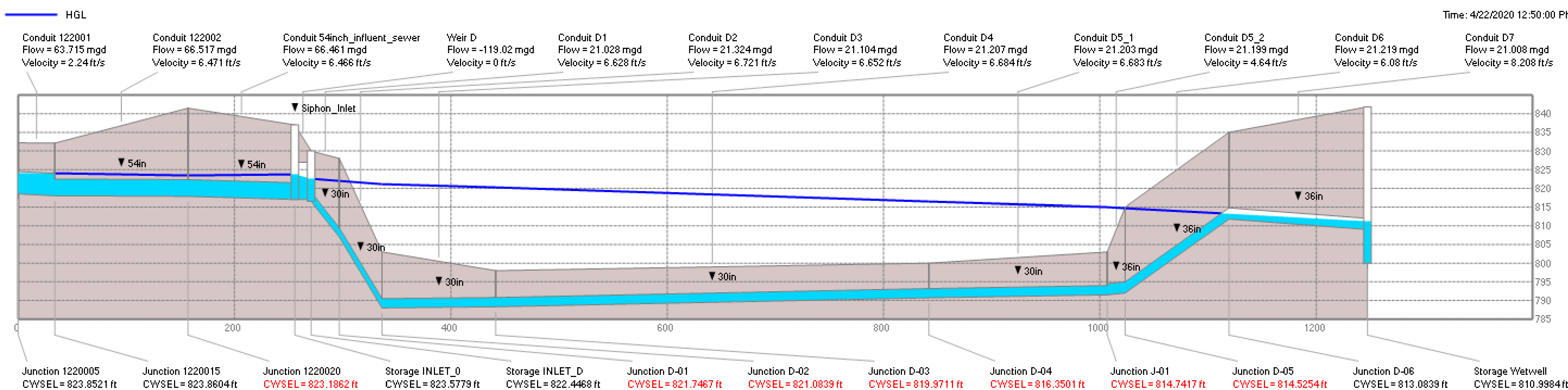
Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	2	45	6.6
Barrel B	30	1	25	6.6
Barrel C	30	CLOSED	-	0.0
Barrel D	30	0	10	6.7

Maximum Capacity of 57 MGD before surcharging occurs

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure	Title
14	**Hydraulic Gradeline Profile – Option 4 Barrels A & B**





Stantec

Date: April 30, 2020

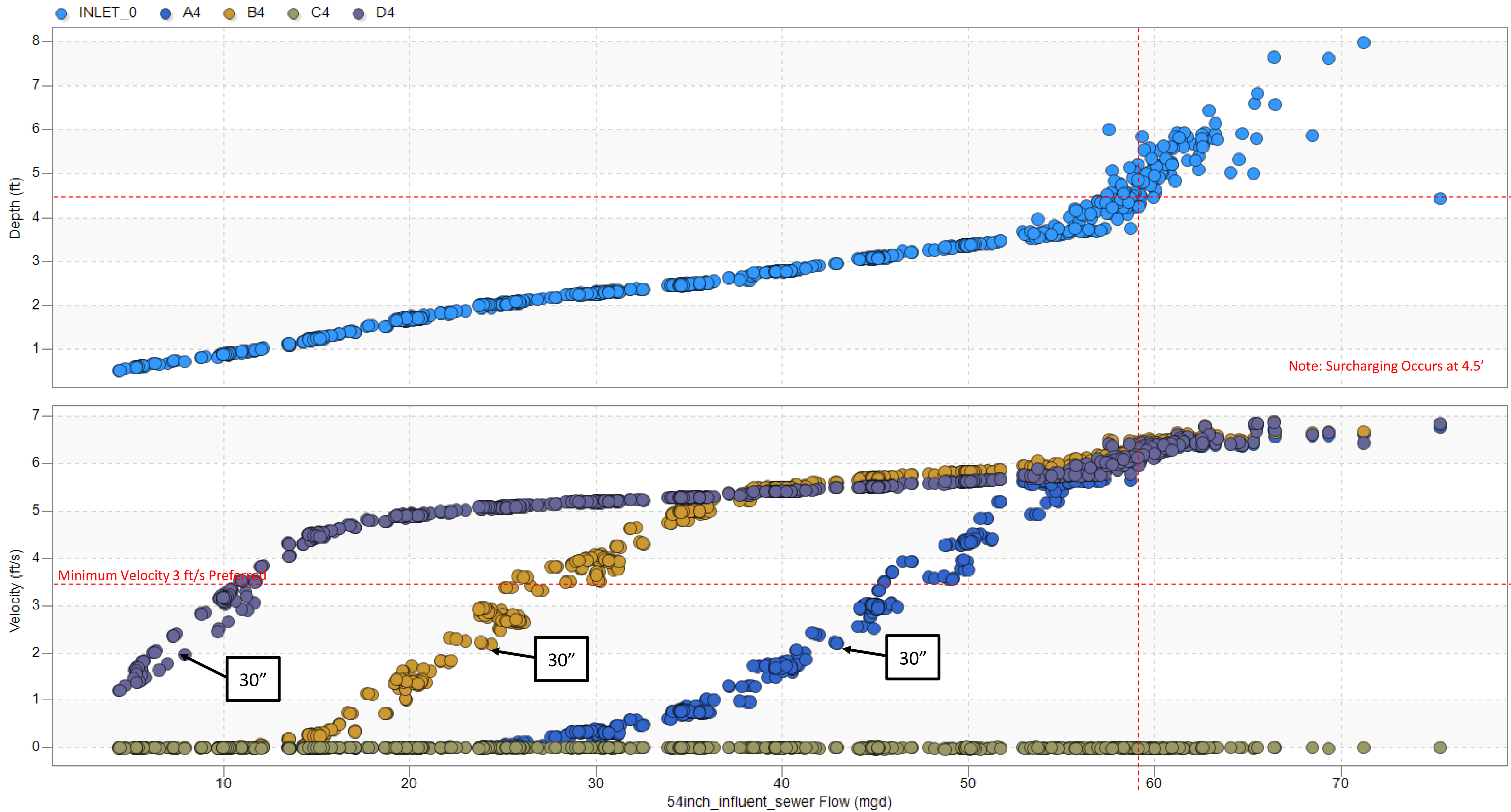
Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	2	45	6.6
Barrel B	30	1	25	6.6
Barrel C	30	CLOSED	-	0.0
Barrel D	30	0	10	6.7

Maximum Capacity of 57 MGD before surcharging occurs

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure
15

Title
Hydraulic Gradeline Profile – Option 4
Barrels C & D



Stantec

Date: April 30, 2020

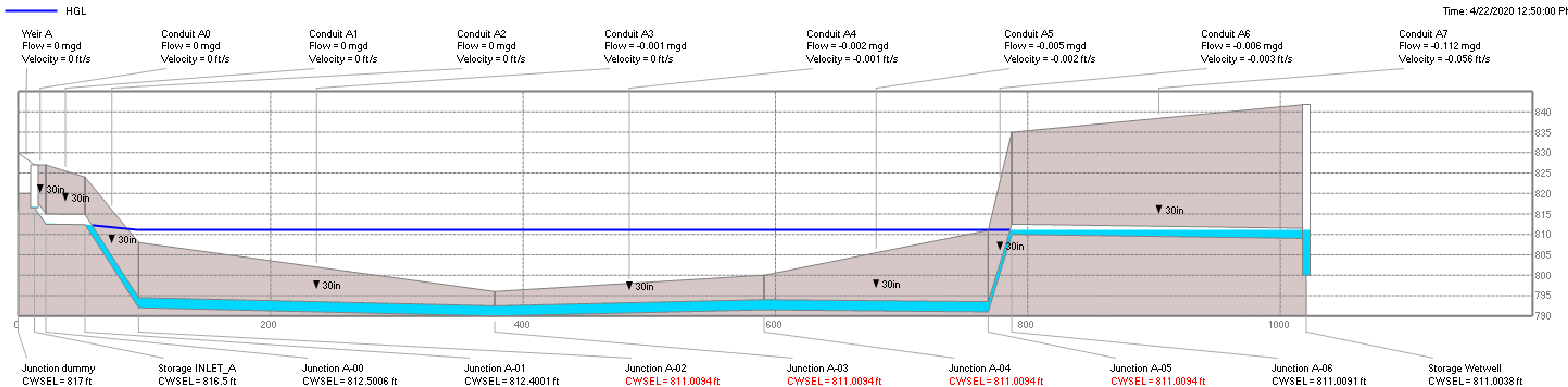
Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	2	45	6.6
Barrel B	30	1	25	6.6
Barrel C	30	CLOSED	-	0.0
Barrel D	30	0	10	6.7

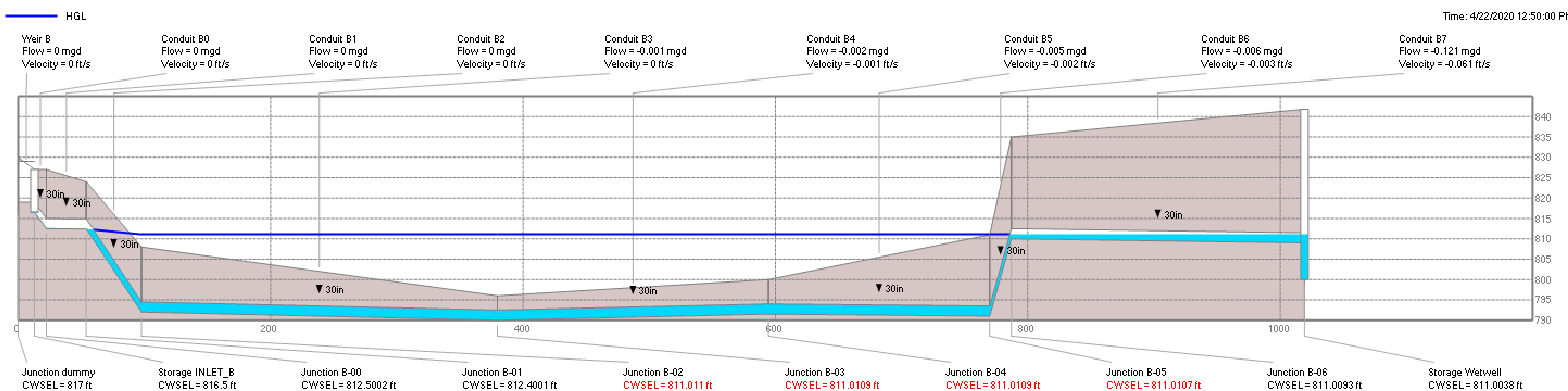
Maximum Capacity of 57 MGD before surcharging occurs

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure 16

Title **Siphon Velocity Curve – Option 4**





Stantec

Date: April 30, 2020

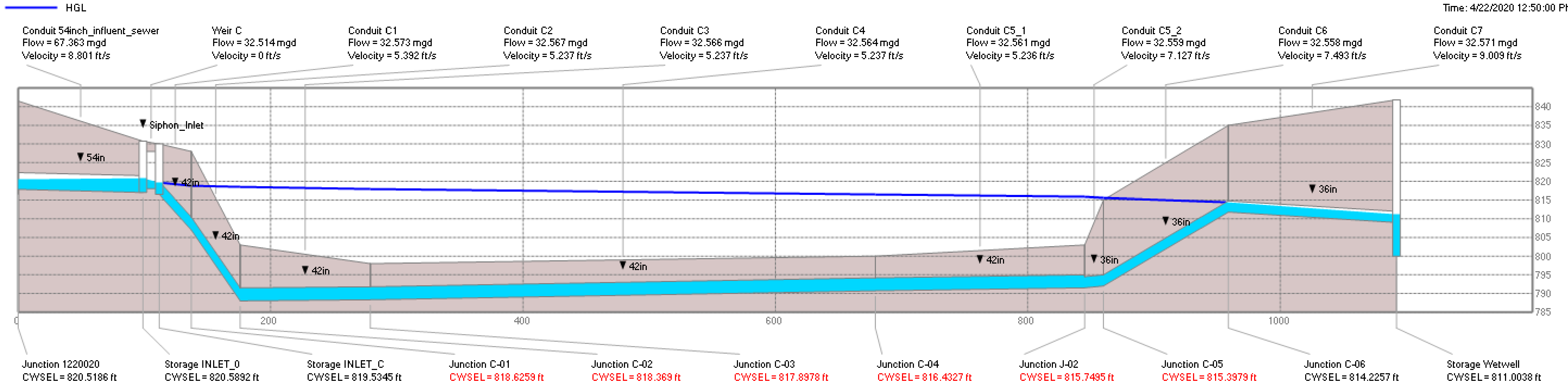
Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	CLOSED	-	0.0
Barrel B	30	CLOSED	-	0.0
Barrel C	30	1	50	5.2
Barrel D	30	0	20	5.6

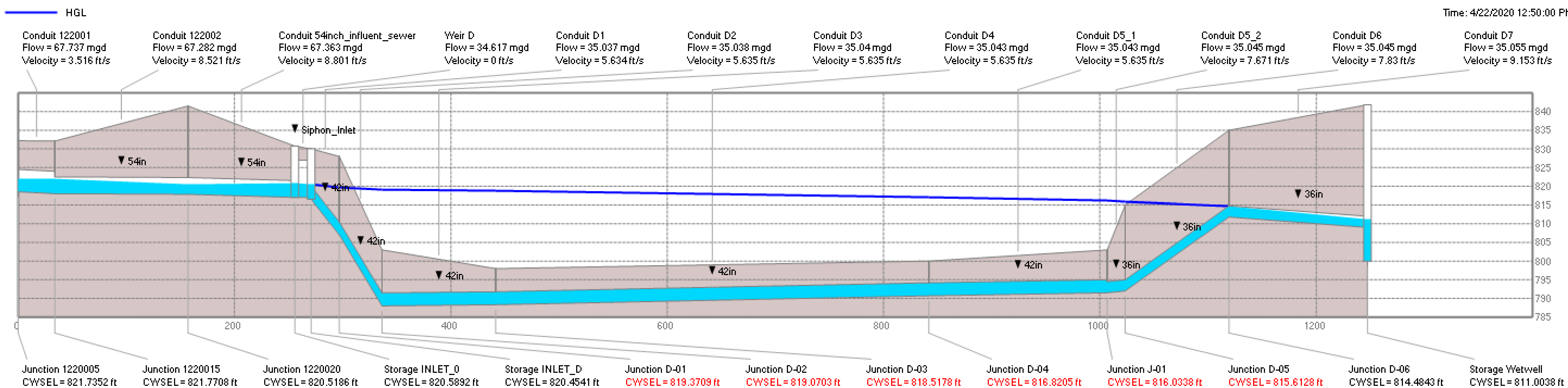
Sufficient Capacity for 67 MGD

Velocity for Barrel C meets minimum only > 50 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure	Title
17	**Hydraulic Gradeline Profile – Option 5** **Barrels A & B**





Stantec

Date: April 30, 2020

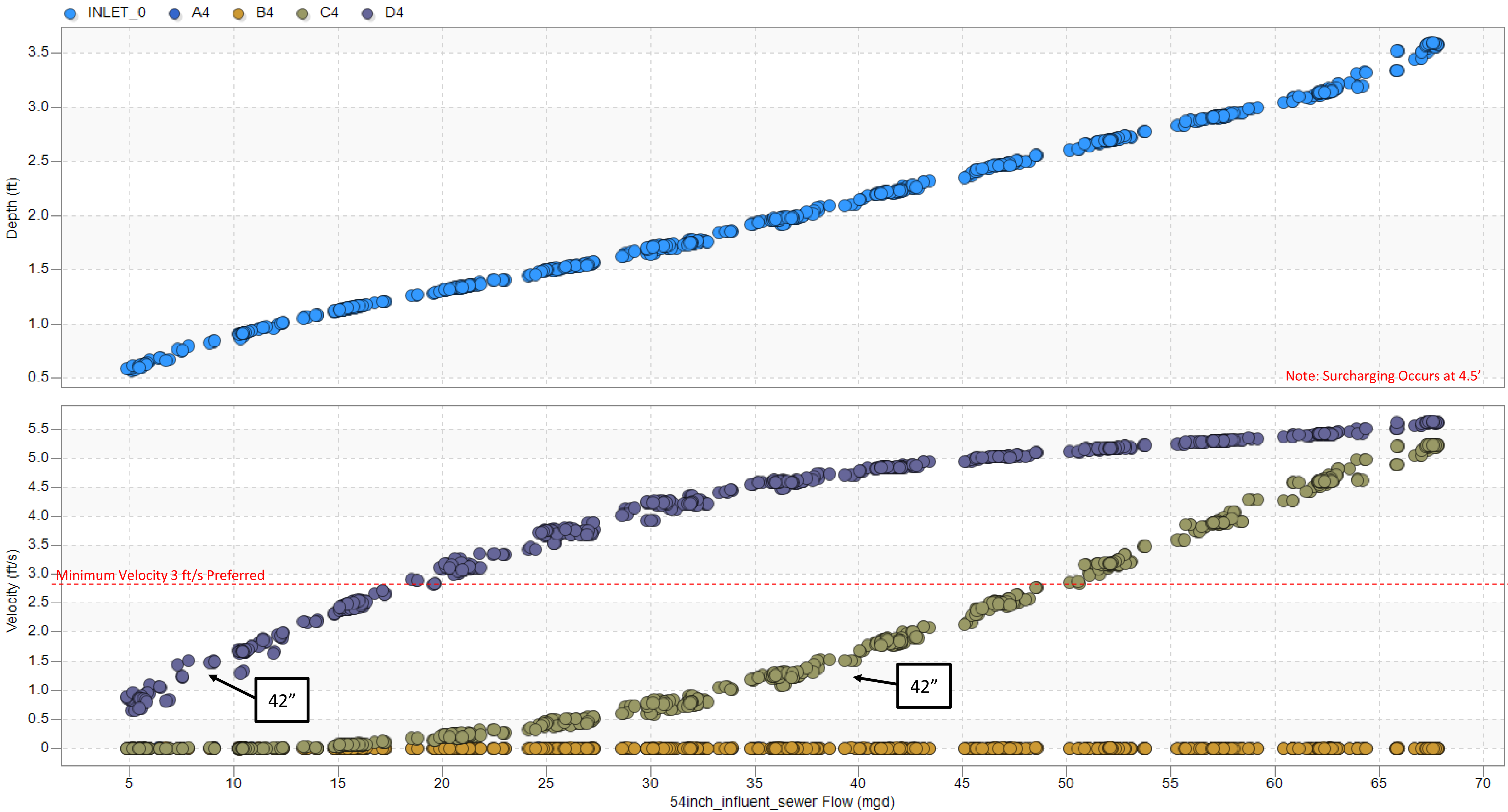
Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	CLOSED	-	0.0
Barrel B	30	CLOSED	-	0.0
Barrel C	30	1	50	5.2
Barrel D	30	0	20	5.6

Sufficient Capacity for 67 MGD

Velocity for Barrel C meets minimum only > 50 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure	Title
18	**Hydraulic Gradeline Profile – Option 5 Barrels C & D**



Stantec

Date: April 30, 2020

Option	Diameter	Weir Height	Q @ 3ft/s	V @ 67 MGD
Barrel A	30	CLOSED	-	0.0
Barrel B	30	CLOSED	-	0.0
Barrel C	30	1	50	5.2
Barrel D	30	0	20	5.6

Sufficient Capacity for 67 MGD

Velocity for Barrel C meets minimum only > 50 MGD

Client/Project
Metropolitan Council Environmental Services
Lift Station L-32 Siphon Retrofit

Figure 19

Title **Siphon Velocity Curve – Option 5**

APPENDIX C – PUMP CURVES

APPENDIX C PUMP CURVES

To:	Daryl Kirschenman Minneapolis MN Office	From:	Mark Rolfs Minneapolis MN Office
File:	173420004	Date:	July 16, 2020

Reference: Appendix C Pump Curves- L-32 East Side Hydraulic Model Results

A hydraulic model was completed of the proposed East Side L-32 lift station and forcemains. A separate model was made for the influent siphon piping. The data to populate the model was provided partly by the pipe sizing and configuration of the existing L-32 station located on the west side and partly based on numerous other MCES lift stations that were used to provide for the basic station layout used in this report. The lift station piping, new east side forcemains and the connection to the existing forcemains on the east side of the river are shown on Figure 1 on the next page. As shown on Figure 1, the layout of the hydraulic model includes Reservoir R-1 which represents the lift station wet well and was modeled with a water level at elevation 805 ft based on the drop needed from the west side as calculated in the siphon evaluation. Reservoir R-2 represents the discharge junction box that L-32 is required to pump to at the end of the 42" diameter PCCP forcemains. 839.25 ft is the top of pipe discharge elevation for the L-32 pumps.

The hydraulic model results are based on a wet well level at 805 ft and pipe roughness of C=110 for the existing forcemains and with C=120 for the new DIP piping in and around the new lift station.

To begin the evaluation, a single point generic pump curve was developed by the WaterCad software. This gets the model to a good starting point for pump selection. Once the design point is established, other station operating points are run to see approximately how the pump would respond to less than the number of design points operating.

For this analysis we looked at three options.

Option 1 – A six pump station with 5 pump operating.

Option 2 – An eight pump station with 6 pumps operating

Option 3 – An eight pump station with 7 pumps operating.

The traditional firm capacity definition for an 8 pump station would be Option 3. However due to the split wet well and the critical nature of this lift station it was also decided to consider Option 2 which would in effect provide for firm capacity on each side of a split wet well. Due to the relatively minor change in pump and HP requirements, it is recommended that if an eight pump station is selected for this this critical lift station, then it be considered with 6 pumps operating for firm capacity.

Based on the generic pump, several Cornell pumps were selected for evaluation. After considering cost and size, it was decided to use the 900 rpm Cornell pumps for the final analysis. All of the Cornell pump curves looked at are included in this appendix, but only the three pumps identified in the summary results table were used for complete analysis. These are the three recommended pumps for Options 1,2,3 above.

Option 1 – Cornell Pump Model 16NHG22 with 21.81 inch impeller, 200 HP

Option 2 - Cornell Pump Model 16NHG22 with 20.38 inch impeller, 150 HP

Option 3 – Cornell Pump Model 14NHGA with 18.63 inch impeller, 125 HP

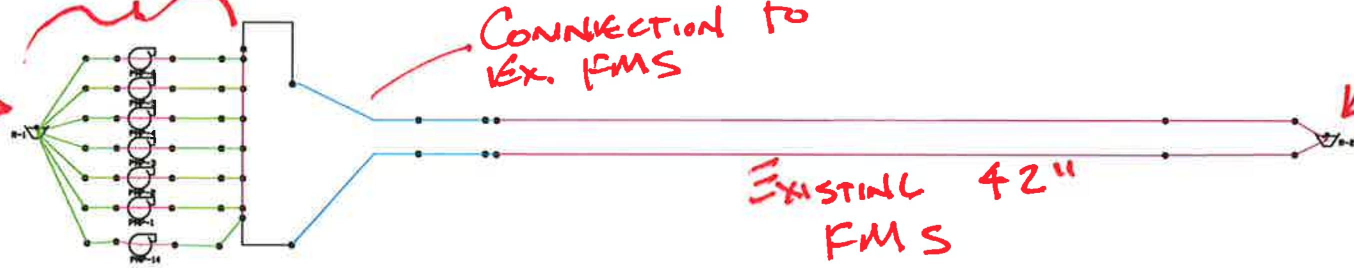
APPENDIX C

L-32
PUMP STATION
UP TO 7 ACTIVE
PUMPS

R-1
WET WELL

R-2
DISCHARGE
TO GRAVITY

CONNECTION TO
EX. FMS



EXISTING 42"
FMS

FIGURE 1
HYDRAULIC MODEL

L32 East Side Pump Station - 67 MGD

TABLE 1 - SIX PUMP STATION (5 Active Pumps)

Number of Pumps Running	Generic Pump Flow per Pump (gpm)	Generic Pump TDH (feet)	Generic Pump 80% Eff. (HP)	Station Flow (gpm)	Station Flow (MGD)	Cornell Pump Flow per Pump (gpm)	Cornell Pump TDH (feet)	Cornell Pump Actual (HP)	Station Flow (gpm)	Station Flow (MGD)
1	11,067	52.4	183	11,067	15.9	10,679	51.2	171	10,679	15.4
2	10,767	53.9	183	21,534	31.0	10,445	52.8	172	20,890	30.1
3	10,336	56.1	183	31,008	44.7	10,107	55.1	172	30,321	43.7
4	9,845	58.4	181	39,380	56.7	9,718	57.8	173	38,872	56.0
5	9,306	60.8	179	46,530	67.0	9,288	60.6	173	46,440	66.9

Notes:

Generic Pump is a single point pump curve created by WaterCad to reflect standard centrifual pump curve
Cornell Pump is Model 16NHG22 with 16 inch suction and 16 inch discharge. 885 rpm. 21.81 inch impeller curve
900 rpm Nominal Speed, 200 HP

L32 East Side Pump Station - 67 MGD

TABLE 2 - EIGHT PUMP STATION (6 Active Pumps)

Number of Pumps Running	Generic Pump: Flow per Pump (gpm)	Generic Pump: TDH (feet)	Generic Pump: 80% Eff. (HP)	Station Flow (gpm)	Station Flow (MGD)	Cornell Pump: Flow per Pump (gpm)	Cornell Pump: TDH (feet)	Cornell Pump: Actual (HP)	Station Flow (gpm)	Station Flow (MGD)
1	9,482	47.6	142	9,482	13.7	9,288	47.1	137	9,288	13.4
2	9,266	48.9	143	18,532	26.7	9,100	48.4	136	18,200	26.2
3	8,951	50.7	143	26,853	38.7	8,828	50.2	136	26,484	38.1
4	8,590	52.7	143	34,360	49.5	8,510	52.4	136	34,040	49.0
5	8,177	54.9	142	40,885	58.9	8,156	54.8	136	40,780	58.7
6	7,755	57.0	140	46,530	67.0	7,788	57.2	136	46,728	67.3

Notes:

Generic Pump is a single point pump curve created by WaterCad to reflect standard centrifual pump curve
Cornell Pump is Model 16NHG22 with 16 inch suction and 16 inch discharge. 885 rpm. 20.38 inch impeller curve
900 rpm Nominal Speed, 150 HP

L32 East Side Pump Station - 67 MGD

TABLE 3 - EIGHT PUMP STATION (7 Active Pumps)

Number of Pumps Running	Generic Pump Flow per Pump (gpm)	Generic Pump TDH (feet)	Generic Pump 80% Eff. (HP)	Station (gpm)	Flow (MGD)	Cornell Pump Flow per Pump (gpm)	Cornell Pump TDH (feet)	Cornell Pump Actual (HP)	Station (gpm)	Flow (MGD)
1	8,301	44.5	117	8,301	12.0	7,971	43.7	115	7,971	11.5
2	8,142	45.6	117	16,284	23.4	7,851	44.8	114	15,702	22.6
3	7,907	47.1	118	23,721	34.2	7,671	46.4	113	23,013	33.1
4	7,630	48.9	118	30,520	43.9	7,457	48.2	112	29,828	43.0
5	7,315	50.9	118	36,575	52.7	7,209	50.4	112	36,045	51.9
6	6,989	52.8	116	41,934	60.4	6,942	52.6	111	41,652	60.0
7	6,647	54.7	115	46,529	67.0	6,675	54.9	111	46,725	67.3

Notes:

Generic Pump is a single point pump curve created by WaterCad to reflect standard centrifual pump curve
Cornell Pump is Model 14NHGA with 16 inch suction and 14 inch discharge. 889 rpm. 18.63 inch impeller curve
900 rpm Nominal Speed, 125 HP. The single pump operation is pretty far to the right side of the curve.

Pump Data Sheet - Cornell

Company: General Repair Service
Name:
Date: 06/09/2020

Pump:

Size:	16NHG22	Dimensions:	
Type:	Encl Solids Handling	Suction:	16 in
Synch Speed:	900 rpm	Discharge:	16 in
Line:	21.81" x 16°		
Curve:	16NHG229		

Fluid:

Name:	Water		
SG:	1	Vapor Pressure:	0.256 psi a
Density:	62.4 lb/ft³	Atm Pressure:	14.7 psi a
Viscosity:	1.1 cP		
Temperature:	60 °F	Margin Ratio:	1

Pump Limits:

Temperature:	250 °F	Sphere Size:	4.5 in
Wkg Pressure:	125 psi g		

Search Criteria:

Flow:	9306 US gpm	Near Miss:	---
Head:	60.8 ft	Static Head:	0 ft

Motor:

Standard:	NEMA	Size:	200 hp
Enclosure:	TEFC	Speed:	900 rpm
Frame:	449T		
Sizing Criteria:	Max Power on Design Curve		

Preferred Operating Region: 70% - 120% BEP

Pump Selection Warnings:

None

--- Duty Point ---

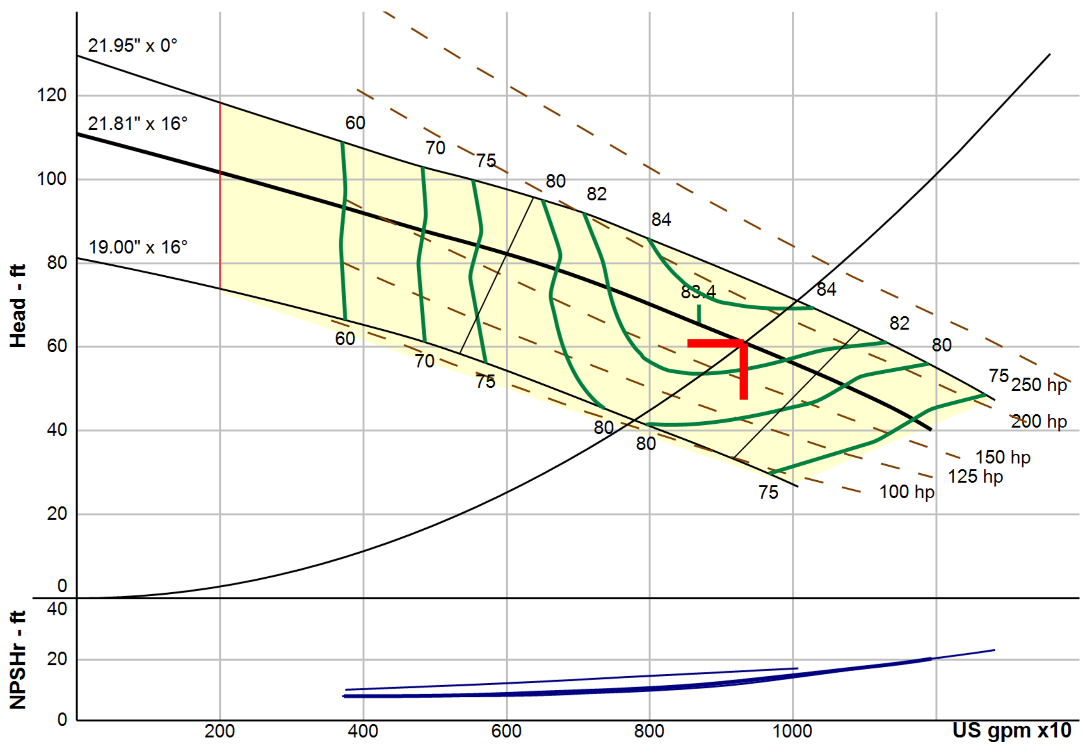
Flow:	9318 US gpm
Head:	61 ft
Eff:	82.7%
Power:	173 hp
NPSHr:	13.2 ft
Speed:	885 rpm

--- Design Curve ---

Shutoff Head:	111 ft
Shutoff dP:	48 psi
Min Flow:	2000 US gpm
BEP:	83.4% @ 8685 US gpm
NOL Power:	173 hp @ 9898 US gpm

--- Max Curve ---

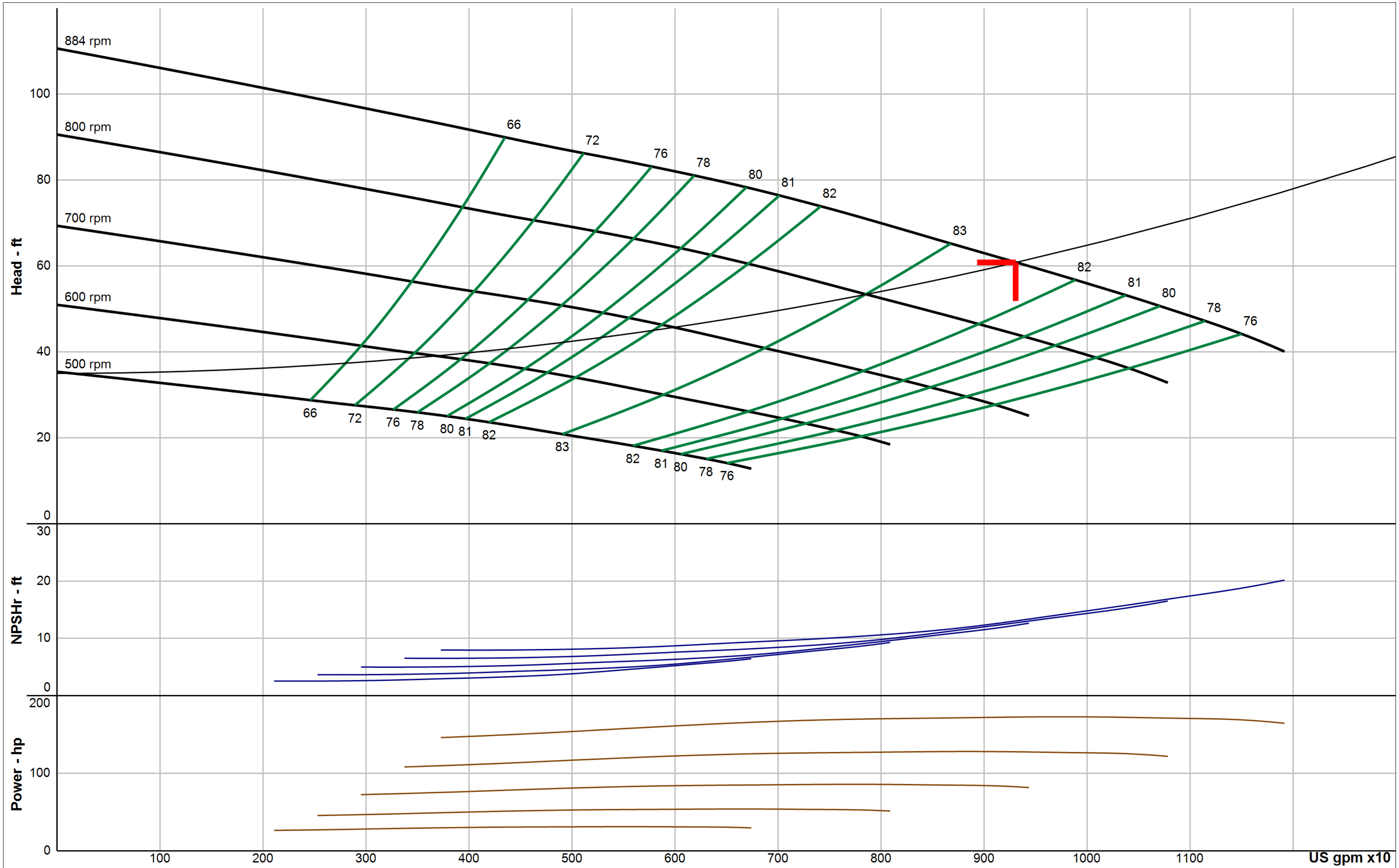
Max Power:	214 hp @ 10284 US gpm



Min flow line represents the absolute lowest flow pump can operate. Consult with factory if operating below 50% of BEP flow

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
11167	885	47	78	170	17.9
9306	885	61	83	173	13.1
7445	885	73.9	82	169	10
5584	885	84.3	75	159	8.41
3722	885	93.4	60	146	8



Min flow line represents the absolute lowest flow pump can operate. Consult with factory if operating below 50% of BEP flow

Company:	General Repair Service	Cornell		Size:	16NHG22
Name:		Catalog: Cornell.60, Vers 3.15.0		Speed:	885 rpm
Date:	06/09/2020	Encl Solids Handling - 900 rpm		Line:	21.81" x 16°
		Design Point:	9306 US gpm, 60.8 ft	Curve:	16NHG229
		Static Head:	35 ft		

Pump Data Sheet - Cornell

Company: General Repair Service
Name:
Date: 06/09/2020

CORNELL®

Pump:

Size:	16NHG22	Dimensions:	
Type:	Encl Solids Handling	Suction:	16 in
Synch Speed:	900 rpm	Discharge:	16 in
Line:	20.38" x 16°		
Curve:	16NHG229		

Fluid:

Name:	Water		
SG:	1	Vapor Pressure:	0.256 psi a
Density:	62.4 lb/ft³	Atm Pressure:	14.7 psi a
Viscosity:	1.1 cP		
Temperature:	60 °F	Margin Ratio:	1

Pump Limits:

Temperature:	250 °F	Sphere Size:	4.5 in
Wkg Pressure:	125 psi g		

Search Criteria:

Flow:	7755 US gpm	Near Miss:	---
Head:	57 ft	Static Head:	0 ft

Motor:

Standard:	NEMA	Size:	150 hp
Enclosure:	TEFC	Speed:	900 rpm
Frame:	449T		
Sizing Criteria:	Max Power on Design Curve		

Preferred Operating Region: 70% - 120% BEP

Pump Selection Warnings:

None

--- Duty Point ---

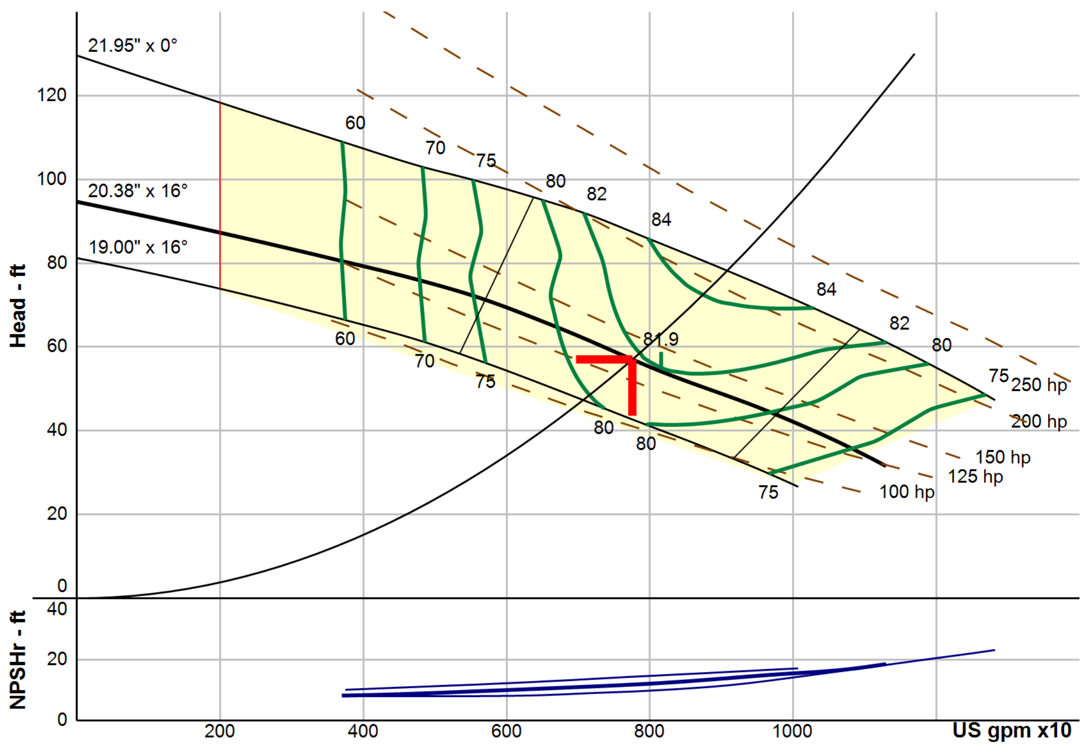
Flow:	7758 US gpm
Head:	57 ft
Eff:	81.4%
Power:	136 hp
NPSHr:	11.8 ft
Speed:	885 rpm

--- Design Curve ---

Shutoff Head: 94.7 ft
Shutoff dP: 41 psi
Min Flow: 2000 US gpm
BEP: 81.9% @ 8157 US gpm
NOL Power:
137 hp @ 6709 US gpm

--- Max Curve ---

Max Power:
214 hp @ 10284 US gpm

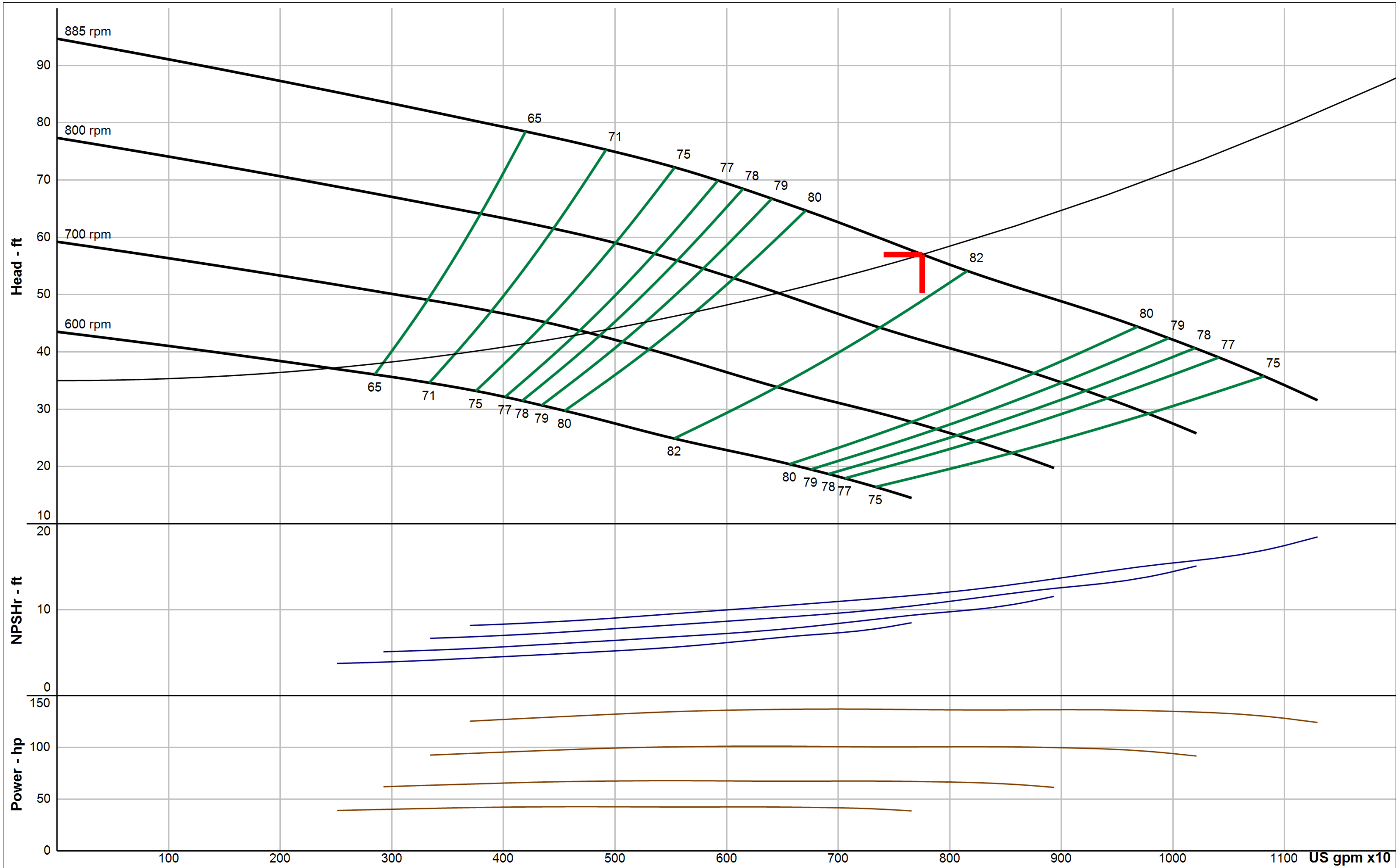


Min flow line represents the absolute lowest flow pump can operate. Consult with factory if operating below 50% of BEP flow

Performance Evaluation:

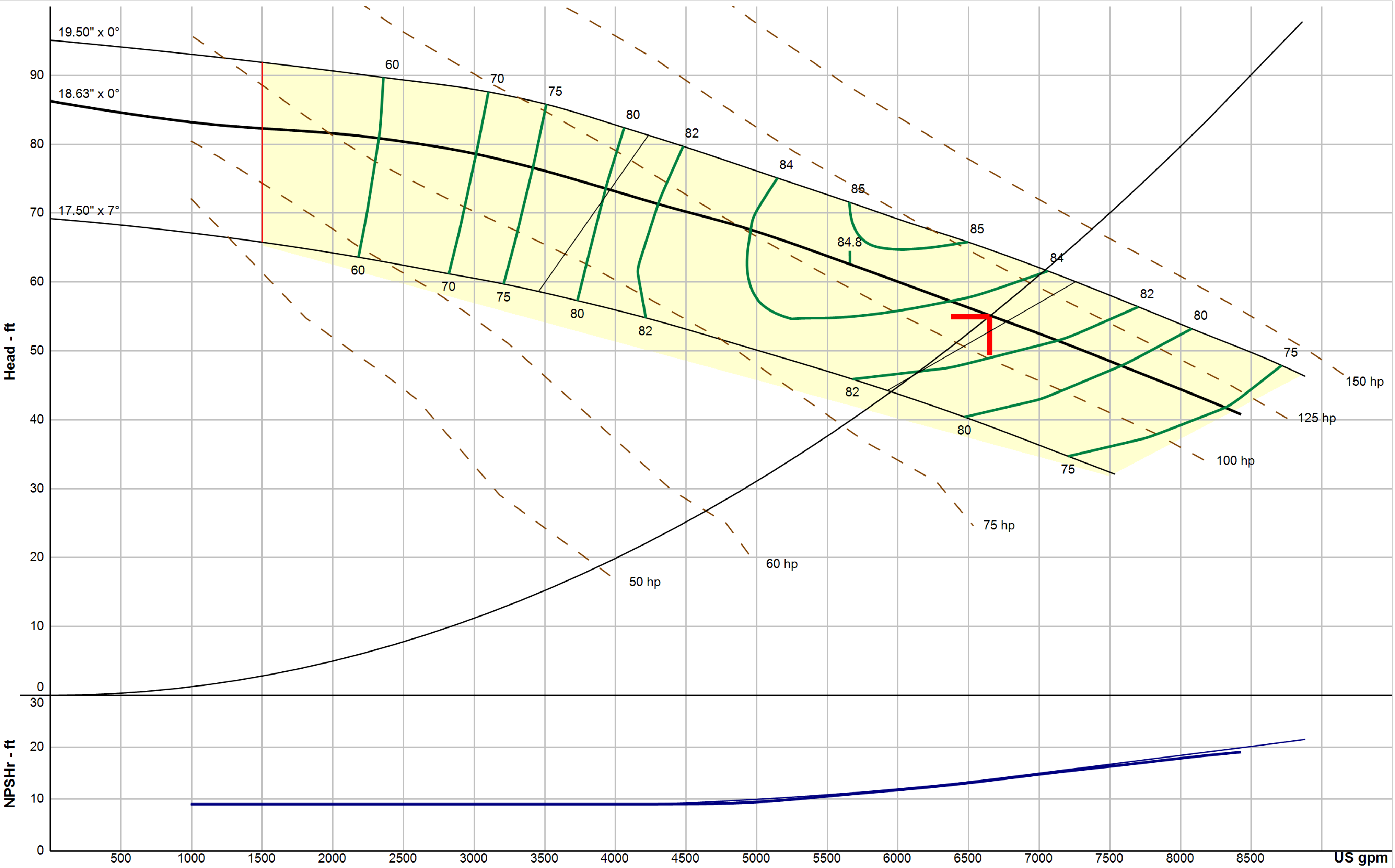
Flow	**Speed**	**Head**	**Efficiency**	**Power**	**NPSHr**
US gpm	rpm	ft	%	hp	ft
9306	885	46.8	80	136	14.3
7755	885	57.1	81	136	11.8
6204	885	67.9	78	136	10.2
4653	885	76.5	69	130	8.77
3102	885	82.8	55	122	8.17

Selected from catalog: Cornell.60, Vers 3.15.0



Min flow line represents the absolute lowest flow pump can operate. Consult with factory if operating below 50% of BEP flow

Company:	General Repair Service	Cornell	Size:	16NHG22
Name:		Catalog: Cornell.60, Vers 3.15.0	Speed:	885 rpm
Date:	06/09/2020	Encl Solids Handling - 900 rpm	Line:	20.38" x 16°
		Design Point: 7755 US gpm, 57 ft	Curve:	16NHG229
		Static Head: 35 ft		



Min flow line represents the absolute lowest flow pump can operate. Consult with factory if operating below 50% of BEP flow

Company:	General Repair Service	Cornell	Size:	14NHGA
Name:	Eight pump selection	Catalog: Cornell.60, Vers 3.15.0	Speed:	890 rpm
Date:	06/09/2020	Encl Solids Handling - 900 rpm	Line:	18.63" x 0°
		Design Point: 6647 US gpm, 55 ft	Curve:	14NHGA9
		Static Head: 0 ft		

CORNELL

Pump Data Sheet - Cornell

Company: General Repair Service
Name:
Date: 06/09/2020

CORNELL®

Pump:

Size:	18NHFL	Dimensions:	
Type:	Encl Solids Handling	Suction:	20 in
Synch Speed:	720 rpm	Discharge:	18 in
Line:	24.75" x 20°		
Curve:	18NHFL7		

Fluid:

Name:	Water		
SG:	1	Vapor Pressure:	0.256 psi a
Density:	62.4 lb/ft³	Atm Pressure:	14.7 psi a
Viscosity:	1.1 cP		
Temperature:	60 °F	Margin Ratio:	1

Pump Limits:

Temperature:	250 °F	Sphere Size:	3.5 in
Wkg Pressure:	125 psi g		

Search Criteria:

Flow:	9306 US gpm	Near Miss:	---
Head:	60.8 ft	Static Head:	0 ft

Motor:

Consult Cornell to select a motor for this pump.

Preferred Operating Region: 70% - 120% BEP

Pump Selection Warnings:

None

--- Duty Point ---

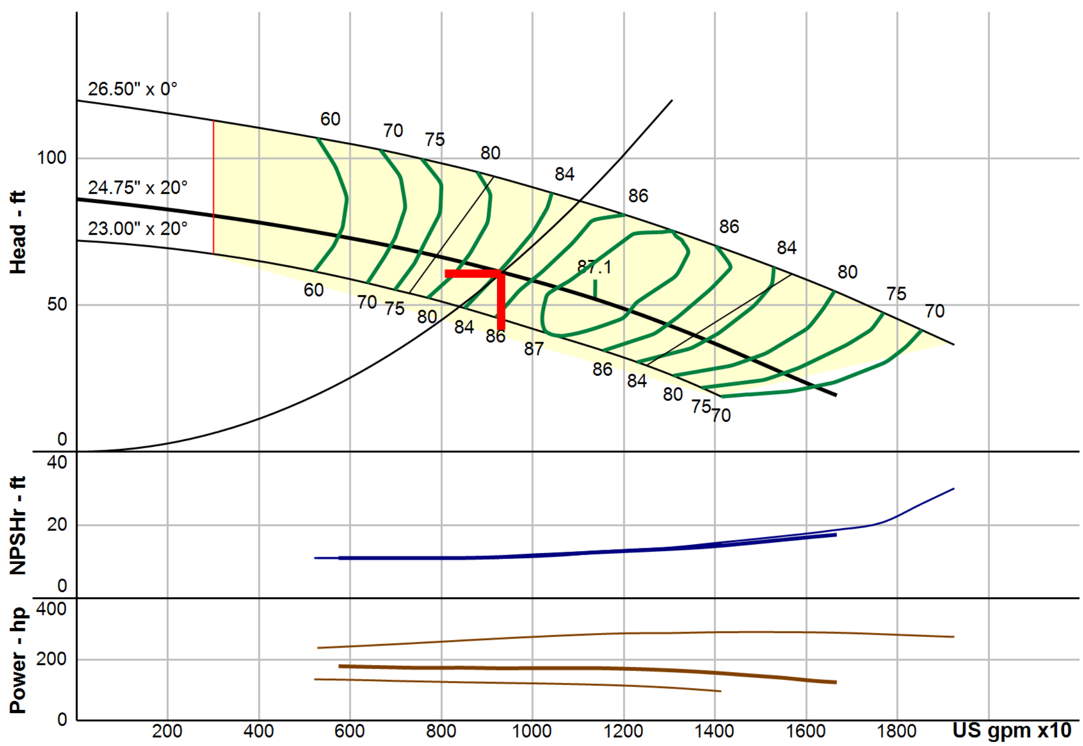
Flow:	9334 US gpm
Head:	61.2 ft
Eff:	84.2%
Power:	171 hp
NPSHr:	11.3 ft
Speed:	705 rpm

--- Design Curve ---

Shutoff Head:	86.1 ft
Shutoff dP:	37.3 psi
Min Flow:	3000 US gpm
BEP:	87.1% @ 11367 US gpm
NOL Power:	178 hp @ 5741 US gpm

--- Max Curve ---

Max Power:	290 hp @ 15288 US gpm



Min flow line represents the absolute lowest flow pump can operate. Consult with factory if operating below 50% of BEP flow

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
11167	705	53	87	172	12.4
9306	705	61.3	84	171	11.3
7445	705	68.3	74	173	11
5584	705	73.9	59	178	11
3722	705	78	42	184	11

Selected from catalog: Cornell.60, Vers 3.15.0

Pump Data Sheet - Cornell

Company: General Repair Service
Name: 7755 at 57 705rpm
Date: 06/09/2020

Pump:

Size:	16NHG26	Dimensions:	
Type:	Encl Solids Handling	Suction:	16 in
Synch Speed:	720 rpm	Discharge:	16 in
Dia:	23.25 in		
Curve:	16NHG267		

Fluid:

Name:	Water		
SG:	1	Vapor Pressure:	0.256 psi a
Density:	62.4 lb/ft³	Atm Pressure:	14.7 psi a
Viscosity:	1.1 cP		
Temperature:	60 °F	Margin Ratio:	1

Pump Limits:

Temperature:	---	Sphere Size:	4.5 in
Wkg Pressure:	---		

Search Criteria:

Flow:	7755 US gpm	Near Miss:	---
Head:	57 ft	Static Head:	0 ft

Motor:

Consult Cornell to select a motor for this pump.

Preferred Operating Region: 70% - 120% BEP

Pump Selection Warnings:

None

--- Duty Point ---

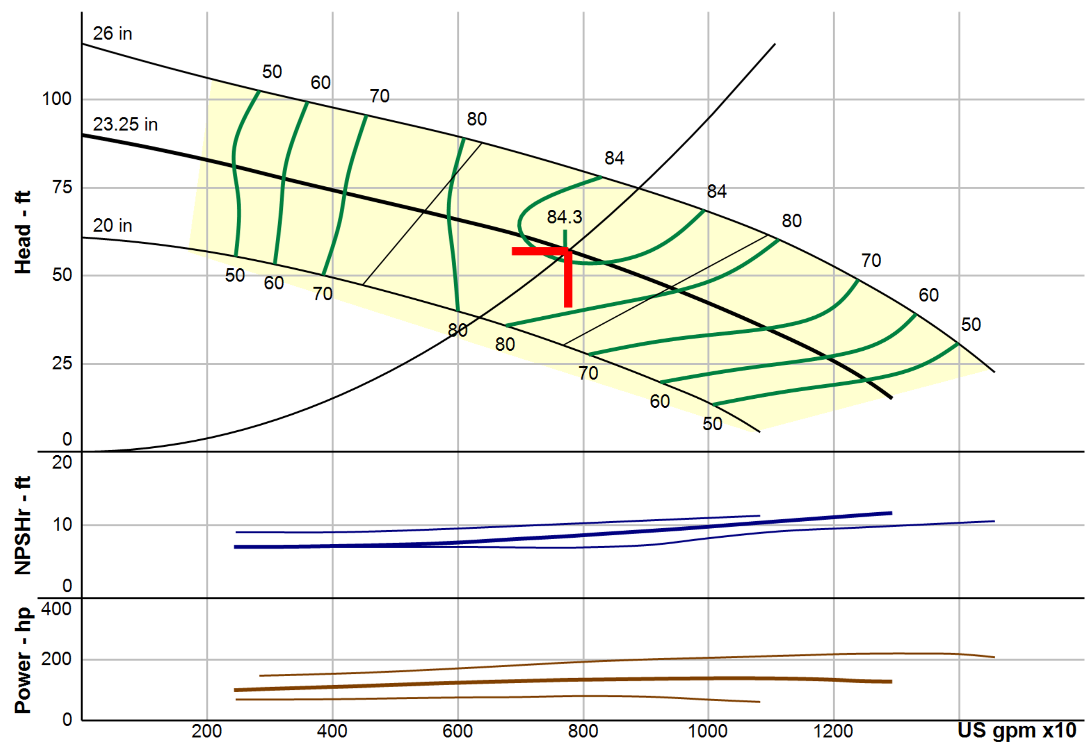
Flow:	7766 US gpm
Head:	57.2 ft
Eff:	84.3%
Power:	133 hp
NPSHr:	8.48 ft
Speed:	705 rpm

--- Design Curve ---

Shutoff Head:	90 ft
Shutoff dP:	39 psi
Min Flow:	--- US gpm
BEP:	84.3% @ 7711 US gpm
NOL Power:	138 hp @ 10926 US gpm

--- Max Curve ---

Max Power:	219 hp @ 13308 US gpm



Min flow line represents the absolute lowest flow pump can operate. Consult with factory if operating below 50% of BEP flow

Performance Evaluation:

Flow	Speed	Head	Efficiency	Power	NPSHr
US gpm	rpm	ft	%	hp	ft
9306	705	47.2	81	137	9.35
7755	705	57.2	84	133	8.48
6204	705	65	81	125	7.72
4653	705	71.6	73	115	7.27
3102	705	78.2	59	104	7.03

Pump Data Sheet - Cornell

Company: General Repair Service
Name:
Date: 06/09/2020

CORNELL®

Pump:

Size:	16NHG26	Dimensions:	
Type:	Encl Solids Handling	Suction:	16 in
Synch Speed:	720 rpm	Discharge:	16 in
Dia:	22.1875 in		
Curve:	16NHG267		

Fluid:

Name:	Water		
SG:	1	Vapor Pressure:	0.256 psi a
Density:	62.4 lb/ft³	Atm Pressure:	14.7 psi a
Viscosity:	1.1 cP		
Temperature:	60 °F	Margin Ratio:	1

Pump Limits:

Temperature:	---	Sphere Size:	4.5 in
Wkg Pressure:	---		

Motor:

Consult Cornell to select a motor for this pump.

Search Criteria:

Flow:	6647 US gpm	Near Miss:	---
Head:	54.7 ft	Static Head:	42 ft

Preferred Operating Region: 70% - 120% BEP

Pump Selection Warnings:

None

--- Duty Point ---

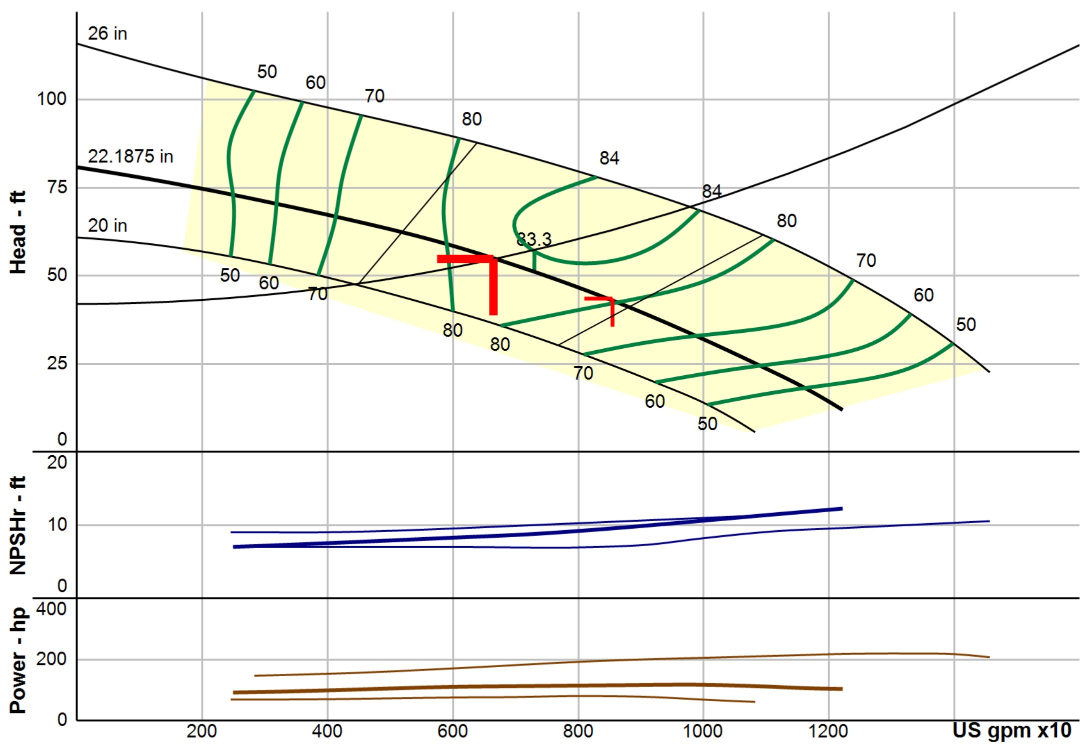
Flow:	6658 US gpm
Head:	54.7 ft
Eff:	81.8%
Power:	112 hp
NPSHr:	8.53 ft
Speed:	705 rpm

--- Design Curve ---

Shutoff Head:	80.9 ft
Shutoff dP:	35 psi
Min Flow:	--- US gpm
BEP:	83.3% @ 7298 US gpm
NOL Power:	117 hp @ 9878 US gpm

--- Max Curve ---

Max Power: 219 hp @ 13308 US gpm



Min flow line represents the absolute lowest flow pump can operate. Consult with factory if operating below 50% of BEP flow

Operating Points:

Data Point	Speed	Flow	Head	NPSHr	Efficiency	Power	Min Flow
	rpm	US gpm	ft	ft	%	hp	US gpm
Primary	705	6658	54.7	8.53	81.8	112	---
1	705	8464	43.5	9.49	80.4	115	---

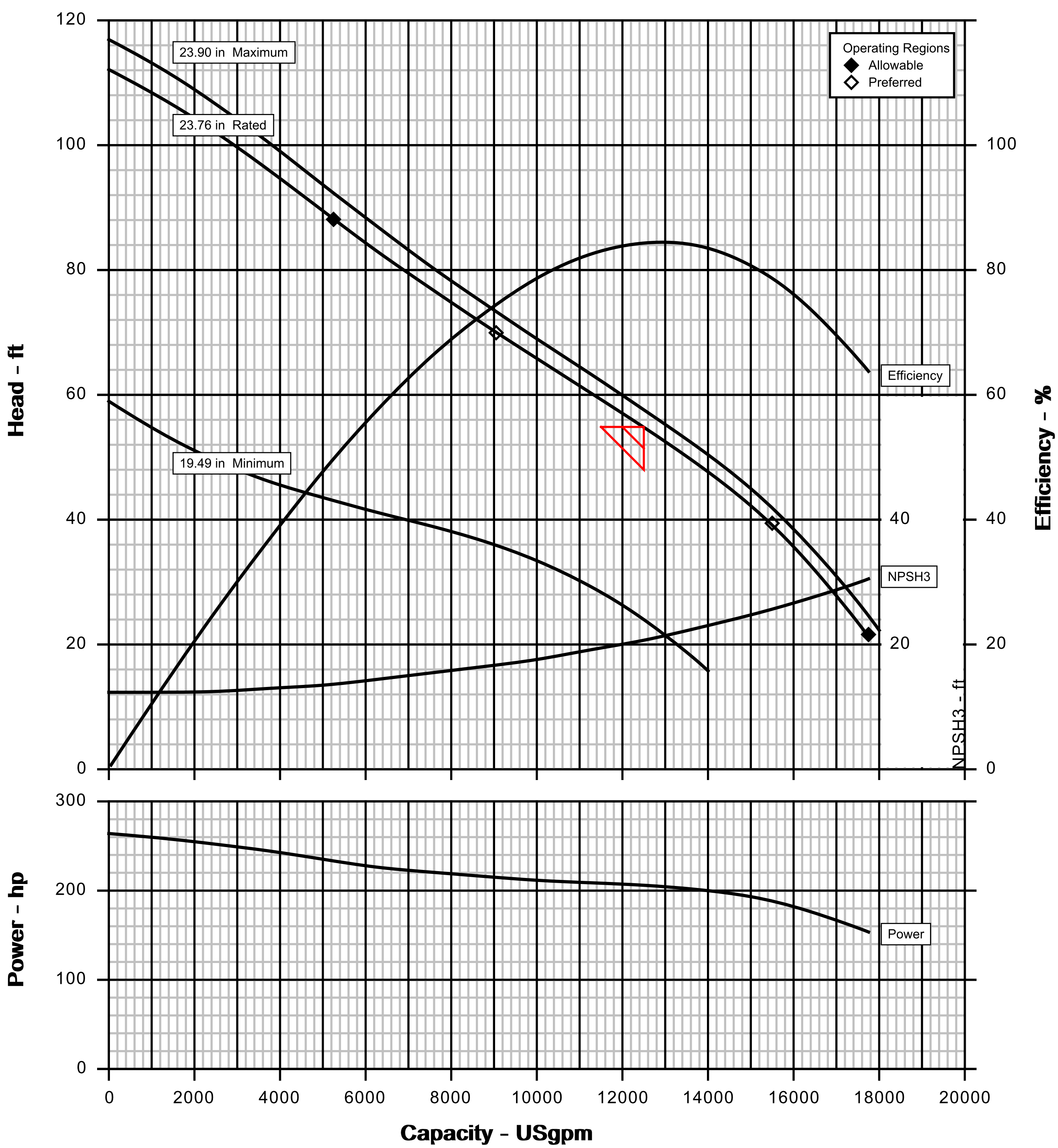
Selected from catalog: Cornell.60, Vers 3.15.0

FLOWSERVE

Pump size & type / Stages	: 24MVX24B	/ 1
Based on curve no.	: 89118673	
Impeller diameter	: 23.76 in	

Customer	: General Repair Service	Capacity	: 12500.0 USgpm
Item number	: -	Head	: 55.00 ft
Service	: -	Density / Specific gravity	: - / 0.999
Flowserve reference	: 2687692364	Pump speed	: 875 rpm
Date	: August 6, 2020	Ns / Nss	: 4933 / 10100 (US units)
		Test tolerance	: ANSI/HI 14.6 Grade 1U

CURVES ARE APPROXIMATE, PUMP IS GUARANTEED FOR ONE SET OF CONDITIONS; CAPACITY, HEAD, AND EFFICIENCY.



Hydraulic Datasheet

Customer	: General Repair Service	Pump / Stages	: 24MVX24B / 1
Customer reference	: -	Based on curve no.	: 89118673
Item number	: -	Flowserve reference	: 2687692364
Service	: -	Date	: August 6, 2020

Operating Conditions

Capacity (rated/normal)	: 12500.0 USgpm / -
Water capacity (CQ=1.00)	: -
Total developed head	: 55.00 ft
Water head (CH=1.00)	: -
NPSHa/NPSHa less margin	: 33.4 ft / -
Maximum suction pressure	: 0.0 psig

Liquid

Liquid type	: Fresh water
Liquid description	: -
Temperature	: 60 °F
Density / Specific gravity	: - / 0.999
Solid Size - Actual / Limit	: 5.00 in / 6.00 in
Viscosity / Vapor pressure	: 1.00 cSt / 0.26 psia

Materials / Specification

Material column code	: CI
Pump specification	: -

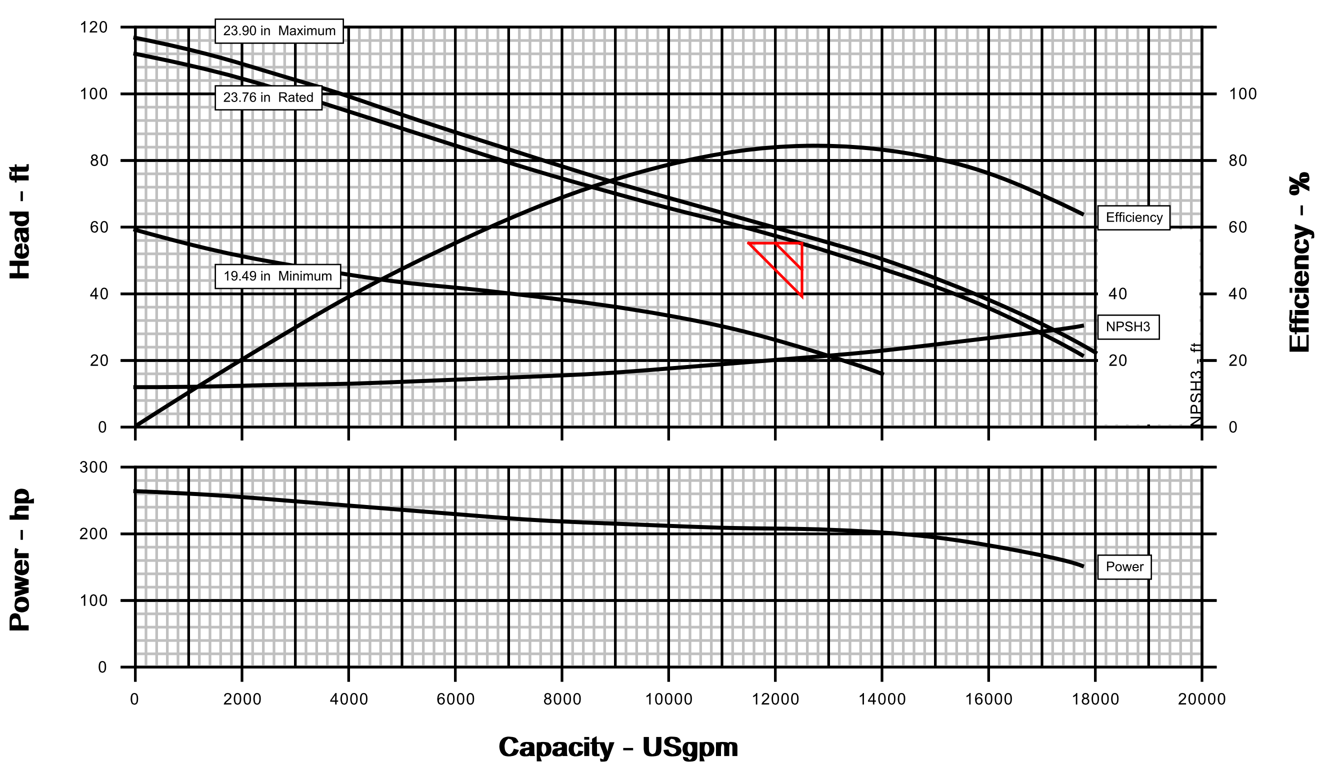
Other Requirements

Hydraulic selection : No specification
Construction : No specification
Test tolerance : ANSI/HI 14.6 Grade 1U
Driver Sizing : Max Power + 3%

Performance

Hydraulic power	: 173 hp	Impeller diameter	
Pump speed	: 875 rpm	Rated	: 23.76 in
Pump overall efficiency (CE=1.00)	: 84.7 %	Maximum	: 23.90 in
NPSH required (NPSH3)	: 20.7 ft	Minimum	: 19.49 in
Rated brake power	: 205 hp	Ns / Nss	: 4933 / 10100 (US units)
		Minimum continuous flow	: 5243.9 USgpm
Maximum brake power	: 262 hp	Maximum head at rated diameter	: 112.24 ft
Driver power rating	: 250 hp / 186 kW	Flow at BEP	: 12912.4 USgpm
Casing working pressure	: 48.5 psig	Flow as % of BEP	: 96.8 %
(based on shut off @ cut dia/rated SG)		Efficiency at normal flow	: -
Maximum allowable	: 65.0 psig	Impeller diameter ratio (rated/max)	: 99.4 %
Hydrostatic test pressure	: 82.0 psig	Head rise to shut off	: 104.1 %
Estimated rated seal chamber pressure	: -	Total head ratio (rated / max) / (max / rated)	: 95.3 % / 105.0 %

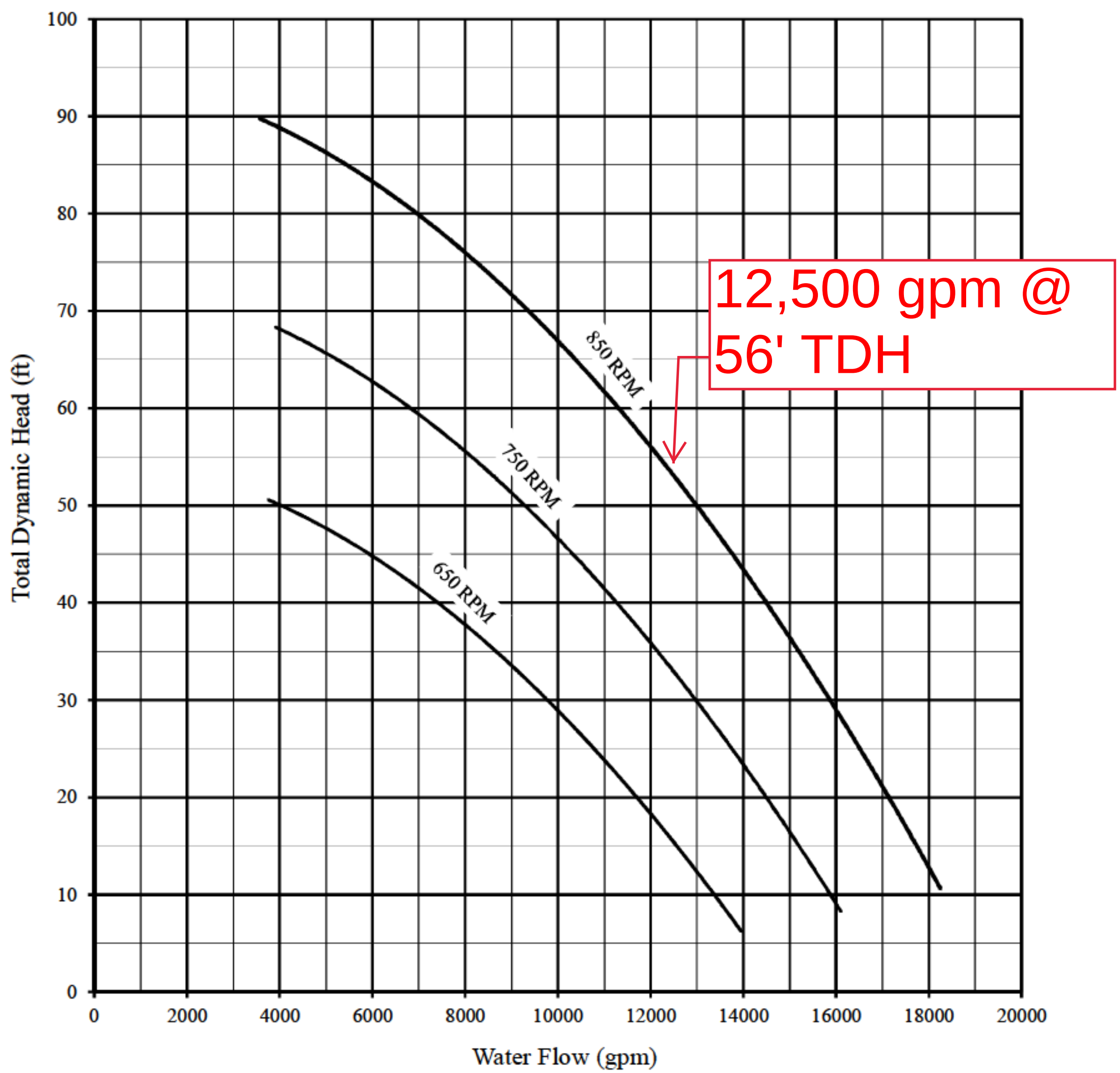
CURVES ARE APPROXIMATE, PUMP IS GUARANTEED FOR ONE SET OF CONDITIONS; CAPACITY, HEAD, AND EFFICIENCY.

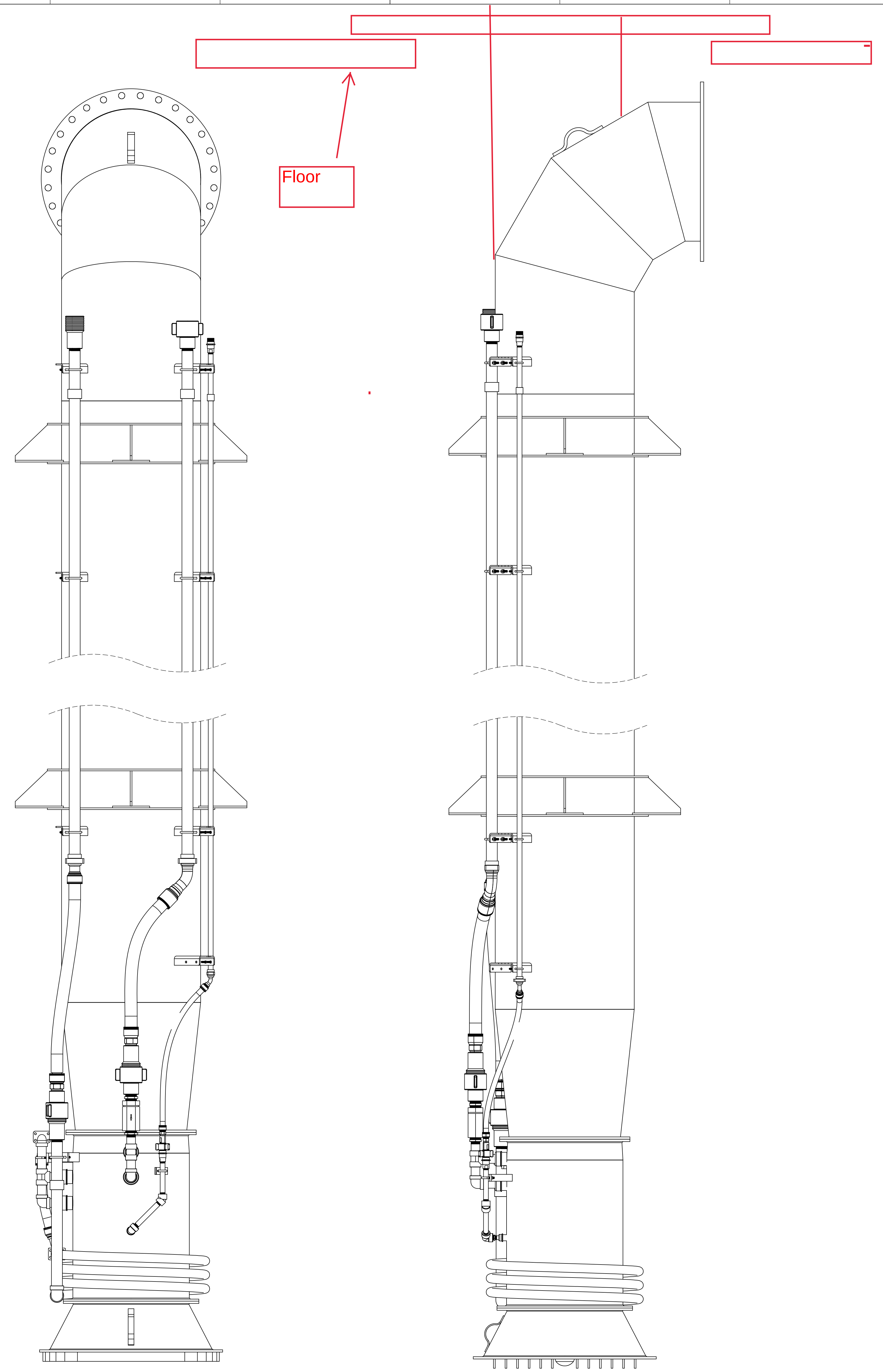


Additional information is required prior to supplying
a General Arrangement Drawing.
Please refer to Flowserve for further assistance.

-

Customer	: General Repair Service	Pump size & type	: 24MVX24B	Drawing number	: -
Item number	: -	Pump speed / Stages	: 875 rpm / 1	Date	: August 6, 2020
Service	: -	Flow / Head	: 12500.0 USgpm / 55.00 ft	Certified by / Date :	: -
Customer PO #	: -	Driver power / Frame	: 250 hp / 186 kW / -	Seal type	: -
Flowserve reference	: 2687692364	Volts / Phase / Hz	: 480 / - / 60 Hz	Seal flush plan	: -


12,500 gpm @
56' TDH
850 RPM
750 RPM
650 RPM
Total Dynamic Head (ft)
Water Flow (gpm)
0
10
20
30
40
50
60
70
80
90
100
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000



INSPECTIONS:
BOXED DIMENSIONS

THIRD-ANGLE PROJECTION | WEIGHT: -

NOTES:
1. NOTES 2, 3, INSPECTIONS AND TOLERANCES ARE APPLICABLE ONLY TO PRODUCTION DRAWINGS.
2. BREAK / DE-BURR ALL SHARP EDGES AND CORNERS.
3. REMOVE ALL BURRS/RAISED EDGES AROUND DRILLED HOLES AND TAPPED HOLES.
4. MARK PART NO. AT LOCATION SHOWN.

PROJECT:
STANDARD

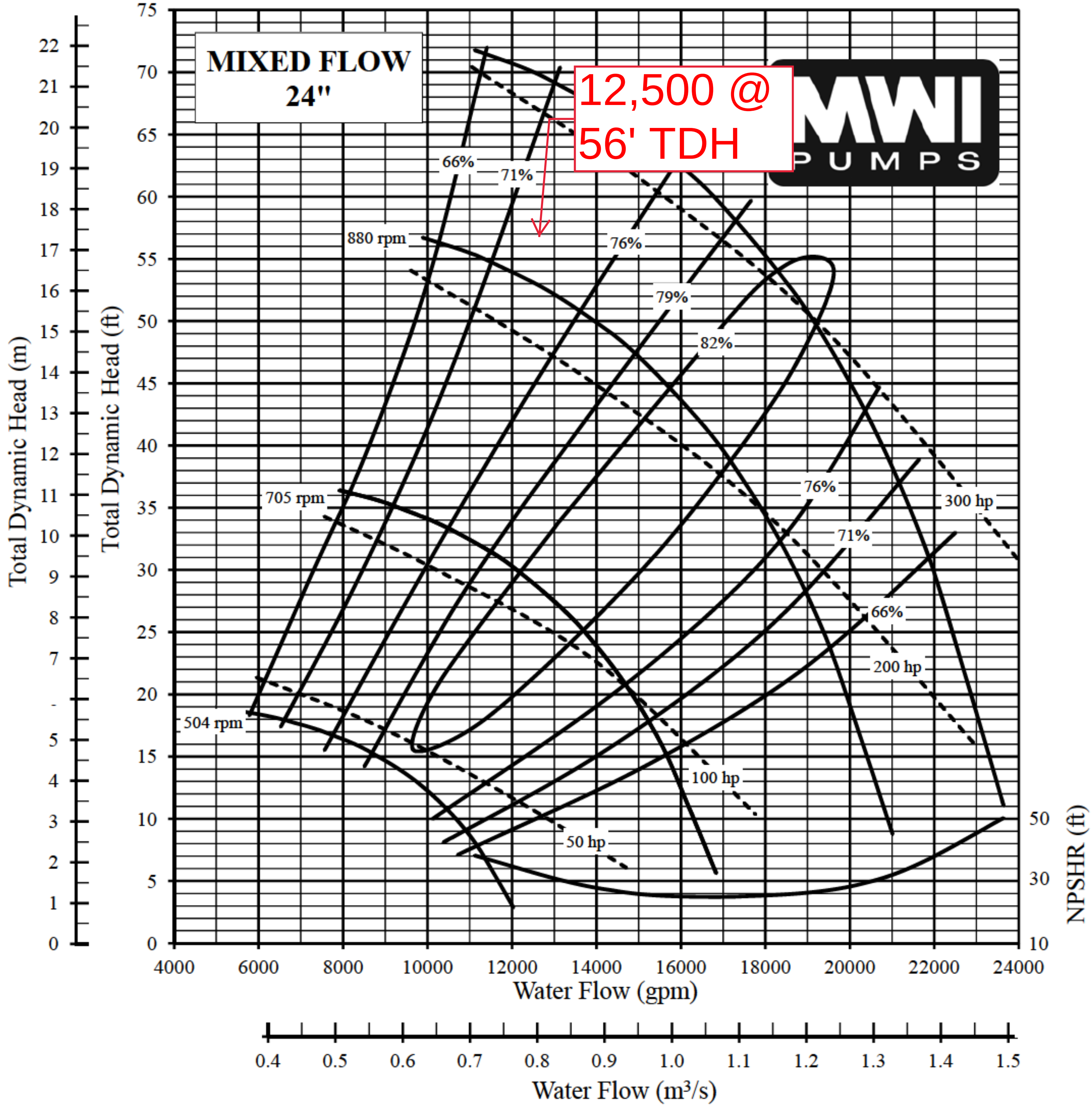
UNLESS OTHERWISE SPECIFIED
TOLERANCES ARE AS FOLLOWS:

IMPERIAL:		METRIC:	
.X	± 0.06 in.	X.	± 1.5 mm
.XX	± 0.03	.X	± 0.8
.XXX	± 0.010	.XX	± 0.25
.XXXX	± 0.001	.XXX	± 0.025
FRACTIONAL	± 1/16		
MACHINED SURFACE FINISH:	125 √	MACHINED SURFACE FINISH:	32 √
BOLT PATTERN TOLERANCE: EQUAL SPACING VARIATION 0.03 MAX ALL HOLES.		BOLT PATTERN TOLERANCE: EQUAL SPACING VARIATION 0.8 MAX ALL HOLES.	

TITLE: -

JOB NO.: N/A
APPROVED BY:
DRAWN BY:
DRAWING NO.: -
REV: - | SHEET: 1 OF 1 | 8/6/2020

MWI PUMPS
33 NORTHWEST ELLER STREET
DEERFIELD BEACH, FL 33441
WWW.MWICORP.COM



PUMP BOWL PERFORMANCE CURVE	
TYPE: MIXED FLOW	**IMPELLER DIA: 21.1"**
MODEL NO: MF 24-661400SB+	**SPEED: As Noted**
INTAKE DIA: 32"	**DISCHARGE COLUMN DIA: 24"**
CURVE NO.: N2466B	**Ns: 6600 Code B**

SINGLE STAGE PERFORMANCE
FOR TWO STAGES MULTIPLY HEAD AND HORSEPOWER BY 2 0 AND EFFICIENCY BY 1 0
PERFORMANCE IS BASED ON PUMPING CLEAR, NONAERATED WATER, WITH A SPECIFIC GRAVITY OF 1 0, TEMPERATURE 85 °F OR LESS AND AT SEA LEVEL PUMP PERFORMANCE MAY BE AFFECTED BY HIGHER TEMPERATURES, SPECIFIC GRAVITY, ALTITUDES AND SUMP CONDITIONS

IT IS HEREBY CERTIFIED THAT THIS CURVE REPRESENTS THE TRUE PERFORMANCE CHARACTERISTICS OF THE MWI PUMP MODEL SHOWN AND WAS OBTAINED BY SCALE MODEL TEST AND CALCULATIONS IN ACORDANCE WITH STANDARDS OF THE HYDRAULIC INSTITUTE.

MWI CORPORATION
CERTIFIED BY

MWI CORPORATION
Deerfield Beach, Florida

APPENDIX D – ODOR CONTROL ANALYSIS

APPENDIX D

ODOR CONTROL ANALYSIS

Stantec has conducted a review of the current odor control system at L-32 on the west side of the river as well as preliminary modeling of the interceptors upstream. The purpose of Appendix D is to outline the analysis conducted to this point and provide high level cost estimates and recommendations.

The Odor control upgrades on the west side include the following:

1. Reconfiguring the Existing Radial Carbon Unit
2. Installing new OC ductwork to siphon structure
3. Further investigation into odor issues that may result upstream from modifications

The odor control upgrades on the east side include the following:

1. Installation of a new odor control unit
2. Duct sizing and configuration

Stantec has not conducted their own odor study in the L-32 area and will be using data and as-builts provided by MCES and conducted by other consultants.

1.1 INTERCEPTOR AIR DRAG MODELING

Stantec developed a model of the interceptors upstream of L-32 (west side) using air drag calculations to provide a baseline for potential air movement. Air drag calculations consider the friction between the sewage flowing through the sewer and the air in the headspace above the sewage, assuming that air can vent in and out of the sewer as needed. The baseline model looks at individual sewer segments rather than the cumulative flow through the system and does not take into account the effects of drop structures or the removal of air by current systems. The table below is a summary of the air drag modeling conducted for the pipes leading into the new siphon head structure on the west side of the river. Note that pipe ID is ordered from upstream to downstream, 122001 will connect into the siphon structure.

Interceptor Pipe ID	Flow Condition	Diameter (in)	Flow Depth (in)	Flow (MGD)	Predicted Airflow (cfm)
122003	Average	54	11.38	16	3,075

	Peak/Wet Weather	54	54	67	0
122002	Average	54	11.38	16	3,177
	Peak/Wet Weather	54	23.99	67	4,392
122001	Average	54	11.38	16	3,177
	Peak/Wet Weather	54	23.99	67	4,392

As seen in the table the predicted airflow entering the siphon structure will be receiving roughly 4,400 cfm of odorous air to be ventilated through the proposed odor control duct within the structure. One point of concern is during peak flows the interceptor pipe 122003 upstream of L-32 could experience an airflow pinch point. This causes a block in airflow down the pipe and can result in backup of air creating positive pressure upstream of the pinch point.

1.2 DESIGN CRITERIA-WEST SIDE

The Odor control upgrades on the west side are limited to making the old radial carbon unit functional for treating the siphon structure. This will require that the current blend of carbon within the filter be confirmed as still practical.

A new odor collection duct will have to be constructed from the odor control unit to siphon structure. Given the predicted airflow volumes this duct will need to between 20”-24”. The final size will be dependent on the alignment of the ductwork. Stantec is operating under the assumption that the current unit is working efficiently at its designed loads.

Under the current conditions it is not recommended that chemical addition be added to the west side of the river. The siphon is a short distance and the addition of chemical will have little to no effect on odor generation over the residence time. Focusing on maintaining vapor phase odor control on the west and implementing odor control on the east is the recommended approach.

1.3 DESIGN CRITERIA-EAST SIDE

Local odor control will be necessary at the new L-32 Lift Station to provide safe worker access areas exposed to harmful odorous air and well as prevent corrosion inside the lift station. Installing odor control measures will also help to prevent odors from escaping and causing odor complaints in the surrounding neighborhood. There are a wide variety of odor control technologies available in the marketplace. However, not all technologies are suitable for all applications. Generally, the technology is driven by the compounds to be treated and the environmental conditions of the air flow to be treated.

The main odor component that will need to be treated at this lift station is H_2S. The siphon entering the lift station wet well reduces the influent air flow to zero. Therefore, the air that is required to be contained, collected, treated and released will all be from the wet well, pump rooms and storage tank if applicable. Vapor phase treatment will be the most effective way of odor control under these circumstances. Given the 10 ppm average inlet H_2S for the carbon system on the west side of the river, carbon would be the most effective treatment process for the lift station on the east side as well. Below are the design criteria for the odor system on the west side.

Air collection rates for the odor control system

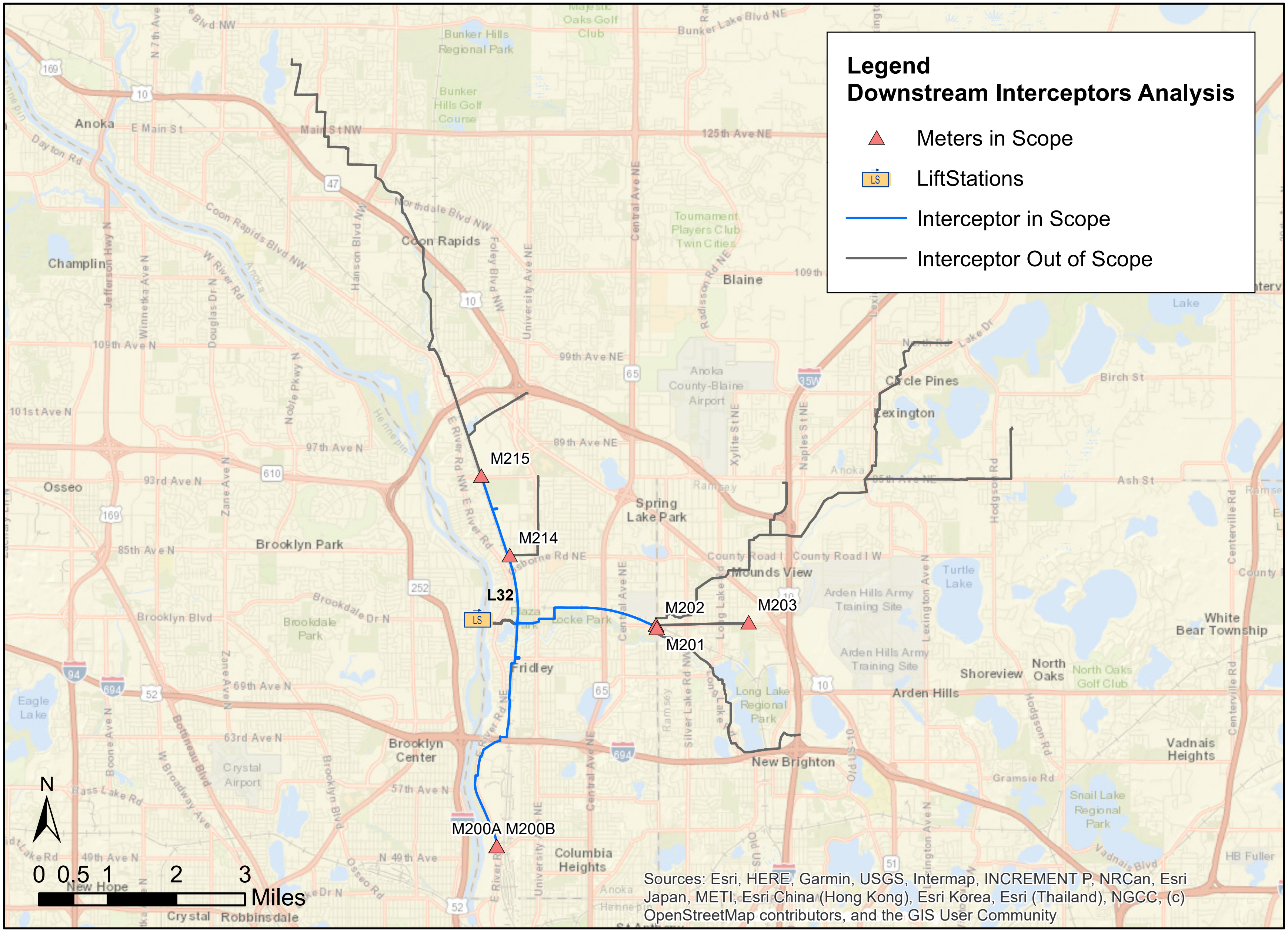
Area	Area Volume (ft^3)	Ventilation rate (air changes per hour)	Airflow (ft^3/min)
Wet Well 1		12	5,000
Wet Well 2		12	5,000
Pump Room 1		6	2,500
Pump Room 2		6	2,500
Overflow Tank		6	
Total *Excluding Overflow Tank			15,000

The table below represents the conceptual design for a carbon system capable of treating the air at the new lift station.

Carbon System	
Vessel Diameter	9 ft
Vessel Height	15 ft
Flow Rate	15,000 cfm
Depth of Carbon	2 ft
H2S Removal Efficiency	>99%
Vessel Material of Construction: Fiberglass Reinforced Plastic (FRP)	
Carbon Filter Headloss	8-inches of water column
FRP Mist Eleminator Headloss	Clean: 0.5” w.c. Dirty: 1.25 w.c.
Odor Control Supply Fans	
Supply Fans	2 (duty/duty depending on operating condition)
Flow Rate Capacity	15,000 cfm
Static Pressure	10-inches of water column
Material of Construction: Fiberglass reinforced plastic (FRP) for corrosion resistance	
Motor	100 HP explosion proof, Class I Division I
Noise Enclosure	Yes
Drive Type	Variable Frequency Drive
Odor Control Ductwork	
Dampers: Manual butterfly valves schedule 80 PVC	
Odor Control Duct	FRP

APPENDIX E – L32_DOWNSTREAM CAPACITY ANALYSIS

Downstream L32 Interceptors Analysis



Stantec

MCES
L32 Downstream
Phase 2 - Lift Station Evaluation

Interceptor Capacity

Simulations – Per MCES Meeting

Inflow	3 x RCAP	2 x 72" Pipes	Downstream Sewer Levels
FM data* FM data + 20%* FM data + 50%* Peak Flows Peak Flows + 50%	No debris / full Max. Capacity	No debris / full Max. Capacity	Outfall – free fall

3 x 1 x 1 x 1

x 2* = 6 sets of results

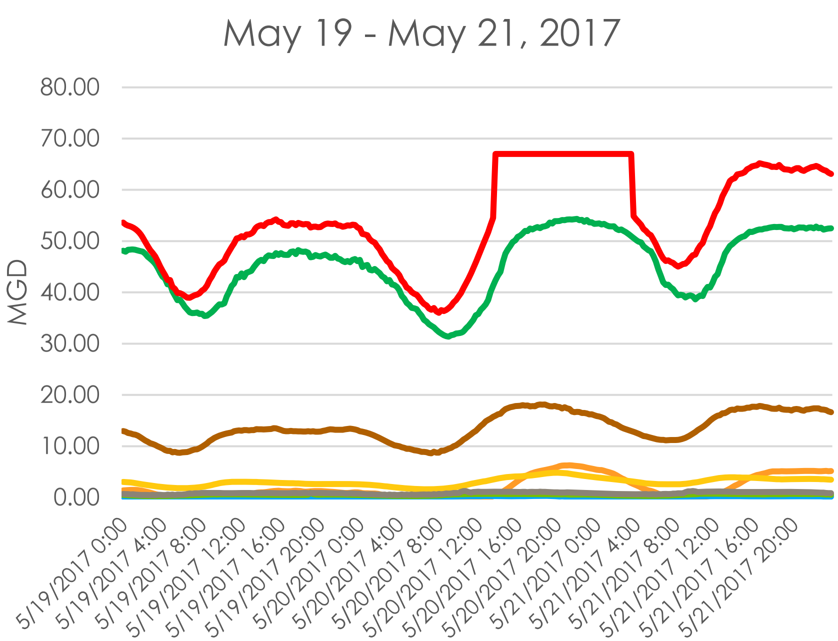
6 sets + 2 peak flow simulations = 8 Total Simulations

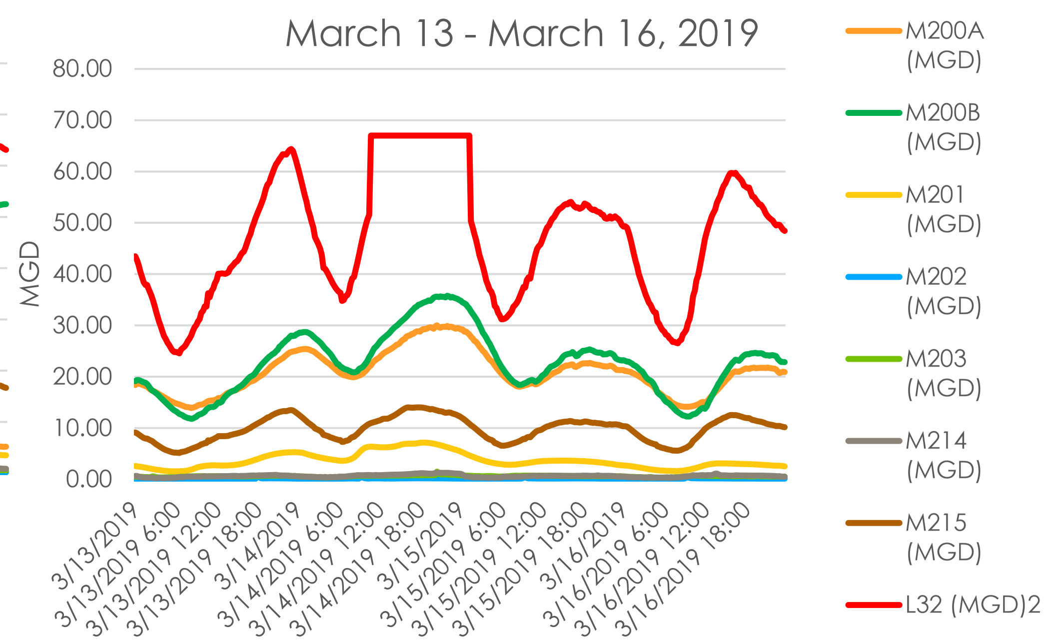
*Two events (5/20/2017 and 3/14/2019)

Updated Results

For FM Scenarios:

Used extended 67MGD DS of L32.





Updated Results

Scenarios:

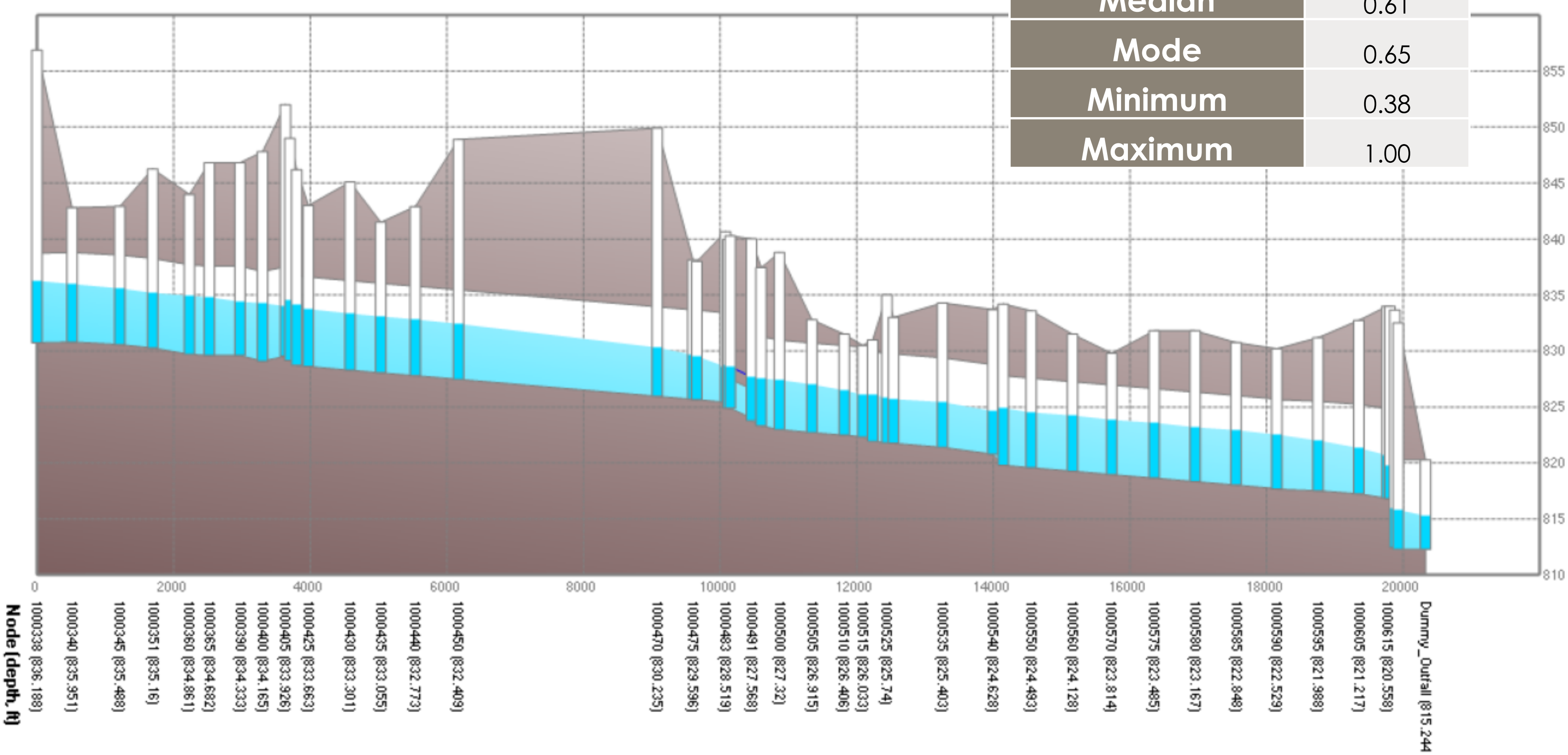
- Scenario 1: Existing Meter Data
  - Scenario 1 – Event 1 (5/20/2017)
  - Scenario 1 – Event 2 (3/14/2019)
- Scenario 2: Existing Meter Data plus 20%
  - Scenario 2 – Event 1 (5/20/2017)
  - Scenario 2 – Event 2 (3/14/2019)
- Scenario 3: Existing Meter Data plus 50%
  - Scenario 3 – Event 1 (5/20/2017)
  - Scenario 3 – Event 2 (3/14/2019)
- Scenario 4: Peak Flows*
- Scenario 5: Peak Flows* plus 50%

Meters	*Peak Flows
M201	7.16
M202	0.90
M203	4.75
M214	2.85
M215	18.14

Updated Results

Scenario 1 – Event 1

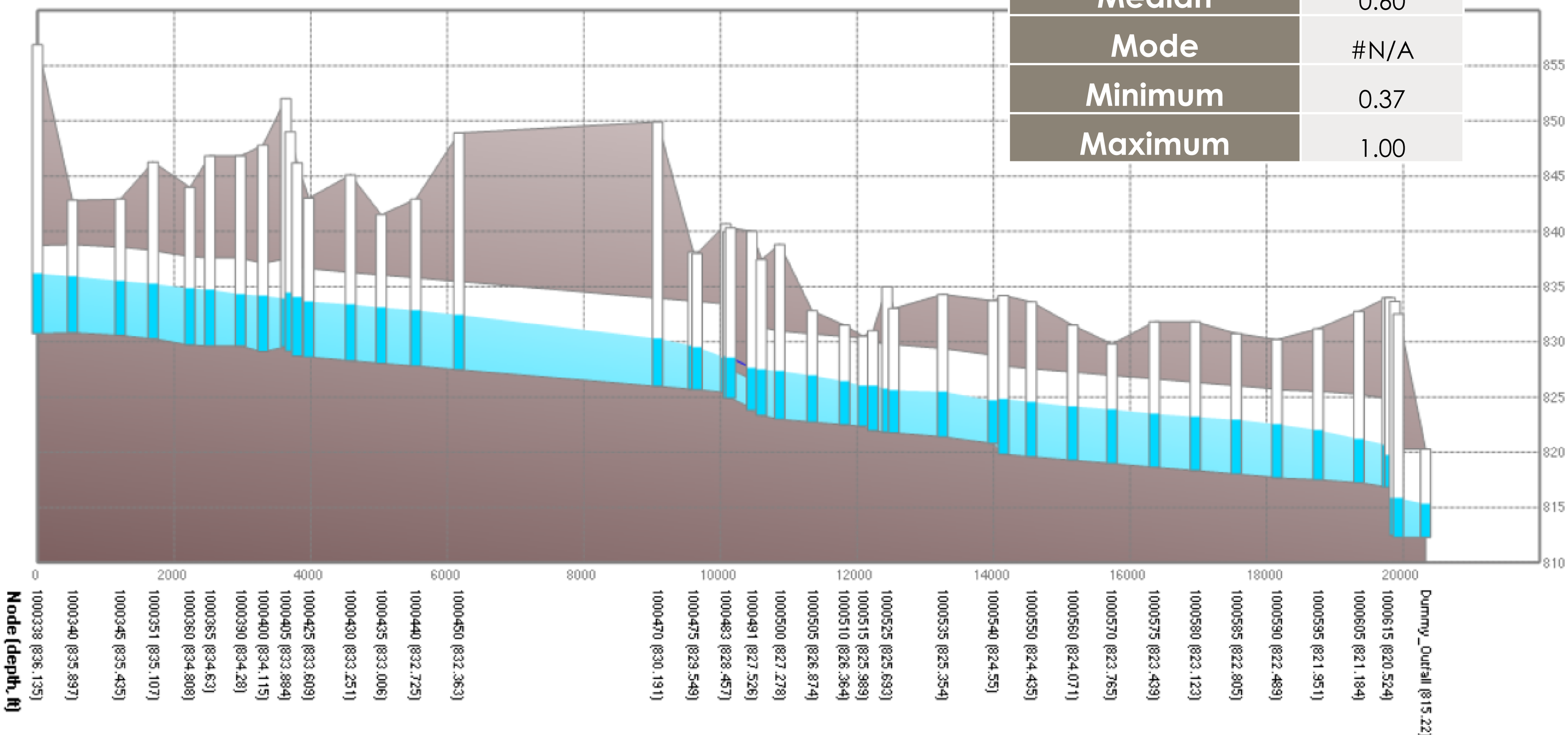
Max. Capacity:	
Mean	0.58
Median	0.61
Mode	0.65
Minimum	0.38
Maximum	1.00



Updated Results

Scenario 1 – Event 2

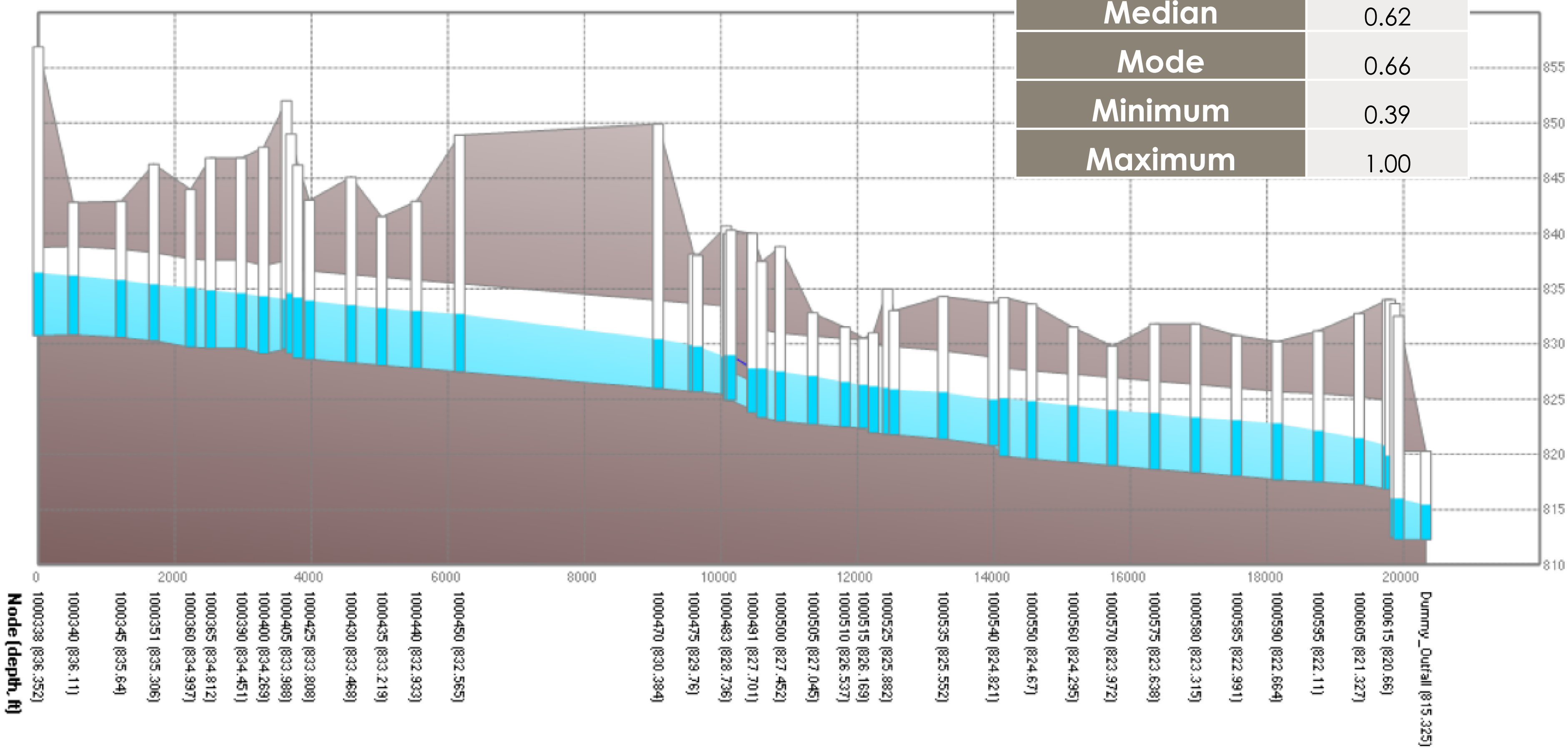
Max. Capacity:	
Mean	0.57
Median	0.60
Mode	#N/A
Minimum	0.37
Maximum	1.00



Updated Results

Scenario 2 – Event 1

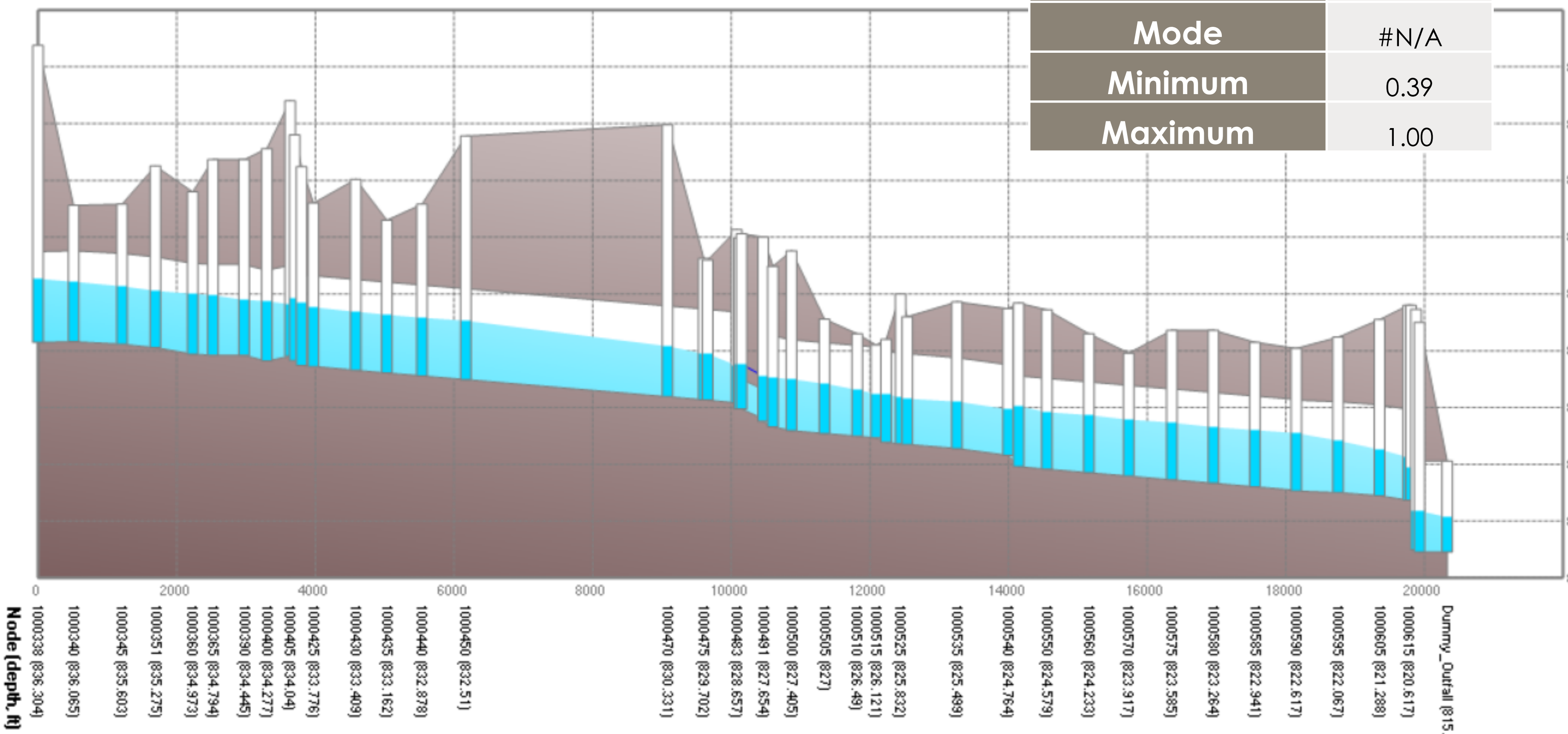
Max. Capacity:	
Mean	0.60
Median	0.62
Mode	0.66
Minimum	0.39
Maximum	1.00



Updated Results

Scenario 2 – Event 2

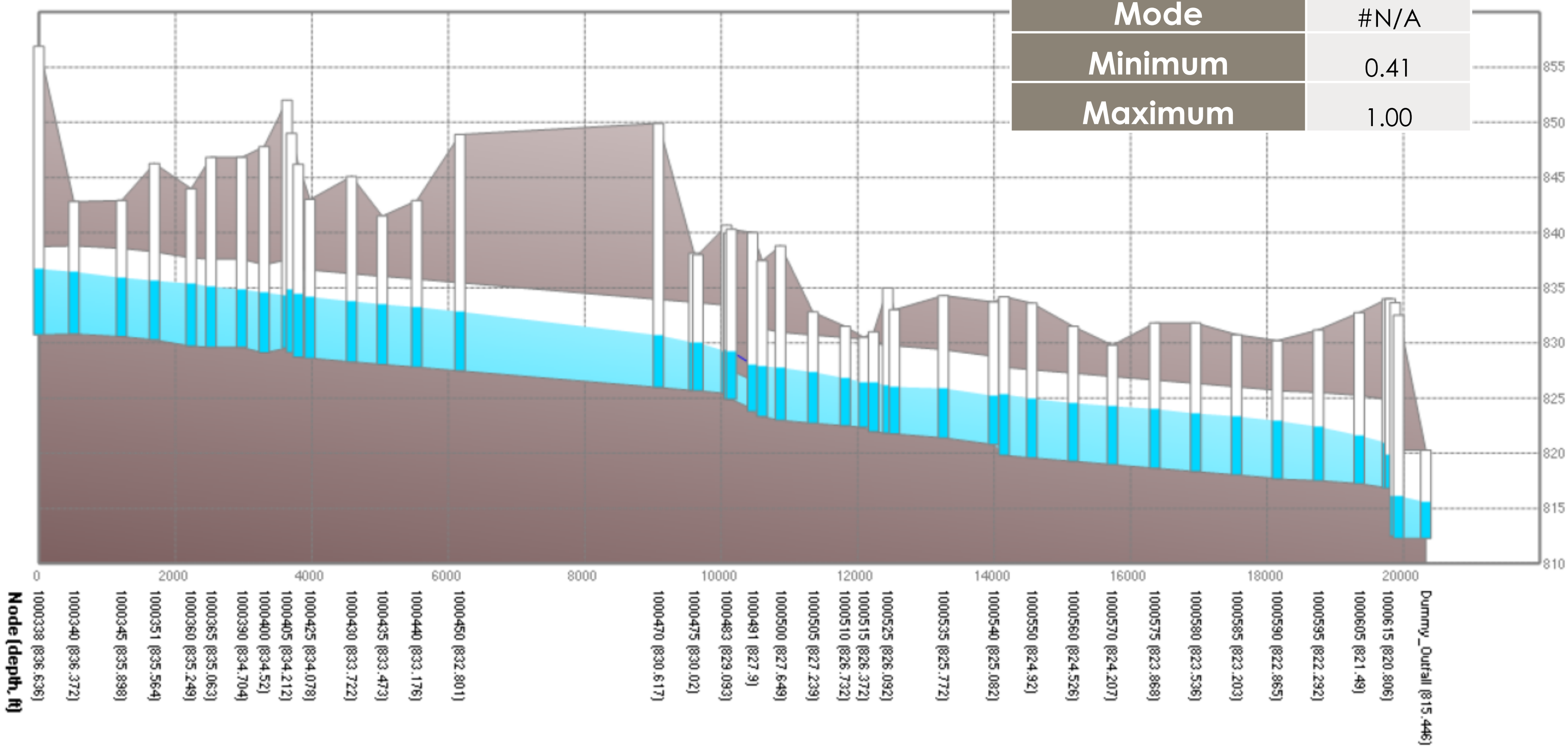
Max. Capacity:	
Mean	0.59
Median	0.62
Mode	#N/A
Minimum	0.39
Maximum	1.00



Updated Results

Scenario 3 – Event 1

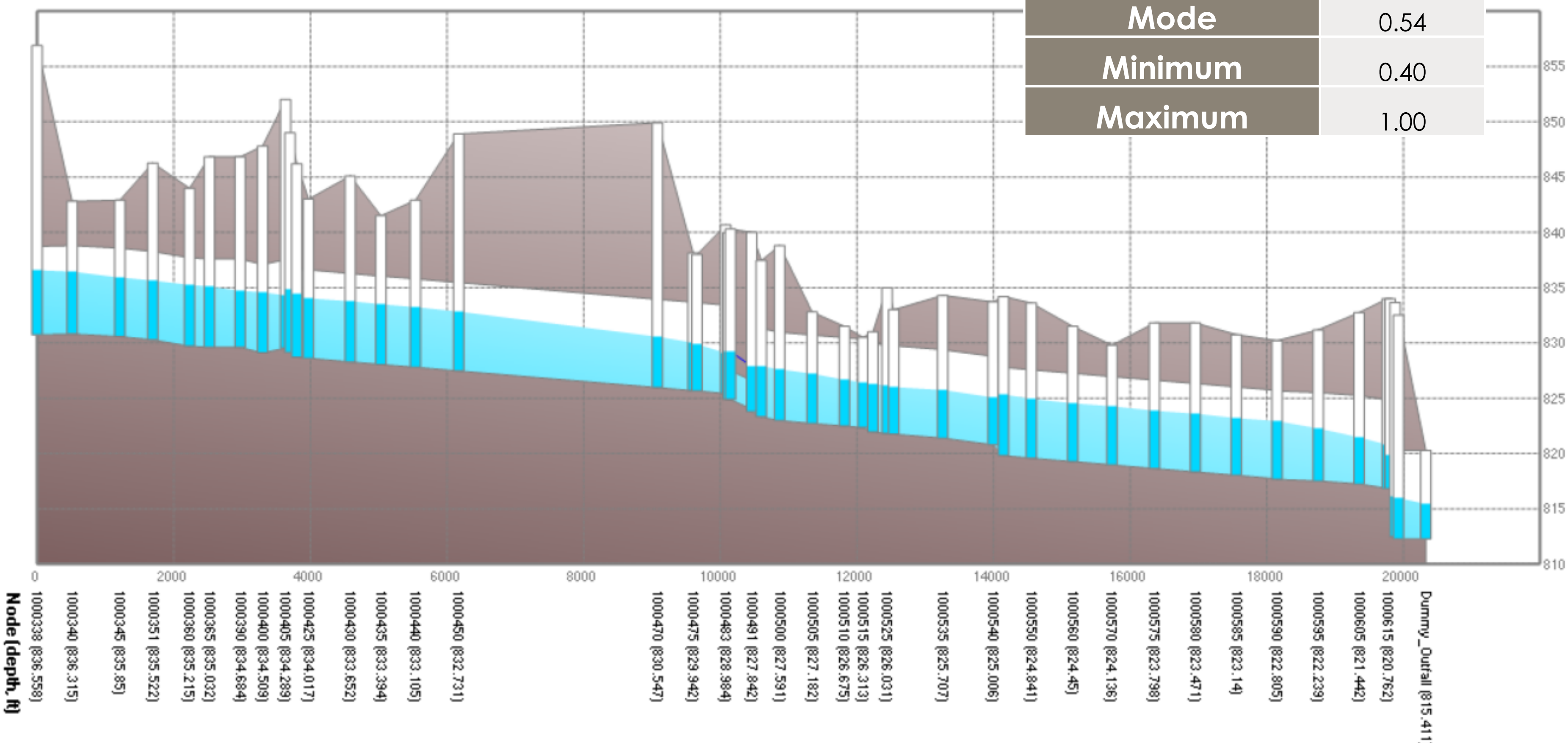
Max. Capacity:	
Mean	0.63
Median	0.66
Mode	#N/A
Minimum	0.41
Maximum	1.00



Updated Results

Scenario 3 – Event 2

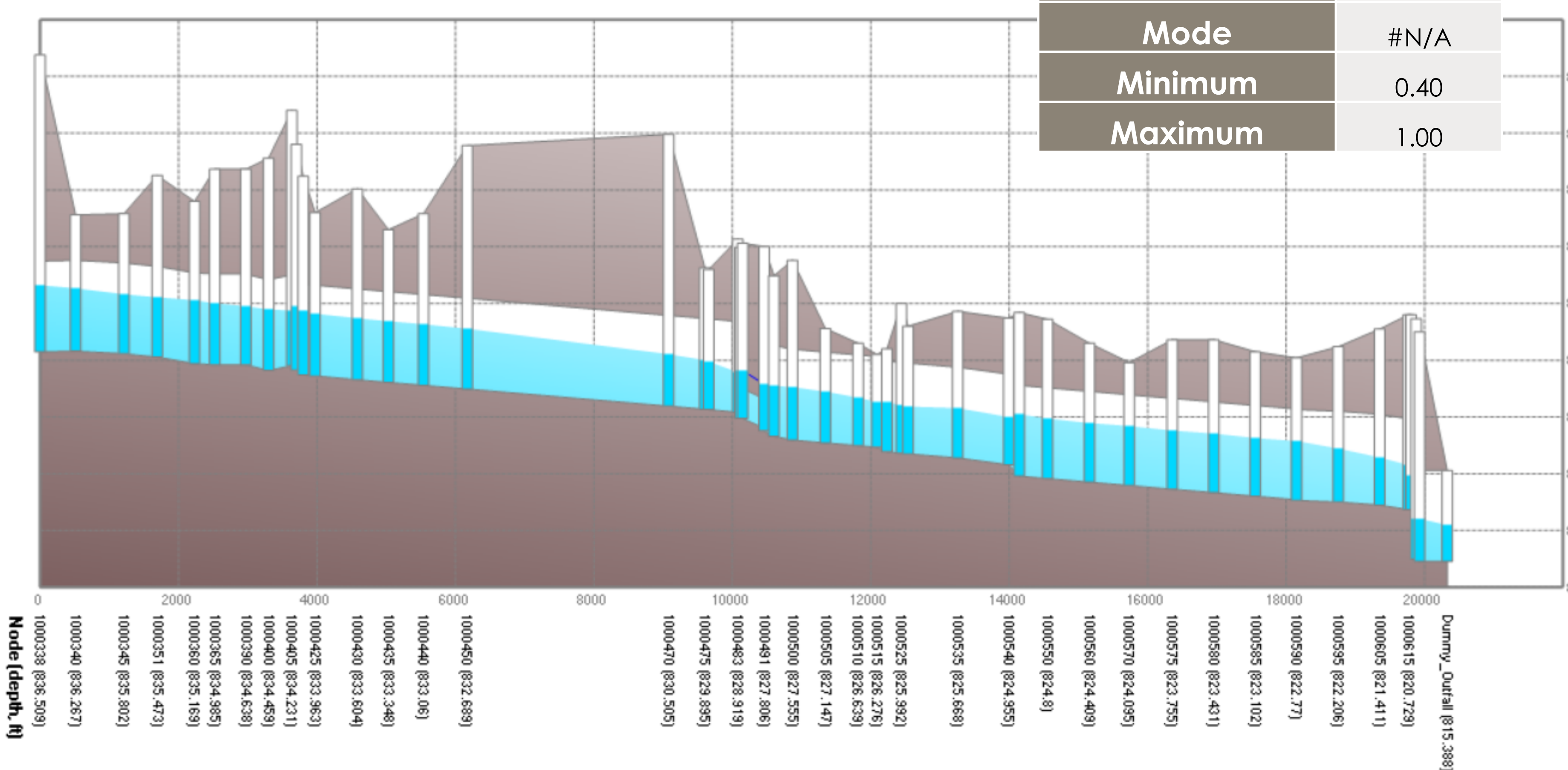
Max. Capacity:	
Mean	0.63
Median	0.65
Mode	0.54
Minimum	0.40
Maximum	1.00



Updated Results

Scenario 4 – Peak Flows

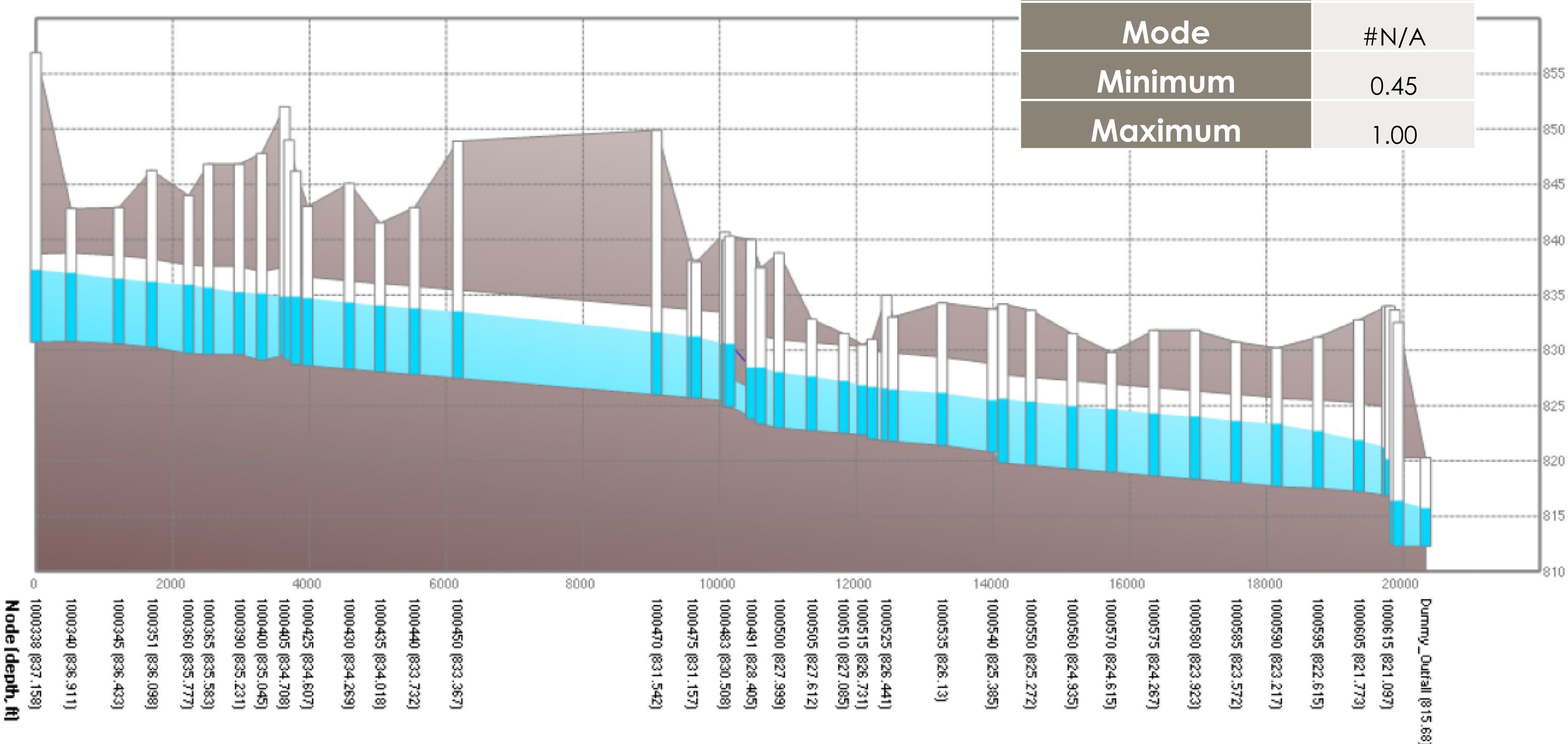
Max. Capacity:	
Mean	0.62
Median	0.64
Mode	#N/A
Minimum	0.40
Maximum	1.00



Updated Results

Scenario 5 – Peak Flows + 50%

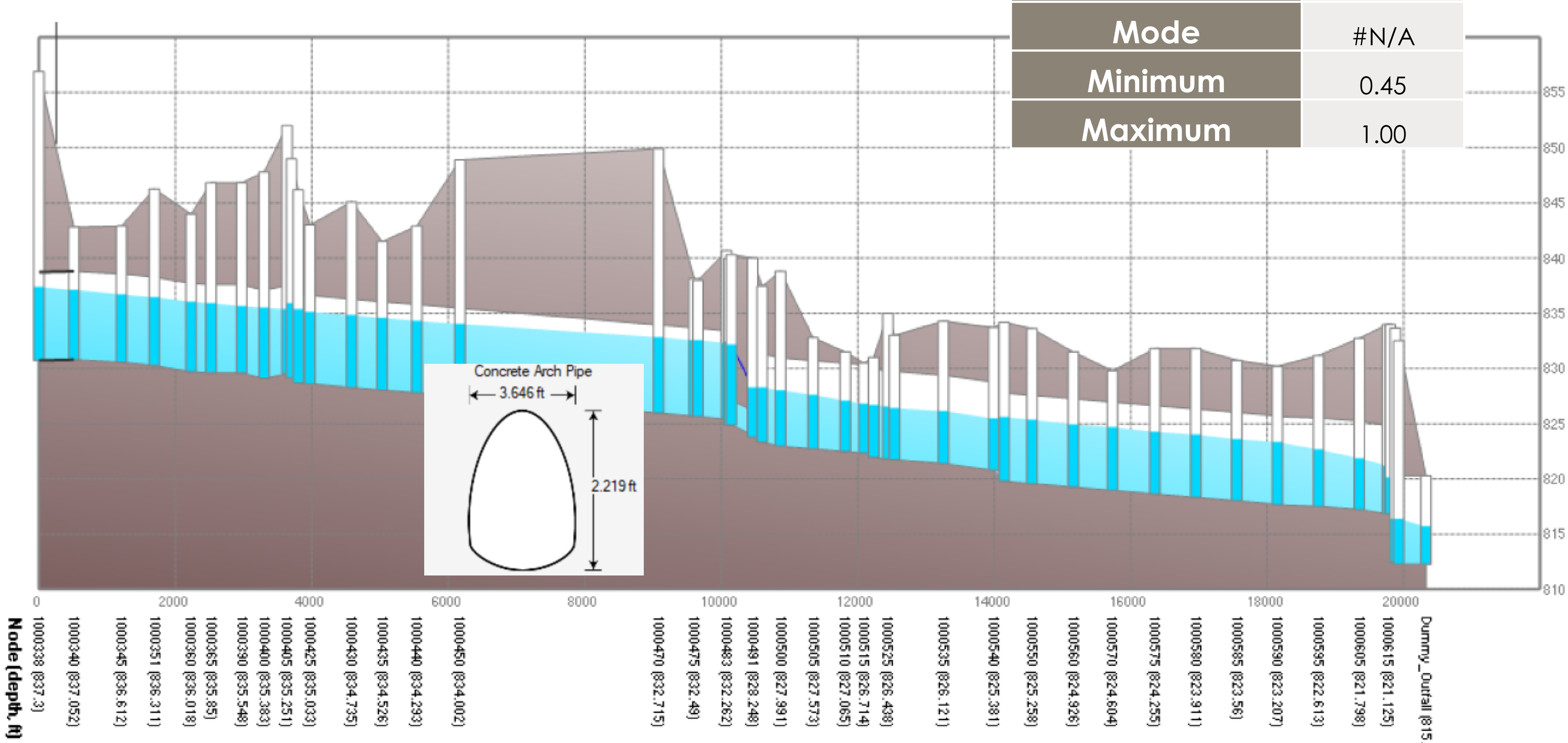
Max. Capacity:	
Mean	0.71
Median	0.74
Mode	#N/A
Minimum	0.45
Maximum	1.00



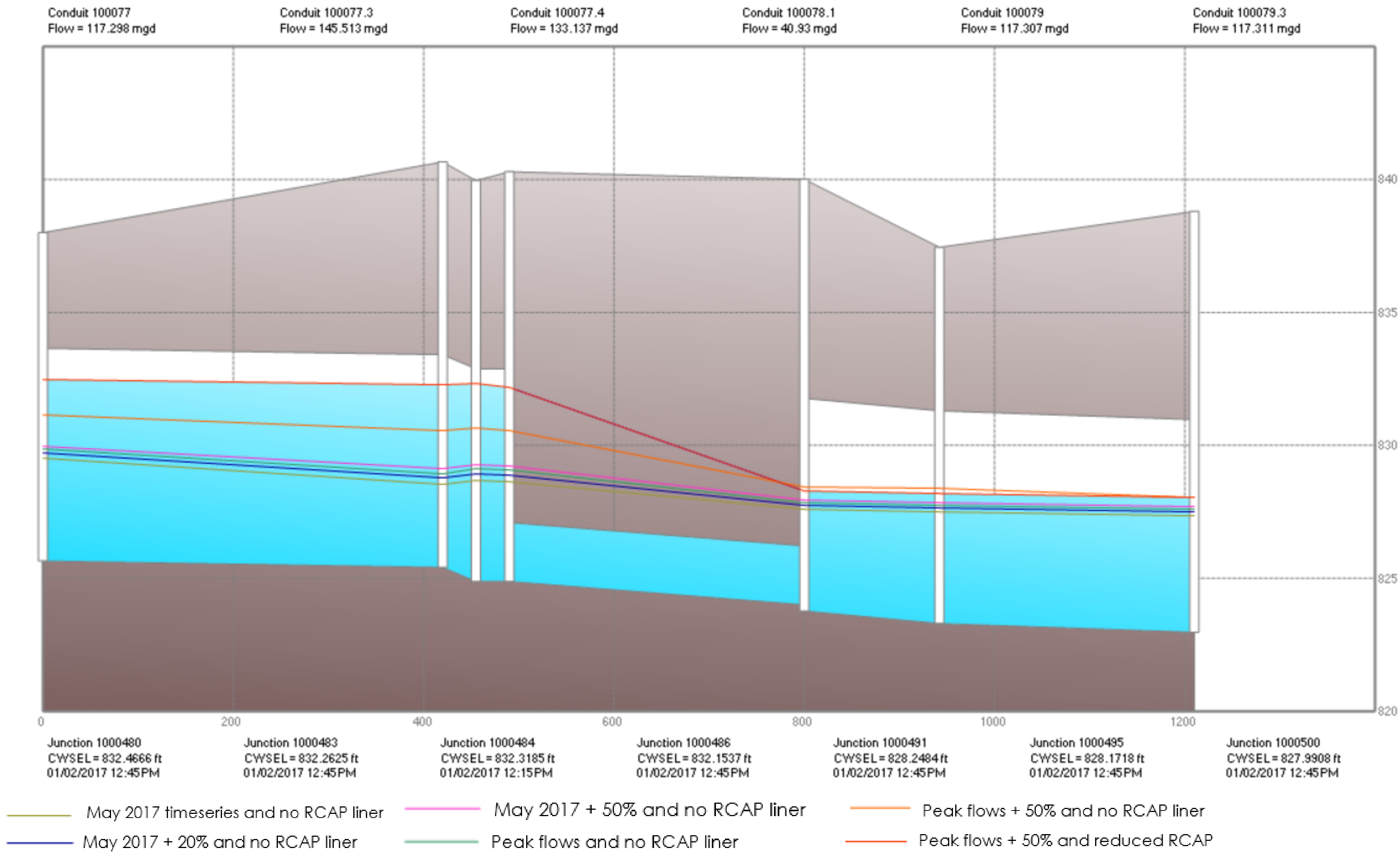
Updated Results

Extra Scenario – Peak Flows + 50%
Reduced Arch Pipes (liner extreme case)

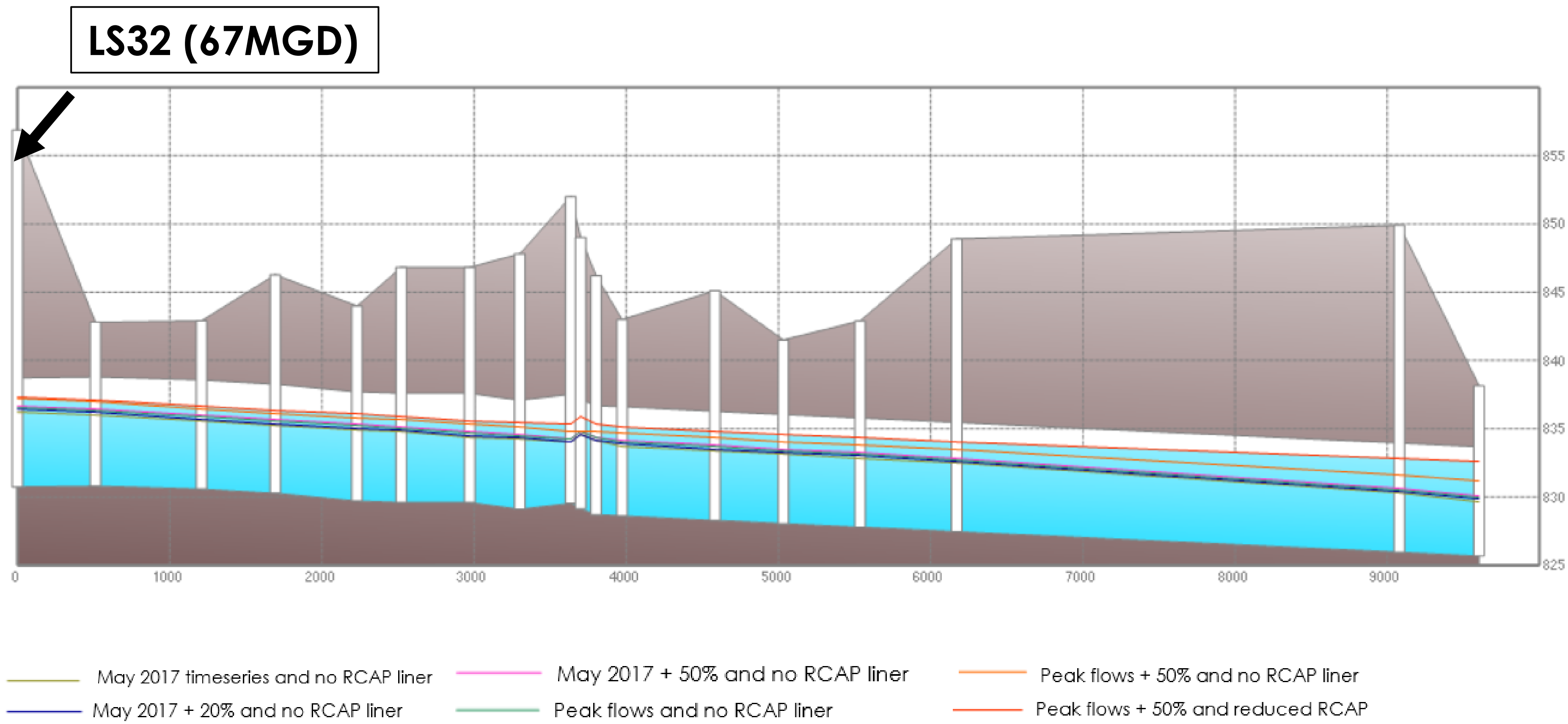
Max. Capacity:	
Mean	0.75
Median	0.76
Mode	#N/A
Minimum	0.45
Maximum	1.00



Scenarios Comparison



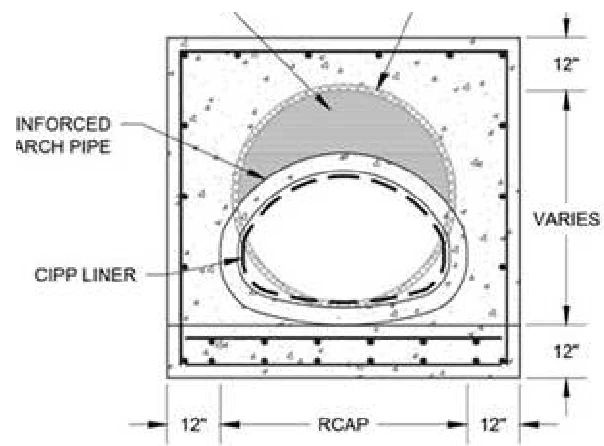
Scenarios Comparison



Assumptions

- No significant infiltration in interceptor
- No downstream constraints
  - No downstream meter in the interceptor to confirm possible constraints
- Arch pipes sized as shown in record drawings

Assumptions: 4.26’ (W) x 2.6’ (H) [Standard Size]; Clean / No Debris



Conclusion

- Assuming the previous assumptions are correct, the model results indicate that the interceptor's capacity is adequate for all scenarios analyzed under this scope.

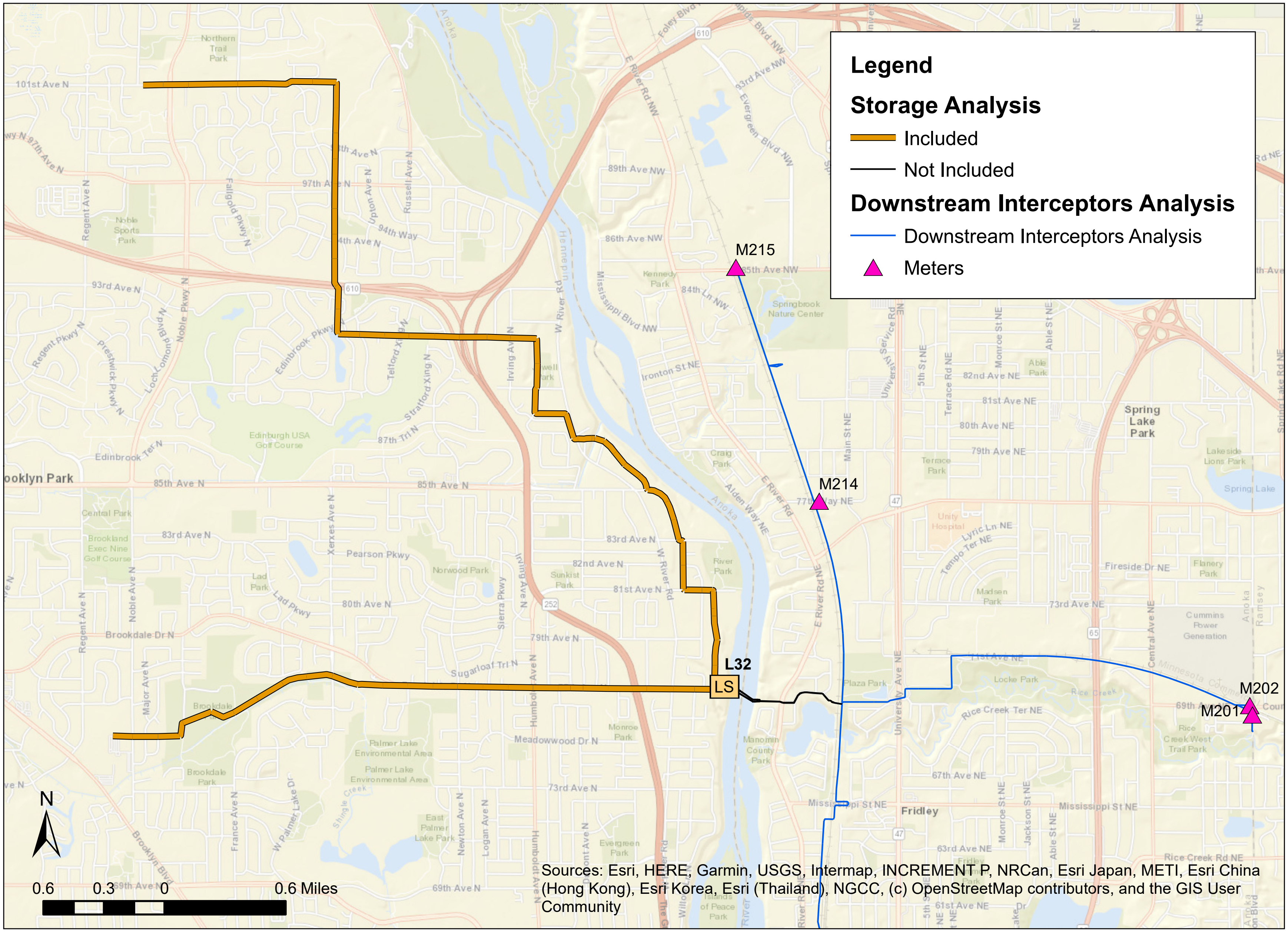
Name	Inlet Node	Outlet Node	Diameter (ft)	Diameter (in)	Slope (ft/ft)	Slope (%)
100032	1000200	1000205	5	60	0.131	13.09
100033	1000205	1000210	5	60	0.005	0.54
100034	1000210	1000215	5	60	0.005	0.45
100035	1000215	1000220	5	60	0.005	0.52
100036	1000220	1000225	5	60	0.008	0.75
100037	1000225	1000230	6	72	0.000	0.04
100038	1000230	1000235	6	72	0.000	0.00
100039	1000235	1000240	6	72	0.001	0.13
100040	1000240	1000245	6	72	0.000	0.04
100041	1000245	1000250	6	72	0.000	0.03
100042	1000250	1000255	6	72	0.000	0.04
100043	1000255	1000260	6	72	0.000	0.04
100044	1000260	1000265	6	72	0.000	0.04
100045	1000265	1000270	6	72	0.000	0.04
100046	1000270	1000275	6	72	0.000	0.04
100047	1000275	1000280	6	72	0.001	0.14
100048	1000280	1000285	6.5	78	0.000	0.02
100049	1000285	1000290	6.5	78	0.000	0.03
100050	1000290	1000295	6.5	78	0.008	0.78
100051	1000295	1000300	6.5	78	0.000	0.02
100052	1000300	1000305	6.5	78	0.000	0.03
100053	1000305	1000310	6.5	78	0.000	0.03
100054	1000310	1000315	6.5	78	0.000	0.03
100055	1000315	1000320	6.5	78	0.000	0.02
100056	1000320	1000325	6.5	78	0.000	-0.02
100057	1000325	1000330	6.5	78	0.000	0.04
100058	1000330	1000336	6.5	78	0.001	0.14
100059.1	1000336	1000338	8	96	0.000	0.00
100059.2	1000338	1000340	8	96	0.000	-0.01
100060	1000340	1000345	8	96	0.000	0.03
100061	1000345	1000351	8	96	0.001	0.06
100062	1000351	1000360	8	96	0.001	0.11
100063	1000360	1000365	8	96	0.000	0.04
100064	1000365	1000390	8	96	0.000	0.00
100065	1000390	1000400	8	96	0.002	0.15
100066	1000400	1000405	8	96	-0.001	-0.13
100067	1000405	1000410	8	96	0.006	0.60
100068	1000410	1000415	8	96	0.004	0.44
100069	1000415	1000425	8	96	0.001	0.05
100070	1000425	1000430	8	96	0.001	0.05
100071	1000430	1000435	8	96	0.001	0.05
100072	1000435	1000440	8	96	0.001	0.05
100073	1000440	1000450	8	96	0.001	0.05
100074	1000450	1000470	8	96	0.001	0.05
100075	1000470	1000475	8	96	0.001	0.05
100076	1000475	1000480	8	96	0.001	0.05

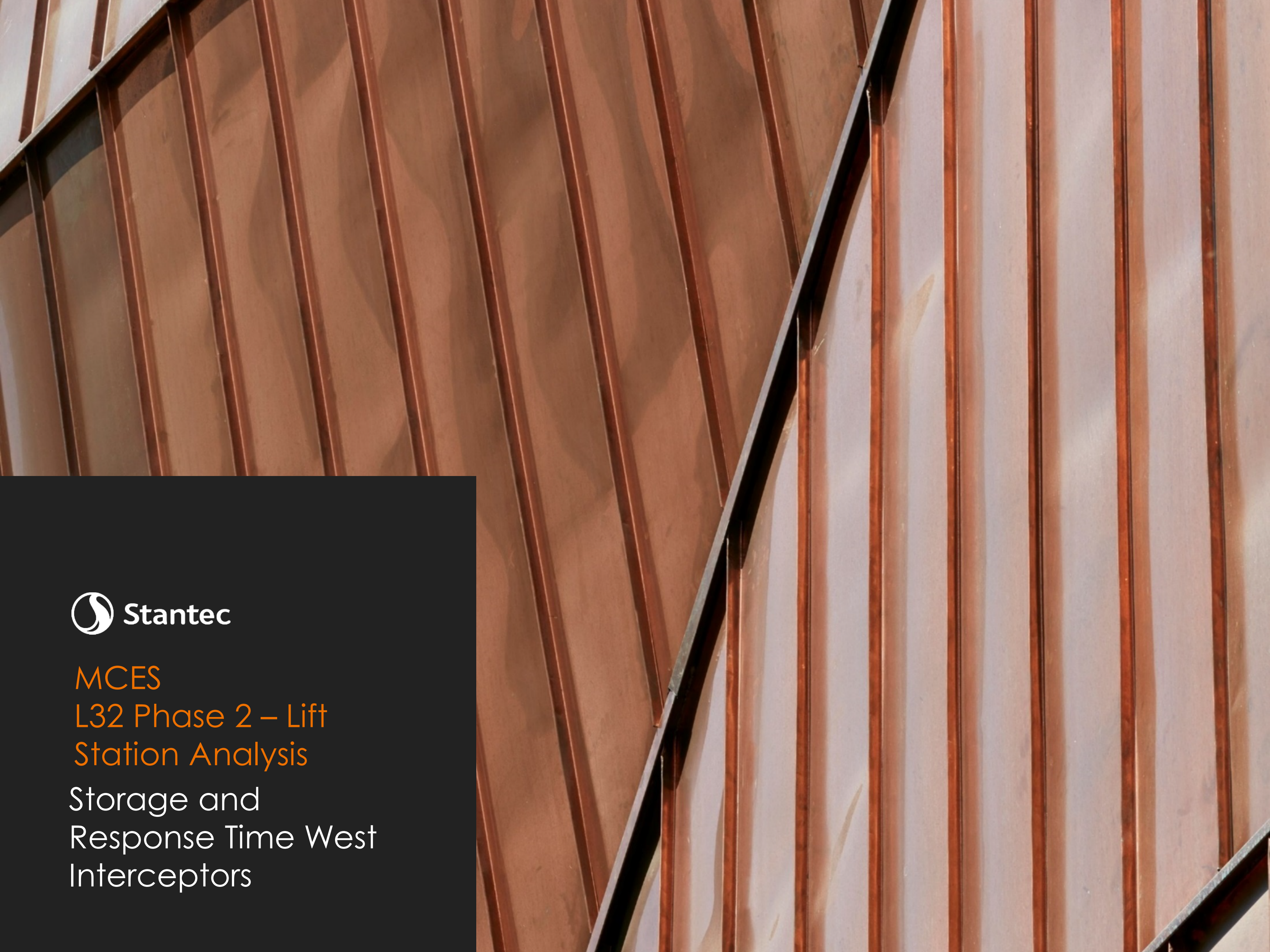
Name	Inlet Node	Outlet Node	Diameter (ft)	Diameter (in)	Slope (ft/ft)	Slope (%)
100077	1000480	1000483	8	96	0.001	0.06
100077.3	1000483	1000484	8	96	0.015	1.51
100077.4	1000484	1000486	8	96	0.000	0.00
100078.2	1000486	1000491	7	84	0.003	0.28
100079	1000491	1000495	8	96	0.003	0.33
100079.3	1000495	1000500	8	96	0.001	0.12
100080	1000500	1000505	8	96	0.001	0.06
100081	1000505	1000510	8	96	0.000	0.05
100082	1000510	1000515	8	96	0.001	0.06
100083	1000515	1000520	8	96	0.003	0.28
100084	1000520	1000525	8	96	0.001	0.06
100085	1000525	1000530	8	96	0.001	0.05
100086	1000530	1000535	8	96	0.001	0.05
100087	1000535	1000540	8	96	0.001	0.08
100088	1000540	1000545	8	96	0.007	0.66
100089	1000545	1000550	8	96	0.001	0.05
100090	1000550	1000560	8	96	0.001	0.05
100091	1000560	1000570	8	96	0.001	0.05
100092	1000570	1000575	8	96	0.001	0.05
100093	1000575	1000580	8	96	0.001	0.05
100094	1000580	1000585	8	96	0.001	0.05
100095	1000585	1000590	8	96	0.001	0.05
100096	1000590	1000595	8	96	0.000	0.02
100097	1000595	1000605	8	96	0.000	0.05
100098	1000605	1000615	8	96	0.001	0.10
100099	1000615	1000620	8	96	0.000	0.05
100101	1000620	1000630	6	72	-0.002	-0.24
100102	1000630	1000635	6	72	0.004	0.39
100104	1000620	1000645	6	72	-0.002	-0.24
100105	1000645	1000635	6	72	0.004	0.39
101007	1010035	1000280	1.5	18	0.079	7.95
103113	1030784	1030785	5.5	66	0.016	1.56
103114	1030785	1030795	4	48	0.011	1.07
103115	1030795	1030810	4	48	0.000	0.02
103116	1030810	1030815	5	60	0.006	0.61
103117	1030815	1030820	5	60	0.002	0.21
103118	1030820	1030825	5	60	0.001	0.09
103119	1030825	1030830	5	60	0.002	0.16
103120	1030830	1030835	5	60	0.001	0.13
103121	1030835	1030840	5	60	0.002	0.23
103122	1030840	1030845	5	60	0.011	1.12
103123	1030845	1030850	5	60	0.002	0.17
103124	1030850	1030855	5	60	0.002	0.21
103125	1030855	1030860	5	60	0.002	0.19
103126	1030860	1030865	5	60	0.002	0.16
103127	1030865	1030870	5	60	0.003	0.29

Name	Inlet Node	Outlet Node	Diameter (ft)	Diameter (in)	Slope (ft/ft)	Slope (%)
103128	1030870	1030875	5	60	0.002	0.21
103129	1030875	1030880	5	60	0.002	0.17
103130	1030880	1030885	5	60	0.002	0.18
103131	1030885	1030890	5	60	0.002	0.17
103132	1030890	1030895	5	60	0.002	0.19
103133	1030895	1030900	5	60	0.002	0.18
103134	1030900	1030905	5	60	0.002	0.19
103135	1030905	1030915	5	60	0.002	0.17
103136	1030915	1030920	5	60	0.002	0.16
103137	1030920	1030930	5	60	0.002	0.18
103138	1030930	1030935	5	60	0.002	0.20
103139	1030935	1030940	5	60	0.002	0.17
103140	1030940	1030950	5	60	0.002	0.17
103141	1030950	1030970	6	72	0.001	0.08
103142	1030970	1030975	6	72	0.000	0.04
103144	1030975	1000336	6	72	0.002	0.22
122015	1220137	1000338	5	60	-0.001	-0.09
90040	900300	900310	3.5	42	0.002	0.22
90041	900310	1030810	3.5	42	0.001	0.09
Dummy_Outfall	1000635	Dummy_Outfall	8	96	0.000	0.00
L.163	1000530	1000535	8	96	0.001	0.05
100078.1	1000486	1000491	7	84	0.003	0.28
100078.3	1000486	1000491	7	84	0.003	0.28

APPENDIX F – L32_UPSTREAM STORAGE CAPACITY

Upstream L32 Interceptors Analysis





Stantec

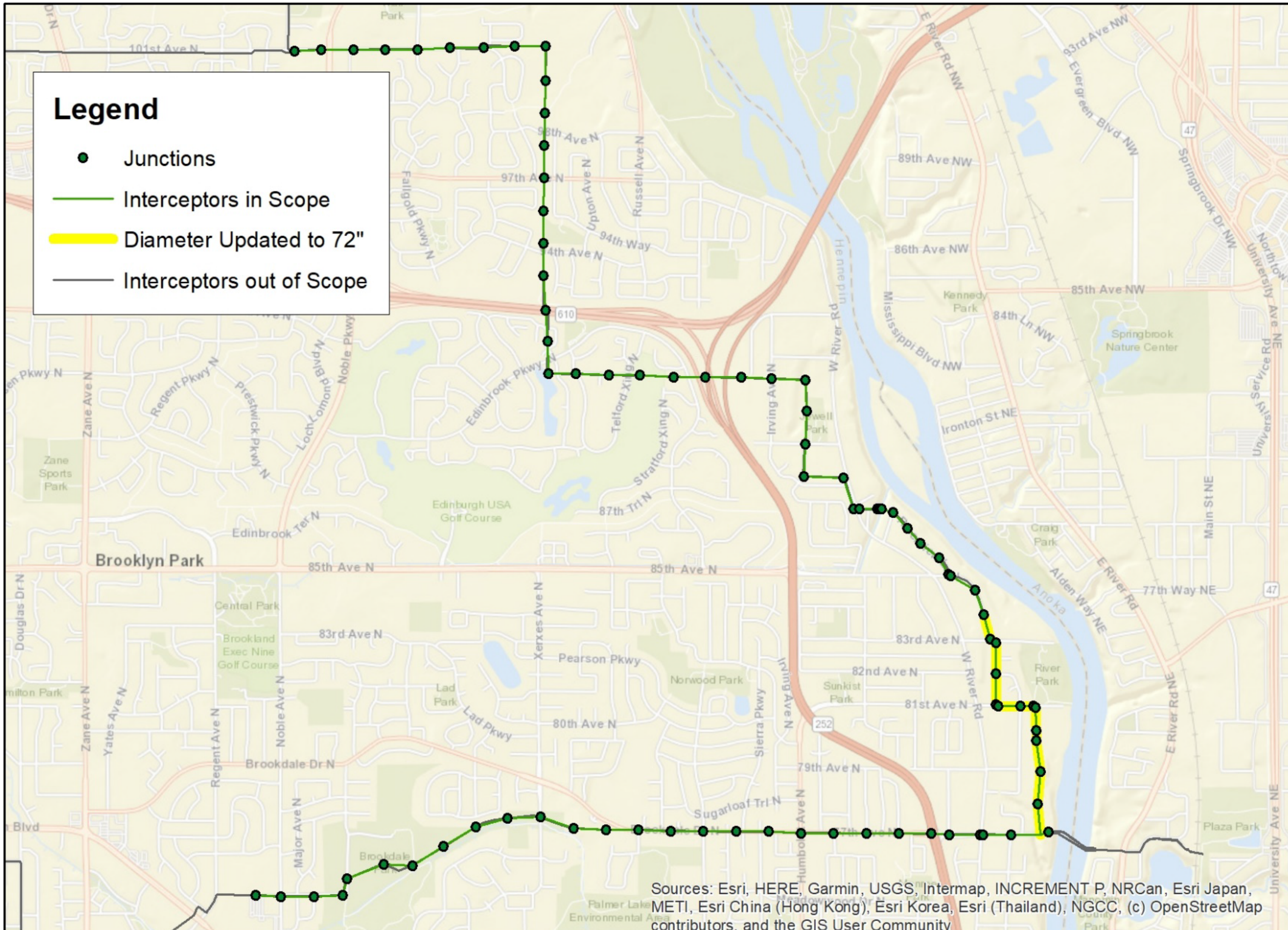
MCES L32 Phase 2 – Lift Station Analysis

Storage and Response Time West Interceptors

Assumptions

- Free fall conditions (no obstructions downstream of L32)
- No changes in current peak dry weather flow estimated using data from 2018 and 2019. Current capacity of 36MGD from 2018 used
- Peak flow of 67MGD based on projected ultimate flow

Study Area



Legend
Junctions
Interceptors in Scope
Diameter Updated to 72"
Interceptors out of Scope
Brooklyn Park
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

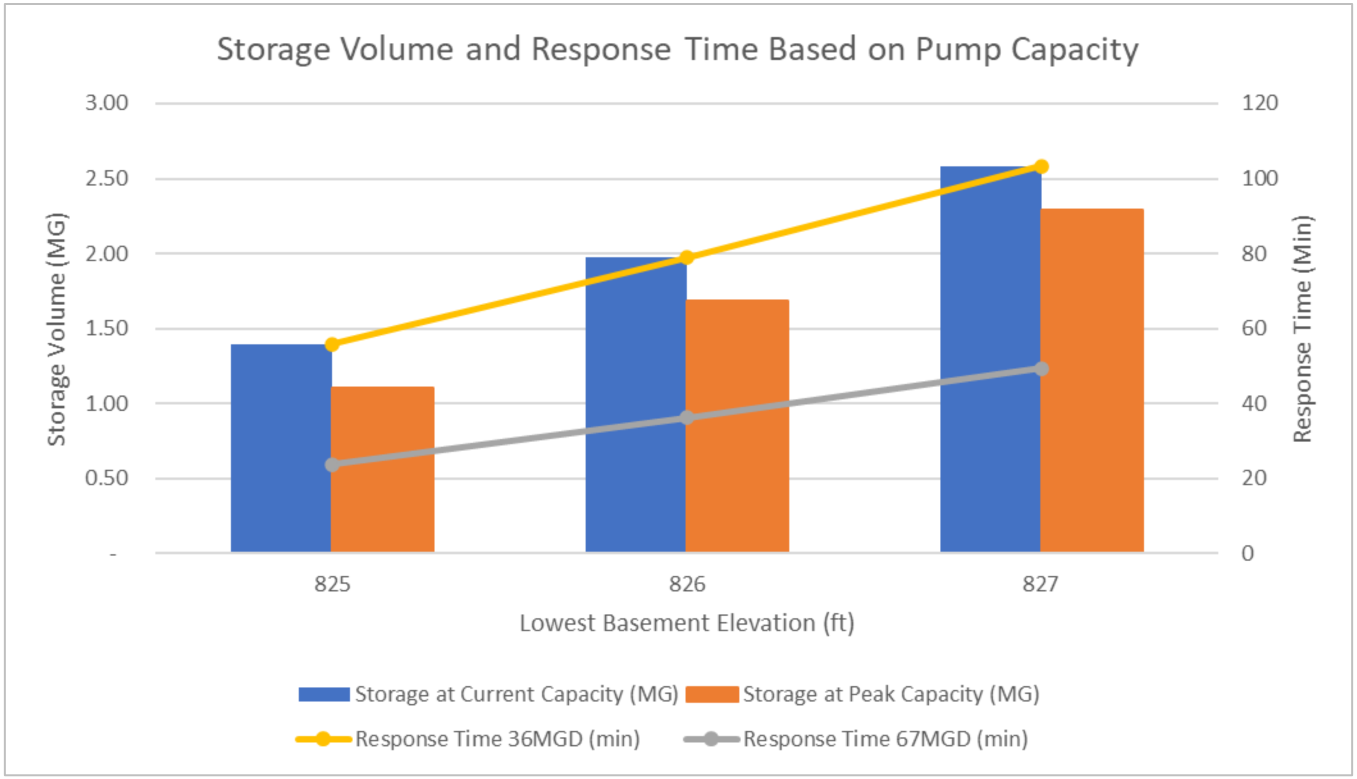
Estimated Storage and Response Time

		Volume				
	Initial Conditions	*Empty pipes (MG)*	*Incoming flow of 36MGD (MG)*	*Incoming flow of 67MGD (MG)*	*Storage Available at* ***Current Capacity*** *(MG)*	*Storage Available at* ***Peak Capacity*** *(MG)*
825ft	Mississippi Lane* (MG)	1.07	0.29	0.45	0.78	0.62
	Brookdale Dr. (MG)	0.77	0.16	0.29	0.61	0.48
	Lift station pipes (MG)	0.02	0.02	0.02	0.01	0.00
	Total (MG)	1.87	0.47	0.76	1.40	1.11
826ft	Mississippi Lane* (MG)	1.48	0.29	0.45	1.19	1.03
	Brookdale Dr. (MG)	0.94	0.16	0.29	0.78	0.65
	Lift station pipes (MG)	0.02	0.02	0.02	0.01	0.00
	Total (MG)	2.44	0.47	0.76	1.97	1.68
827ft	Mississippi Lane* (MG)	1.92	0.29	0.45	1.63	1.47
	Brookdale Dr. (MG)	1.11	0.16	0.29	0.94	0.82
	Lift station pipes (MG)	0.02	0.02	0.02	0.01	0.00
	Total (MG)	3.06	0.47	0.76	2.58	2.29

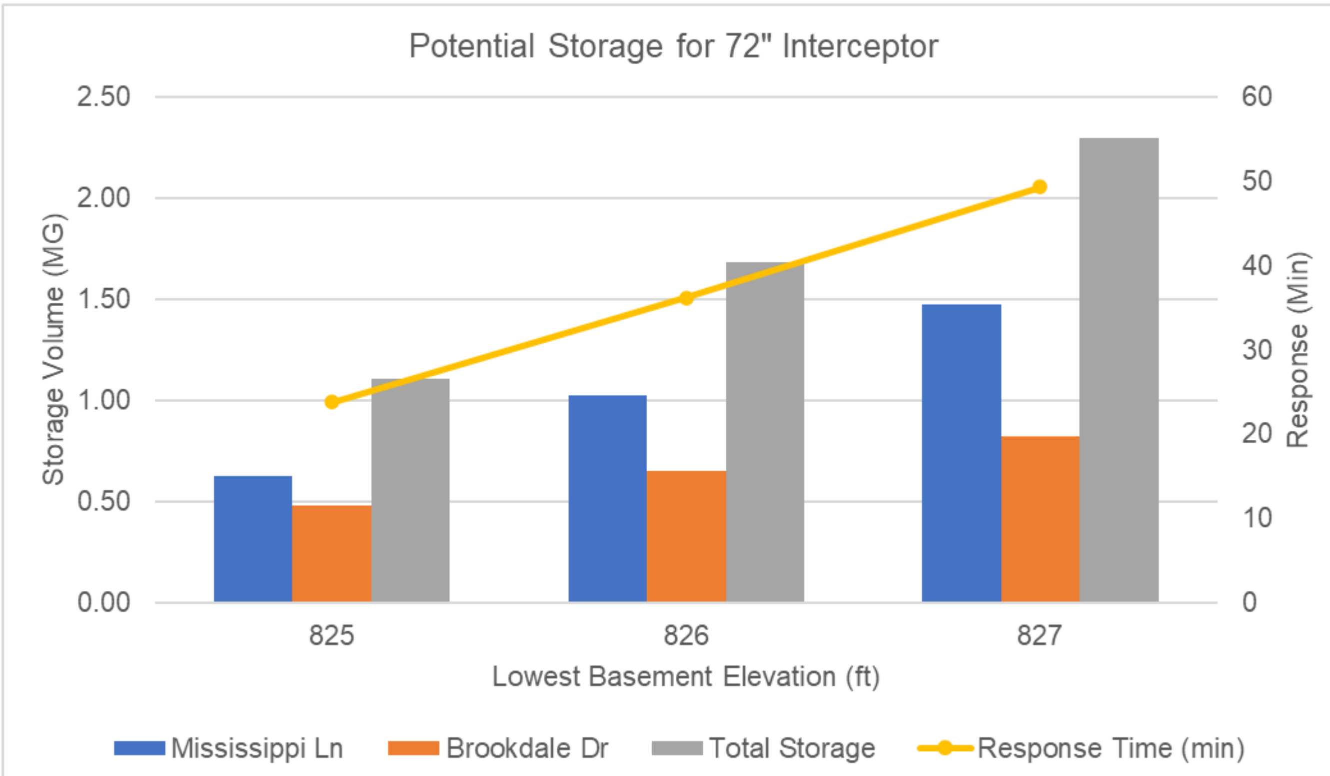
Basement Elevation (ft)	*Storage at Current Capacity (MG)*	*Current Response Time 36MGD (min)*	*Storage at Peak Capacity (MG)*	*Peak Response Time 67MGD (min)*
825	1.40	56	1.11	24
826	1.97	79	1.68	36
827	2.58	103	2.29	49

*Mississippi Lane 72" Diameter

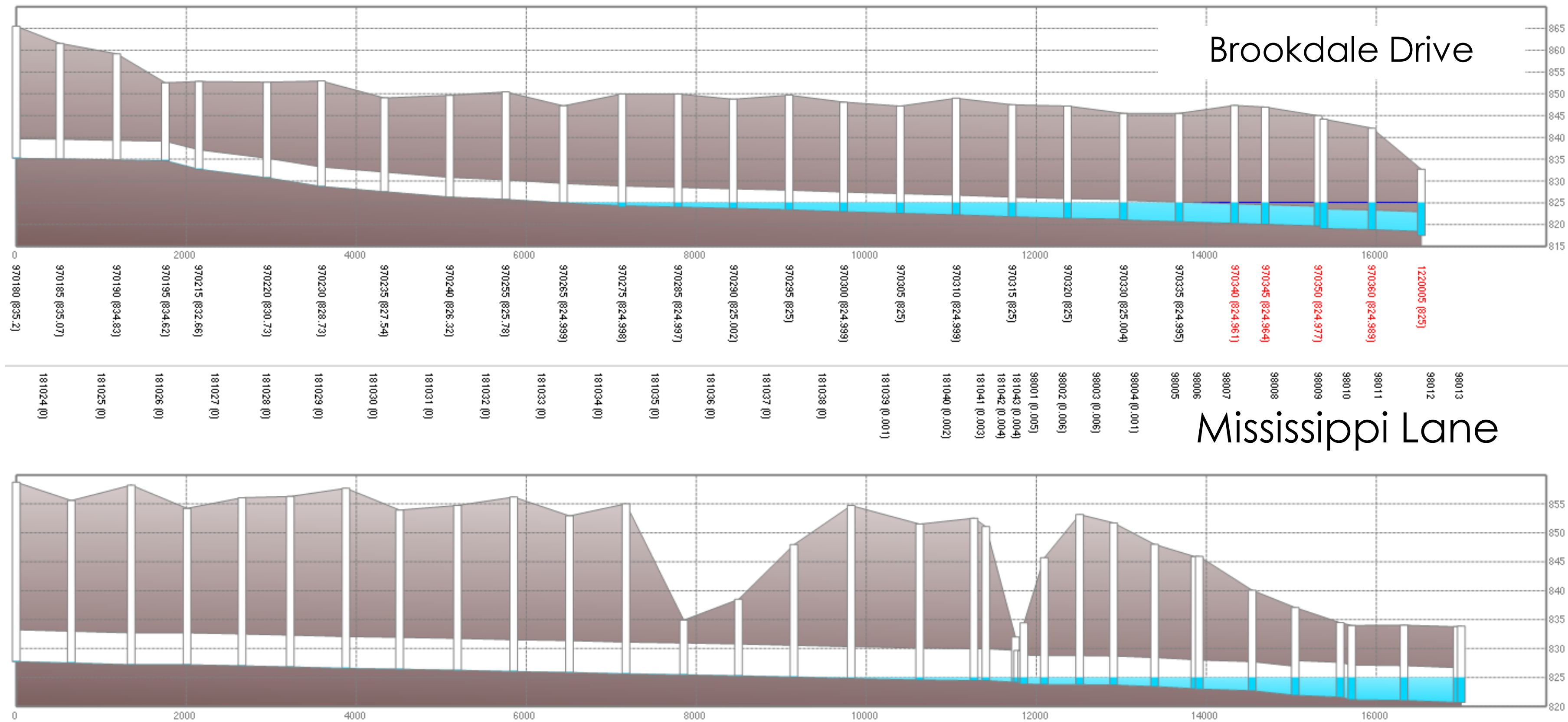
Potential Storage Volume – Current vs. Peak Capacity



Potential Storage Volume at Peak Capacity

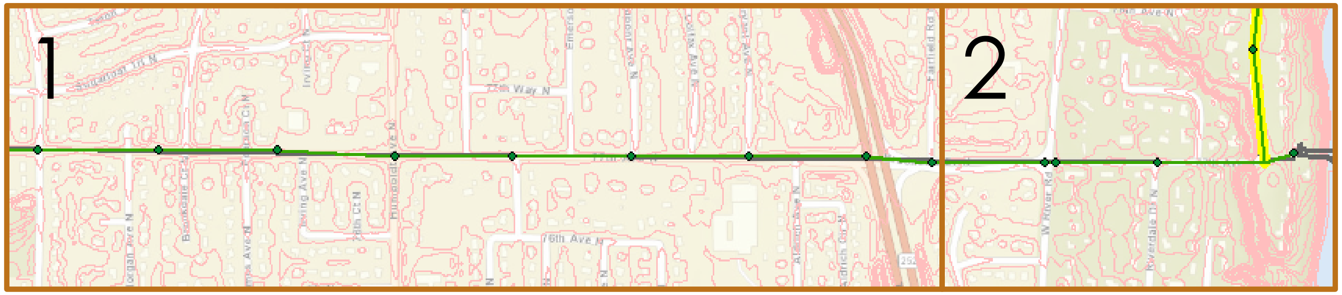


Basements on Brookdale Dr.

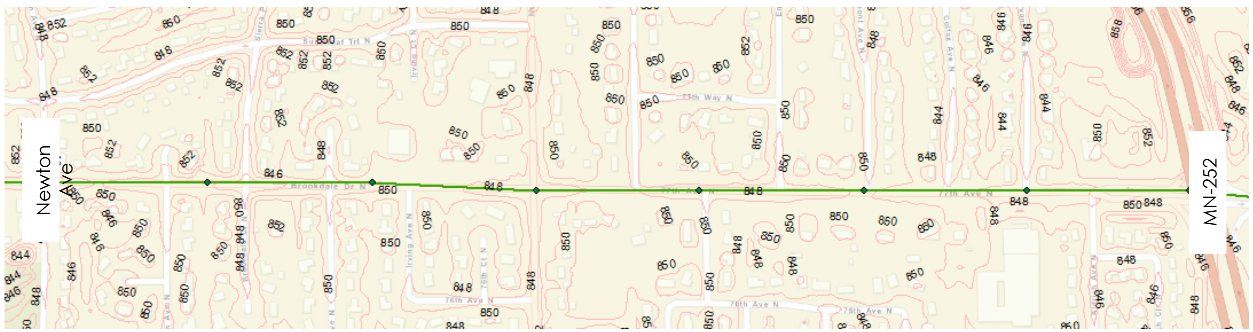


Rim elevations indicate that most basement levels on Brookdale Dr. are higher than 835ft. This was confirmed with 2ft-contours information. There are a few locations closer to the lift station that should be verified (areas below 835ft which could result in basement elevation of 827ft).

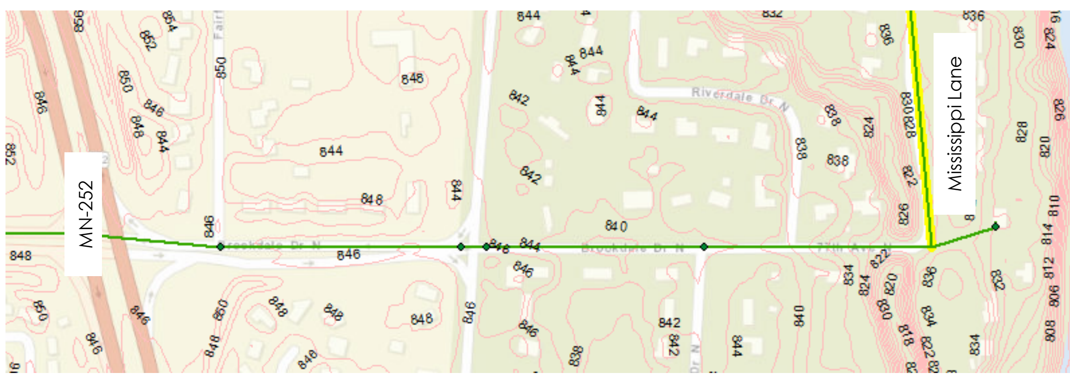
Surface Elevation on Brookdale Dr



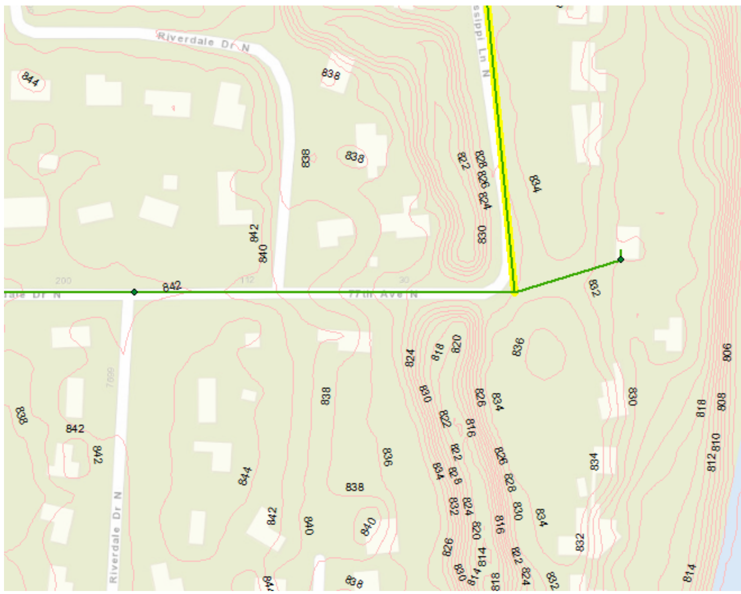
1

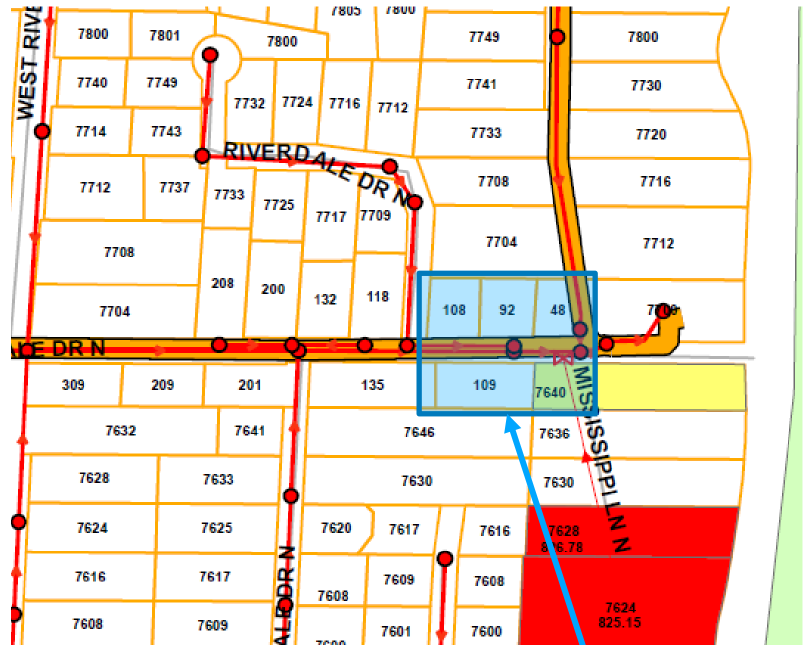


2



Basements on Brookdale Dr.





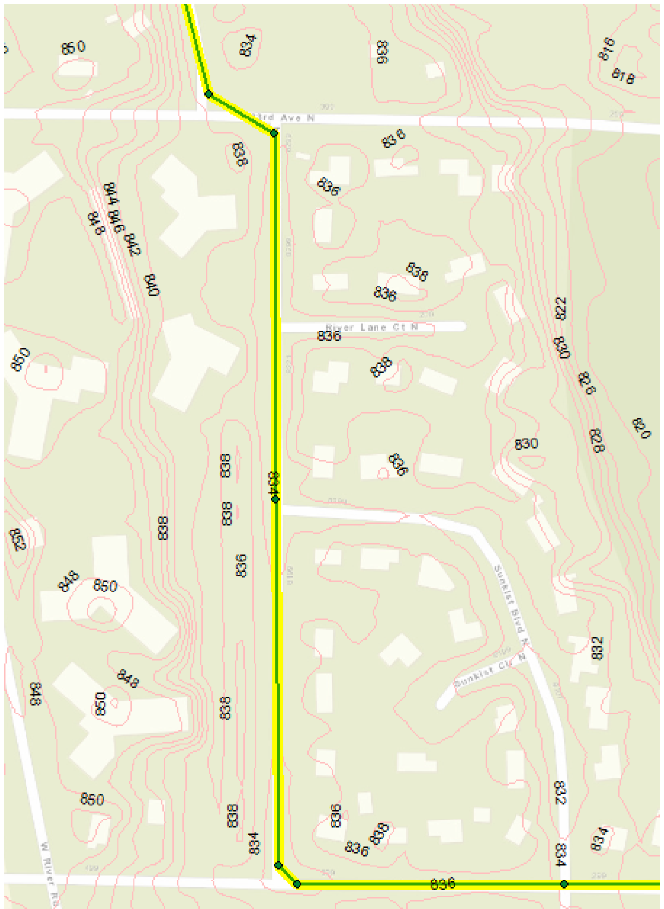
Houses in blue should be surveyed

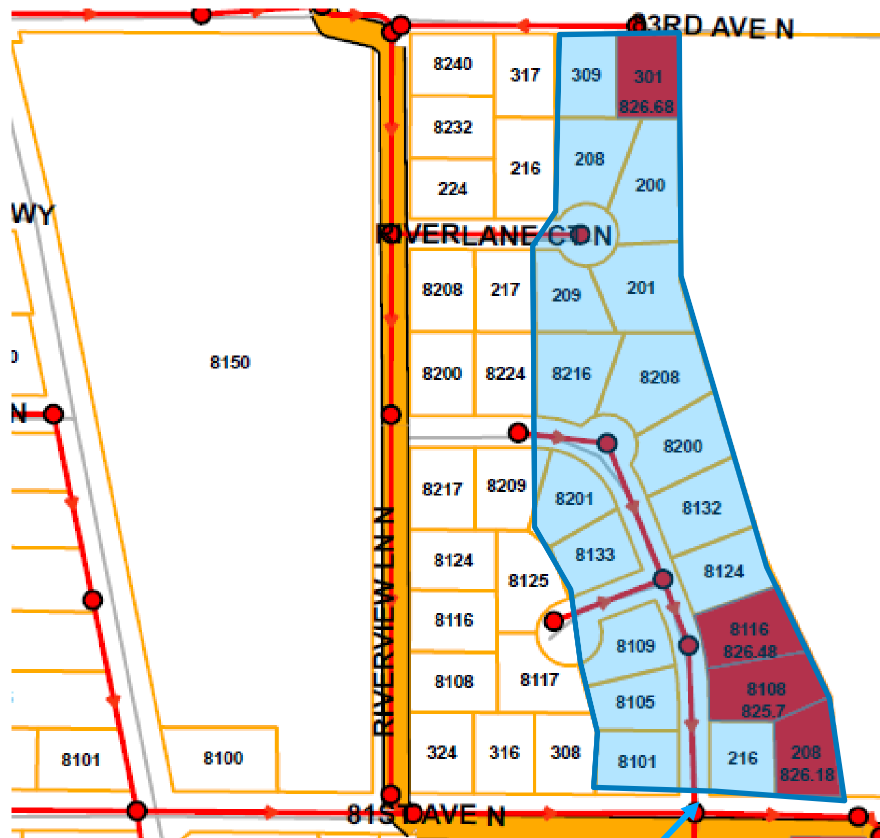
Basements on Brookdale Dr.

Survey Results

Address	Elevation	Note
48 Brookdale Drive	NA	MetC owns the property and there is no house
92 Brookdale Drive	832.62ft	Level with the Clean out
92 Brookdale Drive	829.52ft	Level that is the deepest. Used this one
108 Brookdale Drive	830.60ft	
109 Brookdale Drive	832.61ft	
7640 Mississippi Lane	822.65ft	

Basements on Mississippi Ln.



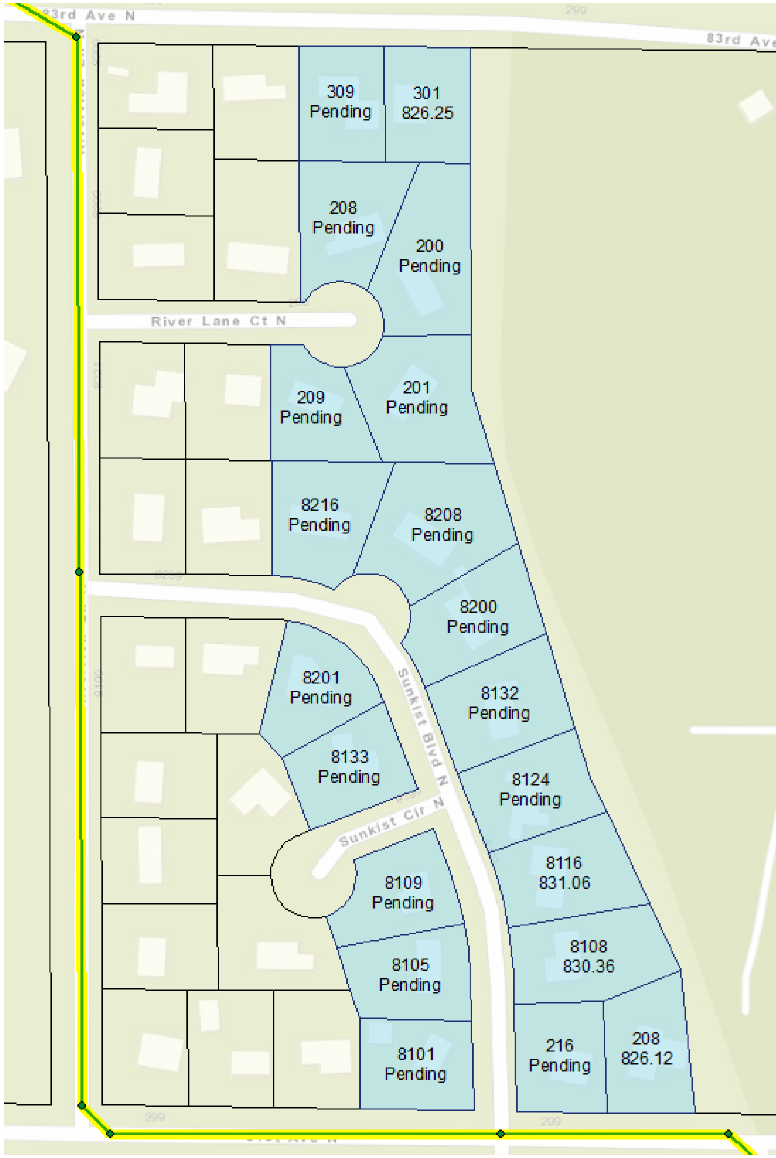


Houses in blue are below 836ft. They should be surveyed

Basements on Mississippi Ln.

Survey Results

Address	Elevation	Note
208 81st Avenue North	826.12ft	Level that is the deepest. Homeowner mentions the basement did fill up with sewage
8108 Sunkist Boulevard North	830.36ft	Previously reported at 825.7
8116 Sunkist Boulevard North	831.06ft	Previously reported at 826.48
301 83rd Avenue North	826.25ft	Previously reported at 826.68. Homeowner mentions the sewer smell is unbearable
200 River Ln Ct		Pending survey
201 River Ln Ct		Pending survey
208 River Ln Ct		Pending survey
209 River Ln Ct		Pending survey
216 81st Ave N		Pending survey
309 83rd Ave N		Pending survey
8101 Sunkist Blvd		Pending survey
8105 Sunkist Blvd		Pending survey
8109 Sunkist Blvd		Pending survey
8124 Sunkist Blvd		Pending survey
8132 Sunkist Blvd		Pending survey
8133 Sunkist Blvd		Pending survey
8200 Sunkist Blvd		Pending survey
8201 Sunkist Blvd		Pending survey
8208 Sunkist Blvd		Pending survey
8216 Sunkist Blvd		Pending survey



Name	Inlet Node	Outlet Node	Diameter (ft)	Diameter (in)	Slope (ft/ft)	Slope (%)
122002	1220005	1220020	4.5	54	0.0034	0.34
122003	1220020	1220030	4.5	54	0.0021	0.21
98001	980005	980010	5	60	0.0003	0.03
98002	980010	980020	5	60	0.0001	0.01
98003	980020	980025	5	60	0.0002	0.02
98004	980025	980030	5	60	0.0005	0.05
98005	980030	980045	5	60	0.0008	0.08
98006	980045	980050	5	60	0.0012	0.12
98007	980050	980070	5	60	0.0005	0.05
98008	980070	980080	5	60	0.0016	0.16
98009	980080	980085	6	72	0.0006	0.06
98010	980085	980100	6	72	0.0034	0.34
98011	980100	980105	6	72	0.0002	0.02
98012	980105	980110	6	72	0.0006	0.06
98013	980110	980115	6	72	0.0006	0.06
98014	980115	980120	6	72	0.0006	0.06
98015	980120	980125	6	72	0.0005	0.05
98016	980125	980135	6	72	0.0000	0.00
98017	980137	980140	6	72	0.0004	0.04
98017.1	980135	980137	6	72	0.0013	0.13
98018	980140	980150	6	72	0.0004	0.04
98019	980150	980165	6	72	0.0009	0.09
98020	980165	1220005	6	72	0.0003	0.03
181045	1810330	980005	5.5	66	0.0104	1.04
181043	1810320	1810325	5.5	66	0.0008	0.08
181044	1810325	1810330	5.5	66	0.0006	0.06
181042	1810305	1810320	5.5	66	0.0008	0.08
181041	1810295	1810305	5.5	66	0.0000	0.00
181040	1810285	1810295	5.5	66	0.0002	0.02
181039	1810270	1810285	5.5	66	0.0003	0.03
181038	1810255	1810270	5.5	66	0.0003	0.03
181010	1810060	1810065	5.5	66	0.0001	0.01
181011	1810065	1810070	5.5	66	0.0003	0.03
181012	1810070	1810075	5.5	66	0.0002	0.02
181013	1810075	1810080	5.5	66	0.0002	0.02
181014	1810080	1810085	5.5	66	0.0002	0.02
181015	1810085	1810095	5.5	66	0.0001	0.01
181016	1810095	1810105	5.5	66	0.0003	0.03
181017	1810105	1810115	5.5	66	0.0004	0.04
181018	1810115	1810125	5.5	66	0.0001	0.01
181019	1810125	1810130	5.5	66	0.0003	0.03
181020	1810130	1810135	5.5	66	0.0002	0.02
181021	1810135	1810140	5.5	66	0.0004	0.04
181022	1810140	1810145	5.5	66	0.0002	0.02
181023	1810145	1810150	5.5	66	0.0001	0.01
181024	1810150	1810155	5.5	66	0.0004	0.04

Name	Inlet Node	Outlet Node	Diameter (ft)	Diameter (in)	Slope (ft/ft)	Slope (%)
181025	1810155	1810165	5.5	66	0.0004	0.04
181026	1810165	1810175	5.5	66	0.0000	0.00
181027	1810175	1810185	5.5	66	0.0003	0.03
181028	1810185	1810195	5.5	66	0.0004	0.04
181029	1810195	1810200	5.5	66	0.0004	0.04
181030	1810200	1810205	5.5	66	0.0002	0.02
181031	1810205	1810210	5.5	66	0.0003	0.03
181032	1810210	1810215	5.5	66	0.0004	0.04
181033	1810215	1810220	5.5	66	0.0002	0.02
181034	1810220	1810225	5.5	66	0.0004	0.04
181035	1810225	1810235	5.5	66	0.0002	0.02
181036	1810235	1810245	5.5	66	0.0003	0.03
181037	1810245	1810255	5.5	66	0.0003	0.03

Name	Inlet Node	Outlet Node	Diameter (ft)	Diamter (in)	Slope (ft/ft)	Slope (%)
122002	1220005	1220020	4.5	54	0.0034	0.34
122003	1220020	1220030	4.5	54	0.0021	0.21
97025	970180	970185	4.5	54	0.0003	0.03
97026	970185	970190	4.5	54	0.0004	0.04
97027	970190	970195	4.5	54	0.0004	0.04
97028	970195	970215	4.5	54	0.0050	0.50
97029	970215	970220	4.5	54	0.0024	0.24
97030	970220	970230	4.5	54	0.0031	0.31
97031	970230	970235	4.5	54	0.0016	0.16
97032	970235	970240	4.5	54	0.0016	0.16
97033	970240	970255	4.5	54	0.0008	0.08
97034	970255	970265	4.5	54	0.0012	0.12
97035	970265	970275	4.5	54	0.0009	0.09
97036	970275	970285	4.5	54	0.0005	0.05
97037	970285	970290	4.5	54	0.0005	0.05
97038	970290	970295	4.5	54	0.0005	0.05
97039	970295	970300	4.5	54	0.0007	0.07
97040	970300	970305	4.5	54	0.0005	0.05
97041	970305	970310	4.5	54	0.0005	0.05
97042	970310	970315	4.5	54	0.0007	0.07
97043	970315	970320	4.5	54	0.0006	0.06
97044	970320	970330	4.5	54	0.0003	0.03
97046	970330	970335	4.5	54	0.0006	0.06
97047	970335	970340	4.5	54	0.0006	0.06
97048	970340	970345	4.5	54	0.0006	0.06
97049	970345	970350	4.5	54	0.0006	0.06
97050	970350	970355	4.5	54	0.0089	0.89
97051	970355	970360	4.5	54	0.0004	0.04
97052	970360	1220005	4.5	54	0.0007	0.07

Lift Station L-32 Storage and O&M Summary

Lift Station L-32 Storage and O&M Summary									
Option	**WEST SIDE STORAGE at 67 MGD ULLTIMATE PEAK FLOW**	**Storage Volume MGD**	**Response Time Minutes**	**Comment**	**Construction Estimate**	**25% Contingency**	**25% Undeveloped Design Details**	**Total**	**Annual O&M**
1	Existing Interceptor to Elev. 825	1.1 MG	24 Minutes	Existing Pipes	$ -	$ -	$ -	$ -	**$0**
2	Existing Interceptor to Elev. 826	1.68 MG	36 Minutes	Construct Mississippi Ln. LS	$ 650,000.00	$ 162,500.00	$ 162,500.00	$975,000.00	**$10,000**
3	Existing Interceptor to Elev. 827	2.29 MG	49 Minutes	Need Additional Survey, assume 2nd LS	$ 650,000.00	$ 162,500.00	$ 162,500.00	$975,000.00	**$10,000**

APPENDIX G – RESPONSE TANK SIZING EAST

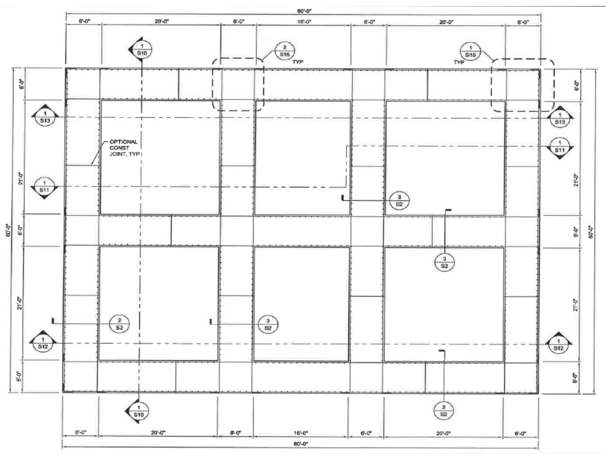
RECTANGULAR CAISSON

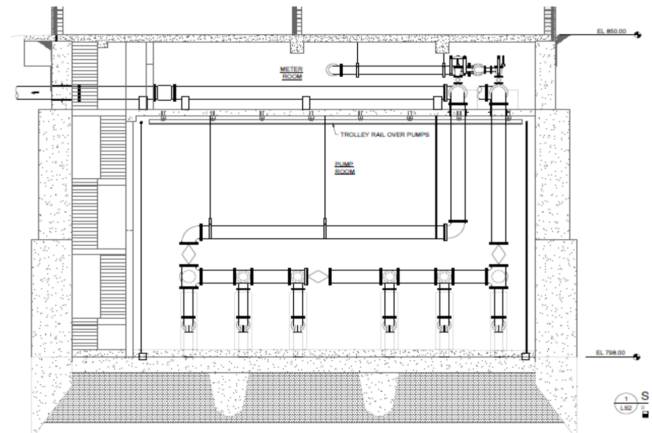
Stantec

Client:	MCES		**Date:**	6/16/2020
Project:	L-32 Lift Station		**By:**	P. Caswell
Proj. No.:	173402004			

Caisson Dimensions:

Interior Length, A =	68.00	Ft.	Existing Ground Elev. =	**850.0**
Interior Width, B =	48.00	Ft.	Wet Well HWL Elev. =	**840.0**
Building Length =	40.00	Ft.	Groundwater Elev. =	**821.0**
Building Width =	30.00	Ft.	Bottom Elev. =	**798.0**





DISPLACED VOLUME/BUOYANT FORCE:

Lift	Description	Top El	Lift Ht.	Thickness	Length, A'	Width, B'	Vol. Disp.	Buoy. Force	
4	Perimeter Wall - 1	850.00							
3	Perimeter Wall - 2	835.00	15.00	3.00	74.00	54.00	59,940	3,740	kips
2	Perimeter Wall - 3	820.00	15.00	5.00	78.00	58.00	67,860	4,234	kips
1	Perimeter Wall - 4	798.00	22.00	6.00	80.00	60.00	105,600	6,589	kips
0	Base Slab	790.00	6.00	6.00	80.00	60.00	28,800	1,797	
							262,200	**16,361**	
							CF	kips	

RESISTING FORCE:

No.	Description	Length	Width	Thickness	Height	Area/Vol.	Density	Weight	
1.1	Building	40.00	30.00		10.00	800.0	150.00	180.0	kips
2.1	Caisson Lift 1 Walls	68.00	48.00	3.00	15.00	10,980.0	0.15	1,647.0	kips
2.2	Caisson Lift 2 Walls	68.00	48.00	5.00	15.00	18,900.0	0.15	2,835.0	kips
2.3	Caisson Lift 3 Walls	68.00	48.00	6.00	22.00	33,792.0	0.15	5,068.8	kips
2.4	Intermediate Wall	48.00	0.00	1.50	50.00	7,650.0	0.15	1,147.5	
2.5	Intermediate Wall	28.00	0.00	1.00	50.00	3,000.0	0.15	450.0	
3.1	Slab - Base	68.00	48.00	8.00	-	26,112.0	0.15	3,916.8	kips
3.2	Slab - Structural Base	68.00	48.00	0.00	-	0.0	0.15	0.0	kips
3.3	Slab - Lean Conc. Fill	68.00	48.00	2.00	-	6,528.0	0.15	979.2	kips
3.4	Slab - Intermediate	68.00	48.00	1.33	-	4,352.0	0.15	652.8	kips
3.5	Slab - Main Level	68.00	48.00	1.33	-	4,352.0	0.15	652.8	kips
						116,466		**17,530**	kips
						4,314	CY		

STRUCTURE QUANTITIES/COSTS:

Buoyant Force =		16,361	kips
Dead Load Force Provided =		17,530	kips
Safety Factor =		**1.07**	FAIL
Anchoring Force Req'd =		7,012	kips
Qty. Helical Piles =	45 kip uplift capacity	156	Piles

	Option A	
Cost Estimate Quantities:	**48' x 68'**	
Excavation	9,711	CY
Concrete	4,314	CY
Liner - Full Height	11,520	SF
Helical Piles	156	EA

OPTION B: 68'-0" CIRCULAR CAISSON

Stantec

Client: MCES
Project: L-32
Proj. No.: 173420004

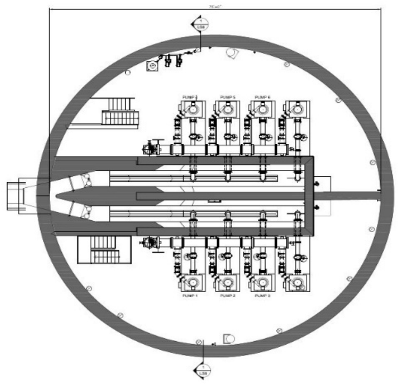
Date: 6/16/2020
By: P. Caswell

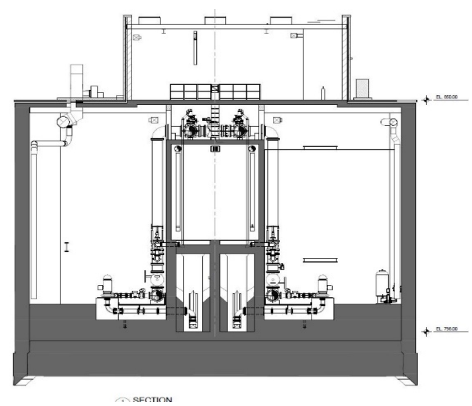
Site/Structure Data:

Existing Ground Elev. =	850.00
Top of Tank Elev. =	850.00
Groundwater Elev. =	821.00
Wet Well HWL Elev. =	840.00
Top of Base Slab Elev. =	798.00

Soil/Concrete Data:

Soil Density (pcf), gs =	120
Conc. Strength (psi), f'c =	6,000
Lateral Earth Coef. =	0.530





TANK GEOMETRY/BUOYANCY:

DISPLACED VOLUME:

Elev.	Shear Vu	Min. t (ft.)		Dsgn t (ft.)	Vol. Disp.	Buoy.Force	Comments
					68.00 ft. Dia.		
850	N/A	N/A	N/A	3.0	43,009	0	Top of Main Floor Slab
840	N/A	N/A	N/A	3.0	43,009	0	
830	N/A	N/A	N/A	5.0	47,784	0	
820	N/A	N/A	N/A	5.0	47,784	0	HWL = 821
810	N/A	N/A	N/A	5.0	47,784	2,982	
798	N/A	N/A	N/A	5.0	57,340	3,578	Elev. Top of Slab
Slabs	-	9.0	-	8.0	49,876	3,112	7' grade bms/2' slab
Hydrostatic pressure included below z = 30 ft.					**336,585**	**9,672**	
					CF	kips	

CONCRETE RESISTING FORCE:

Component	Ht./Dia.(ft)	Length (ft)	Thick. (ft)	Conc. Qty.	Conc. Wt.	Comments
				68.00 ft. Dia.		
Perimeter wall - Lift 3	20	-	3.0	13,383	2,007	
Perimeter wall - Lift 2	32	-	5.0	36,694	5,504	
Perimeter wall - Lift 1	10	-	6.0	13,949	2,092	Driving shoe
Top slab	-	-	1.3	4,842	726	16" slab
Interm. Slab	-	-	0.0	0	0	
Base slabs	-	-	8.0	29,054	4,358	
Other slabs (2)	16	50	1.3	2,133	320	
Interior walls - 1 (2 walls)	42	50	1.3	5,600	840	
Interior walls - 2	16	46	1.3	981	147	
Other	-	-	-	0	0	
				3,949	**15,995**	
				CY	kips	

OTHER DEAD LOADS:

Control Building	10.0	40.0	30.0		166	Average 138 psf building DL.
					166	kips

STRUCTURE QUANTITIES/COSTS:

Buoyant Force =		9,672	kips
Dead Load Force Provided =		15,995	kips
Safety Factor =		**1.65**	PASS
Anchoring Force Req'd =		**0**	kips
Qty. Helical Piles =	45 kip uplift capacity	0	Piles

	Option B	
Cost Estimate Quantities:	**68.00**	**Ft.**
Excavation	12,466	CY
Concrete	3,949	CY
Liner - Full Height	18,052	SF
Helical Piles	0	EA

Notes:

1. Unreinforced tremie slab cannot span 68'. Base must be dewatered to excavate/construct slab in the dry.
2.

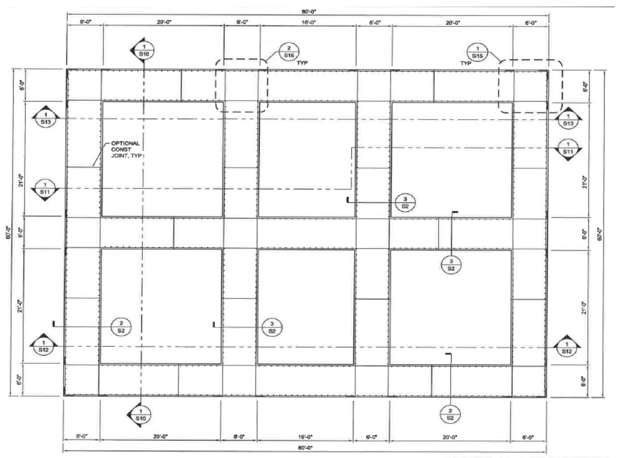
RECTANGULAR CAISSON

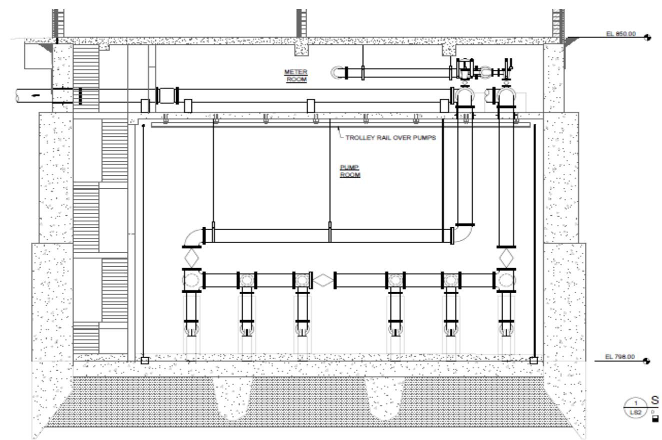
Client: MCES
Project: L-32 Lift Station
Proj. No.: 173402004

Date: 6/16/2020
By: P. Caswell

Caisson Dimensions:

Interior Length, A =	98.00	Ft.	Existing Ground Elev. =	**850.0**
Interior Width, B =	48.00	Ft.	Wet Well HWL Elev. =	**840.0**
Building Length =	40.00	Ft.	Groundwater Elev. =	**821.0**
Building Width =	30.00	Ft.	Bottom Elev. =	**798.0**





DISPLACED VOLUME/BUOYANT FORCE:

Lift	Description	Top El	Lift Ht.	Thickness	Length, A'	Width, B'	Vol. Disp.	Buoy. Force	
4	Perimeter Wall - 1	850.00							
3	Perimeter Wall - 2	835.00	15.00	3.00	104.00	54.00	84,240	5,257	kips
2	Perimeter Wall - 3	820.00	15.00	5.00	108.00	58.00	93,960	5,863	kips
1	Perimeter Wall - 4	798.00	22.00	6.00	110.00	60.00	145,200	9,060	kips
0	Base Slab	790.00	8.00	6.00	110.00	60.00	52,800	3,295	
							376,200	**23,475**	
							CF	kips	

RESISTING FORCE:

No.	Description	Length	Width	Thickness	Height	Area/Vol.	Density	Weight	
1.1	Building	40.00	30.00		10.00	800.0	150.00	180.0	kips
2.1	Caisson Lift 1 Walls	98.00	48.00	3.00	15.00	13,680.0	0.15	2,052.0	kips
2.2	Caisson Lift 2 Walls	98.00	48.00	5.00	15.00	23,400.0	0.15	3,510.0	kips
2.3	Caisson Lift 3 Walls	98.00	48.00	6.00	22.00	41,712.0	0.15	6,256.8	kips
2.4	Intermediate Wall	48.00	0.00	1.50	50.00	7,650.0	0.15	1,147.5	
2.5	Intermediate Wall	28.00	0.00	1.00	50.00	3,000.0	0.15	450.0	
3.1	Slab - Base	98.00	48.00	8.00	-	37,632.0	0.15	5,644.8	kips
3.2	Slab - Structural Base	98.00	48.00	0.00	-	0.0	0.15	0.0	kips
3.3	Slab - Lean Conc. Fill	98.00	48.00	2.00	-	9,408.0	0.15	1,411.2	kips
3.4	Slab - Intermediate	98.00	48.00	1.33	-	6,272.0	0.15	940.8	kips
3.5	Slab - Main Level	98.00	48.00	1.33	-	6,272.0	0.15	940.8	kips
						149,826		**22,534**	kips
						5,549	CY		

STRUCTURE QUANTITIES/COSTS:

Buoyant Force =		23,475	kips
Dead Load Force Provided =		22,534	kips
Safety Factor =		**0.96**	FAIL
Anchoring Force Req'd =		10,326	kips
Qty. Helical Piles =	45 kip uplift capacity	229	Piles

	Option B	
Cost Estimate Quantities:	**48' x 98'**	
Excavation	13,933	CY
Concrete	5,549	CY
Liner - Full Height	11,520	SF
Helical Piles	229	EA

OPTION D: 76'-0" CIRCULAR CAISSON

Stantec

Client: MCES
Project: L-32
Proj. No.: 173420004

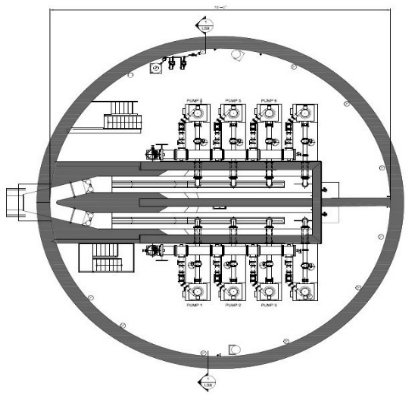
Date: 6/16/2020
By: P. Caswell

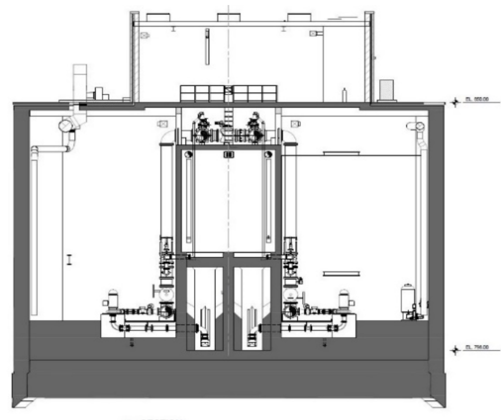
Site/Structure Data:

Proposed Ground Elev. =	850.00
Top of Structure Elev. =	850.00
Groundwater Elev. =	821.00
Wet Well HWL Elev. =	840.00
Top of Base Slab Elev. =	798.00

Soil/Concrete Data:

Soil Density (pcf), gs =	120
Conc. Strength (psi), f'c =	6,000
Lateral Earth Coef. =	0.530





TANK GEOMETRY/BUOYANCY:

DISPLACED VOLUME:

Elev.	Shear Vu	Min. t (ft.)		Dsgn t (ft.)	Vol. Disp. (76.00 ft. Dia.)	B. Force (76.00 ft. Dia.)	Comments
850	N/A	N/A	N/A	3.0	52,810	0	Top of Main Floor Slab
840	N/A	N/A	N/A	3.0	52,810	0	
830	N/A	N/A	N/A	5.0	58,088	0	
820	N/A	N/A	N/A	5.0	58,088	0	HWL = 821
810	N/A	N/A	N/A	5.0	58,088	3,625	
798	N/A	N/A	N/A	5.0	69,706	4,350	Elev. Top of Base Slab
Slabs	-	10.0	-	10.0	72,382	4,517	8' Grade Beams/2' Slab
Hydrostatic pressure included below z = 30 ft.					**421,973**	**12,491**	
					CF	kips	

CONCRETE RESISTING FORCE:

Component	Ht./Dia.(ft)	Length (ft)	Thick. (ft)	Conc. Qty. (76.00 ft. Dia.)	Conc. Wt. (76.00 ft. Dia.)	Comments
Perimeter wall - Lift 3	20	-	3.0	14,891	2,234	
Perimeter wall - Lift 2	32	-	5.0	40,715	6,107	
Perimeter wall - Lift 1	10	-	6.0	15,457	2,319	
Top slab	-	-	1.3	6,049	907	
Interm. Slab	-	-	0.0	0	0	N/A
Base slabs	-	-	10.0	45,365	6,805	
Other slabs (2)	16	60	1.3	2,560	384	
Interior walls - 1 (2 walls)	42	60	1.3	6,720	1,008	
Interior walls - 2	16	54	1.3	1,152	173	
Other	-	-	-	0	0	
				4,923	**19,936**	
				CY	kips	

OTHER DEAD LOADS:

Control Building	10.0	40.0	30.0		166	Assumed min. size
				kips	**166**	kips

STRUCTURE QUANTITIES/COSTS:

Buoyant Force =		12,491	kips
Dead Load Force Provided =		19,936	kips
Safety Factor =		**1.60**	PASS
Anchoring Force Req'd =		0	kips
Qty. Helical Piles =	45 kip uplift capacity	0	Piles

	Option D	
Cost Estimate Quantities:	**76.00**	**Ft.**
Excavation	15,629	CY
Concrete	4,923	CY
Liner - Full Height	21,130	SF
Helical Piles	0	EA

Notes:

1. Tremie slab cannot span 76'. Base must be dewatered to excavate/construct slab in the dry.
2.

Stantec

BASE SLAB SIZING

Client: MCES
Project: L-32
Proj. No.: 173420004

Date: 5/13/2020
By: P. Caswell

Hydrostatic Pressure Data:

Groundwater Elev. =	820.00	
Top of Slab Elev. =	790.00	
Hydrostatic Head, H =	30.00	ft

Soil/Concrete Data:

Conc. Density, pc =	150	pcf
Conc. Strength, f'c =	5,000	psi
Modulus of Rupture, Mr =	530	psi
Allowable MOR =	265	psi

Unreinforced Tremie Slab Thickness Determination:

Slab Span = **76.00** Ft.

Hydro Uplift q, ksf	Slab Thick. t, ft.	Slab Wt. qr, ksf	Net Hydro qn, ksf	Factored qu, ksf	Fact. Mom. Mu, ft-k	Slab S.M. Sx, cu.in.	Tensile Stress fb, psi	PASS/ FAIL	Comments	Fact. Shear Vu, kips	Shear Cap. phi*Vc, k
2.496	**10.00**	1.50	1.00	2.893	2088.89	28,800	**870**	FAIL			
2.621	**12.00**	1.80	0.82	2.835	2047.13	41,472	**592**	FAIL			
2.746	**14.00**	2.10	0.65	2.778	2005.37	56,448	**426**	FAIL			

Reinforced Concrete Slab Thickness Determination:

Slab Span = **76.00** Ft.

Hydro Uplift q, ksf	Slab Thick. t, ft.	Slab Wt. qr, ksf	Net Hydro qn, ksf	Factored qu, ksf	Fact. Mom. Mu, ft-k	Reinf. As (sq.in.)	Phi*Mn/1.3 ft-k	PASS/ FAIL	Comments	Fact. Shear Vu, kips	Shear Cap. phi*Vc, k	PASS/ FAIL
2.246	**6.00**	0.90	1.35	3.009	2,172	5.08	1,107.4	FAIL	2 mats #10@6" EW	114.3	95.0	FAIL
2.309	**7.00**	1.05	1.26	2.980	2,152	6.24	1,604.6	FAIL	2 mats #11@6" EW	113.2	112.3	FAIL
2.371	**8.00**	1.20	1.17	2.951	2,131	6.24	1,863.6	FAIL	2 mats #11@6" EW	112.1	129.6	PASS
2.434	**9.00**	1.35	1.08	2.922	2,110	6.24	2,122.7	FAIL	2 mats #11@6" EW	111.0	146.9	PASS
2.496	**10.00**	1.50	1.00	2.893	2,089	6.24	2,381.8	PASS	2 mats #11@6" EW	109.9	164.2	PASS

BAR SIZE DESIGNATION*	WEIGHT (LBS/FOOT)	BAR DIAMETER (INCHES)	CROSS- SECTIONAL AREA (SQ. IN.) PER FT.	
			AT 12" C.C.	AT 6" C.C.
#3	0.376	0.375	0.11	0.22
#4	0.668	0.500	0.20	0.40
#5	1.043	0.625	0.31	0.62
#6	1.502	0.750	0.44	0.88
#7	2.044	0.875	0.60	1.20
#8	2.670	1.000	0.79	1.58
#9	3.400	1.128	1.00	2.00
#10	4.303	1.270	1.27	2.54
#11	5.313	1.410	1.56	3.12
#14	7.650	1.693	2.25	4.50
#18	13.600	2.257	4.00	8.00

LIFT STATION ESTIMATED COST COMPARISON

Client: MCES
Project: L-32
Proj. No.: 173420004

Date: 6/16/2020
By: P. Caswell

Item No.	Item	Unit	Unit Price	Option A '48' x 68' Qty.(1)	Option A Cost	Option B 68 ft. Dia. Qty.(1)	Option B Cost	Option C '48' x 98' Qty.(1)	Option C Cost	Option D 76 ft. Dia. Qty.(1)	Option D Cost
2.1	Excavation	CY	$50.00	9,711	$485,550	12,466	$623,300	13,394	$669,700	15,629	$781,450
2.2	Dewatering (2)	LS	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000
2.3	Helical Piles	EA	$2,000.00	187	$374,000	0	$0	229	$458,000	0	$0
3.1	Concrete	CY	$1,000.00	4,193	$4,193,000	3,949	$3,949,000	5,549	$5,549,000	4,923	$4,923,000
3.2	Concrete Liner - Panels	SF	$50.00	11,520	$576,000	18,052	$902,600	11,520	$576,000	21,130	$1,056,500
13.0	Building (30'x40')	SF	$200.00	1,200	$240,000	1,200	$240,000	1,200	$240,000	1,200	$240,000
	TOTAL				$6,868,550		$6,714,900		$8,492,700		$8,000,950

(1) All quantities are entered manually and are not calculated in this worksheet.
(2) Placeholder cost, not calculated.
(3) All other building costs, systems costs, contingencies, etc. are included elsewhere in the cost estimate total.

3.0MG CIRCULAR RESPONSE TANK

Stantec

Client:	MCES	**Date:**	5/19/2020
Project:	L-32	**By:**	P. Caswell
Proj. No.:	173420004		

Site/Tank Data:

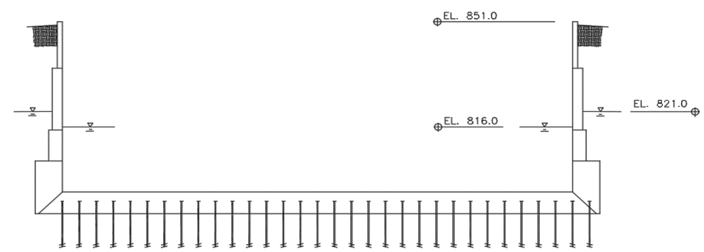
Existing Ground Elev. =	850.00	Gross Storage Volume =		Gal.
Top of Tank Elev. =	850.00	Net Storage Volume =	**3,000,000**	Gal.
Groundwater Elev. =	821.00	=	401,070	CF
Max. Tank Interior Water Elev. =	**816.00**	Tank Freeboard =	34.0	Ft.

Soil/Concrete Data:

Soil Density, gs =	120	pcf
Conc. Strength, f'c =	6,000	psi
Lateral Earth Coef. =	0.530	

Basic Tank Storage Geometries:

Inside Dia.	Net Area	SWD	Bottom EL.	Depth	Gross Vol.
100	7,854	51.1	764.9	**85.1**	4,997,429
125	12,272	32.7	783.3	**66.7**	6,120,983
150	17,672	22.7	793.3	**56.7**	7,494,216
175	24,053	16.7	799.3	**50.7**	9,117,127
200	31,416	12.8	803.2	**46.8**	10,989,717
200	31,416	12.8	830.0	**20.0**	4,699,834



TANK GEOMETRY/BUOYANCY:

Wall Thicknesses				TANK DIAMETERS										Pump in/Gravity out	
				100 ft. Dia.		**125** ft. Dia.		**150** ft. Dia.		**175** ft. Dia.		**200** ft. Dia.		**200** ft. Dia.	
Depth, Z	Shear Vu	Min. t (ft.)	Dsgn t (ft.)	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force
0	0.0	1.0	1.5	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
5	1.4	1.0	1.5	41,662	0	64,340	0	91,927	0	124,423	0	161,828	0	161,828	0
15	12.2	1.0	1.5	83,323	0	128,680	0	183,854	0	248,846	0	323,655	0	323,655	0
25	33.8	2.0	3.0	88,248	0	134,782	0	191,135	0	257,305	0	333,292	0	333,292	0
30	48.6	2.8	3.0	44,124	0	67,391	0	95,567	0	128,652	0	166,646	0	166,646	0
35	68.1	3.8	4.0	45,805	2,858	69,465	4,335	98,034	6,117	131,511	8,206	169,898	10,602	0	0
45	127.1	7.0	8.0	105,683	6,595	156,145	9,743	216,425	13,505	286,522	17,879	366,436	22,866	0	0
50	166.6	9.0	9.0	54,680	3,412	80,303	5,011	110,836	6,916	146,277	9,128	0	0	0	0
55	212.7	11.5	10.0	113,098	7,057	165,130	10,304	226,981	14,164	0	0	0	0	0	0
65	324.9	17.4	10.0	113,098	7,057	165,130	10,304	0	0	0	0	0	0	0	0
75	463.7	24.7	10.0	113,098	7,057	0	0	0	0	0	0	0	0	0	0
85	629.1	33.4	10.0	113,098	7,057	0	0	0	0	0	0	0	0	0	0
Slab		5.0	10.0	56,549	3,529	82,565	5,152	113,490	7,082	149,324	9,318	190,067	11,860	0	0
Hydrostatic pressure included below z = 30 ft.					**44,623**	kips	**44,849**	kips	**47,784**	kips	**44,531**	kips	**45,327**	kips	**0**

Wall shear reinforcement req'd below z = 50 ft.

RESISTING FORCE:		100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.		Pump in/Gravity out 200 ft. Dia.		
Depth, Z	Wall t (ft)	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	
0	1.5	0	0	0	0	0	0	0	0	0	0	0	0	
5	1.5	2,392	359	2,981	447	3,570	535	4,159	624	4,748	712	4,748	712	
15	1.5	4,783	717	5,961	894	7,139	1,071	8,317	1,248	9,495	1,424	9,495	1,424	
25	3.0	9,708	1,456	12,064	1,810	14,420	2,163	16,776	2,516	19,132	2,870	19,132	2,870	
30	3.0	4,854	728	6,032	905	7,210	1,081	8,388	1,258	9,566	1,435	9,566	1,435	
35	3.0	4,854	728	6,032	905	7,210	1,081	8,388	1,258	9,566	1,435	0	0	
45	5.0	16,493	2,474	20,420	3,063	24,347	3,652	28,274	4,241	32,201	4,830	0	0	
50	5.0	8,247	1,237	10,210	1,532	12,174	1,826	14,137	2,121	0	0	0	0	
55	5.0	8,247	1,237	10,210	1,532	12,174	1,826	0	0	0	0	0	0	
65	5.0	16,493	2,474	20,420	3,063	0	0	0	0	0	0	0	0	
75	6.0	19,981	2,997	0	0	0	0	0	0	0	0	0	0	
85	6.0	19,981	2,997	0	0	0	0	0	0	0	0	0	0	
6' Base Slab	8.0	63,410	9,512	93,687	14,053	129,855	19,478	171,913	25,787	219,862	32,979	73,287	10,993	2' thick slab
		6,646	**26,916**	**6,964**	**28,203**	**8,078**	**32,715**	**9,643**	**39,053**	**11,280**	**45,686**	**4,305**	**17,434**	kips
		CY	kips	CY	kips	CY	kips	CY	kips	CY	kips	CY	kips	
Buoyant Force =			44,623 kips		44,849 kips		47,784 kips		44,531 kips		45,327 kips		0 kips	
Safety Factor =			1.5		1.5		1.5		1.5		1.5		1.5	
Resistance Req'd =			66,934 kips		67,274 kips		71,676 kips		66,796 kips		67,991 kips		0 kips	
Add'l Resisting Force Req'd =			**40,018** kips		**39,071** kips		**38,961** kips		**27,743** kips		**22,305** kips		**0** kips	
Qty. Helical Piles (@45k)=		45	889		868		866		617		496		0	

Other quantities:	**100**	**Ft.**	**125**	**Ft.**	**150**	**Ft.**	**175**	**Ft.**	**200**	**Ft.**	**200**	**Ft.**
Excavation	36,017	CY	41,257	CY	49,194	CY	54,550	CY	63,401	CY	36,497	CY
Liner - Above HWL+2'	10,053	SF	12,566	SF	15,080	SF	17,593	SF	20,106	SF	20,106	SF
Liner - Below HWL+2'	24,525	SF	25,891	SF	29,309	SF	34,320	SF	40,694	SF	23,876	SF
Cover	7,854	SF	12,272	SF	17,672	SF	24,053	SF	31,416	SF	31,416	SF

Stantec

3.0 MG CIRCULAR RESPONSE TANK COSTS

Client: MCES
Project: L-32
Proj. No.: 173420004

Date: 6/15/2020
By: P. Caswell

MAJOR ITEM CONSTRUCTION COSTS

Item No.	Item	Unit	Unit Price	100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.	
				Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost
2.1	Excavation	CY	$50.00	36,017	$1,800,850	41,257	$2,062,850	49,194	$2,459,700	54,550	$2,727,500	63,401	$3,170,050
2.2	Dewatering (2)	LS	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000
2.3	Helical Piles	EA	$2,000.00	633	$1,266,000	675	$1,350,000	724	$1,448,000	503	$1,006,000	412	$824,000
3.1	Concrete	CY	$1,000.00	9,494	$9,494,000	9,116	$9,116,000	9,654	$9,654,000	10,905	$10,905,000	12,210	$12,210,000
3.2	Liner - Above HWL+2'	SF	$50.00	0	$0	0	$0	0	$0	0	$0	0	$0
3.3	Liner - Below HWL+2'	SF	$50.00	24,525	$1,226,250	25,891	$1,294,550	29,309	$1,465,450	34,320	$1,716,000	40,694	$2,034,700
13.0	Aluminum Cover	SF	$75.00	7,854	$589,050	12,272	$920,400	17,672	$1,325,400	24,053	$1,803,975	31,416	$2,356,200
	TOTAL				$15,376,150		$15,743,800		$17,352,550		$19,158,475		$21,594,950
	Structure cost per gallon =				**$5.13**		**$5.25**		**$5.78**		**$6.39**		**$7.20**

(1) All quantities are entered manually and are not calculated in this worksheet.

(2) Dewatering cost is a concept-level estimate, as a place-holder.

SUPPLEMENTAL SYSTEM COSTS

Item No.	Item	Unit	Unit Price(3)	100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.	
				Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
1	Submersible Pump Station	LS	$250,000.00	1	$250,000	1	$250,000	1	$250,000	1	$250,000	1	$250,000
2	Tank Washdown System	LS	$100,000	1	$100,000	1	$100,000	1	$100,000	1	$100,000	1	$100,000
3	Odor Control System	LS	$300,000.00	1	$300,000	1	$300,000	1	$300,000	1	$300,000	1	$300,000
	TOTAL				$650,000		$650,000		$650,000		$650,000		$650,000

(3) Costs are concept-level estimates, based upon experience.

ESTIMATED COST ADJUSTMENTS

Item No.	Item	Unit	Amount	100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.	
				Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
1	Structure Subtotal	LS	N/A	N/A	$15,376,150	N/A	$15,743,800	N/A	$17,352,550	N/A	$19,158,475	N/A	$21,594,950
2	Supplemental Systems	LS	N/A	N/A	$650,000	N/A	$650,000	N/A	$650,000	N/A	$650,000	N/A	$650,000
	Base Subtotal				$16,026,150		$16,393,800		$18,002,550		$19,808,475		$22,244,950
	Contingency - Const. Costs	LS	30%	N/A	$4,807,845	N/A	$4,918,140	N/A	$5,400,765	N/A	$5,942,543	N/A	$6,673,485
	Adj. Subtotal				$20,833,995		$21,311,940		$23,403,315		$25,751,018		$28,918,435
	Contingency - Undev. Dsgn.	LS	25%	N/A	$5,208,499	N/A	$5,327,985	N/A	$5,850,829	N/A	$6,437,754	N/A	$7,229,609
	TOTAL				**$26,042,494**		**$26,639,925**		**$29,254,144**		**$32,188,772**		**$36,148,044**

1.5MG CIRCULAR RESPONSE TANK

Stantec

Client: MCES
Project: L-32
Proj. No.: 173420004

Date: 6/8/2020
By: P. Caswell

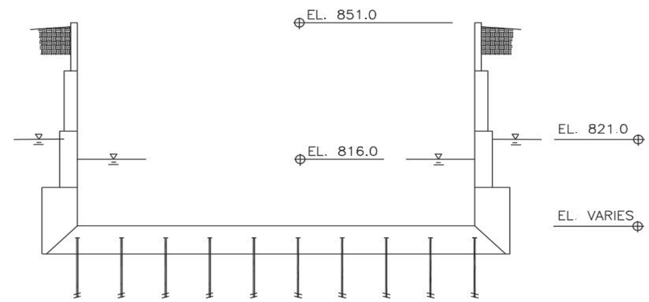
Site/Tank Data:

Existing Ground Elev. =	850.00
Top of Tank Elev. =	850.00
Max. Groundwater Elev. =	821.00
Max. Tank Interior Water Elev. =	**816.00**

Net Storage Volume =	**1,500,000**	Gal.
=	200,535	CF
Tank Freeboard =	34.0	Ft.

Soil/Concrete Data:

Soil Density, gs =	120 pcf
Conc. Strength, f'c =	6,000 psi
Lateral Earth Coef. =	0.530



SECTION

Basic Tank Storage Geometries:

Inside Dia.	Net Area	SWD	Bottom EL.	Depth	Gross Vol.
100	7,854	25.5	790.5	**59.5**	3,497,429
125	12,272	16.3	799.7	**50.3**	4,620,983
150	17,672	11.3	804.7	**45.3**	5,994,216
175	24,053	8.3	807.7	**42.3**	7,617,127
200	31,416	6.4	809.6	**40.4**	9,489,717

TANK GEOMETRY/BUOYANCY:

BUOYANCY		**100** ft. Dia.		**125** ft. Dia.		**150** ft. Dia.		**175** ft. Dia.		**200** ft. Dia.		
Depth, Z	Wall t (ft.)	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Comment
0	1.5	0	0	0	0	0	0	0	0	0	0	
10	1.5	83,323	0	128,680	0	183,854	0	248,846	0	323,655	0	
20	1.5	83,323	0	128,680	0	183,854	0	248,846	0	323,655	0	
25	3.0	44,124	0	67,391	0	95,567	0	128,652	0	166,646	0	
30	3.0	44,124	0	67,391	0	95,567	0	128,652	0	166,646	0	HWL = 821
40	3.0	88,248	5,507	134,782	8,410	191,135	11,927	257,305	16,056	333,292	20,797	
42.5	5.0	23,758	1,483	35,785	2,233	50,266	3,137	67,201	4,193	0	0	
45	5.0	23,758	1,483	35,785	2,233	50,266	3,137	0				
50	5.0	47,517	2,965	107,354	6,699	0	0	0	0	0	0	
55	5.0	47,517	2,965	0	0	0	0	0	0	0	0	
60	5.0	47,517	2,965	0	0	0	0	0	0	0	0	
8' Slab	6.0	98,521	6,148	117,929	7,359	164,896	10,290	219,717	13,710	282,392	17,621	
		631,729	**23,514**	823,778	**26,934**	1,015,406	**28,489**	1,299,220	**33,960**	1,596,288	**38,419**	
		CF	kips	CF	kips	CF	kips	CF	kips	CF	kips	

Hydrostatic pressure included below z = 30 ft.
Wall shear reinforcement req'd below z = 50 ft.

RESISTING FORCE:		100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.		Pump in/Gravity out 200 ft. Dia.	
Depth, Z	Wall t (ft)	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.
0	1.5	0	0	0	0	0	0	0	0	0	0	0	0
10	1.5	4,783	717	5,961	894	7,139	1,071	8,317	1,248	9,495	1,424	9,495	1,424
20	1.5	4,783	717	5,961	894	7,139	1,071	8,317	1,248	9,495	1,424	9,495	1,424
25	3.0	4,854	728	6,032	905	7,210	1,081	8,388	1,258	9,566	1,435	9,566	1,435
30	3.0	4,854	728	6,032	905	7,210	1,081	8,388	1,258	9,566	1,435	9,566	1,435
40	3.0	9,708	1,456	12,064	1,810	14,420	2,163	16,776	2,516	19,132	2,870	0	0
42.5	5.0	4,123	619	5,105	766	6,087	913	7,069	1,060	0	0	0	0
45	5.0	4,123	619	5,105	766	6,087	913	0	0	0	0	0	0
50	5.0	8,247	1,237	10,210	1,532	0	0	0	0	0	0	0	0
55	5.0	8,247	1,237	0	0	0	0	0	0	0	0	0	0
60	5.0	8,247	1,237	0	0	0	0	0	0	0	0	0	0
8' Slab	6.0	78,816	11,822	117,929	17,689	164,896	24,734	219,717	32,958	282,392	42,359	88,248	13,237
		5,214	**21,118**	**6,459**	**26,160**	**8,155**	**33,028**	**10,258**	**41,546**	**12,580**	**50,947**	**4,680**	**18,956**
		CY	kips	CY	kips	CY	kips	CY	kips	CY	kips	CY	kips

		100 ft.	125 ft.	150 ft.	175 ft.	200 ft.
Buoyant Force =		23,514 kips	26,934 kips	28,489 kips	33,960 kips	38,419 kips
Resisting Force =		21,118 kips	26,160 kips	33,028 kips	41,546 kips	50,947 kips
Safety Factor =		**0.90** kips	**0.97** kips	**1.16** kips	**1.22** kips	**1.33** kips
Add'l Resistance Req'd =		14,154 kips	14,241	9,706	9,393	6,681
No. (45k) Piles Req'd =	45	315	316	216	209	148

Other quantities:	**100**	**Ft.**	**125**	**Ft.**	**150**	**Ft.**	**175**	**Ft.**	**200**	**Ft.**	**200**	**Ft.**
Excavation	23,397	CY	30,510	CY	37,608	CY	48,119	CY	59,122	CY	0	CY
Liner - Above (HWL+2')	10,053	SF	12,566	SF	15,080	SF	17,593	SF	20,106	SF	20,106	SF
Liner - Below (HWL+2')	16,504	SF	19,474	SF	23,962	SF	29,736	SF	36,683	SF	36,683	SF
Cover	7,854	SF	12,272	SF	17,672	SF	24,053	SF	31,416	SF	31,416	SF

Stantec

1.5 MG CIRCULAR RESPONSE TANK COSTS

Client: MCES
Project: L-32
Proj. No.: 173420004

Date: 6/15/2020
By: P. Caswell

MAJOR ITEM CONSTRUCTION COSTS

Item No.	Item	Unit	Unit Price	100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.	
				Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost
2.1	Excavation	CY	$50.00	23,397	$1,169,850	30,510	$1,525,500	37,608	$1,880,400	48,119	$2,405,950	59,122	$2,956,100
2.2	Dewatering (2)	LS	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000
2.3	Helical Piles	EA	$2,000.00	315	$630,000	316	$632,000	216	$432,000	209	$418,000	148	$296,000
3.1	Concrete	CY	$1,000.00	5,214	$5,214,000	6,459	$6,459,000	8,155	$8,155,000	10,258	$10,258,000	12,580	$12,580,000
3.2	Buried Concrete Roof & Cols.	LS	$7,450,000.00	0	$0	0	$0	0	$0	0	$0	0	$0
3.3	Liner - Below HWL+2'	SF	$50.00	16,504	$825,200	19,474	$973,700	23,962	$1,198,100	29,736	$1,486,800	36,683	$1,834,150
13.0	Aluminum Cover	SF	$75.00	7,854	$589,050	12,272	$920,400	17,672	$1,325,400	24,053	$1,803,975	31,416	$2,356,200
	TOTAL				$9,428,100		$11,510,600		$13,990,900		$17,372,725		$21,022,450
	Structure cost per gallon =				**$3.14**		**$3.84**		**$4.66**		**$5.79**		**$7.01**

(1) All quantities are entered manually and are not calculated in this worksheet.

(2) Dewatering cost is a concept-level estimate, as a place-holder.

SUPPLEMENTAL SYSTEM COSTS

Item No.	Item	Unit	Unit Price(3)	100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.	
				Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
1	Submersible Pump Station	LS	$250,000.00	1	$250,000	1	$250,000	1	$250,000	1	$250,000	1	$250,000
2	Tank Washdown System	LS	$100,000	1	$100,000	1	$100,000	1	$100,000	1	$100,000	1	$100,000
3	Odor Control System	LS	$300,000.00	1	$300,000	1	$300,000	1	$300,000	1	$300,000	1	$300,000
	TOTAL				$650,000		$650,000		$650,000		$650,000		$650,000

(3) Costs are concept-level estimates, based upon experience.

ESTIMATED COST ADJUSTMENTS

Item No.	Item	Unit	Amount	100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.	
				Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
Part 1	Structure Subtotal	LS	N/A	N/A	$9,428,100	N/A	$11,510,600	N/A	$13,990,900	N/A	$17,372,725	N/A	$21,022,450
Part 2	Supplemental Systems	LS	N/A	N/A	$650,000	N/A	$650,000	N/A	$650,000	N/A	$650,000	N/A	$650,000
	Base Subtotal				$10,078,100		$12,160,600		$14,640,900		$18,022,725		$21,672,450
	Contingency - Const. Costs	LS	30%	N/A	$3,023,430	N/A	$3,648,180	N/A	$4,392,270	N/A	$5,406,818	N/A	$6,501,735
	Adj. Subtotal				$13,101,530		$15,808,780		$19,033,170		$23,429,543		$28,174,185
	Contingency - Undev. Dsgn.	LS	25%	N/A	$3,275,383	N/A	$3,952,195	N/A	$4,758,293	N/A	$5,857,386	N/A	$7,043,546
	TOTAL				**$16,376,913**		**$19,760,975**		**$23,791,463**		**$29,286,928**		**$35,217,731**

Stantec

3.0MG CIRCULAR RESPONSE TANK

Client: MCES
Project: L-32
Proj. No.: 173420004

Date: 5/19/2020
By: P. Caswell

Site/Tank Data:

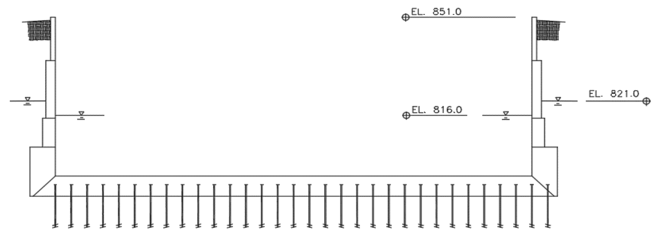
Existing Ground Elev. =	850.00	Gross Storage Volume =		Gal.
Top of Tank Elev. =	850.00	Net Storage Volume =	3,000,000	Gal.
Groundwater Elev. =	821.00	=	401,070	CF
Max. Tank Interior Water Elev. =	**816.00**	Tank Freeboard =	34.0	Ft.

Soil/Concrete Data:

Soil Density, gs =	120 pcf
Conc. Strength, f'c =	6,000 psi
Lateral Earth Coef. =	0.530

Basic Tank Storage Geometries:

Inside Dia.	Net Area	SWD	Bottom EL.	Depth	Gross Vol.
100	7,854	51.1	764.9	**85.1**	4,997,429
125	12,272	32.7	783.3	**66.7**	6,120,983
150	17,672	22.7	793.3	**56.7**	7,494,216
175	24,053	16.7	799.3	**50.7**	9,117,127
200	31,416	12.8	803.2	**46.8**	10,989,717
200	31,416	12.8	830.0	**20.0**	4,699,834



TANK GEOMETRY/BUOYANCY:

Wall Thicknesses				TANK DIAMETERS 100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.		Pump in/Gravity out 200 ft. Dia.	
Depth, Z	Shear Vu	Min. t (ft.)	Dsgn t (ft.)	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force
0	0.0	1.0	1.5	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
5	1.4	1.0	1.5	41,662	0	64,340	0	91,927	0	124,423	0	161,828	0	161,828	0
15	12.2	1.0	1.5	83,323	0	128,680	0	183,854	0	248,846	0	323,655	0	323,655	0
25	33.8	2.0	3.0	88,248	0	134,782	0	191,135	0	257,305	0	333,292	0	333,292	0
30	48.6	2.8	3.0	44,124	0	67,391	0	95,567	0	128,652	0	166,646	0	166,646	0
35	68.1	3.8	4.0	45,805	2,858	69,465	4,335	98,034	6,117	131,511	8,206	169,898	10,602	0	0
45	127.1	7.0	8.0	105,683	6,595	156,145	9,743	216,425	13,505	286,522	17,879	366,436	22,866	0	0
50	166.6	9.0	9.0	54,680	3,412	80,303	5,011	110,836	6,916	146,277	9,128	0	0	0	0
55	212.7	11.5	10.0	113,098	7,057	165,130	10,304	226,981	14,164	0	0	0	0	0	0
65	324.9	17.4	10.0	113,098	7,057	165,130	10,304	0	0	0	0	0	0	0	0
75	463.7	24.7	10.0	113,098	7,057	0	0	0	0	0	0	0	0	0	0
85	629.1	33.4	10.0	113,098	7,057	0	0	0	0	0	0	0	0	0	0
Slab		5.0	10.0	56,549	3,529	82,565	5,152	113,490	7,082	149,324	9,318	190,067	11,860	0	0
Hydrostatic pressure included below z = 30 ft.					**44,623**	kips	**44,849**	kips	**47,784**	kips	**44,531**	kips	**45,327**	kips	**0** kips

Wall shear reinforcement req'd below z = 50 ft.

RESISTING FORCE:

		100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.		Pump in/Gravity out 200 ft. Dia.	
Depth, Z	Wall t (ft)	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.
0	1.5	0	0	0	0	0	0	0	0	0	0	0	0
5	1.5	2,392	359	2,981	447	3,570	535	4,159	624	4,748	712	4,748	712
15	1.5	4,783	717	5,961	894	7,139	1,071	8,317	1,248	9,495	1,424	9,495	1,424
25	3.0	9,708	1,456	12,064	1,810	14,420	2,163	16,776	2,516	19,132	2,870	19,132	2,870
30	3.0	4,854	728	6,032	905	7,210	1,081	8,388	1,258	9,566	1,435	9,566	1,435
35	3.0	4,854	728	6,032	905	7,210	1,081	8,388	1,258	9,566	1,435	0	0
45	5.0	16,493	2,474	20,420	3,063	24,347	3,652	28,274	4,241	32,201	4,830	0	0

50	5.0	8,247	1,237	10,210	1,532	12,174	1,826	14,137	2,121	0	0	0	0	
55	5.0	8,247	1,237	10,210	1,532	12,174	1,826	0	0	0	0	0	0	
65	5.0	16,493	2,474	20,420	3,063	0	0	0	0	0	0	0	0	
75	6.0	19,981	2,997	0	0	0	0	0	0	0	0	0	0	
85	6.0	19,981	2,997	0	0	0	0	0	0	0	0	0	0	
6' Base Slab	8.0	63,410	9,512	93,687	14,053	129,855	19,478	171,913	25,787	219,862	32,979	73,287	10,993	2' thick slab
		6,646	**26,916**	**6,964**	**28,203**	**8,078**	**32,715**	**9,643**	**39,053**	**11,280**	**45,686**	**4,305**	**17,434**	kips
		CY	kips	CY	kips	CY	kips	CY	kips	CY	kips	CY	kips	
Buoyant Force =			44,623 kips		44,849 kips		47,784 kips		44,531 kips		45,327 kips		0 kips	
Safety Factor =			1.5		1.5		1.5		1.5		1.5		1.5	
Resistance Req'd =			66,934 kips		67,274 kips		71,676 kips		66,796 kips		67,991 kips		0 kips	
Add'l Resisting Force Req'd =			**40,018** kips		**39,071** kips		**38,961** kips		**27,743** kips		**22,305** kips		**0** kips	
Qty. Helical Piles (@45k)=		45	889		868		866		617		496		0	

Other quantities:	**100**	**Ft.**	**125**	**Ft.**	**150**	**Ft.**	**175**	**Ft.**	**200**	**Ft.**	**200**	**Ft.**
Excavation	36,017	CY	41,257	CY	49,194	CY	54,550	CY	63,401	CY	36,497	CY
Liner - Above HWL+2'	10,053	SF	12,566	SF	15,080	SF	17,593	SF	20,106	SF	20,106	SF
Liner - Below HWL+2'	24,525	SF	25,891	SF	29,309	SF	34,320	SF	40,694	SF	23,876	SF
Cover	7,854	SF	12,272	SF	17,672	SF	24,053	SF	31,416	SF	31,416	SF

Stantec

3.0 MG CIRCULAR RESPONSE TANK COSTS

Client: MCES
Project: L-32
Proj. No.: 173420004

Date: 6/15/2020
By: P. Caswell

MAJOR ITEM CONSTRUCTION COSTS

Item			Unit	**100** ft. Dia.		**125** ft. Dia.		**150** ft. Dia.		**175** ft. Dia.		**200** ft. Dia.	
No.	Item	Unit	Price	Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost
2.1	Excavation	CY	$50.00	36,017	$1,800,850	41,257	$2,062,850	49,194	$2,459,700	54,550	$2,727,500	63,401	$3,170,050
2.2	Dewatering (2)	LS	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000
2.3	Helical Piles	EA	$2,000.00	633	$1,266,000	675	$1,350,000	724	$1,448,000	503	$1,006,000	412	$824,000
3.1	Concrete	CY	$1,000.00	9,494	$9,494,000	9,116	$9,116,000	9,654	$9,654,000	10,905	$10,905,000	12,210	$12,210,000
3.2	Liner - Above HWL+2'	SF	$50.00	0	$0	0	$0	0	$0	0	$0	0	$0
3.3	Liner - Below HWL+2'	SF	$50.00	24,525	$1,226,250	25,891	$1,294,550	29,309	$1,465,450	34,320	$1,716,000	40,694	$2,034,700
13.0	Aluminum Cover	SF	$75.00	7,854	$589,050	12,272	$920,400	17,672	$1,325,400	24,053	$1,803,975	31,416	$2,356,200
	TOTAL				$15,376,150		$15,743,800		$17,352,550		$19,158,475		$21,594,950
	Structure cost per gallon =				**$5.13**		**$5.25**		**$5.78**		**$6.39**		**$7.20**

(1) All quantities are entered manually and are not calculated in this worksheet.

(2) Dewatering cost is a concept-level estimate, as a place-holder.

SUPPLEMENTAL SYSTEM COSTS

Item			Unit	**100** ft. Dia.		**125** ft. Dia.		**150** ft. Dia.		**175** ft. Dia.		**200** ft. Dia.	
No.	Item	Unit	Price(3)	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
1	Submersible Pump Station	LS	$250,000.00	1	$250,000	1	$250,000	1	$250,000	1	$250,000	1	$250,000
2	Tank Washdown System	LS	$100,000	1	$100,000	1	$100,000	1	$100,000	1	$100,000	1	$100,000
3	Odor Control System	LS	$300,000.00	1	$300,000	1	$300,000	1	$300,000	1	$300,000	1	$300,000
	TOTAL				$650,000		$650,000		$650,000		$650,000		$650,000

(3) Costs are concept-level estimates, based upon experience.

ESTIMATED COST ADJUSTMENTS

Item				**100** ft. Dia.		**125** ft. Dia.		**150** ft. Dia.		**175** ft. Dia.		**200** ft. Dia.	
No.	Item	Unit	Amount	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
1	Structure Subtotal	LS	N/A	N/A	$15,376,150	N/A	$15,743,800	N/A	$17,352,550	N/A	$19,158,475	N/A	$21,594,950
2	Supplemental Systems	LS	N/A	N/A	$650,000	N/A	$650,000	N/A	$650,000	N/A	$650,000	N/A	$650,000
	Base Subtotal				$16,026,150		$16,393,800		$18,002,550		$19,808,475		$22,244,950
	Contingency - Const. Costs	LS	30%	N/A	$4,807,845	N/A	$4,918,140	N/A	$5,400,765	N/A	$5,942,543	N/A	$6,673,485
	Adj. Subtotal				$20,833,995		$21,311,940		$23,403,315		$25,751,018		$28,918,435
	Contingency - Undev. Dsgn.	LS	25%	N/A	$5,208,499	N/A	$5,327,985	N/A	$5,850,829	N/A	$6,437,754	N/A	$7,229,609
	TOTAL				**$26,042,494**		**$26,639,925**		**$29,254,144**		**$32,188,772**		**$36,148,044**

Stantec

1.5MG CIRCULAR RESPONSE TANK

Client: MCES
Project: L-32
Proj. No.: 173420004

Date: 6/8/2020
By: P. Caswell

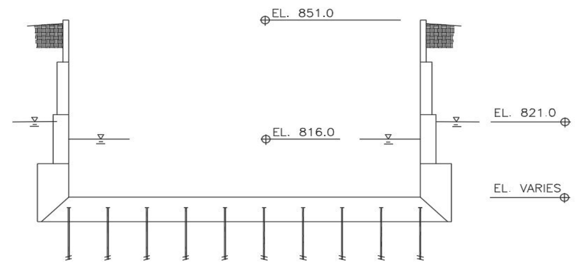
Site/Tank Data:

Existing Ground Elev. =	850.00
Top of Tank Elev. =	850.00
Max. Groundwater Elev. =	821.00
Max. Tank Interior Water Elev. =	**816.00**

Net Storage Volume =	**1,500,000**	Gal.
=	200,535	CF
Tank Freeboard =	34.0	Ft.

Soil/Concrete Data:

Soil Density, gs =	120 pcf
Conc. Strength, f'c =	6,000 psi
Lateral Earth Coef. =	0.530



SECTION

Basic Tank Storage Geometries:

Inside Dia.	Net Area	SWD	Bottom EL.	Depth	Gross Vol.
100	7,854	25.5	790.5	**59.5**	3,497,429
125	12,272	16.3	799.7	**50.3**	4,620,983
150	17,672	11.3	804.7	**45.3**	5,994,216
175	24,053	8.3	807.7	**42.3**	7,617,127
200	31,416	6.4	809.6	**40.4**	9,489,717

TANK GEOMETRY/BUOYANCY:

BUOYANCY		**100** ft. Dia.		**125** ft. Dia.		**150** ft. Dia.		**175** ft. Dia.		**200** ft. Dia.		
Depth, Z	Wall t (ft.)	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Vol. Disp.	B. Force	Comment
0	1.5	0	0	0	0	0	0	0	0	0	0	
10	1.5	83,323	0	128,680	0	183,854	0	248,846	0	323,655	0	
20	1.5	83,323	0	128,680	0	183,854	0	248,846	0	323,655	0	
25	3.0	44,124	0	67,391	0	95,567	0	128,652	0	166,646	0	
30	3.0	44,124	0	67,391	0	95,567	0	128,652	0	166,646	0	HWL = 821
40	3.0	88,248	5,507	134,782	8,410	191,135	11,927	257,305	16,056	333,292	20,797	
42.5	5.0	23,758	1,483	35,785	2,233	50,266	3,137	67,201	4,193	0	0	
45	5.0	23,758	1,483	35,785	2,233	50,266	3,137	0				
50	5.0	47,517	2,965	107,354	6,699	0	0	0	0	0	0	
55	5.0	47,517	2,965	0	0	0	0	0	0	0	0	
60	5.0	47,517	2,965	0	0	0	0	0	0	0	0	
8' Slab	6.0	98,521	6,148	117,929	7,359	164,896	10,290	219,717	13,710	282,392	17,621	
		631,729	**23,514**	823,778	**26,934**	1,015,406	**28,489**	1,299,220	**33,960**	1,596,288	**38,419**	
		CF	kips	CF	kips	CF	kips	CF	kips	CF	kips	

Hydrostatic pressure included below z = 30 ft.
Wall shear reinforcement req'd below z = 50 ft.

RESISTING FORCE:		**100** ft. Dia.		**125** ft. Dia.		**150** ft. Dia.		**175** ft. Dia.		**200** ft. Dia.		**Pump in/Gravity out** **200** ft. Dia.	
Depth, Z	Wall t (ft)	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.	Conc. Qty.	Conc. Wt.
0	1.5	0	0	0	0	0	0	0	0	0	0	0	0
10	1.5	4,783	717	5,961	894	7,139	1,071	8,317	1,248	9,495	1,424	9,495	1,424
20	1.5	4,783	717	5,961	894	7,139	1,071	8,317	1,248	9,495	1,424	9,495	1,424
25	3.0	4,854	728	6,032	905	7,210	1,081	8,388	1,258	9,566	1,435	9,566	1,435

30	3.0	4,854	728	6,032	905	7,210	1,081	8,388	1,258	9,566	1,435	9,566	1,435
40	3.0	9,708	1,456	12,064	1,810	14,420	2,163	16,776	2,516	19,132	2,870	0	0
42.5	5.0	4,123	619	5,105	766	6,087	913	7,069	1,060	0	0	0	0
45	5.0	4,123	619	5,105	766	6,087	913	0	0	0	0	0	0
50	5.0	8,247	1,237	10,210	1,532	0	0	0	0	0	0	0	0
55	5.0	8,247	1,237	0	0	0	0	0	0	0	0	0	0
60	5.0	8,247	1,237	0	0	0	0	0	0	0	0	0	0
8' Slab	6.0	78,816	11,822	117,929	17,689	164,896	24,734	219,717	32,958	282,392	42,359	88,248	13,237
		5,214	**21,118**	**6,459**	**26,160**	**8,155**	**33,028**	**10,258**	**41,546**	**12,580**	**50,947**	**4,680**	**18,956** kips
		CY	kips	CY	kips	CY	kips	CY	kips	CY	kips	CY	kips

Buoyant Force =	23,514 kips	26,934 kips	28,489 kips	33,960 kips	38,419 kips
Resisting Force =	21,118 kips	26,160 kips	33,028 kips	41,546 kips	50,947 kips
Safety Factor =	**0.90** kips	**0.97** kips	**1.16** kips	**1.22** kips	**1.33** kips
Add'l Resistance Req'd =	14,154 kips	14,241	9,706	9,393	6,681
No. (45k) Piles Req'd = 45	315	316	216	209	148

Other quantities:	**100**	**Ft.**	**125**	**Ft.**	**150**	**Ft.**	**175**	**Ft.**	**200**	**Ft.**	**200**	**Ft.**
Excavation	23,397	CY	30,510	CY	37,608	CY	48,119	CY	59,122	CY	0	CY
Liner - Above (HWL+2')	10,053	SF	12,566	SF	15,080	SF	17,593	SF	20,106	SF	20,106	SF
Liner - Below (HWL+2')	16,504	SF	19,474	SF	23,962	SF	29,736	SF	36,683	SF	36,683	SF
Cover	7,854	SF	12,272	SF	17,672	SF	24,053	SF	31,416	SF	31,416	SF

Stantec

1.5 MG CIRCULAR RESPONSE TANK COSTS

Client: MCES
Project: L-32
Proj. No.: 173420004

Date: 6/15/2020
By: P. Caswell

MAJOR ITEM CONSTRUCTION COSTS

Item No.	Item	Unit	Unit Price	100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.	
				Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost	Qty.(1)	Cost
2.1	Excavation	CY	$50.00	23,397	$1,169,850	30,510	$1,525,500	37,608	$1,880,400	48,119	$2,405,950	59,122	$2,956,100
2.2	Dewatering (2)	LS	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000	1.0	$1,000,000
2.3	Helical Piles	EA	$2,000.00	315	$630,000	316	$632,000	216	$432,000	209	$418,000	148	$296,000
3.1	Concrete	CY	$1,000.00	5,214	$5,214,000	6,459	$6,459,000	8,155	$8,155,000	10,258	$10,258,000	12,580	$12,580,000
3.2	Liner - Above HWL+2'	SF	$50.00	0	$0	0	$0	0	$0	0	$0	0	$0
3.3	Liner - Below HWL+2'	SF	$50.00	16,504	$825,200	19,474	$973,700	23,962	$1,198,100	29,736	$1,486,800	36,683	$1,834,150
13.0	Aluminum Cover	SF	$75.00	7,854	$589,050	12,272	$920,400	17,672	$1,325,400	24,053	$1,803,975	31,416	$2,356,200
	TOTAL				$9,428,100		$11,510,600		$13,990,900		$17,372,725		$21,022,450
	Structure cost per gallon =				**$3.14**		**$3.84**		**$4.66**		**$5.79**		**$7.01**

(1) All quantities are entered manually and are not calculated in this worksheet.

(2) Dewatering cost is a concept-level estimate, as a place-holder.

SUPPLEMENTAL SYSTEM COSTS

Item No.	Item	Unit	Unit Price(3)	100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.	
				Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
1	Submersible Pump Station	LS	$250,000.00	1	$250,000	1	$250,000	1	$250,000	1	$250,000	1	$250,000
2	Tank Washdown System	LS	$100,000	1	$100,000	1	$100,000	1	$100,000	1	$100,000	1	$100,000
3	Odor Control System	LS	$300,000.00	1	$300,000	1	$300,000	1	$300,000	1	$300,000	1	$300,000
	TOTAL				$650,000		$650,000		$650,000		$650,000		$650,000

(3) Costs are concept-level estimates, based upon experience.

ESTIMATED COST ADJUSTMENTS

Item No.	Item	Unit	Amount	100 ft. Dia.		125 ft. Dia.		150 ft. Dia.		175 ft. Dia.		200 ft. Dia.	
				Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost
Part 1	Structure Subtotal	LS	N/A	N/A	$9,428,100	N/A	$11,510,600	N/A	$13,990,900	N/A	$17,372,725	N/A	$21,022,450
Part 2	Supplemental Systems	LS	N/A	N/A	$650,000	N/A	$650,000	N/A	$650,000	N/A	$650,000	N/A	$650,000
	Base Subtotal				$10,078,100		$12,160,600		$14,640,900		$18,022,725		$21,672,450
	Contingency - Const. Costs	LS	30%	N/A	$3,023,430	N/A	$3,648,180	N/A	$4,392,270	N/A	$5,406,818	N/A	$6,501,735
	Adj. Subtotal				$13,101,530		$15,808,780		$19,033,170		$23,429,543		$28,174,185
	Contingency - Undev. Dsgn.	LS	25%	N/A	$3,275,383	N/A	$3,952,195	N/A	$4,758,293	N/A	$5,857,386	N/A	$7,043,546
	TOTAL				**$16,376,913**		**$19,760,975**		**$23,791,463**		**$29,286,928**		**$35,217,731**

APPENDIX H – COST ESTIMATE

Lift Station L-32 Project Summary					
Section	**Description**	**Construction Estimate**	**25% Contingency**	**25% Undeveloped Design Details**	**Total**
	Rehabilitation West Lift Station Pump and Control Replacement and Storage	Construction Estimate	25% Contingency	25% Undeveloped Design Details	Total
West LS1	6 Pump 150 HP. 64 MGD Capacity	$ 7,315,000.00	$ 1,828,750.00	$ 1,828,750.00	$ 10,972,500.00
West LS2	6 Pump 200 HP 67 MGD Capacity	$ 7,703,000.00	$ 1,925,750.00	$ 1,925,750.00	$ 11,554,500.00
West Storage	1.0 MG Storage/20 Minute tank	$ 8,060,000.00	$ 2,015,000.00	$2,015,000	$ 12,090,000.00
West LS	Mississippi Lane Lift Station	$ 650,000.00	$ 162,500.00	$ 162,500.00	$ 975,000.00
	River Crossing				
	River Crossing	$ 7,827,000.00	$ 1,956,750.00	$ 1,956,750.00	$ 11,740,500.00
	East Lift Station Options	Construction Estimate	25% Contingency	25% Undeveloped Design Details	Total
Option A	6 Pump Rectangular	$ 14,989,000.00	$ 3,747,250.00	$ 3,747,250.00	$ 22,483,500.00
Option B	6 Pump Circular Design	$ 15,111,800.00	$ 3,777,950.00	$ 3,777,950.00	$ 22,667,700.00
Option C	8 Pump Rectangular Design	$ 18,008,000.00	$ 4,502,000.00	$ 4,502,000.00	$ 27,012,000.00
Option D	8 Pump Circular Design	$ 16,882,800.00	$ 4,220,700.00	$ 4,220,700.00	$ 25,324,200.00
Option K	2 Hydraulic Pumps	$ 1,500,000.00	$ 375,000.00	$ 375,000.00	$ 2,250,000.00
	1.5 MG Storage Tanks	Construction Estimate	30 % Contingency	25% Undeveloped Design Details	Total
100 ft.	Diameter	$ 10,078,100.00	$ 3,023,430.00	$ 3,275,383.00	$ 16,376,913.00
125 ft	Diameter	$ 12,160,600.00	$ 3,648,180.00	$ 3,952,195.00	$ 19,760,975.00
150 ft	Diameter	$ 14,640,900.00	$ 4,392,270.00	$ 4,758,293.00	$ 23,791,463.00
150 ft.	Diameter Buried.	$ 22,090,900.00	$ 6,627,270.00	$ 7,179,543.00	$ 35,897,713.00
175 ft	Diameter	$ 18,022,725.00	$ 5,406,817.50	$ 5,857,386.00	$ 29,286,928.50
200 ft	Diameter	$ 21,672,450.00	$ 6,501,735.00	$ 7,043,546.00	$ 35,217,731.00
	3.0 MG Storage Tanks	Construction Estimate	30 % Contingency	25% Undeveloped Design Details	Total
100 ft	Diameter	$ 16,026,150.00	$ 4,807,845.00	$ 5,208,499.00	$ 26,042,494.00
125 ft	Diameter	$ 16,393,800.00	$ 4,918,140.00	$ 5,327,985.00	$ 26,639,925.00
150 ft	Diameter	$ 18,002,550.00	$ 5,400,765.00	$ 5,850,829.00	$ 29,254,144.00
175 ft	Diameter	$ 19,808,475.00	$ 5,942,542.50	$ 6,437,754.00	$ 32,188,771.50
200 ft	Diameter	$ 22,244,950.00	$ 6,673,485.00	$ 7,229,609.00	$ 36,148,044.00

Lift Station L-32 Option A- 6 Pump Cost Summary		
Section	**Description**	**Total Division Cost**
DIV. 1	General Requirements	$1,767,000
DIV. 2	Site Work	$779,000
DIV. 3	Concrete	$4,624,000
DIV. 4	Masonry	$528,000
DIV. 5	Metals	$130,000
DIV. 6	Wood and Plastics	$163,000
DIV. 7	Thermal and Moisture Protection	$148,000
DIV. 8	Doors and Windows	$108,000
DIV. 9	Finishes	$907,000
DIV. 10	Specialties	$26,000
DIV. 11	Equipment	$2,160,000
DIV. 13	Specialty Systems	$400,000
DIV. 14	Conveying Systems	$60,000
DIV. 15	Mechanical	$1,178,000
DIV. 16	Electrical	$2,011,000
SUB-TOTAL PROJECT COST		$14,989,000
25%	Contingency	$3,747,250
25%	Undeveloped Design Details	$3,747,250
SUB-TOTAL PROJECT COST		$22,483,500

Lift Station L-32 Option B- 6 Pump Circular Cost Summary		
Section	**Description**	**Total Division Cost**
DIV. 1	General Requirements	$1,770,000
DIV. 2	Site Work	$975,000
DIV. 3	Concrete	$4,000,000
DIV. 4	Masonry	$407,000
DIV. 5	Metals	$553,000
DIV. 6	Wood and Plastics	$62,000
DIV. 7	Thermal and Moisture Protection	$238,000
DIV. 8	Doors and Windows	$49,000
DIV. 9	Finishes	$1,222,800
DIV. 10	Specialties	$26,000
DIV. 11	Equipment	$2,160,000
DIV. 13	Specialty Systems	$400,000
DIV. 14	Conveying Systems	$60,000
DIV. 15	Mechanical	$1,178,000
DIV. 16	Electrical	$2,011,000
SUB-TOTAL PROJECT COST		$15,111,800
25%	Contingency	$3,777,950
25%	Undeveloped Design Details	$3,777,950
SUB-TOTAL PROJECT COST		$22,667,700

Lift Station L-32 Estimate C, 8 Pump Rectangular cost Summary		
Section	**Description**	**Total Division Cost**
DIV. 1	General Requirements	$2,194,000
DIV. 2	Site Work	$988,000
DIV. 3	Concrete	$6,058,000
DIV. 4	Masonry	$637,000
DIV. 5	Metals	$130,000
DIV. 6	Wood and Plastics	$163,000
DIV. 7	Thermal and Moisture Protection	$195,000
DIV. 8	Doors and Windows	$108,000
DIV. 9	Finishes	$1,107,000
DIV. 10	Specialties	$26,000
DIV. 11	Equipment	$2,250,000
DIV. 13	Specialty Systems	$400,000
DIV. 14	Conveying Systems	$60,000
DIV. 15	Mechanical	$1,424,000
DIV. 16	Electrical	$2,268,000
SUB-TOTAL PROJECT COST		$18,008,000
25%	Contingency	$4,502,000
25%	Undeveloped Design Details	$4,502,000
SUB-TOTAL PROJECT COST		$27,012,000

Lift Station L-32 Estimate D, 8 Pump Circular Summary		
Section	**Description**	**Total Division Cost**
DIV. 1	General Requirements	$1,822,000
DIV. 2	Site Work	$1,192,000
DIV. 3	Concrete	$4,973,000
DIV. 4	Masonry	$407,000
DIV. 5	Metals	$553,000
DIV. 6	Wood and Plastics	$62,000
DIV. 7	Thermal and Moisture Protection	$238,000
DIV. 8	Doors and Windows	$49,000
DIV. 9	Finishes	$1,382,800
DIV. 10	Specialties	$26,000
DIV. 11	Equipment	$2,250,000
DIV. 13	Specialty Systems	$400,000
DIV. 14	Conveying Systems	$60,000
DIV. 15	Mechanical	$1,350,000
DIV. 16	Electrical	$2,118,000
SUB-TOTAL PROJECT COST		$16,882,800
25%	Contingency	$4,220,700
25%	Undeveloped Design Details	$4,220,700
SUB-TOTAL PROJECT COST		$25,324,200

Lift Station L-32 Cost Estimate E River Crossing /Site Piping						
Section	Description	Units	Quantity	Unit Price	Item Cost	Total Division Cost
DIV. 1	General Requirements			Estimated DIV Costs:		$600,000
1400	Quality Control	LS	1	$25,000	$25,000	
1500	Mobilization	LS	1	$50,000	$50,000	
1500	Televise Barrels A & B	EA	2	$5,000	$5,000	
1563	Dewatering	LS	1	$100,000	$100,000	
1563	Silt Fence	LF	4000	$5	$20,000	
1569	Temporary Conveyance	LS	1	$350,000	$350,000	
1650	Startup (and Testing)	LS	1	$50,000	$50,000	
DIV. 2	Site Work and Piping			Estimated DIV Costs:		$5,935,000
2050	Demolition Meter Vault	LS	1	$200,000	$200,000	
2050	Demoliton Valve Vault	LS	1	$200,000	$200,000	
2100	Site Preparation	LS	1	$50,000	$50,000	
2200	Excavation Siphon Structure	CY	600	$25	$15,000	
2200	Excavation Diversion Structure	CY	400	$25	$10,000	
2200	Shaft Excavation Near River East	LS	1	$250,000	$250,000	
2200	Backfill & Compaction	CY	1000	$20	$20,000	
2200	Clean Barrels A & B	LS	2	$50,000	$100,000	
2270	Slope Protection & Erosion Control	LS	1	$25,000	$25,000	
2510	Paving	LS	1	$50,000	$50,000	
2600	4" water service East	LS	1	$10,000	$10,000	
2515	21" Odor Control Piping	LF	100	$400	$40,000	
2614	24" DIP Forcemain Pipe Sewer East	LF	400	$350	$140,000	
2700	54" Gravity Sanitary Sewer	LF	120	$1,000	$120,000	
2700	42" Gravity Sanitary Sewer West	LF	100	$750	$75,000	
2700	42" Gravity Sanitary Sewer East	LF	500	$2,500	$1,250,000	
2700	30" gravity Sanitary Sewer West	LF	100	$400	$40,000	
2700	30" Gravity Sanitary Sewer East	LF	700	$2,000	$1,400,000	
2700	30" CIPP with restriction liner	LF	830	$1,000	$830,000	
2700	30" CIPP with restriction liner	LF	830	$1,000	$830,000	
2700	72" Overflow to storage tank	LF	100	$2,000	$200,000	
2700	8" DIP Forcemain from stroage tank	LF	100	$200	$20,000	
2900	Landscaping					
	Seed	AC	7	$5,000	$35,000	
	Trees, Plants, Shrubs	LS	1	$25,000	$25,000	
DIV. 3	Concrete			Estimated DIV Costs:		$760,000
3300	Cast-in-Place Concrete					
	Diversion Structure West	LS	1	$300,000	$300,000	
	Siphon Head Structure West					
	Baseslab	CY	75	$1,000	$75,000	
	Walls	CY	100	$1,000	$100,000	
	Top Stab	CY	75	$1,000	$75,000	
	Interior Walls	CY	50	$1,000	$50,000	
	Wiers	LS	1	$10,000	$10,000	
	Siphon Tail works structure					
	Base slab 10 x 24	CY	10	$1,000	$10,000	

Lift Station L-32 Cost Estimate E River Crossing /Site Piping						
Section	Description	Units	Quantity	Unit Price	Item Cost	Total Division Cost
	Walls	CY	50	$1,000	$50,000	
	Top Stab	CY	10	$1,000	$10,000	
	Concrete thrust blocks-new pipe	CY	80	$1,000	$80,000	
DIV. 4	**Masonry**				**Estimated DIV Costs:**	**$0**
DIV. 5	**Metals**				**Estimated DIV Costs:**	**$75,000**
5500	Metal Fabrications					
	Aluminum Railing	LS	1	$10,000	$10,000	
	Grating	LS	1	$25,000	$25,000	
	Hatches Headworks	EA	2	$10,000	$20,000	
	Hatches Tailworks	EA	2	$10,000	$20,000	
DIV. 6	**Wood and Plastics**				**Estimated DIV Costs:**	**$10,000**
6600	Weirs	LS	1	$10,000	$10,000	
DIV. 7	**Thermal and Moisture Protection**				**Estimated DIV Costs:**	**$2,000**
7210	Insulation below grade	SF	400	$5	$2,000	
DIV. 9	**Finishes**				**Estimated DIV Costs:**	**$80,000**
9880	Concrete Floor Sealer	SF	1,000	$20	$20,000	
9901	Coat Siphn Structure	SF	1200	$50	$60,000	
DIV. 10	**Specialties**				**Estimated DIV Costs:**	**$20,000**
10200	Louvers and Vents	LS	1	$20,000	$20,000	
DIV. 11	**Equipment**				**Estimated DIV Costs:**	**$210,000**
	Sluice Gates Headworks	EA	4	$20,000	$80,000	
	Sluice Gates Tailworks	EA	6	$20,000	$120,000	
	Bubbler System	EA	1	$10,000	$10,000	
DIV. 13	**Speacialty Systems**				**Estimated DIV Costs:**	**$0**
DIV. 14	**Conveying Systems**				**Estimated DIV Costs:**	**$0**
DIV. 15	**Mechanical**				**Estimated DIV Costs:**	**$115,000**
15010	Mechanical General Provisions	LS	1	$50,000	$50,000	
15050	Mechanical Basic Materials & Methods	LS	1	$14,500	$14,500	
15060	Process Piping and Fittings	LS	1	$50,000	$50,000	
DIV. 16	**Electrical**				**Estimated DIV Costs:**	**$20,000**
	General-Wires, Cables, Conduit	LS	1	$10,000	$10,000	
	Lighting, Misc.	LS	1	$10,000	$10,000	

Lift Station L-32 Cost Estimate E River Crossing /Site Piping						
Section	Description	Units	Quantity	Unit Price	Item Cost	Total Division Cost
SUB-TOTAL PROJECT COST						$7,827,000
25% Contingency						$1,956,750
25% Undeveloped Design Details						$1,956,750
Total Construction Cost						$11,740,500

Estimate G Lift Station L-32 West 6 150 HP. 6 Pump Cost Summary		
Section	**Description**	**Total Division Cost**
DIV. 1	General Requirements	$1,303,000
DIV. 2	Site Work and demolition	$350,000
DIV. 3	Concrete	$506,000
DIV. 4	Masonry	$0
DIV. 5	Metals	$80,000
DIV. 6	Wood and Plastics	$50,000
DIV. 7	Thermal and Moisture Protection	$70,000
DIV. 8	Doors and Windows	$55,000
DIV. 9	Finishes	$286,000
DIV. 10	Specialties	$26,000
DIV. 11	Equipment	$1,380,000
DIV. 13	Specialty Systems	$400,000
DIV. 14	Conveying Systems	$100,000
DIV. 15	Mechanical	$761,000
DIV. 16	Electrical	$1,948,000
SUB-TOTAL PROJECT COST		$7,315,000
25%	Contingency	$1,828,750
25%	Undeveloped Design Details	$1,828,750
SUB-TOTAL PROJECT COST		$10,972,500

Estimate H Lift Station L-32 West 200 HP. 6 Pump Cost Summary		
Section	**Description**	**Total Division Cost**
DIV. 1	General Requirements	$1,303,000
DIV. 2	Site Work and Demolition	$350,000
DIV. 3	Concrete	$506,000
DIV. 4	Masonry	$0
DIV. 5	Metals	$80,000
DIV. 6	Wood and Plastics	$50,000
DIV. 7	Thermal and Moisture Protection	$70,000
DIV. 8	Doors and Windows	$55,000
DIV. 9	Finishes	$286,000
DIV. 10	Specialties	$26,000
DIV. 11	Equipment	$1,650,000
DIV. 13	Specialty Systems	$400,000
DIV. 14	Conveying Systems	$100,000
DIV. 15	Mechanical	$757,000
DIV. 16	Electrical	$2,070,000
SUB-TOTAL PROJECT COST		$7,703,000
25%	Contingency	$1,925,750
25%	Undeveloped Design Details	$1,925,750
SUB-TOTAL PROJECT COST		$11,554,500

Estimate I West Side 1.0MG Storage Tank		
Section	**Description**	**Total Division Cost**
DIV. 1	General Requirements	$1,400,000
DIV. 2	Site Work	$596,000
DIV. 3	Concrete	$4,300,000
DIV. 4	Masonry	$0
DIV. 5	Metals	$30,000
DIV. 6	Wood and Plastics	$0
DIV. 7	Thermal and Moisture Protection	$0
DIV. 8	Doors and Windows	$0
DIV. 9	Finishes	$450,000
DIV. 10	Specialties	$0
DIV. 11	Equipment	$670,000
DIV. 13	Specialty Systems	$50,000
DIV. 14	Conveying Systems	$20,000
DIV. 15	Mechanical	$244,000
DIV. 16	Electrical	$300,000
SUB-TOTAL PROJECT COST		$8,060,000
25%	Contingency	$2,015,000
25%	Undeveloped Design Details	$2,015,000
SUB-TOTAL PROJECT COST		$12,090,000

Estimate J Mississippi Lane Lift Station						
Section	Description	Units	Quantity	Unit Price	Item Cost	Total Division Cost
DIV. 1	**General Requirements**				**Estimated DIV Costs:**	**$91,000**
1400	Quality Control	LS	1	$25,000	$25,000	
1500	Mobilization	LS	1	$5,000	$5,000	
1563	Dewatering	LS	1	$50,000	$50,000	
1563	Silt Fence	LF	200	$5	$1,000	
1650	Startup (and Testing)	LS	1	$10,000	$10,000	
DIV. 2	**Site Work**				**Estimated DIV Costs:**	**$78,000**
2100	Site Preparation (Clearing/Grubbing)	LS	1	$0	$0	
2200	Excavation Lift Station	CY	400	$50	$20,000	
2200	Backfill & Compaction or export	CY	400	$20	$8,000	
2510	Paving	LS	1	$50,000	$50,000	
2600	8" Gravity Sanitary Sewer	LF	50	$100	$5,000	
2600	4" DIP Forcemain	LF	50	$80	$4,000	
DIV. 3	**Concrete**				**Estimated DIV Costs:**	**$150,000**
3300	Cast-in-Place Concrete					
	Lift Station Structure	LS	1	$100,000	$100,000	
	Valve Vault Structure	LS	1	$50,000	$50,000	
DIV. 4	**Masonry**				**Estimated DIV Costs:**	**$0**
4200	Masonry					
DIV. 5	**Metals**				**Estimated DIV Costs:**	**$20,000**
5500	Metal Fabrications					
	Hatches	LS	2	$5,000	$10,000	
	Metal Fab Ladders	LS	2	$5,000	$10,000	
DIV. 6	**Wood and Plastics**				**Estimated DIV Costs:**	**$0**
DIV. 7	**Thermal and Moisture Protection**				**Estimated DIV Costs:**	**$0**
DIV. 8	**Doors and Windows**				**Estimated DIV Costs:**	**$0**
DIV. 9	**Finishes**				**Estimated DIV Costs:**	**$0**
DIV. 10	**Specialties**				**Estimated DIV Costs:**	**$0**
DIV. 11	**Equipment**				**Estimated DIV Costs:**	**$16,000**
	Submersible pumps	EA	2	$8,000	$16,000	
DIV. 13	**Speacialty Systems**				**Estimated DIV Costs:**	**$50,000**
13400	Instrumentation and Controls RTU Panel	LS	1	$50,000	$50,000	
DIV. 14	**Conveying Systems**				**Estimated DIV Costs:**	**$0**
DIV. 15	**Mechanical**				**Estimated DIV Costs:**	**$60,000**
15010	Mechanical General Provisions	LS	1	$10,000	$10,000	

15060	Process Piping and Fittings					
	4" DIP	LF	40	$120	$4,800	
	4" base elbows	EA	2	$5,000	$10,000	
	Vent Piping	LS	1	$500	$500	
15100	Valves and Accessories					
	Flange Coupling Daaptor	EA	2	$800	$1,600	
	4" CV	EA	2	$1,200	$2,400	
	4" PV	EA	2	$3,000	$6,000	
15990	Startup (and Testing)	LS	1	$25,000	$25,000	
DIV. 16	**Electrical**			**Estimated DIV Costs:**		**$185,000**
	General-Wires, Cables, Conduit	LS	1	$10,000	$10,000	
	50KW, Generator, pad, Transfer Switch	LS	1	$75,000	$75,000	
	Control Panel	LS	1	$100,000	$100,000	
SUB-TOTAL PROJECT COST						**$650,000**
25% Contingency						**$162,500**
25% Undeveloped Design Details						**$162,500**
Total Construction Cost						**$975,000**

Estimate K L-32 Hydraulic Pump Estimate						
Section	Description	Units	Quantity	Unit Price	Item Cost	Total Division Cost
DIV. 1	**General Requirements**				**Estimated DIV Costs:**	**$40,000**
1400	Quality Control	LS	1	$25,000	$25,000	
1500	Mobilization	LS	1	$5,000	$5,000	
1650	Startup (and Testing) General	LS	1	$10,000	$10,000	
DIV. 2	**Site Work**				**Estimated DIV Costs:**	**$0**
DIV. 3	**Concrete**				**Estimated DIV Costs:**	**$70,000**
3300	Cast-in-Place Concrete					
	Lift Station Structure Walls	CY	60	$1,000	$60,000	
	Small sump pump	LS	2	$5,000	$10,000	
DIV. 4	**Masonry**				**Estimated DIV Costs:**	**$0**
4200	Masonry					
DIV. 5	**Metals**				**Estimated DIV Costs:**	**$70,000**
5500	Metal Fabrications					
	Hatches	LS	2	$5,000	$10,000	
	Metal Fab Ladders	LS	2	$10,000	$20,000	
	Roof Hatches	LS	2	$10,000	$20,000	
	Sluic Gates	LS	2	$10,000	$20,000	
DIV. 6	**Wood and Plastics**					**$0**
DIV. 7	**Thermal and Moisture Protection**					**$0**
DIV. 8	**Doors and Windows**					**$0**
DIV. 9	**Finishes**					**$0**
DIV. 10	**Specialties**					**$0**
DIV. 11	**Equipment**				**Estimated DIV Costs:**	**$600,000**
	Submersible Hydraulic pumps	EA	2	$300,000	$600,000	
DIV. 13	**Speacialty Systems**				**Estimated DIV Costs:**	**$25,000**
13400	Instrumentation and Controls	LS	1	$25,000	$25,000	
	RTU Panel					
DIV. 14	**Conveying Systems**				**Estimated DIV Costs:**	**$0**
DIV. 15	**Mechanical**				**Estimated DIV Costs:**	**$285,000**
15010	Mechanical General Provisions	LS	1	$50,000	$50,000	
15060	20" DIP	LF	160	$500	$80,000	
15060	20" - 90 Bend	LB	1600	$10	$16,000	
15,060	24" x 20" tee	LB	3000	$10	$30,000	
15100	Valves and Accessories					
	Flange Coupling Adaptor	EA	2	$1,800	$3,600	
	20" Check Valves	EA	2	$20,000	$40,000	
	20" Plug vavles	EA	2	$20,000	$40,000	
15990	Startup (and Testing) Supplier	LS	1	$25,000	$25,000	
DIV. 16	**Electrical**				**Estimated DIV Costs:**	**$410,000**
	General-Wires, Cables, Conduit	LS	1	$10,000	$10,000	
	300 HP. Diesel Engine and enclosure	LS	2	$150,000	$300,000	
	Control Panel	LS	1	$100,000	$100,000	
SUB-TOTAL PROJECT COST						**$1,500,000**
25% Contingency						**$375,000**
25% Undeveloped Design Details						**$375,000**
Total Construction Cost						**$2,250,000**

Lift Station L-32 Storage and O&M Summary

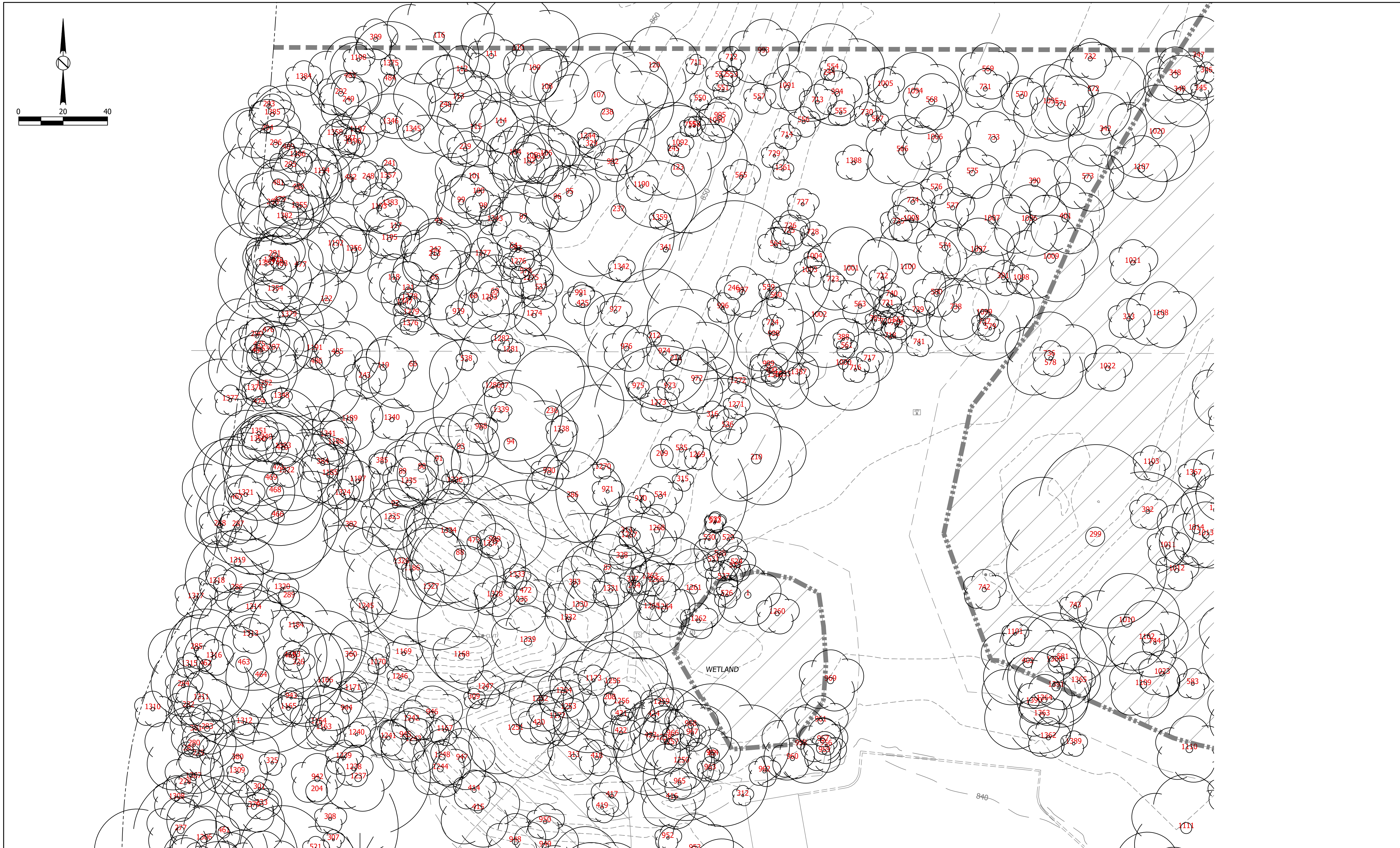
OPTION	WEST SIDE STORAGE at 36 MGD EXISTING PEAK FLOW	Storage Volume MGD	Response Time Minutes	Comment	Construction Estimate	25% Contingency	25% Undeveloped Design Details	Total	Annual O&M
1	Existing Interceptor to Elev. 825	1.4 MG	56 Minutes	Existing Pipes					**$0**
2	Existing Interceptor to Elev. 826	1.97 MG	79 Minutes	Construct Mississippi Ln. LS	$ 650,000.00	$ 162,500.00	$ 162,500.00	$ 975,000.00	**$10,000**
3	Existing Interceptor to Elev. 827	2.29 MG	103 Minutes	Need Additional Survey, assume 2nd LS	$ 650,000.00	$ 162,500.00	$ 162,500.00	$ 975,000.00	**$10,000**
	WEST SIDE STORAGE at 67 MGD ULLTIMATE PEAK FLOW								
4	Existing Interceptor to Elev. 825	1.1 MG	24 Minutes	Existing Pipes					**$0**
5	Existing Interceptor to Elev. 826	1.68 MG	36 Minutes	Construct Mississippi Ln. LS	$ 650,000.00	$ 162,500.00	$ 162,500.00	$ 975,000.00	**$10,000**
6	Existing Interceptor to Elev. 827	2.29 MG	49 Minutes	Need Additional Survey, assume 2nd LS	$ 650,000.00	$ 162,500.00	$ 162,500.00	$ 975,000.00	**$10,000**
	WEST SIDE STORAGE								
7	70 Foot Diameter	1.0 MG	20 Minutes	Gravity In/Pump Out	$ 8,060,000.00	$ 2,015,000.00	$2,015,000	$ 12,090,000.00	
	EAST SIDE PUMPS								
8	Hydraulic pumps.	2 x 12,500 gpm= 25,000 gpm equivalent to 1.5 MG	Continuous	Pump Out	$ 1,500,000.00	$ 375,000.00	$ 375,000.00	$ 2,250,000.00	
	EAST SIDE STORAGE								
9	150 ft. Diameter Alum. Roof	1.5 MG	30 Minutes	Gravity In/Pump Out	$ 14,640,900.00	$ 4,392,270.00	$ 4,758,293.00	$ 23,791,463.00	
10	150 ft. Diameter Buried Conc. Roof	1.5 MG	30 Minutes	Gravity In/Pump Out	$ 22,090,900.00	$ 6,627,270.00	$ 7,179,543.00	$ 35,897,713.00	
	EAST SIDE STORAGE								
11	150 ft. Diameter	3.0 MG	60 Minutes	Gravity In/Pump Out	$ 18,002,550.00	$ 5,400,765.00	$ 5,850,829.00	$ 29,254,144.00	

APPENDIX I – TREE SURVEY

EXISTING TREE SURVEY - EAST SIDE

L32 RIVER CROSSING

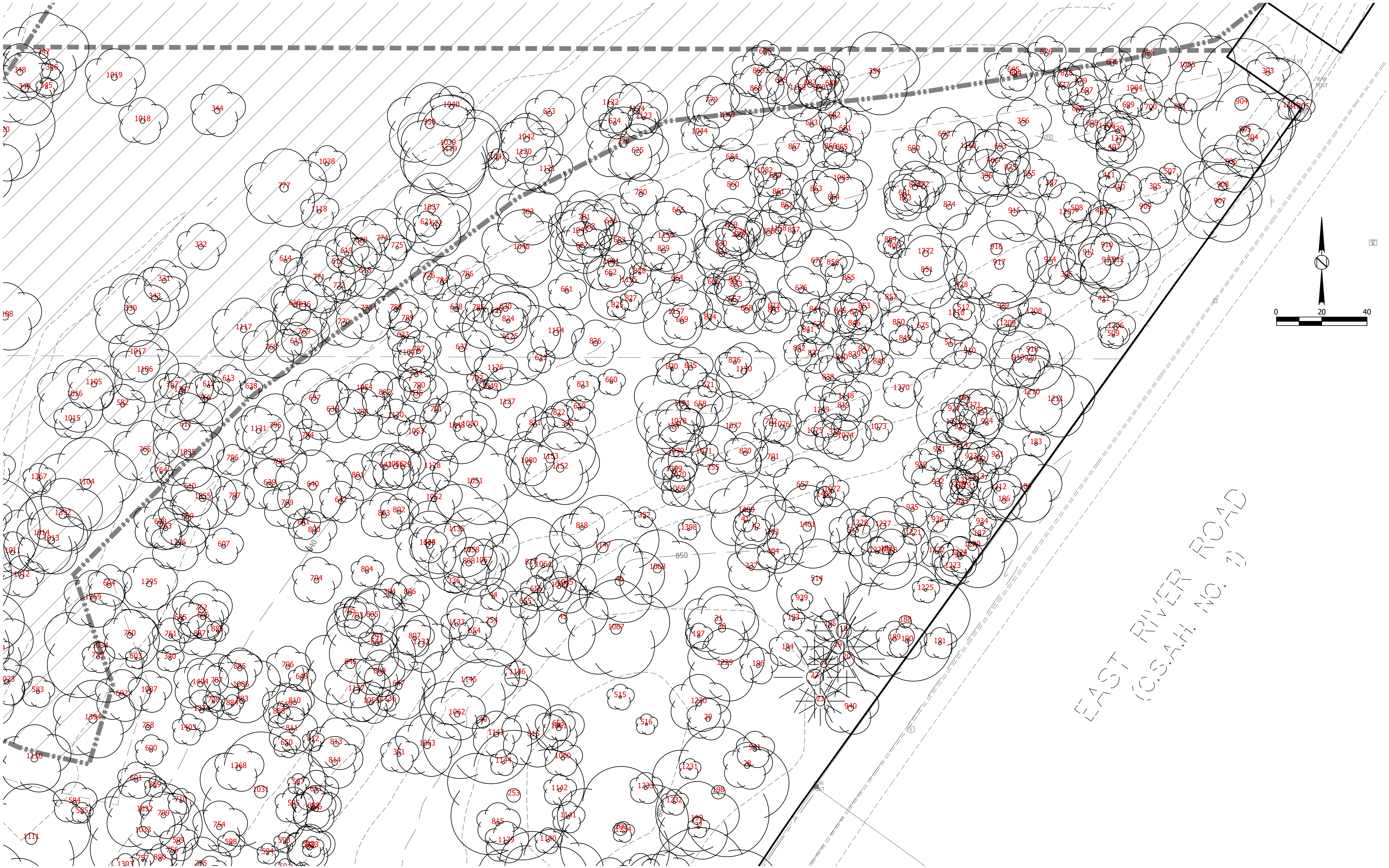
FIGURE T1



EXITING TREE SURVEY - EAST SIDE NW CORNER

L32 RIVER CROSSING

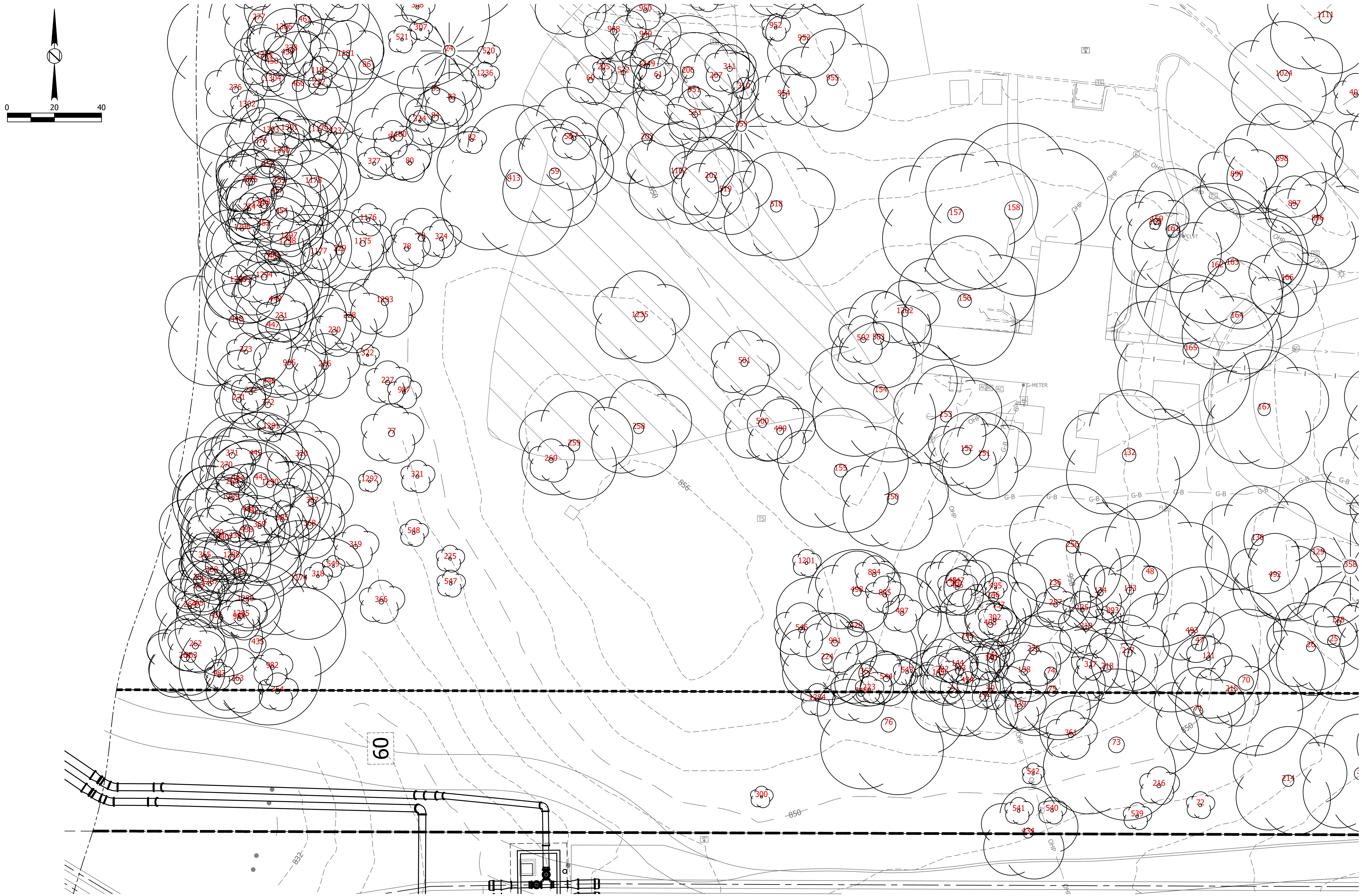
FIGURE T2



EXITING TREE SURVEY - EAST SIDE NE CORNER

L32 RIVER CROSSING

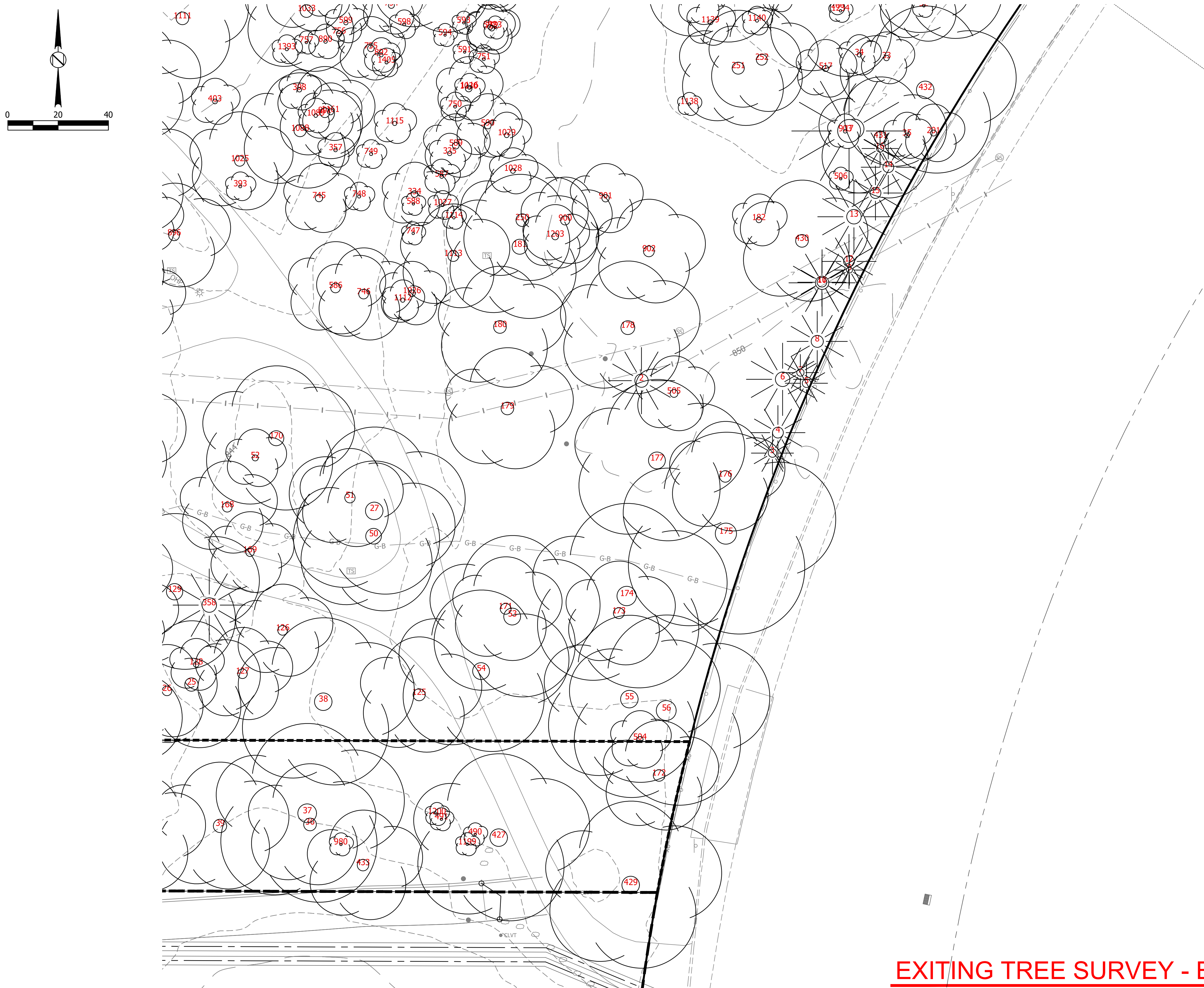
FIGURE T3



EXITING TREE SURVEY - EAST SIDE SW CORNER

L32 RIVER CROSSING

FIGURE T4



EXITING TREE SURVEY - EAST SIDE SE CORNER

L32 RIVER CROSSING

FIGURE T5

Tree Survey Results

ID	Common Name	Species	DBH (inches)	Condition*	Latitude	Longitude
1	Black Walnut	Juglans nigra	12	Good	45.094818790	-93.277102457
2	Norway (red) pine	Pinus resinosa	11	Good	45.094136522	-93.275630877
3	Norway (red) pine	Pinus resinosa	7	Good	45.094057479	-93.275429174
4	Norway (red) pine	Pinus resinosa	9	Good	45.094079838	-93.275420730
5	Norway (red) pine	Pinus resinosa	7	Good	45.094133653	-93.275376761
6	Norway (red) pine	Pinus resinosa	12	Fair	45.094137958	-93.275413565
7	Norway (red) pine	Pinus resinosa	6	Fair	45.094145261	-93.275386149
8	Norway (red) pine	Pinus resinosa	10	Good	45.094179247	-93.275360234
9	Norway (red) pine	Pinus resinosa	5	Poor	45.094257086	-93.275310735
10	Norway (red) pine	Pinus resinosa	11	Good	45.094243158	-93.275352735
11	Norway (red) pine	Pinus resinosa	8	Poor	45.094243817	-93.275352989
12	Norway (red) pine	Pinus resinosa	9	Good	45.094266546	-93.275311327
13	Norway (red) pine	Pinus resinosa	12	Good	45.094315228	-93.275303752
14	Norway (red) pine	Pinus resinosa	9	Fair	45.094369312	-93.275250865
15	Norway (red) pine	Pinus resinosa	9	Poor	45.094341116	-93.275270546
16	Norway (red) pine	Pinus resinosa	6	Poor	45.094389667	-93.275263484
17	Norway (red) pine	Pinus resinosa	19	Good	45.094408783	-93.275311306
18	Norway (red) pine	Pinus resinosa	14	Good	45.094783587	-93.274947445
19	Norway (red) pine	Pinus resinosa	13	Good	45.094764202	-93.274957252
20	Norway (red) pine	Pinus resinosa	14	Good	45.094749381	-93.274942176
21	Norway (red) pine	Pinus resinosa	6	Poor	45.094742967	-93.274981935
22	Norway (red) pine	Pinus resinosa	15	Good	45.094727216	-93.274997168
23	Norway (red) pine	Pinus resinosa	9	Good	45.094698369	-93.274987564
24	Norway (red) pine	Pinus resinosa	10	Poor	45.094492040	-93.277778578
25	Northern red oak	Quercus rubra	22	Good	45.093805040	-93.276323928
26	Northern red oak	Quercus rubra	16	Poor	45.093798180	-93.276361474
27	Northern red oak	Quercus rubra	29	Good	45.093994379	-93.276042413
28	Northern red oak	Quercus rubra	9	Fair	45.094619752	-93.275112728
29	Northern red oak	Quercus rubra	8	Fair	45.094676343	-93.275179433
30	Northern red oak	Quercus rubra	13	Fair	45.094786294	-93.275155749
31	Northern red oak	Quercus rubra	13	Fair	45.094795975	-93.275161797

32	Northern red oak	Quercus rubra	4	Good	45.094545158	-93.275196167
33	Northern red oak	Quercus rubra	9	Good	45.094488329	-93.275253678
34	Northern red oak	Quercus rubra	7	Good	45.094491642	-93.275295564
35	Northern red oak	Quercus rubra	8	Fair	45.094404002	-93.275222004
36	Northern red oak	Quercus rubra	21	Good	45.093652451	-93.276141291
37	Northern red oak	Quercus rubra	31	Fair	45.093664745	-93.276145645
38	Northern red oak	Quercus rubra	29	Fair	45.093786323	-93.276120853
39	Northern red oak	Quercus rubra	22	Fair	45.093650926	-93.276279876
40	Northern red oak	Quercus rubra	24	Good	45.094673358	-93.275564841
41	Northern red oak	Quercus rubra	4	Good	45.094915980	-93.275115912
42	Northern red oak	Quercus rubra	5	Good	45.094907477	-93.275096848
43	Northern red oak	Quercus rubra	1	Fair	45.095278246	-93.277640967
44	Northern red oak	Quercus rubra	5	Poor	45.094824170	-93.275547012
45	Northern red oak	Quercus rubra	16	Fair	45.094797884	-93.275428118
46	Northern red oak	Quercus rubra	16	Fair	45.094843803	-93.275331337
47	Northern pin oak	Quercus ellipsoidalis	28	Fair	45.093803182	-93.276544764
48	Northern pin oak	Quercus ellipsoidalis	27	Poor	45.093883305	-93.276626295
49	Northern pin oak	Quercus ellipsoidalis	7	Fair	45.093747481	-93.276888120
50	Northern pin oak	Quercus ellipsoidalis	26	Fair	45.093966808	-93.276043509
51	Northern pin oak	Quercus ellipsoidalis	17	Poor	45.094008758	-93.276079795
52	Northern pin oak	Quercus ellipsoidalis	10	Good	45.094052151	-93.276225715
53	Northern pin oak	Quercus ellipsoidalis	28	Fair	45.093879207	-93.275829995
54	Northern pin oak	Quercus ellipsoidalis	28	Good	45.093819733	-93.275877849
55	Northern pin oak	Quercus ellipsoidalis	29	Good	45.093789174	-93.275649600
56	Northern pin oak	Quercus ellipsoidalis	33	Good	45.093776730	-93.275592736
57	Northern pin oak	Quercus ellipsoidalis	8	Fair	45.094390432	-93.277573594
58	Northern pin oak	Quercus ellipsoidalis	19	Poor	45.094389711	-93.277583150
59	Northern pin oak	Quercus ellipsoidalis	20	Fair	45.094349259	-93.277604555
60	Northern pin oak	Quercus ellipsoidalis	9	Poor	45.094457896	-93.277546055
61	Northern pin oak	Quercus ellipsoidalis	7	Fair	45.094462046	-93.277434794
62	Northern pin oak	Quercus ellipsoidalis	28	Good	45.094621058	-93.277164889
63	Northern pin oak	Quercus ellipsoidalis	8	Good	45.095244140	-93.277503332
64	Northern pin oak	Quercus ellipsoidalis	14	Good	45.095247122	-93.277510970

65	Northern pin oak	Quercus ellipsoidalis	16	Fair	45.095208341	-93.277648680
66	Northern pin oak	Quercus ellipsoidalis	18	Fair	45.095101301	-93.277686408
67	Northern pin oak	Quercus ellipsoidalis	29	Fair	45.095074642	-93.277526758
68	Northern pin oak	Quercus ellipsoidalis	18	Fair	45.095185567	-93.277580823
69	Northern pin oak	Quercus ellipsoidalis	15	Fair	45.095191204	-93.277543524
70	Northern pin oak	Quercus ellipsoidalis	27	Fair	45.093757027	-93.276468389
71	Northern pin oak	Quercus ellipsoidalis	16	Fair	45.093724184	-93.276546834
72	Northern pin oak	Quercus ellipsoidalis	5	Fair	45.093614131	-93.276543474
73	Northern pin oak	Quercus ellipsoidalis	28	Poor	45.093684364	-93.276681316
74	Northern pin oak	Quercus ellipsoidalis	23	Poor	45.093767516	-93.276789222
75	Northern pin oak	Quercus ellipsoidalis	18	Poor	45.093746788	-93.276786784
76	Northern pin oak	Quercus ellipsoidalis	26	Fair	45.093707718	-93.277055947
77	Northern pin oak	Quercus ellipsoidalis	11	Poor	45.094046614	-93.277873253
78	Northern pin oak	Quercus ellipsoidalis	8	Good	45.094261438	-93.277848029
79	Northern pin oak	Quercus ellipsoidalis	11	Fair	45.094273987	-93.277824560
80	Northern pin oak	Quercus ellipsoidalis	7	Fair	45.094361443	-93.277843386
81	Northern pin oak	Quercus ellipsoidalis	7	Fair	45.094388953	-93.277871827
82	Northern pin oak	Quercus ellipsoidalis	5	Fair	45.094388236	-93.277741230
83	Northern pin oak	Quercus ellipsoidalis	10	Fair	45.094435563	-93.277774130
84	Northern pin oak	Quercus ellipsoidalis	11	Fair	45.094413931	-93.277801428
85	Northern pin oak	Quercus ellipsoidalis	14	Fair	45.094445680	-93.277800465
86	Northern pin oak	Quercus ellipsoidalis	27	Poor	45.094473587	-93.277914420
87	Northern pin oak	Quercus ellipsoidalis	14	Fair	45.094849762	-93.277347217
88	Northern pin oak	Quercus ellipsoidalis	22	Good	45.094868780	-93.277604465
89	Northern pin oak	Quercus ellipsoidalis	13	Good	45.094968847	-93.277704655
90	Northern pin oak	Quercus ellipsoidalis	14	Good	45.094974881	-93.277670799
91	Northern pin oak	Quercus ellipsoidalis	17	Good	45.094984625	-93.277641067
92	Northern pin oak	Quercus ellipsoidalis	10	Good	45.094929244	-93.277717419
93	Northern pin oak	Quercus ellipsoidalis	14	Good	45.094999100	-93.277603076
94	Northern pin oak	Quercus ellipsoidalis	24	Fair	45.095005089	-93.277516500
95	Northern pin oak	Quercus ellipsoidalis	11	Good	45.095314407	-93.277413523
96	Northern pin oak	Quercus ellipsoidalis	13	Good	45.095307797	-93.277434576
97	Northern pin oak	Quercus ellipsoidalis	13	Fair	45.095283265	-93.277494109

98	Northern pin oak	Quercus ellipsoidalis	7	Good	45.095296642	-93.277563600
99	Northern pin oak	Quercus ellipsoidalis	10	Good	45.095303724	-93.277602359
100	Northern pin oak	Quercus ellipsoidalis	11	Good	45.095314959	-93.277572137
101	Northern pin oak	Quercus ellipsoidalis	15	Fair	45.095333336	-93.277579695
102	Northern pin oak	Quercus ellipsoidalis	8	Fair	45.095351784	-93.277483939
103	Northern pin oak	Quercus ellipsoidalis	10	Fair	45.095357696	-93.277467505
104	Northern pin oak	Quercus ellipsoidalis	11	Good	45.095362569	-93.277508123
105	Northern pin oak	Quercus ellipsoidalis	16	Good	45.095358656	-93.277479437
106	Northern pin oak	Quercus ellipsoidalis	12	Good	45.095361500	-93.277454014
107	Northern pin oak	Quercus ellipsoidalis	25	Fair	45.095433098	-93.277362829
108	Northern pin oak	Quercus ellipsoidalis	15	Good	45.095443851	-93.277453167
109	Northern pin oak	Quercus ellipsoidalis	12	Good	45.095466799	-93.277474542
110	Northern pin oak	Quercus ellipsoidalis	22	Fair	45.095491377	-93.277503099
111	Northern pin oak	Quercus ellipsoidalis	9	Good	45.095484102	-93.277549905
112	Northern pin oak	Quercus ellipsoidalis	10	Fair	45.095465327	-93.277601148
113	Northern pin oak	Quercus ellipsoidalis	12	Fair	45.095431723	-93.277607303
114	Northern pin oak	Quercus ellipsoidalis	12	Good	45.095401415	-93.277533121
115	Northern pin oak	Quercus ellipsoidalis	15	Fair	45.095393982	-93.277576708
116	Northern pin oak	Quercus ellipsoidalis	20	Fair	45.095506801	-93.277641032
117	Northern pin oak	Quercus ellipsoidalis	12	Good	45.095272100	-93.277716593
118	Northern pin oak	Quercus ellipsoidalis	10	Good	45.095208221	-93.277720012
119	Northern pin oak	Quercus ellipsoidalis	11	Good	45.095099654	-93.277738310
120	Northern pin oak	Quercus ellipsoidalis	16	Good	45.095469938	-93.277265907
121	Northern pin oak	Quercus ellipsoidalis	11	Fair	45.095195372	-93.277694895
122	Northern pin oak	Quercus ellipsoidalis	11	Fair	45.095181850	-93.277837348
123	Northern pin oak	Quercus ellipsoidalis	25	Fair	45.095344149	-93.277224632
124	Northern pin oak	Quercus ellipsoidalis	11	Fair	45.095028865	-93.275239349
125	Bur oak	Quercus macrocarpa	20	Good	45.093793886	-93.275973269
126	Bur oak	Quercus macrocarpa	16	Fair	45.093864068	-93.276183453
127	Bur oak	Quercus macrocarpa	16	Fair	45.093816871	-93.276245301
128	Bur oak	Quercus macrocarpa	9	Fair	45.093826889	-93.276316669
129	Bur oak	Quercus macrocarpa	27	Good	45.093906192	-93.276349798
130	Bur oak	Quercus macrocarpa	20	Good	45.093923026	-93.276449409

131	Bur oak	Quercus macrocarpa	8	Fair	45.093785180	-93.276529690
132	Bur oak	Quercus macrocarpa	24	Good	45.094021886	-93.276660446
133	Bur oak	Quercus macrocarpa	13	Fair	45.093863855	-93.276658771
134	Bur oak	Quercus macrocarpa	10	Fair	45.093861247	-93.276707692
135	Bur oak	Quercus macrocarpa	7	Fair	45.093841343	-93.276737504
136	Bur oak	Quercus macrocarpa	17	Good	45.093870628	-93.276782466
137	Bur oak	Quercus macrocarpa	13	Fair	45.093844491	-93.276875323
138	Bur oak	Quercus macrocarpa	11	Fair	45.093769089	-93.276832940
139	Bur oak	Quercus macrocarpa	9	Fair	45.093729066	-93.276840303
140	Bur oak	Quercus macrocarpa	8	Good	45.093782832	-93.276887616
141	Bur oak	Quercus macrocarpa	6	Fair	45.093786049	-93.276885751
142	Bur oak	Quercus macrocarpa	16	Good	45.093740482	-93.276898538
143	Bur oak	Quercus macrocarpa	14	Good	45.093770609	-93.276939181
144	Bur oak	Quercus macrocarpa	7	Poor	45.093776810	-93.276942395
145	Bur oak	Quercus macrocarpa	18	Good	45.093808759	-93.276926239
146	Bur oak	Quercus macrocarpa	18	Good	45.093856195	-93.276883688
147	Bur oak	Quercus macrocarpa	12	Fair	45.093872634	-93.276941552
148	Bur oak	Quercus macrocarpa	12	Fair	45.093872818	-93.276954687
149	Bur oak	Quercus macrocarpa	7	Poor	45.093766229	-93.276974121
150	Bur oak	Quercus macrocarpa	19	Good	45.093970388	-93.277049429
151	Bur oak	Quercus macrocarpa	16	Good	45.094020835	-93.276898961
152	Bur oak	Quercus macrocarpa	14	Good	45.094026754	-93.276927534
153	Bur oak	Quercus macrocarpa	19	Fair	45.094066476	-93.276961731
154	Bur oak	Quercus macrocarpa	26	Good	45.094094980	-93.277068766
155	Bur oak	Quercus macrocarpa	23	Poor	45.094003682	-93.277134805
156	Bur oak	Quercus macrocarpa	24	Good	45.094201366	-93.276930861
157	Bur oak	Quercus macrocarpa	28	Good	45.094301221	-93.276945783
158	Bur oak	Quercus macrocarpa	32	Good	45.094306852	-93.276850314
159	Bur oak	Quercus macrocarpa	11	Fair	45.094293736	-93.276614958
160	Bur oak	Quercus macrocarpa	2	Good	45.094290343	-93.276617793
161	Bur oak	Quercus macrocarpa	23	Good	45.094282761	-93.276588523
162	Bur oak	Quercus macrocarpa	31	Good	45.094240418	-93.276516166
163	Bur oak	Quercus macrocarpa	24	Good	45.094243608	-93.276490602

164	Bur oak	Quercus macrocarpa	21	Good	45.094181834	-93.276483285
165	Bur oak	Quercus macrocarpa	28	Good	45.094143763	-93.276559043
166	Bur oak	Quercus macrocarpa	14	Good	45.094225824	-93.276400376
167	Bur oak	Quercus macrocarpa	22	Fair	45.094074895	-93.276438359
168	Bur oak	Quercus macrocarpa	16	Good	45.093998376	-93.276268835
169	Bur oak	Quercus macrocarpa	14	Fair	45.093949276	-93.276233709
170	Bur oak	Quercus macrocarpa	25	Good	45.094073607	-93.276193372
171	Bur oak	Quercus macrocarpa	18	Fair	45.093887584	-93.275840108
172	Bur oak	Quercus macrocarpa	19	Good	45.093705872	-93.275603830
173	Bur oak	Quercus macrocarpa	18	Fair	45.093882857	-93.275665769
174	Bur oak	Quercus macrocarpa	32	Fair	45.093901601	-93.275653664
175	Bur oak	Quercus macrocarpa	35	Poor	45.093969689	-93.275500878
176	Bur oak	Quercus macrocarpa	19	Good	45.094031988	-93.275501770
177	Bur oak	Quercus macrocarpa	28	Good	45.094049443	-93.275607060
178	Bur oak	Quercus macrocarpa	23	Good	45.094194270	-93.275651912
179	Bur oak	Quercus macrocarpa	21	Good	45.094106107	-93.275837382
180	Bur oak	Quercus macrocarpa	21	Good	45.094194969	-93.275848844
181	Bur oak	Quercus macrocarpa	25	Good	45.094282467	-93.275818413
182	Bur oak	Quercus macrocarpa	9	Good	45.094311630	-93.275450163
183	Bur oak	Quercus macrocarpa	5	Poor	45.095009975	-93.274618412
184	Bur oak	Quercus macrocarpa	13	Fair	45.094956216	-93.274636599
185	Bur oak	Quercus macrocarpa	19	Fair	45.095063384	-93.274741643
186	Bur oak	Quercus macrocarpa	8	Fair	45.094940939	-93.274673212
187	Bur oak	Quercus macrocarpa	4	Poor	45.094899303	-93.274714858
188	Bur oak	Quercus macrocarpa	23	Good	45.094794513	-93.274842080
189	Bur oak	Quercus macrocarpa	7	Fair	45.094773306	-93.274860414
190	Bur oak	Quercus macrocarpa	7	Fair	45.094771343	-93.274838838
191	Bur oak	Quercus macrocarpa	6	Poor	45.094768634	-93.274782726
192	Bur oak	Quercus macrocarpa	15	Fair	45.094880835	-93.274874420
193	Bur oak	Quercus macrocarpa	4	Poor	45.094797075	-93.275033342
194	Bur oak	Quercus macrocarpa	7	Poor	45.094761384	-93.275043298
195	Bur oak	Quercus macrocarpa	6	Fair	45.094789410	-93.274970889
196	Bur oak	Quercus macrocarpa	7	Fair	45.094741229	-93.275093596

197	Bur oak	Quercus macrocarpa	5	Fair	45.094777200	-93.275195675
198	Bur oak	Quercus macrocarpa	25	Fair	45.094587930	-93.275161917
199	Bur oak	Quercus macrocarpa	15	Fair	45.094553611	-93.275198510
200	Bur oak	Quercus macrocarpa	24	Good	45.094543400	-93.275329085
201	Bur oak	Quercus macrocarpa	10	Fair	45.094406512	-93.275181257
202	Bur oak	Quercus macrocarpa	15	Fair	45.094344349	-93.277347761
203	Bur oak	Quercus macrocarpa	18	Good	45.094389582	-93.277453092
204	Bur oak	Quercus macrocarpa	41	Poor	45.094577023	-93.277854227
205	Bur oak	Quercus macrocarpa	4	Fair	45.094470936	-93.277524548
206	Bur oak	Quercus macrocarpa	21	Good	45.094466876	-93.277385932
207	Bur oak	Quercus macrocarpa	13	Good	45.094460888	-93.277339563
208	Bur oak	Quercus macrocarpa	23	Fair	45.094690397	-93.277343462
209	Bur oak	Quercus macrocarpa	43	Good	45.094990668	-93.277252553
210	Bur oak	Quercus macrocarpa	18	Fair	45.094986545	-93.277087749
211	Bur oak	Quercus macrocarpa	21	Fair	45.095108782	-93.277227755
212	Bur oak	Quercus macrocarpa	27	Fair	45.095136071	-93.277265732
213	Bur oak	Quercus macrocarpa	13	Fair	45.095237391	-93.277649007
214	Bur oak	Quercus macrocarpa	20	Fair	45.093642647	-93.276398682
215	Bur oak	Quercus macrocarpa	13	Fair	45.093746956	-93.276491700
216	Bur oak	Quercus macrocarpa	7	Good	45.093636864	-93.276611293
217	Bur oak	Quercus macrocarpa	14	Fair	45.093791452	-93.276662098
218	Bur oak	Quercus macrocarpa	13	Fair	45.093773377	-93.276696428
219	Bur oak	Quercus macrocarpa	10	Fair	45.093819898	-93.276731273
220	Bur oak	Quercus macrocarpa	13	Poor	45.093793545	-93.276817802
221	Bur oak	Quercus macrocarpa	16	Fair	45.093744920	-93.276949259
222	Bur oak	Quercus macrocarpa	12	Fair	45.093769659	-93.276967365
223	Bur oak	Quercus macrocarpa	5	Fair	45.093748837	-93.277087762
224	Bur oak	Quercus macrocarpa	17	Fair	45.093784264	-93.277157201
225	Bur oak	Quercus macrocarpa	5	Fair	45.093900982	-93.277776968
226	Bur oak	Quercus macrocarpa	12	Fair	45.094125132	-93.277982933
227	Bur oak	Quercus macrocarpa	8	Good	45.094106038	-93.277879770
228	Bur oak	Quercus macrocarpa	13	Fair	45.094181259	-93.277942150
229	Bur oak	Quercus macrocarpa	15	Poor	45.094259484	-93.277958251

230	Bur oak	Quercus macrocarpa	9	Fair	45.094164618	-93.277967229
231	Bur oak	Quercus macrocarpa	9	Poor	45.094181069	-93.278054485
232	Bur oak	Quercus macrocarpa	4	Poor	45.094453034	-93.277992327
233	Bur oak	Quercus macrocarpa	6	Fair	45.094560119	-93.277950082
234	Bur oak	Quercus macrocarpa	28	Poor	45.094827748	-93.277300608
235	Bur oak	Quercus macrocarpa	12	Fair	45.094810932	-93.277496398
236	Bur oak	Quercus macrocarpa	26	Poor	45.095043516	-93.277444291
237	Bur oak	Quercus macrocarpa	28	Fair	45.095292584	-93.277328055
238	Bur oak	Quercus macrocarpa	24	Fair	45.095412009	-93.277347635
239	Bur oak	Quercus macrocarpa	7	Poor	45.095369319	-93.277595394
240	Bur oak	Quercus macrocarpa	20	Poor	45.095421328	-93.277629864
241	Bur oak	Quercus macrocarpa	28	Fair	45.095348801	-93.277727236
242	Bur oak	Quercus macrocarpa	13	Fair	45.095242645	-93.277647484
243	Bur oak	Quercus macrocarpa	8	Poor	45.095087106	-93.277770629
244	Bur oak	Quercus macrocarpa	20	Fair	45.095460863	-93.276960666
245	Bur oak	Quercus macrocarpa	19	Fair	45.095366828	-93.277232167
246	Bur oak	Quercus macrocarpa	35	Poor	45.095194947	-93.277127487
247	Bur oak	Quercus macrocarpa	19	Fair	45.094774233	-93.275746258
248	Bur oak	Quercus macrocarpa	7	Poor	45.095332935	-93.277764227
249	Bur oak	Quercus macrocarpa	11	Poor	45.095427938	-93.277799228
250	Bur oak	Quercus macrocarpa	21	Good	45.094311438	-93.275814385
251	Bur oak	Quercus macrocarpa	20	Fair	45.094477243	-93.275481946
252	Bur oak	Quercus macrocarpa	18	Fair	45.094486351	-93.275445746
253	Bur oak	Quercus macrocarpa	25	Fair	45.094583958	-93.275512327
254	Bur oak	Quercus macrocarpa	17	Fair	45.094793764	-93.275549720
255	Bur oak	Quercus macrocarpa	17	Good	45.094979248	-93.275170885
256	Sugar maple	Acer saccharum	23	Good	45.093914995	-93.276753298
257	Sugar maple	Acer saccharum	7	Fair	45.093847190	-93.276781217
258	Silver maple	Acer saccharinum	18	Good	45.094052394	-93.277466887
259	Silver maple	Acer saccharinum	20	Fair	45.094032760	-93.277573017
260	Silver maple	Acer saccharinum	8	Fair	45.094015229	-93.277610933
261	Silver maple	Acer saccharinum	14	Poor	45.093785797	-93.278212367
262	Silver maple	Acer saccharinum	10	Poor	45.093799268	-93.278195652

263	Silver maple	Acer saccharinum	12	Fair	45.093759056	-93.278126585
264	Silver maple	Acer saccharinum	5	Fair	45.093844770	-93.278204641
265	Silver maple	Acer saccharinum	8	Fair	45.093846501	-93.278192458
266	Silver maple	Acer saccharinum	12	Fair	45.093876735	-93.278189183
267	Silver maple	Acer saccharinum	10	Fair	45.093866641	-93.278189647
268	Silver maple	Acer saccharinum	12	Fair	45.093885321	-93.278168779
269	Silver maple	Acer saccharinum	6	Fair	45.093988124	-93.278134777
270	Silver maple	Acer saccharinum	10	Fair	45.094007316	-93.278145015
271	Silver maple	Acer saccharinum	9	Good	45.094086056	-93.278124090
272	Silver maple	Acer saccharinum	7	Fair	45.094094336	-93.278104622
273	Silver maple	Acer saccharinum	7	Fair	45.094141549	-93.278112774
274	Silver maple	Acer saccharinum	6	Fair	45.094307649	-93.278107168
275	Silver maple	Acer saccharinum	12	Good	45.094339419	-93.278107575
276	Silver maple	Acer saccharinum	11	Fair	45.094446762	-93.278130226
277	Silver maple	Acer saccharinum	13	Fair	45.094528667	-93.278091485
278	Silver maple	Acer saccharinum	4	Fair	45.094585814	-93.278083757
279	Silver maple	Acer saccharinum	8	Poor	45.094621206	-93.278060312
280	Silver maple	Acer saccharinum	5	Fair	45.094633593	-93.278068050
281	Silver maple	Acer saccharinum	17	Fair	45.094627168	-93.278076926
282	Silver maple	Acer saccharinum	8	Fair	45.094681034	-93.278078059
283	Silver maple	Acer saccharinum	10	Fair	45.094653893	-93.278045099
284	Silver maple	Acer saccharinum	7	Fair	45.094706660	-93.278086549
285	Silver maple	Acer saccharinum	8	Fair	45.094752587	-93.278063706
286	Silver maple	Acer saccharinum	9	Poor	45.094825764	-93.277993281
287	Silver maple	Acer saccharinum	7	Fair	45.094904001	-93.277991489
288	Silver maple	Acer saccharinum	8	Poor	45.094904587	-93.278022988
289	Silver maple	Acer saccharinum	40	Poor	45.094816146	-93.277902735
290	Silver maple	Acer saccharinum	7	Fair	45.095138190	-93.277958548
291	Silver maple	Acer saccharinum	11	Fair	45.095237705	-93.277927312
292	Silver maple	Acer saccharinum	9	Fair	45.095437463	-93.277812032
293	Silver maple	Acer saccharinum	8	Fair	45.095421931	-93.277937492
294	Silver maple	Acer saccharinum	12	Fair	45.095392536	-93.277940360
295	Silver maple	Acer saccharinum	8	Fair	45.095347552	-93.277900267

296	Silver maple	Acer saccharinum	10	Fair	45.095374374	-93.277925735
297	Silver maple	Acer saccharinum	11	Fair	45.095121949	-93.277929319
298	Silver maple	Acer saccharinum	13	Poor	45.095301202	-93.277930795
299	Silver maple	Acer saccharinum	36	Good	45.094890899	-93.276496646
300	Red maple	Acer rubrum	4	Good	45.093623690	-93.277264892
301	Ironwood	Ostrya virginiana	5	Fair	45.094579776	-93.277954174
302	Hackberry	Celtis occidentalis	6	Fair	45.093829977	-93.276881387
303	Hackberry	Celtis occidentalis	8	Good	45.095459629	-93.274221639
304	Hackberry	Celtis occidentalis	6	Fair	45.095379157	-93.274248444
305	Hackberry	Celtis occidentalis	6	Good	45.095319815	-93.274414705
306	Hackberry	Celtis occidentalis	7	Fair	45.095213073	-93.274565981
307	Hackberry	Celtis occidentalis	4	Good	45.094516759	-93.277825216
308	Hackberry	Celtis occidentalis	6	Poor	45.094542701	-93.277830787
309	Hackberry	Celtis occidentalis	4	Poor	45.094691175	-93.277579725
310	Hackberry	Celtis occidentalis	4	Fair	45.094448580	-93.277294091
311	Hackberry	Celtis occidentalis	9	Good	45.094471170	-93.277317314
312	Hackberry	Celtis occidentalis	4	Good	45.094571380	-93.277111129
313	Hackberry	Celtis occidentalis	10	Good	45.094619343	-93.277406102
314	Hackberry	Celtis occidentalis	14	Good	45.094896270	-93.277313850
315	Hackberry	Celtis occidentalis	4	Poor	45.094959548	-93.277216125
316	Hackberry	Celtis occidentalis	6	Fair	45.095039289	-93.277164229
317	Hackberry	Celtis occidentalis	5	Good	45.093775252	-93.276723720
318	Hackberry	Celtis occidentalis	5	Good	45.093880674	-93.277994284
319	Hackberry	Celtis occidentalis	8	Good	45.093915018	-93.277932530
320	Hackberry	Celtis occidentalis	13	Poor	45.094020426	-93.278021341
321	Hackberry	Celtis occidentalis	6	Good	45.093996618	-93.277830741
322	Hackberry	Celtis occidentalis	4	Good	45.094137800	-93.277912521
323	Hackberry	Celtis occidentalis	6	Good	45.094396277	-93.277965882
324	Hackberry	Celtis occidentalis	4	Good	45.094410151	-93.277826655
325	Hackberry	Celtis occidentalis	5	Good	45.094611865	-93.277931865
326	Hackberry	Celtis occidentalis	6	Fair	45.094733637	-93.277886073
327	Hackberry	Celtis occidentalis	5	Fair	45.094835821	-93.277303462
328	Hackberry	Celtis occidentalis	5	Good	45.094865271	-93.277321941

329	Hackberry	Celtis occidentalis	5	Fair	45.095373444	-93.277375218
330	Hackberry	Celtis occidentalis	14	Good	45.095171899	-93.276167683
331	Hackberry	Celtis occidentalis	8	Good	45.095207946	-93.276110509
332	Hackberry	Celtis occidentalis	9	Good	45.095249191	-93.276047736
333	Hackberry	Celtis occidentalis	8	Fair	45.095159661	-93.276438066
334	Hackberry	Celtis occidentalis	11	Good	45.094339873	-93.275980372
335	Hackberry	Celtis occidentalis	7	Good	45.094384106	-93.275926307
336	Hackberry	Celtis occidentalis	4	Fair	45.094841303	-93.275614285
337	Hackberry	Celtis occidentalis	9	Fair	45.094859820	-93.275105444
338	Hackberry	Celtis occidentalis	8	Good	45.095021450	-93.274962197
339	Hackberry	Celtis occidentalis	8	Good	45.095389362	-93.274478507
340	Hackberry	Celtis occidentalis	5	Good	45.094749686	-93.276100494
341	Hackberry	Celtis occidentalis	1	Good	45.095245143	-93.277245458
342	Hackberry	Celtis occidentalis	15	Fair	45.095391526	-93.276479072
343	Hackberry	Celtis occidentalis	12	Fair	45.095186400	-93.276126793
344	Hackberry	Celtis occidentalis	10	Good	45.095413940	-93.276019708
345	Hackberry	Celtis occidentalis	4	Poor	45.095442092	-93.276312174
346	Hackberry	Celtis occidentalis	4	Fair	45.095464240	-93.276302609
347	Hackberry	Celtis occidentalis	16	Good	45.095482588	-93.276316696
348	Hackberry	Celtis occidentalis	11	Fair	45.095460678	-93.276357608
349	Hackberry	Celtis occidentalis	14	Good	45.095440632	-93.276349450
350	Hackberry	Celtis occidentalis	16	Fair	45.095397738	-93.275656243
351	Hackberry	Celtis occidentalis	7	Fair	45.094633669	-93.275708469
352	Hackberry	Celtis occidentalis	4	Fair	45.094921233	-93.275288418
353	Hackberry	Celtis occidentalis	15	Fair	45.094900465	-93.275068732
354	Hackberry	Celtis occidentalis	16	Fair	45.095459294	-93.274894547
355	Hackberry	Celtis occidentalis	9	Fair	45.095335388	-93.274630057
356	Hackberry	Celtis occidentalis	10	Fair	45.095399237	-93.274640389
357	Hackberry	Celtis occidentalis	6	Poor	45.094387918	-93.276102106
358	Balsam fir	Abies balsamea	12	Poor	45.093891716	-93.276296386
359	Balsam fir	Abies balsamea	9	Poor	45.094404327	-93.277298089
360	Red elm, slippery elm	Ulmus rubra	14	Good	45.094742857	-93.277794385
361	Red elm, slippery elm	Ulmus rubra	9	Good	45.093695641	-93.276756053

362	Red elm, slippery elm	Ulmus rubra	12	Good	45.093767210	-93.277092922
363	Red elm, slippery elm	Ulmus rubra	16	Fair	45.093785577	-93.278203048
364	Red elm, slippery elm	Ulmus rubra	7	Good	45.093745955	-93.278060563
365	Red elm, slippery elm	Ulmus rubra	9	Good	45.093902433	-93.278180556
366	Red elm, slippery elm	Ulmus rubra	8	Good	45.093850707	-93.277890016
367	Red elm, slippery elm	Ulmus rubra	14	Fair	45.093966187	-93.278003692
368	Red elm, slippery elm	Ulmus rubra	12	Fair	45.093939365	-93.278007961
369	Red elm, slippery elm	Ulmus rubra	6	Fair	45.093937935	-93.278090261
370	Red elm, slippery elm	Ulmus rubra	11	Fair	45.093928496	-93.278160097
371	Red elm, slippery elm	Ulmus rubra	10	Fair	45.094021165	-93.278135274
372	Red elm, slippery elm	Ulmus rubra	10	Fair	45.094080058	-93.278076444
373	Red elm, slippery elm	Ulmus rubra	15	Fair	45.094222911	-93.278113373
374	Red elm, slippery elm	Ulmus rubra	7	Fair	45.094273209	-93.277791549
375	Red elm, slippery elm	Ulmus rubra	12	Good	45.094339702	-93.278103665
376	Red elm, slippery elm	Ulmus rubra	13	Fair	45.094384782	-93.278088146
377	Red elm, slippery elm	Ulmus rubra	6	Fair	45.094360944	-93.277901811
378	Red elm, slippery elm	Ulmus rubra	10	Fair	45.094492798	-93.278038153
379	Red elm, slippery elm	Ulmus rubra	10	Fair	45.094557601	-93.277963391
380	Red elm, slippery elm	Ulmus rubra	15	Good	45.094616341	-93.277992113
381	Red elm, slippery elm	Ulmus rubra	10	Poor	45.094651909	-93.278064661
382	Red elm, slippery elm	Ulmus rubra	11	Good	45.094903678	-93.277794325
383	Red elm, slippery elm	Ulmus rubra	11	Fair	45.094832131	-93.277404558
384	Red elm, slippery elm	Ulmus rubra	8	Good	45.094981297	-93.277843671
385	Red elm, slippery elm	Ulmus rubra	5	Good	45.094982507	-93.277740347
386	Red elm, slippery elm	Ulmus rubra	18	Good	45.094939939	-93.277408189
387	Red elm, slippery elm	Ulmus rubra	5	Good	45.095379872	-93.277797096
388	Red elm, slippery elm	Ulmus rubra	4	Good	45.095134378	-93.276935919
389	Red elm, slippery elm	Ulmus rubra	4	Good	45.095157540	-93.276879900
390	Red elm, slippery elm	Ulmus rubra	13	Good	45.095327187	-93.276602452
391	Red elm, slippery elm	Ulmus rubra	7	Good	45.095210131	-93.276657036
392	Red elm, slippery elm	Ulmus rubra	7	Good	45.094921791	-93.276404893
393	Red elm, slippery elm	Ulmus rubra	5	Good	45.094348272	-93.276248804
394	Red elm, slippery elm	Ulmus rubra	6	Good	45.094828144	-93.275724635

395	Red elm, slippery elm	Ulmus rubra	10	Good	45.095032483	-93.275420335
396	Red elm, slippery elm	Ulmus rubra	11	Good	45.095332624	-93.274703224
397	Red elm, slippery elm	Ulmus rubra	5	Good	45.095324116	-93.274591847
398	Red elm, slippery elm	Ulmus rubra	7	Good	45.094453481	-93.276157608
399	Red elm, slippery elm	Ulmus rubra	8	Fair	45.095504586	-93.277751372
400	Red elm, slippery elm	Ulmus rubra	4	Fair	45.095093918	-93.277062020
401	Red elm, slippery elm	Ulmus rubra	14	Good	45.095283882	-93.276548438
402	Red elm, slippery elm	Ulmus rubra	18	Good	45.094735183	-93.276614169
403	Red elm, slippery elm	Ulmus rubra	8	Fair	45.094440889	-93.276287752
404	Red elm, slippery elm	Ulmus rubra	6	Fair	45.094877083	-93.275068308
405	Red elm, slippery elm	Ulmus rubra	4	Fair	45.095247708	-93.274861353
406	Red elm, slippery elm	Ulmus rubra	13	Fair	45.095350846	-93.274692571
407	Red elm, slippery elm	Ulmus rubra	7	Fair	45.095367444	-93.274484622
408	American elm	Ulmus americana	9	Fair	45.093823952	-93.276888657
409	American elm	Ulmus americana	5	Fair	45.095289951	-93.274506230
410	American elm	Ulmus americana	8	Poor	45.095318895	-93.274476713
411	American elm	Ulmus americana	4	Poor	45.095333354	-93.274493439
412	American elm	Ulmus americana	5	Poor	45.095183682	-93.274502170
413	American elm	Ulmus americana	28	Fair	45.094340933	-93.277671923
414	American elm	Ulmus americana	8	Fair	45.094577784	-93.277579697
415	American elm	Ulmus americana	15	Fair	45.094554774	-93.277572675
416	American elm	Ulmus americana	12	Good	45.094568008	-93.277234586
417	American elm	Ulmus americana	8	Good	45.094570615	-93.277339460
418	American elm	Ulmus americana	7	Fair	45.094617878	-93.277365858
419	American elm	Ulmus americana	6	Poor	45.094556588	-93.277356553
420	American elm	Ulmus americana	8	Fair	45.094659131	-93.277466613
421	American elm	Ulmus americana	4	Fair	45.094670074	-93.277323101
422	American elm	Ulmus americana	7	Fair	45.094648889	-93.277323640
423	American elm	Ulmus americana	15	Good	45.094643423	-93.277271996
424	American elm	Ulmus americana	8	Fair	45.094669538	-93.277266562
425	American elm	Ulmus americana	8	Fair	45.095176496	-93.277390291
426	American elm	Ulmus americana	11	Fair	45.095481396	-93.274426471
427	Cottonwood	Populus deltoides	29	Poor	45.093638120	-93.275850737

428	Cottonwood	Populus deltoides	29	Good	45.093820232	-93.277109500
429	Cottonwood	Populus deltoides	29	Good	45.093586491	-93.275647429
430	Cottonwood	Populus deltoides	21	Good	45.094288908	-93.275383750
431	Cottonwood	Populus deltoides	21	Good	45.094401454	-93.275262704
432	Cottonwood	Populus deltoides	29	Good	45.094453557	-93.275194064
433	Cottonwood	Populus deltoides	19	Fair	45.093608110	-93.276059654
434	Cottonwood	Populus deltoides	17	Fair	45.093581435	-93.276826461
435	Cottonwood	Populus deltoides	30	Poor	45.093801345	-93.278093428
436	Cottonwood	Populus deltoides	22	Fair	45.093832422	-93.278161653
437	Cottonwood	Populus deltoides	21	Fair	45.093882662	-93.278123326
438	Cottonwood	Populus deltoides	25	Fair	45.093931964	-93.278111549
439	Cottonwood	Populus deltoides	17	Good	45.093925139	-93.278130496
440	Cottonwood	Populus deltoides	23	Poor	45.093923324	-93.278151290
441	Cottonwood	Populus deltoides	26	Fair	45.093955746	-93.278108418
442	Cottonwood	Populus deltoides	27	Fair	45.093954197	-93.278102608
443	Cottonwood	Populus deltoides	25	Poor	45.093992783	-93.278088722
444	Cottonwood	Populus deltoides	25	Poor	45.093992004	-93.278126054
445	Cottonwood	Populus deltoides	16	Poor	45.094021080	-93.278097174
446	Cottonwood	Populus deltoides	19	Fair	45.094105050	-93.278074488
447	Cottonwood	Populus deltoides	25	Fair	45.094170255	-93.278068263
448	Cottonwood	Populus deltoides	26	Fair	45.094177007	-93.278128149
449	Cottonwood	Populus deltoides	15	Good	45.094200476	-93.278064407
450	Cottonwood	Populus deltoides	27	Fair	45.094252090	-93.278069365
451	Cottonwood	Populus deltoides	23	Fair	45.094250620	-93.278065676
452	Cottonwood	Populus deltoides	22	Fair	45.094288789	-93.278083538
453	Cottonwood	Populus deltoides	14	Good	45.094313241	-93.278082572
454	Cottonwood	Populus deltoides	20	Good	45.094302986	-93.278054335
455	Cottonwood	Populus deltoides	23	Good	45.094338344	-93.278058084
456	Cottonwood	Populus deltoides	25	Fair	45.094356992	-93.278076486
457	Cottonwood	Populus deltoides	22	Good	45.094326911	-93.278061656
458	Cottonwood	Populus deltoides	38	Fair	45.094477285	-93.278070231
459	Cottonwood	Populus deltoides	17	Fair	45.094487827	-93.278044543
460	Cottonwood	Populus deltoides	20	Good	45.094451422	-93.278027054

461	Cottonwood	Populus deltoides	22	Good	45.094526167	-93.278016088
462	Cottonwood	Populus deltoides	22	Good	45.094732139	-93.278048535
463	Cottonwood	Populus deltoides	30	Fair	45.094733287	-93.277981411
464	Cottonwood	Populus deltoides	30	Fair	45.094717828	-93.277951496
465	Cottonwood	Populus deltoides	26	Fair	45.094741739	-93.277901000
466	Cottonwood	Populus deltoides	25	Fair	45.094915888	-93.277922241
467	Cottonwood	Populus deltoides	21	Fair	45.094937542	-93.277993780
468	Cottonwood	Populus deltoides	32	Fair	45.094945870	-93.277926875
469	Cottonwood	Populus deltoides	26	Fair	45.094961226	-93.277933926
470	Cottonwood	Populus deltoides	24	Fair	45.094998012	-93.277914680
471	Cottonwood	Populus deltoides	22	Fair	45.094974201	-93.277921345
472	Cottonwood	Populus deltoides	44	Fair	45.094821785	-93.277490261
473	Cottonwood	Populus deltoides	26	Poor	45.094883949	-93.277580122
474	Cottonwood	Populus deltoides	27	Good	45.095054987	-93.277954809
475	Cottonwood	Populus deltoides	11	Fair	45.095125842	-93.277954426
476	Cottonwood	Populus deltoides	20	Fair	45.095143524	-93.277938717
477	Cottonwood	Populus deltoides	19	Fair	45.095223954	-93.277882443
478	Cottonwood	Populus deltoides	24	Good	45.095229071	-93.277923238
479	Cottonwood	Populus deltoides	17	Good	45.095304456	-93.277918530
480	Cottonwood	Populus deltoides	16	Fair	45.095319983	-93.277886417
481	Cottonwood	Populus deltoides	23	Fair	45.095324883	-93.277921421
482	Cottonwood	Populus deltoides	10	Good	45.095331624	-93.277794993
483	Cottonwood	Populus deltoides	16	Poor	45.095457222	-93.277796132
484	Cottonwood	Populus deltoides	23	Fair	45.095453980	-93.277726967
485	Cottonwood	Populus deltoides	9	Fair	45.095116549	-93.277818095
486	Cottonwood	Populus deltoides	23	Good	45.095104953	-93.277855233
487	Cottonwood	Populus deltoides	20	Fair	45.095117641	-93.277957287
488	Cottonwood	Populus deltoides	15	Fair	45.095225180	-93.277915477
489	Cottonwood	Populus deltoides	25	Poor	45.095369179	-93.277903702
490	Wild black cherry	Prunus serotina	4	Poor	45.093641606	-93.275886831
491	Wild black cherry	Prunus serotina	4	Good	45.093658125	-93.275938858
492	Wild black cherry	Prunus serotina	16	Poor	45.093880039	-93.276420833
493	Wild black cherry	Prunus serotina	11	Good	45.093814758	-93.276557131

494	Wild black cherry	Prunus serotina	4	Good	45.093757142	-93.276926052
495	Wild black cherry	Prunus serotina	4	Fair	45.093866714	-93.276879958
496	Wild black cherry	Prunus serotina	7	Good	45.093867330	-93.276943320
497	Wild black cherry	Prunus serotina	7	Poor	45.093837305	-93.277033730
498	Wild black cherry	Prunus serotina	15	Good	45.093862540	-93.277108223
499	Wild black cherry	Prunus serotina	12	Good	45.094049403	-93.277234020
500	Wild black cherry	Prunus serotina	14	Fair	45.094058325	-93.277263385
501	Wild black cherry	Prunus serotina	12	Good	45.094128767	-93.277293057
502	Wild black cherry	Prunus serotina	9	Poor	45.094155599	-93.277097569
503	Wild black cherry	Prunus serotina	18	Good	45.094156361	-93.277072643
504	Wild black cherry	Prunus serotina	10	Poor	45.093745107	-93.275633207
505	Wild black cherry	Prunus serotina	13	Fair	45.094122497	-93.275580792
506	Wild black cherry	Prunus serotina	4	Good	45.094356672	-93.275324104
507	Wild black cherry	Prunus serotina	4	Good	45.095338050	-93.274389292
508	Wild black cherry	Prunus serotina	5	Good	45.095293840	-93.274548313
509	Wild black cherry	Prunus serotina	5	Poor	45.095141424	-93.274486034
510	Wild black cherry	Prunus serotina	6	Fair	45.095120501	-93.274731870
511	Wild black cherry	Prunus serotina	8	Poor	45.095130937	-93.274764559
512	Wild black cherry	Prunus serotina	4	Fair	45.095172768	-93.274742267
513	Wild black cherry	Prunus serotina	9	Good	45.094902746	-93.274931716
514	Wild black cherry	Prunus serotina	16	Fair	45.094844446	-93.274993358
515	Wild black cherry	Prunus serotina	5	Good	45.094703147	-93.275329913
516	Wild black cherry	Prunus serotina	4	Poor	45.094670265	-93.275284943
517	Wild black cherry	Prunus serotina	10	Good	45.094476872	-93.275347554
518	Wild black cherry	Prunus serotina	20	Fair	45.094311127	-93.277240639
519	Wild black cherry	Prunus serotina	16	Poor	45.094328549	-93.277324492
520	Wild black cherry	Prunus serotina	4	Fair	45.094489348	-93.277713601
521	Wild black cherry	Prunus serotina	5	Good	45.094505327	-93.277856047
522	Wild black cherry	Prunus serotina	8	Fair	45.094467028	-93.277492319
523	Wild black cherry	Prunus serotina	10	Poor	45.094417783	-93.277374568
524	Wild black cherry	Prunus serotina	7	Poor	45.094857398	-93.277122338
525	Wild black cherry	Prunus serotina	5	Poor	45.094852604	-93.277124325
526	Wild black cherry	Prunus serotina	5	Poor	45.094818302	-93.277138860

527	Wild black cherry	Prunus serotina	7	Fair	45.094839156	-93.277144667
528	Wild black cherry	Prunus serotina	10	Fair	45.094867977	-93.277151053
529	Wild black cherry	Prunus serotina	5	Poor	45.094887417	-93.277136587
530	Wild black cherry	Prunus serotina	4	Fair	45.094887340	-93.277169819
531	Wild black cherry	Prunus serotina	4	Fair	45.094860571	-93.277162521
532	Wild black cherry	Prunus serotina	4	Fair	45.094907754	-93.277160396
533	Wild black cherry	Prunus serotina	4	Poor	45.094909413	-93.277158969
534	Wild black cherry	Prunus serotina	8	Poor	45.094940242	-93.277254759
535	Wild black cherry	Prunus serotina	8	Fair	45.094997841	-93.277218210
536	Wild black cherry	Prunus serotina	7	Poor	45.095026471	-93.277137548
537	Wild black cherry	Prunus serotina	8	Poor	45.095196494	-93.277463486
538	Wild black cherry	Prunus serotina	4	Fair	45.095108117	-93.277593363
539	Wild black cherry	Prunus serotina	5	Fair	45.093601288	-93.276647237
540	Wild black cherry	Prunus serotina	5	Good	45.093607898	-93.276787072
541	Wild black cherry	Prunus serotina	5	Good	45.093607474	-93.276842022
542	Wild black cherry	Prunus serotina	4	Good	45.093650579	-93.276818178
543	Wild black cherry	Prunus serotina	5	Good	45.093768835	-93.277025524
544	Wild black cherry	Prunus serotina	10	Fair	45.093761146	-93.277059693
545	Wild black cherry	Prunus serotina	11	Fair	45.093744456	-93.277101117
546	Wild black cherry	Prunus serotina	10	Fair	45.093818186	-93.277198870
547	Wild black cherry	Prunus serotina	5	Good	45.093871898	-93.277775852
548	Wild black cherry	Prunus serotina	5	Good	45.093930931	-93.277836726
549	Wild black cherry	Prunus serotina	4	Good	45.093892023	-93.277969055
550	Wild black cherry	Prunus serotina	4	Good	45.095429569	-93.277185602
551	Wild black cherry	Prunus serotina	4	Good	45.095442010	-93.277145777
552	Wild black cherry	Prunus serotina	6	Good	45.095458583	-93.277149351
553	Wild black cherry	Prunus serotina	4	Fair	45.095458746	-93.277130377
554	Wild black cherry	Prunus serotina	5	Fair	45.095468256	-93.276954305
555	Wild black cherry	Prunus serotina	5	Poor	45.095413629	-93.276940422
556	Wild black cherry	Prunus serotina	6	Fair	45.095402615	-93.277005273
557	Wild black cherry	Prunus serotina	6	Fair	45.095431081	-93.277082493
558	Wild black cherry	Prunus serotina	4	Fair	45.095397309	-93.277195719
559	Wild black cherry	Prunus serotina	4	Fair	45.095195833	-93.277065921

560	Wild black cherry	Prunus serotina	4	Good	45.095186289	-93.277053273
561	Wild black cherry	Prunus serotina	4	Fair	45.095124210	-93.276929917
562	Wild black cherry	Prunus serotina	7	Poor	45.095155935	-93.276839641
563	Wild black cherry	Prunus serotina	7	Fair	45.095175127	-93.276906799
564	Wild black cherry	Prunus serotina	7	Good	45.095249783	-93.277053694
565	Wild black cherry	Prunus serotina	7	Good	45.095334500	-93.277114024
566	Wild black cherry	Prunus serotina	14	Good	45.095366689	-93.276833053
567	Wild black cherry	Prunus serotina	4	Good	45.095403659	-93.276876214
568	Wild black cherry	Prunus serotina	11	Fair	45.095427459	-93.276782027
569	Wild black cherry	Prunus serotina	11	Fair	45.095465560	-93.276683834
570	Wild black cherry	Prunus serotina	8	Fair	45.095434192	-93.276624885
571	Wild black cherry	Prunus serotina	12	Fair	45.095422749	-93.276556413
572	Wild black cherry	Prunus serotina	19	Fair	45.095441123	-93.276500225
573	Wild black cherry	Prunus serotina	13	Poor	45.095333175	-93.276509581
574	Wild black cherry	Prunus serotina	11	Fair	45.095247315	-93.276758703
575	Wild black cherry	Prunus serotina	10	Fair	45.095339613	-93.276710975
576	Wild black cherry	Prunus serotina	6	Fair	45.095319769	-93.276773804
577	Wild black cherry	Prunus serotina	8	Good	45.095296748	-93.276745397
578	Wild black cherry	Prunus serotina	7	Fair	45.095110796	-93.276574258
579	Wild black cherry	Prunus serotina	5	Fair	45.095147626	-93.276679761
580	Wild black cherry	Prunus serotina	9	Fair	45.095190206	-93.276773569
581	Wild black cherry	Prunus serotina	6	Fair	45.094740126	-93.276553045
582	Wild black cherry	Prunus serotina	8	Good	45.095057386	-93.276181693
583	Wild black cherry	Prunus serotina	6	Fair	45.094709458	-93.276326543
584	Wild black cherry	Prunus serotina	8	Good	45.094574905	-93.276263793
585	Wild black cherry	Prunus serotina	4	Good	45.094562935	-93.276250801
586	Wild black cherry	Prunus serotina	16	Fair	45.094237472	-93.276102065
587	Wild black cherry	Prunus serotina	6	Good	45.094359015	-93.275938618
588	Wild black cherry	Prunus serotina	4	Fair	45.094329179	-93.275982274
589	Wild black cherry	Prunus serotina	11	Fair	45.094392652	-93.275916880
590	Wild black cherry	Prunus serotina	11	Fair	45.094414598	-93.275867638
591	Wild black cherry	Prunus serotina	4	Good	45.094494778	-93.275903225
592	Wild black cherry	Prunus serotina	8	Fair	45.094521781	-93.275863841

593	Wild black cherry	Prunus serotina	4	Good	45.094526670	-93.275904622
594	Wild black cherry	Prunus serotina	4	Fair	45.094513283	-93.275933397
595	Wild black cherry	Prunus serotina	7	Fair	45.094571960	-93.275888931
596	Wild black cherry	Prunus serotina	9	Fair	45.094567451	-93.275850849
597	Wild black cherry	Prunus serotina	4	Good	45.094597778	-93.275881005
598	Wild black cherry	Prunus serotina	5	Fair	45.094524923	-93.275996388
599	Wild black cherry	Prunus serotina	7	Fair	45.094526729	-93.276086114
600	Wild black cherry	Prunus serotina	6	Fair	45.094638455	-93.276132833
601	Wild black cherry	Prunus serotina	7	Fair	45.094602243	-93.276158323
602	Wild black cherry	Prunus serotina	10	Fair	45.094704866	-93.276182735
603	Wild black cherry	Prunus serotina	4	Fair	45.094750128	-93.276158725
604	Wild black cherry	Prunus serotina	8	Good	45.094838494	-93.276204574
605	Wild black cherry	Prunus serotina	9	Fair	45.094797073	-93.276082079
606	Wild black cherry	Prunus serotina	9	Good	45.094800038	-93.276043725
607	Wild black cherry	Prunus serotina	7	Fair	45.094885893	-93.276008743
608	Wild black cherry	Prunus serotina	10	Good	45.094913051	-93.276117083
609	Wild black cherry	Prunus serotina	11	Fair	45.094919571	-93.276070445
610	Wild black cherry	Prunus serotina	11	Good	45.094956340	-93.276066258
611	Wild black cherry	Prunus serotina	13	Good	45.095031334	-93.276073396
612	Wild black cherry	Prunus serotina	5	Poor	45.095080279	-93.276034444
613	Wild black cherry	Prunus serotina	6	Fair	45.095087094	-93.276000395
614	Wild black cherry	Prunus serotina	6	Fair	45.095232236	-93.275902882
615	Wild black cherry	Prunus serotina	8	Poor	45.095132345	-93.275884725
616	Wild black cherry	Prunus serotina	8	Good	45.095178499	-93.275886884
617	Wild black cherry	Prunus serotina	14	Fair	45.095228825	-93.275813665
618	Wild black cherry	Prunus serotina	10	Fair	45.095217914	-93.275766559
619	Wild black cherry	Prunus serotina	8	Poor	45.095241491	-93.275798328
620	Wild black cherry	Prunus serotina	10	Poor	45.095254363	-93.275773138
621	Wild black cherry	Prunus serotina	5	Poor	45.095276833	-93.275661744
622	Wild black cherry	Prunus serotina	12	Fair	45.095274631	-93.275644653
623	Wild black cherry	Prunus serotina	9	Fair	45.095410580	-93.275451458
624	Wild black cherry	Prunus serotina	6	Fair	45.095398776	-93.275339415
625	Wild black cherry	Prunus serotina	11	Fair	45.095363461	-93.275300355

626	Wild black cherry	Prunus serotina	11	Good	45.095277837	-93.275345368
627	Wild black cherry	Prunus serotina	10	Good	45.095248278	-93.275395534
628	Wild black cherry	Prunus serotina	9	Fair	45.095173760	-93.275610323
629	Wild black cherry	Prunus serotina	15	Fair	45.095169149	-93.275541505
630	Wild black cherry	Prunus serotina	9	Good	45.095173935	-93.275526147
631	Wild black cherry	Prunus serotina	5	Fair	45.095112110	-93.275465744
632	Wild black cherry	Prunus serotina	10	Fair	45.095125256	-93.275601031
633	Wild black cherry	Prunus serotina	6	Fair	45.095139713	-93.275701868
634	Wild black cherry	Prunus serotina	7	Good	45.095093788	-93.275678826
635	Wild black cherry	Prunus serotina	11	Fair	45.095069234	-93.275678405
636	Wild black cherry	Prunus serotina	12	Fair	45.095049482	-93.275822436
637	Wild black cherry	Prunus serotina	12	Fair	45.095063068	-93.275853037
638	Wild black cherry	Prunus serotina	4	Fair	45.095077340	-93.275961445
639	Wild black cherry	Prunus serotina	10	Fair	45.094960567	-93.275929760
640	Wild black cherry	Prunus serotina	14	Poor	45.094958681	-93.275856246
641	Wild black cherry	Prunus serotina	6	Fair	45.094912927	-93.275871860
642	Wild black cherry	Prunus serotina	8	Fair	45.094939761	-93.275808158
643	Wild black cherry	Prunus serotina	9	Good	45.094981921	-93.275731550
644	Wild black cherry	Prunus serotina	7	Fair	45.094767776	-93.275746097
645	Wild black cherry	Prunus serotina	13	Good	45.094887668	-93.275656271
646	Wild black cherry	Prunus serotina	17	Good	45.094743339	-93.275791653
647	Wild black cherry	Prunus serotina	13	Fair	45.094716751	-93.275709264
648	Wild black cherry	Prunus serotina	5	Fair	45.094725446	-93.275875077
649	Wild black cherry	Prunus serotina	9	Good	45.094691604	-93.275901774
650	Wild black cherry	Prunus serotina	5	Poor	45.094645342	-93.275900897
651	Wild black cherry	Prunus serotina	8	Poor	45.094589177	-93.275850244
652	Wild black cherry	Prunus serotina	8	Fair	45.094568546	-93.275854980
653	Wild black cherry	Prunus serotina	6	Poor	45.094668924	-93.275435898
654	Wild black cherry	Prunus serotina	6	Good	45.094780839	-93.275579249
655	Wild black cherry	Prunus serotina	6	Fair	45.094816878	-93.275492073
656	Wild black cherry	Prunus serotina	6	Poor	45.094831620	-93.275473564
657	Wild black cherry	Prunus serotina	11	Fair	45.094958366	-93.275017946
658	Wild black cherry	Prunus serotina	8	Good	45.095055876	-93.275192918

659	Wild black cherry	Prunus serotina	5	Good	45.095053007	-93.275399453
660	Wild black cherry	Prunus serotina	5	Fair	45.095085030	-93.275345064
661	Wild black cherry	Prunus serotina	7	Fair	45.095195184	-93.275421429
662	Wild black cherry	Prunus serotina	5	Fair	45.095215442	-93.275346235
663	Wild black cherry	Prunus serotina	8	Good	45.095254525	-93.275331099
664	Wild black cherry	Prunus serotina	10	Good	45.095208745	-93.275232695
665	Wild black cherry	Prunus serotina	9	Poor	45.095290977	-93.275230354
666	Wild black cherry	Prunus serotina	4	Fair	45.095204083	-93.275170063
667	Wild black cherry	Prunus serotina	11	Fair	45.095182747	-93.275134069
668	Wild black cherry	Prunus serotina	9	Fair	45.095171873	-93.275113656
669	Wild black cherry	Prunus serotina	7	Fair	45.095158394	-93.275224080
670	Wild black cherry	Prunus serotina	6	Fair	45.095101126	-93.275241658
671	Wild black cherry	Prunus serotina	4	Good	45.095079139	-93.275179379
672	Wild black cherry	Prunus serotina	7	Good	45.095152316	-93.274989797
673	Wild black cherry	Prunus serotina	6	Good	45.095174822	-93.275067166
674	Wild black cherry	Prunus serotina	8	Good	45.095167667	-93.274926915
675	Wild black cherry	Prunus serotina	6	Good	45.095150911	-93.274811949
676	Wild black cherry	Prunus serotina	9	Good	45.095196726	-93.275020454
677	Wild black cherry	Prunus serotina	13	Good	45.095229751	-93.274993527
678	Wild black cherry	Prunus serotina	7	Fair	45.095263887	-93.275124056
679	Wild black cherry	Prunus serotina	9	Good	45.095261169	-93.275125953
680	Wild black cherry	Prunus serotina	8	Good	45.095333198	-93.275064571
681	Wild black cherry	Prunus serotina	9	Good	45.095390393	-93.274944886
682	Wild black cherry	Prunus serotina	6	Fair	45.095406144	-93.274963156
683	Wild black cherry	Prunus serotina	7	Fair	45.095396777	-93.275002233
684	Wild black cherry	Prunus serotina	8	Fair	45.095355563	-93.275138468
685	Wild black cherry	Prunus serotina	9	Good	45.095448464	-93.275054709
686	Wild black cherry	Prunus serotina	5	Fair	45.095483460	-93.275082029
687	Wild black cherry	Prunus serotina	9	Good	45.095445421	-93.275004920
688	Wild black cherry	Prunus serotina	6	Fair	45.095444806	-93.274968640
689	Wild black cherry	Prunus serotina	7	Fair	45.095462038	-93.274979829
690	Wild black cherry	Prunus serotina	8	Good	45.095365974	-93.274827560
691	Wild black cherry	Prunus serotina	8	Fair	45.095311963	-93.274843484

692	Wild black cherry	Prunus serotina	11	Poor	45.095383420	-93.274775526
693	Wild black cherry	Prunus serotina	10	Poor	45.095368393	-93.274679497
694	Wild black cherry	Prunus serotina	6	Fair	45.095456870	-93.274653631
695	Wild black cherry	Prunus serotina	11	Fair	45.095461115	-93.274657023
696	Wild black cherry	Prunus serotina	7	Good	45.095470691	-93.274488200
697	Wild black cherry	Prunus serotina	7	Fair	45.095435837	-93.274531200
698	Wild black cherry	Prunus serotina	7	Fair	45.095396611	-93.274522488
699	Wild black cherry	Prunus serotina	5	Fair	45.095418665	-93.274460420
700	Wild black cherry	Prunus serotina	4	Fair	45.095416147	-93.274421830
701	Wild black cherry	Prunus serotina	7	Poor	45.094992055	-93.275068274
702	Wild black cherry	Prunus serotina	7	Poor	45.095034493	-93.275071652
703	Wild black cherry	Prunus serotina	8	Poor	45.094799738	-93.275780346
704	Wild black cherry	Prunus serotina	9	Fair	45.094844466	-93.275849865
705	Wild black cherry	Prunus serotina	6	Fair	45.094805472	-93.275792710
706	Wild black cherry	Prunus serotina	8	Fair	45.094739727	-93.275898877
707	Wild black cherry	Prunus serotina	11	Fair	45.094720891	-93.276020772
708	Wild black cherry	Prunus serotina	4	Fair	45.094697185	-93.276025980
709	Wild black cherry	Prunus serotina	9	Fair	45.094559714	-93.276111508
710	Wild black cherry	Prunus serotina	5	Fair	45.094576691	-93.276081611
711	Wild black cherry	Prunus serotina	4	Poor	45.095473557	-93.277193007
712	Wild black cherry	Prunus serotina	5	Poor	45.095480092	-93.277130903
713	Wild black cherry	Prunus serotina	7	Fair	45.095427262	-93.276981095
714	Wild black cherry	Prunus serotina	5	Poor	45.095384270	-93.277034141
715	Wild black cherry	Prunus serotina	4	Fair	45.095396404	-93.277203355
716	Wild black cherry	Prunus serotina	5	Fair	45.095096854	-93.276914838
717	Wild black cherry	Prunus serotina	5	Poor	45.095108809	-93.276890269
718	Wild black cherry	Prunus serotina	6	Poor	45.095136328	-93.276854144
719	Wild black cherry	Prunus serotina	5	Poor	45.095152162	-93.276842469
720	Wild black cherry	Prunus serotina	5	Poor	45.095153785	-93.276862463
721	Wild black cherry	Prunus serotina	5	Poor	45.095176626	-93.276858478
722	Wild black cherry	Prunus serotina	5	Poor	45.095209785	-93.276868150
723	Wild black cherry	Prunus serotina	4	Poor	45.095206221	-93.276953819
724	Wild black cherry	Prunus serotina	4	Poor	45.095152374	-93.277059133

725	Wild black cherry	Prunus serotina	7	Fair	45.095266139	-93.277030733
726	Wild black cherry	Prunus serotina	7	Fair	45.095271779	-93.277028052
727	Wild black cherry	Prunus serotina	6	Poor	45.095301151	-93.277006854
728	Wild black cherry	Prunus serotina	5	Fair	45.095264157	-93.276988856
729	Wild black cherry	Prunus serotina	5	Poor	45.095360953	-93.277056227
730	Wild black cherry	Prunus serotina	5	Fair	45.095411739	-93.276894544
731	Wild black cherry	Prunus serotina	8	Fair	45.095443390	-93.276688378
732	Wild black cherry	Prunus serotina	8	Good	45.095480574	-93.276505447
733	Wild black cherry	Prunus serotina	11	Fair	45.095381143	-93.276673609
734	Wild black cherry	Prunus serotina	8	Fair	45.095303562	-93.276814806
735	Wild black cherry	Prunus serotina	7	Fair	45.095277446	-93.276839892
736	Wild black cherry	Prunus serotina	17	Fair	45.095114604	-93.276576846
737	Wild black cherry	Prunus serotina	5	Poor	45.095153615	-93.276689488
738	Wild black cherry	Prunus serotina	12	Fair	45.095171807	-93.276739841
739	Wild black cherry	Prunus serotina	6	Fair	45.095168336	-93.276805552
740	Wild black cherry	Prunus serotina	5	Poor	45.095188101	-93.276851579
741	Wild black cherry	Prunus serotina	5	Poor	45.095128674	-93.276804030
742	Wild black cherry	Prunus serotina	8	Good	45.094825492	-93.276690227
743	Wild black cherry	Prunus serotina	6	Poor	45.094804017	-93.276531396
744	Wild black cherry	Prunus serotina	5	Fair	45.094759513	-93.276392492
745	Wild black cherry	Prunus serotina	12	Fair	45.094335446	-93.276127572
746	Wild black cherry	Prunus serotina	16	Fair	45.094230792	-93.276058823
747	Wild black cherry	Prunus serotina	4	Poor	45.094296966	-93.275982464
748	Wild black cherry	Prunus serotina	5	Poor	45.094337159	-93.276065685
749	Wild black cherry	Prunus serotina	5	Poor	45.094383438	-93.276047305
750	Wild black cherry	Prunus serotina	5	Poor	45.094435222	-93.275918008
751	Wild black cherry	Prunus serotina	5	Fair	45.094486968	-93.275873801
752	Wild black cherry	Prunus serotina	9	Good	45.094520730	-93.275861426
753	Wild black cherry	Prunus serotina	4	Poor	45.094521507	-93.275856261
754	Wild black cherry	Prunus serotina	10	Poor	45.094545651	-93.276016049
755	Wild black cherry	Prunus serotina	11	Fair	45.094498702	-93.276047611
756	Wild black cherry	Prunus serotina	1	Fair	45.094515045	-93.276096407
757	Wild black cherry	Prunus serotina	4	Fair	45.094505154	-93.276147007

758	Wild black cherry	Prunus serotina	1	Fair	45.094666228	-93.276138002
759	Wild black cherry	Prunus serotina	6	Fair	45.094751474	-93.276223691
760	Wild black cherry	Prunus serotina	10	Fair	45.094777920	-93.276169424
761	Wild black cherry	Prunus serotina	7	Poor	45.094776968	-93.276099193
762	Wild black cherry	Prunus serotina	11	Fair	45.094808874	-93.276046914
763	Wild black cherry	Prunus serotina	8	Poor	45.094907535	-93.276107895
764	Wild black cherry	Prunus serotina	4	Fair	45.094975295	-93.276115717
765	Wild black cherry	Prunus serotina	12	Poor	45.095000800	-93.276143254
766	Wild black cherry	Prunus serotina	10	Fair	45.095063386	-93.276040603
767	Wild black cherry	Prunus serotina	5	Poor	45.095079634	-93.276096464
768	Wild black cherry	Prunus serotina	11	Fair	45.095124719	-93.275927178
769	Wild black cherry	Prunus serotina	9	Fair	45.095143752	-93.275870923
770	Wild black cherry	Prunus serotina	9	Fair	45.095155647	-93.275803219
771	Wild black cherry	Prunus serotina	13	Fair	45.095209585	-93.275845814
772	Wild black cherry	Prunus serotina	6	Poor	45.095199493	-93.275811271
773	Wild black cherry	Prunus serotina	12	Fair	45.095172221	-93.275764633
774	Wild black cherry	Prunus serotina	12	Fair	45.095256990	-93.275737666
775	Wild black cherry	Prunus serotina	5	Poor	45.095248117	-93.275711651
776	Wild black cherry	Prunus serotina	7	Fair	45.095211414	-93.275657221
777	Wild black cherry	Prunus serotina	15	Good	45.095320531	-93.275905188
778	Wild black cherry	Prunus serotina	14	Fair	45.095374422	-93.275324669
779	Wild black cherry	Prunus serotina	10	Fair	45.095424476	-93.275173597
780	Wild black cherry	Prunus serotina	8	Fair	45.095312576	-93.275294626
781	Wild black cherry	Prunus serotina	11	Fair	45.095282226	-93.275391652
782	Wild black cherry	Prunus serotina	11	Fair	45.095271195	-93.275383378
783	Wild black cherry	Prunus serotina	12	Fair	45.095288902	-93.275488184
784	Wild black cherry	Prunus serotina	7	Fair	45.095205612	-93.275635154
785	Wild black cherry	Prunus serotina	5	Fair	45.095173237	-93.275572621
786	Wild black cherry	Prunus serotina	8	Fair	45.095213238	-93.275591547
787	Wild black cherry	Prunus serotina	8	Fair	45.095122361	-93.275675075
788	Wild black cherry	Prunus serotina	8	Fair	45.095173036	-93.275713646
789	Wild black cherry	Prunus serotina	7	Fair	45.095159858	-93.275693869
790	Wild black cherry	Prunus serotina	6	Fair	45.095078612	-93.275674242

791	Wild black cherry	Prunus serotina	5	Fair	45.095049677	-93.275644860
792	Wild black cherry	Prunus serotina	4	Fair	45.095087003	-93.275575075
793	Wild black cherry	Prunus serotina	10	Fair	45.095046055	-93.275771093
794	Wild black cherry	Prunus serotina	7	Fair	45.095018065	-93.275864625
795	Wild black cherry	Prunus serotina	13	Fair	45.095029878	-93.275920243
796	Wild black cherry	Prunus serotina	6	Fair	45.094990669	-93.275993518
797	Wild black cherry	Prunus serotina	7	Poor	45.094944610	-93.275990168
798	Wild black cherry	Prunus serotina	10	Fair	45.094985910	-93.275914454
799	Wild black cherry	Prunus serotina	9	Fair	45.094936048	-93.275899947
800	Wild black cherry	Prunus serotina	8	Fair	45.094903241	-93.275853513
801	Wild black cherry	Prunus serotina	9	Poor	45.094969823	-93.275778822
802	Wild black cherry	Prunus serotina	7	Fair	45.094927505	-93.275708370
803	Wild black cherry	Prunus serotina	9	Poor	45.094923368	-93.275734377
804	Wild black cherry	Prunus serotina	6	Poor	45.094855400	-93.275763372
805	Wild black cherry	Prunus serotina	11	Fair	45.094800419	-93.275754513
806	Wild black cherry	Prunus serotina	7	Fair	45.094828421	-93.275690054
807	Wild black cherry	Prunus serotina	7	Fair	45.094774442	-93.275681815
808	Wild black cherry	Prunus serotina	10	Fair	45.094865349	-93.275589008
809	Wild black cherry	Prunus serotina	9	Fair	45.094731850	-93.275741609
810	Wild black cherry	Prunus serotina	7	Fair	45.094696316	-93.275887135
811	Wild black cherry	Prunus serotina	9	Fair	45.094662768	-93.275891756
812	Wild black cherry	Prunus serotina	4	Poor	45.094650027	-93.275855596
813	Wild black cherry	Prunus serotina	10	Fair	45.094646404	-93.275816271
814	Wild black cherry	Prunus serotina	10	Fair	45.094623930	-93.275818428
815	Wild black cherry	Prunus serotina	8	Fair	45.094549824	-93.275539289
816	Wild black cherry	Prunus serotina	12	Good	45.094655967	-93.275478357
817	Wild black cherry	Prunus serotina	18	Good	45.094864120	-93.275482528
818	Wild black cherry	Prunus serotina	8	Fair	45.094908615	-93.275395473
819	Wild black cherry	Prunus serotina	9	Poor	45.095054126	-93.274947904
820	Wild black cherry	Prunus serotina	8	Poor	45.094998894	-93.275116028
821	Wild black cherry	Prunus serotina	7	Fair	45.095033123	-93.275475821
822	Wild black cherry	Prunus serotina	5	Fair	45.095045384	-93.275434596
823	Wild black cherry	Prunus serotina	6	Fair	45.095079736	-93.275393929

824	Wild black cherry	Prunus serotina	7	Fair	45.095159199	-93.275521638
825	Wild black cherry	Prunus serotina	4	Poor	45.095176061	-93.275334854
826	Wild black cherry	Prunus serotina	9	Fair	45.095132023	-93.275372548
827	Wild black cherry	Prunus serotina	4	Poor	45.095183951	-93.275311786
828	Wild black cherry	Prunus serotina	4	Poor	45.095217092	-93.275296520
829	Wild black cherry	Prunus serotina	8	Poor	45.095244406	-93.275256030
830	Wild black cherry	Prunus serotina	10	Fair	45.095250431	-93.275157604
831	Wild black cherry	Prunus serotina	10	Fair	45.095240324	-93.275156013
832	Wild black cherry	Prunus serotina	8	Fair	45.095207448	-93.275134216
833	Wild black cherry	Prunus serotina	8	Fair	45.095201290	-93.275131296
834	Wild black cherry	Prunus serotina	4	Fair	45.095161126	-93.275176080
835	Wild black cherry	Prunus serotina	8	Fair	45.095102315	-93.275209505
836	Wild black cherry	Prunus serotina	6	Fair	45.095108898	-93.275133990
837	Wild black cherry	Prunus serotina	7	Poor	45.095117723	-93.274998673
838	Wild black cherry	Prunus serotina	9	Poor	45.095088730	-93.274974199
839	Wild black cherry	Prunus serotina	7	Poor	45.095116181	-93.274929064
840	Wild black cherry	Prunus serotina	9	Fair	45.095112751	-93.274950510
841	Wild black cherry	Prunus serotina	4	Poor	45.095146386	-93.275008416
842	Wild black cherry	Prunus serotina	6	Fair	45.095123576	-93.275023408
843	Wild black cherry	Prunus serotina	8	Poor	45.095170090	-93.275067163
844	Wild black cherry	Prunus serotina	5	Poor	45.095170466	-93.274996380
845	Wild black cherry	Prunus serotina	8	Fair	45.095168883	-93.274953170
846	Wild black cherry	Prunus serotina	6	Poor	45.095154069	-93.274929065
847	Wild black cherry	Prunus serotina	9	Fair	45.095123008	-93.274912182
848	Wild black cherry	Prunus serotina	5	Poor	45.095107759	-93.274886803
849	Wild black cherry	Prunus serotina	6	Poor	45.095135596	-93.274842624
850	Wild black cherry	Prunus serotina	7	Fair	45.095155279	-93.274853239
851	Wild black cherry	Prunus serotina	14	Fair	45.095218740	-93.274804954
852	Wild black cherry	Prunus serotina	5	Poor	45.095185786	-93.274866115
853	Wild black cherry	Prunus serotina	9	Fair	45.095174960	-93.274912491
854	Wild black cherry	Prunus serotina	5	Fair	45.095255522	-93.274867599
855	Wild black cherry	Prunus serotina	9	Fair	45.095209142	-93.274938787
856	Wild black cherry	Prunus serotina	5	Poor	45.095227699	-93.274965779

857	Wild black cherry	Prunus serotina	6	Poor	45.095267028	-93.275033012
858	Wild black cherry	Prunus serotina	9	Fair	45.095265523	-93.275075822
859	Wild black cherry	Prunus serotina	11	Fair	45.095273106	-93.275139513
860	Wild black cherry	Prunus serotina	11	Fair	45.095322093	-93.275137008
861	Wild black cherry	Prunus serotina	8	Poor	45.095313475	-93.275059105
862	Wild black cherry	Prunus serotina	7	Poor	45.095297261	-93.275045175
863	Wild black cherry	Prunus serotina	8	Fair	45.095316797	-93.274994709
864	Wild black cherry	Prunus serotina	12	Fair	45.095306600	-93.274964999
865	Wild black cherry	Prunus serotina	7	Fair	45.095367282	-93.274951034
866	Wild black cherry	Prunus serotina	8	Fair	45.095368490	-93.274969977
867	Wild black cherry	Prunus serotina	7	Fair	45.095368000	-93.275032279
868	Wild black cherry	Prunus serotina	10	Fair	45.095438543	-93.275097901
869	Wild black cherry	Prunus serotina	10	Fair	45.095459949	-93.275093225
870	Wild black cherry	Prunus serotina	8	Fair	45.095439730	-93.274989492
871	Wild black cherry	Prunus serotina	10	Fair	45.095321576	-93.274825602
872	Wild black cherry	Prunus serotina	8	Fair	45.095322138	-93.274811426
873	Wild black cherry	Prunus serotina	8	Fair	45.095305649	-93.274841880
874	Wild black cherry	Prunus serotina	9	Poor	45.095297698	-93.274766756
875	Wild black cherry	Prunus serotina	7	Poor	45.095342906	-93.274662149
876	Wild black cherry	Prunus serotina	7	Fair	45.095482780	-93.274600872
877	Wild black cherry	Prunus serotina	7	Fair	45.095442410	-93.274571416
878	Wild black cherry	Prunus serotina	5	Fair	45.095457266	-93.274566043
879	Wild black cherry	Prunus serotina	9	Fair	45.095447461	-93.274541627
880	Wild black cherry	Prunus serotina	6	Poor	45.095414334	-93.274546601
881	Wild black cherry	Prunus serotina	6	Fair	45.095416491	-93.274371779
882	Wild black cherry	Prunus serotina	9	Fair	45.095069842	-93.275732613
883	Wild black cherry	Prunus serotina	1	Fair	45.094698325	-93.275976639
884	Wild black cherry	Prunus serotina	4	Fair	45.094693465	-93.275994046
885	Wild black cherry	Prunus serotina	8	Fair	45.094737580	-93.275981023
886	Wild black cherry	Prunus serotina	4	Fair	45.094783143	-93.276019201
887	Wild black cherry	Prunus serotina	8	Poor	45.094777511	-93.276049706
888	Wild black cherry	Prunus serotina	4	Poor	45.094683165	-93.275913701
889	Wild black cherry	Prunus serotina	4	Fair	45.094594259	-93.276126157

890	Wild black cherry	Prunus serotina	6	Fair	45.094506253	-93.276117546
891	Wild black cherry	Prunus serotina	16	Fair	45.094428518	-93.276118564
892	Wild black cherry	Prunus serotina	6	Poor	45.094491405	-93.276031672
893	Box elder	Acer negundo	4	Poor	45.093837874	-93.276687557
894	Box elder	Acer negundo	7	Poor	45.093882402	-93.277079512
895	Box elder	Acer negundo	7	Fair	45.093858798	-93.277062242
896	Box elder	Acer negundo	18	Fair	45.094294973	-93.276350618
897	Box elder	Acer negundo	11	Poor	45.094311922	-93.276388896
898	Box elder	Acer negundo	21	Good	45.094363998	-93.276409493
899	Box elder	Acer negundo	14	Fair	45.094345912	-93.276483471
900	Box elder	Acer negundo	15	Good	45.094311100	-93.275748438
901	Box elder	Acer negundo	12	Fair	45.094335298	-93.275686286
902	Box elder	Acer negundo	18	Poor	45.094277498	-93.275619557
903	Box elder	Acer negundo	6	Poor	45.094408361	-93.275317272
904	Box elder	Acer negundo	25	Good	45.095422981	-93.274266391
905	Box elder	Acer negundo	18	Poor	45.095389273	-93.274260919
906	Box elder	Acer negundo	11	Poor	45.095349863	-93.274284551
907	Box elder	Acer negundo	15	Fair	45.095302062	-93.274303904
908	Box elder	Acer negundo	15	Good	45.095322071	-93.274298795
909	Box elder	Acer negundo	16	Good	45.095295473	-93.274431156
910	Box elder	Acer negundo	16	Fair	45.095248956	-93.274497130
911	Box elder	Acer negundo	11	Fair	45.095240050	-93.274528566
912	Box elder	Acer negundo	15	Fair	45.095230979	-93.274478002
913	Box elder	Acer negundo	11	Poor	45.095230672	-93.274495270
914	Box elder	Acer negundo	9	Fair	45.095230773	-93.274594419
915	Box elder	Acer negundo	11	Poor	45.095290282	-93.274655261
916	Box elder	Acer negundo	21	Poor	45.095246609	-93.274686155
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1181	Basswood	Tilia americana	13	Fair	45.094486538	-93.277948348
1182	Basswood	Tilia americana	6	Fair	45.094466634	-93.277991787
1183	Basswood	Tilia americana	6	Good	45.094743037	-93.277896244
1184	Basswood	Tilia americana	6	Fair	45.094779220	-93.277890609
1185	Basswood	Tilia americana	12	Fair	45.094967074	-93.277831093
1186	Basswood	Tilia americana	4	Fair	45.094849566	-93.277688000

1187	Basswood	Tilia americana	8	Good	45.094959423	-93.277782387
1188	Basswood	Tilia americana	9	Fair	45.095005752	-93.277820924
1189	Basswood	Tilia americana	12	Fair	45.095034482	-93.277796941
1190	Basswood	Tilia americana	6	Good	45.095323015	-93.277288051
1191	Basswood	Tilia americana	8	Good	45.095121500	-93.277857893
1192	Basswood	Tilia americana	11	Good	45.095250174	-93.277821300
1193	Basswood	Tilia americana	10	Fair	45.095296095	-93.277745642
1194	Basswood	Tilia americana	10	Good	45.095339568	-93.277845690
1195	Basswood	Tilia americana	8	Fair	45.095257545	-93.277727526
1196	Basswood	Tilia americana	6	Fair	45.095376075	-93.277790414
1197	Basswood	Tilia americana	10	Fair	45.095391084	-93.277782551
1198	Basswood	Tilia americana	6	Fair	45.095479459	-93.277781554
1199	Green ash	Fraxinus pennsylvanica	4	Good	45.093630925	-93.275899093
1200	Green ash	Fraxinus pennsylvanica	4	Fair	45.093663859	-93.275945883
1201	Green ash	Fraxinus pennsylvanica	5	Fair	45.093895963	-93.277190967
1202	Green ash	Fraxinus pennsylvanica	12	Good	45.094187008	-93.277029334
1203	Green ash	Fraxinus pennsylvanica	11	Good	45.094293638	-93.275763901
1204	Green ash	Fraxinus pennsylvanica	5	Fair	45.095418582	-93.274182609
1205	Green ash	Fraxinus pennsylvanica	5	Fair	45.095416873	-93.274164899
1206	Green ash	Fraxinus pennsylvanica	7	Fair	45.095150871	-93.274481945
1207	Green ash	Fraxinus pennsylvanica	12	Fair	45.095288958	-93.274565082
1208	Green ash	Fraxinus pennsylvanica	6	Poor	45.095168780	-93.274622011
1209	Green ash	Fraxinus pennsylvanica	4	Poor	45.095154100	-93.274666980
1210	Green ash	Fraxinus pennsylvanica	15	Poor	45.095070740	-93.274625707
1211	Green ash	Fraxinus pennsylvanica	14	Poor	45.095062419	-93.274585233
1212	Green ash	Fraxinus pennsylvanica	8	Good	45.094955548	-93.274682579
1213	Green ash	Fraxinus pennsylvanica	8	Fair	45.094968150	-93.274720620
1214	Green ash	Fraxinus pennsylvanica	9	Poor	45.095006223	-93.274748643
1215	Green ash	Fraxinus pennsylvanica	8	Poor	45.095034644	-93.274758555
1216	Green ash	Fraxinus pennsylvanica	10	Good	45.095166673	-93.274754687
1217	Green ash	Fraxinus pennsylvanica	5	Fair	45.094962989	-93.274741144
1218	Green ash	Fraxinus pennsylvanica	7	Good	45.094958643	-93.274752278
1219	Green ash	Fraxinus pennsylvanica	5	Fair	45.094957455	-93.274743553

1220	Green ash	Fraxinus pennsylvanica	16	Poor	45.094886085	-93.274727336
1221	Green ash	Fraxinus pennsylvanica	4	Good	45.094900124	-93.274828465
1222	Green ash	Fraxinus pennsylvanica	6	Fair	45.094878893	-93.274788062
1223	Green ash	Fraxinus pennsylvanica	7	Good	45.094859950	-93.274760919
1224	Green ash	Fraxinus pennsylvanica	7	Poor	45.094875585	-93.274749775
1225	Green ash	Fraxinus pennsylvanica	5	Fair	45.094833219	-93.274807437
1226	Green ash	Fraxinus pennsylvanica	6	Fair	45.094878974	-93.274890092
1227	Green ash	Fraxinus pennsylvanica	11	Good	45.094910580	-93.274880399
1228	Green ash	Fraxinus pennsylvanica	5	Poor	45.094911785	-93.274919627
1229	Green ash	Fraxinus pennsylvanica	14	Fair	45.094742285	-93.275151050
1230	Green ash	Fraxinus pennsylvanica	11	Good	45.094695993	-93.275195597
1231	Green ash	Fraxinus pennsylvanica	4	Fair	45.094616004	-93.275210822
1232	Green ash	Fraxinus pennsylvanica	5	Fair	45.094575605	-93.275237463
1233	Green ash	Fraxinus pennsylvanica	6	Fair	45.094592905	-93.275286138
1234	Green ash	Fraxinus pennsylvanica	4	Poor	45.094539722	-93.275324450
1235	Green ash	Fraxinus pennsylvanica	17	Fair	45.094182266	-93.277465041
1236	Green ash	Fraxinus pennsylvanica	5	Poor	45.094463328	-93.277719871
1237	Green ash	Fraxinus pennsylvanica	13	Good	45.094592715	-93.277781814
1238	Green ash	Fraxinus pennsylvanica	7	Good	45.094604293	-93.277789703
1239	Green ash	Fraxinus pennsylvanica	7	Fair	45.094617835	-93.277807146
1240	Green ash	Fraxinus pennsylvanica	5	Fair	45.094646691	-93.277784632
1241	Green ash	Fraxinus pennsylvanica	7	Poor	45.094642287	-93.277729352
1242	Green ash	Fraxinus pennsylvanica	8	Good	45.094664120	-93.277689050
1243	Green ash	Fraxinus pennsylvanica	13	Good	45.094638785	-93.277685627
1244	Green ash	Fraxinus pennsylvanica	11	Good	45.094604206	-93.277638725
1245	Green ash	Fraxinus pennsylvanica	6	Good	45.094802652	-93.277768248
1246	Green ash	Fraxinus pennsylvanica	5	Fair	45.094715801	-93.277708888
1247	Green ash	Fraxinus pennsylvanica	7	Fair	45.094703463	-93.277559892
1248	Green ash	Fraxinus pennsylvanica	11	Good	45.094618894	-93.277635337
1249	Green ash	Fraxinus pennsylvanica	9	Poor	45.094474402	-93.277453745
1250	Green ash	Fraxinus pennsylvanica	11	Good	45.094612587	-93.277218372
1251	Green ash	Fraxinus pennsylvanica	19	Fair	45.094652775	-93.277507485
1252	Green ash	Fraxinus pennsylvanica	12	Good	45.094688511	-93.277464684

1253	Green ash	Fraxinus pennsylvanica	11	Good	45.094678585	-93.277415247
1254	Green ash	Fraxinus pennsylvanica	10	Good	45.094698496	-93.277423147
1255	Green ash	Fraxinus pennsylvanica	20	Good	45.094710160	-93.277338483
1256	Green ash	Fraxinus pennsylvanica	7	Poor	45.094685293	-93.277322802
1257	Green ash	Fraxinus pennsylvanica	22	Fair	45.094634954	-93.277237054
1258	Green ash	Fraxinus pennsylvanica	13	Fair	45.094640761	-93.277249138
1259	Green ash	Fraxinus pennsylvanica	8	Fair	45.094684826	-93.277252772
1260	Green ash	Fraxinus pennsylvanica	8	Good	45.094795896	-93.277051222
1261	Green ash	Fraxinus pennsylvanica	16	Good	45.094825399	-93.277197088
1262	Green ash	Fraxinus pennsylvanica	7	Fair	45.094786961	-93.277188396
1263	Green ash	Fraxinus pennsylvanica	7	Fair	45.094839523	-93.277272922
1264	Green ash	Fraxinus pennsylvanica	11	Fair	45.094801475	-93.277247421
1265	Green ash	Fraxinus pennsylvanica	5	Fair	45.094802885	-93.277269639
1266	Green ash	Fraxinus pennsylvanica	10	Good	45.094835323	-93.277262623
1267	Green ash	Fraxinus pennsylvanica	4	Poor	45.094890332	-93.277309290
1268	Green ash	Fraxinus pennsylvanica	10	Fair	45.094898999	-93.277261078
1269	Green ash	Fraxinus pennsylvanica	5	Poor	45.094989168	-93.277190842
1270	Green ash	Fraxinus pennsylvanica	4	Fair	45.094974625	-93.277354925
1271	Green ash	Fraxinus pennsylvanica	5	Good	45.095051282	-93.277122687
1272	Green ash	Fraxinus pennsylvanica	4	Good	45.095080859	-93.277119289
1273	Green ash	Fraxinus pennsylvanica	7	Fair	45.095053688	-93.277258809
1274	Green ash	Fraxinus pennsylvanica	8	Fair	45.095163814	-93.277474980
1275	Green ash	Fraxinus pennsylvanica	8	Good	45.095207916	-93.277480875
1276	Green ash	Fraxinus pennsylvanica	6	Fair	45.095228213	-93.277502896
1277	Green ash	Fraxinus pennsylvanica	7	Fair	45.095237944	-93.277564553
1278	Green ash	Fraxinus pennsylvanica	4	Good	45.095184340	-93.277692002
1279	Green ash	Fraxinus pennsylvanica	7	Good	45.095165546	-93.277689571
1280	Green ash	Fraxinus pennsylvanica	4	Fair	45.095074977	-93.277547079
1281	Green ash	Fraxinus pennsylvanica	5	Fair	45.095119630	-93.277516108
1282	Green ash	Fraxinus pennsylvanica	4	Fair	45.095132590	-93.277531922
1283	Green ash	Fraxinus pennsylvanica	7	Fair	45.095183846	-93.277553228
1284	Green ash	Fraxinus pennsylvanica	6	Good	45.093736708	-93.277173138
1285	Green ash	Fraxinus pennsylvanica	9	Fair	45.093834484	-93.278120791

1286	Green ash	Fraxinus pennsylvanica	10	Good	45.093851745	-93.278113439
1287	Green ash	Fraxinus pennsylvanica	6	Poor	45.093871158	-93.278172046
1288	Green ash	Fraxinus pennsylvanica	10	Fair	45.093902666	-93.278136343
1289	Green ash	Fraxinus pennsylvanica	9	Fair	45.093970145	-93.278137481
1290	Green ash	Fraxinus pennsylvanica	12	Fair	45.093987578	-93.278072966
1291	Green ash	Fraxinus pennsylvanica	5	Good	45.094052627	-93.278070909
1292	Green ash	Fraxinus pennsylvanica	4	Good	45.093991181	-93.277909272
1293	Green ash	Fraxinus pennsylvanica	13	Fair	45.094199813	-93.277884349
1294	Green ash	Fraxinus pennsylvanica	10	Good	45.094228498	-93.278082713
1295	Green ash	Fraxinus pennsylvanica	6	Good	45.094223470	-93.278125255
1296	Green ash	Fraxinus pennsylvanica	6	Fair	45.094284411	-93.278119081
1297	Green ash	Fraxinus pennsylvanica	7	Fair	45.094274434	-93.278042148
1298	Green ash	Fraxinus pennsylvanica	12	Good	45.094268049	-93.278044324
1299	Green ash	Fraxinus pennsylvanica	5	Good	45.094311263	-93.278089028
1300	Green ash	Fraxinus pennsylvanica	10	Good	45.094373571	-93.278054452
1301	Green ash	Fraxinus pennsylvanica	7	Good	45.094400297	-93.278041068
1302	Green ash	Fraxinus pennsylvanica	6	Fair	45.094427389	-93.278110737
1303	Green ash	Fraxinus pennsylvanica	7	Fair	45.094397460	-93.278071955
1304	Green ash	Fraxinus pennsylvanica	4	Fair	45.094457246	-93.278068610
1305	Green ash	Fraxinus pennsylvanica	11	Poor	45.094484569	-93.278082549
1306	Green ash	Fraxinus pennsylvanica	13	Fair	45.094517301	-93.278050593
1307	Green ash	Fraxinus pennsylvanica	11	Fair	45.094593363	-93.278068879
1308	Green ash	Fraxinus pennsylvanica	9	Fair	45.094567564	-93.278098247
1309	Green ash	Fraxinus pennsylvanica	4	Good	45.094599757	-93.277992993
1310	Green ash	Fraxinus pennsylvanica	7	Poor	45.094678085	-93.278140202
1311	Green ash	Fraxinus pennsylvanica	11	Fair	45.094690410	-93.278055785
1312	Green ash	Fraxinus pennsylvanica	5	Good	45.094661061	-93.277979983
1313	Green ash	Fraxinus pennsylvanica	7	Good	45.094768822	-93.277969653
1314	Green ash	Fraxinus pennsylvanica	10	Good	45.094801772	-93.277964584
1315	Green ash	Fraxinus pennsylvanica	5	Fair	45.094731724	-93.278075957
1316	Green ash	Fraxinus pennsylvanica	7	Poor	45.094741800	-93.278033396
1317	Green ash	Fraxinus pennsylvanica	8	Fair	45.094814964	-93.278065092
1318	Green ash	Fraxinus pennsylvanica	7	Poor	45.094834089	-93.278028296

1319	Green ash	Fraxinus pennsylvanica	13	Fair	45.094859232	-93.277992222
1320	Green ash	Fraxinus pennsylvanica	6	Good	45.094826448	-93.277914324
1321	Green ash	Fraxinus pennsylvanica	7	Poor	45.094942725	-93.277978048
1322	Green ash	Fraxinus pennsylvanica	6	Fair	45.094970333	-93.277906868
1323	Green ash	Fraxinus pennsylvanica	7	Good	45.095000401	-93.277912701
1324	Green ash	Fraxinus pennsylvanica	6	Good	45.094942666	-93.277808891
1325	Green ash	Fraxinus pennsylvanica	12	Fair	45.094913020	-93.277722845
1326	Green ash	Fraxinus pennsylvanica	22	Good	45.094858066	-93.277706966
1327	Green ash	Fraxinus pennsylvanica	24	Fair	45.094826559	-93.277655140
1328	Green ash	Fraxinus pennsylvanica	8	Good	45.094817304	-93.277543557
1329	Green ash	Fraxinus pennsylvanica	14	Good	45.094761385	-93.277485929
1330	Green ash	Fraxinus pennsylvanica	14	Fair	45.094804693	-93.277395489
1331	Green ash	Fraxinus pennsylvanica	7	Fair	45.094824549	-93.277341507
1332	Green ash	Fraxinus pennsylvanica	1	Fair	45.094788693	-93.277415355
1333	Green ash	Fraxinus pennsylvanica	5	Good	45.094841544	-93.277504840
1334	Green ash	Fraxinus pennsylvanica	17	Good	45.094895684	-93.277624353
1335	Green ash	Fraxinus pennsylvanica	10	Good	45.094957349	-93.277693735
1336	Green ash	Fraxinus pennsylvanica	5	Fair	45.094957950	-93.277613466
1337	Green ash	Fraxinus pennsylvanica	4	Good	45.094880063	-93.277551068
1338	Green ash	Fraxinus pennsylvanica	6	Fair	45.095020880	-93.277427649
1339	Green ash	Fraxinus pennsylvanica	4	Good	45.095044945	-93.277532747
1340	Green ash	Fraxinus pennsylvanica	8	Fair	45.095035253	-93.277723372
1341	Green ash	Fraxinus pennsylvanica	10	Fair	45.095015238	-93.277834721
1342	Green ash	Fraxinus pennsylvanica	5	Fair	45.095221371	-93.277323130
1343	Green ash	Fraxinus pennsylvanica	6	Fair	45.095280616	-93.277543435
1344	Green ash	Fraxinus pennsylvanica	4	Good	45.095382617	-93.277381769
1345	Green ash	Fraxinus pennsylvanica	4	Good	45.095391550	-93.277686294
1346	Green ash	Fraxinus pennsylvanica	4	Poor	45.095400879	-93.277725381
1347	Green ash	Fraxinus pennsylvanica	4	Good	45.095177861	-93.277701255
1348	Green ash	Fraxinus pennsylvanica	4	Fair	45.095062352	-93.277915807
1349	Green ash	Fraxinus pennsylvanica	9	Poor	45.095011298	-93.277945584
1350	Green ash	Fraxinus pennsylvanica	8	Fair	45.095009300	-93.277956674
1351	Green ash	Fraxinus pennsylvanica	7	Fair	45.095018508	-93.277955241

1352	Green ash	Fraxinus pennsylvanica	9	Fair	45.095077707	-93.277945888
1353	Green ash	Fraxinus pennsylvanica	4	Fair	45.095119911	-93.277951165
1354	Green ash	Fraxinus pennsylvanica	8	Good	45.095194591	-93.277926597
1355	Green ash	Fraxinus pennsylvanica	7	Good	45.095297166	-93.277884797
1356	Green ash	Fraxinus pennsylvanica	9	Good	45.095244024	-93.277789717
1357	Green ash	Fraxinus pennsylvanica	5	Fair	45.095334118	-93.277730177
1358	Green ash	Fraxinus pennsylvanica	6	Good	45.095387000	-93.277822682
1359	Green ash	Fraxinus pennsylvanica	4	Good	45.095282197	-93.277256290
1360	Green ash	Fraxinus pennsylvanica	4	Good	45.095088064	-93.277054908
1361	Green ash	Fraxinus pennsylvanica	4	Fair	45.095343467	-93.277041481
1362	Green ash	Fraxinus pennsylvanica	8	Fair	45.094642817	-93.276578346
1363	Green ash	Fraxinus pennsylvanica	9	Good	45.094670619	-93.276589380
1364	Green ash	Fraxinus pennsylvanica	10	Good	45.094689414	-93.276585290
1365	Green ash	Fraxinus pennsylvanica	6	Poor	45.094711673	-93.276524991
1366	Green ash	Fraxinus pennsylvanica	19	Poor	45.094737089	-93.276567994
1367	Green ash	Fraxinus pennsylvanica	6	Poor	45.094967610	-93.276324942
1368	Green ash	Fraxinus pennsylvanica	9	Good	45.094617040	-93.275983160
1369	Green ash	Fraxinus pennsylvanica	11	Good	45.094822078	-93.276231987
1370	Green ash	Fraxinus pennsylvanica	7	Good	45.095075726	-93.274848587
1371	Green ash	Fraxinus pennsylvanica	7	Fair	45.095054507	-93.274726508
1372	Green ash	Fraxinus pennsylvanica	11	Good	45.095241172	-93.274807344
1373	Green ash	Fraxinus pennsylvanica	9	Good	45.095378130	-93.274476960
1374	Green ash	Fraxinus pennsylvanica	8	Good	45.094686596	-93.276046070
1375	Green ash	Fraxinus pennsylvanica	4	Poor	45.095472732	-93.277725088
1376	Green ash	Fraxinus pennsylvanica	4	Fair	45.095152129	-93.277691012
1377	Green ash	Fraxinus pennsylvanica	6	Fair	45.095059023	-93.278005124
1378	Green ash	Fraxinus pennsylvanica	4	Fair	45.095071897	-93.277962235
1379	Green ash	Fraxinus pennsylvanica	4	Fair	45.095162795	-93.277902799
1380	Green ash	Fraxinus pennsylvanica	4	Fair	45.095226083	-93.277942748
1381	Green ash	Fraxinus pennsylvanica	10	Fair	45.095230150	-93.277933093
1382	Green ash	Fraxinus pennsylvanica	8	Fair	45.095283933	-93.277910648
1383	Green ash	Fraxinus pennsylvanica	5	Fair	45.095300223	-93.277726334
1384	Green ash	Fraxinus pennsylvanica	7	Poor	45.095456069	-93.277877114

1385	Green ash	Fraxinus pennsylvanica	8	Fair	45.095411929	-93.277931704
1386	Green ash	Fraxinus pennsylvanica	7	Poor	45.095360430	-93.277887531
1387	Green ash	Fraxinus pennsylvanica	4	Fair	45.095091552	-93.277013585
1388	Green ash	Fraxinus pennsylvanica	7	Fair	45.095352220	-93.276917984
1389	Green ash	Fraxinus pennsylvanica	5	Fair	45.094635578	-93.276534017
1390	Green ash	Fraxinus pennsylvanica	20	Fair	45.094686255	-93.276603608
1391	Green ash	Fraxinus pennsylvanica	16	Fair	45.094705914	-93.276564741
1392	Green ash	Fraxinus pennsylvanica	14	Fair	45.094924028	-93.276283752
1393	Green ash	Fraxinus pennsylvanica	5	Fair	45.094497724	-93.276177135
1394	Green ash	Fraxinus pennsylvanica	15	Fair	45.094676294	-93.276232409
1395	Green ash	Fraxinus pennsylvanica	10	Fair	45.094840165	-93.276135945
1396	Green ash	Fraxinus pennsylvanica	10	Fair	45.094887628	-93.276087168
1397	Green ash	Fraxinus pennsylvanica	11	Fair	45.095073214	-93.276079618
1398	Green ash	Fraxinus pennsylvanica	4	Poor	45.094906410	-93.275212649
1399	Green ash	Fraxinus pennsylvanica	8	Fair	45.094977089	-93.275237862
1400	Green ash	Fraxinus pennsylvanica	14	Good	45.094927311	-93.275114146
1401	Green ash	Fraxinus pennsylvanica	16	Good	45.094909674	-93.275009728
1402	Green ash	Fraxinus pennsylvanica	4	Poor	45.094946269	-93.274980222
1403	Green ash	Fraxinus pennsylvanica	6	Fair	45.094663773	-93.276069137
1404	Green ash	Fraxinus pennsylvanica	10	Fair	45.094718788	-93.276048540
1405	Green ash	Fraxinus pennsylvanica	5	Fair	45.094483280	-93.276023564
1406	Apple	Malus sp.	9	Fair	45.095393468	-93.274496966

*Good –Intact or very nearly intact crown (less than ~10% crown die-off), good form, no or minimal structural damage; no or limited structural issues; little or no signs of diseases, storm damage, or leaning.
Fair –Somewhat impacted crown (die back or canopy damage up to one fourth to one third of crown), minimal structural damage such as broken limbs, form is fair (2 or more stems, leaning bole, or similar), structural issues such as included bark on main stem(s); some signs of storm damage and/or signs of disease impacting the tree.
Poor –Damage of more than one third of the crown, form is poor (multiple stems, arching or severely leaning boles), structural issuessuch as splitting at included bark, moderate to significant structural damage (e.g. storm damage, heart rot), evidence of systemic disease issues (e.g. oak wilt, EAB).

Appendix B

Geotechnical Report

American Engineering Testing, Inc.

CONSULTANTS
• ENVIRONMENTAL
• GEOTECHNICAL
• MATERIALS
• FORENSICS

June 21, 2019

Stantec
733 Marquette Avenue, Suite 1000
Minneapolis, MN 55402

Attn: Daryl Kirschenman, PE

RE: Geotechnical Exploration and Preliminary Opinions
Lift Station L-32 Improvements
Fridley, Minnesota
AET No. 01-20475

Dear Mr. Kirschenman:

This letter report presents the results of the geotechnical exploration performed at the referenced site and presents our preliminary opinions pertaining installation of below-grade tanks/structures. This work is being performed per our March 14, 2019 proposal, which was authorized by you on May 2, 2019. The authorized scope consists of four standard penetration test borings, soil laboratory testing, and preparation of this preliminary report.

1.0 Project Information

The project site currently serves as a Girl Scout camp at 6900 East River Road. An existing lift station is located in the southwest corner of the site. New below grade structures/storage tanks are proposed to be located to the east/northeast of this existing station as shown on attached Figure 1. Currently estimated structure bottom elevations are around 790 feet.

2.0 Site Exploration and Testing

Four standard penetration test borings (SB-1 to SB-4) were drilled and sampled at the site from May 28 to 31, 2019. The logs of the test borings are attached. The boring locations graphically appear on attached Figure 1. The Ramsey County coordinates appear on the logs. The final locations and surface elevations were surveyed by others.

The boring logs contain information concerning soil layering, soil classification, geologic description, and moisture condition. Relative density or consistency is also noted for the natural soils, which is based on the standard penetration resistance (N-value). We refer you to the standard sheet entitled "Exploration/Classification Methods" for details on the drilling and sampling methods, the classification methods, and the water level measurement methods. Data sheets concerning the Unified Soils Classification System, the descriptive terminology, and the symbols used on the boring logs are also attached.

The laboratory test program included two Atterberg Limits tests, ten sieve analysis tests, and numerous water content tests. The test results appear on the individual boring logs adjacent to the samples upon which they were performed and/or on the data sheets following the boring logs.

3.0 Conditions Encountered

3.1 Soil Profile

The generalized geologic profile consists of 1 to 2 feet of surficial topsoil/fill overlying granular water-deposited (alluvial) sandy soils, which then includes substantial deposits of glacially-deposited till soils and fine alluvial soils interlayered below depths of about 13 to 24 feet. The depths and thicknesses of the till and fine alluvium vary, as represented on the fence diagram (profile view) attached as Figure 2. The till is predominantly represented by the SC and CL soils. The fine alluvial soils are found below elevation 790 feet and are represented by CL and CL-ML soils. Therefore, the planned structures will mainly penetrate though the granular alluvium and till deposits.

The granular alluvium is mostly sand (SP) and sand with silt (SP-SM), with some zones of silty sand (SM). The upper granular alluvium is primarily loose to medium dense. The deeper-seated alluvium (below the upper till deposit) is somewhat denser; being medium dense to dense.

The glacial tills are mostly sandy lean clay (CL) and clayey sand (SC), with lesser zones of silty sand (SM). Many soils are borderline cases (e.g., CL/SC). The cohesive till soils are very stiff to hard, with zones of stiff soils sometimes present at the top of the till deposit.

3.2 Groundwater

Groundwater appeared in the boreholes at depths ranging from 8.8 feet (Boring SB-3) to 39.6 feet (Boring SB-2). Review of the data suggests there are two significant groundwater levels. The shallower level represented by Borings SB-1, SB-3, and SB-4 is considered to be perched or held up over the slow-draining glacial till deposit. This level was found to be in the elevation range of about 835½ to 837 feet. The level at Boring SB-2 is also somewhat perched upon slow draining stratifications, as the underlying sands to about elevation 811 feet are moist before becoming waterbearing. The lower groundwater level at this location is then considered to be at approximate elevation 811 feet. It is expected that this lower level is hydraulically connected to the Mississippi River to the west. Based on the plans for the existing lift station, the OHWL of the river near this project location is elevation 809.5 feet, although measurements available to us show more normal levels may be on the order of 803 to 805 feet. Therefore, there does appear to be a gradient towards the river, as would be expected. Water levels will fluctuate seasonally and annually.

4.0 Opinions/Recommendations

4.2 Soil Support Suitability

The existing natural soils are considered suitable for support of the below grade structures and piping systems. The soils around elevation 790 feet are either the granular alluvium or the glacial till. The fine alluvium appears below this elevation; but does have a hard consistency. For design of bottom slabs, a modulus of subgrade reaction (k-value) of 200 psi/inch can be assumed.

4.2 Installation Method

We understand you are considering structure installation using a caisson method. This appears to be preferable compared to an open cut method, as open excavations to elevation 790 feet would penetrate the lower groundwater level, resulting in a hydraulic conduit from the Mississippi River. Boring SB-3 shows the granular alluvium extends to a substantial depth below elevation 790 feet, and it would be very difficult to cut-off/seal groundwater migration from the river and surrounding sand deposits.

A caisson installation would have to be done using "wet" methods. Fluid would need to be maintained within the structure, particularly as it approaches and extends into the deeper granular alluvial layer. Without the interior "fluid hold-down," the bottom would be expected to heave due to hydrostatic forces within the granular soils.

Note that the caisson installation method may be complicated by the presence of very stiff to hard cohesive soils, soils with substantial gravel content, and possible cobbles/boulders.

5.0 Additional Review

We are available to conduct additional geotechnical review as the project design progresses. There may be additional considerations based on the design, the installation method chosen, and support of piping pending their installation method.

6.0 Limitations

Within the limitations of scope, budget, and schedule, we have endeavored to provide our services according to generally accepted geotechnical engineering practices at this time and location. Other than this, no warranty, express or implied, is intended.

Authored By,
American Engineering Testing, Inc.

Jeffery K. Voyen

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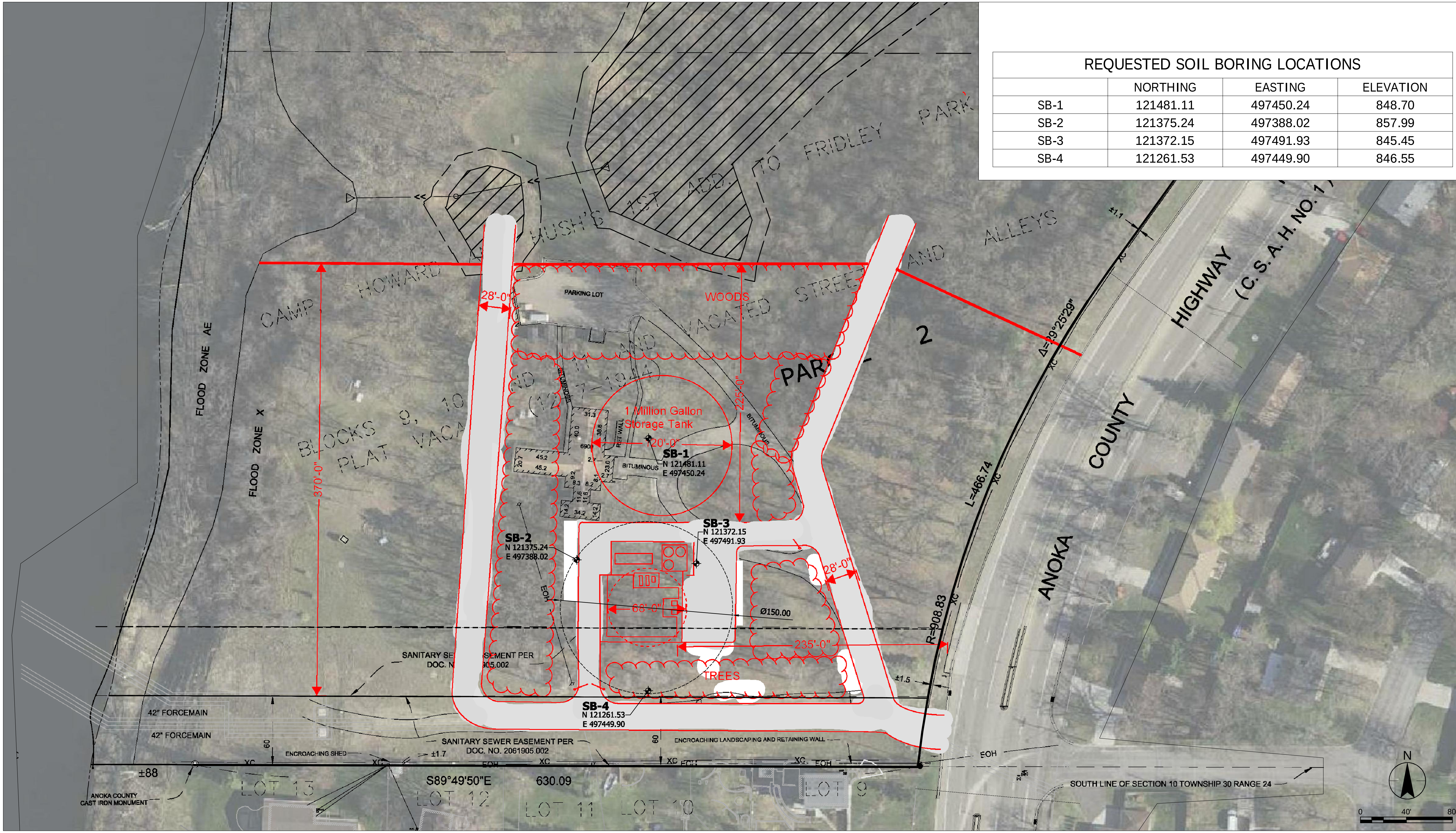
Reviewed By,
American Engineering Testing, Inc.

Gregory R. Reuter, PE, PG
Vice President/Principal Engineer

Attachments:

- Figure 1 – Boring Locations
- Figure 2 – Fence Diagram
- Subsurface Boring Logs
- Sieve Analysis Test Results
- Exploration/Classification Methods
- Boring Log Notes
- Unified Soil Classification System



REQUESTED SOIL BORING LOCATIONS			
	NORTHING	EASTING	ELEVATION
SB-1	121481.11	497450.24	848.70
SB-2	121375.24	497388.02	857.99
SB-3	121372.15	497491.93	845.45
SB-4	121261.53	497449.90	846.55

REQUESTED SOIL BORING LOCATIONS (as surveyed)

METROPOLITAN COUNCIL ENVIRONMENTAL SERVICES

MCES L-32

DATE 06/11/2019 PROJ. NO. 193804409

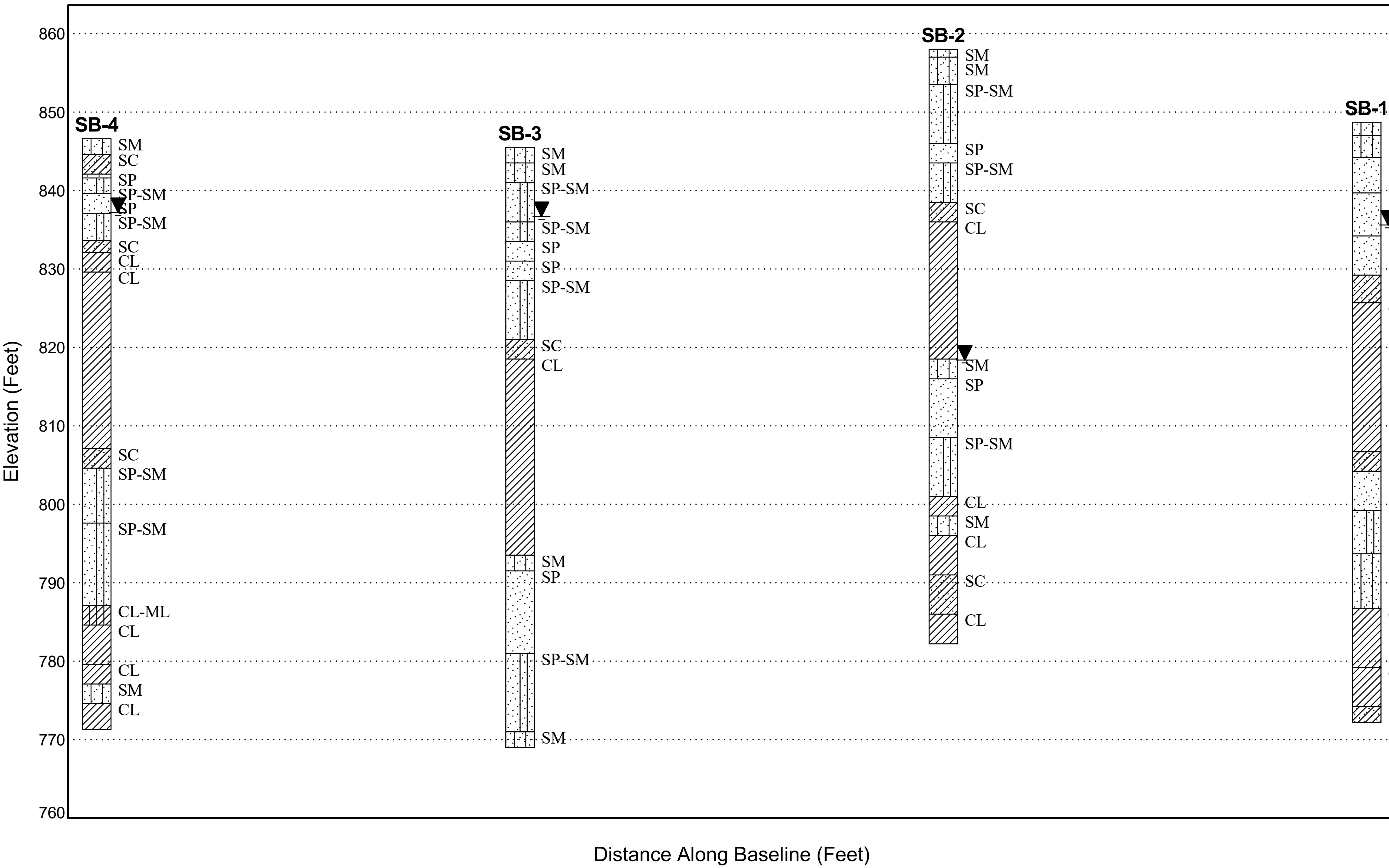
FIGURE 1

BORING LOCATIONS

AET 01-20475

Stantec
733 Marquette Avenue, Suite 1000
Minneapolis, MN 55402
www.stantec.com

Plot Date: 06/11/2019 - 4:04pm
Drawing name: V:\1938\active\193804409\CAD\Dwg\193804409_Soil Boring Figure.dwg
Xrefs: 193804409XSXV, 193804409_Map All Layers, 193804409V102



American Engineering Testing
550 Cleveland Avenue North
St. Paul, MN 55114
Telephone: (651) 659-9001
Fax: (651) 659-1347

Figure 2 - Fence Diagram
Lift Station L-32 Improvements
Fridley, MN
AET No: 01-20475

AET 8.5X11 GRAPHIC ABBR-NO NVALUE 01-20475.GPJ AET+CPT+WELL_20181012_JG.GDT 6/19/19

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET No: **01-20475** Log of Boring No. **SB-1 (p. 1 of 2)**

Project: **Lift Station L-32 Improvements; Fridley, MN**

Surface Elevation **848.7** Anoka Co. Coordinates: N **121481** E **497450**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	WC	DEN	LL	PL	%-#200
1	SILTY SAND, with organic fines, trace roots, fine grained, dark brown, moist, very loose (SM) (possible fill)	TOPSOIL OR FILL	4	M	SS	24					
2											
3	SILTY SAND, a little gravel, trace wood and roots, fine grained, brown, moist, loose (SM)	COARSE ALLUVIUM	6	M	SS	20					
4											
5	SAND WITH SILT, a little gravel, fine to medium grained, brown, moist, loose to medium dense (SP-SM)										
6			10	M	SS	18					
7											
8			11	M	SS	20					
9											
10	SAND, fine grained, light brownish to gray, moist to waterbearing, loose (SP)		10	M	SS	20					
11											
12											
13			7	M/W	SS	20					
14											
15	SAND, fine grained, brown to gray, waterbearing, very loose to loose (SP)										
16			2	W	SS	18					
17											
18			9	W	SS	12	25				2
19											
20	CLAYEY SAND, a little gravel, gray, stiff (SC)	TILL	9	M	SS	24	15				
21											
22	Missed 22'-24' sample due to inadvertent overdrilling										
23	SANDY LEAN CLAY, a little gravel, gray, very stiff (CL/SC)										
24											
25											
26			20	M	SS	2					
27											
28			22	M	SS	24	17				
29											
30											
31			20	M	SS	20	18				
32											
33			21	M	SS	24	18				
34											
35											
36			27	M	SS	12	30				

DEPTH:	DRILLING METHOD
0-14½'	3.25" HSA
14½-74½'	RDF w/DM

BORING COMPLETED: **5/28/19**

DR: **SG** LG: **GH** Rig: **91C**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
5/28/19	10:10	16.5	14.5	13.8		13.1
5/28/19	10:20	16.5	14.5	13.7		13.1

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET No: **01-20475** Log of Boring No. **SB-1 (p. 2 of 2)**

Project: **Lift Station L-32 Improvements; Fridley, MN**

Anoka Co. Coordinates: N **121481** E **497450**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	WC	DEN	LL	PL	%-#200
38	SANDY LEAN CLAY, a little gravel, gray, very stiff (CL/SC) *(continued)*		25	M	SS	24	19				
40–41			23	M	SS	24	19				
42–43	CLAYEY SAND, a little gravel, grayish brown, hard (SC)		40	M	SS	24	10				
45–46	SAND, fine to medium grained, brown, waterbearing, medium dense to dense (SP)	COARSE ALLUVIUM	21	W	SS	24					
48			24	W	SS	24					
50–51	SAND WITH SILT, fine grained, brown, waterbearing, dense (SP-SM)		20	W	SS	18					
53			21	W	SS	14					
55–56	SILTY SAND, a little gravel, fine grained, brown, wet, dense (SM)		33	W	SS	18					
58			35	W	SS	20					
60–61			30	W	SS	20	25				37
62–63	LEAN CLAY, brown, hard, laminations of silt below 64' (CL)	FINE ALLUVIUM	33	M	SS	24	29				
65–66	Note: WC not conducted on same portion of sample as LL/PL. Mixing of lensed sample also affects results.		37	M	SS	24	26		26	18	
68			66	M	SS	22	28				
70–71	SANDY LEAN CLAY, a little gravel, reddish brown, hard (CL)	TILL	60	M	SS	23	12				
73			53	M	SS	24	13				
75–76	CLAYEY SAND, a little gravel, gray, hard, lenses and laminations of silty sand (SC)		65	M	SS	24	13				
	END OF BORING										

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET No: 01-20475 Log of Boring No. SB-2 (p. 1 of 2)

Project: Lift Station L-32 Improvements; Fridley, MN

Surface Elevation 858.0 Anoka Co. Coordinates: N 121375 E 497388

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	WC	DEN	LL	PL	%-#200
1–2	SILTY SAND, with organic fines, a little gravel, trace roots, fine grained, dark brown, moist, loose (SM) (possible fill)	TOPSOIL OR FILL	5	M	SS	20					
2–4	SILTY SAND, a little gravel, fine grained, brown, moist, very loose (SM)	COARSE ALLUVIUM	4	M	SS	20					
5–12	SAND WITH SILT, a little gravel, fine to medium grained, brown, moist, loose to very loose (SP-SM)		7	M	SS	24					
			6	M	SS	24					
			5	M	SS	18					
12–14	SAND, a little gravel, medium to fine grained, moist, very loose (SP)		3	M	SS	12					
15–19	SAND WITH SILT, fine grained, light brownish gray, moist, medium dense (SP-SM)		11	M	SS	20					
			14	M	SS	20					
20–22	CLAYEY SAND, a little gravel, brown, very stiff (SC/SM)	TILL	22	M	SS	24					
22–36	SANDY LEAN CLAY, a little gravel, gray, hard to very stiff (CL/SC)		42	M	SS	24					
			22	M	SS	24	13				
			27	M	SS	24	14				50
			46	M	SS	24	14				
			29	M	SS	24	16				
			25	M	SS	24	13				

DEPTH:	DRILLING METHOD	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-49½'	3.25" HSA							
49½-74½'	RDF w/DM	5/29/19	9:58	41.5	39.5	39.8		None
		5/29/19	10:15	41.5	39.5	39.8		39.6
BORING COMPLETED:	5/29/19	5/29/19	10:44	49.0	47.0	47.2		46.7
DR: SG LG: GH	Rig: 91C	5/29/19	10:55	49.0	47.0	47.2		46.7

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-20475.GPJ AET+CPT+WELL_20181012_JG.GDT 6/18/19

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET No: **01-20475** Log of Boring No. **SB-2 (p. 2 of 2)**

Project: **Lift Station L-32 Improvements; Fridley, MN**

Anoka Co. Coordinates: N **121375** E **497388**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	WC	DEN	LL	PL	%-#200
38–39	SANDY LEAN CLAY, a little gravel, gray, hard to very stiff (CL/SC) *(continued)*		44	M	SS	24	13				
40–41	SILTY SAND, a little gravel, fine grained, gray, moist, very dense, laminations of clayey sand (SM)	COARSE ALLUVIUM OR TILL	95	M/W	SS	24					
42–49	SAND, fine grained, brown, moist to waterbearing, dense to medium dense (SP)	COARSE ALLUVIUM	33	M	SS	20	2				
			22	M	SS	24	4				
			19	W	SS	20	15				
50–56	SAND WITH SILT, fine grained, brown, waterbearing, dense (SP-SM)		34	W	SS	24	22				6
			48	W	SS	24	26				7
			46	W	SS	24					
57–59	SANDY LEAN CLAY WITH GRAVEL, reddish brown, hard, lenses of silty sand (CL/SC)	TILL	69	M/W	SS	12	16				
60–61	SILTY SAND WITH GRAVEL, brown, very dense (SM/SC)		50/.3	M	SS	8					
62–66	SANDY LEAN CLAY, a little gravel, gray, hard, lenses of silty sand (CL/SC)		43	M	SS	20					
			69	M	SS	24					
67–71	CLAYEY SAND, a little gravel, brownish gray, medium dense to dense (SC/SM)		23	M	SS	24	11				
			45	M	SS	24	10				
72–75	LEAN CLAY, a little gravel, gray, hard (CL) *29/.5 + 52/.5 + 50/.4 **30/.5 + 51/.5 + 50/.3	FINE ALLUVIUM	*	M	SS	16	12				
			**	M	SS	14	15				

END OF BORING

AET_CORP W-COORDINATES 01-20475.GPJ AET+CPT+WELL_20181012_JG.GDT 6/18/19

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET No: **01-20475** Log of Boring No. **SB-3 (p. 1 of 2)**

Project: **Lift Station L-32 Improvements; Fridley, MN**

Surface Elevation **845.5** Anoka Co. Coordinates: N **121372** E **497492**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	WC	DEN	LL	PL	%-#200
1–2	SILTY SAND, with organic fines, trace roots, fine grained, black to dark brown, moist, very loose (SM) (possible fill)	TOPSOIL OR FILL	4	M	SS	24					
3–4	SILTY SAND, a little gravel, fine grained, brown, moist, loose (SM) (possible fill)	COARSE ALLUVIUM OR FILL	5	M	SS	20					
5–9	SILTY SAND, a little gravel, trace roots, fine to medium grained, dark brown to brown, moist, medium dense to loose (SM) (possible fill)		15	M	SS	24					
			9	▼	SS	14					
10–12	SAND WITH SILT, fine to medium grained, brown, waterbearing, loose (SP-SM)	COARSE ALLUVIUM	6	W	SS	18					
13–14	SAND, medium to fine grained, gray, waterbearing, loose (SP)		7	W	SS	14	19				4
15–17	SAND, fine to medium grained, gray, waterbearing, loose (SP)		7	W	SS	12					
18–24	SAND WITH SILT, fine grained, gray, waterbearing, medium dense to dense (SP-SM)		15	W	SS	16					
			30	W	SS	18	22				7
			39	W	SS	18					
25–27	CLAYEY SAND, a little gravel, gray, stiff (SC)	TILL	14	M	SS	24	13				
28–36	SANDY LEAN CLAY, a little gravel, gray, hard to very stiff (CL)		37	M	SS	24	12				
			54	M	SS	24	13				
			46	M	SS	24	17				
			36	M	SS	24	15				

DEPTH:	DRILLING METHOD	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-9½'	**3.25" HSA**							
9½-74½'	**RDF w/DM**	**5/30/19**	**8:40**	**11.5**	**9.5**	**9.7**		**9.2**
		5/30/19	**8:50**	**11.5**	**9.5**	**9.5**		**8.8**
BORING COMPLETED:	**5/30/19**							
DR: **SG** LG: **GH**	Rig: **91C**							

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-20475.GPJ AET+CPT+WELL_20181012_JG.GDT 6/18/19

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET No: **01-20475** Log of Boring No. **SB-3 (p. 2 of 2)**

Project: **Lift Station L-32 Improvements; Fridley, MN**

Anoka Co. Coordinates: N **121372** E **497492**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	WC	DEN	LL	PL	%-#200
38	SANDY LEAN CLAY, a little gravel, gray, hard to very stiff (CL) *(continued)*		30	M	SS	24	17				
40–41			25	M	SS	18	22				
43			22	M	SS	24	19				
45–46			22	M	SS	24	17				
48			26	M	SS	24	16				
50–51			34	M	SS	12	28				
52–54	SILTY SAND, a little gravel, brownish gray, dense (SM/SC)		41	M	SS	20					
54–55	SAND, fine to medium grained, gray, waterbearing, medium dense to dense (SP)	COARSE ALLUVIUM	22	W	SS	14	20				3
58			25	W	SS	12					
60–61			31	W	SS	14					
63			29	W	SS	18					
65–66	SAND WITH SILT, fine grained, gray, waterbearing, medium dense to dense (SP-SM)		23	W	SS	18					
68			26	W	SS	20					
70–71			28	W	SS	20					
73			31	W	SS	24					
75–76	SILTY SAND, a little gravel, fine to medium grained, gray, wet, dense (SM)		31	W	SS	24					
	END OF BORING										

FIELD & LABORATORY TESTS: WC, DEN, LL, PL, %-#200

AET_CORP W-COORDINATES 01-20475.GPJ AET+CPT+WELL_20181012_JG.GDT 6/18/19

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET No: **01-20475** Log of Boring No. **SB-4 (p. 1 of 2)**

Project: **Lift Station L-32 Improvements; Fridley, MN**

Surface Elevation **846.6** Anoka Co. Coordinates: N **121262** E **497450**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	SILTY SAND, with organic fines, a little gravel, trace roots, fine to medium grained, dark brown, moist, medium dense (SM) (possible fill)	TOPSOIL OR FILL	13	M	SS	6					
3	CLAYEY SAND WITH GRAVEL, brown, stiff (SC) (possible fill)	MIXED ALLUVIUM OR FILL	11	M	SS	12					
5	SAND, a little gravel, fine to medium grained, brown, moist, loose (SP)	COARSE ALLUVIUM	10	M	SS	10					
7	SAND WITH SILT, a little gravel, fine grained, reddish brown, moist, loose (SP-SM)										
8	SAND, fine grained, light brownish gray, moist to waterbearing, loose (SP)		10	M	SS	12					
10	SAND WITH SILT, fine grained, light brownish gray, waterbearing, medium dense (SP-SM)		15	W	SS	16					
13	CLAYEY SAND, a little gravel, gray, stiff (SC)	TILL	12	W/M	SS	16	14				
15	SANDY LEAN CLAY, a little gravel, gray, very stiff, a lens of sand (CL/SC)		30	M	SS	12	14				
18	SANDY LEAN CLAY, a little gravel, gray, very stiff to hard (CL/SC)		24	M	SS	14	19				
20			26	M	SS	24	16				
23			30	-	SS	0					
25			32	-	SS	0					
28			23	M	SS	10	19				
30			19	M	SS	24	18		31	14	
33			20	M	SS	24	19				
35			26	M	SS	24	15				

DEPTH:	DRILLING METHOD
0-16½'	3.25" HSA
16½-74½'	RDF w/DM

BORING COMPLETED: **5/31/19**

DR: **SG** LG: **CJ** Rig: **91C**

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
5/31/19	9:00	11.5	9.5	9.7		9.5
5/31/19	9:10	11.5	9.5	9.7		9.4

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP W-COORDINATES 01-20475.GPJ AET+CPT+WELL_20181012_JG.GDT 6/18/19

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET No: **01-20475** Log of Boring No. **SB-4 (p. 2 of 2)**

Project: **Lift Station L-32 Improvements; Fridley, MN**

Anoka Co. Coordinates: N **121262** E **497450**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	WC	DEN	LL	PL	%-#200
38	SANDY LEAN CLAY, a little gravel, gray, very stiff to hard (CL/SC) *(continued)*		45	M	SS	24	17 13				
40	CLAYEY SAND, a little gravel, gray, hard (SC)		53	M	SS	24					
42	SAND WITH SILT, a little gravel, fine to medium grained, gray to grayish brown, waterbearing, dense (SP-SM)	COARSE ALLUVIUM	45	W	SS	20					
45			45	W	SS	14	17				5
47			34	W	SS	12					
49	SAND WITH SILT, fine grained, grayish brown, waterbearing, very dense to medium dense (SP-SM)		52	W	SS	20					
52			30	W	SS	18	23				6
55			80	W	SS	18					
57			100/.1	-	SS						
60	SILTY CLAY, grayish brown, hard (CL-ML)	FINE ALLUVIUM	64	M	SS	24					
62	LEAN CLAY, brownish gray, hard (CL)		96	M	SS	24	16				
65			86	M	SS	20	24				
67	LEAN CLAY, brown, hard, laminations of silty sand (CL)		95	M	SS	22	26				
70	SILTY SAND, reddish brown, very dense (SM) *48/.5 + 86/.5 + 50/.4	TILL	*	M	SS	16					
72	SANDY LEAN CLAY, a little gravel, brownish gray, hard, laminations of sand (CL)		100/.3	M	SS	8	21				
75			100/.3	M	SS	8	12				
	END OF BORING										

AET_CORP W-COORDINATES 01-20475.GPJ AET+CPT+WELL_20181012_JG.GDT 6/18/19

SIEVE ANALYSIS TEST RESULTS

PROJECT:
Lift Station L-32 Improvements
Fridley, Minnesota

AET NO.: 01-20475

DATE: June 18, 2019

TEST METHOD: General conformance with ASTM:D6913, Method A

RESULTS:

Boring Number	SB-1	SB-1	SB-2	SB-2	SB-2
Sample Depth	17'-19'	59½'-61½'	27'-29'	49½'-51½'	52'-54'
Dry Sample Weight (gms)	195.85	183.57	163.88	180.26	229.06
Sieve Size or Number	**Percent Passing By Weight**				
3/4"	100	100	100	100	100
5/8"	100	94	100	100	100
1/2"	100	94	98	100	100
3/8"	100	94	98	100	100
#4	100	94	96	100	100
#10	100	93	92	100	100
#20	99	92	87	100	100
#40	78	88	80	99	99
#100	5.2	74	59	24	37
#200	2.2	36.6	50.2	5.8	7.1

Note: The small sample size limits the accuracy of the test, and the sample may not necessarily be representative of the entire layer shown on the boring log.

SIEVE ANALYSIS TEST RESULTS

PROJECT:
Lift Station L-32 Improvements
Fridley, Minnesota

AET NO.: 01-20475

DATE: June 18, 2019

TEST METHOD: General conformance with ASTM:D6913, Method A

RESULTS:

Boring Number	SB-3	SB-3	SB-3	SB-4	SB-4
Sample Depth	12'-14'	19½'-21½'	54½'-56½'	44½'-46½'	52'-54'
Dry Sample Weight (gms)	268.78	241.42	294.23	321.49	206.52
Sieve Size or Number	**Percent Passing By Weight**				
3/4"	100	100	100	100	100
5/8"	100	100	100	100	100
1/2"	99	100	100	100	100
3/8"	94	100	100	100	100
#4	89	100	100	100	100
#10	81	100	100	99	100
#20	69	100	98	96	100
#40	39	99	60	54	97
#100	6.7	35	4.8	7.7	14
#200	3.9	7.3	3.4	5.0	5.9

Note: The small sample size limits the accuracy of the test, and the sample may not necessarily be representative of the entire layer shown on the boring log.

EXPLORATION/CLASSIFICATION METHODS

SAMPLING METHODS

Split-Spoon Samples (SS) - Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM: D1586 with one primary modification. The ASTM test method consists of driving a 2" O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30". The sampler is driven a total of 18" into the soil. After an initial set of 6", the number of hammer blows to drive the sampler the final 12" is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically limited to about 60% of its potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

AET's drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30". The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviations of the N-values using this method are significantly better than the standard ASTM Method.

Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

CLASSIFICATION METHODS

Soil classifications shown on the boring logs are based on the Unified Soil Classification (USC) system. The USC system is described in ASTM: D2487 and D2488. Where laboratory classification tests (sieve analysis or Atterberg Limits) have been performed, accurate classifications per ASTM: D2487 are possible. Otherwise, soil classifications shown on the boring logs are visual-manual judgments. Charts are attached which provide information on the USC system, the descriptive terminology, and the symbols used on the boring logs.

The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

WATER LEVEL MEASUREMENTS

The ground water level measurements are shown at the bottom of the boring logs. The following information appears under "Water Level Measurements" on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement
- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

SAMPLE STORAGE

Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

BORING LOG NOTES

DRILLING AND SAMPLING SYMBOLS

Symbol	Definition
AR:	Sample of material obtained from cuttings blown out the top of the borehole during air rotary procedure.
B, H, N:	Size of flush-joint casing
CAS:	Pipe casing, number indicates nominal diameter in inches
COT:	Clean-out tube
DC:	Drive casing; number indicates diameter in inches
DM:	Drilling mud or bentonite slurry
DR:	Driller (initials)
DS:	Disturbed sample from auger flights
DP:	Direct push drilling; a 2.125 inch OD outer casing with an inner 1½ inch ID plastic tube is driven continuously into the ground.
FA:	Flight auger; number indicates outside diameter in inches
HA:	Hand auger; number indicates outside diameter
HSA:	Hollow stem auger; number indicates inside diameter in inches
LG:	Field logger (initials)
MC:	Column used to describe moisture condition of samples and for the ground water level symbols
N (BPF):	Standard penetration resistance (N-value) in blows per foot (see notes)
NQ:	NQ wireline core barrel
PQ:	PQ wireline core barrel
RDA:	Rotary drilling with compressed air and roller or drag bit.
RDF:	Rotary drilling with drilling fluid and roller or drag bit
REC:	In split-spoon (see notes), direct push and thin-walled tube sampling, the recovered length (in inches) of sample. In rock coring, the length of core recovered (expressed as percent of the total core run). Zero indicates no sample recovered.
SS:	Standard split-spoon sampler (steel; 1.5" is inside diameter; 2" outside diameter); unless indicated otherwise
SU	Spin-up sample from hollow stem auger
TW:	Thin-walled tube; number indicates inside diameter in inches
WASH:	Sample of material obtained by screening returning rotary drilling fluid or by which has collected inside the borehole after “falling” through drilling fluid
WH:	Sampler advanced by static weight of drill rod and hammer
WR:	Sampler advanced by static weight of drill rod
94mm:	94 millimeter wireline core barrel
▼:	Water level directly measured in boring
▽:	Estimated water level based solely on sample appearance

TEST SYMBOLS

Symbol	Definition
CONS:	One-dimensional consolidation test
DEN:	Dry density, pcf
DST:	Direct shear test
E:	Pressuremeter Modulus, tsf
HYD:	Hydrometer analysis
LL:	Liquid Limit, %
LP:	Pressuremeter Limit Pressure, tsf
OC:	Organic Content, %
PERM:	Coefficient of permeability (K) test; F - Field; L - Laboratory
PL:	Plastic Limit, %
q_p:	Pocket Penetrometer strength, tsf (approximate)
q_c:	Static cone bearing pressure, tsf
q_u:	Unconfined compressive strength, psf
R:	Electrical Resistivity, ohm-cms
RQD:	Rock Quality Designation of Rock Core, in percent (aggregate length of core pieces 4" or more in length as a percent of total core run)
SA:	Sieve analysis
TRX:	Triaxial compression test
VSR:	Vane shear strength, remolded (field), psf
VSU:	Vane shear strength, undisturbed (field), psf
WC:	Water content, as percent of dry weight
%-200:	Percent of material finer than #200 sieve

STANDARD PENETRATION TEST NOTES
(Calibrated Hammer Weight)

The standard penetration test consists of driving a split-spoon sampler with a drop hammer (calibrated weight varies to provide N_{60} values) and counting the number of blows applied in each of three 6" increments of penetration. If the sampler is driven less than 18" (usually in highly resistant material), permitted in ASTM: D1586, the blows for each complete 6" increment and for each partial increment is on the boring log. For partial increments, the number of blows is shown to the nearest 0.1' below the slash.

The length of sample recovered, as shown on the “REC” column, may be greater than the distance indicated in the N column. The disparity is because the N-value is recorded below the initial 6" set (unless partial penetration defined in ASTM: D1586 is encountered) whereas the length of sample recovered is for the entire sampler drive (which may even extend more than 18").

UNIFIED SOIL CLASSIFICATION SYSTEM
ASTM Designations: D 2487, D2488

AMERICAN ENGINEERING TESTING, INC.

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification: Group Symbol	Soil Classification: Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$[E]	GW	Well graded gravel[F]
			$Cu<4$ and/or $1>Cc>3$[E]	GP	Poorly graded gravel[F]
		Gravels with Fines more than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel[F.G.H]
			Fines classify as CL or CH	GC	Clayey gravel[F.G.H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$[E]	SW	Well-graded sand[I]
			$Cu<6$ and/or $1>Cc>3$[E]	SP	Poorly-graded sand[I]
		Sands with Fines more than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand[G.H.I]
			Fines classify as CL or CH	SC	Clayey sand[G.H.I]
Fine-Grained Soils 50% or more passes the No. 200 sieve (see Plasticity Chart below)	Silts and Clays Liquid limit less than 50	inorganic	PI>7 and plots on or above "A" line[J]	CL	Lean clay[K.L.M]
			PI<4 or plots below "A" line[J]	ML	Silt[K.L.M]
		organic	Liquid limit–oven dried / Liquid limit – not dried <0.75	OL	Organic clay[K.L.M.N] Organic silt[K.L.M.O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K.L.M]
			PI plots below "A" line	MH	Elastic silt[K.L.M]
		organic	Liquid limit–oven dried / Liquid limit – not dried <0.75	OH	Organic clay[K.L.M.P] Organic silt[K.L.M.Q]
Highly organic soil			Primarily organic matter, dark in color, and organic in odor	PT	Peat[R]

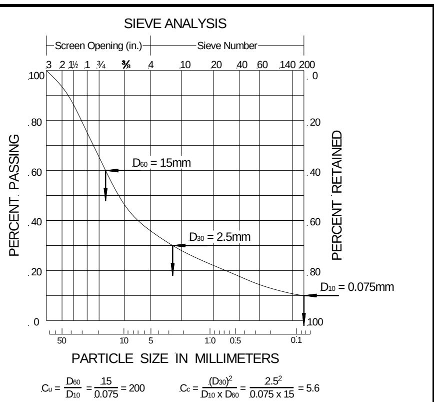
Notes

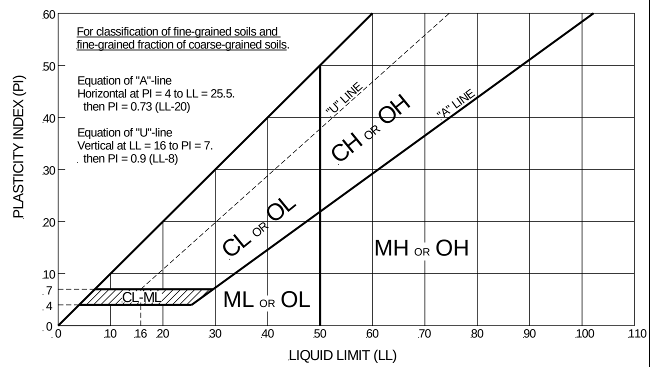
[A]Based on the material passing the 3-in (75-mm) sieve.
[B]If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C]Gravels with 5 to 12% fines require dual symbols:
- GW-GM well-graded gravel with silt
- GW-GC well-graded gravel with clay
- GP-GM poorly graded gravel with silt
- GP-GC poorly graded gravel with clay

[D]Sands with 5 to 12% fines require dual symbols:
- SW-SM well-graded sand with silt
- SW-SC well-graded sand with clay
- SP-SM poorly graded sand with silt
- SP-SC poorly graded sand with clay

[E]$Cu = D_{60}/D_{10}$, $Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F]If soil contains ≥15% sand, add "with sand" to group name.
[G]If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H]If fines are organic, add "with organic fines" to group name.
[I]If soil contains ≥15% gravel, add "with gravel" to group name.
[J]If Atterberg limits plot is hatched area, soils is a CL-ML silty clay.
[K]If soil contains 15 to 29% plus No. 200 add "with sand" or "with gravel", whichever is predominant.
[L]If soil contains ≥30% plus No. 200, predominantly sand, add "sandy" to group name.
[M]If soil contains ≥30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N]PI≥4 and plots on or above "A" line.
[O]PI<4 or plots below "A" line.
[P]PI plots on or above "A" line.
[Q]PI plots below "A" line.
[R]Fiber Content description shown below.





Plasticity Chart

ADDITIONAL TERMINOLOGY NOTES USED BY AET FOR SOIL IDENTIFICATION AND DESCRIPTION

Grain Size

Term	Particle Size
Boulders	Over 12"
Cobbles	3" to 12"
Gravel	#4 sieve to 3"
Sand	#200 to #4 sieve
Fines (silt & clay)	Pass #200 sieve

Gravel Percentages

Term	Percent
A Little Gravel	3% - 14%
With Gravel	15% - 29%
Gravelly	30% - 50%

Consistency of Plastic Soils

Term	N-Value, BPF
Very Soft	less than 2
Soft	2 - 4
Firm	5 - 8
Stiff	9 - 15
Very Stiff	16 - 30
Hard	Greater than 30

Relative Density of Non-Plastic Soils

Term	N-Value, BPF
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	Greater than 50

Moisture/Frost Condition (MC Column)

D (Dry):	Absence of moisture, dusty, dry to touch.
M (Moist):	Damp, although free water not visible. Soil may still have a high water content (over "optimum").
W (Wet/ Waterbearing):	Free water visible intended to describe non-plastic soils. Waterbearing usually relates to sands and sand with silt.
F (Frozen):	Soil frozen

Layering Notes

Laminations:	Layers less than ½" thick of differing material or color.
Lenses:	Pockets or layers greater than ½" thick of differing material or color.

Peat Description

Term	Fiber Content (Visual Estimate)
Fibric Peat:	Greater than 67%
Hemic Peat:	33 – 67%
Sapric Peat:	Less than 33%

Organic Description (if no lab tests)

Soils are described as *organic*, if soil is not peat and is judged to have sufficient organic fines content to influence the Liquid Limit properties. *Slightly organic* used for borderline cases.

Root Inclusions

With roots:	Judged to have sufficient quantity of roots to influence the soil properties.
Trace roots:	Small roots present, but not judged to be in sufficient quantity to significantly affect soil properties.

Appendix C

Environmental Assessment Worksheet (EAW)

MCES L32A Lift Station

Environmental Assessment Worksheet (EAW)

Prepared for the
Metropolitan Council Environmental Services (MCES)

By
Stantec Consulting Services, Inc.

February 24, 2021

Table of Contents

List of Appendices

List of Figures (Appendix A)

List of Tables/Charts

1. Project Title

MCES L32A Lift Station Environmental Assessment Worksheet (EAW)

2. Proposer

Proposer	Metropolitan Council Environmental Services (MCES)
Contact	Jeannine Clancy
Title	Assistant General Manager, Technical Services
Address	390 Robert St N St. Paul, MN 55101
Phone	651-602-1210
Email	Jeannine.Clancy@metc.state.mn.us

3. RGU

RGU:	Minnesota Pollution Control Agency (MPCA)
Contact:	Dan Card
Title	Supervisor, Environmental Review Unit
Address	520 Lafayette Road St. Paul, MN 55155
Phone	651-757-2261
Email	dan.card@state.mn.us

4. Reason for EAW Preparation: (check one)

Required:	Discretionary:
☐ EIS Scoping	☐ Citizen petition
X Mandatory EAW *Minnesota Rules 4410.4300 Subp. 18B*	☐ RGU discretion
	☐ Proposer initiated

5. Project Location

County: Anoka County
City: Fridley
PLS Location (¼, ¼, Section, Township, Range): Section 10, Township 30, Range 24
Watershed (81 major watershed scale): Mississippi River – Twin Cities Watershed
GPS Coordinates: Approximately 45.094154,-93.2780001
Tax Parcel Number: 103024430021, 103024430001, 103024430002, 103024420003

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project.
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.

All required maps and additional full-page maps displaying relevant information are found in Appendix A. The County map, USGS Map and EAW Boundary map are shown in Figure 5-1, 5-2 and 5-3.

6. **Project Description**

   a. **Provide a project summary of 50 words or less to be published in the *EQB Monitor*.**
   Metropolitan Council Environmental Services (MCES) is proposing to construct a new sanitary sewer lift station (L32A) at 6900 East River Road in the City of Fridley. The lift station is proposed to have a capacity of 67 million gallons per day (mgd) and will involve construction of a single-story control building.

   b. **Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.**

   Metropolitan Council Environmental Services (MCES) is proposing to construct a new lift station L32A. MCES has purchased the former Girl Scout Camp Lockeslea site, located along the eastern banks of the Mississippi River in the City of Fridley, for the purpose of constructing and operating a sanitary sewer lift station. The facility will occupy approximately seven acres of the 22-acre site.

   The new lift station in Fridley is to replace the aging facility in Brooklyn Park that is 50 years old and has a maximum capacity of 43 MGD and has reached the end of its useful life. Extensive rehabilitation to the existing lift station requires more space than what is available at the current site. Additionally, it lacks adequate storage to allow for response time during power outages which may lead to sewer backups. The new L32A is one part of MCES's multi-phase approach to preserve wastewater assets in the Fridley area and will provide additional capacity to accommodate future population growth in the area. Wastewater from this facility will be pumped to the Metropolitan Wastewater Treatment Plant in St. Paul.

   The Camp Lockeslea site was purchased by MCES in March 2016 with the intent to serve as the site for the new lift station, located at 6900 East River Road. The Girl Scouts requested a lease termination as of October 1, 2020. The existing Brooklyn Park lift station site will continue to be used for an odor control facility and pipe access structures. Limited site work will be conducted at the existing Brooklyn Park lift station site to make the connection to the new lift station in Fridley.

   Planning for L32A in Fridley began in 2019 with collecting site information and creating a concept plan for the lift station within the site. The design of the lift station and site will occur in 2021-2022 with construction beginning in 2022. The lift station is anticipated to be operational in 2026.

   Figure 6-1 illustrates the proposed construction area and site plan for the L32A Lift Station.

c. Project Magnitude

Table 6-1: Proposed Acreage Assumptions for L32A Lift Station

Total Project Acreage	7 acres
Linear project length	710 feet
Number and type of residential units	0
Commercial building area (in square feet)	0
Industrial building area (in square feet)	6,000 square feet[1]
Other uses – specify (in square feet)	-
Lift Station	6,000 square feet
Structure height(s)	One story

d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The new lift station in Fridley is to replace the aging facility in Brooklyn Park that is 50 years old and has reached the end of its useful life. Extensive rehabilitation to the existing lift station requires more space than what is available at the current site. Additionally, it lacks adequate storage to allow for response time during power outages which may lead to sewer backups. The new facility will preserve wastewater system assets and will accommodate growth within local communities. The new L32A is one part of MCES's multi-phase approach to preserve wastewater assets in the Fridley area and will provide additional capacity to accommodate future population growth in the area. Wastewater from this facility will be pumped to the Metropolitan Wastewater Treatment Plant in St. Paul.

e. Are future stages of this development including development on any other property planned or likely to happen? If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

No. Future stages of the Lift Station L32A improvements are not currently planned. However, this project is one part of a larger asset renewal plan and there is additional work in the area going through the design phase. These future projects would be subject to their own environmental review at the time of their proposal.

f. Is this project a subsequent stage of an earlier project? If yes, briefly describe the past development, timeline and any past environmental review.

No

[1] A single-story control building will be constructed over the lift station. Square-footage is listed twice, but will only occupy 6,000 square feet of land in total.

7. Cover Types: Estimate the acreage of the site with each of the following cover types before and after development.

Land cover in the EAW area was determined based on the Minnesota Land Cover Classification System (MLCCS) data from 2008. The MLCCS is a natural resource inventory classification system used to standardize land cover identification and interpretation in Minnesota. MLCCS data for the EAW area was developed by the Anoka Conservation District (ACD) in coordination with the Minnesota DNR and other local partners. The system categorizes open and developed areas in terms of land cover, rather than land use, using a 16-class land cover classification scheme. This EAW categorizes land cover boundaries based upon the National Land Cover Database (NLCD). For example, land cover identified as "wetlands" is calculated based on vegetation viewed from a high altitude and from a 30-meter resolution. It is not delineated wetlands but instead vegetative cover inside a grid that fits into categories of "woody wetland" and "emergent herbaceous wetlands."

As illustrated in Table 7-1 and Figure 7-1, cover types vary minimally within the EAW area, with most land currently covered by forests. There is a segment of land leading from East River Road and ballooning into the site that is classified as artificial surfaces and associated areas, representing the functional areas of Camp Lockeslea. Another portion of land cover running along the site's northern boundary is classified as planted or cultivated vegetation. Current land cover is illustrated in Figure 7-1.

Table 7-1: **Existing Land Cover in the EAW Area**

MLCCS Land Cover	Before	After	MLCCS Land Cover	Before	After
Wetlands	3.4[2]	3.4	Lawn/ landscaping	2.1	2.1
Deep water/streams	0	0	Impervious surface	3.7	4.2
Wooded/forest	12.9	12.4	Stormwater Pond	0	0
Brush/Grassland	0	0	Other (describe)	0	0
Cropland	0	0			
			TOTAL	**22.1**	**22.1**

[2] There is a delineated wetland on site, which is not designated in the MLCCS Land Cover Data. The wetland is included in table 7.1 above and is discussed in Question 11 iv.a. surface waters. A wetland delineation report is also included as Appendix B.

8. Permits and Approvals Required

List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Table 8-1 lists all permits that are anticipated to be required or may be required depending on the specific project type, for development in the EAW area.

Table 8-1: Anticipated Permit Requirements

Unit of Government	Type of Approval or Permit	Status
City of Fridley	Site Plan Review	Not submitted
	Conditional Use Permit	Not submitted
	Grading Permit	Not submitted
	Sewer Connection Permit	Not submitted
	Water Connection Permit	Not submitted
	Building Permits	Not submitted
	MN Local/State/Federal Application for Water/Wetland Projects and the Wetland Replacement Plan Supplement, if needed	Not submitted
	Floodplain Permit, if needed	Not submitted
	Critical Area District Site Plan Approval	Not submitted
Rice Creek Watershed District	Project Review Approval	Not submitted
Anoka County	County Roadway Access permits	Not submitted
	Sanitary Sewer Plan Approval	Not submitted
	Small Generator Hazardous Waste Permits	Not submitted
	Utility Permit	Not submitted
Minnesota Department of Health	Water Main Plan Review	Not submitted
	Notification or Permit for Well Construction or Alteration	Not submitted
	Notification or Permit for Well Sealing	Not submitted
Minnesota Department of Natural Resources	Public Waters Work Permit	Not submitted
	Temporary Water Appropriation Permit for construction dewatering	Not submitted
Minnesota Pollution Control Agency	Air Emission Facility Permit	Not submitted
	401 Water Quality Certification	Not submitted
	NPDES MS4 Stormwater Discharge Permit	Not submitted
	NPDES Stormwater Permit	Not submitted
	Sanitary Sewer Extension Permit	Not submitted
Metropolitan Council	Wastewater System Nonobjection Decision MCES connection permit	Not submitted
	Comprehensive Plan Amendment	Pending

9. Land Use

a. Describe:

i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

Existing land use within the project site is Institutional. As stated in previous questions, the prior use of the property was Camp Lockeslea Girl Scout Camp. There is existing utility infrastructure on the south side of the project site, located within a 60-foot utility easement.

The surrounding land use is predominately single-family residential. The project site is bordered by single-family homes to the north and south. The Mississippi River borders the project site to the west, and East River Road forms the eastern boundary of the site.

There are no parks or trails located within or adjacent to the site. The area surrounding the site is developed as single-family residential and does not have prime or unique farmlands.

Existing land use is illustrated in Figure 9-1.

ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

The City of Fridley is currently in the final steps of updating their 2040 Comprehensive Plan which addresses planned future land uses and policies for the entire city. Land within the project site is guided Utility on the southern 1/3 of the site, and Park and Recreation on the northern 2/3 of the site. The northern portion of the site includes a wetland, which is further described in Question 11, Water Resources. The planned land uses surrounding and adjacent to the site are single-family residential.

The planned land use for the site is illustrated in Figure 9-2.

iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

Land within the project site is zoned Public Facilities District (P). The adjacent land is zoned One Family Dwelling District (R-1). Permitted uses in the Public Facilities District include public buildings and uses, as well as public drains, sewers, water lines, water storage, treatment and pumping facilities and other public utility service facilities. Due to the site's proximity to the Mississippi River, there are also several special overlay districts that apply to the site including the Floodplain Management Overlay District, Critical Area Overlay District, Wetland Overlay District and Shoreland Overlay District. The base zoning map for the site is illustrated in Figure 9-5.

The City of Fridley has established three floodplain management overlay districts in the City. These districts include:

1. Floodway District: areas designated as a floodway by FEMA.

2. Flood Fringe District: areas designated as a 100-year floodplain (Zone AE) by FEMA that are adjacent to a floodway, but outside a floodway.
3. General Floodplain District: areas designated as a 100-year floodplain (Zone A or Zone AE) by FEMA without a floodplain.

The western portion of the project site adjacent to the River is designated as a floodway by FEMA, and a small portion of the area is designated Flood Fringe, or within the 100-year floodplain (Zone AE). Within these areas, special regulations are in place to protect from flooding. Permitted uses include agricultural uses, industrial and commercial loading areas, parking areas, private and public park, utilities, and recreational areas (excluding buildings), and lawns or gardens. Generally, any uses in these areas will have a low flood damage potential and will not obstruct flood flows or increase flood elevations. More information about the floodplain regulations can be found in the City's Zoning Code §205.27 O-1. The floodplain is shown in Figure 9-3.

The Mississippi River Corridor Critical Area (MRCCA) and corresponding Critical Area Overlay District are also applicable within the EAW boundary. The project site has both the CA-RN (River Neighborhood District) and CA-SR (Separated from River District) management districts. The CA-RN district is characterized by residential neighborhoods that are riparian, readily visible from the river, or that abut riparian parkland. The CA-SR district is characterized by its physical and visual distance from the Mississippi River and includes land separated from the River by distance, topography, development, or a transportation corridor. More information about the Critical Area Overlay district can be found in the City's Zoning Code §205.28 O-2. The zoning code requires that a site plan be submitted per requirements in §205.28 (7) prior to approval of any building or zoning permit. The MRCCA and Critical Area Overlay is illustrated in Figure 9-4.

The Shoreland Overlay District applies to the project area due to the proximity to the Mississippi River. The shoreland district is overlaid upon zoning districts, and the regulations and requirements are applied in addition to those established by the base zoning district (P - Public Facilities). In the shoreland overlay district, certain setbacks apply for structures within the shore and bluff areas. Per Fridley City Code, structures must be setback 100 feet from the ordinary high water level of the river, and 40 feet from the top of the bluff. A permit will be required from the City for all work within the shoreland overlay district and will be sought as part of the permitting process. The shoreland overlay district is described further in the City of Fridley Zoning Code §205.32 O-7, and shown in Figure 9-3

Finally, the EAW area also contains a wetland outside of the 7-acre project site and is within the wetland overlay district. A wetland delineation has been conducted as part of this project, which is discussed in Question 11 and the full delineation report can be seen in Appendix B.

b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The construction of a lift station is consistent with existing land use, planned future land use and base zoning of the EAW area. The City previously considered development of residential on the northern half of the subject property. The proposed 2040 Comprehensive Plan guides this area as park, which is a more compatible use to the proposed lift station. The northern portion of the EAW site is guided as park on the future land use map, as the lift station development is anticipated to be confined to the southern 1/3 of the site, leaving the northern 2/3 of the site for park development.

The EAW project site is bordered to the north and south by land zoned, guided and developed as single-family residential. There may be potential impacts between the proposed project and the single-family land uses. The project should minimize the impacts on single-family homes through odor mitigation and by actively addressing any other identified impacts to single-family homes.

Several zoning overlays also apply to portions or the entirety of the EAW area, as discussed above. The entire site is within the Critical Area Overlay District (MRCCA) and portions of the site are designated CA-RN and CA-SR. Standards defined in the City's zoning code §205.28 O-2 regarding building, views, setbacks and other requirements specific to this district will need to be met by the project. Specifically, new structures must be placed not less than 40 feet from the top of the bluff line, and not less than 100 feet from the Mississippi river ordinary high water line. An exception to this is approved river crossings of essential services and distribution services. A portion of the EAW site is also in the 100-year floodplain (Zone AE). A coffer dam may need to be installed in the river during construction to access the existing forcemain. This work will be regulated as part of the permitting process for work within the floodplain/shoreland district.

c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

The proposed project will include two measures aimed at mitigating any potential incompatibility with the surrounding uses. Given the nature of the project, the proposed lift station will involve odor control methods to mitigate the effect of the project on neighboring properties. The City has also guided the land north of the proposed project as park to provide a buffer between the residential area to the north and the proposed lift station project. This land was initially guided for residential development and has since been guided as park to be more compatible with the proposed lift station.

10. Geologic Hazards and Soil Conditions

a. Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

The surficial geology across the project site is comprised of Richfield terrace sands and gravelly sands, deposited during the Wisconsin episode of glaciation. This material is typically found 50 to 70 feet above the modern floodplain, at an elevation of 870 feet in the Fridley area. This material is underlain by New Ulm Formation deposits of mixed till, comprised of loam to sandy-loam textured sediments along with an unsorted mixture of pebbles, cobbles, and boulders.

Depth to bedrock is estimated to be 150-200 feet over most of the project site, with the depth being 100-150 feet along the river's edge. The uppermost bedrock unit, as mapped by the Anoka County Geologic Atlas, is the Jordan sandstone. Small sub-croppings of Prairie du Chien dolomite are mapped to the north and south of the project site, but not at the site itself.

Karst conditions most generally occur where carbonate bedrock (limestone, dolomite) is present within 50 feet of the land surface. Since those conditions do not appear to exist at the project site, the likelihood of karst conditions is low.

b. Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

The following soil types were identified within project site, using the NRCS Web Soil Survey online application provided by the US Department of Agriculture. Figure 10-1 shows the mapped soil types present.

Table 10-1: Soil Types

Map Unit Symbol	Map Unit Name	Hydrologic Soil Group	Aquifer Sensitivity	Drainage	Percent of Area
D64B	Urban land – Hubbard complex, Mississippi River Valley, 0-8% slopes	A	Not rated	Excessively drained	4.4%
Ma	Markey muck, occasionally ponded, 0-1% slopes	A/D	Sensitive	Very poorly drained	30.6%
UhdD	Urban land – Hayden complex, 15-25% slopes	B	Not rated	Well Drained	0.5%
UzB	Urban land – Zimmerman complex, 0-8% slopes	A	Not rated	Excessively drained	63.4%
W	Water	---	---	---	1.2%

Topography in the project site is variable, with a slight to moderate slope over the majority of the site, except along the western edge of the site bordering the Mississippi River, where steeper slopes are present. A flat area is also present where the wetland has been delineated. Drainage is towards the Mississippi River to the west. Soils are generally highly permeable and well-drained, except for the Markey Muck, which is present under the delineated wetland.

Soil hydrologic groups are mostly Group A, which have a high infiltration rate and low runoff potential. These soils are typically deep, well-drained sandy or gravelly soils with a high rate of water transmission. Approximately 68% of the project site is overlain by Group A soils. Group B soils have a moderate infiltration rate and are somewhat finer to moderately coarse textures. Less than 1% of the project site is overlain by Group B soils. Group A/D soils have a high infiltration rate when they are drained but have a very slow infiltration rate when saturated. Approximately 31% of the project site is overlain by Group A/D soils. Since the A/D soils are represented by the Markey Muck, which is present under the delineated wetland, it should be assumed that the soils are generally saturated and will have a slow infiltration rate.

While most of the soils types present do not have an identified sensitivity rating for the underlying aquifer, the high rates of infiltration present with Group A soils tend to have a higher sensitivity. Therefore, it should be assumed the underlying aquifer is sensitive to infiltration across much of the project site.

Soil erosion hazards were not well defined for the soil types, except for the Markey Muck which has a low erosion potential. For the other soil types, erosion potential should be assumed to be higher in areas where topography is steeper, particularly along the edge of the Mississippi River valley.

The volume of excavation will vary from 36,000 cubic yards to 63,000 cubic yards, depending on the final design chosen for the lift station. Approximately 75% of the excavated soils will be exported off site for disposal. The remaining soil will be stockpiled on site and used to fill in excavated areas around the completed lift station. To reduce soil erosion and runoff, silt fence will be employed around the excavated areas and the stockpiled soil. The stockpile will also be seeded and/or covered as necessary to prevent runoff of loose soil.

11. Water Resources

a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.

i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

Surface waters within one mile of the project site include Locke Lake, the Mississippi River, Rice Creek, and multiple wetlands of various designations. Tables 11-1 and 11-2 below list impaired waters from the MPCA's Impaired Waters List and public waters from the DNR's Public Waters Inventory (PWI) List. According to the Minnesota Wild and Scenic Rivers System, the Upper Mississippi River is classified as "recreational" in the section running along the site.

Table 11-1: Impaired Waters Within One Mile of the Project Site

Impaired Water	Distance to Project Boundary	Impairment
Stream from Long Lake to Locke Lake	0.5 miles from Eastern site border	Benthic Macroinvertebrates Bioassessments, Fish Bioassessments
Silver Creek from Locke Lake to the Mississippi River	0.25 miles from Southern site border	Benthic Macroinvertebrates Bioassessments, Dissolved Oxygen, Fish Bioassessments
Mississippi River Between Crow River and Upper St. Anthony Falls	0.05 miles from Western site border	PCBs in Fish Tissue, Nutrients, Fecal Coliform
County Ditch Number Seventeen	0.98 miles from Northern site border	Benthic Macroinvertebrates Bioassessment, Escherichia coli (E. coli)

Table 11-2: DNR Public Waters Within One Mile of the Project Site

Name	DNR Public Waters Inventory Number	Distance to Project Boundary
Locke Lake	02007700	0.17 miles from Southern site border

Within a one-mile radius of the site, there are over 150 acres of wetlands, including 3.37 acres on the project site itself. More wetland delineation information is detailed in Section *iv, a* below.

ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

The water table aquifer in the project site is located within the Prairie du Chien dolomite bedrock. No springs or seeps were identified on the property.

1. **Depth to groundwater:** Groundwater at the project site ranges between 0 feet and 50 feet in depth, based on nearby well data and soil borings. Groundwater is expected to be at or near the surface in the vicinity of the delineated wetland. Soil

borings completed at the proposed site of the lift station construction show two different depths to groundwater. Some borings show what appears to be a perched water table at approximately 7-9 feet below the ground surface. Depth to water in the sand-and-gravel aquifer appears to be 30-50 feet, reflecting the water elevation of the Mississippi River, which the aquifer is hydraulically connected to. Based on the estimated excavation depths, it is likely that dewatering will be required to complete the project construction.

2. **MDH wellhead protection area:** The entire project site falls within the wellhead protection area for the City of Brooklyn Center. This wellhead protection area is considered to be "vulnerable" to contamination from spills occurring at or near the land surface. Vulnerability is generally based on the lack of low-permeability layers existing between the land surface and the aquifer. Brooklyn Center's wells utilize the Jordan aquifer, which is located approximately 150-200 feet below the land surface at the project site.

No wells were identified at the project site, following a search of the County Well Index database. However, this does not rule out the possibility that wells may exist on the project site, as the database often does not include older wells that pre-date the Minnesota Well Code. Most of the properties surrounding the project site are connected to municipal water, so it is believed that very few private wells exist in the surrounding neighborhood. Well locations within ½ mile of the site are shown in Figure 11-1.

b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

1. **If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.**
2. **If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.**
3. **If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.**

The Metropolitan Council Environmental Services (MCES) Lift Station L32A proposed to be built at Camp Lockeslea in Fridley is intended to provide additional pumping capacity for the MCES wastewater system, moving 67 million gallons per day. Wastewater will flow by gravity through the existing forcemains which will be converted to gravity siphon pipes allowing flow to be diverted by gravity to the new lift station on the east side of the river at Camp Lockeslea. The water stored at this lift station is ultimately treated at the MCES

Metropolitan Wastewater Treatment Plant and discharged to the Mississippi River. This plant is located at 2400 Childs Rd., St Paul, MN 55106, about 16 miles from the site. Expanding the capacity of wastewater lifting is necessary in this area because the existing lift station is reaching the end of its useful life and storage and pumping capacity need to be increased to better mitigate power outages and future population growth. Adding a new lift station is proposed rather than rehabilitating the existing site because the Brooklyn Park site lacks adequate space for the desired capacity.

Wastewater discharge from Lift Station L32A will not be discharged to surface water or to a subsurface sewage treatment system. Instead, it will flow to the publicly owned treatment facility, MCES Metropolitan Wastewater Treatment Plant (Childs Road, St. Paul). Wastewater will flow directly into the wet-well without pre-treatment. The proposed lift station will contribute minimal wastewater discharge. The EPA estimated wastewater discharges for residential users to be 300 gallons per unit per day, and discharges for parks to be 50 gallons per acre per day, which at seven acres, would be 350 gallons per day. Projected discharge from the lift station property will likely be less than 350 gallons per day. The discharge should not significantly impact the quantity of water flowing into the MCES Metropolitan Wastewater Treatment Plant, which is designed to treat 251 million gallons per day.

Wastewater discharges from this site will be typical domestic wastewater discharges. There is no industrial wastewater produced on site. There is no required expansion of municipal wastewater infrastructure to accommodate the wastewater discharge of this project.

ii. Stormwater - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

Regulatory Context: Under proposed conditions, a stormwater management system will be implemented to address local, state, and federal requirements, as discussed below. This system will generally consist of Best Management Practices (BMPs) that provide rate control, volume control, and/or water quality treatment. A variety of permanent and temporary stormwater management features may be used, including but not limited to channels, vegetative restoration, silt fencing, and detention ponds, depending on the features of the site.

Among others, the proposed project must consider regulations including the NPDES Construction General Permit, MPCA regulations, Rice Creek Watershed District (RCWD) standards, and relevant municipal regulations (City of Fridley). The City of Fridley's stormwater system is a small municipal separate storm sewer system (MS4) permitted through the Minnesota Pollution Control Agency, which must comply with the MS4 general permit for stormwater management and discharge control. A stormwater Pollution Prevention Plan (SWPPP) outlines the activities that a city undertakes as part of this Permit, specific to its respective watershed district. Common stormwater discharge concerns within the Rice Creek Watershed Management Plan include increased nutrient flow, accelerated sedimentation, and the health of wetlands. Water quality treatment on-site will be designed to meet Rice Creek Watershed District Standards, including maximum TSS removal, at least 85% of reconstructed impervious surface treated for phosphorous, and a detention pond depth of 1.1 inches times the area of impervious surface. Further information on detention volumes and preliminary sizing of detention facility for this site is described below in the Best Management Practices section.

Site Context: In monitoring and estimating the flow of stormwater, there are six main topographic highs on the west and east portion of the site, indicated in the topographic map found in Figure 11-2. Starting with the two easternmost highpoints, most of the water will likely flow down the steep grade indicated in orange, leading directly into the on-site wetland. A small portion of the eastern flow will go towards East River Road, which will be conveyed by storm sewer. Water coming from the other four highpoints, located in the western portion of the site, will largely flow west towards the Mississippi River, with a small portion also flowing into the on-site wetland, which exists as a low point. Overall, most of the water flowing through the site will drain to the Mississippi River, with a small portion draining into the on-site wetland, and an even smaller portion draining towards East River Road.

Addition of impervious surfaces will be minimal on the site, as most of the site's natural features will be preserved. New impervious surfaces will include the lifting station, a small parking lot, a picnic area, a short turnaround, and a footpath. Any increase in impervious surface area on site (i.e. the addition of a road) may potentially increase runoff rates and volumes, so stormwater BMPs must be considered. The largest potential source of pollution from the site would be the new parking lot and turnaround leading to the lift station, which could include oil, exhaust, and trash. However, this has limited access and will not be heavily used daily, so pollution concerns are relatively small.

Figures 11-3 and 11-4 show the approximate location of the lift station, as well as a concept development of the site described above.

Best Management Practices: Best Management Practices implemented on the site must address both permanent and temporary runoff controls. Permanent BMPs to address erosion and pollution mitigation may include a detention pond, bioretention pond, or a similar structure, following the guidelines provided by the Rice Creek Watershed District. The Rice Creek Watershed District's water quality treatment standard is determined by the new or reconstructed impervious acreage on the site. The standard is 1.1 inches of water retained for each acre of new or reconstructed impervious surface on site. Based on preliminary estimates, the site has roughly 2.5 acres of impervious surface which in order to treat according to Rice Creek standards, would require a detention facility of roughly 400 square feet to treat all of the impervious surfaces on site.

Minimizing the damage and removal of natural trees and vegetation on the plot is the most important sedimentation control and stabilization measure for the project, as most of the plot will be kept in its natural state to buffer the effects of development. Channels and ditches, especially along the constructed road, can be used if needed.

Temporary erosion controls will also be used for the period during and immediately after construction. These temporary BMPs include erosion control blankets and silt fences, which help prevent large-scale sediment removal during the project process itself and would likely be built on the steep slope leading into the Mississippi River on the west side of the site. This is where runoff velocity is expected to be the highest.

iii. Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

During construction activities, it is anticipated that dewatering to an elevation of 780 feet will be required. A series of temporary dewatering wells will likely need to be constructed in a circular pattern around the construction site. These temporary wells would likely be 100 feet in depth and spaced every 50-100 feet around the project site.

Any dewatering activity that exceeds 10,000 gallons per day or 1 million gallons per year requires a DNR Water Appropriation permit. A continuous dewatering rate of 7gpm exceeds this threshold, so it is anticipated that this permit will be required, as the actual pumping rate is expected to be much higher. Two private domestic water supply wells are located within 0.5 miles of the proposed site of dewatering on the east side of the Mississippi River. The unique numbers of these wells are 206655 and 223735. Both of these wells are completed in the deeper bedrock aquifers and are not anticipated to be negatively affected by the dewatering activities, as the dewatering wells are not expected to reach the bedrock nor will they draw groundwater below the top of the bedrock. A number of private domestic wells are located on the west side of the Mississippi River near the project site. The river acts as a major hydrogeologic boundary for the unconsolidated aquifer, however, so dewatering activities at the project site is unlikely to have any measurable impacts to wells west of the river.

Following completion of dewatering activities, the temporary dewatering wells will need to be sealed with grout by a licensed well contractor. This is required by the Well Code to ensure the wells do not become a potential pathway for contaminants to enter the aquifer.

The completed facility will have a water connection with the City of Fridley capable of delivering an estimated 200gpm of water to the facility for washing and maintenance. This water would only be used periodically and would not represent a significant increase in annual water pumped by the City's wells. The current City of Fridley water supply system has sufficient capacity to supply this need without any additional infrastructure or increases in the annual water appropriation permit.

iv. Surface Waters

a) Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.

A field survey was completed October 2018 to locate and verify the presence of wetlands within the of the Project area using the Routine On-Site Determination Method defined in the USACE Wetland Delineation Manual (USACE, 1987), subsequent guidance documents (USACE, 1991 and 1992), and the Midwest Regional Supplement (USACE, 2010). A copy of the wetland delineation report is included in Appendix B. The wetland delineation report identified two wetlands within the property, totaling about 3.37 acres of site area. The largest wetland area, located in the center of the property, was determined to be a shrub-scrub, broad-level deciduous, seasonally saturated (PSS1B) type wetland. On the west central portion of the property, a smaller wetland area was identified as an isolated, depressional, fresh meadow (PEMB) type wetland.

Within one mile of the site, over 150 acres of wetland delineated areas were identified using the National Wetlands Inventory database. This largely consists of freshwater and forested shrub wetland, as well as freshwater emergent wetland.

Non-isolated wetlands and most waterways are considered Waters of the United States (WOTUS); therefore, they are subject to regulation by the U.S. Army Corps of Engineers (USACE) under the Clean Water Act (CWA) and the jurisdictional regulatory authority lies with the USACE. The MNDNR has regulatory authority over certain wetlands, navigable waters, and adjacent lands under Statute 103G and Rule 6115.0250. All wetlands are protected under the Wetland Conservation Act Rules Chapter 8420 and administered by a local government unit (LGU). An LGU can be a city, county, watershed district or soil and water conservation district depending on project location.

The project will likely not result in any direct temporary or operational impact, as the Lift Station is located outside of the designated wetlands area, towards the south of the site. The parking lot, picnic area, and footpath on the site intentionally avoid the wetland area as to minimize wetland disturbance. However, due to the project location being so close to wetland areas, indirect impacts are possible.

During construction, all reasonable measures must be taken to prevent mixing of topsoil and subsoil in wetland delineated areas during grubbing and trenching. Significant dewatering may be needed to construct the piping and lift station. Permanent erosion controls may be installed in adjacent upland areas during construction and restoration and may include slope breakers, interceptor diversion devices, and/or vegetative cover to minimize long-term sedimentation into the wetlands. Energy dissipation devices may be installed at the down-slope end of surface water diversion devices to prevent erosion off the site into wetlands.

After the completion of construction, wetland areas will generally be allowed to revegetate naturally. Emergent wetlands will revert to pre-existing conditions within one to two growing seasons following construction and should be monitored for a minimum of three years after the completion of construction to ensure successful revegetation of the project area.

The Rice Creek Watershed District (RCWD) recognizes the importance of healthy wetlands. In its 2020 Watershed Management Plan, the RCWD lists Water Quality Goal 3 to manage wetlands in a manner which improves diversity and ecological integrity on a District-wide basis, consistent with the Wetland Conservation Act and augmenting Comprehensive Wetland Protection and Management Plans (CWPMP) and local opportunities for preservation, enhancement, and restoration, while balancing multiple resource issues.

b) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

Three ephemeral streams run within the project site itself, totaling 0.04 acres of site area as shown on Figure 3 above. Two of these act as surface water outlets from the on-site wetlands to the Mississippi River and are located on the eastern and western edges of the wetland area. The third ephemeral stream acts as a surface water outlet between a culvert on-site and the Mississippi River. These streams are all categorized as unnamed tributaries and should not be modified or physically altered during or after project construction.

The Mississippi River is the most vulnerable surface water area for this project. The River runs directly adjacent to the site, 0.05 miles west of the site boundary. The project will require that four 42" forcemain barrels on opposite sides of the river be connected by piping that runs through the riverbed. These connections will be made close to the riverbank, where the slope approaches or exceeds 12% grade. The use of sheeting or a cofferdam may be required to prevent erosion both during and after construction. Aquatic plant removal and riparian alteration should be kept to a minimum during construction to provide prevention of erosion.

Another physical effect of this project on the Mississippi River is the potential for increased runoff and sedimentation due to site grading and construction from the main area of the site into the river. This could potentially cause an increase in turbidity and nutrient concentrations. In addition to the use of detention ponds, trenches, or bioretention on the site, the use of erosion blankets or other projects that increase vegetation on the slope leading directly into the Mississippi River will also provide prevention of erosion.

Watercraft usage on the adjacent section of the Mississippi River will likely remain unchanged, as the proposed practices and alterations will do little to change the features of the river itself. No permanent or temporary impact to navigation or watercraft use will occur. An intensive study on current and projected watercraft usage was not conducted as part of this EAW, as impacts are expected to be minimal.

12. Solid Wastes, Hazardous Wastes, Storage Tanks

a. Pre-project site conditions – Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

A Phase I Environmental Site Assessment (ESA) was conducted by Terracon and published on February 1, 2016. A summary of its Findings are as follows:

The report did not identify any known or suspect recognized environmental conditions (RECs), controlled recognized environmental conditions (CRECs), or historical recognized conditions (HRECs) in connection with the Site. The following findings are based on the results of our assessment:

• Since prior to 1937, the majority of the Site has consisted of undeveloped and agricultural land with a structure near the southern portion of the parcel. Additions to the building were constructed in the 1960s and 1980s. At the time of the reconnaissance, the Site was operated as a Girl Scout camp and consisted of a parcel totaling approximately 20 acres including two structures, a parking lot, and forested area. The majority of the Site consisted of wooded and grass-covered areas.

• At the time of the reconnaissance, the Site was developed with one approximately 8,000 square foot two story building with offices, meeting rooms, and dorms and one approximately 500 square foot building used as storage and a garage. The site is heated by a natural gas furnace and is connected to the City water and sanitary sewer system. It is not known if there was a heating source for the building prior to 1937 or a septic system prior to the current connections.

• A small amount of staining was observed on pavement within the garage. The staining was approximately two feet in diameter near the parking bay for the camp manager's vehicle and appeared to be a *de minimis* condition to the site.

• The government database records review identified one listing at the Site consisting of a construction stormwater permit issued during reconstruction of the sanitary sewer line on the south side of the property.

The following databases were also reviewed to evaluate on-site or nearby potential sources of contamination or environmental hazards: the Minnesota Pollution Control Agency (MPCA) "What's in My Neighborhood", the Minnesota Department of Agriculture (MDA) "County Spill Records" and the MPCA Petroleum Remediation Program (PRP) online maps.

A search of MPCA's What's in My Neighborhood database revealed the following sites within 500 feet, but not in the EAW area:

MCES Interceptor MSB 69U1 Forcemain – 6900 East River Road, Fridley:

- Inactive Construction Stormwater Permit (C00036455) issued July 27, 2013 and terminated September 11, 2015. Two Letters of Warning (LOW) issued March 18, 2014 and April 3, 2014.

CSAH1 Reconstruction - Latitude 45.0940126, Longitude -93.27508794

- Inactive Construction Stomwater Permit (C00005694) issued March 21, 1999 and terminated April 1, 2009.

Dennis Scheller – 7121 Riverview Terrace, Fridley:

- Inactive Underground Storage Tank (UST) Site (TS0018066). One 4000-gallon fuel oil UST installed in 1974 and has since been removed with no releases identified.

The MDA County Spill Records, MPCA PRP online maps, and the National Pipeline Mapping System (NPMS) did not reveal any sites in the EAW area or nearby potential sources of contamination or environmental hazards.

b. Project related generation/storage of solid wastes – Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

Construction

Construction wastes will be typical relative to the construction of utilities, roads, and commercial/industrial structures. Construction wastes will be primarily nonhazardous and can be managed as municipal solid waste (MSW) or construction/demolition debris. However, hazardous wastes in the form of used oils/lubricants, waste paints or other materials may be generated during construction. Potential environmental effects from solid waste handling, storage, and disposal may include windblown debris and spills or releases of non-hazardous materials. Through the development review process, the City will require that all MPCA and other applicable regulatory requirements be met regarding the management and disposal of construction-related wastes. Recycling and source reduction of non-recyclable wastes will be strongly encouraged, but this will be the responsibility of the developer and/or the construction contractor.

Post-Construction

It is estimated that the lift station will largely be unmanned. Technicians will perform daily checks on the equipment for approximately one hour per day, Monday through Friday. Typical residential or commercial non-hazardous wastes are not expected to be produced and there will not be a dedicated storage/trash or recycling area at the property. In the event limited post-construction waste is generated at the lift station, it would be primarily managed as MSW. Recycling for the lift station will be conducted in accordance with the 2016 Recycling Law (Minnesota Statutes Chapter 115A, Section 115A.151).

c. Project related use/storage of hazardous materials – Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including

method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

Construction

Hazardous materials in the form of used oils/lubricants, paints or other maintenance-related materials may be used/stored during construction in small and large quantities. Location of hazardous materials is expected to vary throughout the construction process. Through the development review process, the City will require that all MPCA and other regulatory requirements be met regarding use and storage of hazardous materials. Equipment fueling activities during construction will comply with MPCA operating and containment requirements. Prior to construction activities a spill prevention plan will be prepared to provide best management plans to minimize and mitigated petroleum and hazardous materials spills.

Potential Impacts

Potential impacts of accidental spill or release of hazardous materials:

- A release of petroleum hydrocarbons from the construction site activities to the soil and/or groundwater. Nearby sensitive receptors include residences which are located adjacent to the south, a girl scout camp adjacent to the north, residences to the east across East River Road Northeast, and the Mississippi River located adjacent to the west.

Post-Construction

Hazardous materials in the form of used oils/lubricants and small amounts of paints or other maintenance materials may be used/stored during lift station operation. No above or below ground tanks will be installed within the EAW area as part of post-construction operations.

Potential Impacts

Potential impacts of accidental spill or release of hazardous materials:

- A release of petroleum hydrocarbons from potential site equipment to the soil and/or groundwater. Nearby sensitive receptors include residences which are located adjacent to the north and south, residences to the east across East River Road Northeast, and the Mississippi River located adjacent to the west.

d. Project related generation/storage of hazardous wastes – Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

Construction

Hazardous waste in the form of used oils/lubricants, paints or other maintenance-related materials may be generated during construction in small quantities. Location of hazardous wastes is expected to vary throughout the construction process. Through the development review process, the City will require that all MPCA and other regulatory requirements be met regarding storage and disposal of hazardous wastes.

The following databases were reviewed to evaluate on-site or nearby potential sources of contamination or environmental hazards: the MPCA "What's in My Neighborhood", the MDA "County Spill Records" and the MPCA PRP online maps. The databases and online maps did not reveal any potential sources of contamination or environmental hazards within the EAW or the surrounding area. If soil contamination is discovered through due diligence testing or during development, the developer or other responsible party will be required to appropriately mitigate the contaminants according to the type of development planned and in compliance with MPCA rules. Fueling activities during construction will comply with MPCA operating and containment requirements. Based on our current understanding of the development no permanent tanks will be installed within the EAW area as part of post-construction operations.

Potential Impacts

Potential impacts of hazardous waste handling, storage, and disposal:

- A release of petroleum hydrocarbons from the construction site activities to the soil and/or groundwater. Nearby sensitive receptors include residences which are located adjacent to the south, a girl scout camp adjacent to the north, residences to the east across East River Road Northeast, and the Mississippi River located adjacent to the west.
- Identification of a historical release or abandoned UST during construction activities.

Post-Construction

Very small amounts of hazardous wastes in the form of used oils/lubricants, waste paints or other maintenance materials may be generated during lift station operation. Through the development review process, the City will require that all MPCA and other regulatory requirements be met regarding storage and disposal of hazardous wastes. Certain types of hazardous wastes such as universal wastes and electronic wastes will be recycled.

13. Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (rare features)

a. Describe fish and wildlife resources as well as habitats and vegetation on or near the site.

The site was formerly used as a Girl Scout camp and buildings, parking lot and driveway are present on the southern portion of the site. A 60-foot wide utility corridor and an existing junction structure is present along the southern boundary of the project site. A field survey for wetlands and waterbodies was conducted for the project in October 2018. Results of the survey determined that vegetation within the project site consists of upland woodland, wet meadow wetland, and scrub-shrub type wetland. Upland woodlands were dominated by bur oak (*Quercus macrocarpa*), American Basswood (*Tilia americana*), prickly gooseberry (Ribes cynosbati), and large-leaved aster (*Eurybia macrophylla*). Woodland adjacent to the Mississippi River consisted of floodplain forest species including Cottonwood (*Populus deltoides*) and silver maple (*Acer saccharinum*). Dominant plant species within the wetland areas consisted of common buckthorn (*Rhamnus cathartica*), reed canary grass (*Phalaris arundinacea*), stinging nettle (*Urtica dioica*), small-spike false nettle (*Boehmeria cylindrica*) and garlic mustard (*Alliaria petiolate*). Three ephemeral streams are present within the project site, and the Mississippi River is present on the western boundary of the site.

Some of the major wildlife species that are common in the project site are white-tailed deer, eastern cottontail rabbit, red squirrel, and chipmunk. Muskrat and beaver may be present occasionally near the Mississippi River. House wrens, northern cardinals, American goldfinches, blue jays, song sparrows and common yellowthroats are some of the bird species common to the area. Game birds include Canada goose and wild turkey. Waterfowl such as wood ducks, mallards, blue-winged teal, ruddy duck and hooded mergansers may be found in and around the wetlands and waterways within the project site. Raptor species include sharp-shinned hawk, Cooper's hawk, broad-winged hawk, and great horned owl.

Fisheries Resource

Mississippi River is a designated National River and Recreation Area. The Mississippi River, Locke Lake and Rice Creek are Minnesota Department of Natural Resources (MDNR) Protected Waters (PWI). The MDNR regulates water development activities below the ordinary high water level (OHWL) that affect the course, current, or cross-section of a PWI lake, wetland, river or stream.

There are no designated trout streams within one mile of the project site. There are no Designated Outstanding Resource Value Waters (ORVW) as defined by Minnesota Statutes Chapter 7050.0335 Subpart 1.D(6). The Mississippi River is designated as ORVW from County State-Aid Highway 7 bridge in Saint Cloud to the northwestern city limits of Anoka but not within the limits of the project site.

No federal or state-listed fish species are known to occur within one mile of the project site. Mussel surveys have been conducted within the Mississippi River. Species identified within one mile of the project site include *Amblema plicata, Lampsilis cardium, Lampsilis siliquoidea, Fusconaia flava, Potamilus alatus, Quadrula quadrula, Oliquaria reflexa, Truncilla truncate, and Ligumia recta. Ligumia recta* is designated as state special concern. See Item 13.b for further discussion regarding rare features

Wildlife Resource

Data was obtained from the Minnesota Geospatial Commons website to determine the presence or absence of known native plant communities within the project site. This includes an evaluation of RSEAs, which are natural areas or ecologically significant terrestrial, or wetland areas identified by the MDNR. No RSEAs are located within or adjacent to the project site. The nearest RSEA is located approximately 0.73-mile downstream within the Mississippi River (Durnam Island) and another is 0.75-mile east of the project site associated with Rice Creek. A portion of the Mississippi River, Locke Lake and Rice Creek comprise a regionally significant ecological corridor and is approximately 0.1-mile south of the project site at its closest point.

The project lies within an Important Bird Area (IBA.) IBAs are discrete sites that provide essential habitat for one or more bird species and include habitat for breeding, wintering, and/or migrating birds (Audubon, 2020). The project lies within the North Metro Mississippi River IBA which is a corridor along the Mississippi River, Locke Lake and Rice Creek.

There is a site of biological significance to the south of the project site, within a mile of the site. There are no sites of biological significance within the project site. Sites of biological significance and other important ecological areas are shown in Figure 13-1.

There are no designated wildlife management areas or waterfowl production areas within the project site.

b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-760) and/or correspondence number (ERDB) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The USFWS IPaC Environmental Conservation Online System was accessed to obtain a list of federally listed T&E, proposed and candidate species and federally designated critical habitat that may be present within the project site. The Minnesota Department of Natural Resources (MDNR) Natural Heritage Inventory System (NHIS) database was also reviewed for state-listed T&E species with the potential to occur within the project sites.

Available data describing the life history, critical habitat and conservation measures associated with each species was used to help determine if the project may have an adverse effect on listed species. Data was retrieved from sources including the USFWS Region 3 website, NatureServe Explorer Online Encyclopedia of Life (NatureServe, 2020), MDNR T&E species information available online (MDNR, 2020a), and relevant scientific journals and publications referenced below.

There are three known occurrences of rare species or natural communities in one mile of the project site, northern long-eared bat (*Myotis septentrionalis*), federally threatened; Blanding's turtle (*Emydoidiea blandingii*), state threatened; and black sandshell musssell (*Ligumia recta*), state special concern.

Northern long-eared bat

During winter, NLEBs use large caves and mines that have large passages and entrances, constant temperatures, and high humidity with no air currents. No bats were observed within the project site during the field survey. The project is not within 0.25 mile of a known, occupied hibernaculum, or within 150 feet of a known, occupied maternity roost tree. However, the project site may contain suitable summer habitat for the NLEB.

Blandings turtle

Wetland complexes and adjacent sandy uplands are necessary to support viable populations of Blanding's turtles. Calm, shallow waters, including wetlands associated with rivers and streams with rich aquatic vegetation, are especially preferred. In Minnesota, this species appears fairly adaptable, utilizing a wide variety of wetland types and riverine habitats in different regions of the state. Open marshes and bottomland wetlands provide summer and winter habitat. Ephemeral wetlands are utilized in spring and early summer, while deeper marshes and backwater pools are utilized in both the summer and winter. One Blanding's turtle was observed approximately 0.5 mile northeast of the project site in 1994.

Black Sandshell

This mussel species prefers riffle and run areas of medium to large rivers where substrates are dominated by sand or gravel. Eight live individuals were found within the Mississippi River near the project site during the Statewide Mussel Survey in 2007.

c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

Direct impacts on common and special status birds, mammals, fish, and reptiles from construction and operation of the project may include limited mortality of eggs, nests, young, and less mobile species. Indirect impacts on wildlife species may include the incremental reduction of forest cover, habitat fragmentation, temporarily augmented noise levels, and dust effects from construction access. However, mobile species will most likely return following construction.

Northern long-eared bat

Potential impacts to individual bats may occur if clearing or construction takes place when the species is breeding, foraging, or raising pups in its summer habitat. Bats may be injured or killed if occupied trees are cleared during this active window, and the species may be disturbed during clearing or construction activities due to noise or human presence.

Anoka County is listed as a county within the white nose syndrome buffer zone per the Final 4(d) Rule (USFWS, 2020). The MDNR NHIS database was queried for occurrences and locations for known maternity roost trees and hibernacula. According to the NHIS database, the project site is not within 0.25 mile of a known, occupied hibernaculum, or within 150 feet of a known, occupied maternity roost tree. Tree clearing is planned for the project.

Blandings turtle

The Blanding's turtle population is declining due to factors such as wetland drainage and degradation, development on upland nesting areas, encounters with vehicles when trying to cross roads, and possibly collection for the pet trade. The project site does not include prime habitat for the Blanding's turtle. However, the potential exists for the turtle to be present.

Black sandshell

This species is of special concern status and are particularly vulnerable to deterioration in water quality, such as caused by increased siltation. It is imperative that sound erosion and sediment control practices be implemented and maintained throughout the duration of the project.

Migratory birds

Construction of the project has the potential to impact birds protected under the MBTA. Under the MBTA, construction activities in grassland, roadsides, wetland, riparian, shrubland, or woodland habitats, and construction activities that occur on bridges or culverts that would otherwise result in the taking of migratory birds, eggs, young, and/or active nests should be avoided. Although the provisions of the MBTA are applicable throughout the entire year, most migratory bird nesting activity in Minnesota occurs mid-April to mid-July. MCES has not identified when construction plans to begin and end but necessary efforts will be made to avoid impacts to migratory birds.

Invasive Species

Invasive species including common buckthorn, reed canary grass and garlic mustard were observed to be present throughout the project site during the wetland and waterbody delineation conducted for the project in October 2018.

MCES will implement the following measures during construction to minimize the spread of noxious weeds:

- A pre-construction meeting will be held to provide project contractors with information and training regarding noxious weed identification and management. Contractors will be informed about measures to be taken to prevent the spread of noxious weeds in uncontaminated areas and about controlling the proliferation of weeds present in the project site. Qualified EIs will conduct on-site monitoring before and during construction.
- Silt fence will be installed around noxious weed areas in the proposed construction footprint, which will initially limit construction access to these areas.
- The construction contractor will stockpile cleared noxious weeds and salvaged topsoil adjacent to the area from which they were stripped to prevent the transport of noxious weed seeds, roots, or rhizomes with the soil. Stockpiled soil from noxious weed areas will be marked with signage and will be returned to the areas from which they were stripped. Soil and vegetation from noxious weed areas would not be moved outside of the identified and marked noxious weed infestation areas.
- In areas where full topsoil stripping cannot occur (e.g., wetlands), a layer of geotextile fabric, or a functional equivalent will installed at the boundaries of areas containing noxious weeds. Then, a layer of construction mats will be installed. The contractor will utilize the mat to traverse the noxious weed area, limiting direct contract with the area. The mats and fabric will be removed as part of final clean up. The mats will be sprayed and the fabric will be disposed of at a landfill.
- MCES will place cleaning at the project site if needed, to best minimize the spread of noxious weeds. Construction equipment and vehicles that are used to move vegetation and topsoil during clearing and restoration phases of the project that come into contact with vegetation or disturbed soil in areas where noxious weeds have been identified will be cleaned before being allowed to work in non-noxious weed areas of the site. Equipment traveling out of noxious weed areas will be cleaned free of soil and plant

debris prior to proceeding into an area without invasive plants. Water from the cleaning stations will be collected and transported off-site to an appropriate disposal facility.

- All ground disturbing equipment will be clean and free of soil or plant debris prior to arriving onsite. The on-site EI will inspect all equipment upon arrival and maintain a log of such inspections. In the event that equipment arrives in a manner not consistent with the above requirement(s), the EI will direct the contractor to clean the equipment at an off-site location prior to its use on the project.
- Construction areas that contain noxious weeds may be mowed prior to equipment access. The mower will be cleaned prior to leaving the noxious weed area. As an additional measure, MCES may elect to treat the noxious weed areas with an herbicide. MCES will not utilize herbicides within 100 feet of a wetland or waterbody. A licensed herbicide applicator will conduct the spraying.
- Prior to excavation activities within wetlands with noxious weeds, a row of silt fencing will be installed at the boundaries of areas containing noxious weeds, and the fencing will be removed upon establishment of permanent vegetative cover.
- Restoration-specific BMPs include the following.
- MCES will revegetate disturbed areas as soon as possible. Revegetation includes topsoil replacement, planting, seeding, fertilizing, and weed free mulching as necessary Seeding will be conducted on disturbed areas that have reached final grade or that will remain undisturbed for 30 days.
- MCES will use seed and other plant materials that have been certified as weed free.

MCES does not propose any eradication measures within the identified areas. MCES will monitor the construction area to ensure that the noxious weeds do not spread outside of the areas where they have been documented during pre-construction surveys.

MDNR tracks oak wilt in Minnesota (MDNR, 2020b). Oak wilt is caused by an invasive fungus that may affect and kill all species of oak trees. MDNR maintains a map of the county distribution of oak wilt in Minnesota. According to the mapping, all of the project site is within the oak-wilt infected area. The high-risk time when oaks are most susceptible to infection is from April 1 through July 15 in the southern half of Minnesota, and April 15 through July 15 in the northern half of Minnesota. If the spring is unusually warm, the risk of oak wilt can occur before April. If the daily high temperature is about 60 degrees Fahrenheit or higher for six consecutive days, there may be a risk of oak wilt.

MDA also recognizes Dutch elm disease as a fungus that can kill elm trees and other species (MDA, 2020c). MDA does not have regulations or quarantine zones for Dutch elm disease but recommends limiting removal and disposal of elm trees.

The project is inside the Emerald Ash Borer (EAB) county quarantine area and the generally infested area as mapped by the MDA.

d. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

MCES has avoided the wetlands, forested areas and waterbodies within the project sites to the extent practicable to minimize habitat disturbance and fragmentation. The proposed lift station is to be located primarily within an existing utility easement containing an existing junction structure and area developed as Girl Scout Camp facilities. No dredging or filling within wetlands or below the OHWL of waterbodies will be conducted and is further discussed in Question 11.

MCES will limit tree clearing to the extent practicable. The high-risk time when oaks are most susceptible to oak wilt infection is from April 1 through July 15 in the southern half of Minnesota, and April 15 through July 15 in the northern half of Minnesota. MCES will attempt to limit disturbance to oak stands during this time; however, avoidance of all oak removal may not be possible. If MCES removes oaks between April 1 and July 15, MCES will comply with MDNR recommendations to apply water-based paint or shellac immediately to the cuts. If an infected oak tree is cut, MCES will not remove it from the property but instead burn or tarp the infected tree to prevent the spread of the disease.

MCES will not transport cut elm trees outside of the counties where they originated. Further, if a tree is suspected to be infected with Dutch elm disease, MCES will follow MDNR recommendations and chip, burn or bury the tree.

MCES will comply with the MDA EAB quarantine regulations and not transport ash trees (limbs, branches, stumps or chips) outside of the quarantine zone. MCES will leave cut trees on the property. If MCES removes cut trees, MCES will find a disposal location within each EAB county quarantine area to prevent moving potentially infected wood outside of the quarantine area.

Stormwater management and erosion control measures (as required by the permits listed in Table 8-1) will help to minimize impact to the common as well as sensitive wildlife species and their habitat.

Northern long-eared bat

Tree clearing has been avoided to the extent practicable by locating the lift station facilities within the existing utility corridor and area occupied the existing Girl Scout Camp facilities. Tree clearing will be done outside of the NLEB pupping season from June 1 to July 31. The NLEB 4(d) Rule Streamlined Consultation Form will be utilized to ensure that any incidental take of the NLEB is not prohibited by the Final 4(d) Rule.

Blanding's turtle

MCES will coordinate with the MDNR regarding avoidance protocol and protocols for Blanding's turtle surveys if necessary during the NHI review process. Measures that will be conducted to avoid and minimize impacts on Blanding's turtles should they occur within the project site include the following.

- Turtles that are in imminent danger should be moved, by hand, out of the project site;
- Turtles that are not in imminent danger should be left undisturbed;
- No nests should be disturbed;
- Silt fencing should be used to keep turtles out of construction areas, where necessary, and removed after the area has been revegetated;
- No dredging, deepening, or filling of wetlands should occur;
- Wetlands should be protected from pollutants such as fuels and lubricants;

- Erosion and sediment control devices should be used to prevent silt and sediment from reaching wetlands and waterbodies;
- Erosion control mesh, if used, should be limited to wildlife-friendly materials;
- Trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade;
- Culverts under access roads crossing wetland areas, between wetland areas, or between wetland and nesting areas should be at least 36 inches in diameter and flat-bottomed or elliptical;
- Construction areas should be returned to preconstruction conditions;
- Keep utility access and maintenance roads to a minimum in order to reduce the potential for road kill;
- Return below-ground utility construction sites to original grade (trenches can trap turtles);
- Re-vegetate graded areas with native grasses and forbs;
- If necessary, use mechanical methods (not chemical) to manage vegetation in infrequently mowed areas such as ditches, along utility access roads, and under power lines; and
- Perform work fall through spring (after October 1 and before June 1).

MCES will implement the practices above and will train construction personnel regarding identification of the Blanding's turtle and the proper implementation of the MDNR recommendations. These recommendations will be written into the construction plans and specifications for the project. Regular inspection will ensure that the recommendations are being followed. These mitigation measures will minimize potential impacts on the Blanding's turtle.

Black sandshell

Sound erosion and sediment control practices be implemented and maintained throughout the duration of the project. Erosion control methods are discussed in Question 11. Erosion and sediment control plans will be submitted to the MPCA and the Rice Creek Watershed District for review and approval as required during the permitting process.

Migratory Birds

MCES will attempt to limit removal or impacts to vegetation during primary nesting season of breeding birds. If construction work cannot be avoided during peak breeding season (mid-April to mid-July), MCES will have a biologist conduct a pre-construction nest survey for breeding birds within the project construction area. The nest survey will determine the absence or presence of breeding birds and their nests. Pre-construction nest surveys will be completed according to the following procedures.

- No more than two days before construction activities commence, pre-construction nest surveys for migratory birds will be completed by a qualified avian biologist. The area surveyed will include the proposed workspaces or areas where potentially suitable habitat has been identified.
- If an occupied raptor nest is observed during the survey, construction activities will not be permitted within a 660-foot buffer of the raptor nest site during the breeding season or until the fledglings have left the area. MCES will complete consultation with the USFWS and MDNR if an active raptor nest is observed.

- If a nest, other than a raptor nest, is observed during the survey, construction activities will not be permitted within a 100-foot buffer of the nest until consultation with MDNR and USFWS occurs. MCES will implement buffers and practices recommended by agencies during the consultation.
- Upon completion, the survey results will be submitted to the USFWS and MDNR, as appropriate. If breeding birds are not present, construction can proceed with no restrictions. If breeding birds or active nests are present, additional consultation will be completed.

If any nests are observed, MCES will contact the USFWS to determine any necessary avoidance or mitigation measures. MCES will consult with the USFWS Twin Cities Ecological Services Field Office regarding impacts on migratory birds. Due to the use of pre-construction nesting bird surveys, which will minimize any potential effect of the project on nesting migratory birds, the project will his expected to have no effect on birds protected under the MBTA.

14. Historic Properties

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

1) Historic Designations

The Banfill Tavern, also known as the Locke House, was listed on the National Register of Historic Places on December 12, 1976. It was built in 1847 and has been used as an inn, logging camp office, private home, dairy farm, post office, and summer home. It is currently owned by Anoka County and home to the Banfill-Locke Center for the Arts. The address of the property is 666 East River Road in Fridley, MN. The property is approximately 0.4 miles from the proposed location of the lift station, separated by an established single-family neighborhood.

A review of State Historic Preservation Office (SHPO) files shows *potentially* historic properties to the east of the property on the other side of East River Road. Another property is identified approximately 0.4 miles north of the subject site along the west side of East River Road. No impacts are anticipated to the integrity of these properties from the construction or operation of the lift station. Figure 14-1 shows the location of potentially historic properties based on SHPO files, and the location of the Banfill Tavern.

2) Known Artifact Areas

This Project must comply with applicable state mandates governing cultural resources, including the Minnesota Historic Sites Act, Minnesota Field Archaeology Act, and Minnesota Private Cemeteries Act.

During May and June 2020, 106 Group conducted Phase I and II archaeological investigations for the Project (Rufledt and Bray 2020). Because Project details were still being refined at the time of the Phase I and II investigations, the study area for archaeology was defined to include all potential areas of ground disturbing activities associated with construction. The archaeological study area, which totaled 14 acres, was larger than the current 7-acre project area but completely encompasses it.

An archaeological literature review and assessment was prepared, which included research at the Minnesota Office of the State Archaeologist (OSA) and the Minnesota State Historic Preservation Office (SHPO), and historical map and aerial photograph research. No previously recorded archaeological sites or historic properties were identified within the project area. Subsequently, a Phase I archaeological field survey was conducted within areas of moderate to high archaeological potential within the study area. The primary objective of the Phase I archaeological survey was to identify whether the area to be affected by the proposed Project contained any intact archaeological resources, and if so, whether those resources are potentially eligible for listing in the National Register of Historic Places (NRHP). The Phase I survey included visual assessment, pedestrian survey, and excavation of shovel tests. During the Phase I archaeological survey, one previously unrecorded precontact archaeological site (21AN0185) was identified and assessed as potentially eligible for listing in the NRHP. A Phase II archaeological evaluation was conducted to evaluate the eligibility of site 21AN0185 for listing in the NRHP. This investigation consisted of additional close-interval shovel testing, the excavation of test excavation units, and subsequent evaluation of the site's eligibility for listing in the NRHP.

Based on the results of the Phase I survey and Phase II evaluation, the site contained a small number of artifacts (objects made or used by humans in the past) and no below-surface archeological features. The artifacts found within the site did not have any characteristics that allow them to be associated with a specific time period or culture. Because of this, the site has not yielded, nor does it have the potential to yield, information important to an understanding of prehistory. As a result of Phase II investigations, site 21AN0185 was recommended as not eligible for listing in the NRHP and, therefore, does not qualify as a historic property. No other archaeological site or known historic properties are located within proximity to the project area; therefore, there are there will be no anticipated effects to historic properties as a result of project construction and operation.

Reference
Rufledt, Jason, and Madeleine Bray
2020 Phase I and II Archaeological Investigations for the MCES L32 Facility Plan Project. Prepared by 106 Group for Stantec, July 2020.

3) Architectural Features
There are no properties on the National or State Registers, or listed in the State Historic Sites Network, that could be affected by this project, and therefore no further cultural features work is required for compliance with state cultural resources laws. However, the project must also comply with Section 106 and therefore, as discussed with SHPO, additional study of historical architectural properties is required. The additional historic architectural review for Section 106 compliance is being completed.

15. Visual

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

Scenic Views

The EAW project site is partially developed as the Girl Scout Camp Lockslea and is located on the eastern bank of the Mississippi River. The site also has an existing utility easement on the southern portion of the property. The property itself is bordered by the Mississippi River to the west, East River Road to the east, and single-family homes to the north and south. There are a variety of views from each of these vantage points. The views are summarized below.

North: The area north of the EAW site is predominately single-family homes. Because the entire northern part of the EAW site is wooded, there is dense screening between the project site on the southern part of the site and these homes. There is also dense screening between the single-family homes and the Mississippi River, limiting scenic views towards and across the river.

East: The EAW site is bordered to the east by East River Road, a 4-lane Minor Arterial roadway. Across the street (further to the east) are single family homes. Again, because of the existing tree coverage on the EAW site, views of the site and to the river are obscured. Some of these homes have scenic views of Locke Lake, which is to the southeast of the EAW site.

South: The area south of the EAW site is also predominately single-family homes. There is an existing 60-foot utility easement on the southern portion of the site, abutting the single-family homes. There is very little screening between these homes and the EAW site. There is also less dense vegetation between these homes and the Mississippi river, meaning that the homes nearest to the river likely have a scenic view.

West: The Mississippi River abuts the site to the west. The impacts to the homes across the river are likely to be minimal.

Visual Effects

The properties most impacted by the project are the five single-family homes abutting the southern portion of the site. While there is an existing utility easement, and very little screening or vegetation currently, the construction of additional utility infrastructure is likely to have an impact on the views of these homeowners. Impacts could include light pollution from additional lighting on site, visual obstruction and a limited timeframe of unsightly construction views.

The residential neighborhoods to the north and east (across East River Road) are unlikely to have their views impacted by the Lift Station project. The homes to the north have existing dense forest and vegetation protecting them from visual impacts of construction and utility infrastructure. The City has designated the land on the northern 2/3 of the EAW site as park and recreation on their Future Land Use Map, further protecting the views of the single-family homes to the north. The project will also not impact any existing views of the Mississippi River. The single-family homes across East River Road likely do not currently have a view of the River due to the amount of land between them and the river and exiting vegetation. The project is unlikely to have an impact on their scenic views.

The views from the Mississippi River and from homes across the river may be slightly impacted by the project. Potential impacts include visible utility infrastructure and construction (time-limited).

16. Air

a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

No permanent stationary sources of air emissions are anticipated.

Two 650 KW generators will be located at the lift station building to power the pumps in the event of an extended power outage, a diesel fuel powered permanently mounted generator would be used to temporarily operate the lift station. The lift station generator will be equipped with mufflers and standard emissions control apparatus to minimize air and noise pollution.

While "peaking" is not anticipated at this lift station, if it does become an option, MCES may sign an agreement with the electric utility allowing the power company to use the standby generator to help meet peak power demands in the summer.

If used for peaking, a stationary source air emissions permit from the MPCA may be required for Nitrogen Oxides (NOx) if use exceeds 300 hours in any 12-month period. A stationary source air permit is not required for a generator that will be used only for emergency power, regardless of the generator size. If applicable, a stationary source permit will be obtained from the MPCA.

b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Construction vehicles and heavy equipment will be used during construction of the project. Exhaust emissions during construction could cause temporary impacts to ambient air quality within the area directly surrounding the project site but will not be significant.

Following construction, the project does not propose to permanently alter traffic levels, therefore vehicle emissions directly associated with the project will not have a significant effect on air quality. The project may enable development which could result in measurable impacts to air quality. Traffic increases due to local development will be reviewed as the development occurs.

c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

Dust:
Dust will be generated by equipment and machinery during construction. The construction contractor will be required to provide dust control measures, such as spraying water on the construction site to reduce airborne dust and avoiding construction activities during periods of high winds. The contractor shall take special care in providing and maintaining dust control operations appropriate for the proximity of the site to residential homes and other nearby facilities. To reduce the dust, sweeping and watering of haul roads and construction sites will be performed as needed. Additional dust control measures available to contractors include minimizing the amount of open graded areas and scheduling regular watering in areas that may have soils susceptible to wind erosion.

Following completion of construction, the City's contractors will establish final grade, seed and mulch the project site.

Dust impacts will be temporary and confined to the immediate vicinity of the project site. Operation of the Lift Station is not expected to generate dust.

Odors:
During construction, some vehicle exhaust odors from heavy equipment and construction vehicles will be released. However, construction equipment will have factory-installed mufflers or their equivalent in good working order during the life of the construction contract. Additionally, odors from diesel fuel exhaust generated by the construction equipment is temporary and will occur during daytime construction hours. Therefore, significant impacts from diesel fuel exhaust odors are not anticipated.

As with any sanitary sewer system, a potential for odors to form during operation of the proposed system exists. During the design process, odor mitigation will be considered for including reconfiguring the existing radial carbon unit, installing new OC ductwork to siphon structure on the west side of the river, and installing a new odor control unit on the east side of the river. The decision on what odor control to include will be made during the design phase. Any increase to the existing average ambient air quality conditions due to the project are not expected to cause exceedances to human health standards.

17. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

The project is situated adjacent to residential neighborhoods and along East River Road, a busy four-lane, divided roadway. The residential homes within the surrounding area make up the sensitive receptors in the vicinity of the project. According to the MPCA Minnesota Noise rules, Minn. R. ch. 7030, these residential receptors are included in Noise Area Classification Zone 1 and the project is subject to the applicable state noise standards during construction and operation.

During construction, the primary source of noise is from construction vehicles entering and leaving and during operation of heavy construction equipment. Construction equipment will have factory-installed mufflers or their equivalent in good working order during the life of the construction contracts. Noise impacts from construction equipment will be controlled by restricting the hours of operation to daylight hours, or those permitted by local ordinances.

Construction noise impacts will be temporary and will generally be confined to the immediate vicinity of the project site. By state law, the project must comply with state noise standards. The City does not expect noise above state standards related to the operation of the lift station. There is no expected reduction to quality of life based on project-generated noise.

18. Transportation

a. ***Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.***

The project is located along East River Road, a four-lane Minor Arterial roadway, designated as no parking. The proposed project will require approximately 10 parking spaces. Additional vehicles during construction will temporarily increase traffic as construction vehicles utilize area roads to access the site. Temporary traffic control will be implemented during construction as needed.

Traffic during construction and, to a lesser degree, after construction is anticipated to add to the total average daily traffic generated. However, in either case, no significant peak hour traffic will be generated.

The project will not affect alternative transportation modes or transit availability.

b. ***Discuss the effect on traffic congestion on affected roads, and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional***

transportation system. If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceed 2,500, a traffic impact study must be prepared as a part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's <u>Access Management Manual</u>, Chapter 5 or a similar local guidance.

Temporary traffic restrictions or closures are not anticipated during construction of the project. Peak hour traffic in both construction and post-construction conditions will not exceed 250 vehicles or 2,500 daily trips. There will be no notable increase in traffic or changes to the transportation system following completion of the project. No long-term traffic impacts or impacts to the regional transportation system will occur.

c. *Identify measures that will be taken to minimize or mitigate project related transportation effects.*

Traffic accessing the site during and after construction will need to follow federal, state, and local requirements, including seasonal and/or weight restrictions, as well as debris management and control.

19. Cumulative Potential Effects

a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

This lift station is one component of the wastewater conveyance system that serves the Metropolitan Area, by collecting and conveying wastewater to be treated before discharging into the Mississippi River, it is by its nature a form of environmental mitigation. This facility will replace the existing facility in Brooklyn Park, which is outdated, lacks enough capacity and has recurring odor issues.

The L32A lift station will eliminate the risk of sewer backups due to inadequate capacity and will substantially reduce the odor issues on the west side of the River. Odor Control on the west side of the River will still be required, and additional odor control equipment will also be installed on the East side of the river.

b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

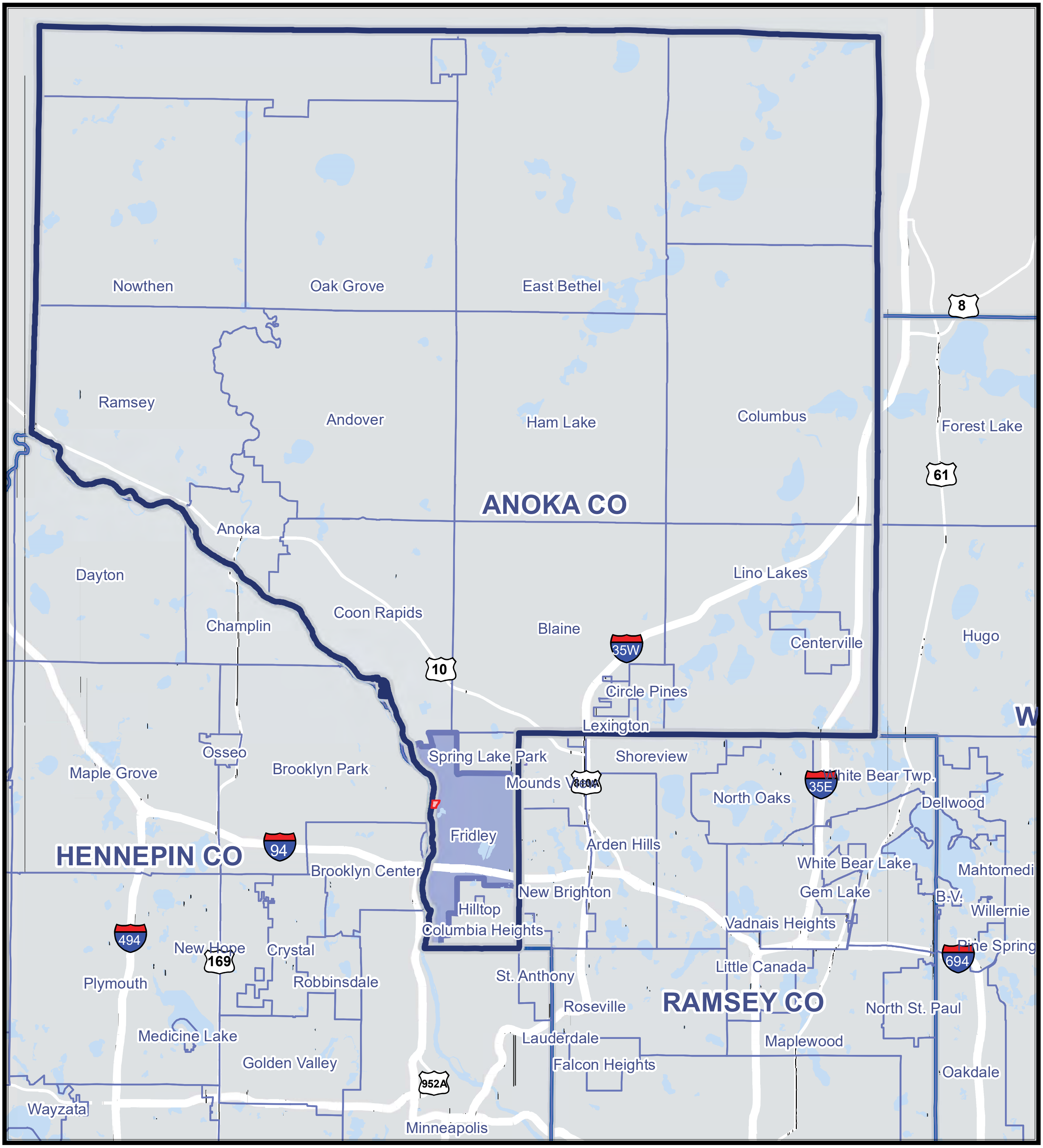
The facility is part of a connected and integrated wastewater conveyance system, but the L32A project itself will not cause or require the completion of additional projects.

c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

This project will provide improved wastewater service to the large drainage area. This area is planned to continue to grow and develop, which will have inherent environmental effects. The development that will be supported by this facility will all be consistent with the local comprehensive plans in the cities it serves. All of that development will be subject to local zoning and all applicable federal, State and local permits.

Appendix A

Figures



Project Location - Figure 5-1

MCES Lift Station EAW
Fridley, Minnesota

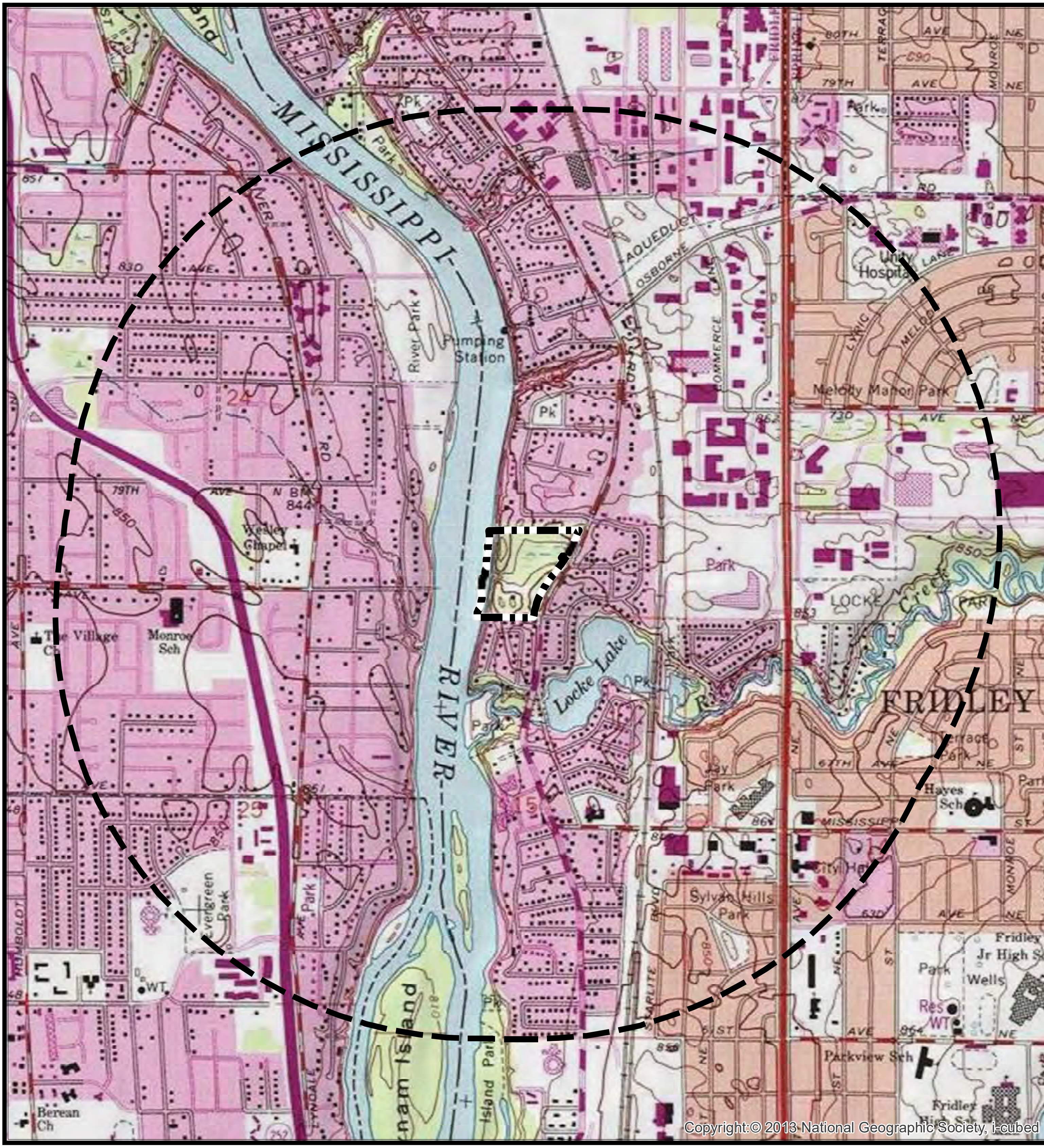
N

0 5 10 Miles

- EAW Area
- Anoka County Boundary
- Other County Boundaries
- Open Water
- City of Fridley

April 24, 2020

Stantec



USGS Topo Map - Figure 5-2

MCES Lift Station EAW
Fridley, Minnesota

N

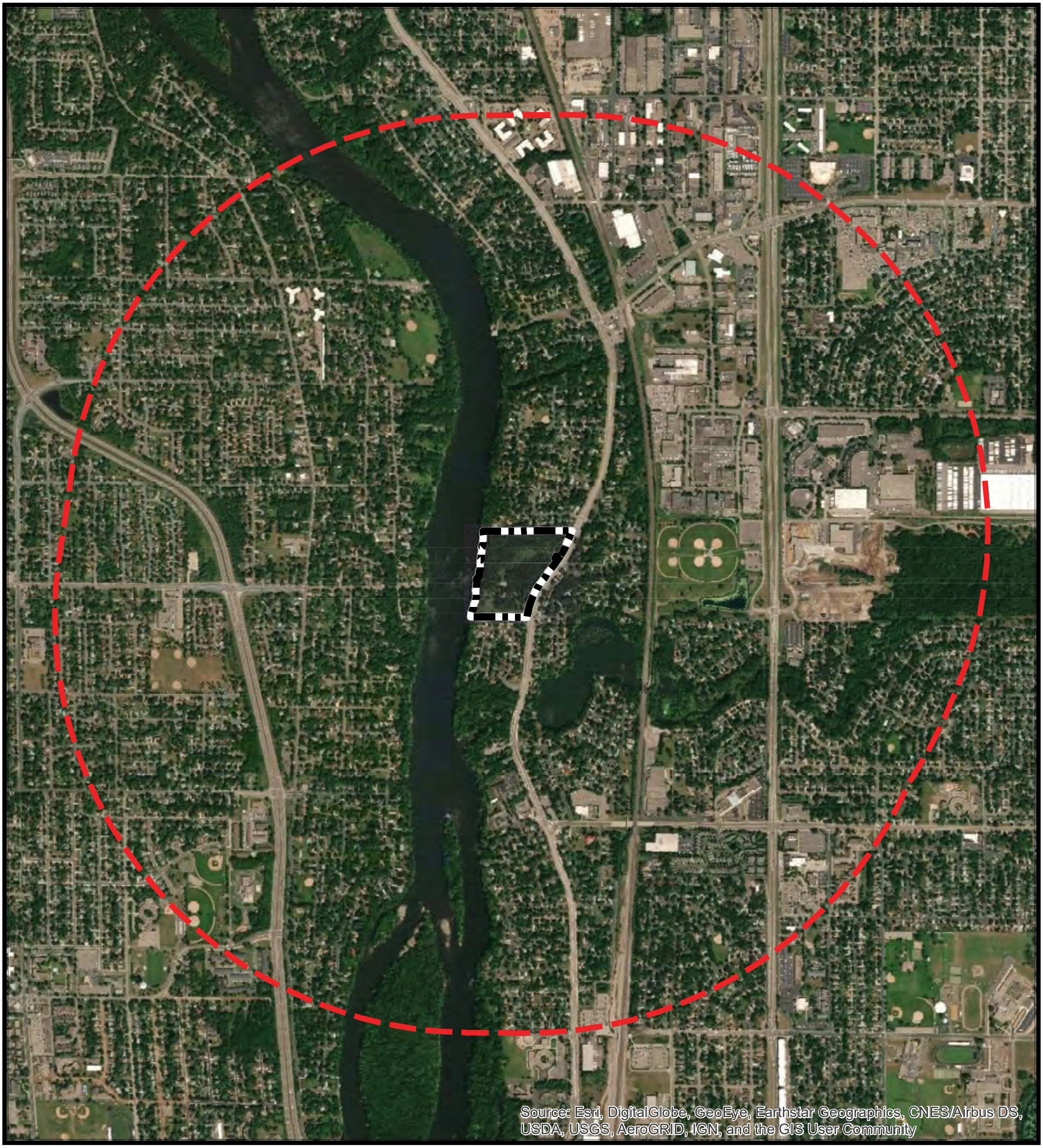
0 0.5 Miles

EAW Boundary

1-Mile from Site

April 30,2020

Stantec

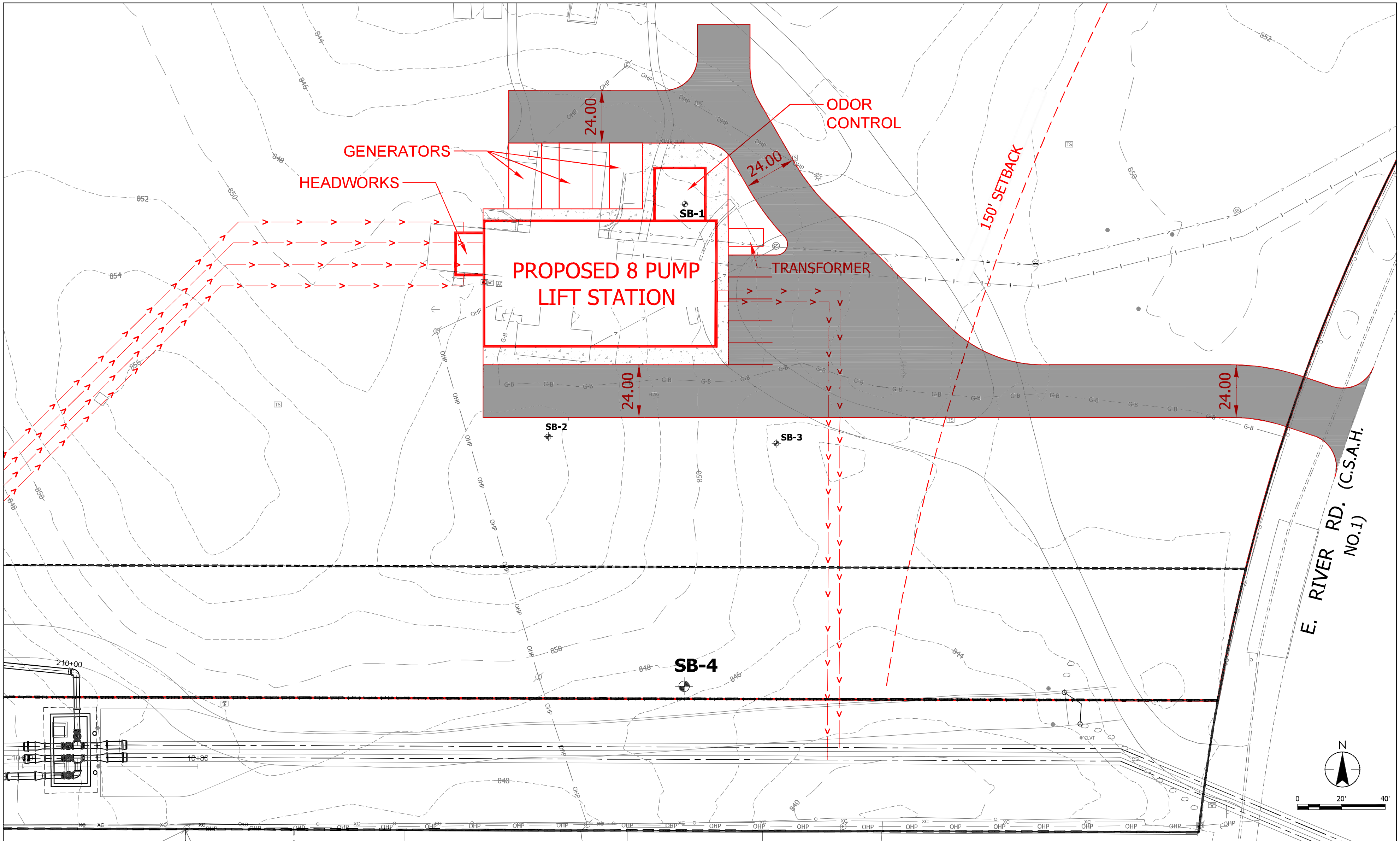


Aerial Map - Figure 5-3

MCES Lift Station EAW
Fridley, Minnesota

April 30, 2020

Stantec



EAST SIDE LIFT STATION OPTION C - ABOVE GRADE PLAN
L32 RIVER CROSSING
FIGURE 6-1

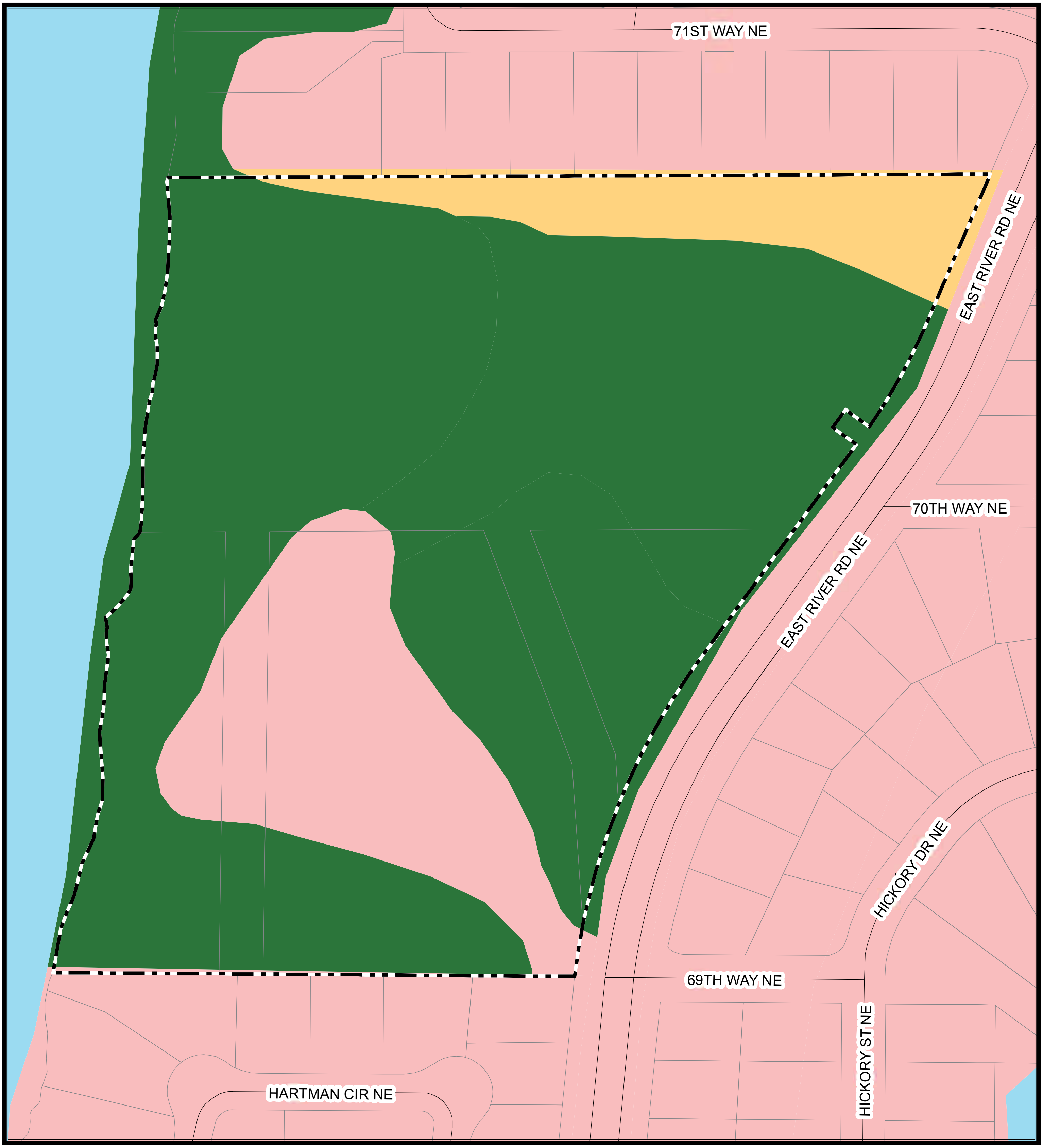


Figure 7-1

Existing Land Cover

MCES Lift Station EAW
Fridley, Minnesota

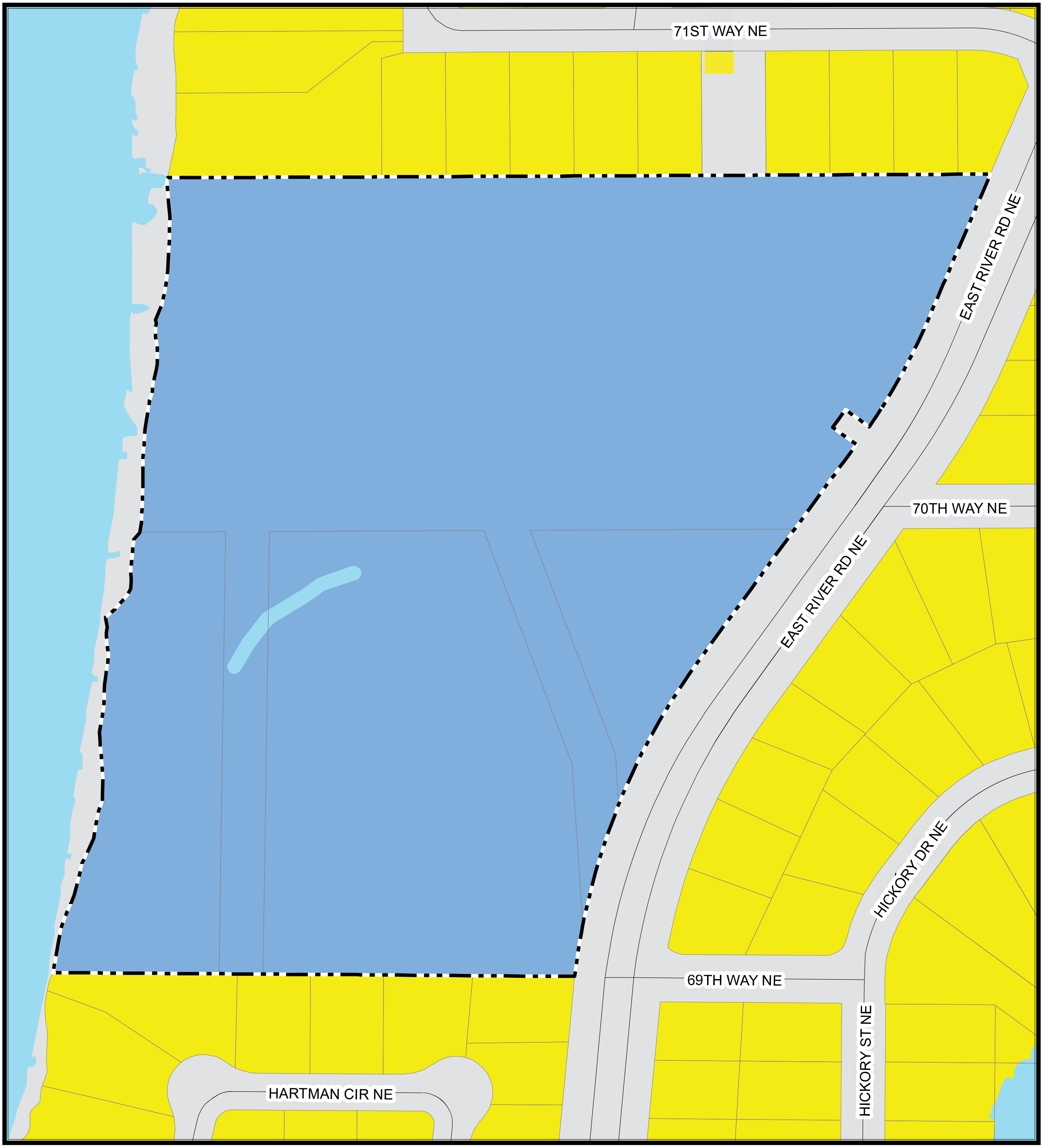
EAW Boundary
Artificial Surfaces and Associated Areas
Planted or Cultivated Vegetation
Forests
Woodland
Shrubland
Herbaceous
Nonvascular Vegetation
Sparse Vegetation
Open Water

N

0 500 Feet

April 30, 2020

Stantec



Existing Land Use - Figure 9-1

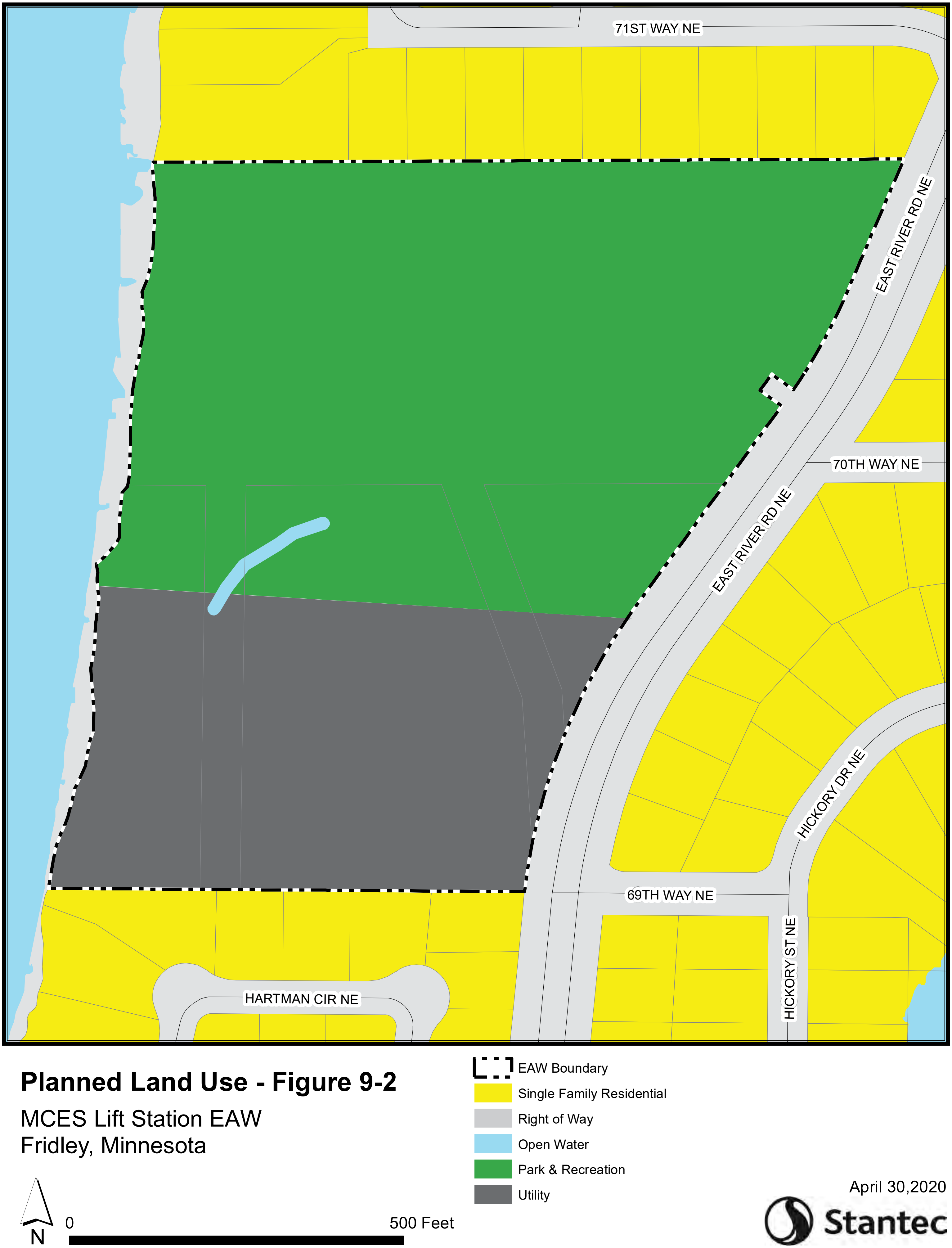
MCES Lift Station EAW
Fridley, Minnesota

EAW Boundary
Single Family Residential
Institutional
Right of Way
Open Water

N
0 500 Feet

April 30,2020

Stantec

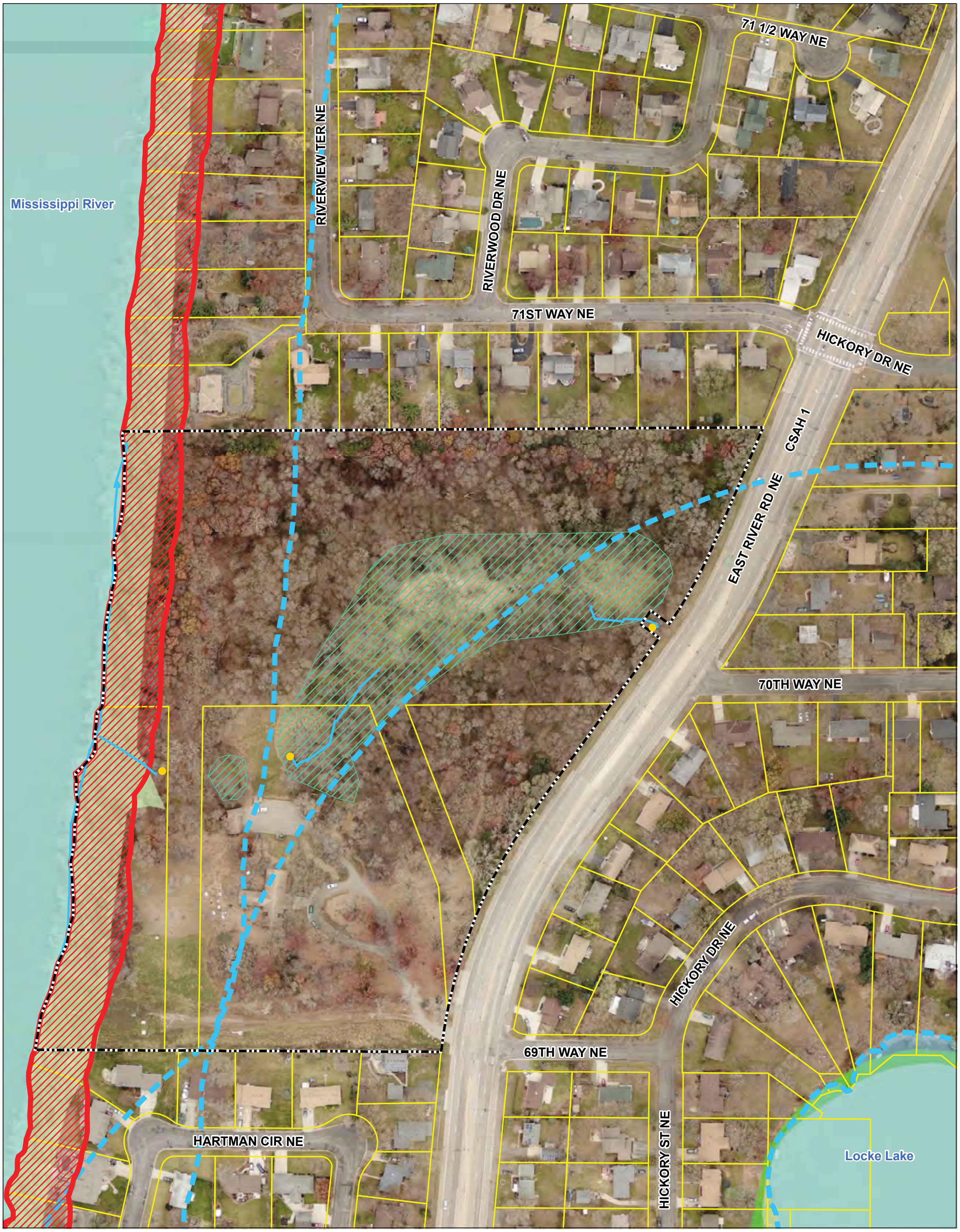


Planned Land Use - Figure 9-2

MCES Lift Station EAW
Fridley, Minnesota

April 30,2020

Stantec



Water Features - Figure 9-3

Girl Scout Camp, Fridley MN

- Culvert
- Field Delineated Waterway
- Open Water
- 100-Year Floodplain
- 500-Year Floodplain
- Field Delineated Wetlands
- Shoreland Boundary
- 100' Shoreland Setback from River
- EAW Boundary
- 2018 Anoka County Land Parcel Lines

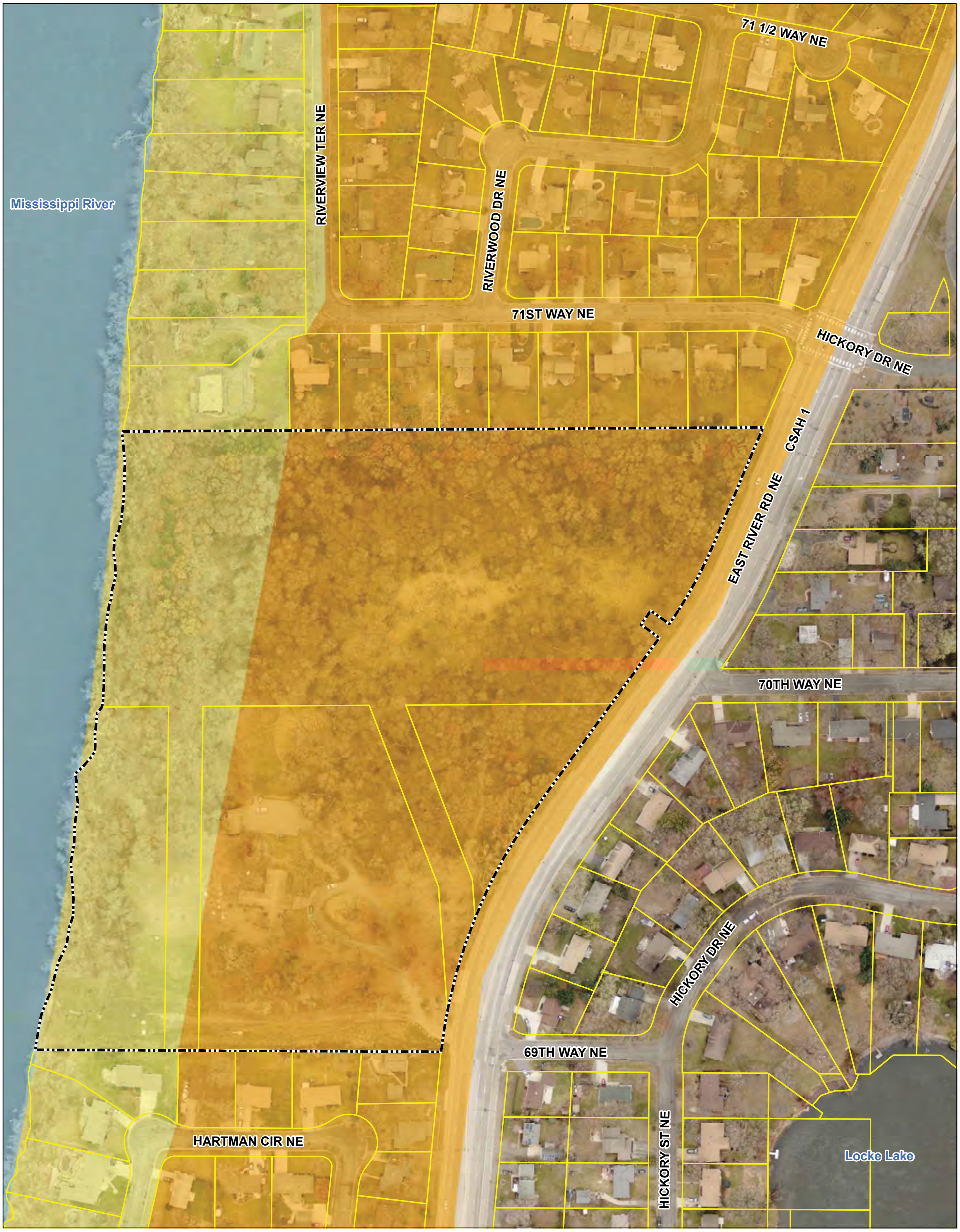
N

80 0 80 160 240 Feet

October 31, 2018

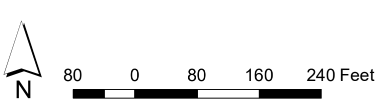
Stantec

V:\1938\active\193804409\GIS\Projects\Reference_Files\Water Features.mxd



Mississippi River Critical Areas - Figure 9-4

Girl Scout Camp, Fridley MN



River Neighborhood District (CA-RN)
Separated from River District (CA-SR)
Mississippi River
EAW Boundary
2018 Anoka County Land Parcel Lines

August 28, 2018

Stantec

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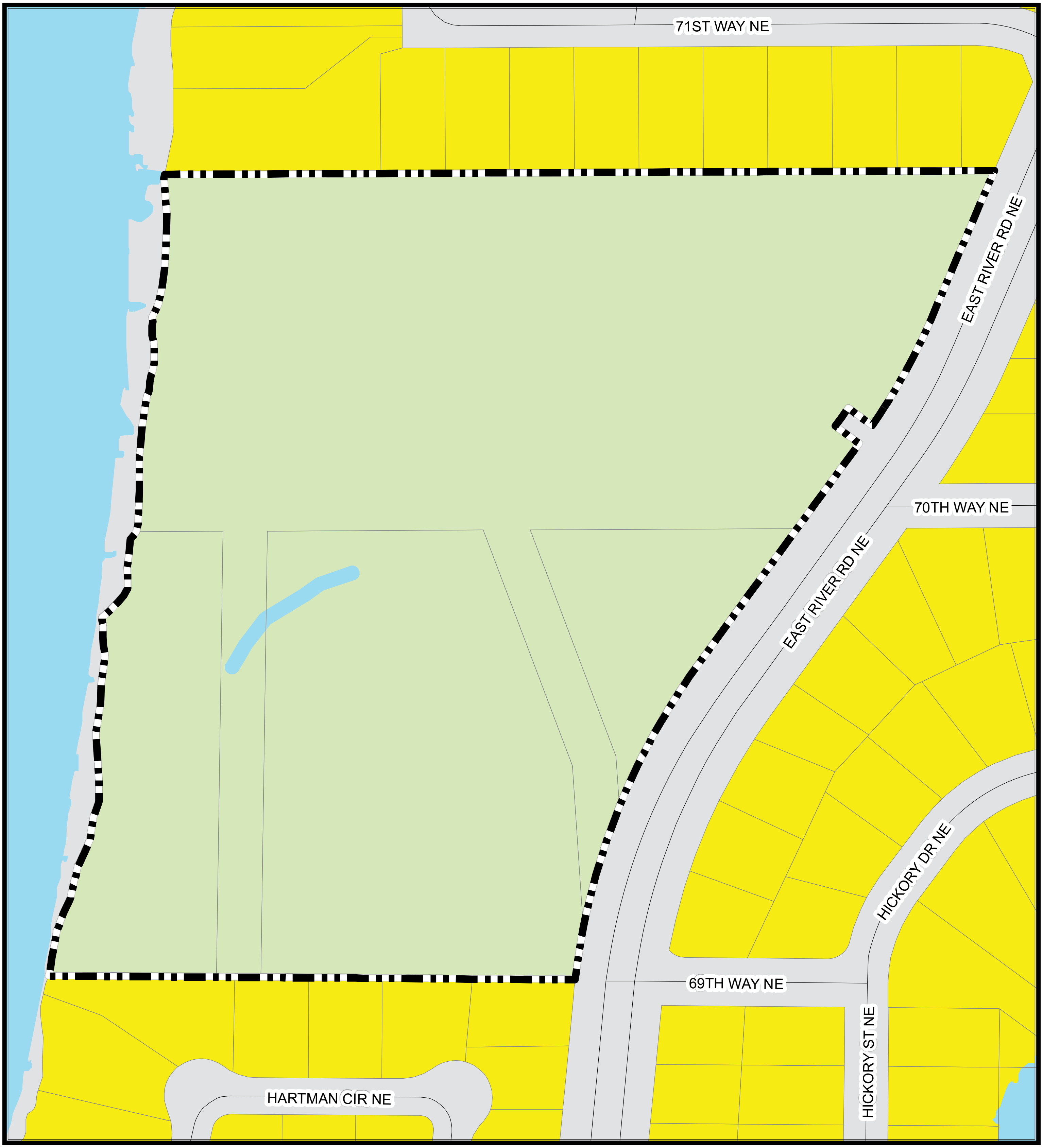


Zoning Map - Figure 9-5

MCES Lift Station EAW
Fridley, Minnesota

EAW Boundary
P - Public Facilities District
R-1 - One-Family Dwelling District
Right of Way
Open Water

N
0 500 Feet

April 30,2020

Soil Map - Figure 10-1

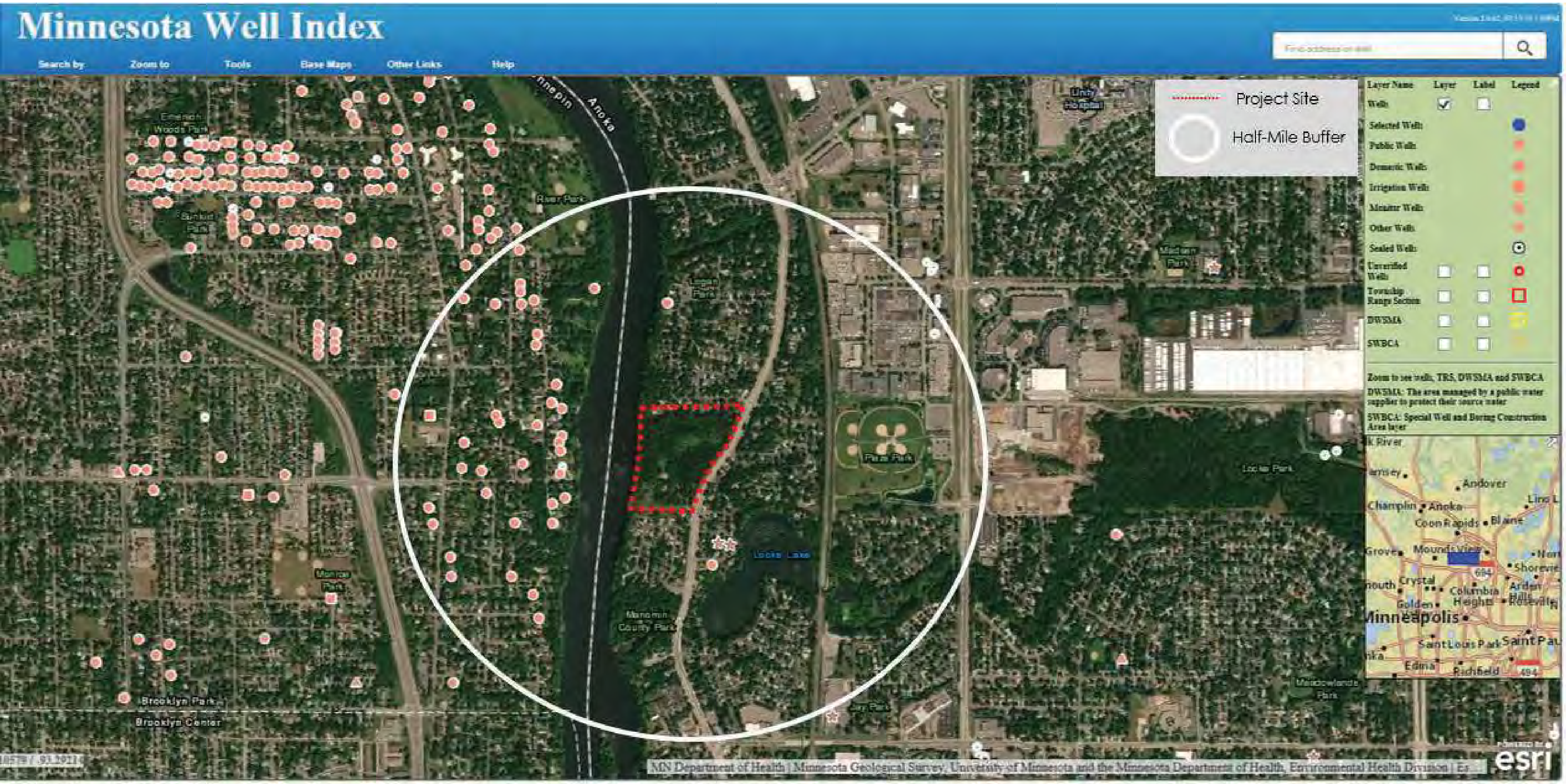
MCES Lift Station EAW
Fridley, Minnesota

EAW Boundary
Ma - Markey muck
UhdD - Urban land-Hayden complex, 15 to 25 percent slopes
UhuB - Urban land-Hubbard complex, 0 to 8 percent slopes
Un - Urban land-Lino complex, 0 to 3 percent slopes
UzB - Urban land-Zimmerman complex, 0 to 8 percent slopes
W - Water

N
0 500 Feet

April 30, 2020

Stantec



Well Locations - Figure 11-1

Site Topography - Figure 11-2

Girl Scout Camp, Fridley MN

- 10' Contours
- 2' Contours
- Generalized Bluff Line
- Generalized 40' Bluff Setback
- 12%+ Slopes
- EAW Boundary
- 2018 Anoka County Land Parcel Lines
- Open Water
- Field Delineated Wetlands

N

80 0 80 160 240 Feet

October 31, 2018

Stantec

V:\1938\active\193804409\GIS\Projects\Reference_Files\Site Topo.mxd

2017 Anoka County Aerial Photo - Figure 11-3

Girl Scout Camp, Fridley MN

N

80 0 80 160 240 Feet

Site Boundary

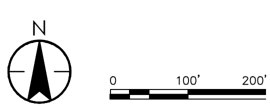
2018 Anoka County Land Parcel Lines

August 28, 2018

Stantec

V:\1938\resource\plaud\Due Diligence-Fridley\2017 Aerial.mxd

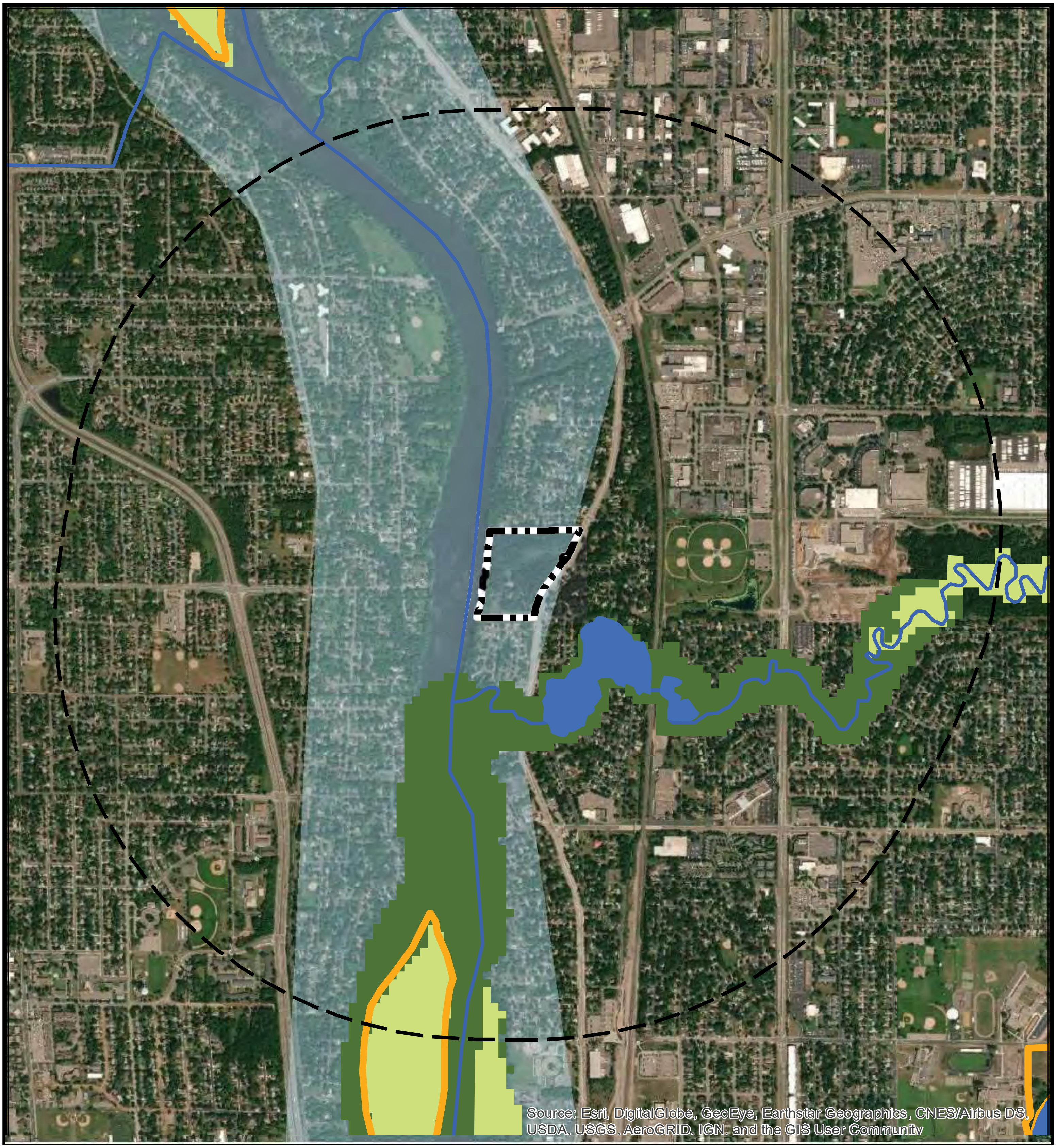
Concept Site Development - **Figure 11-4**
Girl Scout Camp, Fridley MN



Site Boundaries
2018 Anoka County Land Parcel Lines
Potential Site Development Parcel Lines

December 6, 2018

Stantec



EAW Boundary
1-Mile from Site
MCBS Sites of Biodiversity Significance
MLCCS Regionally Significant Ecological Areas 2008
MLCCS Regional Ecological Corridors 2008
MNDNR Public Waters Basin
MNDNR Public Waters Watercourses
Mississippi National River and Recreation Area

Sites of Biological Significance - Figure 13-1

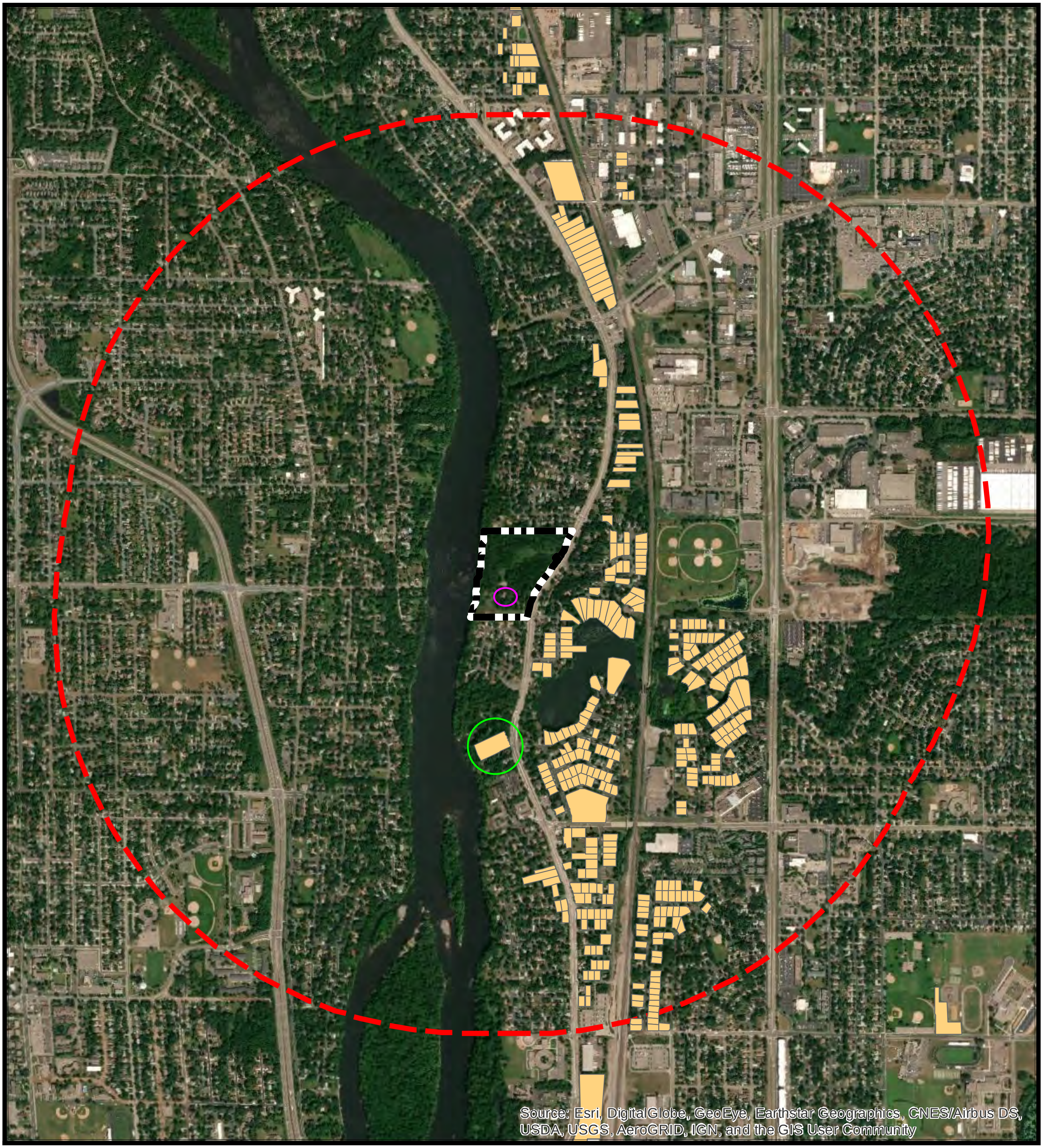
MCES Lift Station EAW, Fridley, Minnesota

0 0.5 Miles

N

May 21, 2020

Stantec



SHPO Identified Historic Properties - Figure 14-1

MCES Lift Station EAW
Fridley, Minnesota

N

0 0.5 Miles

AUAR Boundary
1-Mile from Site
Historic Parcels (as designated by SHPO)
Banfill Tavern
Former Camp Lockslea Girl Scout Buildings (not historically designated)

April 30, 2020

Stantec

Appendix B

Wetland Delineation Report

Wetland Delineation Report

MCES New Lift Station L32A Phase 1 Project
City of Fridley, Minnesota
Stantec Project #: 193804409

Prepared for:
Metropolitan Council Environmental Services

Jeny Shah
Metropolitan Council Environmental Services
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Sign-off Sheet

This document entitled Wetland Delineation Report was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of the Metropolitan Council Environmental Services (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by Jennifer Kamm
(signature)
Jennifer Kamm, Environmental Scientist, WDC#1253

Reviewed by Mike Pederson
(signature)
Mike Pederson, Environmental Scientist, WDC#1265

Reviewed by Julia Millet
(signature)
Julia Millet, Ecologist, WDC#1280

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1.0 INTRODUCTION

Stantec Consulting Services Inc. (Stantec) performed a wetland determination and delineation of the MCES New Lift Station L-32A Phase 1 property ("Property") on behalf of the Metropolitan Council Environmental Services (MCES). The Project is located in the City of Fridley in Anoka County, Minnesota (See Appendix A, Figure 1). The Property consists of 22.5 acres situated on the east bank of the Mississippi River (Figure 1).

The purpose and objective of the wetland determination and delineation was to identify the extent and spatial arrangement of wetlands and waterways within the Property. The wetland delineation was completed by Jennifer Kamm of Stantec on October 11th, 2018. Two wetland areas and four streams were identified on the Property.

Wetlands and waterways that are considered waters of the U.S. are subject to regulation under Section 404 of the Clean Water Act (CWA) and the jurisdictional regulatory authority lies with the U.S. Army Corps of Engineers (USACE). The Minnesota Department of Natural Resources (MNDNR) has regulatory authority over certain wetlands, navigable waters and adjacent lands under Statute 103G and Rule 6115.0250. All wetlands are protected under the Wetland Conservation Act Rules Chapter 8420 and administered by a Local Governmental Unit (LGU). LGUs can be a City, County, Watershed District or Soil and Water Conservation District depending on project location. For this Property the LGU is the Coon Creek Watershed District. Stantec recommends this report be submitted to the LGU and USACE for a preliminary or an approved jurisdictional review and concurrence.

2.0 METHODS

2.1 WETLANDS

Wetland determinations were based on the criteria and methods outlined in the *U.S. Army Corps of Engineers Wetlands Delineation Manual,* Technical Report Y-87-1 (1987) and subsequent guidance documents (USACE 1991, 1992), and the *Regional Supplement to the Corps of Engineers Wetlands Determination Manual: Northcentral Northeast Version 2.0*, Technical Report ERDC/EL TR-12-1 (2012).

The wetland determination involved the use of available resources to assist in the assessment such as U.S. Geological Survey (USGS) topographic maps, U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) soil survey, Minnesota Department of Natural Resources (MDNR) National Wetland Inventory (NWI) update mapping, MNDNR Protected/Public Waters mapping, US Geological Survey National Hydrography Data (NHD), and recent and historic publicly available aerial photography.

On-site wetland determinations were made using the three criteria (vegetation, soil, and hydrology) and technical approach defined in the USACE 1987 Manual and applicable Regional Supplement. According to procedures described in the 1987 Manual and applicable Regional Supplement, areas that under normal circumstances reflect a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology (e.g., inundated or saturated soils) are considered wetlands.

Additionally, as climate plays an important role in the formation and identification of wetlands, the antecedent precipitation in the months leading up to the field investigations was reviewed. The current year's precipitation data was compared to long-term (30-year) precipitation averages and standard deviation to determine if precipitation was normal, wet, or dry for the area using a WETS analysis as developed by the NRCS.

The uppermost wetland boundary and sampling points were surveyed with a Global Positioning System (GPS) capable of sub-meter accuracy and mapped using Geographical Information System (GIS) software.

2.2 WATERWAYS

The ordinary high-water mark for waterways was determined and surveyed along with culverts, and/or other connections to off-site wetland or aquatic features that may be under federal or state authority using a Global Positioning System (GPS) and mapped using Geographic Information System (GIS) software. Waterbodies (i.e., ponds, creeks, streams, rivers) were identified by the presence of an ordinary high-water mark (OHWM). Common identifiable indicators of an OHWM include open water or evidence of a clear, natural line visible on the bank, shelving, changes in soil characteristics, destruction of terrestrial vegetation, the presence of litter and debris, and watermarks on structures that are inundated during normal high-water conditions. Streams were classified as perennial, intermittent, or ephemeral based on field observations and review of depth to water table and flood frequency data available from the USDA NRCS. The

OHWM typically represents the potential limits of the USACE jurisdiction. The USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

3.0 RESULTS

3.1 SITE DESCRIPTION

The Property is comprised of an approximate 22.5-acre site located in Section 10, Township 30 North, Range 24 West, in the City of Fridley, Anoka County, Minnesota (see Figure 4). The Property consisted primarily of upland woodland, wetlands, and streams. Developed area consisted of two buildings and a parking lot.

Soils present within the Property and their hydric status are summarized in Table 1. Wetlands identified during the field investigation are located primarily within areas mapped as hydric soils. An NRCS Soil Survey map showing the extent of these soils within the Property is provided Figure 2 of Appendix A.

Table 1. NRCS Mapped Soils Within the Property

Soil Symbol	Soil Unit Name	Drainage Class	Hydric Soil?
D64B	Urban land-Hubbard complex, Mississippi River Valley, 0 to 8 percent slopes	Excessively Drained	No
Ma	Markey muck, occasionally ponded, 0 to 1 percent slopes	Very Poorly Drained	Yes
UhdD	Urban land-Hayden complex, 15 to 25 percent slopes	Well Drained	No
UzB	Urban land-Zimmerman complex, 0 to 8 percent slopes	Excessively Drained	No

The NWI map identifies one palustrine, emergent, persistent wetland bordered by forested, broad-leaved deciduous temporarily flooded wetland (PEM1A and PFO1A) within the Property. The field delineated wetland (WL-1) is within the same vicinity as wetlands identified on the NWI map. The field delineated wetland (WL-2) is not identified on the NWI map (Appendix A, Figure 5). The MNDNR Protected/Public Waters map identified the Mississippi River, a perennial waterbody, on the western boundary of the Property (Figure 3, Appendix A).

Average precipitation for the investigation area was obtained from the Anoka, Fridley, MN National Weather Service (NWS) weather station and used for the WETS analysis. A total of 12.24 inches of precipitation occurred in the three-month time prior to the delineation in 2018 compared to the average of 10.68 inches. Based on the WETS analysis, conditions were wetter than normal (Appendix D).

3.2 WETLAND

Two wetlands were identified and delineated within the Property during the 2018 site visit. Wetland determination data forms were completed for four sample points along transects through the wetlands and adjacent uplands and are provided in Appendix B. Photographs of the wetlands and adjacent lands are contained in Appendix C. The wetland boundary and sample point locations are shown on Figure 5 (Appendix A). The wetlands are summarized in Table 2 and described in detail in the following sections.

Table 2. Summary of Wetlands Delineated within the Property

Wetland ID	Eggers & Reed	Circular 39	Cowardin Class	Adjacent Surface Waters	Acreage (on-site)
Wetland 1 (WL-1)	Shrub-Carr	6	PSS1B	Surface water outlet via ephemeral stream to the Mississippi River	3.279
Wetland 2 (WL-2)	Fresh (Wet) Meadow	2	PEMB	Isolated	0.094
TOTAL					**3.373**

3.2.1 Wetland 1 (WL-1)

Wetland 1 (WL-1) was determined to be a shrub-scrub, broad-leaved deciduous, seasonally saturated (PSS1B) type wetland located in the center of the Property. WL-1 is directly connected to two unnamed ephemeral tributaries that flow through the wetland. The ephemeral tributaries are located at the eastern and western edges of WL-1 and are field delineated as Stream 1 and Stream 2 which are described below and shown on Figure 5 in Appendix A. The unnamed ephemeral tributaries associated with WL-1 flow west through culverts and eventually discharge into the Mississippi River.

Vegetation

Dominant plant species identified at sample points completed within WL-1 consist of buckthorn (*Rhamnus cathartica*), reed canary grass (*Phalaris arundinacea*), stinging nettle (*Urtica dioica*), and small-spike false nettle (*Boehmeria cylindrica*). Other common species identified in the wetland are listed on the data forms contained in Appendix B. The dominant species within the wetland are comprised mostly of hydrophytic vegetation (OBL, FACW, and/or FAC) and meet the hydrophytic vegetation criterion.

Hydrology

Wetland hydrology was met with primary indicators of High Water Table (A2) and Saturation (A3). It also had secondary indicators that included Drainage Patterns (B10), Geomorphic Position (D2) and the FAC-Neutral Test (D5). Therefore, the wetland hydrology criterion was met.

Soils

Soils within the wetland are mapped by the NRCS as Markey muck (Appendix A, Figure 2). The soils identified at sample point WL1-1W met the NRCS Field Indicator A3-Black Histic. Therefore, the wetland hydrology criterion was met.

Wetland Boundary

The wetland boundary was determined based on distinct differences in vegetation, hydrology, soils and topography consisting of the following: 1) Transition from a scrub-shrub wetland community dominated by buckthorn and reed canary grass to a mesic woodland upland community dominated by black cherry (*Prunus serotina*), bur oak (*Quercus macrocarpa*), prickly gooseberry (*Ribes cynosbati*), and large-leaved aster (*Eurybia macrophylla*); 2) Transition from saturated soils within the wetland to lack of wetland hydrology indicators within the adjacent upland; and 3) Transition from poorly drained hydric soils to somewhat poorly drained non-hydric soils.

3.2.2 Wetland 2 (WL-2)

Wetland 2 (WL-2) is an isolated, depressional, fresh (wet) meadow (PEMB) type wetland on the west central portion of the Property.

Vegetation

Dominant plant species identified at sample points completed within WL-2 consist of reed canary grass, small-spike false nettle, and garlic mustard (*Alliaria petiolate*). Other common species identified in the wetland are listed on the data forms contained in Appendix B. The dominant species within the wetland are comprised mostly of hydrophytic vegetation (OBL, FACW, and/or FAC) and meet the hydrophytic vegetation criterion.

Hydrology

Hydrology was met with a primary indicator of Saturation (A3). It also had secondary indicators of Geomorphic Position (D2) and the FAC-Neutral Test (D5). Therefore, the wetland hydrology criterion was met.

Soils

Soils within the wetland are mapped by the NRCS as Urban land (Appendix A, Figure 2). NRCS Field Indicators of hydric soils identified at sample point WL2-1W consisted of F6-Redox Dark surface. Therefore, the hydric soil criterion was satisfied.

Wetland Boundary

The wetland boundary was determined based on distinct differences in vegetation, hydrology, soils and topography consisting of the following: 1) Transition from a wet meadow wetland community dominated by reed canary grass and small-spike false nettle to a mesic woodland upland community dominated by as bur oak, American Basswood (*Tilia americana*), prickly gooseberry, and large-leaved aster; 2) Transition from saturated soils within the wetland to lack of wetland hydrology indicators within the adjacent upland; and 3) Transition from poorly drained hydric soils to somewhat poorly drained non-hydric soils.

3.3 WATERWAYS

Four waterways were delineated within the Property; their descriptions are detailed below and summarized in Table 3. All culvert locations were located with a GPS capable of sub-meter accuracy. The locations of the waterways are shown on the aerial photo-based map included as Figure 5 in Appendix A. Photographs of the waterways are provided in Appendix C.

Table 3. Summary of Waterways Delineated within the Property

Waterway ID	Name	Classification	Cowardin	Preliminary Jurisdictional Status	Length within Property (feet)	Acres
ST-1	Unnamed tributary	Ephemeral	R4UB	Jurisdictional	157.3	0.01
ST-2	Unnamed tributary	Ephemeral	R4UB	Jurisdictional	273.3	0.02
ST-3	Unnamed tributary	Ephemeral	R4UB	Jurisdictional	128.8	0.01
ST-4	Mississippi River	Perennial	R2UBH	Jurisdictional	1,333	NA
TOTAL					**1,892.4**	**0.04[1]**
[1] Sum includes ST-1, ST-2, and ST-3. ST-4 was located on Property boundary and not included in total acres.						

3.3.1 Stream 1 (ST-1)

Stream ST-1 is not an NHD, PWI, or NWI mapped waterbody. This ephemeral stream originates at a culvert at East River Road on the east side of the Property and flows west into WL-1 where it becomes diffuse and no longer exhibits a bed or bank. This stream is part of a flow through system which is hydrologically connected the Mississippi River, a Waters of the U.S., and is not isolated. Based on professional judgement, ST-1 is jurisdictional; however, the USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

3.3.2 Stream 2 (ST-2)

Stream ST-2 is not an NHD, PWI, or NWI mapped waterbody. This ephemeral stream originates within WL-1. A culvert is present at the western terminus of the waterbody. Standing water was present in the stream at the time of the survey and was stagnant. It is assumed that the stream flows west through the culvert and is part of a flow through system which is hydrologically connected the Mississippi River, a Waters of the U.S., and not isolated. Based on professional judgement, ST-2 is jurisdictional; however, the USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

3.3.3 Stream 3 (ST-3)

Stream ST-3 is not an NHD, PWI, or NWI mapped waterbody. This ephemeral stream originates at a culvert and flows west 1,069.9 feet to its confluence with the Mississippi River. This stream is hydrologically connected the Mississippi River, a Waters of the U.S., and not isolated. Based on professional judgment, ST-3 is jurisdictional; however, the USACE has full discretion in determining the jurisdictional status of referenced wetlands and waterbodies.

3.3.4 Stream 4 (ST-4)

ST-4 is the Mississippi River, an NHD, PWI, and NWI mapped lower perennial unconsolidated bottom, permanently flooded (R2UBH) waterbody. PWI mapped waterbodies are protected waters of the State and are subject to Minnesota Statutes, Section 105.42, which requires that a permit be obtained before making any alteration in the course, current or cross-section of these waters. This segment of the Mississippi River is EPA 303(d) listed as impaired for mercury in fish tissue, PCB(s) in fish tissue, and fecal coliform. A TMDL is completed for mercury. The Mississippi River is a Waters of the U.S., and therefore is jurisdictional.

3.4 OTHER ENVIRONMENTAL CONSIDERATIONS

This report is limited to the identification of state and/or federally regulated wetlands and waterways within the Property. However, there may be other regulated environmental features within the Property, including, but not limited to, historical or archeological features, endangered or threatened species, and/or floodplains, etc. Federal, state, and local units of government and regional planning organizations may have regulatory authority to control or restrict land uses within or in proximity to these features. Stantec can assist with identification and/or assessment of additional regulated resources at your request, to the extent that the work is within our range of expertise.

4.0 CONCLUSION

Stantec performed a wetland determination and delineation of the MCES New Lift Station L32A Phase 1 Project on behalf of the MCES. The purpose and objective of the wetland determination and delineation was to identify the extent and spatial arrangement of wetlands and waterways within the Property.

Two wetlands were identified and delineated in the Property in accordance with state and federal guidelines and were surveyed with GPS and mapped using GIS software. There was a combined total of 3.373 acres of wetlands in the Property. Wetlands were composed of seasonally flooded (PEMA) and scrub-shrub (PSS1C) type wetlands. Adjacent uplands were composed of upland woodland. Additionally, four waterways were mapped in the Property for a total of approximately 1,892. linear feet of streams. Combined these streams consisted of approximately 0.04 acre.

The USACE has regulatory authority over Waters of the U.S. including adjacent wetlands, and the MNDNR has regulatory authority over certain wetlands, navigable waters and adjacent lands under Statute 103G and Rule 6115.0250. All wetlands are protected under the Wetland Conservation Act Rules Chapter 8420 and administered by a Local Governmental Unit. Local Government Units can be a City, County, Watershed District or Soil and Water Conservation District depending on project location. Stantec recommends this report be submitted to Local Governmental Unit and USACE for final jurisdictional review and concurrence. Finally, counties, townships and municipalities may have local zoning authority over certain types of wetlands and waterways.

Prior to beginning work at this site or disturbing or altering wetlands, waterways, or adjacent lands in any way, Stantec recommends that the owner obtain the necessary permits or other agency regulatory review and concurrence with regard to the proposed work to comply with applicable regulations. Stantec can assist with identification and/or assessment of additional regulated resources at your request, to the extent that the work is within our range of expertise.

The information provided by Stantec regarding wetland boundaries is a scientific-based analysis of the wetland and upland conditions present on the Property at the time of the fieldwork. The delineation was performed by experienced and qualified professionals using standard practices and sound professional judgment. The ultimate decision on wetland boundaries rests with the USACE and LGU, in some cases, the MNDNR as well. As a result, there may be adjustments to boundaries based upon review by a regulatory agency. An agency determination can vary from time to time depending on various factors including, but not limited to recent precipitation patterns and the season of the year. In addition, the physical characteristics of the Property can change over time, depending on the weather, vegetation patterns, drainage activities on adjacent parcels, or other events. Any of these factors can change the nature and extent of wetlands on the site. This wetland delineation report and the associated wetland boundaries cannot be depended on until they are approved by the U.S. Army Corps of Engineers and Wetland Conservation Act. It is recommended to review and confirm these approvals before depending on this report.

5.0 REFERENCES

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Appendix A – Figures

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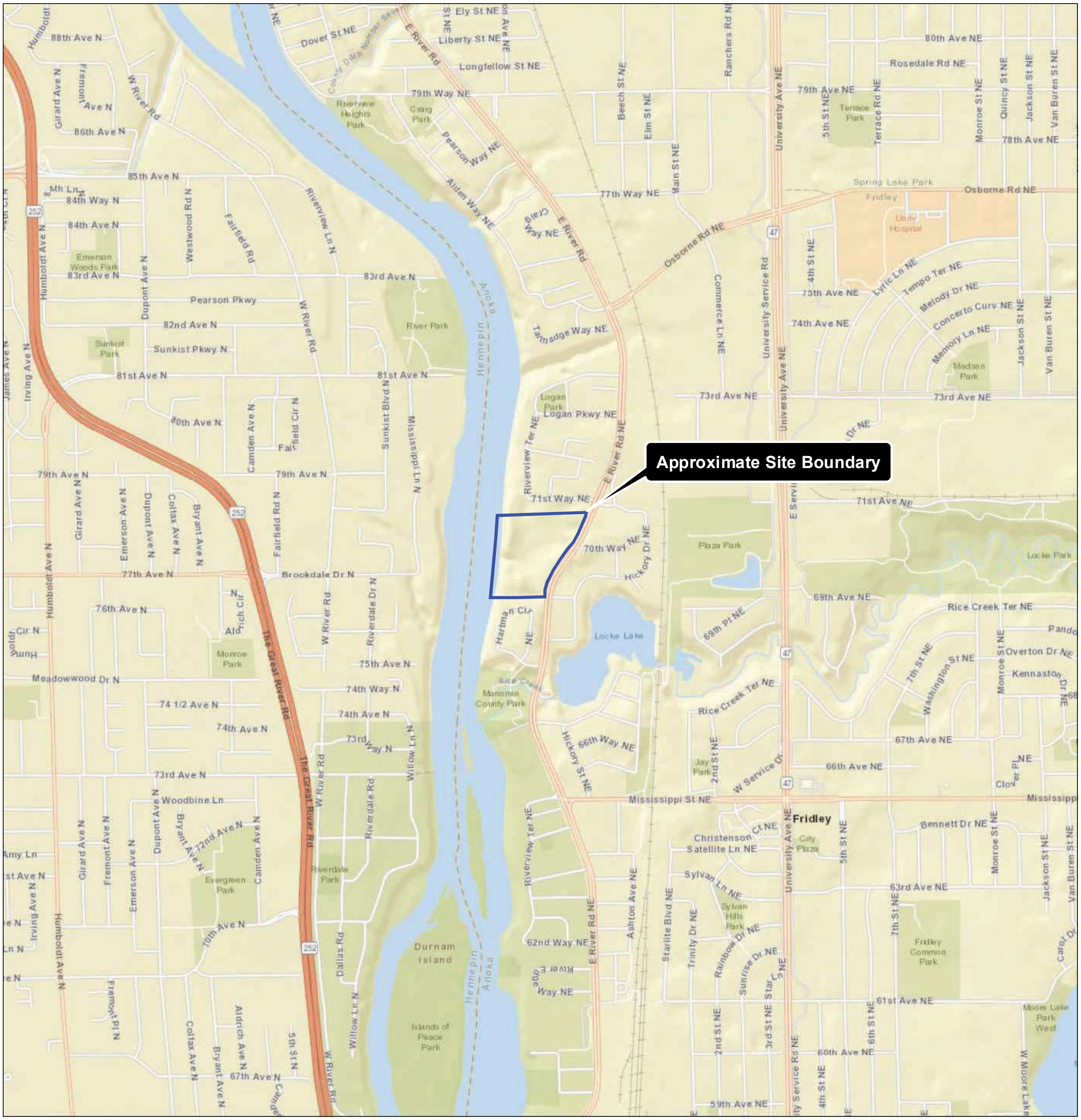

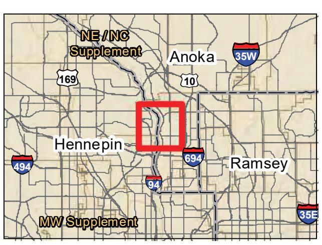

Legend

Approximate Site Boundary

Notes

1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources Include: Stantec, NADS, USGS
3. Background: World Street Map

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Figure No.
1

Title
Project Location

Client/Project
Metropolitan Council Environmental Services
MCES New Lift Station L-32A Phase 1
Wetland Delineation

Project Location
T30N, R24W, S10,
C. of Fridley,
Anoka Co., MN

193804409
Prepared by SF on 2018-10-05
Technical Review by JM on 2018-10-05
Independent Review by XXX on 2018-XX-XX

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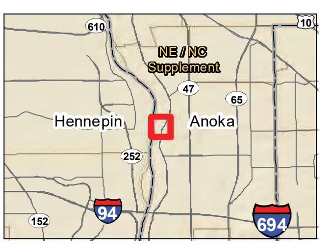

Legend
Approximate Site Boundary
NRCS Soil Survey Data
Hydric Ratings
Predominantly Hydric Soil
Partially Hydric Soil
Non-Hydric Soil

National Hydrography Dataset
Perennial Stream
Intermittent Stream
Waterbody

Figure No.
2
Title
NRCS Soil Survey Data
Hydric Ratings

Client/Project
Metropolitan Council Environmental Services
MCES New Lift Station L32A Phase 1
Wetland Delineation

Project Location 193804409
T30N, R24W, S10, C. of Fridley, Anoka Co., MN
Prepared by SF on 2018-10-05
Technical Review by JM on 2018-10-05
Independent Review by XXX on 2018-XX-XX

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1:3,600 (at original document size of 8.5x11)
N

Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources Include: Stantec, NADS, USGS, NRCS
3. Orthophotography: 2017 NAIP

Stantec

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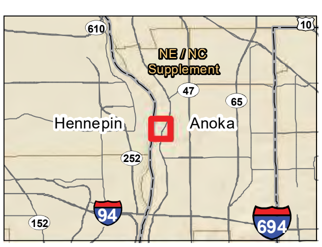

Legend

Approximate Site Boundary

DNR Protected/Public Waters Inventory

Water Basin

Water Wetland *

Waterway

*No Features Within Data Frame

Figure No.
3

Title
MN Protected/Public Waters

Client/Project
Metropolitan Council Environmental Services
MCES New Lift Station L-32A Phase 1
Wetland Delineation

Project Location 193804409
T30N, R24W, S10,
C. of Fridley,
Anoka Co., MN

Prepared by SF on 2018-10-05
Technical Review by JM on 2018-10-05
Independent Review by XXX on 2018-XX-XX

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Feet
1:3,600 (at original document size of 8.5x11)

N

Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources Include: Stantec, NADS, USGS, MNDNR
3. Orthophotography: 2017 NAIP

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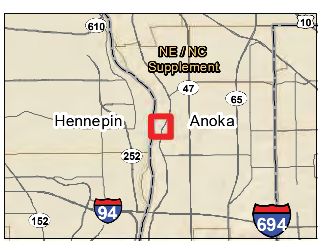
Stantec



Legend

Approximate Site Boundary

National Wetlands Inventory Feature

National Hydrography Dataset

Perennial Stream

Intermittent Stream

Waterbody

Notes

1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources Include: Stantec, NADS, USGS, USFWS
3. Orthophotography: 2017 NAIP

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Figure No.
4

Title
National Wetlands Inventory

Client/Project
Metropolitan Council Environmental Services
MCES New Lift Station L-32A Phase 1
Wetland Delineation

Project Location 193804409
T30N, R24W, S10,
C. of Fridley,
Anoka Co., MN

Prepared by SF on 2018-10-05
Technical Review by JM on 2018-10-05
Independent Review by JK on 2018-10-18

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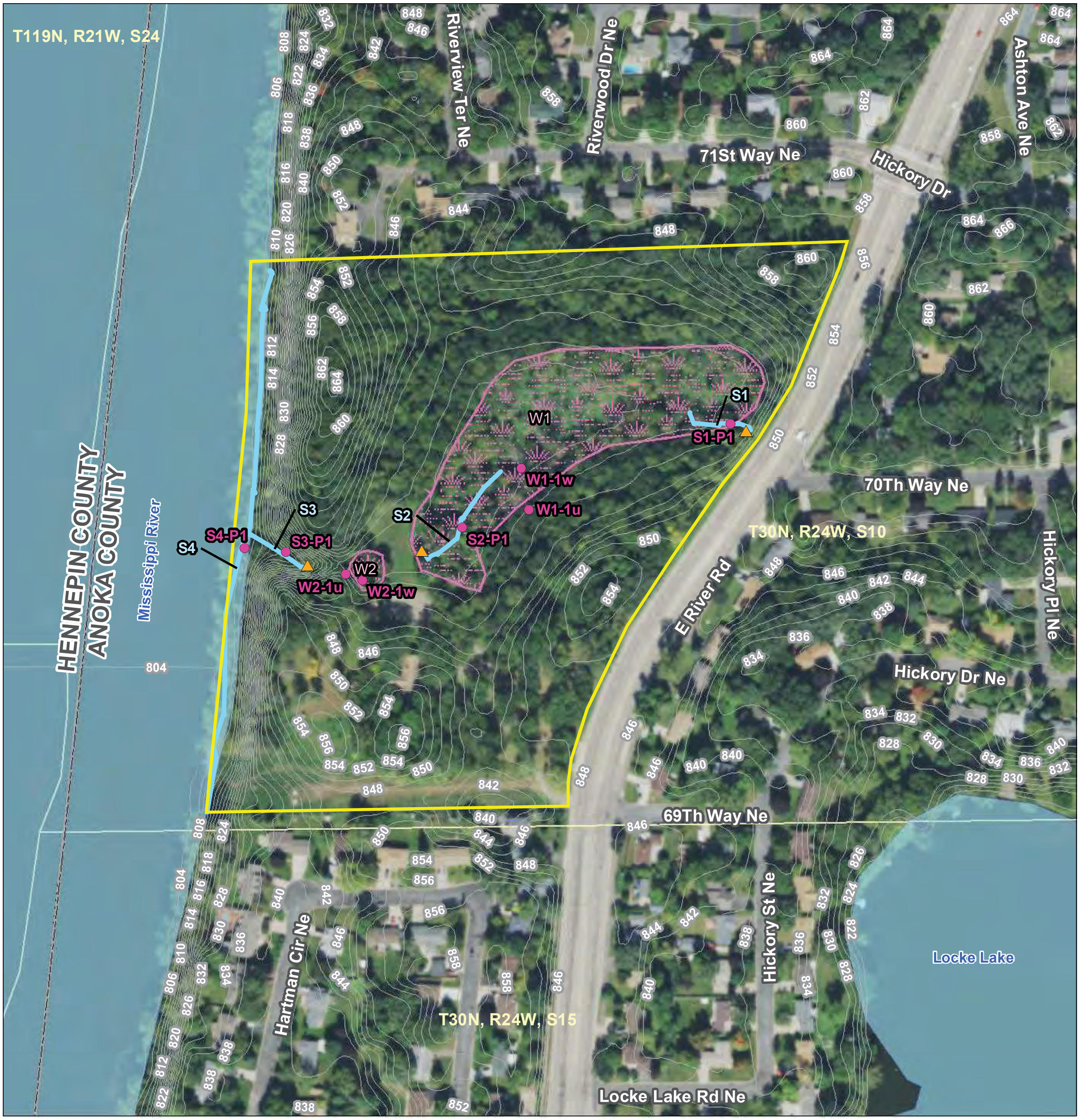

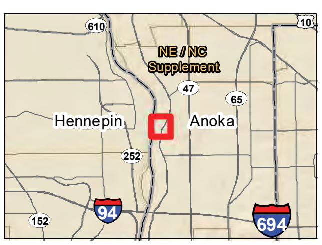

Legend

- Approximate Site Boundary
- Sample Point
- Culvert
- Field Delineated Waterway
- Field Delineated Wetland Area
- 2ft Lidar Elevation Contour

National Hydrography Dataset

- Perennial Stream
- Intermittent Stream
- Waterbody

Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Data Sources Include: Stantec, NADS, USGS, MnGeo
3. Orthophotography: 2017 NAIP

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Figure No.
5

Title
Field Collected Data

Client/Project
Metropolitan Council Environmental Services
MCES New Lift Station L-32 Phase 1
Wetland Delineation

Project Location 193804409
T30N, R24W, S10, Prepared by SF on 2018-10-05
C. of Fridley, Technical Review by JM on 2018-10-05
Anoka Co., MN Independent Review by JK on 2018-10-18

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Appendix B – Wetland and Waterbody Data Forms

Stantec

WETLAND DETERMINATION DATA FORM
Northcentral and Northeast Region

Project/Site: MCES New L-32A Lift Station — Stantec Project #: 193804409 — Date: 10/11/18
Applicant: Metropolitan Council Environmental Services — County: Anoka
Investigator #1: Jennifer Kamm — Investigator #2: — State: Minnesota
Soil Unit: Markey muck — Mapped NWI Classification: PFO1A/PEM1A — Wetland ID: W1
Landform: Depression — Local Relief: Concave — Sample Point: W1-1W
Slope (%): 1-3 — Cowardin Classification: PSS1B — Circular 39 Classification: Type 6 — Community ID: Shrub-carr
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks) ☑ Yes ☐ No — Section: 10
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? — Are normal circumstances present? ☑ Yes ☐ No — Township: 30N
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? — Range: 24W

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? ☑ Yes ☐ No
Hydric Soils Present? ☑ Yes ☐ No
Wetland Hydrology Present? ☑ Yes ☐ No
Is This Sampling Point Within A Wetland? ☑ Yes ■ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present ☐):

Primary:
- ☐ A1 - Surface Water
- ☑ A2 - High Water Table
- ☑ A3 - Saturation
- ☐ B1 - Water Marks
- ☐ B2 - Sediment Deposits
- ☐ B3 - Drift Deposits
- ☐ B4 - Algal Mat or Crust
- ☐ B5 - Iron Deposits
- ☐ B7 - Inundation Visible on Aerial Imagery
- ☐ B8 - Sparsely Vegetated Concave Surface
- ☐ B9 - Water-Stained Leaves
- ☐ B13 - Aquatic Fauna
- ☐ B15 - Marl Deposits
- ☐ C1 - Hydrogen Sulfide Odor
- ☐ C3 - Oxidized Rhizospheres on Living Roots
- ☐ C4 - Presence of Reduced Iron
- ☐ C6 - Recent Iron Reduction in Tilled Soils
- ☐ C7 - Thin Muck Surface
- ☐ Other (Explain in Remarks)

Secondary:
- ☐ B6 - Surface Soil Cracks
- ☑ B10 - Drainage Patterns
- ☐ B16 - Moss Trim Lines
- ☐ C2 - Dry-Season Water Table
- ☐ C8 - Crayfish Burrows
- ☐ C9 - Saturation Visible on Aerial Imagery
- ☐ D1 - Stunted or Stressed Plants
- ☑ D2 - Geomorphic Position
- ☐ D3 - Shallow Aquitard
- ☐ D4 - Microtopographic Relief
- ☑ D5 - FAC-Neutral Test

Field Observations:

Surface Water Present?	☐ Yes	☐ No	Depth:	(in.)
Water Table Present?	☑ Yes	☐ No	Depth: 8	(in.)
Saturation Present?	☑ Yes	☐ No	Depth: 6	(in.)

Wetland Hydrology Present? ☑ Yes ☐ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks: Sample point located in shallow depression surrounded by mesic forest. Point approximately 0.5 feet lower in elevation than surrounding upland.

SOILS

Map Unit Name: Markey muck — Series Drainage Class: Very poorly drained
Taxonomy: Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix Color (Moist)		Matrix %	Redox Color (Moist)		Redox %	Type	Location	Texture (e.g. clay, sand, loam)
0	9	1	10YR	2/1	100	--	--	--	--	--	muck
9	13	2	10YR	2/1	90	10YR	5/6	5	C	M	muck
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

NRCS Hydric Soil Field Indicators (check here if indicators are not present ☐):
- ☐ A1- Histosol
- ☐ A2 - Histic Epipedon
- ☑ A3 - Black Histic
- ☐ A4 - Hydrogen Sulfide
- ☐ A5 - Stratified Layers
- ☐ A11 - Depleted Below Dark Surface
- ☐ A12 - Thick Dark Surface
- ☐ S1 - Sandy Muck Mineral
- ☐ S4 - Sandy Gleyed Matrix
- ☐ S5 - Sandy Redox
- ☐ S6 - Stripped Matrix
- ☐ S7 - Dark Surface (LRR R, MLRA 149B)
- ☐ S8 - Polyvalue Below Surface (LRR R, MLRA 149B)
- ☐ S9 - Thin Dark Surface (LRR R, MLRA 149B)
- ☐ F1 - Loamy Mucky Mineral (LRR K, L)
- ☐ F2 - Loamy Gleyed Matrix
- ☐ F3 - Depleted Matrix
- ☐ F6 - Redox Dark Surface
- ☐ F7 - Depleted Dark Surface
- ☐ F8 - Redox Depressions

Indicators for Problematic Soils [1]
- ☐ A10 - 2 cm Muck (LRR K, L, MLRA 149B)
- ☐ A16 - Coast Prairie Redox (LRR K, L, R)
- ☐ S3 - 5cm Mucky Peat of Peat (LRR K, L, R)
- ☐ S7 - Dark Surface (LRR K, L, M)
- ☐ S8 - Polyvalue Below Surface (LRR K, L)
- ☐ S9 - Thin Dark Surface (LRR K, L)
- ☐ F12 - Iron-Manganese Masses (LRR K, L, R)
- ☐ F19 - Piedmont Floodplain Soils (MLRA 149B)
- ☐ F21 - Red Parent Material
- ☐ TA6 - Mesic Spodic (MLRA 144A, 145, 149B)
- ☐ TF12 - Very Shallow Dark Surface
- ☐ Other (Explain in Remarks)

[1] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) — Type: N/A — Depth: N/A

Hydric Soil Present? ☑ Yes ☐ No

Remarks:

Stantec

WETLAND DETERMINATION DATA FORM
Northcentral and Northeast Region

Project/Site: MCES New L-32A Lift Station | Wetland ID: W1 | Sample Point: **W1-1W**

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 10 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*Celtis occidentalis*	1		FAC
2.	--			--
3.	--			--
4.	--			--
5.	--			--
6.	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
	Total Cover =	1		

Sapling/Shrub Stratum (Plot size: 5 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*RHAMNUS CATHARTICA*	30	Y	FAC
2.	--			--
3.	--			--
4.	--			--
5.	--			--
6.	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
	Total Cover =	30		

Herb Stratum (Plot size: 2 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*PHALARIS ARUNDINACEA*	100	Y	FACW
2.	*Boehmeria cylindrica*	10	N	OBL
3.	*PERSICARIA MACULOSA*	5	N	FAC
4.	*Urtica dioica*	5	N	FAC
5.	*Solidago gigantea*	1	N	FACW
6	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
11.	--			--
12.	--			--
13.	--			--
14.	--			--
15.	--			--
	Total Cover =	121		

Woody Vine Stratum (Plot size: 10 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*Vitis riparia*	1		FAC
2.	--			--
3.	--			--
4.	--			--
5.	--			--
	Total Cover =	1		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ***100%*** (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:	
OBL spp.	10	x 1 =	10
FACW spp.	101	x 2 =	202
FAC spp.	42	x 3 =	126
FACU spp.	0	x 4 =	0
UPL spp.	0	x 5 =	0
Total	153 (A)		338 (B)

Prevalence Index = B/A = ***2.209***

Hydrophytic Vegetation Indicators:

- ☑ Yes ☐ No Rapid Test for Hydrophytic Vegetation
- ☑ Yes ☐ No Dominance Test is > 50%
- ☑ Yes ☐ No Prevalence Index is ≤ 3.0 *
- ☐ Yes ☑ No Morphological Adaptations (Explain) *
- ☐ Yes ☑ No Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present ☑Yes ☐ No

Remarks:

Additional Remarks:

Stantec

WETLAND DETERMINATION DATA FORM
Northcentral and Northeast Region

Project/Site: MCES New L-32A Lift Station | Stantec Project #: 193804409 | Date: 10/11/18
Applicant: Metropolitan Council Environmental Services | County: Anoka
Investigator #1: Jennifer Kamm | Investigator #2: | State: Minnesota
Soil Unit: Markey muck | Mapped NWI Classification: PFO1A | Wetland ID: W2
Landform: Side slope | Local Relief: Linear | Sample Point: W1-1U
Slope (%): 3-5 | Cowardin Classification: | Circular 39 Classification: -- | Community ID: Upland
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks) ☑ Yes ☐ No | Section: 10
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? | Are normal circumstances present? | Township: 30N
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? | ☑ Yes ☐ No | Range: 24W

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? ☐ Yes ☑ No
Wetland Hydrology Present? ☐ Yes ☑ No
Hydric Soils Present? ☑ Yes ☐ No
Is This Sampling Point Within A Wetland? ☐ Yes ☑ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present ☑):

Primary:
- ☐ A1 - Surface Water
- ☐ A2 - High Water Table
- ☐ A3 - Saturation
- ☐ B1 - Water Marks
- ☐ B2 - Sediment Deposits
- ☐ B3 - Drift Deposits
- ☐ B4 - Algal Mat or Crust
- ☐ B5 - Iron Deposits
- ☐ B7 - Inundation Visible on Aerial Imagery
- ☐ B8 - Sparsely Vegetated Concave Surface
- ☐ B9 - Water-Stained Leaves
- ☐ B13 - Aquatic Fauna
- ☐ B15 - Marl Deposits
- ☐ C1 - Hydrogen Sulfide Odor
- ☐ C3 - Oxidized Rhizospheres on Living Roots
- ☐ C4 - Presence of Reduced Iron
- ☐ C6 - Recent Iron Reduction in Tilled Soils
- ☐ C7 - Thin Muck Surface
- ☐ Other (Explain in Remarks)

Secondary:
- ☐ B6 - Surface Soil Cracks
- ☐ B10 - Drainage Patterns
- ☐ B16 - Moss Trim Lines
- ☐ C2 - Dry-Season Water Table
- ☐ C8 - Crayfish Burrows
- ☐ C9 - Saturation Visible on Aerial Imagery
- ☐ D1 - Stunted or Stressed Plants
- ☐ D2 - Geomorphic Position
- ☐ D3 - Shallow Aquitard
- ☐ D4 - Microtopographic Relief
- ☐ D5 - FAC-Neutral Test

Field Observations:

Surface Water Present? ☐ Yes ☑ No Depth: (in.)
Water Table Present? ☐ Yes ☑ No Depth: (in.)
Saturation Present? ☐ Yes ☑ No Depth: (in.)

Wetland Hydrology Present? ☐ Yes ☑ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks: Sample point located in hill sideslope in mesic forest adjacent to depressional wetland.

SOILS

Map Unit Name: Markey muck | Series Drainage Class: Very poorly drained
Taxonomy: Sandy or sandy-skeletal, mixed, euic, frigid Terric Haplosaprists

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix Color (Moist)		Matrix %	Redox Features Color (Moist)		Redox %	Type	Location	Texture (e.g. clay, sand, loam)
0	9	1	10YR	2/1	100	--	--	--	--	--	silt loam
9	17	2	10YR	2/1	40	10YR	6/6	5	C	M	sand
--	--	2	10YR	7/2	55	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

NRCS Hydric Soil Field Indicators (check here if indicators are not present ☐):

- ☐ A1- Histosol
- ☐ A2 - Histic Epipedon
- ☐ A3 - Black Histic
- ☐ A4 - Hydrogen Sulfide
- ☐ A5 - Stratified Layers
- ☐ A11 - Depleted Below Dark Surface
- ☐ A12 - Thick Dark Surface
- ☐ S1 - Sandy Muck Mineral
- ☐ S4 - Sandy Gleyed Matrix
- ☐ S5 - Sandy Redox
- ☐ S6 - Stripped Matrix
- ☐ S7 - Dark Surface (LRR R, MLRA 149B)
- ☐ S8 - Polyvalue Below Surface (LRR R, MLRA 149B)
- ☐ S9 - Thin Dark Surface (LRR R, MLRA 149B)
- ☐ F1 - Loamy Mucky Mineral (LRR K, L)
- ☐ F2 - Loamy Gleyed Matrix
- ☑ F3 - Depleted Matrix
- ☐ F6 - Redox Dark Surface
- ☐ F7 - Depleted Dark Surface
- ☐ F8 - Redox Depressions

Indicators for Problematic Soils [1]
- ☐ A10 - 2 cm Muck (LRR K, L, MLRA 149B)
- ☐ A16 - Coast Prairie Redox (LRR K, L, R)
- ☐ S3 - 5cm Mucky Peat of Peat (LRR K, L, R)
- ☐ S7 - Dark Surface (LRR K, L, M)
- ☐ S8 - Polyvalue Below Surface (LRR K, L)
- ☐ S9 - Thin Dark Surface (LRR K, L)
- ☐ F12 - Iron-Manganese Masses (LRR K, L, R)
- ☐ F19 - Piedmont Floodplain Soils (MLRA 149B)
- ☐ F21 - Red Parent Material
- ☐ TA6 - Mesic Spodic (MLRA 144A, 145, 149B)
- ☐ TF12 - Very Shallow Dark Surface
- ☐ Other (Explain in Remarks)

[1] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) Type: N/A Depth: N/A

Hydric Soil Present? ☑ Yes ☐ No

Remarks:

Stantec

WETLAND DETERMINATION DATA FORM

Northcentral and Northeast Region

Project/Site: MCES New L-32A Lift Station   Wetland ID: W2   Sample Point: **W1-1U**

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 10 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*Prunus serotina*	30	Y	FACU
2.	--			--
3.	--			--
4.	--			--
5.	--			--
6.	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
	Total Cover =	30		

Sapling/Shrub Stratum (Plot size: 5 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*RHAMNUS CATHARTICA*	5	Y	FAC
2.	--			--
3.	--			--
4.	--			--
5.	--			--
6.	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
	Total Cover =	5		

Herb Stratum (Plot size: 2 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*Festuca subverticillata*	40	Y	FACU
2.	*ALLIARIA PETIOLATA*	30	Y	FACU
3.	*Eurybia macrophylla*	5	N	UPL
4.	*Matteuccia struthiopteris*	5	N	FAC
5.	*Ribes cynosbati*	2	N	FACU
6	*Matteuccia struthiopteris*	2	N	FAC
7.	*LEONURUS CARDIACA*	1	N	UPL
8.	*Geum canadense*	1	N	FAC
9.	--			--
10.	--			--
11.	--			--
12.	--			--
13.	--			--
14.	--			--
15.	--			--
	Total Cover =	86		

Woody Vine Stratum (Plot size: 10 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	--			--
2.	--			--
3.	--			--
4.	--			--
5.	--			--
	Total Cover =	0		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: *25%* (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:	
OBL spp.	0	x 1 =	0
FACW spp.	0	x 2 =	0
FAC spp.	13	x 3 =	39
FACU spp.	102	x 4 =	408
UPL spp.	6	x 5 =	30
Total	121 (A)		477 (B)

Prevalence Index = B/A = *3.942*

Hydrophytic Vegetation Indicators:

- ☐ Yes ☑ No Rapid Test for Hydrophytic Vegetation
- ☐ Yes ☑ No Dominance Test is > 50%
- ☐ Yes ☑ No Prevalence Index is ≤ 3.0 *
- ☐ Yes ☑ No Morphological Adaptations (Explain) *
- ☐ Yes ☑ No Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present ☐ Yes ☑ No

Remarks:

Additional Remarks:

Stantec

WETLAND DETERMINATION DATA FORM
Northcentral and Northeast Region

Project/Site: MCES New L-32A Lift Station | Stantec Project #: [E.g. 193700096] | Date: 10/11/18
Applicant: Metropolitan Council Environmental Services | County: Anoka
Investigator #1: Jennifer Kamm | Investigator #2: | State: Minnesota
Soil Unit: Urban land | Mapped NWI Classification: PUBF | Wetland ID: W2
Landform: Depression | Local Relief: Concave | Sample Point: W2-1W
Slope (%): 3-5 | Cowardin Classification: PEMB | Circular 39 Classification: Type 2 | Community ID: Fresh wet meadow
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks) ☑ Yes ☐ No | Section: 10
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? | Are normal circumstances present? | Township: 30N
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? | ☑ Yes ☐ No | Range: 24W

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? ☑ Yes ☐ No | Hydric Soils Present? ☑ Yes ☐ No
Wetland Hydrology Present? ☑ Yes ☐ No | Is This Sampling Point Within A Wetland? ☑ Yes ■ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present ☐):

Primary:
- ☐ A1 - Surface Water
- ☐ A2 - High Water Table
- ☑ A3 - Saturation
- ☐ B1 - Water Marks
- ☐ B2 - Sediment Deposits
- ☐ B3 - Drift Deposits
- ☐ B4 - Algal Mat or Crust
- ☐ B5 - Iron Deposits
- ☐ B7 - Inundation Visible on Aerial Imagery
- ☐ B8 - Sparsely Vegetated Concave Surface
- ☐ B9 - Water-Stained Leaves
- ☐ B13 - Aquatic Fauna
- ☐ B15 - Marl Deposits
- ☐ C1 - Hydrogen Sulfide Odor
- ☐ C3 - Oxidized Rhizospheres on Living Roots
- ☐ C4 - Presence of Reduced Iron
- ☐ C6 - Recent Iron Reduction in Tilled Soils
- ☐ C7 - Thin Muck Surface
- ☐ Other (Explain in Remarks)

Secondary:
- ☐ B6 - Surface Soil Cracks
- ☐ B10 - Drainage Patterns
- ☐ B16 - Moss Trim Lines
- ☐ C2 - Dry-Season Water Table
- ☐ C8 - Crayfish Burrows
- ☐ C9 - Saturation Visible on Aerial Imagery
- ☐ D1 - Stunted or Stressed Plants
- ☑ D2 - Geomorphic Position
- ☐ D3 - Shallow Aquitard
- ☐ D4 - Microtopographic Relief
- ☑ D5 - FAC-Neutral Test

Field Observations:

Surface Water Present?	☐ Yes	☐ No	Depth:	(in.)
Water Table Present?	☐ Yes	☐ No	Depth:	(in.)
Saturation Present?	☑ Yes	☐ No	Depth: 9	(in.)

Wetland Hydrology Present? ☑ Yes ☐ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks: Sample point located in shallow depression surrounded by mesic forest. Point approximately 1 foot lower in elevation than surrounding upland.

SOILS

Map Unit Name: Urban land | Series Drainage Class: 0
Taxonomy: 0

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix Color (Moist)		Matrix %	Redox Color (Moist)		Redox %	Type	Location	Texture (e.g. clay, sand, loam)
0	4	1	10YR	2/1	100	--	--	--	--	--	silt loam
4	12	2	10YR	2/1	95	10YR	4/6	5	C	M	silt loam
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

NRCS Hydric Soil Field Indicators (check here if indicators are not present ☐):
- ☐ A1- Histosol
- ☐ A2 - Histic Epipedon
- ☐ A3 - Black Histic
- ☐ A4 - Hydrogen Sulfide
- ☐ A5 - Stratified Layers
- ☐ A11 - Depleted Below Dark Surface
- ☐ A12 - Thick Dark Surface
- ☐ S1 - Sandy Muck Mineral
- ☐ S4 - Sandy Gleyed Matrix
- ☐ S5 - Sandy Redox
- ☐ S6 - Stripped Matrix
- ☐ S7 - Dark Surface (LRR R, MLRA 149B)
- ☐ S8 - Polyvalue Below Surface (LRR R, MLRA 149B)
- ☐ S9 - Thin Dark Surface (LRR R, MLRA 149B)
- ☐ F1 - Loamy Mucky Mineral (LRR K, L)
- ☐ F2 - Loamy Gleyed Matrix
- ☐ F3 - Depleted Matrix
- ☑ F6 - Redox Dark Surface
- ☐ F7 - Depleted Dark Surface
- ☐ F8 - Redox Depressions

Indicators for Problematic Soils [1]
- ☐ A10 - 2 cm Muck (LRR K, L, MLRA 149B)
- ☐ A16 - Coast Prairie Redox (LRR K, L, R)
- ☐ S3 - 5cm Mucky Peat of Peat (LRR K, L, R)
- ☐ S7 - Dark Surface (LRR K, L, M)
- ☐ S8 - Polyvalue Below Surface (LRR K, L)
- ☐ S9 - Thin Dark Surface (LRR K, L)
- ☐ F12 - Iron-Manganese Masses (LRR K, L, R)
- ☐ F19 - Piedmont Floodplain Soils (MLRA 149B)
- ☐ F21 - Red Parent Material
- ☐ TA6 - Mesic Spodic (MLRA 144A, 145, 149B)
- ☐ TF12 - Very Shallow Dark Surface
- ☐ Other (Explain in Remarks)

[1] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) Type: Rock | Depth: 12 inches

Hydric Soil Present? ☑ Yes ☐ No

Remarks:

Stantec

WETLAND DETERMINATION DATA FORM
Northcentral and Northeast Region

Project/Site: MCES New L-32A Lift Station | Wetland ID: W2 | Sample Point: **W2-1W**

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 10 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	--			--
2.	--			--
3.	--			--
4.	--			--
5.	--			--
6.	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
	Total Cover =	0		

Sapling/Shrub Stratum (Plot size: 5 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	--			--
2.	--			--
3.	--			--
4.	--			--
5.	--			--
6.	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
	Total Cover =	0		

Herb Stratum (Plot size: 2 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*PHALARIS ARUNDINACEA*	50	Y	FACW
2.	*Boehmeria cylindrica*	30	Y	OBL
3.	*ALLIARIA PETIOLATA*	10	N	FACU
4.	*Symphyotrichum cordifolium*	7	N	UPL
5.	*Symphyotrichum lanceolatum*	2	N	FACW
6	*Matteuccia struthiopteris*	1	N	FAC
7.	--			--
8.	--			--
9.	--			--
10.	--			--
11.	--			--
12.	--			--
13.	--			--
14.	--			--
15.	--			--
	Total Cover =	100		

Woody Vine Stratum (Plot size: 10 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	--			--
2.	--			--
3.	--			--
4.	--			--
5.	--			--
	Total Cover =	0		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ***100%*** (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:	
OBL spp.	30	x 1 =	30
FACW spp.	52	x 2 =	104
FAC spp.	1	x 3 =	3
FACU spp.	10	x 4 =	40
UPL spp.	7	x 5 =	35
Total	100 (A)		212 (B)

Prevalence Index = B/A = ***2.120***

Hydrophytic Vegetation Indicators:

- ☑ Yes ☐ No Rapid Test for Hydrophytic Vegetation
- ☑ Yes ☐ No Dominance Test is > 50%
- ☑ Yes ☐ No Prevalence Index is ≤ 3.0 *
- ☐ Yes ☑ No Morphological Adaptations (Explain) *
- ☐ Yes ☑ No Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present ☑ Yes ☐ No

Remarks:

Additional Remarks:

Stantec

WETLAND DETERMINATION DATA FORM
Northcentral and Northeast Region

Project/Site: MCES New L-32A Lift Station
Stantec Project #: 193804409
Date: 10/11/18
Applicant: Metropolitan Council Environmental Services
County: Anoka
Investigator #1: Jennifer Kamm
Investigator #2:
State: Minnesota
Soil Unit: Urban land
Mapped NWI Classification: PUBF
Wetland ID: W2
Landform: Side slope
Local Relief: Linear
Sample Point: W2-1U
Slope (%): 5-10
Cowardin Classification:
Circular 39 Classification: –
Community ID: Upland
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks) ☑ Yes ☐ No
Section: 10
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are normal circumstances present? ☑ Yes ☐ No
Township: 30N
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic?
Range: 24W

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present? ☐ Yes ☑ No
Hydric Soils Present? ☐ Yes ☑ No
Wetland Hydrology Present? ☐ Yes ☑ No
Is This Sampling Point Within A Wetland? ☐ Yes ☑ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present ☑):

Primary:
- ☐ A1 - Surface Water
- ☐ A2 - High Water Table
- ☐ A3 - Saturation
- ☐ B1 - Water Marks
- ☐ B2 - Sediment Deposits
- ☐ B3 - Drift Deposits
- ☐ B4 - Algal Mat or Crust
- ☐ B5 - Iron Deposits
- ☐ B7 - Inundation Visible on Aerial Imagery
- ☐ B8 - Sparsely Vegetated Concave Surface
- ☐ B9 - Water-Stained Leaves
- ☐ B13 - Aquatic Fauna
- ☐ B15 - Marl Deposits
- ☐ C1 - Hydrogen Sulfide Odor
- ☐ C3 - Oxidized Rhizospheres on Living Roots
- ☐ C4 - Presence of Reduced Iron
- ☐ C6 - Recent Iron Reduction in Tilled Soils
- ☐ C7 - Thin Muck Surface
- ☐ Other (Explain in Remarks)

Secondary:
- ☐ B6 - Surface Soil Cracks
- ☐ B10 - Drainage Patterns
- ☐ B16 - Moss Trim Lines
- ☐ C2 - Dry-Season Water Table
- ☐ C8 - Crayfish Burrows
- ☐ C9 - Saturation Visible on Aerial Imagery
- ☐ D1 - Stunted or Stressed Plants
- ☐ D2 - Geomorphic Position
- ☐ D3 - Shallow Aquitard
- ☐ D4 - Microtopographic Relief
- ☐ D5 - FAC-Neutral Test

Field Observations:

Surface Water Present? ☐ Yes ☑ No Depth: (in.)
Water Table Present? ☐ Yes ☑ No Depth: (in.)
Saturation Present? ☐ Yes ☑ No Depth: (in.)

Wetland Hydrology Present? ☐ Yes ☑ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A

Remarks: Sample point located in hill sideslope in mesic forest adjacent to depressional wetland.

SOILS

Map Unit Name: Urban land
Series Drainage Class: 0
Taxonomy: 0

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)

Top Depth	Bottom Depth	Horizon	Matrix Color (Moist)		Matrix %	Redox Features Color (Moist)		Redox %	Type	Location	Texture (e.g. clay, sand, loam)
0	14	1	10YR	2/1	100	–	–	–	–	–	silt loam
–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–

NRCS Hydric Soil Field Indicators (check here if indicators are not present ☑):

- ☐ A1- Histosol
- ☐ A2 - Histic Epipedon
- ☐ A3 - Black Histic
- ☐ A4 - Hydrogen Sulfide
- ☐ A5 - Stratified Layers
- ☐ A11 - Depleted Below Dark Surface
- ☐ A12 - Thick Dark Surface
- ☐ S1 - Sandy Muck Mineral
- ☐ S4 - Sandy Gleyed Matrix
- ☐ S5 - Sandy Redox
- ☐ S6 - Stripped Matrix
- ☐ S7 - Dark Surface (LRR R, MLRA 149B)
- ☐ S8 - Polyvalue Below Surface (LRR R, MLRA 149B)
- ☐ S9 - Thin Dark Surface (LRR R, MLRA 149B)
- ☐ F1 - Loamy Mucky Mineral (LRR K, L)
- ☐ F2 - Loamy Gleyed Matrix
- ☐ F3 - Depleted Matrix
- ☐ F6 - Redox Dark Surface
- ☐ F7 - Depleted Dark Surface
- ☐ F8 - Redox Depressions

Indicators for Problematic Soils [1]
- ☐ A10 - 2 cm Muck (LRR K, L, MLRA 149B)
- ☐ A16 - Coast Prairie Redox (LRR K, L, R)
- ☐ S3 - 5cm Mucky Peat of Peat (LRR K, L, R)
- ☐ S7 - Dark Surface (LRR K, L, M)
- ☐ S8 - Polyvalue Below Surface (LRR K, L)
- ☐ S9 - Thin Dark Surface (LRR K, L)
- ☐ F12 - Iron-Manganese Masses (LRR K, L, R)
- ☐ F19 - Piedmont Floodplain Soils (MLRA 149B)
- ☐ F21 - Red Parent Material
- ☐ TA6 - Mesic Spodic (MLRA 144A, 145, 149B)
- ☐ TF12 - Very Shallow Dark Surface
- ☐ Other (Explain in Remarks)

[1] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed) Type: N/A Depth: N/A

Hydric Soil Present? ☐ Yes ☑ No

Remarks:

Stantec

WETLAND DETERMINATION DATA FORM
Northcentral and Northeast Region

Project/Site: MCES New L-32A Lift Station | Wetland ID: W2 | Sample Point: **W2-1U**

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 10 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*Quercus macrocarpa*	30	Y	FACU
2.	*Celtis occidentalis*	10	Y	FAC
3.	*Tilia americana*	10	Y	FACU
4.	*Populus deltoides*	10	Y	FAC
5.	*Fraxinus pennsylvanica*	5	N	FACW
6.	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
	Total Cover =	65		

Sapling/Shrub Stratum (Plot size: 5 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*Ribes cynosbati*	5	Y	FACU
2.	*RHAMNUS CATHARTICA*	5	Y	FAC
3.	*Celtis occidentalis*	1	N	FAC
4.	--			--
5.	--			--
6.	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
	Total Cover =	11		

Herb Stratum (Plot size: 2 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	*ALLIARIA PETIOLATA*	20	Y	FACU
2.	*Festuca subverticillata*	20	Y	FACU
3.	*Eurybia macrophylla*	10	N	UPL
4.	*Matteuccia struthiopteris*	5	N	FAC
5.	--			--
6	--			--
7.	--			--
8.	--			--
9.	--			--
10.	--			--
11.	--			--
12.	--			--
13.	--			--
14.	--			--
15.	--			--
	Total Cover =	55		

Woody Vine Stratum (Plot size: 10 meter radius)

	Species Name	% Cover	Dominant	Ind.Status
1.	--			--
2.	--			--
3.	--			--
4.	--			--
5.	--			--
	Total Cover =	0		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: *38%* (A/B)

Prevalence Index Worksheet

Total % Cover of:		Multiply by:	
OBL spp.	0	x 1 =	0
FACW spp.	5	x 2 =	10
FAC spp.	31	x 3 =	93
FACU spp.	85	x 4 =	340
UPL spp.	10	x 5 =	50
Total	131 (A)		493 (B)

Prevalence Index = B/A = *3.763*

Hydrophytic Vegetation Indicators:

☐ Yes	☑ No	Rapid Test for Hydrophytic Vegetation
☐ Yes	☑ No	Dominance Test is > 50%
☐ Yes	☑ No	Prevalence Index is ≤ 3.0 *
☐ Yes	☑ No	Morphological Adaptations (Explain) *
☐ Yes	☑ No	Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present ☐ Yes ☑ No

Remarks:

Additional Remarks:

Appendix C – Site Photographs

Photo 1. Sample Point W1-1W, wetland facing east

Photo 2. Sample Point W1-1W, wetland facing north

Photo 3. Sample Point W1-1W, wetland facing south

Photo 4. Sample Point W1-1W, wetland facing west

Photo 5. Sample Point W1-1U, upland facing south

Photo 6. Sample Point W1-1U, upland facing southeast

Photo 7. Sample Point W1-1U, upland facing southwest

Photo 8. Sample Point W2-1W, wetland facing east

Photo 9. Sample Point W2-1U, upland facing northwest

Photo 10. Stream 1, Sample Point S1-P1, facing east

Photo 11. Stream 1, Sample Point S1-P1, facing south

Photo 12. Stream 1, Sample Point S1-P1, facing west

Photo 13. Stream 2, Sample Point S2-P1, facing northwest

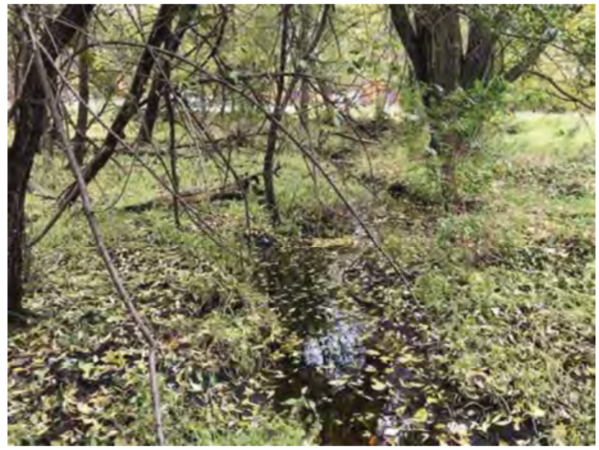

Photo 14. Stream 2, Sample Point S2-P1, facing southwest

Photo 15. Stream 2, Sample Point S2-P1, facing west

Photo 16. Stream 3, Sample Point S3-P1, facing northwest

Photo 17. Stream 3, Sample Point S3-P1, facing southeast

Photo 18. Stream 3, Sample Point S3-P1, facing southwest

Photo 19. Stream 4, Sample Point S4-P1, facing north

Photo 20. Stream 4, Sample Point S4-P1, facing south

Photo 21. Stream 4, Sample Point S4-P1, facing west

Photo 22. Utility right-of-way, upland facing west

Photo 23. Utility right-of-way, upland facing east

Appendix D – WETS Analysis

WETS Analysis Worksheet

Project Name: MCES New L-32A Lift Station
Project Number: Phase I 193804409
Period of interest: July - September
Station: Anoka, Fridley
County: Anoka County, Minnesota

Long-term rainfall records (from WETS table)

	Month	3 years in 10 less than	Normal	3 years in 10 greater than
1st month prior:	September	1.99	3.14	3.80
2nd month prior:	August	2.81	3.69	4.54
3rd month prior:	July	2.51	3.85	4.60
		Sum =	**10.68**	

Site determination

Site Rainfall (in)	Condition Dry/Normal*/Wet	Condition** Value	Month Weight	Product
4.59	Wet	3	3	9
3.64	Normal	2	2	4
4.01	Normal	2	1	2
Sum = **12.24**			Sum*** =	**15**

*Normal precipitation with 30% to 70% probability of occurrence

Determination: **X** Wet
___ Dry
___ Normal

**Condition value:
Dry = 1
Normal = 2
Wet = 3

***If sum is:
6 to 9 then period has been drier than normal
10 to 14 then period has been normal
15 to 18 then period has been wetter than normal

Precipitation data source: http://climateapps.dnr.state.mn.us/gridded_data/precip/wetland/wetland.asp

Reference: Donald E.Woodward, ed. 1997. *Hydrology Tools for Wetland Determination* , Chapter 19. Engineering Field Handbook. U.S. Department of Agriculture, Natural Resources Conservation Service, Fort Worth, TX.

Appendix D

Summary of Public Hearing Presentation, Public Comments Received, and Actions

Appendix D. Summary of Public Hearing Noticing, Presentation, Public Comments Received, and Actions

Contents:

- Public Hearing Notice
    - Version of notice for MCES project webpage posting and for newspaper publication.
    - Version of notice for mailing to property owners near project route.

- Publication of Public Hearing Notice
    - Star Tribune, November 15, 2020

- Virtual Public Hearing, December 17, 2020
    - Agenda and public hearing purpose
    - Sign-in Sheet (List of registrants)
    - Presentation
        - Location of project sites, p. 12
        - Alternatives evaluation, p. 18-29
        - Estimated sewer service charges, p. 33
    - Transcript
    - Video of public hearing (available upon request)

- Documentation of Comments from Public and Other Agencies:
    - Discussions with public hearing attendees focused on building location, odor mitigation methods and expectations, spill prevention, facility façade, and plans for the unused land (see attached public hearing transcript).
    - Project-related emailed and mailed comments/questions and responses are available in the attached public comments log.
    - We heard no major opposition to the project.

- Mailing Lists
    - SERP Form
    - Government/Community Stakeholder List
    - Citizens/Property Owners List
    - The mailing lists are also available as Excel spreadsheets by contacting Tim O'Donnell, Metropolitan Council Environmental Services, at tim.odonnell@metc.state.mn.us

Metropolitan Council Public Hearing:

Fridley Area Lift Station (L-32A) Draft Facility Plan

Date: Thursday, December 17, 2020
Time: 4:00 p.m.
Location: Online

The Metropolitan Council will hold an online public hearing to inform the public about and to accept comments on its Draft Facility Plan for constructing a new regional wastewater lift station (to be named L-32A) in Fridley. The Metropolitan Council's Environmental Services Division (MCES) prepared the Draft Facility Plan.

For information about the project and instructions for logging into or calling into the online public hearing on Dec. 17, go to *www.metrocouncil.org/sewerconstruction/fridley* or call the project phone number at 763-520-8650.

The Draft Facility Plan for this project outlines the issues at the existing lift station in Brooklyn Park, why a new lift station is needed, various alternatives studied for the lift station, and the reasons that support MCES's resulting recommendations. The new lift station will allow MCES to continue to provide sufficient and reliable wastewater conveyance from the Champlin, Anoka, Brooklyn Park and Fridley area to the MCES regional wastewater collection system for the period 2020 to 2040. The Draft Facility Plan also addresses the ultimate wastewater flow anticipated at built-out conditions in these cities.

Wastewater generated in Champlin, Anoka and Brooklyn Park currently is conveyed to the existing L-32 lift station in Brooklyn Park through a series of regional sanitary sewers, which then convey the wastewater through Fridley, Minneapolis and Saint Paul to MCES's Metropolitan Wastewater Treatment Plant (Metro Plant) in Saint Paul. The existing lift station, located on the west side of the Mississippi River, must be upgraded or replaced due to its aging and deteriorating infrastructure and to provide sufficient capacity for future growth and provide reliable wastewater conveyance for the region. The existing L-32 site is limited in size, making it challenging to upgrade the existing lift station and build new structures while keeping the existing lift station running and meeting community needs.

MCES owns property on the east side of the Mississippi River in Fridley, which was formerly known as Girl Scouts Camp Lockeslea. This site is large enough to build a new lift station with required wastewater storage, an odor control facility, and other related structures to meet future community needs, while having less construction impacts to the community than other alternatives. MCES recommends constructing the new lift station on the east side of Mississippi River in Fridley.

Copies of the Draft Facility Plan, a plan summary, a project area map for the new Lift Station L-32A, and a recent public information meeting presentation will be available for the public to review after Nov. 17, 2020, at the project webpage: *www.metrocouncil.org/sewerconstruction/fridley*. The Draft Facility Plan also will be available for the **public to review** during regular business hours at:

- Fridley City Hall, 7071 University Ave. N.E., Fridley
- Brooklyn Park City Hall, 5200 85th Ave. N., Brooklyn Park

- Anoka County Library – Mississippi Library, 410 Mississippi St. N.E., Fridley
- Hennepin County Library – Brooklyn Park Library, 8500 W. Broadway Ave., Brooklyn Park

All interested people are encouraged to attend the online public hearing and offer comments on Thursday, Dec. 17, 2020, at 4 p.m. This hearing will be streamed live and recorded. In addition to providing comments during the online public hearing, you also may provide comments in the following ways by 5 p.m. Dec. 28, 2020:

- Mail written comments to: Tim O'Donnell at Metropolitan Council Environmental Services, 390 Robert St. N., Saint Paul, MN 55101-1805
- Email comments to: *public.info@metc.state.mn.us*
- Record comments on: Metropolitan Council Public Comment Line at 651-602-1500
- Send TTY comments to 651-291-0904

Comments submitted prior to the public hearing will be read into the public record during the online public hearing.

Upon request, MCES will provide reasonable accommodations to persons with disabilities at the public hearing. Please submit such requests to Tim O'Donnell before Dec. 7, 2020, by email at *tim.odonnell@metc.state.mn.us* or by phone at 651-602-1269.

Next steps: MCES staff will review public comments and evaluate changes to the Draft Facility Plan to address the comments submitted by the public. A recommendation for final adoption of the Facility Plan will be considered by the Metropolitan Council in January 2021.

METROPOLITAN COUNCIL

Fridley Area Lift Station (L32A)

Join us for a virtual public hearing!

Provide comments and learn more about the proposed draft Facility Plan for the Fridley Area Lift Station (L32A) project.

Thursday, December 17, 2020
Hearing starts at 4 p.m.
Presentation at 4:05 p.m.

To join the virtual public hearing, please register in advance.
To register, please visit the project website:
metrocouncil.org/sewerconstruction/fridley

Review the Fridley Area lift station draft Facility Plan, which compares the options for the lift station and the potential impacts. You can review the Facility Plan and other materials on the project website. Printed versions are also available for the public to review at the following locations:

- **Fridley City Hall,** 7071 University Avenue NE, Fridley
- **Brooklyn Park City Hall,** 5200 85th Avenue N, Brooklyn Park
- **Anoka County Library – Mississippi Library,** 410 Mississippi Street NE, Fridley
- **Hennepin County Library – Brooklyn Park Library,** 8500 W Broadway Avenue, Brooklyn Park

METROPOLITAN COUNCIL
390 Robert Street North
Saint Paul, MN 55101-1805

Provide your comments

Submit your comments on the draft Facility Plan by 5 p.m. on December 28, 2020. You can provide your comments through:

- Attendance at the December 17 virtual public hearing
- Mail: Tim O'Donnell, Met Council Environmental Services, 390 Robert Street N, Saint Paul MN 55101-1805
- Email: public.info@metc.state.mn.us
- Recording on the Met Council Public Comment line: 651-602-1500
- TTY text: 651-291-0904

About the Fridley Area Lift Station Project

Metropolitan Council Environmental Services (MCES), operator of the metro-area wastewater collection and treatment system, plans to build a new lift station at 6900 East River Road in Fridley. The new facility will be built across the Mississippi River from the existing facility in Brooklyn Park. The existing lift station in Brooklyn Park will be converted to an odor control facility and will provide access to the regional sanitary sewer pipes that cross under the river.

PROJECT CONTACT

metrocouncil.org/sewerconstruction/fridley

info@fridleyarealiftstation.com

763-520-8650

Ad Number: 0000374127-01
Insertion Number: N/A
Size: 1 Col x 13.94 in
Color Type: 0

Advertiser: Metropolitan Council
Agency: N/A
Section-Page-Zone(s): H-4-All
Description: Metropolitan Council Public Hear...

StarTribune
Sunday, November 15, 2020

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Mortgage Foreclosures

NOTICE OF MORTGAGE FORECLOSURE SALE

THE RIGHT TO VERIFICATION OF THE DEBT AND IDENTITY OF THE ORIGINAL CREDITOR WITHIN THE TIME PROVIDED BY LAW IS NOT AFFECTED BY THIS ACTION.

NOTICE IS HEREBY GIVEN, that default has occurred in the conditions of the following described mortgage:

Mortgagor: Dale H. Peterson and Teresa A. Peterson, husband and wife

Mortgagee: Ameriquest Mortgage Company

Dated: April 22, 2003

Recorded: October 20, 2003

Anoka County Recorder Document No. 1864435

Assigned To: Deutsche Bank National Trust Company, as Trustee, in trust for the registered Holders of Ameriquest Mortgage Securities Inc., Asset-Backed Pass-Through Certificates, Series 2003-11

Dated: January 20, 2009

Recorded: February 11, 2009

Anoka County Recorder Document No. 2005451.016

Assigned To: Deutsche Bank National Trust Company, as Trustee for Ameriquest Mortgage Securities Inc., Asset-Backed Pass-Through Certificates, Series 2003-11

Dated: September 16, 2014

Recorded: October 1, 2014

Anoka County Recorder Document No. 2091491.001

Transaction Agent: N/A

Transaction Agent Mortgage Identification Number: N/A

Lender or Broker: Ameriquest Mortgage Company

Residential Mortgage Servicer: PHH Mortgage Corporation

Mortgage Originator: Ameriquest Mortgage Company

LEGAL DESCRIPTION OF PROPERTY: THAT PART OF THE WEST 430 FEET OF NORTHWEST 1/4 OF SOUTHWEST 1/4 OF SECTION 2, TOWNSHIP 33, RANGE 25 LYING NORTH OF THE SOUTH 300 FEET THEREOF, ANOKA COUNTY, MINNESOTA.

This is Abstract Property.

TAX PARCEL NO.: 02-33-25-32-0003

ADDRESS OF PROPERTY:
22333 Xenon St NW
Nowthen, MN 55330

COUNTY IN WHICH PROPERTY IS LOCATED: Anoka

ORIGINAL PRINCIPAL AMOUNT OF MORTGAGE: $192,000.00

AMOUNT DUE AND CLAIMED TO BE DUE AS OF DATE OF NOTICE: $166,737.41

That prior to the commencement of this mortgage foreclosure proceeding Mortgagee/Assignee of Mortgagee complied with all notice requirements as required by statute; that no action or proceeding has been instituted at law or otherwise to recover the debt secured by said mortgage, or any part thereof;

PURSUANT to the power of sale contained in said mortgage, the above described property will be sold by the Sheriff of said county as follows:

DATE AND TIME OF SALE: January 8, 2021, 10:00 AM

PLACE OF SALE: Sheriff's Office, 13301 Hanson Boulevard NW, Andover, MN to pay the debt then secured by said Mortgage, and taxes, if any, on said premises, and the costs and disbursements, including attorneys' fees allowed by law subject to redemption within 6 Months from the date of said sale by the mortgagor(s), their personal representatives or assigns.

DATE TO VACATE PROPERTY: The date on or before which the mortgagor must vacate the property if the mortgage is not reinstated under Minnesota Statutes section 580.30 or the property redeemed under Minnesota Statutes section 580.23 is July 8, 2021 at 11:59 p.m. If the foregoing date is a Saturday, Sunday or legal holiday, then the date to vacate is the next business day at 11:59 p.m.

MORTGAGOR(S) RELEASED FROM FINANCIAL OBLIGATION ON MORTGAGE: NONE

THE TIME ALLOWED BY LAW FOR REDEMPTION BY THE MORTGAGOR, THE MORTGAGOR'S PERSONAL REPRESENTATIVES OR ASSIGNS, MAY BE REDUCED TO FIVE WEEKS IF A JUDICIAL ORDER IS ENTERED UNDER MINNESOTA STATUTES SECTION 582.032, DETERMINING, AMONG OTHER THINGS, THAT THE MORTGAGED PREMISES ARE IMPROVED WITH A RESIDENTIAL DWELLING OF LESS THAN FIVE UNITS, ARE NOT PROPERTY USED IN AGRICULTURAL PRODUCTION, AND ARE ABANDONED.

Dated: October 8, 2020

Deutsche Bank National Trust Company, as Trustee for Ameriquest Mortgage Securities Inc., Asset-backed Pass-Through Certificates, Series 2003-11, Assignee of Mortgagee

By: HALLIDAY, WATKINS & MANN, P.C.

Attorneys for: Deutsche Bank National Trust Company, as Trustee for Ameriquest Mortgage Securities Inc., Asset-backed Pass-Through Certificates, Series 2003-11, Assignee of Mortgagee

101 Fifth Street East, Suite 2626
St. Paul, MN 55101
651-291-8955
651-228-1753 (fax)

THIS COMMUNICATION IS FROM A DEBT COLLECTOR ATTEMPTING TO COLLECT A DEBT. ANY INFORMATION OBTAINED WILL BE USED FOR THAT PURPOSE.

MN10048

10/11, 10/18, 10/25, 11/1, 11/8, 11/15/20 Star Tribune

NOTICE OF MORTGAGE FORECLOSURE SALE

THE RIGHT TO VERIFICATION OF THE DEBT AND IDENTITY OF THE ORIGINAL CREDITOR WITHIN THE TIME PROVIDED BY LAW IS NOT AFFECTED BY THIS ACTION.

NOTICE IS HEREBY GIVEN, that default has occurred in conditions of the following described mortgage:

DATE OF MORTGAGE: June 24, 2005

MORTGAGOR: Nicholas Penner, a single person.

MORTGAGEE: Mortgage Electronic Registration Systems, Inc., as mortgagee, as nominee for Voyager Bank its successors and assigns.

DATE AND PLACE OF RECORDING: Recorded September 15, 2005 Hennepin County Recorder, Document No. 8654336.

ASSIGNMENTS OF MORTGAGE: Assigned to: Ditech Financial LLC. Dated September 26, 2019 Recorded September 26, 2019, as Document No. A10706316. And thereafter assigned to: New Residential Mortgage LLC. Dated December 12, 2019 Recorded December 12, 2019, as Document No. A10735309. And thereafter assigned to: NewRez LLC d/b/a Shellpoint Mortgage Servicing. Dated February 21, 2020 Recorded February 25, 2020, as Document No. A10759955 and by Document Dated March 31, 2020 Recorded April 13, 2020, as Document No. A10779345.

TRANSACTION AGENT: Mortgage Electronic Registration Systems, Inc.

TRANSACTION AGENT'S MORTGAGE IDENTIFICATION NUMBER ON MORTGAGE: 1000389-0001001714-8

LENDER OR BROKER AND MORTGAGE ORIGINATOR STATED ON MORTGAGE: Voyager Bank

RESIDENTIAL MORTGAGE SERVICER: NewRez LLC d/b/a Shellpoint Mortgage Servicing

MORTGAGED PROPERTY ADDRESS: 2827 Bryant Avenue North #2, Minneapolis, MN 55411

TAX PARCEL I.D. #: 09-029-24-44-0256

LEGAL DESCRIPTION OF PROPERTY: CIC No. 1460, Urban Homeworks Bryant Unit #2, Hennepin County, MN

COUNTY IN WHICH PROPERTY IS LOCATED: Hennepin

ORIGINAL PRINCIPAL AMOUNT OF MORTGAGE: $104,000.00

AMOUNT DUE AND CLAIMED TO BE DUE AS OF DATE OF NOTICE, INCLUDING TAXES, IF ANY, PAID BY MORTGAGEE: $86,246.98

That prior to the commencement of this mortgage foreclosure proceeding Mortgagee/Assignee of Mortgagee complied with all notice requirements as required by statute; That no action or proceeding has been instituted at law or otherwise to recover the debt secured by said mortgage, or any part thereof;

PURSUANT to the power of sale contained in said mortgage, the above described property will be sold by the Sheriff of said county as follows:

DATE AND TIME OF SALE: January 5, 2021 at 11:00 AM

PLACE OF SALE: Hennepin County Sheriff's Office, Civil Division, Room 30, 350 South 5th Street, Minneapolis, MN to pay the debt then secured by said Mortgage, and taxes, if any, on said premises, and the costs and disbursements, including attorneys' fees allowed by law subject to redemption within six (6) months from the date of said sale by the mortgagor(s), their personal representatives or assigns unless reduced to Five (5) weeks under MN Stat. §580.07.

TIME AND DATE TO VACATE PROPERTY: If the real estate is an owner-occupied, single-family dwelling, unless otherwise provided by law, the date on or before which the mortgagor(s) must vacate the property if the mortgage is not reinstated under section 580.30 or the property is not redeemed under section 580.23 is 11:59 p.m. on July 6, 2021, unless that date falls on a weekend or legal holiday, in which case it is the next weekday, and unless the redemption period is reduced to 5 weeks under MN Stat. Secs. 580.07 or 582.032.

MORTGAGOR(S) RELEASED FROM FINANCIAL OBLIGATION ON MORTGAGE:None

"THE TIME ALLOWED BY LAW FOR REDEMPTION BY THE MORTGAGOR, THE MORTGAGOR'S PERSONAL REPRESENTATIVES OR ASSIGNS, MAY BE REDUCED TO FIVE WEEKS IF A JUDICIAL ORDER IS ENTERED UNDER MINNESOTA STATUTES, SECTION 582.032, DETERMINING, AMONG OTHER THINGS, THAT THE MORTGAGED PREMISES ARE IMPROVED WITH A RESIDENTIAL DWELLING OF LESS THAN FIVE UNITS, ARE NOT PROPERTY USED IN AGRICULTURAL PRODUCTION, AND ARE ABANDONED."

Dated: October 28, 2020

NewRez LLC dba Shellpoint Mortgage Servicing

Mortgagee/Assignee of Mortgagee

USSET, WEINGARDEN AND LIEBO, P.L.L.P.

Attorneys for Mortgagee/Assignee of Mortgagee

4500 Park Glen Road #300
Minneapolis, MN 55416
(952) 925-6888
164 - 20-005560 FC

THIS IS A COMMUNICATION FROM A DEBT COLLECTOR.

11/8, 11/5, 11/22, 11/29, 12/6, 12/13/20 Star Tribune

NOTICE OF MORTGAGE FORECLOSURE SALE

THE RIGHT TO VERIFICATION OF THE DEBT AND IDENTITY OF THE ORIGINAL CREDITOR WITHIN THE TIME PROVIDED BY LAW IS NOT AFFECTED BY THIS ACTION.

NOTICE IS HEREBY GIVEN, that default has occurred in conditions of the following described mortgage:

DATE OF MORTGAGE: May 17, 2006

MORTGAGOR: Steven P Neumann and Nancy Nordloef Neumann nka Nancy A Neumann, husband and wife as joint tenants.

MORTGAGEE: Wells Fargo Financial Minnesota, Inc.

DATE AND PLACE OF RECORDING: Filed June 27, 2006, Hennepin County Registrar of Titles, Document No. 4276142 on Certificate of Title No. 1074906.

ASSIGNMENTS OF MORTGAGE: Assigned to: MTGLQ Investors, L.P. Dated November 27, 2017 Filed December 1, 2017, as Document No. T05495215. And thereafter assigned to: Wilmington Savings Fund Society, FSB, d/b/a Christiana Trust, not individually but as trustee for Pretium Mortgage Acquisition Trust. Dated January 28, 2018 Filed February 6, 2018, as Document No. T05510297.

Said Mortgage being upon Registered Land.

TRANSACTION AGENT: NONE

TRANSACTION AGENT'S MORTGAGE IDENTIFICATION NUMBER ON MORTGAGE: NONE

LENDER OR BROKER AND MORTGAGE ORIGINATOR STATED ON MORTGAGE: Wells Fargo Financial Minnesota, Inc.

RESIDENTIAL MORTGAGE SERVICER: Selene Finance LP

MORTGAGED PROPERTY ADDRESS: 3338 Polk Street Northeast, Minneapolis, MN 55418

TAX PARCEL I.D. #: 01-029-24-23-0114

LEGAL DESCRIPTION OF PROPERTY: Lot 6, Block 10, Arlington Heights, Minneapolis, Hennepin County, Minnesota.

COUNTY IN WHICH PROPERTY IS LOCATED: Hennepin

ORIGINAL PRINCIPAL AMOUNT OF MORTGAGE: $167,692.30

AMOUNT DUE AND CLAIMED TO BE DUE AS OF DATE OF NOTICE, INCLUDING TAXES, IF ANY, PAID BY MORTGAGEE: $114,022.49

That prior to the commencement of this mortgage foreclosure proceeding Mortgagee/Assignee of Mortgagee complied with all notice requirements as required by statute; That no action or proceeding has been instituted at law or otherwise to recover the debt secured by said mortgage, or any part thereof;

PURSUANT to the power of sale contained in said mortgage, the above described property will be sold by the Sheriff of said county as follows:

DATE AND TIME OF SALE: January 5, 2021 at 11:00 AM

PLACE OF SALE: Hennepin County Sheriff's Office, Civil Division, Room 30, 350 South 5th Street, Minneapolis, MN to pay the debt then secured by said Mortgage, and taxes, if any, on said premises, and the costs and disbursements, including attorneys' fees allowed by law subject to redemption within six (6) months from the date of said sale by the mortgagor(s), their personal representatives or assigns unless reduced to Five (5) weeks under MN Stat. §580.07.

TIME AND DATE TO VACATE PROPERTY: If the real estate is an owner-occupied, single-family dwelling, unless otherwise provided by law, the date on or before which the mortgagor(s) must vacate the property if the mortgage is not reinstated under section 580.30 or the property is not redeemed under section 580.23 is 11:59 p.m. on July 6, 2021, unless that date falls on a weekend or legal holiday, in which case it is the next weekday, and unless the redemption period is reduced to 5 weeks under MN Stat. Secs. 580.07 or 582.032.

MORTGAGOR(S) RELEASED FROM FINANCIAL OBLIGATION ON MORTGAGE:None

"THE TIME ALLOWED BY LAW FOR REDEMPTION BY THE MORTGAGOR, THE MORTGAGOR'S PERSONAL REPRESENTATIVES OR ASSIGNS, MAY BE REDUCED TO FIVE WEEKS IF A JUDICIAL ORDER IS ENTERED UNDER MINNESOTA STATUTES, SECTION 582.032, DETERMINING, AMONG OTHER THINGS, THAT THE MORTGAGED PREMISES ARE IMPROVED WITH A RESIDENTIAL DWELLING OF LESS THAN FIVE UNITS, ARE NOT PROPERTY USED IN AGRICULTURAL PRODUCTION, AND ARE ABANDONED."

Dated: November 2, 2020

Wilmington Savings Fund Society, FSB d/b/a Christiana Trust, as Trustee

Mortgagee/Assignee of Mortgagee

USSET, WEINGARDEN AND LIEBO, P.L.L.P.

Attorneys for Mortgagee/Assignee of Mortgagee

4500 Park Glen Road #300
Minneapolis, MN 55416
(952) 925-6888
107 - 20-005619 FC

THIS IS A COMMUNICATION FROM A DEBT COLLECTOR.

11/8, 11/5, 11/22, 11/29, 12/6, 12/13/20 Star Tribune

NOTICE OF MORTGAGE FORECLOSURE SALE

THE RIGHT TO VERIFICATION OF THE DEBT AND IDENTITY OF THE ORIGINAL CREDITOR WITHIN THE TIME PROVIDED BY LAW IS NOT AFFECTED BY THIS ACTION.

NOTICE IS HEREBY GIVEN, that default has occurred in the conditions of the following described mortgage:

Mortgagor: GG Home Investments, LLC

Mortgagee: Pine Financial Group, Inc.

Dated: 07/20/2018

Recorded: 07/23/2018

HENNEPIN County Recorder Document No. A10575421

Transaction Agent: N/A

Transaction Agent Mortgage Identification Number:

Lender or Broker: Pine Financial Group, Inc.

Residential Mortgage Servicer: Pine Financial Group, Inc.

Mortgage Originator: Pine Financial Group, Inc.

LEGAL DESCRIPTION OF PROPERTY: Lot 43, West End Addition to Minneapolis, Second Division, Hennepin County, Minnesota

This is Abstract Property.

TAX PARCEL NO.: 32-029-24-33-0124

ADDRESS OF PROPERTY:
2936 Chowen Avenue South
Minneapolis, MN 55416

COUNTY IN WHICH PROPERTY IS LOCATED: HENNEPIN

ORIGINAL PRINCIPAL AMOUNT OF MORTGAGE: $688,800.00

AMOUNT DUE AND CLAIMED TO BE DUE AS OF DATE OF NOTICE: $989,625.36

That prior to the commencement of this mortgage foreclosure proceeding Mortgagee/Assignee of Mortgagee complied with all notice requirements as required by statute; that no action or proceeding has been instituted at law or otherwise to recover the debt secured by said mortgage, or any part thereof;

PURSUANT to the power of sale contained in said mortgage, the above described property will be sold by the Sheriff of said county as follows:

DATE AND TIME OF SALE: December 16, 2020, 10:00AM

PLACE OF SALE: Hennepin County Sheriff's Office, Civil Unit, 350 South Fifth Street, Room 30, Minneapolis, MN 55415 to pay the debt then secured by said Mortgage, and taxes, if any, on said premises, and the costs and disbursements, including attorneys' fees allowed by law subject to redemption within 6 Months from the date of said sale by the mortgagor(s), their personal representatives or assigns.

DATE TO VACATE PROPERTY: The date on or before which the mortgagor must vacate the property if the mortgage is not reinstated under Minnesota Statutes section 580.30 or the property redeemed under Minnesota Statutes section 580.23 is June 16, 2021 at 11:59 p.m. If the foregoing date is a Saturday, Sunday or legal holiday, then the date to vacate is the next business day at 11:59 p.m.

MORTGAGOR(S) RELEASED FROM FINANCIAL OBLIGATION ON MORTGAGE: NONE

THE TIME ALLOWED BY LAW FOR REDEMPTION BY THE MORTGAGOR, THE MORTGAGOR'S PERSONAL REPRESENTATIVES OR ASSIGNS, MAY BE REDUCED TO FIVE WEEKS IF A JUDICIAL ORDER IS ENTERED UNDER MINNESOTA STATUTES SECTION 582.032, DETERMINING, AMONG OTHER THINGS, THAT THE MORTGAGED PREMISES ARE IMPROVED WITH A RESIDENTIAL DWELLING OF LESS THAN FIVE UNITS, ARE NOT PROPERTY USED IN AGRICULTURAL PRODUCTION, AND ARE ABANDONED.

Dated: October 22, 2020

Pine Financial Group, Inc., Mortgagee

Goerlitz Law, PLLC

By: Jared M. Goerlitz
P.O. Box 25194
7595 Currell Blvd
St. Paul, MN 55125
(651)237-3494

Attorneys for:

Pine Financial Group, Inc., Mortgagee

THIS COMMUNICATION IS FROM A DEBT COLLECTOR ATTEMPTING TO COLLECT A DEBT. ANY INFORMATION OBTAINED WILL BE USED FOR THAT PURPOSE.

09/2020-1.00018

Pine Financial Group, Inc.

10/25, 11/1, 11/8, 11/15, 11/22, 11/29/2020 Star Tribune

STATE OF MINNESOTA COUNTY OF HENNEPIN DISTRICT COURT FOURTH JUDICIAL DISTRICT COURT FILE NO.: 27-CV-20-7447 CASE TYPE: 14. OTHER CIVIL JUDGE KAREN A. JANISCH NOTICE OF SHERIFF'S SALE UNDER JUDGMENT AND DECREE

Superior Financing, Inc., Plaintiff(s), vs.

Savage Land Company Limited Liability Company, Dajuan M. Savage, John Doe, Mary Roe and ABC Corporation, Defendant(s).

NOTICE IS HEREBY GIVEN, that under and by virtue of a Judgment and Decree entered in the above entitled action on August 24, 2020, a certified copy of which has been delivered to me directing the sale of the premises hereinafter described to satisfy the amount found and adjudged due to said Plaintiff in the above entitled action from Defendant, Savage Land Company Limited Liability Company, the Sheriff of Hennepin County, will sell at public auction to the highest bidder for cash, on December 17, 2020 at 10:00 a.m., at Hennepin County Sheriff's Office, Civil Unit, 350 South Fifth Street, Room 30, Minneapolis, MN 55415, said county and state, the premises and real estate described in said Judgment and Decree, to-wit:

Lot 12, Block 29, Fairmont Park Addition to Minneapolis, Hennepin County, Minnesota,

being also known and numbered as 2618 Humboldt Avenue North, Minneapolis, MN 55412.

THE TIME ALLOWED BY LAW FOR REDEMPTION BY THE MORTGAGOR, THE MORTGAGOR'S PERSONAL REPRESENTATIVES OR ASSIGNS, MAY BE REDUCED TO FIVE WEEKS IF A JUDICIAL ORDER IS ENTERED UNDER MINNESOTA STATUTES SECTION 582.032 DETERMINING, AMONG OTHER THINGS, THAT THE MORTGAGED PREMISES ARE IMPROVED WITH A RESIDENTIAL DWELLING OF LESS THAN 5 UNITS, ARE NOT PROPERTY USED FOR AGRICULTURAL PRODUCTION, AND ARE ABANDONED.

Hennepin County Sheriff

Date: 10/16/2020

By: Dep. T. Braesch

Print: Dep. T. Braesh

Deputy Sheriff

Date: October 5, 2020

GOERLITZ LAW, PLLC

By: Jared M. Goerlitz

Jared M. Goerlitz (#386714)

jgoerlitz@goerlitzlaw.com

P.O. Box 25194
7595 Currell Blvd
St. Paul, MN 55125
Phone: (651) 237-3494

Attorney for Plaintiff

11/1, 11/8, 11/15, 11/22, 11/29, 12/6/2020 Star Tribune

Place a classified ad today.

Probates

NOTICE OF INFORMAL PROBATE OF WILL AND APPOINTMENT OF PERSONAL REPRESENTATIVE AND NOTICE TO CREDITORS

STATE OF MINNESOTA
FOURTH JUDICIAL DISTRICT COURT
COUNTY OF HENNEPIN
PROBATE MENTAL HEALTH DIVISION

In Re: Estate of
James Gardin Christianson,
James G. Christianson,
James Christianson
Jim Christianson
FILE NO. 27-PA-PR-20-1365
Deceased

TO ALL INTERESTED PERSONS AND CREDITORS:

Notice is hereby given, that an application for informal probate of the above named decedent's last will dated April 21st, 2020 has been filed with the Registrar herein, and the application has been granted informally probating such will. Any objections may be filed in the above, and the same will be heard by the Court upon notice of hearing fixed for such purpose.

Notice is hereby further given that informal appointment of Mark Carl Christianson, whose address is 8805 Stanley Trail, Eden Prairie, MN, 55347, as personal representative of the estate of the above-named decedent, has been made. Any heir, devisee or other interested person may be entitled to appointment as personal representative or may object to the appointment of the personal representative and the personal representative are empowered to fully administer the estate including, after 28 days from the date of issuance of letters, the power to sell, encumber, lease or distribute real estate, unless objections thereto are filed with the Court (pursuant to Section 524.3-607) and the Court otherwise orders.

Notice is further given that ALL CREDITORS having claims against said estate are required to present the same to said personal representative or to the Probate Court Administrator within four months after the date of this notice or said claims will be barred.

Dated: November 12th, 2020

Alonna J. Warns
Registrar
ProSe
Sarah Lindahl-Pfieffer
District Court Administrator

Classified Index

General Policies

Review your ad on the first day of publication. If there are mistakes, notify us immediately. We will make changes for errors and adjust your bill, but only if we receive notice on the first day the ad is published. We limit our liability in this way, and we do not accept liability for any other damages which may result from error or omission in or of an ad. All ad copy must be approved by the newspaper, which reserves the right to request changes, reject or properly classify an ad. The advertiser, and not the newspaper, is responsible for the truthful content of the ad. Advertising is also subject to credit approval.

Legal Notices

PUBLIC ANNOUNCEMENT

YMCA of the North will be accepting bids for daily catered meals for youth of all ages (Early Age Child Care, Preschool, Youth and Young Adults). In order for a bid to be considered, your proposal must meet all HEPA and NAEYC Standards/ Requirements. If you would like to be considered for an invitation, please request a brief meeting by emailing Heidi Murphy at Heidi.Murphy@ymcamn.org. No phone calls will be accepted, all questions are to be emailed. All bids will need to be sent electronically to Heidi.Murphy@ymcamn.org by 5:00 p.m. CDT on November 30th, 2020.

Liability Carrier International Inc. will be permanently closed as of November 20, 2020. Address 4141 West 44th Street Edina MN 55424

Legal Notices

Metropolitan Council
Public Hearing:
Fridley Area Lift Station (L-32A) Draft Facility Plan
Date: Thursday, December 17, 2020
Time: 4:00 p.m.
Location: Online

The Metropolitan Council will hold an online public hearing to inform the public about and to accept comments on its Draft Facility Plan for constructing a new regional wastewater lift station (to be named L-32A) in Fridley. The Metropolitan Council's Environmental Services Division (MCES) prepared the Draft Facility Plan.

For information about the project and instructions for logging into or calling into the online public hearing on Dec. 17, go to www.metrocouncil.org/sewerconstruction/fridley or call the project phone number at 763-520-8650.

The Draft Facility Plan for this project outlines the issues at the existing lift station in Brooklyn Park, why a new lift station is needed, various alternatives studied for the lift station, and the reasons that support MCES's resulting recommendations. The new lift station will allow MCES to continue to provide sufficient and reliable wastewater conveyance from the Champlin, Anoka, Brooklyn Park and Fridley area to the MCES regional wastewater collection system for the period 2020 to 2040. The Draft Facility Plan also addresses the ultimate wastewater flow anticipated at built-out conditions in these cities.

Wastewater generated in Champlin, Anoka and Brooklyn Park currently is conveyed to the existing L-32 lift station in Brooklyn Park through a series of regional sanitary sewers, which then convey the wastewater through Fridley, Minneapolis and Saint Paul to MCES's Metropolitan Wastewater Treatment Plant (Metro Plant) in Saint Paul. The existing lift station, located on the west side of the Mississippi River, must be upgraded or replaced due to its aging and deteriorating infrastructure and to provide sufficient capacity for future growth and provide reliable wastewater conveyance for the region. The existing L-32 site is limited in size, making it challenging to upgrade the existing lift station and build new structures while keeping the existing lift station running and meeting community needs.

MCES owns property on the east side of the Mississippi River in Fridley, which was formerly known as Girl Scouts Camp Lockeslea. This site is large enough to build a new lift station with required wastewater storage, an odor control facility, and other related structures to meet future community needs, while having less construction impacts to the community than other alternatives. MCES recommends constructing the new lift station on the east side of Mississippi River in Fridley.

Copies of the Draft Facility Plan, a plan summary, a project area map for the new Lift Station L-32A, and a recent public information meeting presentation will be available for the public to review after Nov. 17, 2020, at the project webpage: www.metrocouncil.org/sewerconstruction/fridley. The Draft Facility Plan also will be available for the public to review during regular business hours at:

- Fridley City Hall, 7071 University Ave. N.E., Fridley
- Brooklyn Park City Hall, 5200 85th Ave. N., Brooklyn Park
- Anoka County Library – Mississippi Library, 410 Mississippi St. N. E., Fridley
- Hennepin County Library – Brooklyn Park Library, 8500 W. Broadway Ave., Brooklyn Park

All interested people are encouraged to attend the online public hearing and offer comments on Thursday, Dec. 17, 2020, at 4 p.m. This hearing will be streamed live and recorded. In addition to providing comments during the online public hearing, you also may provide comments in the following ways by 5 p.m. Dec. 28, 2020:

- Mail written comments to: Tim O'Donnell at Metropolitan Council Environmental Services, 390 Robert St. N., Saint Paul, MN 55101-1805
- Email comments to: public.info@metc.state.mn.us
- Record comments on: Metropolitan Council Public Comment Line at 651-602-1500
- Send TTY comments to 651-291-0904

Comments submitted prior to the public hearing will be read into the public record during the online public hearing.

Upon request, MCES will provide reasonable accommodations to persons with disabilities at the public hearing. Please submit such requests to Tim O'Donnell before Dec. 7, 2020, by email at tim.odonnell@metc.state.mn.us or by phone at 651-602-1269.

Next steps: MCES staff will review public comments and evaluate changes to the Draft Facility Plan to address the comments submitted by the public. A recommendation for final adoption of the Facility Plan will be considered by the Metropolitan Council in January 2021.

Legal Notices

Metropolitan Council
Public Hearing:

Lake Minnetonka Area Regional Interceptor Improvements Draft Facility Plan

Date: Tuesday, December 15, 2020
Time: 7:00 p.m.
Location: Online

The Metropolitan Council will hold a public hearing to inform the public about and to accept comments on its Draft Facility Plan for improvements to the regional wastewater system in the Lake Minnetonka area. The Metropolitan Council's Environmental Services Division (MCES) prepared the Draft Facility Plan.

For information about the project and instructions for logging into or calling into the online public hearing on Dec. 15, go to www.metrocouncil.org/sewerconstruction/LakeMtkaFacilityPlan or call the project phone number at 952-960-7765.

The Draft Facility Plan for this project outlines the existing conditions of MCES's wastewater collection infrastructure, identifies needed improvement projects, discusses alternatives studied for the projects, and provides the reasons that support our resulting recommendations. These projects will allow MCES to continue to provide sufficient and reliable wastewater collection for the period 2020 to 2030. The Draft Facility Plan also provides projections for anticipated 2040 wastewater flows.

Wastewater from the Lake Minnetonka area is conveyed through a series of regional sanitary sewers within the local communities to the MCES regional wastewater treatment plant (Blue Lake Plant) in Shakopee. This system of regional sanitary sewers consists of sewer pipes and pumping stations. To provide sufficient capacity for future growth and provide reliable wastewater conveyance for the region, this system needs to be maintained and upgraded due to age and wear. No expansion of the regional sanitary sewer system is proposed in this Draft Facility Plan.

Alternatives considered for the projects include: 1) status quo (maintaining the system as-is), 2) rehabilitation of the facilities, and 3) replacement of the facilities with new facilities.

Copies of the Draft Facility Plan, a plan summary, project area maps, and the public hearing presentation slides will be available for the public to review after Nov. 15, 2020, at the project webpage: www.metrocouncil.org/sewerconstruction/LakeMtkaFacilityPlan. The Draft Facility Plan also will be available for the **public to review** during regular business hours at:

- Deephaven City Hall, 20225 Cottagewood Rd., Deephaven
- Orono City Hall, 2750 Kelley Pkwy., Orono
- Shorewood City Hall, 5755 Country Club Rd., Shorewood
- Excelsior Library, 337 Water St., Excelsior

All interested people are encouraged to attend the online public hearing and offer comments on Tuesday, Dec. 15, 2020, at 7 p.m. This hearing will be streamed live and recorded. In addition to providing comments during the online public hearing, you also may provide comments in the following ways by 5 p.m. Dec. 28, 2020:

- Mail written comments to: Tim O'Donnell at Metropolitan Council Environmental Services, 390 Robert St. N., Saint Paul, MN 55101-1805
- Email comments to: public.info@metc.state.mn.us
- Record comments on: Metropolitan Council Public Comment Line at 651-602-1500
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107 Home & Commercial Services

LAWN & LANDSCAPING
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Clean-ups, gutter cleaning, shrub & brush removal, tree/shrub trimming, sod installation & landscaping, river rocks, topsoil, garden weeding, trees, patio installation, fencing installation & repairs.
Residential & Commercial
20% Off Competitors! 612-990-0945

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Wallpaper Removal. Woodworking.. Int/Ext. Free Est. Low Rates. 20 Yrs Exp. In Fridley. Grant 763-789-2510

170 Business for Sale

MOVE TO NEBRASKA! CALL MARV HEGGE REAL ESTATE CO. Interested in a good business in NE? We have good schools, hunting, fishing & friendly people! No riots here & no major crimes. Call Marv Hegge & I will find you a good business.
402-640-3966, 402-388-2601 No texts

313 Auctions/Liquidations

****
CITY OF MINNEAPOLIS
AUCTION of Impounded Vehicles OPEN TO LICENSED SCRAP METAL PROCESSORS & USED MOTOR VEHICLE PARTS DEALERSHIPS ONLY 51 N. Colfax, 2 Blocks So of Glenwood on Colfax. Thursday 11/19/2020 10:30 AM. Lot open for vehicle inspection 1/2 hour prior to sale. Mark Friederichs Lic #2717032; Mpls, MN
****

BEER COLLECTIBLES - VINTAGE SNOWMOBILES AUCTION NOV. 21 10 A.M. Casey McDonald Est. TrockeAuctions.com
Lic 52-20-07 **507-382-8092**

324 Collectibles

AMERICAN FLYER AND LIONEL
Electric Trains Wanted - Will Pay Cash. Call Jerry 763-572-0238

337 Firewood

PREMIUM DRY OAK OR MIXED 4'x8'x16" $200, 2 for $365. Quick delivery. **Cash/Credit. 320-390-0217**

AFFIDAVIT OF PUBLICATION

StarTribune

STATE OF MINNESOTA)
COUNTY OF HENNEPIN)

650 3rd Ave. S, Suite 1300 | Mineapolis, MN | 55488

Terri Swanson, being first duly sworn, on oath states as follows:

1. (S)He is and during all times herein stated has been an employee of the Star Tribune Media Company LLC, a Delaware limited liability company with offices at 650 Third Ave. S., Suite 1300, Minneapolis, Minnesota 55488, or the publisher's designated agent. I have personal knowledge of the facts stated in this Affidavit, which is made pursuant to Minnesota Statutes §331A.07.

2. The newspaper has complied with all of the requirements to constitute a qualified newspaper under Minnesota law, including those requirements found in Minnesota Statutes §331A.02.

3. The dates of the month and the year and day of the week upon which the public notice attached/copied below was published in the newspaper are as follows:

Dates of Publication		Advertiser	Account #	Order #
StarTribune	11/15/2020	METROPOLITAN COUNCIL	1000016545	374127

4. The publisher's lowest classified rate paid by commercial users for comparable space, as determined pursuant to § 331A.06, is as follows: **$890.40**

5. Mortgage Foreclosure Notices. Pursuant to Minnesota Statutes §580.033 relating to the publication of mortgage foreclosure notices: The newspaper's known office of issue is located in Hennepin County. The newspaper complies with the conditions described in §580.033, subd. 1, clause (1) or (2). If the newspaper's known office of issue is located in a county adjoining the county where the mortgaged premises or some part of the mortgaged premises described in the notice are located, a substantial portion of the newspaper's circulation is in the latter county.

FURTHER YOUR AFFIANT SAITH NOT.

Terri Swanson

Subscribed and sworn to before me on: 11/16/2020

Jalene K. Howard

JALENE K HOWARD
NOTARY PUBLIC - MINNESOTA
MY COMMISSION EXPIRES 01/31/25

Notary Public

Agenda

Welcome and Introductions

Presentation

- About MCES
- Facility Plan and Definitions
- Project Background and Drivers for the Project
- Different Alternatives Evaluated
- Proposed Cost Estimates, Limitations and Recommendations for each alternative
- Next Steps

Public Comments and Questions

Public Hearing Purpose

- Summarize the proposed Fridley Area Lift Station project and explain alternative approaches that we evaluated
- Answer your questions
- Receive your comments for the public record

Fridley Area Lift Station

Virtual public hearing registrants

December 17, 2020, 4-5:30 p.m.
Number of registrants: 46

Community Members

- Amy Dritz
- Ann Postera
- Bailey Larson
- Barbara Guhanick
- Barbara Severni
- Colleen O'Connor Toberman (Friends of the Mississippi River)
- David Hoffman
- Heather Carlson
- Heidi Ferris
- Joe Tessier
- John Glatzmaier
- Justin Foell
- Katie Voss
- Lorna Jacobson
- Margaret Pillsbury
- Martin Gavic
- Nicholas Olderding
- Patti Craddock
- Paul & Andi Kimlinger
- Richard Snyder
- Roland Diederich
- Steve Wolsfeld
- William Lueck

Council Members

- Ann Bolkcom (City of Fridley)
- Stephen Eggert (City of Fridley)
- Mandy Meisner (Anoka County)
- Peter Lindstrom (Met Council)
- Reva Chamblis (Met Council)

Staff

- Adam Gordon (MCES)
- Jeannine Clancy (MCES)
- Jeny Baroda (MCES)
- John Hemming (MCES)
- Anna Bessel (MCES)
- Kate Nyquist (MCES)
- Tim O'Donnell (MCES)
- Tim Wedin (MCES)
- Brian Strand (City of Fridley)
- Curtis Pribula (City of Fridley)
- Jim Kosluchar (City of Fridley)
- Rachel Workin (City of Fridley)
- Stacy Stromberg (City of Fridley)
- Craig Runnakko (City of Brooklyn Park)
- Jerry Auge (Anoka County)
- Joe MacPherson (Anoka County)
- Angela Klein (Zan Associates)
- Ashley Osteraas (Zan Associates)

Welcome!

Fridley Lift Station Virtual Public Hearing

December 17, 2020

You are muted and your video is disabled upon entry.

Please utilize the "chat" function (bottom menu bar) if you want to submit comments or questions at this time.

The public hearing will start at 4:00 p.m. Music is playing.
If you do not hear music, please check your audio settings.

METROPOLITAN COUNCIL

Fridley Lift Station (L32A)

Tim Wedin, Assistant Manager, Interceptor Engineering

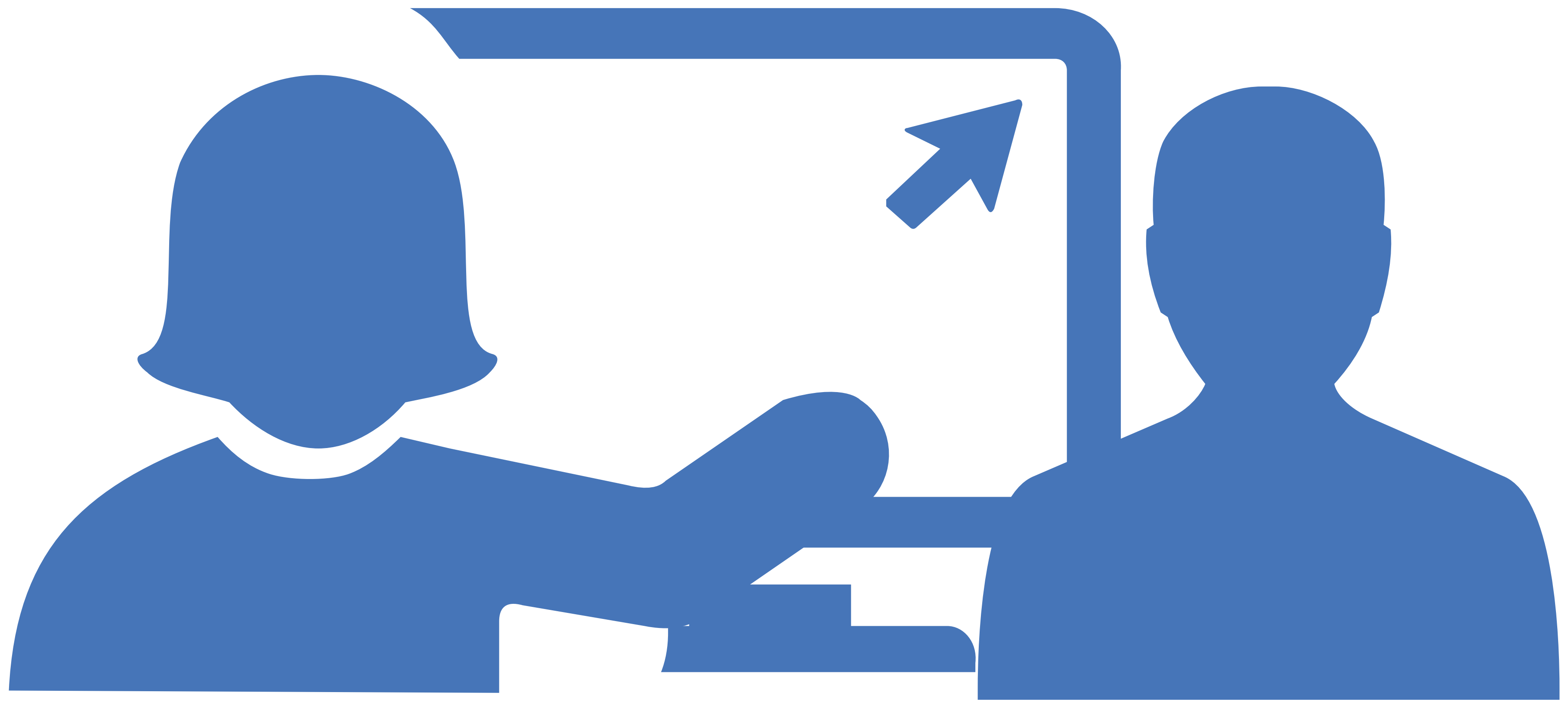
Wastewater Planning & Capital Project Delivery

Metropolitan Council Environmental Services

METROPOLITAN COUNCIL

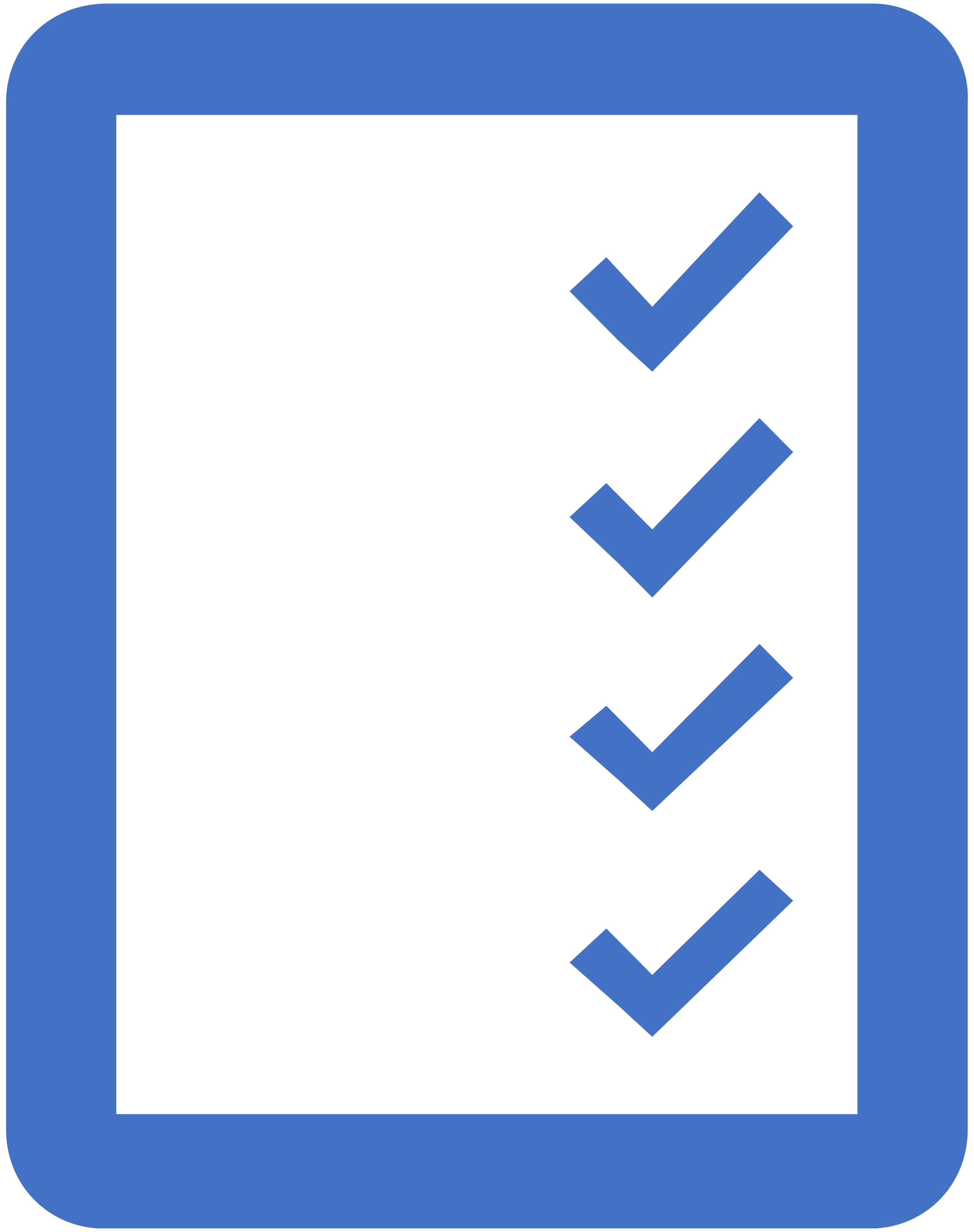
Introductions

- **Peter Lindstrom**
  Metropolitan Council Member District 10
  Chair, Environment Committee
- **Tim O'Donnell**
  Metropolitan Council Environmental Services (MCES)
  Senior Information Coordinator and Project Citizen Liaison
- **Tim Wedin**
  MCES Assistant Manager
  Interceptor Engineering
- **Jeny Baroda**
  MCES Principal Engineer
  Interceptor Engineering
- **Ashley Osteraas & Angela Klein**
  Zan Associates (MCES Project Communications)



Public Hearing Purpose

- Summarize the proposed Fridley Area Lift Station project and explain alternative approaches that we evaluated
- Answer your questions
- Receive your comments for the public record



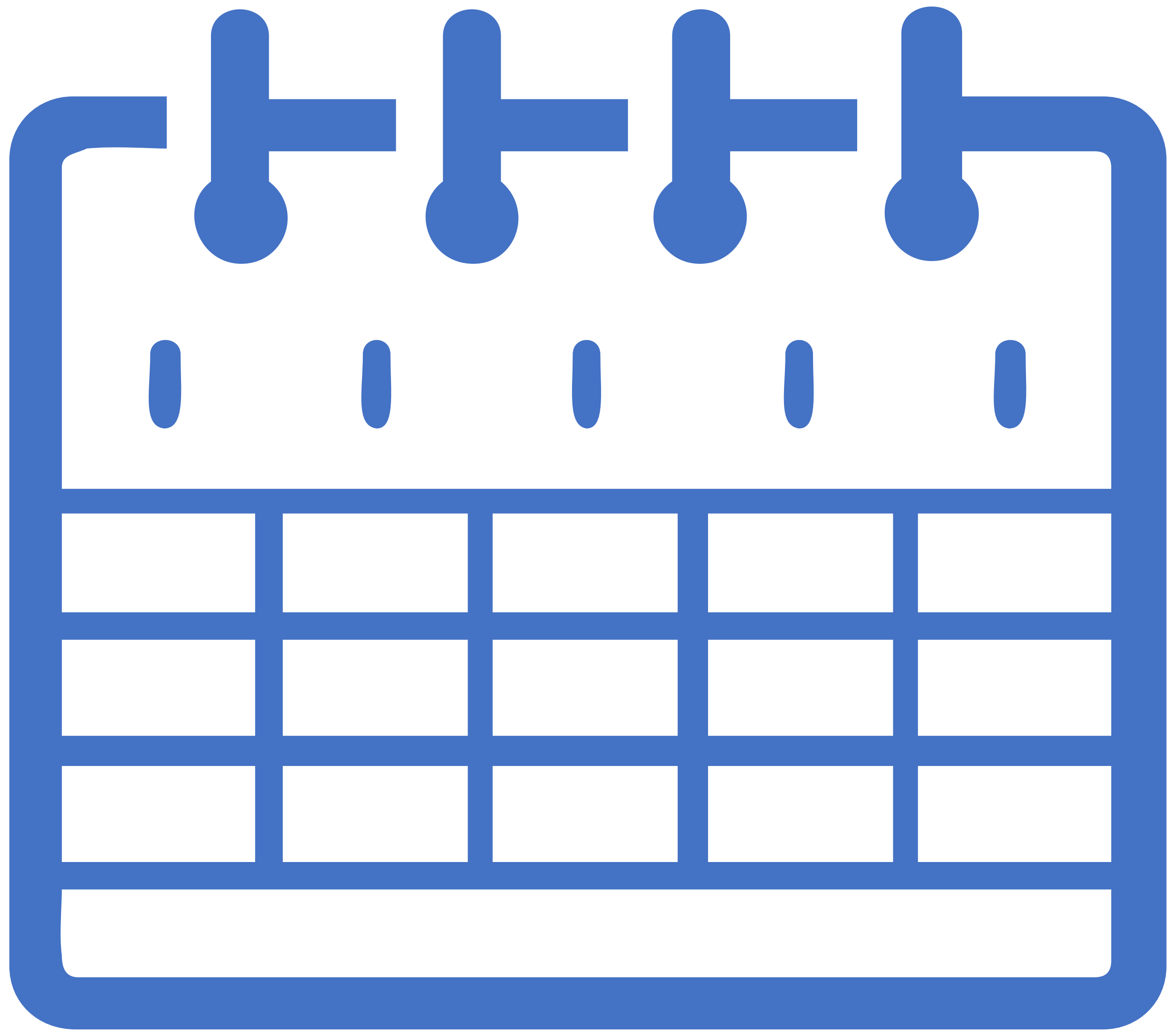
Comment Period

- Draft Facility Plan report available for review at:
  - Fridley City Hall, 7071 University Avenue NE, Fridley
  - Brooklyn Park City Hall, 5200 85th Avenue N, Brooklyn Park
  - Anoka County Library – Mississippi Library, 410 Mississippi Street NE, Fridley
  - Hennepin County Library – Brooklyn Park Library, 8500 W Broadway Avenue, Brooklyn Park
- Metropolitan Council Website: *metrocouncil.org/sewerconstruction/fridley*

Comment Period (Cont.)

- Submit comments no later than **5 p.m. on Monday, December 28, 2020**
- Submit comments to **Tim O'Donnell at Metropolitan Council Environmental Services**, 390 Robert Street North, Saint Paul, MN 55101-1805
    - Email comments to: public.info@metc.state.mn.us
    - Record comments on: Metropolitan Council Public Comment Line at 651-602-1500
    - Send TTY comments to 651-291-0904

Public Notices & Schedule



Nov 15, 2020	Star Tribune notice
Dec 4, 2020	Postcard notice mailed
Dec 2020	Email invitations & social media posts
Dec 17, 2020	Public hearing
Jan/Feb 2021	Metropolitan Council adoption of Facility Plan
Mar 2021	Submit Plan to Minnesota Pollution Control Agency (MPCA) with application for Clean Water Revolving Fund Project Priority List

Agenda

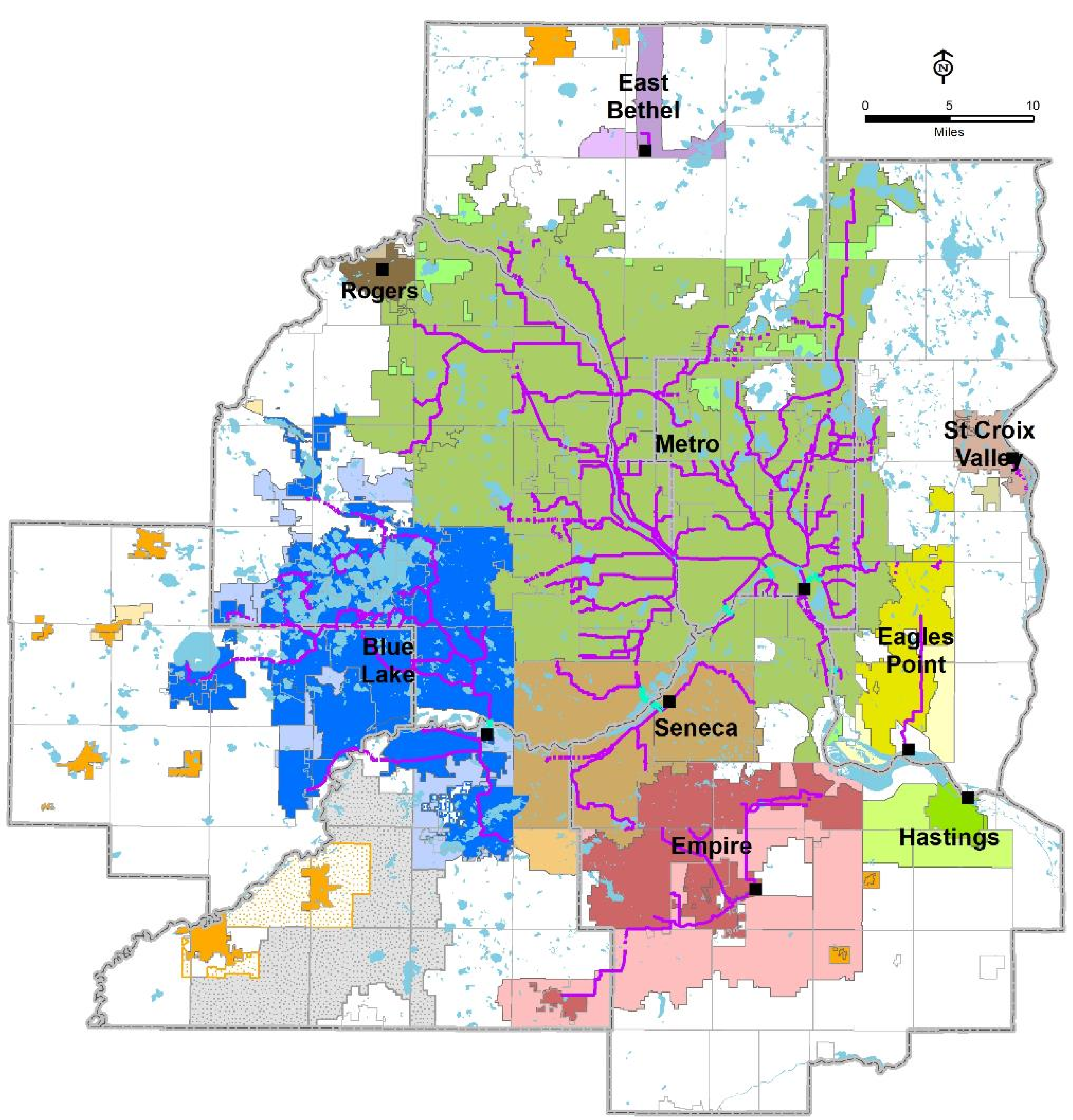
Welcome and Introductions

Presentation

- About MCES
- Facility Plan and Definitions
- Project Background and Drivers for the Project
- Different Alternatives Evaluated
- Proposed Cost Estimates, Limitations and Recommendations for each alternative
- Next Steps

Public Comments and Questions

Metropolitan Council Environmental Services



Protects public health and safety

Protects the environment

Fosters the economic growth of the region

WHO WE SERVE

7-county Twin Cities Metro Area

110 communities

2,700,000+ people

OUR FACILITIES

9 wastewater treatment plants

640 miles of interceptors

$7 billion in valued assets

OUR ORGANIZATION

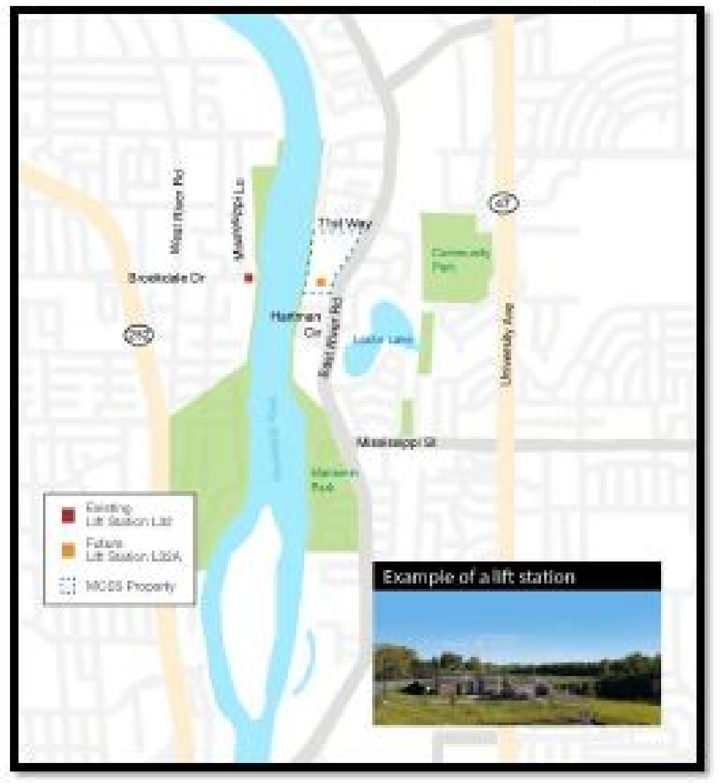
600+ employees

250 million gallons per day (avg)

$150 million / year capital program

What is a Facility Plan?

Draft Facility Plan
for
New Lift Station L32A (Fridley)



METROPOLITAN COUNCIL

December 2020

MCES Facility Plan

This document is a prerequisite to qualify for financing through the Minnesota Public Facilities Authority. The project is funded by using utility fees. The MCES Facility Plan:

- Summarizes the current state of the existing MCES wastewater sewer system
- Identifies the need for rehabilitating existing facilities or constructing new facilities
- Determines the potential environmental impacts of new facilities
- Evaluates alternatives and recommends a course of action

Facility Plan Schedule

Fall 2020	Nov 10, 2020	Dec 17, 2020	Early 2021
Facility Plan Development	Open House	Facility Hearing	Final Facility Plan

Definitions

Wastewater Sewer System
A system of underground pipes that carries wastewater (or sewage) away from buildings. Cities operate their own local wastewater sewer systems within a community. MCES operates the regional wastewater sewer system that carries wastewater from city systems to our treatment plants, similar to how a freeway system carries regional traffic.

MCES Interceptor
The large underground pipes that make up the regional sewer system. These pipes can be either gravity pipes or forcemains.

Gravity Pipe
A sloped pipe that carries wastewater downhill (by gravity) without mechanical assistance.

Forcemain
A pipe that carries wastewater being pumped (or forced) uphill, as opposed to wastewater flowing by gravity.

Flow Meter
A device MCES uses to measure the quantity of wastewater a customer (city) sends to the regional sewer system, similar to how a city water meter measures water usage in a home.

Lift Station
A lift station or pumping station pumps wastewater from low points in the sanitary sewer system to higher points allowing the flow to be carried by regional gravity pipes to the wastewater treatment plant.

Siphon
Pipes that convey flow beneath low lying areas such as rivers, utilities, or other obstructions.

Project Location

- Existing Lift Station L32
  - Located in Brooklyn Park at 7700 Mississippi Lane North
- Proposed Lift Station L32A
  - 6900 E River Road in Fridley, on MCES property which previously was the site of Camp Lockeslea
  - Located across the Mississippi River from the existing lift station

Existing Conditions

- L32 (Brooklyn Park) is 50 years old
- Components such as the structure, piping, and controls show signs of deterioration, requiring replacement

- Failures at the lift station have resulted in back-ups of wastewater into neighboring homes
- There are odor complaints due to inability to address air flow at the current facility
- Lift station is almost at full capacity with the existing flow conditions

Existing and Future Flow

Year	Average Day Flow MGD	Peak Day Flow MGD
2016*	16.55	38.4
2019*	17.28	26.93
2040	25	48
Ultimate	34	67

Note: *from metered data

Current L32 Peak Capacity – 43 MGD

Drivers for the Project

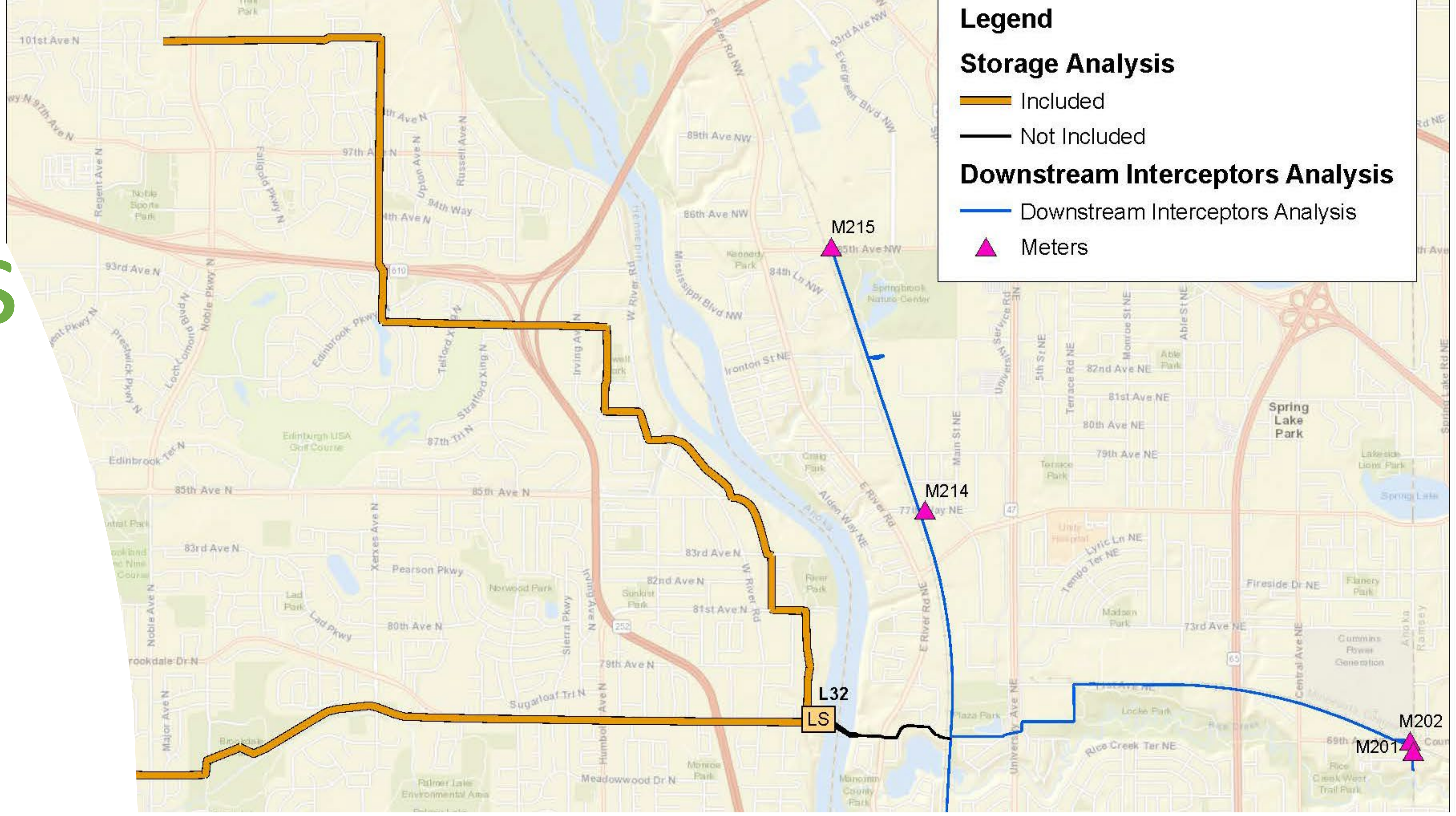
The existing lift station is 50 years old and has reached the end of its useful life.

Condition assessments have documented structural mechanical, and electrical deficiencies which has led to system failures – Backups and odor issues.

The lift station is almost to its full pumping capacity.

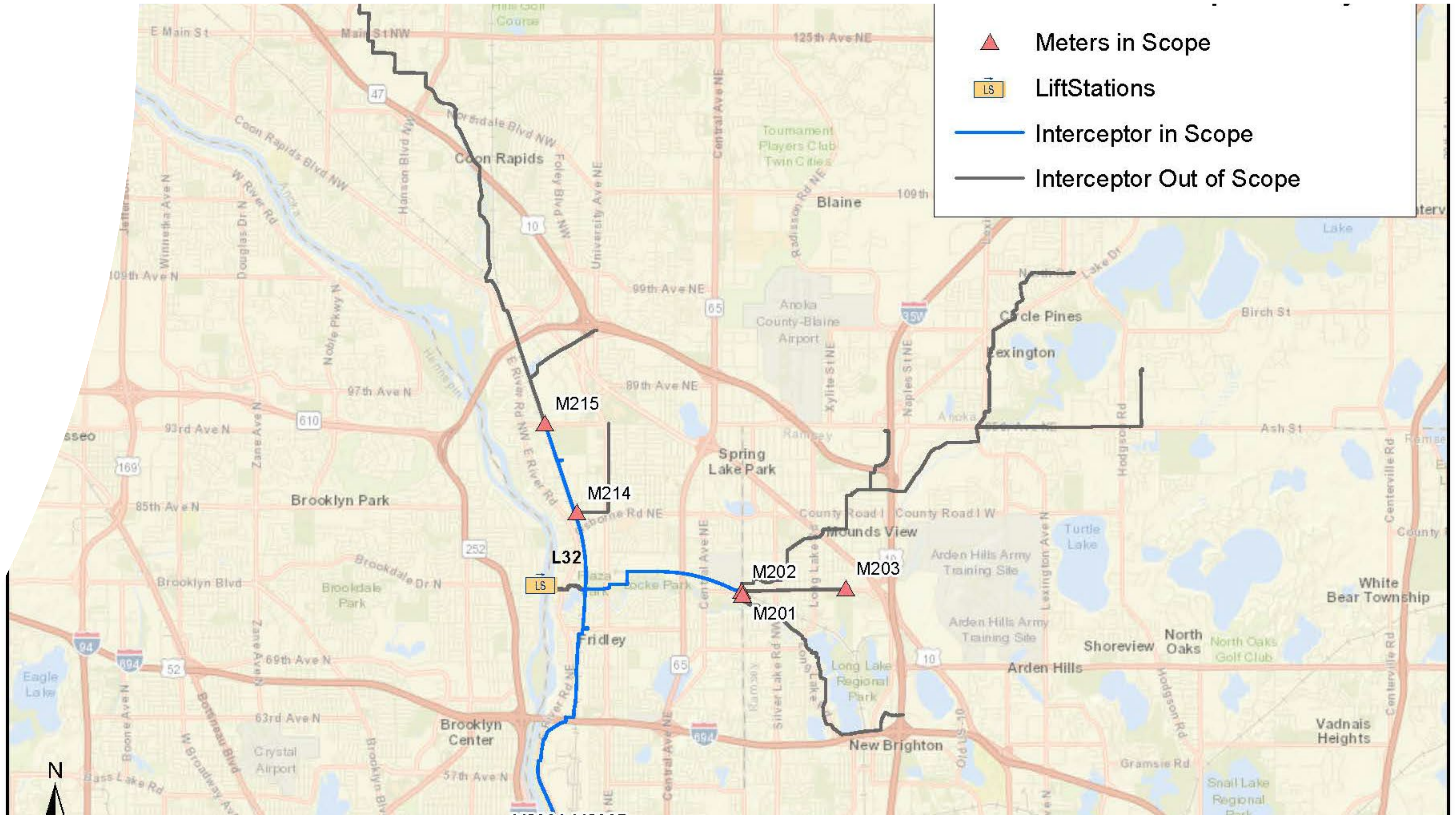
L32 does not have sufficient capacity to serve the current and future needs of the area.

Overall System Analyses



Upstream System Capacity Analysis

- Enough capacity in the pipe for future flow



Downstream System Capacity Analysis

- No capacity concerns

Spill Prevention Analysis

- MCES Design Guidelines recommends 60 min response time under peak flows
  - Additional 30 min response time recommended for ultimate flow
- Spill prevention items analyzed
  - In-line storage
    - Two new small submersible pump station
  - Independent pumping system for additional response time
  - Additional resiliency addition – split wet well system, redundant pumps, automatic bar screen and grinders, etc.

Peak Flows	Available Storage with Existing System	Response Time with Existing System
Existing Flows (38 MGD)	1.4 MG	53 minutes
2040 Flows (48 MGD)	~1.3 MG	41 minutes
Ultimate Flows (67 MGD)	1.1 MG	24 minutes

Alternatives Evaluated

No Change	Replace	New
• Do nothing	• Replace the lift station with a new larger lift station on the existing site in Brooklyn Park	• Construct a new larger lift station on the east side of the river in Fridley

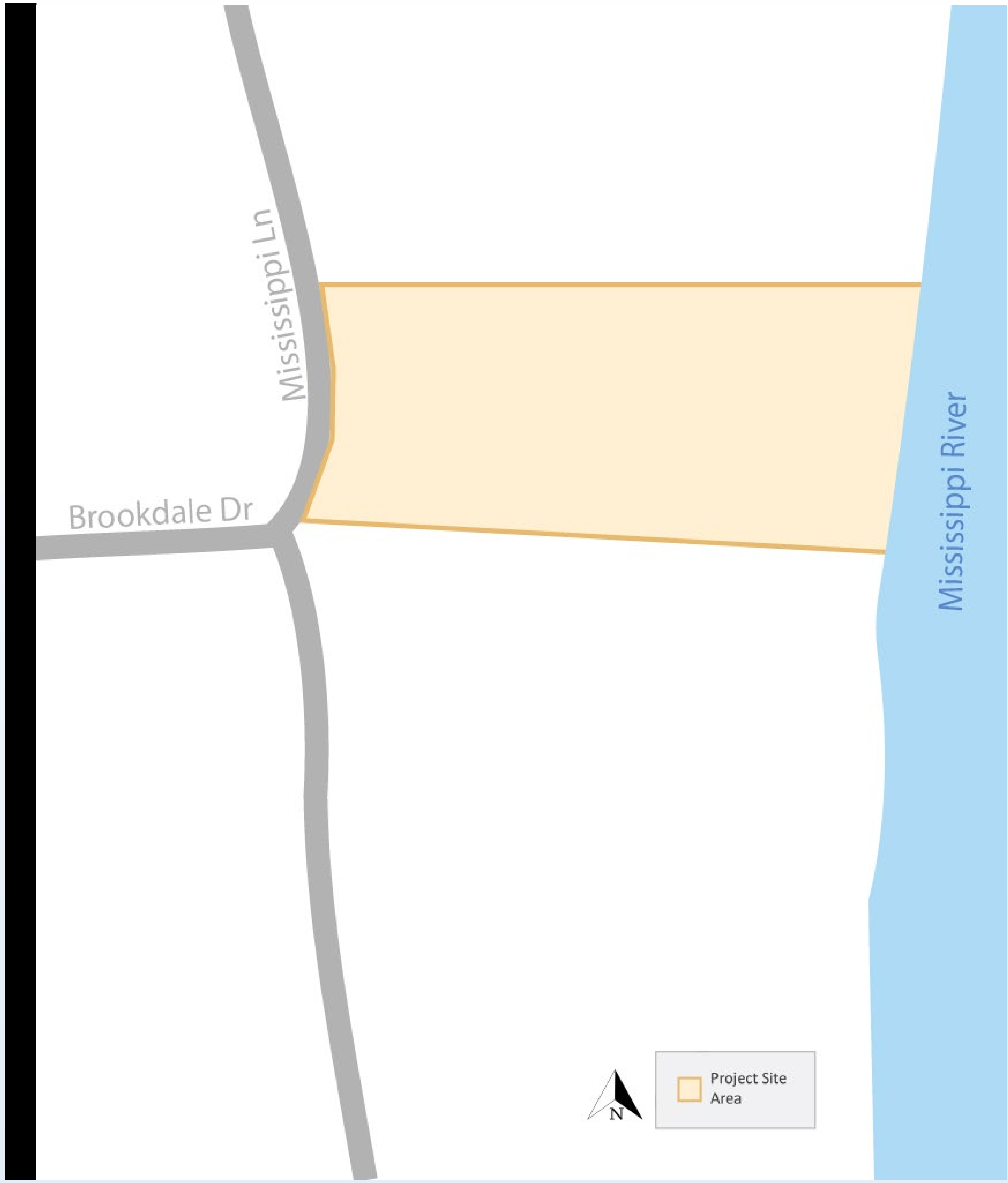
Alternative 1 - Do Nothing

- Keep existing lift station the same size without any upgrades
- Limitations
  - Lift station will continue to deteriorate
  - Require excessive maintenance in the future
  - Eventually lead to failure, back-up in residential basements and overflow/spill into the environment and Mississippi River
- Not a recommended option
  - Does not address environmental health and safety hazards, such as spills
  - Does not meet MCES customer level of service goals
  - Not recommended per MCES policy of providing continued and best customer services to the communities they serve

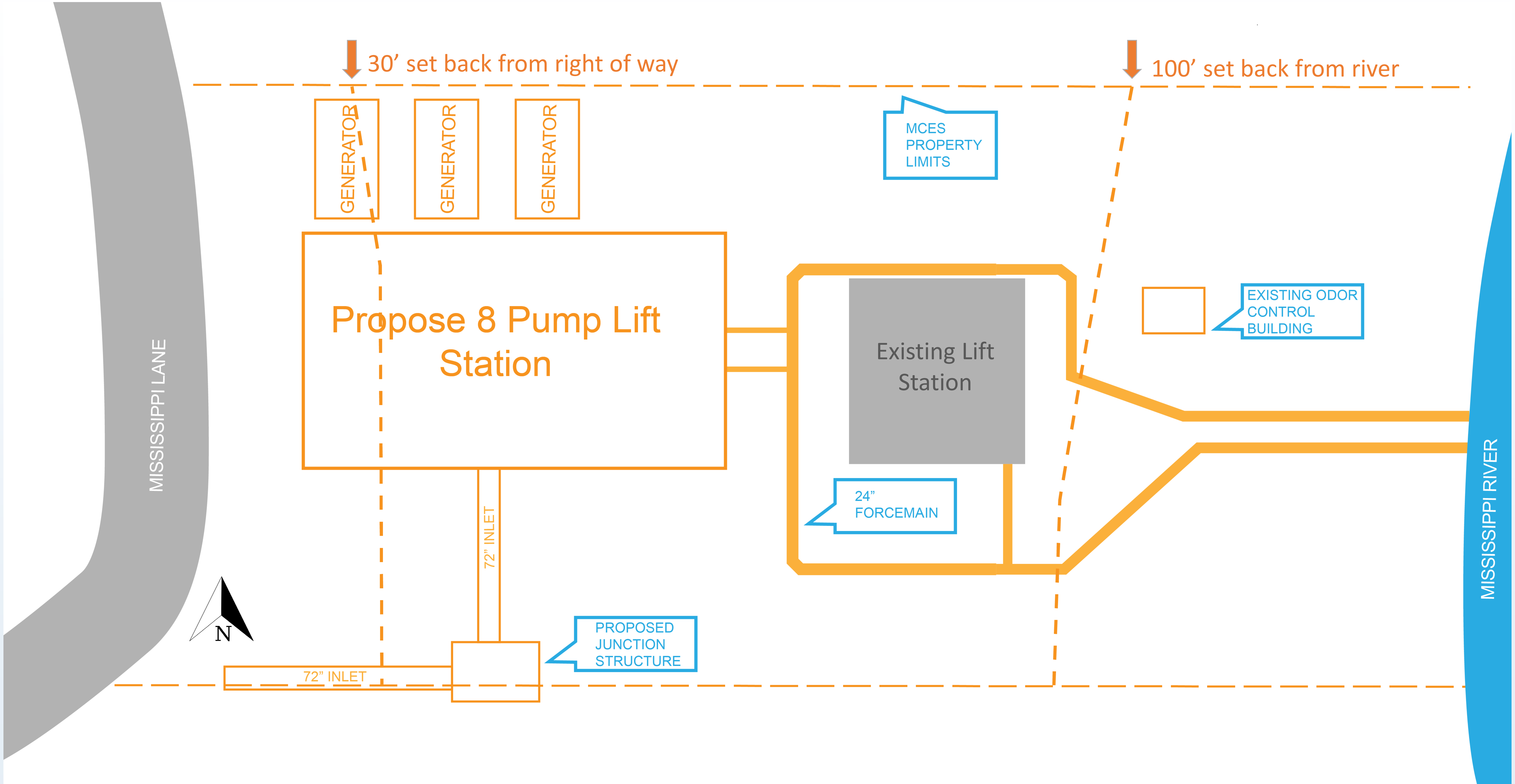
Alternative 2 – New Lift Station on the West Side

This alternative includes:

- Construct a new larger pump station to meet future flow and resiliency needs
- Independent pump system inside the new lift station
- Two new submersible lift stations
- Other resiliency additions
- Upgrades to the existing odor control system
- Maintain operation of existing lift station while constructing a new facility.
    - The existing lift station will be demolished once the new lift station is in operation



Alternative 2 – West Side Property Layout Constraints



This layout shows the setback constraints from the street and neighboring houses with building new lift station on the site

Alternative 2 – Estimated Projected Construction Cost

Sr. No.	Description	Estimated Cost
1	New pump station	$19,200,000
2	Addition of 2 new smaller submersible pump station	$1,560,000
3	Dedicated pumps at lift station	$1,800,000
4	Odor control upgrades	$240,000
5	Property Acquisition + Temporary easements	$960,000
	Subtotal	$23,760,000
	22% Engineering and Administration	$5,227,200
	30% Construction Contingency	$7,128,000
	Total Project Cost (in 2020-dollar amount)	$36,115,200

Alternative 2 – Limitations and Recommendations

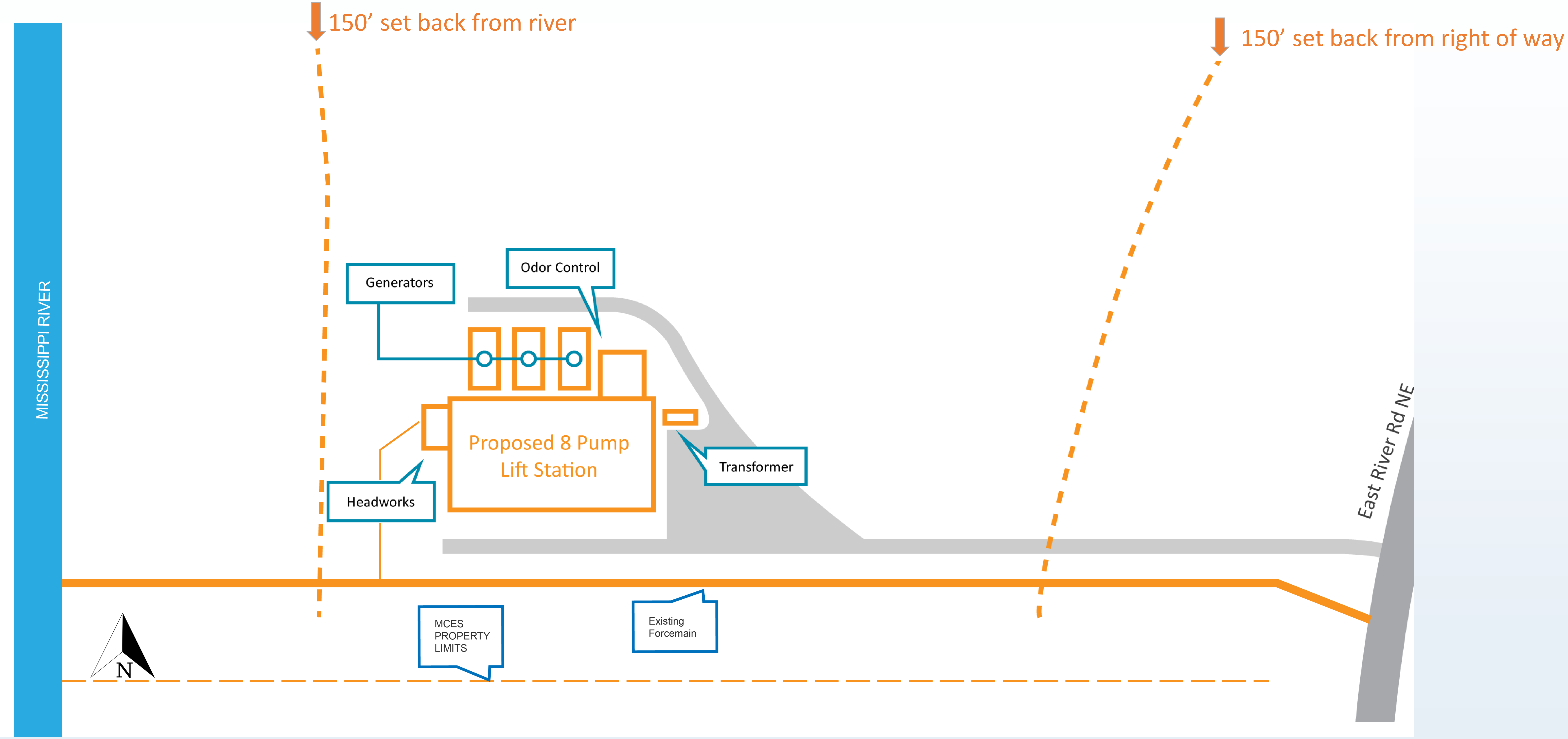
- Limitations
  - Need to keep existing lift station in operation during construction - limiting the available space on site
  - Additional property acquisition is required for new lift station + temporary easements for staging
  - Construction difficulties due to depth – sheeting may be required to protect neighboring properties and street
  - Adequate screening may not be possible – due to space limitations
- Not a recommended option
  - Space constraints due to set back requirements from the river, bluffs, streets and neighboring properties
  - Challenging to build a new lift station while keeping the exiting lift station in operation
  - Require purchasing additional property near the site

Alternative 3 – New Lift Station on the East Side

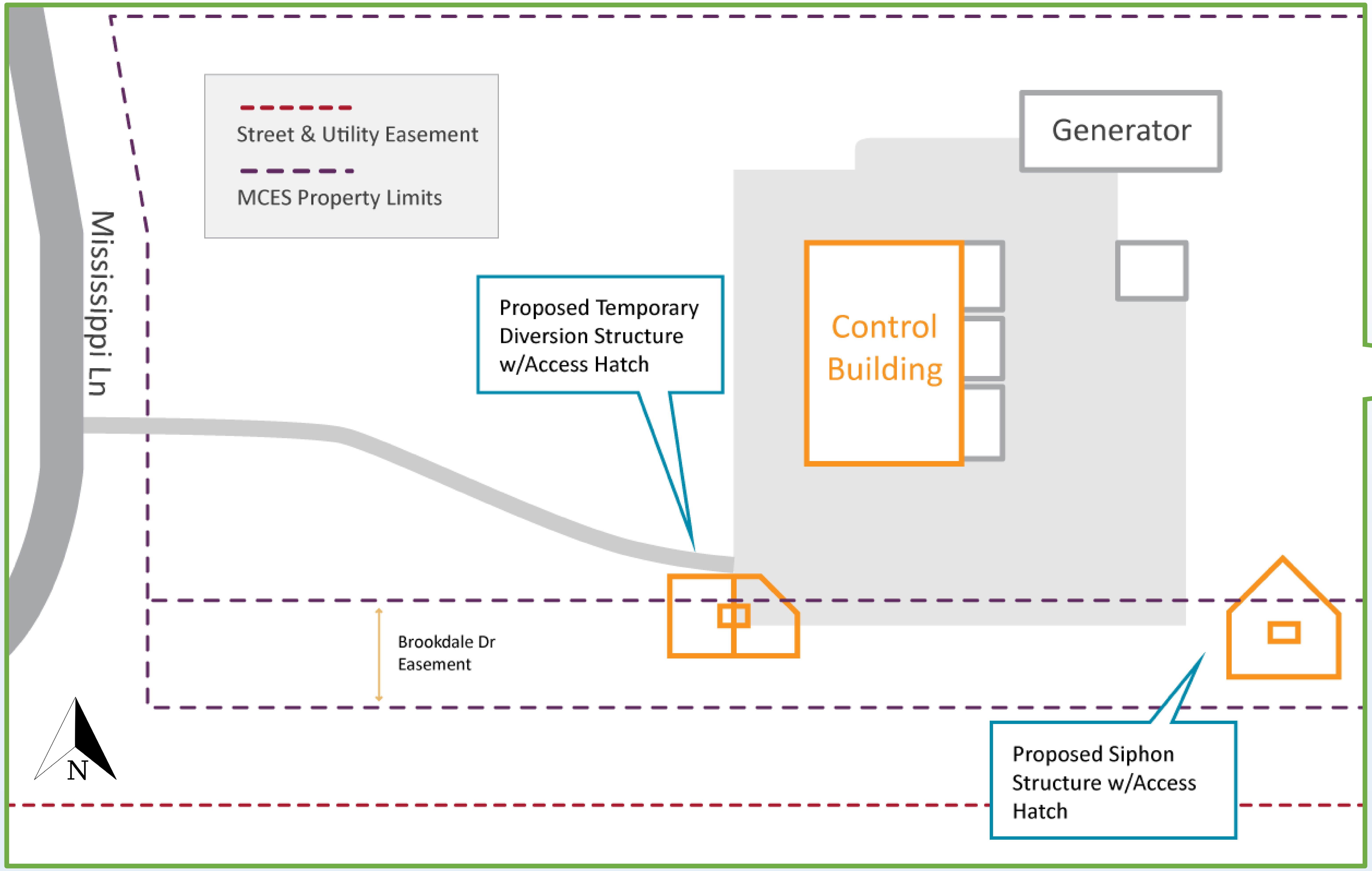
This alternative includes:

- East Side Facilities
  - New pump station to meet future flow and resiliency needs
  - Independent pump system + other resiliency additions
  - Odor control system
  - Flow meter station
- West Side Facilities
  - Control building
  - Siphon structure/headhouse
  - Odor control structure
  - Two new small submersible lift stations
- River crossing
  - Rehabilitate the two existing forcemains

East Side Facilities – Conceptual Plan



West Side Facilities – Conceptual Plan



River Crossing – Upgrade Two Existing Forcemains

Alternative 3 – Estimated Projected Construction Cost

Sr. No.	Description	Estimated Cost
1	New pump station (8-pump circular foundation)	$20,400,000
2	Addition of 2 new smaller submersible pump station	$1,560,000
3	Dedicated pumps at lift station	$1,800,000
4	New odor control system on East Side	$360,000
5	Flow metering	$36,000
6	Siphon system	$6,900,000
7	Odor control system modification on West side	$120,000
8	River Crossing forcemain pipe rehab	$2,400,000
	Subtotal	$33,576,000
	22% Engineering and Administration	$7,386,720
	30% Construction Contingency	$10,072,800
	Total Project Cost (in 2020-dollar amount)	$51,035,520

Alternative 3 – Limitations and Recommendations

- Limitations
  - Construction challenges due to vicinity of river and depth required for construction
  - Highest construction cost
- Recommended option
  - Large open space: 22-acre property, big enough for new lift station and all other requirements
  - No additional easements required for construction
  - Large space will allow for adequate screening of the facility from its neighbor
  - Provide sustainable long-term solution for conveying wastewater in the region
  - Lift station structures will be designed for 67 MGD and other mechanical and electrical equipment be designed for interim capacity of 48 MGD

Existing MCES Lift Station Examples in Residential Area

MCES will work to develop a facility that architecturally integrates into the neighborhood.

L 27 - Hopkins

L 73 - Woodbury

L 60 – Long Lake

L 71 - Chaska

L 76 - Champlin

Information Included in the Report

- Background information and past studies done to date
- Detailed analyses and comparison of alternatives
- Environmental Review of Fridley Site
  - Wetland delineation
  - Archeological and historic sites
  - Environmental Assessment Worksheet (EAW)
- Geotechnical report for Fridley Site
- Project delivery schedule

Financing

- MCES Project Financing
  - Loan from the Minnesota Public Facilities Authority
  - Below market-rate loans used to finance eligible projects which helps keep wastewater rates low
  - Paid for through existing municipal and industrial wastewater rates.

Total Cost and Rate Impacts

- MCES project funding: Public Facilities Authority (PFA) loans (20-year term)
- Loans for these projects are paid from two funding sources:
  - Municipal Wastewater Charges (MWC): This is the MCES portion of your sewer bill.
  - Sewer Availability Charge (SAC): This is a one-time charge for new connections.
- Impact to rates from $51.04 million in loans*:
  - $1.38 = amount included in the annual sewer billing per household ($188 annual average MCES wholesale rate charged to communities).
  - $64.08 = amount paid per year (for 20 years) from the SAC fund per new household connection (or equivalent).

* This project is included in MCES capital improvement plan, so loan payments are already built into future increases to MWC and SAC rates. These figures show the relative impact on rates and how the project will be paid for over time.

Design-Phase Considerations

Engineering studies will investigate:

- Construction method
- Odor control mitigation
- Design of lift station
- Physical and conceptual model of the new lift station and odor control system
- Architectural design
- Coordination with local entities and stakeholders
- Set back requirements from bluffs, river, streets and neighboring properties
- Permits requirements by different regulatory agencies
- Site restoration on new lift station site

Next Steps

- **Dec 28, 2020** Due date for written comments on draft Facility Plan
- **Jan/Feb 2021** Metropolitan Council Adoption of Facility Plan
- **Mar 2021** Submit Plan final Facility Plan to Minnesota Pollution Control Agency (MPCA) with application for Clean Water Revolving Fund Project Priority List

Project Schedule

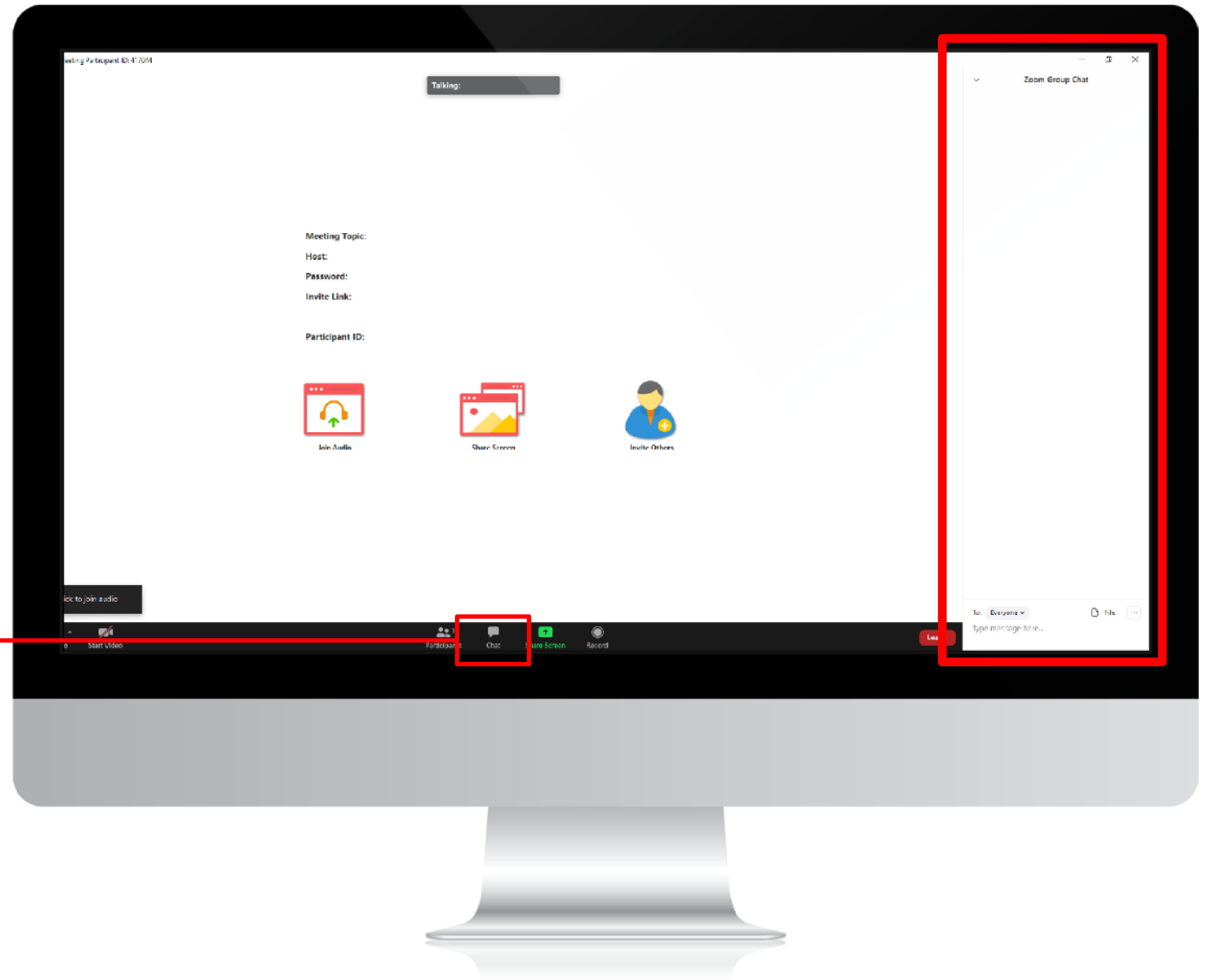
Early 2021
Final Facility Plan

2021 **2023**
Design

2023 **2026**
Construction

Public comments and questions

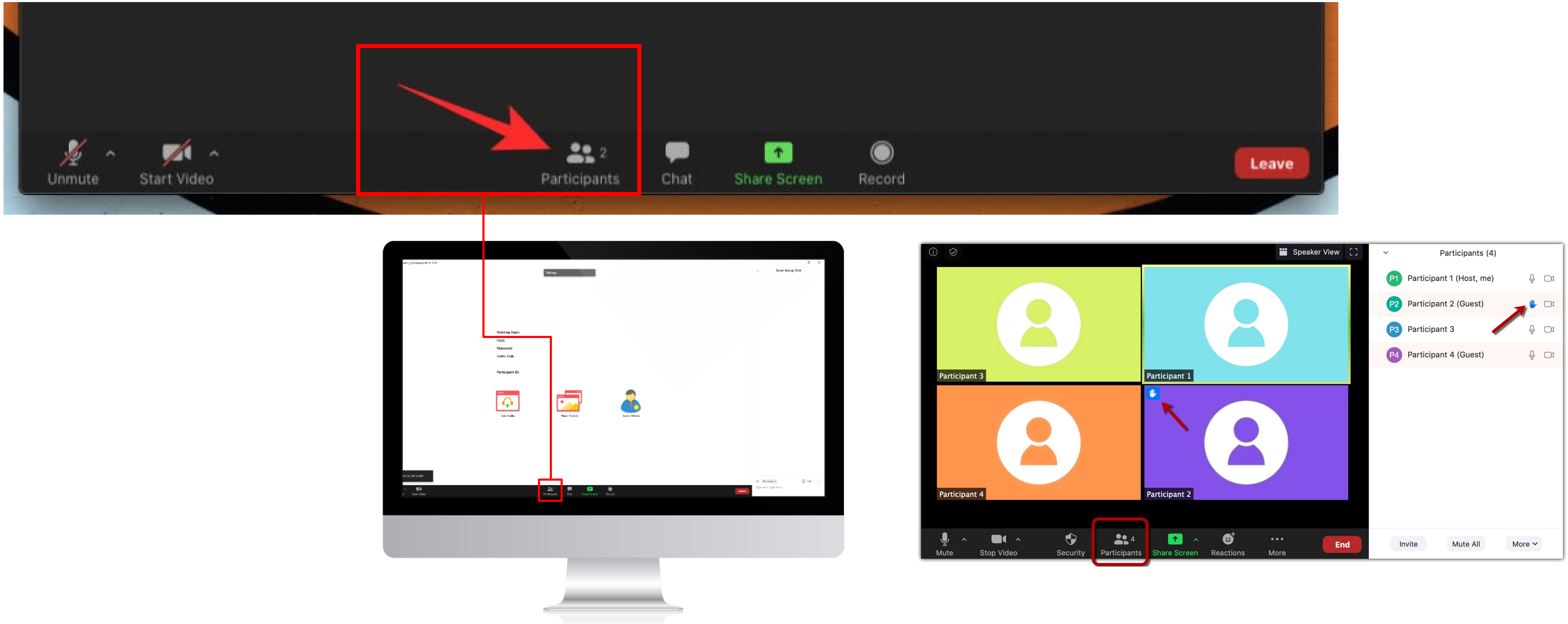
- Participants will be muted during the presentation
- To ask questions or provide comments:
    - Computer, Smartphone and Tablet Users:
    - Use the Chat box to type in questions and comments



Type into the chat box

Public comments and questions

Use the raise hand function to be unmuted and speak aloud.
Select the 'Raise Hand' option inside the "Participants" panel from the right-hand side of the screen.



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Project Contacts

Website

metrocouncil.org/sewerconstruction/fridley

Phone

(763) 520-8650

Email

info@fridleyarealiftstation.com

Visit our project website for more information and to sign up to receive our project email updates.

Thank you for participating in our public hearing

METROPOLITAN COUNCIL

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MCES FRIDLEY AREA LIFT STATION (L32A) VIRTUAL PUBLIC HEARING ON THE DRAFT FACILITY REPORT

December 17, 2020

****

Certified Copy

TRANSCRIPT OF PROCEEDINGS

Date: December 17, 2020
Time: 4:01 o'clock p.m.

REPORTER: Lorna D. Jacobson, Notary Public
Registered Professional Reporter

ON BEHALF OF BENCHMARK REPORTING AGENCY
612.338.3376

APPEARANCES

Peter Lindstrom
Metropolitan Council Member District 10
Chair, Environment Committee

Tim O'Donnell
Metropolitan Council Enviromental Services (MCES)
Senior Information Coordinator and Project Citizen Liaison

Tim Wedin
MCES Assistant Manager
Interceptor Engineering

Jeny Baroda
MCES Principal Engineer
Interceptor Engineering

Ashley Osteraas
Zan Associates (MCES Project Communications)

Angela Klein
Zan Associates (MCES Project Communications)

MR. O'DONNELL: Thank you for bearing with us. I think we're going to go ahead and get started.

I'm from Metropolitan Council Environmental Services, and my name is Tim O'Donnell. And for the public hearing record, I'll spell my name. It's T-i-m, O-'D-o-n-n-e-l-l.

What we're going to start -- before we start the hearing we're going to have Ashley Osteraas, on our project team, go through some brief instructions on how to use the Zoom platform so you can submit questions or comments through a chat box or through a raise-your-hand function; and then we will address them during the public comment period of the hearing.

So, at this point, I'll turn it over to Ashley to get that part of our hearing started.

MS. OSTERAAS: Great. Thank you. Good afternoon. My name is Ashley Osteraas, A-s-h-l-e-y, O-s-t-e-r-a-a-s.

I'm a communications consultant helping Metropolitan Council Environmental Services with today's online public hearing.

So, before we begin, I want to provide you some instructions for how to use the Zoom videoconference platform we are using today, as well as go over how you can submit questions and comments during our public hearing.

Next slide, please.

So, this public hearing is being recorded for documentation and note-taking purposes. If you have any audio issues throughout the first of the public hearing, we do have an option to dial in on your phone and listen in, and we can provide those numbers in the chat box, as well.

Next slide, please.

So, how to submit comments and questions. So, as you noticed, you'll be muted during the presentation. But feel free to ask comments or questions at any time. And you'll be doing that by, at the bottom of your menu there's a chat icon. If you click that and make sure you highlight "Everyone" when providing any comments or questions. You can do that in the chat box.

Next slide, please.

If you prefer speaking verbally, providing your questions or comments that way, you can certainly do that at the end of the presentation. So, again, at the bottom of your menu bar, if you scroll over "Participants," you can see the list of the people that are on the meeting on the right-hand corner and there should be a little icon that says, "Raise hand." So, by clicking that feature means that you want to speak verbally at the end of the presentation, during the public comment period and you can present that way.

Next slide, please.

In the red icon at the bottom of your menu is the "Leave Meeting." So, you can do so at any time during the public meeting.

And now I will pass it off to Council Member Lindstrom to kick things off.

MR. LINDSTROM: Thank you, Ashley. And good afternoon, everyone.

This is Peter Lindstrom. And that's spelled P-e-t-e-r, Lindstrom, L-i-n-d-s-t-r-o-m. And I'm a Met Council Member. I'm chair of the Environment Committee; and I want to welcome you to today's public hearing.

I'm a chair of the Environment Committee, as I mentioned, and the Environment Committee deals with our Metropolitan Council

Environmental Services Division. And you'll hear us use the acronym, "MCES," in referring to this division of the Met Council.

So, at this time, I would like to call the public hearing to order. Now, the subject of this public hearing is the MCES Draft Facility Plan. This plan outlines our recommendations for the Fridley Area Lift Station L32A Project.

With this project we propose to rehabilitate and upgrade our regional sanitary sewer lift station currently located in Brooklyn Park, on the west side of the Mississippi.

The lift station is 50 years old and has reached the end of its useful life. It is also nearing its full capacity, and will not be able to convey future wastewater flows.

Constructing a new larger lift station on the east side of the river in Fridley will help us to continue providing sufficient and reliable wastewater service for the northwest part of the region.

Our staff will provide more details during the presentation.

Next slide, please.

As we begin our public hearing

today we'd like to welcome a few local officials. Tim, do you have a few names out there? I know there's a few of them.

MR. O'DONNELL: Yes. This is Tim O'Donnell again. And we have from the Fridley City Council, Council Members, Ann Bolkcom and Stephen Eggert are here. From Anoka County, we have County Commissioner, Mandy Meisner, from District 4.

MR. LINDSTROM: Fantastic. Council Members, Commissioner, welcome to the public hearing.

MR. O'DONNELL: This is Tim again. I just wanted to add we have some City and County staff with us, too. From the City of Fridley, Brian Strand and Stacy Stromberg; from Brooklyn Park, Craig Runnakko; and from Anoka County, Jerry Auge.

MR. LINDSTROM: Fantastic. Welcome to all our City and County officials.

We also have several MCES staff with us today to present the Draft Facility Plan for this project and to collect comments. I'll have them unmute and turn on their video and introduce themselves. We've heard from Tim already.

Tim, hello.

MR. O'DONNELL: Hi, again. This is Tim O'Donnell, T-i-m, O-D-o-n-n-e-l-l. And I'm a Senior Information Coordinator and Project Citizen Liaison for Met Council Environmental Services. Basically, I assist with our public outreach efforts on our sewer construction projects.

Good to be here tonight.

MR. LINDSTROM: Thank you. We have another Tim with us, as well, Tim Wedin.

MR. WEDIN: Thank you, Council Member Lindstrom. My name is Tim Wedin, spelled T-i-m, last name, capital W-e-d-i-n. I am an assistant manager with Interceptor Engineering, at Met Council Environmental Services. And I'll be part of the project team for the lift station, L32A Project.

MR. LINDSTROM: Thank you.

Jeny Baroda, would you like to say, "Hello"?

MS. BARODA: Hi. This is Jeny Baroda. And I'm a principal engineer at Interceptor Engineering, with Metro Council

Environmental Services. And I'll be working with Tim Wedin on this project.

MR. LINDSTROM: Excellent. Thank you. And assisting us behind the scenes today are our Communications Consultants, Ashley Osteraas and Angela Klein.

Would the two of you like to say, "Hello"?

MS. OSTERAAS: Sure. My name is Ashley Osteraas, A-s-h-l-e-y, O-s-t-e-r-a-a-s. And I'm assisting with the project communications.

MR. LINDSTROM: Well, thanks, everybody. And welcome again.

Next slide, please.

The purpose of this public hearing is to, 1, summarize the proposed lift station improvements project and explain alternative approaches that we have evaluated; Number 2, to answer any questions that you may have about the proposed project; and last, but not least, receive your comments for the public record.

In addition, we have a transcriber recording the proceedings for our official public record. The transcription and video recording of the presentation will be posted on the project website in early January.

As we conduct this public hearing there are a few things I'd like to point out.

All interested persons may present comments or opinions as they relate to the Draft Facility Plan. We will read your comments and questions posted in the online chat box in the order they are entered. If you would like to speak out loud, we will call on you and unmute your microphone in the order you have clicked your raised hand symbol.

We ask that you state and spell your first and last name each time you speak. Also, please include your address and the organization you represent, if any.

Individuals will have three minutes to offer their remarks. Designated representatives of groups or organizations will have five minutes.

We also welcome written comments, and we'll provide you instructions on how to submit them. We also will read into the public record any comments we have received prior to today's public hearing.

Next slide.

For the last couple of weeks a paper copy of the Draft Facility Plan has been available for the public to review at the Fridley and Brooklyn Park City Halls, the Mississippi Library in Fridley, and the Brooklyn Park Library.

An electronic copy of the Draft Facility Plan is available on our project website, on the Metropolitan Council website.

Next slide.

We will continue to have the Draft Facility Plan available for review through December 28th, which is the end of the public comment period.

On the screen you can see the various ways you can submit comments, in addition to commenting during this public hearing today. We will show you this again at the end of the hearing.

Next slide.

Our project implementation schedule includes these key dates and time frames. We published a legal notice of the public hearing in the Star Tribune on November 15th. We mailed the public hearing notice on December 4th to property owners in the proposed project areas, as well as numerous government and community stakeholders. We sent email invitations and did social media posts in December.

We are holding the public hearing today, December 17th. The Metropolitan Council review and adoption of the final facility plan is scheduled for January and February, 2021. And in March we will submit the plan to the Minnesota Pollution Control Agency and we'll include our application to be included on a priority funding list.

This funding would be in the form of low-interest loans that MCES would pay off over a 20-year period.

Next slide, please.

For our agenda today, we've already covered the welcome and introductions. Our presentation will describe our organization and what we do for the region, explain what a facility plan is and define terms that we use in the wastewater industry, look at the need for this project, discuss our proposed facility improvements for Fridley and Brooklyn Park, and our evaluations that led us to this recommendation; cover the cost implications of these regional sanitary sewer improvements and go over our public outreach and facility plan schedule. Then after our presentation we will open it up to comments and questions.

At this time, I'd like to turn it over to Tim O'Donnell to begin our presentation.

MR. O'DONNELL: Thank you, Council Member Lindstrom.

Again, my name is Tim O'Donnell, spelled T-i-m, O'-D-o-n-n-e-l-l, and I work at Metropolitan Council Environmental Services, or MCES.

I'd like to begin our presentation with a brief overview of the Regional Wastewater System and our service area and facilities. After that, we will zero in on the improvements we are planning for our regional sanitary sewer facilities in Fridley and in Brooklyn Park.

The Regional Wastewater System is run by MCES and we are an operating division of the Metropolitan Council.

The map on your screen is of the seven-county Twin Cities Metro area. It shows our wastewater service area and the regional sanitary sewer facilities.

The color shading on the map shows the areas that we serve. It's basically the urban and suburban portions of the Metro area.

Each color-shaded area corresponds to one of our nine regional wastewater treatment plants.

Our wastewater collection system consists of approximately 640 miles of regional sanitary sewers, which we also call "interceptor sewers." These are shown as purple lines on the map. We also have 61 pump stations, also known as "lift stations;" and we have 190 meter stations to measure the volume of wastewater flowing from each community that we serve.

These interceptor sewers that you see on the map are, in effect, they intercept the flow of wastewater from 110 communities in the metro area and carry it to our treatment plants.

In addition to these sewers that MCES operates for the region, these 110 communities combined operate more than 5,000 miles of local sanitary sewer pipes.

The small black squares on the map indicate the location of our wastewater treatment plants. The nine plants combined treat

250 million gallons of wastewater every single day. They discharge the resulting clean water to the Mississippi, Minnesota and the St. Croix Rivers.

Now, to put this volume of wastewater into some perspective, 250 million gallons of wastewater would easily fill the Empire State Building every day.

The wastewater from the northwest suburban area, shaded green on the map, flows through a series of regional sanitary sewers through Minneapolis and St. Paul, then arrives at our Metropolitan Wastewater Treatment Plant, which is about three miles southeast of downtown St. Paul.

It's important to remember that MCES's primary role is collecting and treating wastewater; also known as "sewage." And that's, essentially, everything that goes down your drains.

Your cities, on the other hand, in addition to their local collection of wastewater, they are responsible for the drinking water treatment and distribution, as well as storm water management.

So, our primary role, again, is wastewater collection and treatment. We're often asked in public hearings like this, "How does MCES finance this system?"

What we do is, we bill the 110 communities that are connected to the system to pay for our operation, maintenance and capital improvement costs. The cities, in turn, bill these costs and their local costs to the property owners who are connected to their local sewer system. In the end, about 60% of your sewer bill pays for MCES's regional system costs, and about 40% stays in your community to pay for your local sewer system costs.

The sewer user fees that we collect are enough to fund the regional wastewater system without the need for tax dollars. We also do not levy special assessments on properties near sewer projects like we're talking about today.

These projects have a broader public impact, and so their costs are paid for region-wide.

And now, after this broad overview into who we are and what we do for the region, I'd like to turn it over to my colleague, Tim Wedin. And he'll focus on our plans for the Fridley and Brooklyn Park areas.

Thank you.

MR. WEDIN: Thank you, Tim.

To begin, we would like to explain what a facility plan is. This document that summarizes the current state of the existing MCES wastewater facilities that identifies the need for rehabilitating the existing facilities or constructing new facilities. It also determines the potential environmental and other impacts of new facilities. It considers those factors and recommends a course of action.

This document is a prerequisite to qualify for financing from the Minnesota Public Facilities Authority.

Next slide, please.

There are several terms that we use during our presentation and in our facility plan. A wastewater sewer system is a system of underground pipes that carries wastewater or sewage away from buildings. Cities operate their own local wastewater sewer systems within the community. MCES operates the regional wastewater sewer system that carries wastewater from city systems to our treatment plants, similar to how a freeway system carries the regional traffic. MCES interceptors are large underground pipes that make up the regional sewer system. These pipes can be either gravity pipes or forcemains.

A gravity pipe is a sloped pipe that carries wastewater down a hill, or by gravity, without mechanical assistance. A forcemain, on the other hand, is a pipe that carries wastewater being pumped or forced uphill, as opposed to wastewater flowing by gravity. Flow meters are devices that MCES uses to measure the quantity of wastewater a city sends to the regional wastewater treatment system, similar to how a city water meter measures water usage in a home. Lift stations or pumping stations pump wastewater from low points in this local sanitary sewer system to higher points, allowing the flow to be carried by gravity pipes to a wastewater treatment plant.

Finally, a siphon is a pipe that conveys flow beneath a low-lying area, such as a river, other utilities or other obstructions.

Next slide, please.

Lift Station L32 is located in Brooklyn Park, at 7700 Mississippi Lane North. Our proposed lift station, L32A, is located at 6900 East River Road in Fridley, on MCES property.

This was previously the site of Camp Lockeslea and is located across the Mississippi River from the existing lift station.

Next slide, please.

Lift Station L32 is about 50 years old. Components, such as the structure, piping and controls are showing signs of deterioration and require replacement.

Failures at the lift station have resulted in backups of wastewater into nearby homes. There have been odor complaints due to the inability to address air flow at the current facility. The lift station is almost at full capacity with the existing flow conditions.

Next slide, please.

This slide summarizes the flows that we have conveyed through the lift station over the past several years. In 2016, our average daily flow was 16.5 million gallons per day, with peak flows reaching up to 38.4 million gallons per day. Flows continue to increase as communities grow. Our flow projections for 2040 are for an average daily flow of 25 million gallons per day, with a peak daily flow of 48 million gallons per day. Ultimate capacity projections for the area are for

34 million gallons per day, average daily flow, with a peak daily flow rate of 67 million gallons per day. As a comparison, our current peak flow capacity at Lift Station L32 is 43 million gallons per day.

Next slide, please.

The conditions that are driving us to complete this construction for this project include the fact that the existing lift station is 50 years old and has reached the end of its useful life. Condition assessments have documented structural, mechanical and electrical deficiencies that have led to system failures, such as backups and odor issues. The lift station is almost at its full pumping capacity. L32 does not have sufficient capacity to serve the current or future needs of the area.

Next slide, please.

As part of our evaluation we performed an overall system analysis of the pipes leading to and from Lift Station L32. We determined that there is sufficient capacity upstream of L32 for future growth. We've also determined that downstream capacity is sufficient to support future growth.

Next slide, please.

Our facility plan includes an analysis of various alternatives for preventing spills at the lift station. Our design guidelines recommend a 60-minute response time under peak flows. That allows time for our staff to address any issues at a lift station that may cause the pumps to shut down unexpectedly.

Under current flows we have about 53 minutes of response time. We have determined that we need an additional 30 minutes of response time for the ultimate flow of 67 million gallons per day under peak flow conditions. We analyzed several options to provide this spill prevention.

Inline storage, or storage in the pipes, themselves, is typically how we accomplish this. To provide that additional inline storage we determined that two small submersible lift stations could be added upstream of L32 to address lower interceptor connections. We are also evaluating an independent pumping system to be included in the lift station that would provide for additional response time. This would include high-capacity pumps that would operate independently of the standard pumps in the event of a failure. The lift station would also include traditional resiliency features, such as a split wet well system, redundant pumps and other features that will help improve resiliency and prevent spills at the lift station.

Next slide, please.

For the lift station project, we evaluated three different alternatives. The first was to do nothing; to leave things as they are right now. The second alternative was to replace the lift station in its current location with a new larger lift station that would be suitably sized to handle the flows that are projected through the area. The final option was to construct a new larger lift station on the east side of the river in Fridley; again, to handle the higher flows that are projected for the area.

Next slide, please.

Alternative 1, the do-nothing alternative, keeps the existing lift station the same size without any upgrades. The limitation to this alternative is that the station will continue to deteriorate if we do nothing. We're not fixing the problem that we currently have. Because of the continued deterioration, excessive maintenance will be needed at the lift station in the future. This will lead to increased failures at the lift station. Failures would include an increased frequency of backups in the area, a potential for an overflow or spill into the environment, including into the Mississippi River. Because of this, this is not a recommended option. This does not address environmental health and safety concerns, such as spills. It does not meet our customer service goals. It is not recommended per our policy of providing continued and best customer services to the communities that we serve.

Next slide, please.

Alternative 2 includes the construction of a new lift station on the west side of the Mississippi River at the existing lift station location. It would include construction of a new larger pump station that would meet future flow and resiliency needs. It includes an independent pump system inside of the new lift station to help mitigate spills. Two new submersible lift stations would be added upstream of this existing lift station. Other resiliency features that we have previously discussed, such as the split wet well would also be included. The project would upgrade the existing odor control system. We would need to maintain operation of existing -- of the existing lift station while we are constructing a new facility. Once the new lift station has been completed, we would demolish the old facilities.

Next slide, please.

This slide shows an approximate layout of where our facilities could be located if we were to try to keep them on the west side of the Mississippi River. The facilities are very large compared to the property. Setback requirements limit the space that we have available to construct the new facility at this location.

Next slide, please.

Our cost estimate for this new facility includes the new pump station, new submersible pump stations upstream of L32, dedicated pumps at the lift station, odor control upgrades and acquisition of temporary easements to allow us to construct these facilities. We estimate that this alternative would cost approximately $36,000,000.

Next slide, please.

There are several limitations

with Alternative 2. We need to keep the existing lift station in operation during construction. That limits the space that we have available onsite to construct the new facility. In order to construct the facility, we need to acquire additional property. That would include temporary easements around our facility in order to stage equipment and to stockpile materials. Additionally, there would be a lot of construction difficulties that we would have, due to the depth of the facility. We would need to provide sheeting that would protect the neighboring properties and the street during construction. Space limitations would also limit the screening through the area. This is not the recommended option. Space constraints due to setback requirements from the river, the bluffs, the streets and the neighboring properties limit the area that we can work in. It is very challenging to build a new lift station on this site while keeping that existing in operation. Likely, we would need to purchase more property near the site to provide screening and to construct the new facility. Because of these limitations, we do not recommend moving forward with the option of constructing the new facility on the existing site.

Next slide, please.

Our third alternative is the construction of a new lift station on the east side of the Mississippi River. This alternative includes construction of a new pump station in Fridley, an independent pumping system, and other resiliency features that we've previously discussed, odor control and flow metering. The west side would still require some facilities. These would include a control building, or an odor control building, a siphon structure or head house to conduct wastewater underneath the Mississippi River, an odor control structure to manage the odorous air that accumulates at the siphon structure, and two small submersible lift stations to service city connections to our interceptor system. The project would also include rehabilitating the two ductile iron pipe forcemains that cross the Mississippi River.

Next slide, please.

This is our conceptual plan that shows the location of our new pump station on the east side of the river and what it would include. Our main concern would be ensuring that we meet the required setbacks from the right-of-way to the east, as well as the setbacks to the west from the Mississippi River. This space that we have here also allows us to provide adequate screening of our facility.

Next slide, please.

This shows the facility that will be located on the west side of the river. The odor control building would be constructed in approximately the same location as the existing lift station. We would include a siphon structure that would allow wastewater to enter the siphons, which would conduct flow underneath the Mississippi River. Other minor improvements would also be included on the west side of the river, such as site screening.

Next slide, please.

Wastewater would continue to be conveyed underneath the Mississippi River through the four pipes that are located here. These four pipes would be converted into siphons, which would allow wastewater to flow underneath the river. The two pipes that are shown in red would be rehabilitated.

Next slide, please.

The estimated cost for

Alternative 3 includes a new pump station, two smaller submersible pump stations, dedicated pumps in the lift station for spill prevention, a new odor control system on the east side of the river, flow metering, the siphon head box, odor control modifications on the west side of the river, and rehabilitation of the pipes crossing the river. Our estimate for the entire project is approximately $51,000,000.

Next slide, please.

Alternative 3 has some limitations. There are a number of construction challenges due to the proximity of the river and the depth required for construction of the lift station. It is also the highest construction cost of the three alternatives that we have considered. However, it is our recommended option. The large available space that we have on the east side of the river allows us to meet all of the requirements for building a lift station in this area. The 22-acre parcel that we own is large enough for the new lift station. We would not need to acquire any additional easements or any additional property to allow for construction. The large space will allow for adequate screening of the facility from our neighbors. This alternative will provide a sustainable, long-term solution for conveying wastewater in the region. The lift station structures will be designed for the ultimate peak flow rate of 67 million gallons per day. Other mechanical and electrical equipment, such as the pumps, pipes and controls will be designed to convey our interim capacity of 48 million gallons per day. Again, this is our recommended and most preferred alternative.

Next slide, please.

This slide includes some images of some other lift stations that we have constructed in or near residential areas, as well as what cities they are located in. These facilities all include the same features that we are planning for the new L32A project, such as spill prevention measures and odor control systems. As you can see from these images, none of our lift stations really looks the same. We try to design them such that they fit into the character of the area in which they are built.

Next slide, please.

Additional information is included in the Draft Facility Plan. Background information and past studies that have been done to date related to Lift Station L32 and the system that leads to L32 are included with the report. A detailed analysis and comparison of each of these alternatives is also included. The complete report also includes an environmental review of each alternative, including wetland delineations, evaluation of archeological and historic sites and the draft discretionary environmental assessment worksheet that we prepared as a part of this project. We also included a geotechnical report of the Fridley site and a project delivery schedule.

Next slide, please.

Financing for this project will be provided through a low-interest loan from the Minnesota Public Facilities Authority. These below-market-rate loans are used to finance eligible projects and keep wastewater rates low. These loans are paid for through existing municipal and industrial wastewater rates.

Next slide, please.

The public facilities authority loan has a 20-year term. Loans for these projects are paid for from two funding sources. The first is the municipal wastewater charge, which is the

MCES portion of your sewer bill. The second is the sewer availability charge, or SAC, which is a one-time charge for new connections. The $51,000,000 loan for the project will be paid for through existing sewer rates. Of the $188 annual average MCES wholesale rate that is currently charged to communities, $1.38 will pay for this project; one dollar and thirty-eight cents. When a builder or development constructs a new building, $64.08 of the total SAC charge pays for this project over the next 20 years. This project is already included in the MCES capital improvement plan. These loan payments are already built into future increases to municipal wastewater charges and SAC rates. These figures just show the relative impact on rates and how the product will be paid for over time. These numbers do not reflect an increase in sewer rates due to this project.

Next slide, please.

With the completion of our facility plan, we will move forward with the design phase of the project. The design phase will include engineering studies that will investigate the construction methods or how the facility will be built. Studies will also consider what odor control technologies will best mitigate odors. We will investigate the design of the lift station and create a physical and conceptual model of the new lift station and odor control system. We will work on the architectural design of the buildings and how they fit with the character of the area. We will coordinate with local entities and stakeholders, such as the cities of Fridley and Brooklyn Park, as well as other regulatory agencies and interested parties. We will consider various land use requirements to site our buildings. We will begin to secure permits that are required by different regulatory agencies. We will study site restoration needs on both the east and west sides of the river. These factors will all be considered during the design phase of the project.

Next slide, please.

Our next steps include collecting written comments on the Draft Facility Plan. Written comments are due on December 28th, by 5:00 p.m. In January and February of 2021, the Metropolitan Council will review the final facility plan, which will include these written comments, comments from tonight's meeting and our responses to these comments, and adopt the facility plan. Once the Metropolitan Council has adopted a facility plan, we will submit it to the Minnesota Pollution Control Agency, with an application for a clean water revolving fund project priority list. At the same time, we will move forward with design of the project. That design is scheduled to last for the next two years, from 2021 through 2023. Construction is anticipated to begin in 2023 and last through 2026.

Next slide, please.

With that, I will return the meeting to Council Member Peter Lindstrom, who will guide us through our public comments and question period.

MR. LINDSTROM: Fantastic. Thank you, Tim O'Donnell and Tim Wedin for your presentations.

And, yes, at this time I would like to open it up to public hearing attendees for your comments and questions on the facility plan. I'd like to remind you to state and spell your first and last name each time you speak; also, please include your address and your organization you represent, if any, for the record. You can follow the instructions now on the screen to type into the chat box or click the "Raise Hand" symbol.

So, at this time, I'll keep my eye out for comments and questions.

MR. O'DONNELL: Council Member Lindstrom, this is Tim O'Donnell, from the MCES staff. While we're waiting to see if there are some questions from people in the audience, we did get one question that we received in advance of the hearing by email, and that is from Martin Gavic, spelled M-a-r-t-i-n, G-a-v-i-c. And he lives at 141 Hartman Circle, in Fridley. Mr. Gavic asks us, "Will there be any odors emitted from this lift station? And if so, how will you control them? And where is the exact location of the lift station on the property?"

I believe Tim Wedin covered this in the presentation. But, Tim, if you could just briefly repeat some of this information to answer Mr. Gavic's questions.

MR. WEDIN: Thank you, Tim; and thank you, Mr. Gavic, for the question. I'll take them in the reverse order.

As far as the location of the proposed lift station, right now we are proposing that the building, itself, will be very close to where the existing girl scout building was. So, it will be fairly far away from the homes in the area, fairly far away from the property boundaries of the property, try to remove it as much as we can from the area. We do need to maintain some proximity to the existing pipes, but we are trying to be considerate of our neighbors in the area.

As far as the odors, we will include odor management as a part of the project. There's a number of different technologies that are out there that are available for us to take care of odors at this facility. There may be momentary periods where we will still see odors from that facility, and that may be because the media that is being used to mitigate these odors has reached the end of its useful life. It more likely will be during times when we are changing out the media at this odor control equipment. So, likely, there will be some momentary, temporary odors at that site. But, for the most part, the odor control system will prevent any odors at the facility.

MR. LINDSTROM: Excellent. Thank you.

Scanning for other questions or

comments. I don't see any questions in the chat. I see Joe MacPherson, from Anoka County, let us all know that Anoka County submitted comments in the form of an email and does not have any further comments at this time and thanks us for the detailed information.

Looking for any sort of raised hands or additional comments.

MR. O'DONNELL: Council Member Lindstrom, we do have a couple of additional comments in the chat box from Fridley City Council Member, Ann Bolkcom; and also, from Anoka County Commissioner, Mandy Meisner.

MR. LINDSTROM: I see that. Thank you. Great.

A comment from Ann Bolkcom about great news about the girl scout spot. And from the Commissioner, it says, "Agree. I know the camp is a beloved place for a lot of Fridley residents. Thank you for the detailed presentation."

And we have a question from Barb Bergseth, on 71st Way Northeast; 146 71st Way. "How much noise and smell are generated from the lift station?" That's Question Number 1; and Question Number 2, "What is the expected start date of construction if approved?"

Is there someone from our team that would like to take on those two great questions?

MR. WEDIN: Council Member Lindstrom, I think I can answer those questions. And thank you, Ms. Bergseth, for the questions.

As far as how much noise and smell are generated from the lift station, we will be required to meet the City of Fridley code requirements. They do set forth limitations as far as the level of noise that can be generated at the facility and how many decibels can be heard at the property boundary. With our separating that, pushing that back from the property line, that will help mitigate that issue. Also, the planting of trees and other greenery in the area will also help mitigate a lot of that sound issue. Most of the equipment, itself, especially the pumps and other equipment that will be used for operation of the lift station will be located inside of the building. So, that will also help mitigate a lot of the noise in the area.

Odors, like I mentioned previously, the level of the odors will be very minor. Most of the time, it will be noticed when we are changing out our filter media as part of the odor control system. I'm not sure that I can really quantify what the odor will be, but we're definitely mindful of that with this facility, as with all of our other facilities.

As far as when the construction will commence, I think right now it's too early for us to give an exact date of when construction will begin. We're still in the planning phase of the project and there's still a number of things that can affect when the shovels hit the ground. But right now, we are projecting a 2023 start date for construction activities.

MR. LINDSTROM: Great question.

And I see we have another question from Tom Kimlinger, 109 Hartman Circle, "What is the planned use for the rest of the property not covered by the buildings?"

Great question.

MR. WEDIN: Thank you, Council Member Lindstrom and thank you, Mr. Kimlinger. That is still a question that is being discussed. At this point in time, we don't have a solid answer for what the remainder of the property will be --

or what will be done with the remainder of the property.

Part of the reason for that is, we don't know how much of the property we're exactly going to need to use. We've estimated of the 22-acre parcel we will need to use about seven acres of it, which will mean that there's still another 15 acres that we don't need. There's still a lot of discussion with the City of Fridley that we're having as far as what options are available to that parcel.

Those options include developing the area for residential housing. Those options include Metropolitan Council retaining ownership of the area as a buffer, and including some public space. But at this point in time, it's too early for us to determine what that property is going to be used for in the future. That will be something that we will continue to discuss with the City of Fridley and come to a conclusion with them on moving forward.

MR. LINDSTROM: Excellent.

Commissioner Meisner asks a good question, "If approved, will there be community meetings offered either to gain feedback from residents, or simply to communicate the plans before you break ground?"

Is there a member of our team that would like to address that good question?

MR. WEDIN: Thank you, Council Member Lindstrom, and thank you, Commissioner Meisner. This is a very important question.

Public outreach is a very important part of all our projects, and we will continue to involve the public in the project as we move forward. It may be a while before you hear from us, as far as project breaking ground. Like I said, it will be 2023 before we break ground. But, we will be working closely with the City of Fridley on design of the project. That typically includes sitting down with City Planning Committees to discuss how the project is going to look; not only the building, but also, landscaping and restoration of the site.

I'm trying to think if there's somebody else on the team right now that can help speak a little more to project communication as we move forward here.

Is there anybody else that would like to add to what I've included here?

MR. LINDSTROM: I would just add that as Chair of the Environment Committee for the Met Council, I'd be delighted, Commissioner, to come to a County Board meeting or any other public forum and help talk about the project and extend that to the Fridley staff and City Council officials, or any sort of neighborhood groups out there. I know I'd be willing to address those groups. And your local council member, I'm sure, would join me in those meetings, as well.

Anybody else from our team like to chime in on that one?

MS. BARODA: Council Member Lindstrom, this is Jeny Baroda. I would like to add that we will also be working with other stakeholders, like Friends of Mississippi and Department of Natural Resources as progress to design of this project. So, we will be working with them to determine how the site would look like, what are the site requirements and all that good stuff.

Thank you.

MR. LINDSTROM: Excellent. Thank you.

MR. O'DONNELL: This is

Tim O'Donnell. I'll jump in here, too, from the aspect of our community outreach.

We can certainly hold additional local public information meetings as we move through the design process to start to show you what we're looking at for design of the project. And then certainly again, before construction would begin, that's the point that we will have the most detail that we can offer to the public on the final designs and construction schedules, what we would be doing to try to mitigate the impact of the construction while it's taking place. So, yes, definitely; we will hold additional meetings to keep informing the public about our project.

Thank you.

MR. LINDSTROM: Thank you.

Michael McCarthy asked the question, "Will there be any effluent storage on the site?"

MR. WEDIN: Thank you, Council Member Lindstrom. And thank you, Mr. McCarthy, for your question.

We will not be storing effluent on the site. One of the things that we know is when we store wastewater at a location, that can cause odors. And we're trying to do all we can to limit the odor-causing areas. So, one of the evaluations that we did as we went through and looked at spill prevention for this location was an evaluation of storing wastewater at that site. And we quickly determined that that was not a viable alternative.

MR. LINDSTROM: Great question.

Keeping on the theme of odors, Stephen Eggert asked the question, "What is the typical amount of time needed to change out media for odor control?"

I expect there is a range for different or newer systems.

Tim, would you like to handle that one, as well?

MR. WEDIN: Certainly, Council Member Lindstrom. Thank you, Mr. Eggert, for your question.

I believe, as I recall -- I think you are correct -- it really does depend on the size of the odor control system and the type of the odor control system that we use for managing odors. As I recall, the time for change-out of the media for a lot of our odor control systems is on the order of magnitude of about a half a day. So, four to six hours.

MR. LINDSTROM: Excellent.

Another question that just came in from Barb Bergseth, 146 71st Way Northeast, "As a residential homeowner on the north side, we like the option of a buffer by the Met Council for the 15 acres not used for the lift station."

So, not necessarily a question, but a great comment from Barb Bergseth. All right.

Did I miss any questions in the group chat? And I will scan for raised hands, as well.

Team members, if you see something that I missed, let me know.

MR. O'DONNELL: Sure. This is Tim O'Donnell. We do have one person who has joined our public hearing by their phone. The phone number begins 612-382. Could we unmute them just to see if they have a comment or question, or whether they're here just to listen to the presentation? They're at the bottom end of the participant list.

MR. DIEDERICH: Yes. Can you hear me now?

MR. O'DONNELL: Yes. We can hear you.

MR. DIEDERICH: Hi. My name is Roland Diederich. I live in Fridley, Minnesota, on 66th Way; 40-year resident. And my question is: If there's a breakdown on the Fridley side of the river, are you going to then start trucking the waste away from that area on to St. Paul?

MR. LINDSTROM: Great question.

So, if there's a breakdown -- just to repeat the question, "If there's a breakdown on the Fridley side, how would that be handled? Will it be trucked to St. Paul?"

MR. DIEDERICH: Yeah. I'm visualizing some kind of breakdown. Things do break down and you need to move that waste. I envision trucks driving down East River Road, heading their way towards Pig's Eye Island.

MR. O'DONNELL: Sir, could I ask you to state your name and spell your name again, please?

MR. DIEDERICH: It's Roland, R-o-l-a-n-d, last name is Diederich, D-i-e-d-e-r-i-c-h.

MR. WEDIN: Thank you, Mr. Diederich, for your question. I think it's an important one.

I mentioned earlier on in our presentation about spill prevention. That's really a key thing for us; something that we really try to factor into the design of our projects. We talked about redundant pumping systems, redundant pumps at the lift station. So, when we design our pumps, we design -- or design our lift stations, we design them such that one pump is out of service. So, when we look at our facility, if we've got an eight-pump facility, that we proposed here, we look at it as if one of those pumps is down for servicing. So, we're designing it based on seven pumps being in operation. We're also designing our facilities such that they include emergency generator backups so that if something does happen, where we lose power to the facility, we have an emergency diesel generator at that location that immediately starts up and starts the pumps operating again.

We also talked a little bit about an independent pumping system that would be included as a part of this facility. These would be larger pumps, either diesel-driven, or that include a dedicated diesel generator set that would be able to pump the wastewater at a higher rate.

We also talked a little bit about including some lift stations upstream of this facility that would allow us to store -- temporarily store wastewater inside of our pipes, so we're not spilling into the environment.

Worst case scenario, I have seen where we have had to use tanker trucks, not necessarily to pump from the facility and route it down to Pig's Eye, to the Metropolitan Wastewater Treatment Facility, but maybe down to -- well, down to a receiving facility.

I know Fridley has a liquid waste receiving facility that we operate nearby that we could bring waste to. That would be absolutely the worst case scenario for a situation like this. And we really try to design our facilities such that we never have to get to that worst case scenario.

MR. DIEDERICH: Okay. I guess that's my main concern, because we had a railroad bridge go out here a few years ago -- maybe ten years ago -- when we got five inches of rain per hour. And so things do happen that we can't plan for.

That's a statement, I guess. It's not a question.

Thank you.

MR. WEDIN: Thank you.

MR. LINDSTROM: That's a great question and comment. These are machines and technology, right? So, occasionally, they go a bit haywire and we need to be prepared for that.

Other questions or comments?

MR. O'DONNELL: Council Member Lindstrom, this is Tim O'Donnell again. We had a question. It kind of got buried into the chat box, but we could go back to this one from City Council Member, Ann Bolkcom. She wants to know can we expound on some of the options for the extra property that we would not be using for the lift station site.

MR. LINDSTROM: Tim, could you handle -- Tim Wedin, could you handle that?

MR. WEDIN: Certainly. Thank you very much, and Council Member Bolkcom, thank you very much for the question.

There are two options that we have looked at currently for the use of that additional 15 acres of land in that area.

One of the options that we looked at was the development of some single-family housing around that area. There are some limitations to that site. There is a fairly significant wetland in that area that has some impacts on that. Again, a lot of the same limitations that we have with sighting our lift station would also be imposed on any building in that area. So, the setbacks from the Mississippi River, the setbacks from the bluff, the setbacks from the right-of-way of East River Road; and also, the property line setbacks would impact on where that single-family housing could be built out.

We've talked with the City of Fridley staff about some ideas related to that, and we looked at some of the potential for where that single-family housing could be built, the limitations for where that single-family housing could be built and the requirements for building out the roads and the utilities that would need to be included as a part of that construction. So, that's one option that we've looked at.

The other option that we've

looked at is, again, keeping that area as a buffer and looking at it as more of a public-use space, we have talked with the City of Fridley. And one of the things that they have brought up with us is that they are a river community with no access to the river. So, we've discussed the idea of including trails, possibly a canoe and kayak launch at that location. So, those are the two options that we've really looked at moving forward with the site.

At this point in time, it's still fairly early to make a final decision on what it is that we want to do there. We want to work very closely with the City of Fridley and help determine what's in everyone's best interest moving forward with that location.

MR. LINDSTROM: Thank you, Tim, and Council Member Bolkcom.

Seeking a little bit more clarification on what the building would look like, exactly, I suspect it may be a little early to have a determined answer on that. Obviously, we would work with the City of Fridley on that. But anything further we can say about what the building, itself, would look like at this point?

MR. WEDIN: Thank you Council Member Lindstrom, and thank you, Council Member Bolkcom.

It's really hard for me to say what the building will look like. I'll give you some answers that may help direct you toward our line of thinking.

If you'll reflect back to that slide that I shared that showed the different buildings that we have, the different lift stations that we have. The Chaska lift station that we have, that was something that we worked very closely with Chaska and Carver County on the look of that building. So, that's the building on the lower left of the image that we're showing you right now. Just to the left of that building is the Carver County Government Center. And so, we worked very closely with the City of Chaska and Carver County to build a facility that would look very similar to the Carver County Government Center.

The City of Chaska also asked -- and I believe this is part of their building code requirement -- that we use a specific brick; what they refer to as a "Chaska brick," that has a very distinct look to it, as a part of the exterior of our facility.

L73, up on the top section there in the middle, that was, again, something that we worked very closely with the City of Woodbury on as we designed that facility. They were aware that the area of the -- the nature of the area where we were building this facility was being developed as we were moving forward. So, we wanted something that would fit in with that character of the surrounding area. So, that's why we built something that looked more of like an upper-scale house.

So, as far as what our facility will look like, I don't know. But, there will be a lot of things that we will have to factor in as we move forward. And those things will include building code requirements from the City of Fridley. Those things will include requirements for building in -- close to the Mississippi River. There will be some requirements that will be in place because we're going to -- a flyway. We've talked about designing the building and lighting for bird safety.

There are a number of things that

we'll have to factor into that design. And we'll work with the City of Fridley on moving that forward and how that building is going to look.

MR. LINDSTROM: Thank you, Tim.

Tom Kimlinger asked a further question, "Is it possible to move the pump building as close to the center of the property? That would make the largest buffer in all directions."

Tim?

MR. WEDIN: Thank you, Council Member Lindstrom. Thank you, Mr. Junco -- or thank you, Mr. Kimlinger. I apologize for that.

That's definitely something that we want to look at, as far as sighting the facility. Again, we're trying to keep our lift station as close to the existing pipes as we can. As we separate it from those pipes, we run into some hydraulic issues of being able to move wastewater from that siphon or that siphon crossing of the Mississippi River to the new location of the building. And so, that has an affect on how far north we can put that.

There are also other site limitations that I mentioned previously about the area; not only the setbacks from the

Mississippi River and East River Road, but I also alluded to a wetland that is onsite. We need to make sure that we're far enough away from that wetland when we construct the facility, so we're not adversely impacting it.

So, there are a lot of things that we'll need to factor in as we move forward with the design of the facility. Obviously, like you say, the further away we are from our residents, the less impact that we will have on our neighbors. But there are other things that we can do to help mitigate that impact, as well; that would be a lot of screening that we move forward with as we move forward with the project, too.

MR. LINDSTROM: Thank you.

I don't see any other questions at this time in the chat. I'll give it a few seconds here.

I don't see any raised hands.

Okay. Any other questions via chat or raised hands?

Seeing none, one last call. Any other questions out there?

Okay. Very good. Seeing none, at this time, I would like to remind folks where you can review a copy of our Draft Facility Plan at these various locations, and I would like to remind folks -- next slide, please.

I would like to remind folks that the public hearing record will remain open until 5:00 p.m. on Monday, December 28th. So, if we get off the line here and you remember one additional comment that you want to make, or a question, you have until December 28th. And you may submit comments through any of the methods now showing on the screen: by mail, by email, by the Council's public comment line, or by TTY, text, telephone.

Next slide, please.

So, from now through the next several years, as we design and construct our projects, here's how you can contact us; and also, see the latest project information. This is also where we will post information from this public hearing and from our project open house that was in November.

So, I'll make a final-final call. Is there anyone else who wishes to speak on this matter today? Scanning the chat. . .

MR. O'DONNELL: Council Member Lindstrom, I don't see any other raised hands or comments in the chat.

MR. LINDSTROM: Very good. And I will reiterate that we're happy to come to a Council meeting -- a City Council meeting or work with the County to help get the word out on this really important project.

So, seeing no further comments we will adjourn the public hearing. And thank you so much for participating this evening on this public hearing. And I just want to say your input is so important. We really appreciate you taking the time to learn about this Draft Facility Plan and appreciate your feedback. Look forward to working with our County and local partners and with the neighborhood on making this project a great success. And we hope you enjoy the rest of your day.

Thank you very much.

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(Whereupon at 5:22 o'clock p.m., this hearing was concluded.)

STATE OF MINNESOTA)
) SS:
COUNTY OF BELTRAMI)

REPORTER'S CERTIFICATE

I, Lorna D. Jacobson, a Registered Professional Reporter and Notary Public in and for the County of Beltrami and State of Minnesota, do hereby certify that I reported the foregoing Public Hearing on the 17th day of December, 2020, by Zoom teleconferencing;

THAT the hearing was thereafter under my direction transcribed into computer-assisted transcription, and is a true record of the hearing;

THAT the cost of the original has been charged to the party who ordered the transcript, and that all parties who ordered copies have been charged at the same rate for such copies;

THAT I am not a relative or employee or attorney or counsel of any of the parties, or a relative or employee of such attorney or counsel;

THAT I am not financially interested in the action and have no contract with the parties, attorneys, or persons with an interest in the action that affects or has a substantial tendency to affect my impartiality;

WITNESS MY HAND AND SEAL this 30th day of December, 2020.

Lorna D. Jacobson, Notary Public
Registered Professional Reporter
My Commission Expires: 01/31/2025

LORNA D JACOBSON
Notary Public
Minnesota
My Commission Expires
Jan 31, 2025

Public Comments Log

Date	Name	Contact Information	Method Received	Question/Comment	Response	Additional Follow Up/Notes
12/15/20	Craig Runnakko	craig.runnakko@brooklynpark.org 763-493-8109 Construction Engineer Operations & Maintenance Department | City of Brooklyn Park	Email	Anna, I'm sure this will be covered in the meeting. What is the timeline for the project? What type of impacts will there be to BP residents when the current L32 is being converted to an odor control facility? See you there. Thanks! Craig	Craig indicated with a chat message at the end of the public hearing that MCES staff addressed his questions during their presentation and with answers to other questions.	
12/16/20	Marty Gavic 141 Hartman Cir Fridley	martygavic@gmail.com 763-571-1219	Email	Will there be any odors emitted from this lift station? Where is the exact location of the lift station?	12/16 – Staff called Martin to confirm that he would like his questions read during the public hearing tomorrow. Forwarded this request to MCES staff to include as part of the public comments period.	12/16 – *Forwarded email to Tim O'Donnell with summary of conversation with Martin:* Hi Tim, Just received an email with a couple questions. Martin also called, so I called him back to see if he wanted this read during the hearing tomorrow and he does. He said he lives next to the previous Girl Scout camp and has odor concerns. He wants to know where the lift station will be on the property, not just the address. Martin also mentioned that 90% of the winds come from the NW direction, so he wants to be sure there will be odor control mitigation on the Fridley site as well.

Date	Name	Contact Information	Method Received	Question/Comment	Response	Additional Follow Up/Notes
						Response to Martin from the public hearing on December 17: As far as the location of the proposed lift station, right now we are proposing that the building, itself, will be very close to where the existing girl scout building was. So, it will be fairly far away from the homes in the area, fairly far away from the property boundaries. We do need to maintain some proximity to the existing pipes, but we are trying to be considerate of our neighbors in the area. As far as the odors, we will include odor management as a part of the project. There's a number of different technologies that are out there that are available for us to take care of odors at this facility. There may be momentary periods where we will still see odors from that facility, and that may be because the media that is being used to mitigate these odors has reached the end of its useful life. It is more likely during times when we are changing out the media at this odor control equipment that you will notice some odors. So, likely, there will be some momentary, temporary odors at that site. But, for the most part, the odor control system will prevent any odors at the facility.
12/17/20	Michael McCarthy	mjmccarthy763@comcast.net	Email	What is the current plan for effluent storage at the site of the new pumping station?	*Michael also submitted this question during the public hearing. Below is a copy of the response from the public hearing.* We will not be storing effluent on the site. One of the things that we know is when we store wastewater at a location, that can cause odors. And we're trying to do all we can to limit the odor-	

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					causing areas. So, one of the evaluations that we did as we went through and looked at spill prevention for this location was an evaluation of storing wastewater at that site. And we quickly determined that that was not a viable alternative.	
12/17/20	Roland Diederich 46 66th Way NE Fridley	lanny03@comcast.net	Email	If there is a break down on the east side will you start trucking the waste to St Paul?	*Roland called in to the public hearing and asked this question during the hearing, below is a copy of the transcript from the public hearing.* MR. DIEDERICH: Hi. My name is Roland Diederich. I live in Fridley, Minnesota, on 66th Way; 40-year resident. And my question is: If there's a breakdown on the Fridley side of the river, are you going to then start trucking the waste away from that area on to St. Paul? MR. LINDSTROM: Great question. So, if there's a breakdown -- just to repeat the question, "If there's a breakdown on the Fridley side, how would that be handled? Will it be trucked to St. Paul?" MR. DIEDERICH: Yeah. I'm visualizing some kind of breakdown. Things do break down and you need to move that waste. I envision trucks driving down East River Road, heading their way towards Pig's Eye Island. MR. O'DONNELL: Sir, could I ask you to state your name and spell your name again, please? MR. DIEDERICH: It's Roland, R-o-l-a-n-d, last name is Diederich, D-i-e-d-e-r-i-c-h. MR. WEDIN: Thank you, Mr. Diederich, for your question. I think it's an important one. I mentioned earlier on in our presentation about spill prevention. That's really a key thing for us; something that we really try to factor into the design of our projects. We talked about redundant pumping systems, redundant pumps at the lift station. So, when we design our pumps, or design our lift stations, we design them such	

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					that one pump is out of service. So, when we look at our facility, if we've got an eight-pump facility, that we proposed here, we look at it as if one of those pumps is down for servicing. So, we're designing it based on seven pumps being in operation. We're also designing our facilities such that they include emergency generator backups so that if something does happen, that will remove power to the facility, we have an emergency diesel generator at that location that immediately starts up and starts the pumps operating again. We also talked a little bit about an independent pumping system that would be included as a part of this facility. These would be larger pumps, either diesel-driven or natural gas, that include a dedicated generator set that would be able to pump the wastewater at a higher rate. We also talked a little bit about including some lift stations upstream of this facility that would allow us to temporarily store wastewater inside of our pipes, so we're not spilling into the environment. Worst case scenario, I have seen where we have had to use tanker trucks, not necessarily to pump from the facility and route it down to Pig's Eye, to the Metropolitan Wastewater Treatment Facility, but maybe down to a receiving facility. I know Fridley has a liquid waste receiving facility that we operate nearby that we could bring waste to. That would be absolutely the worst-case scenario for a situation like this. And we really try to design our facilities such that we never have to get to that worst case scenario. MR. DIEDERICH: Okay. I guess that's my main concern, because we had a railroad bridge go out here a few years ago -- maybe ten years ago -- when we got five inches of rain per hour. And so things do happen that we can't plan for. That's a statement, I guess. It's not a question. Thank you.	
12/17/20	Ann Bolkom	City of Fridley Council Member	Public Hearing	Great news of locating building near the girl site area.		

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12/17/20	Mandy Meisner	Anoka County Commissioner	Public Hearing	I know the Camp is a beloved place for a lot of Fridley residents. Thank you for the detailed presentation.		
12/17/20	Joe MacPherson	Engineer | Anoka County	Public Hearing	Hi, this is Joe MacPherson with Anoka County. We've submitted our comments in the form of an email. No further comments at this time. Thanks for the detailed information tonight.	1/11/21 – *No email was received from Joe MacPherson or Anoka County. MCES followed up with Joe to see if he had any comments for the public comment period.* Hello Joe, Thanks for participating in our public hearing meeting for Fridley Lift Station L32A on December 17th. During the meeting, you commented that you will submit your comments via email. We have not received any email from Anoka County so just checking to see if you have any comments so we can document and answer your question if you have any. Please let me know by the end of this Wednesday if you have any comments. Thanks. Jeny	*Original email below was sent to an incorrect email address on 12/8/20.* Gentlemen, We just received the attached notice regarding the proposed Met Council lift station project coming to your community. I noticed the 72" diameter inlet pipe to the facility, wow! Many people don't realize how elaborate our sanitary sewer collection and water distribution infrastructure has become. I took a quick look at the plans located on the project website as it relates to East River Rd and have a few preliminary comments: • One of the potential improvement options includes relocating the access drive north of its existing location. Knowing that these facilities receive weekly and daily deliveries/visits by chemical suppliers and operations workers, the existing access location allows access to the facility from the north and south via an existing median break at the intersection of 69th Way NE. The county will not provide an additional median break along this corridor as it could negatively impact the traffic operations and safety along East River Rd, so we recommend maintaining the existing access location. • If the project will include any work within the East River Rd right-of-way, please reach out to us early so we can discuss traffic control, construction staging, and construction

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						schedules. This roadway is an important arterial roadway for the surrounding communities. If you have any additional questions or comments related to Anoka County right-of-way requirements, engineering standards, or permitting processes, please contact Jane Rose (Traffic Engineering Manager) or Michelle Pritchard (Design Engineer). Sincerely, Joe MacPherson 1/13/21 – *Tim Wedin wrote a letter response to Joe MacPherson:* Dear Joe, Thank you for providing us with your comments on the Fridley Area Lift Station L32A Draft Facility Plan. We appreciate your comments related to the access to the site from East River Road, and coordinating any work within the East River Road Right-of-Way. We anticipate that there will be several permits and reviews that will be needed to advance this project. We plan to coordinate with the County during design to ensure that proper access to the new lift station site is provided in a suitable location. We look forward to coordinating with the County to address traffic control, construction staging, and construction scheduling needs. We appreciate your continued collaboration as this project moves forward. If you have any questions, please feel free to contact me. Sincerely,

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						Tim Wedin
12/17/20	Barb Bergseth 146 71st Way NE Fridley		Public Hearing	How much noise and smell are generated from the lift station? What is the expected start date of construction if approved?	As far as how much noise and smell are generated from the lift station, we will be required to meet the City of Fridley code requirements. They do set forth limitations as far as the level of noise that can be generated at the facility and how many decibels can be heard at the property boundary. With our screening and pushing that back from the property line, that will help mitigate that issue. Also, the planting of trees and other greenery in the area will also help mitigate a lot of that sound issue. Most of the equipment, itself, especially the pumps and other equipment that will be used for operation of the lift station will be located inside of the building. So, that will also help mitigate a lot of the noise in the area. Odors, like I mentioned previously, the level of the odors will be very minor. Most of the time, it will be noticed when we are changing out our filter media as part of the odor control system. I'm not sure that I can really quantify what the odor will be, but we're definitely mindful of that with this facility, as with all of our other facilities. As far as when the construction will commence, I think right now it's too early for us to give an exact date of when construction will begin. We're still in the planning phase of the project and there's still a number of things that can affect when the shovels hit the ground. But right now, we are projecting a 2023 start date for construction activities.	
12/17/20	Tom Kimlinger 109 Hartman Cir Fridley		Public Hearing	Tom Kimlinger 109 Hartman circle: What is the planned use for the rest of the property not covered by the buildings?	That is still a question that is being discussed. At this point in time, we don't have a solid answer for what the remainder of the property will be -- or what will be done with the remainder of the property. Part of the reason for that is, we don't know how much of the property we're exactly going to need to use. We've estimated of the 22-acre parcel we	

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					will need to use about seven acres of it, which will mean that there's still another 15 acres that we don't need. There's still a lot of discussion with the City of Fridley that we're having as far as what options are available to that parcel. Those options include developing the area for residential housing. Those options include Metropolitan Council retaining ownership of the area as a buffer, and including some public space. But at this point in time, it's too early for us to determine what that property is going to be used for in the future. That will be something that we will continue to discuss with the City of Fridley and come to a conclusion with them on moving forward.	
12/17/20	Mandy Meisner	Anoka County Commissioner	Public Hearing	If approved, will there be community meetings offered either to gain feedback from residents or simply to communicate the plans before you break ground?	Public outreach is a very important part of all our projects, and we will continue to involve the public in the project as we move forward. It may be a while before you hear from us, as far as project breaking ground. Like I said, it will be 2023 before we break ground. But, we will be working closely with the City of Fridley on design of the project. That typically includes sitting down with City Planning Committees to discuss how the project is going to look; not only the building, but also, landscaping and restoration of the site. I'm trying to think if there's somebody else on the team right now that can help speak a little more to project communication as we move forward here.	MR. LINDSTROM: I would just add that as Chair of the Environment Committee for the Met Council, I'd be delighted, Commissioner, to come to a County Board meeting or any other public forum and help talk about the project and extend that to the Fridley staff and City Council officials, or any sort of neighborhood groups out there. I know I'd be willing to address those groups. And your local council member, I'm sure, would join me in those meetings, as well. Anybody else from our team like to chime in on that one? MS. BARODA: Council Member Lindstrom, this is Jeny Baroda. I would like to add that we will also be working with other stakeholders, like Friends of Mississippi and Department of Natural Resources as we progress with the design of this project. We will be working with them to determine how the site would look like, what are the site

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						requirements and how much buffer is required. MR. O'DONNELL: This is Tim O'Donnell. I'll jump in here, too, from the aspect of our community outreach. We can certainly hold additional local public information meetings as we move through the design process to start to show you what we're looking at for design of the project. And then certainly again, before construction would begin, that's the point that we will have the most detail that we can offer to the public on the final designs and construction schedules, what we would be doing to try to mitigate the impact of the construction while it's taking place. So, yes, definitely; we will hold additional meetings to keep informing the public about our project.
12/17/20	Mandy Meisner	Anoka County Commissioner	Public Hearing	Thank you. I think that's important and appreciate a joint effort.		
12/17/20	Ann Bolkom	City of Fridley Council Member	Public Hearing	Yes, City would welcome to make presentation at city council meeting. Also, we have a newsletter that can be utilized.		
12/17/20	Barb Bergseth 146 71st Way NE Fridley		Public Hearing	As a residential homeowner on the north side, we like the option of a buffer by the Met Council for the 15 acres not used for the lift station."		
12/17/20	Stephen Eggert	City of Fridley Council Member	Public Hearing	What is the typical amount of time needed to change out media for odor control? I expect there is a range for different or newer systems.	Thank you, Mr. Eggert, for your question. I believe, as I recall -- I think you are correct -- it really does depend on the size of the odor control system and the type of the odor control system that we use for managing odors. As I recall, the time for change-out of the media for a lot of our odor control systems is on the order of magnitude of about a half a day. So, four to six hours.	Well done. Thank you.

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12/17/20	Ann Bolkom	City of Fridley Council Member	Public Hearing	Can you expound some of options?	There are two options that we have looked at currently for the use of that additional 15 acres of land in that area. One of the options that we looked at was the development of some single-family housing around that area. There are some limitations to that site. There is a fairly significant wetland in that area that has some impacts on that. Again, a lot of the same limitations that we have with sighting our lift station would also be imposed on any building in that area. So, the setbacks from the Mississippi River, the setbacks from the bluff, the setbacks from the right-of-way of East River Road; and also, the property line setbacks would impact on where that single-family housing could be built out. We've talked with the City of Fridley staff about some ideas related to that, and we looked at some of the potential for where that single-family housing could be built, the limitations for where that single-family housing could be built and the requirements for building out the roads and the utilities that would need to be included as a part of that construction. So, that's one option that we've looked at. The other option that we've looked at is, again, keeping that area as a buffer and looking at it as more of a public-use space, we have talked with the City of Fridley. And one of the things that they have brought up with us is that they are a river community with no access to the river. So, we've discussed the idea of including playground, trails, possibly a canoe and kayak launch at that location. So, those are the two options that we've really looked at moving forward with the site. At this point in time, it's still fairly early to make a final decision on what it is that we want to do there. We want to work very closely with the City of Fridley and help determine what's in	

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					everyone's best interest moving forward with that location.	
12/17/20	Ann Bolkom	City of Fridley Council Member	Public Hearing	Sorry my comment can you talk what building would look like. Can you share some of buildings in other cities?	MR. LINDSTROM: I suspect it may be a little early to have a determined answer on that. Obviously, we would work with the City of Fridley on that. But anything further we can say about what the building, itself, would look like at this point?	MR. WEDIN: Thank you Council Member Lindstrom, and thank you, Council Member Bolkcom. It's really hard for me to say what the building will look like. I'll give you some answers that may help direct you toward our line of thinking. If you'll reflect back to that slide that I shared that showed the different buildings that we have, the different lift stations that we have. The Chaska lift station that we have, was something that we worked very closely with Chaska and Carver County on the look of that building. So, that's the building on the lower left of the image that we're showing you right now. Just to the left of that building is the Carver County Government Center. And so, we worked very closely with the City of Chaska and Carver County to build a facility that would look very similar to the Carver County Government Center. The City of Chaska also asked, and I believe this is part of their building code requirement, that we use a specific brick; what they refer to as a "Chaska brick," that has a very distinct look to it, as a part of the exterior of our facility. L73, up on the top section there in the middle, that was, again, something that we worked very closely with the City of Woodbury on as we designed that facility. They were aware that the area and the nature of the area where we were building this facility was being developed as we were moving forward.

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						So, we wanted something that would fit in with that character of the surrounding area. So, that's why we built something that looked more of like an upper-scale house. So, as far as what our facility will look like, I don't know. But, there will be a lot of things that we will have to factor in as we move forward. And those things will include building code requirements from the City of Fridley. Those things will include requirements for building in close proximity to the Mississippi River. There will be some requirements that will be in place because we're within a bird flyway. We've talked about designing the building and lighting for bird safety. There are a number of things that we'll have to factor into that design. And we'll work with the City of Fridley on moving that forward and how that building is going to look. MS. BOLKOM: We like white bear one that looks like a single family home.
12/17/20	Tom Kimlinger 109 Hartman Cir Fridley		Public Hearing	Is it possible to move the pump building as close to the center of the property - that would make the largest buffer in all directions?	That's definitely something that we want to look at, as far as sighting the facility. Again, we're trying to keep our lift station as close to the existing pipes as we can. As we separate it from those pipes, we run into some hydraulic issues of being able to move wastewater from that siphon or that siphon crossing of the Mississippi River to the new location of the building. And so, that has an affect on how far north we can put that. There are also other site limitations that I mentioned previously about the area; not only the setbacks from the Mississippi River and East River Road, but I also alluded to a wetland that is	

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					onsite. We need to make sure that we're far enough away from that wetland when we construct the facility, so we're not adversely impacting it. So, there are a lot of things that we'll need to factor in as we move forward with the design of the facility. Obviously, like you say, the further away we are from our residents, the less impact that we will have on our neighbors. But there are other things that we can do to help mitigate that impact, as well; that would be a lot of screening that we move forward with as we move forward with the project, too.	
12/17/20	Jerry Auge	Assistant County Engineer | Anoka County	Public Hearing	Thank you MCES team for the very well done informative presentation and explanation of the project. I have no comments.		
12/17/20	Barb Bergseth 146 71st Way NE Fridley		Public Hearing	Thank you for the helpful presentation!		
12/22/20	Colleen O'Connor Toberman 101 E 5th St, Ste 2000 St. Paul, 55101	ctoberman@fmr.org 651-222-2193 x29 River Corridor Director| Friends of the Mississippi River	Mail	December 22, 2020 Tim O'Donnell Metropolitan Council Environmental Services 390 Robert St. N Saint Paul, MN 55101 Dear Tim: Thank you for the opportunity to comment on the Fridley Area Lift Station Draft Facility Plan. We appreciate the time that you and your colleagues have given to meeting with us and soliciting our feedback about this project. FMR supports investments in water infrastructure and supports the proposed location for the Fridley lift station. Our growing metro-area population, our aging	1/12/21 – *Tim Wedin wrote a letter response to Collen O'Connor:* Dear Colleen, Thank you for providing us with your comments on the Fridley Area Lift Station L32A Draft Facility Plan. As we move forward with the design phase of the project, we will continue to collaborate with you on the siting and design of the lift station facilities. The facility will be designed to meet all applicable City, State, and National standards, including environmental standards. We appreciate your continued collaboration as this project moves forward. If you have any questions, please feel free to contact me. Sincerely,	

Date	Name	Contact Information	Method Received	Question/Comment	Response	Additional Follow Up/Notes
				infrastructure, and the realities of climate change all require ongoing investments in resilient wastewater systems before we experience catastrophic system failures. The Fridley lift station project offers opportunities to protect and enhance the Mississippi River's critical ecological functions as well as its recreational value. As project planning continues, we expect to see MCES on the leading edge of sustainable and context-sensitive design. We appreciate MCES' commitment to meeting the following standards: • State of Minnesota Mississippi River Corridor Critical Area (MRCCA) rules (6106.0010 – 6106.0180) • City of Fridley MRCCA Plan and forthcoming MRCCA ordinance • State of Minnesota B3 building guidelines We also encourage MCES to explore other ways to enhance the riverfront along both sides of the river through this project. For instance, we hope there might be native vegetation options that would better screen the Brooklyn Park facilities from view along the river (without causing infrastructure damage from root systems, etc.). We are also interested in participating in the planning process for the remainder of the Fridley property after facility design is complete. We hope that MCES and the city of Fridley will work together to enhance wildlife habitat and community river access at this site. We look forward to continued collaboration as this project moves forward.	Tim Wedin	

Date	Name	Contact Information	Method Received	Question/Comment	Response	Additional Follow Up/Notes
				In partnership, Colleen O'Connor Toberman River Corridor Director		

Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155-4194

State Environmental Review Process (SERP) Mailing List Form

Clean Water State Revolving Fund Program

Minnesota Rules 7077.0272, subp. 2.a.A.
Minnesota Rules 7077.0277, subp. 3.B.

Doc Type: Wastewater Point Source

Instructions: This is the complete mailing list that the Minnesota Pollution Control Agency (MPCA) will use to public notice the Environmental Summary or other environmental review documents. Please type names and addresses on this form and return to the MPCA staff engineer. This list should be considered minimum. If a more substantial mailing list is available for the Public Participation Program, it should be added to this mailing list. **Please return this mailing list in MS Word format only.**

Example address blocks:

The Honorable Mark Anderson
Minnesota State Senator
135 State Office Building
St. Paul, MN 55113

Marv Johnson, City Administrator
City of Willmar
236 Oriole Avenue
Willmar, MN 55699

Municipality name: Metropolitan Council Environmental Services **Project number:** 809400

Contact name: Tim O'Donnell **Phone number:** 651-602-1269
(person completing the form)

Public notice address information

1.	**The Honorable State Senator:**	**6.**	**City Administrator/Clerk:**
	See attached Government/Community stakeholder list		See attached Government/Community stakeholder list
2.	**The Honorable State Representative:**	**7.**	**Engineering Consultant:**
	See attached Government/Community stakeholder list		Not applicable.
3.	**The Honorable County Board Chair:**	**8.**	**County Planning and Zoning Office:**
	See attached Government/Community stakeholder list		See attached Government/Community stakeholder list
4.	**The Honorable Mayor:**	**9.**	**Watershed District (if established):**
	See attached Government/Community stakeholder list		See attached Government/Community stakeholder list
5.	**Township Board Clerk:***	**10.**	**Regional Development Commission:**
	See attached Government/Community stakeholder list		Metropolitan Council Attn: Lisa Barajas 390 Robert St. N. St. Paul, MN 55101-1805

******Include if any portion of the project (including the facility, interceptor, influent or outfall lines) will be located in the township(s).*

To add rows, place your cursor in the last row of the second column and hit tab.

Interested citizens:	**Interested groups:** (i.e., homeowners associations, environmental, business, civic, etc., organizations)
See attached Citizen/Property Owners list	See attached Government/Community stakeholder list

To add rows, place your cursor in the last row of the second column and hit tab.

Property owners:

Property owner list should include all property owners of the site to be, or which has been previously acquired. For pond systems, include the property owner(s) of the pond site, spray irrigation site(s) and all property owners of homes within one-fourth mile of the pond site and any clusters of homes within one-half mile of the pond site.

See attached Citizen/Property Owners list	

Federal agencies:

ATTN: Field Supervisor
U.S. Fish and Wildlife Service
Twin Cities Field Office
4101 American Boulevard East
Bloomington, MN 55425-1665

ATTN: Environmental Compliance Chief
U.S. Army Corps of Engineers
St. Paul District
180 Fifth Street East, Suite 700
St. Paul, MN 55101-1678

ATTN: Regional Environmental Officer
Federal Emergency Management Agency
Region V Office
536 South Clark Street, 6th Floor
Chicago, IL 60605

State agencies:

ATTN: Environmental Review Supervisor
MN Department of Natural Resources
Division of Ecological and Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155 -4025

ATTN: Manager of Government Programs and Compliance
MN Historical Society
Minnesota Historic Preservation Office
345 West Kellogg Boulevard
St. Paul, MN 55102-1906

ATTN: Cultural Resource Director
MN Indian Affairs Council
161 St. Anthony Avenue, Suite 919
St. Paul, MN 55103

MPCA regional office(s):

Jesse Struve
City of Brooklyn Park
5200 85th Ave N
Brooklyn Park, MN 55443

Dan Ruiz
City of Brooklyn Park
5201 85th Ave N
Brooklyn Park, MN 55443

Jeffrey Lunde
City of Brooklyn Park
5200 85th Ave N
Brooklyn Park, MN 55443

Jim Kosluchar
City of Fridley
7071 University Ave NE
Fridley, MN 55432

Ann Bolkcom
City of Fridley
7071 University Ave NE
Fridley, MN 55432

Wally Wysopal
City of Fridley
7071 University Ave NE
Fridley, MN 55432

West Mississippi River Watershed District
3235 Fernbrook LN N
Plymouth, MN 55447

Reva Chamblis
Metropolitan Council
390 Robert St N
St. Paul, MN 55101

David Sahli
Minnesota Pollution Control Agency
520 Lafayette Rd N
St. Paul, MN 55155

Doug Borglund
Anoka County - Community Development Department
2015 1st Ave N
Anoka, MN 55303

Craig Runnakko
City of Brooklyn Park
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Brooklyn Park, MN 55443

Lisa Jacobson
City of Brooklyn Park
5200 85th Ave N
Brooklyn Park, MN 55443

Jay Stroebel
City of Brooklyn Park
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Brooklyn Park, MN 55443

Scott Hickok
City of Fridley
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Fridley, MN 55432

Scott Lund
City of Fridley
7071 University Ave NE
Fridley, MN 55432

Leah Hall
The Nature Conservancy
1101 West River Pkwy Suite 200
Fridley, MN 55432

Whitney Clark
Friends of the Mississippi River
101 East Fifth Street, Suite 2000
St. Paul, MN 55101

Peter Lindstrom
Metropolitan Council
390 Robert St N
St. Paul, MN 55101

Mandy Meisner
Anoka County
2100 3rd Ave
Anoka, MN 55303

Clark Palmer
Anoka County - Community Development Department
2015 1st Ave N
Anoka, MN 55303

Jon Watson
City of Brooklyn Park
5200 85th Ave N
Brooklyn Park, MN 55443

Terry Parks
City of Brooklyn Park
5200 85th Ave N
Brooklyn Park, MN 55443

Cindy Sherman
City of Brooklyn Park
5201 85th Ave N
Brooklyn Park, MN 55443

Dave Ostwald
City of Fridley
7071 University Ave NE
Fridley, MN 55432

Luke Cardona
City of Fridley
7071 University Ave NE
Fridley, MN 55432

Matthew Danzl
Coon Creek Watershed District
13632 Van Buren St NE
Ham Lake, MN 55304

Colleen O'Connor Toberman
Friends of the Mississippi River
101 East Fifth Street, Suite 2000
St. Paul, MN 55101

Lucas Youngsma
Minnesota Department of Natural Resources - Eco/Waters
1200 Warner Rd
St. Paul, MN 55106

Scott Schulte
Anoka County
2101 3rd Ave
Anoka, MN 55303

Community Works
Hennepin County
701 4th Ave S #400
Minneapolis, MN 55415

Marion Greene
Hennepin County
A2400 Government Center
300 S 6th St
Minneapolis, MN 55487
Sen. Chris Eaton
Minnesota State Senate
95 University Avenue W
Minnesota Senate Bldg, Rm 2303
St. Paul, MN 55155

Jeffrey Lunde
Hennepin County
A2400 Government Center
300 6th St S
Minneapolis, MN 55487
Rep. Connie Bernardy
Minnestota State Representative
563 State Office Building
St. Paul, MN 55155

Sen. Mary K. Kunesh
Minnesota State Senate
95 University Avenue W
Minnesota Senate Bldg, Rm 2323
St. Paul, MN 55155
Rep. Samantha Vang
Minnestota State Representative
527 State Office Building
St. Paul, MN 55155

Resident
7234 E River Rd
Minneapolis, MN 55432-3031

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7210 E River Rd
Minneapolis, MN 55432-3031

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7180 E River Rd
Minneapolis, MN 55432-3027

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7641 Alden Way NE
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97 Craig Way NE
Minneapolis, MN 55432-3062

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90 Craig Way NE
Minneapolis, MN 55432-3008

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7680 Alden Way NE
Minneapolis, MN 55432-3006

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7650 Alden Way NE
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159 Logan Pkwy NE
Minneapolis, MN 55432-3041

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7340 E River Rd
Minneapolis, MN 55432-3033

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Minneapolis, MN 55432-3036

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7300 E River Rd
Minneapolis, MN 55432-3033

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123 Chesney Way NE
Minneapolis, MN 55432-3026

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147 Chesney Way NE
Minneapolis, MN 55432-3013

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120 70th Way NE
Minneapolis, MN 55432-4113

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80 70th Way NE
Minneapolis, MN 55432-4111

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70 70th Way NE
Minneapolis, MN 55432-4111

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7029 E River Rd
Minneapolis, MN 55432-4120

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61 70th Way NE
Minneapolis, MN 55432-4110

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Minneapolis, MN 55432-4111

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36 70th Way NE
Minneapolis, MN 55432-4109

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20 70th Way NE
Minneapolis, MN 55432-4109

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7019 Hickory Dr NE
Minneapolis, MN 55432-4132

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7027 Hickory Dr NE
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Minneapolis, MN 55432-4132

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7107 Ashton Ave NE
Minneapolis, MN 55432-3067

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7129 Ashton Ave NE
Minneapolis, MN 55432-3067

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7135 E River Rd
Minneapolis, MN 55432-3017

Resident
7105 E River Rd
Minneapolis, MN 55432-3028

Resident
7092 Hickory Dr NE
Minneapolis, MN 55432-4134

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7084 Hickory Dr NE
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7076 Hickory Dr NE
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7003 Hickory Dr NE
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6999 Hickory Dr NE
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6971 Hickory Cir NE
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6900 Hickory Dr NE
Minneapolis, MN 55432-4126

Resident
6901 E River Rd
Minneapolis, MN 55432-4101

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6835 E River Rd
Minneapolis, MN 55432-4144

Resident
48 69th Way NE
Minneapolis, MN 55432-4108

Resident
6825 Hickory St NE
Minneapolis, MN 55432-4125

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6820 Hickory St NE
Minneapolis, MN 55432-4124

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6806 Hickory St NE
Minneapolis, MN 55432-4124

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6807 Hickory St NE
Minneapolis, MN 55432-4125

Resident
6801 Hickory St NE
Minneapolis, MN 55432-4125

Resident
54 Locke Lake Rd NE
Minneapolis, MN 55432-4136

Resident
44 Locke Lake Rd NE
Minneapolis, MN 55432-4136

Resident
6802 Hickory St NE
Minneapolis, MN 55432-4124

Resident
6815 E River Rd
Minneapolis, MN 55432-4100

Resident
6811 E River Rd
Minneapolis, MN 55432-4116

Business Occupant
7365 E River Rd
Minneapolis, MN 55432-3034

Business Occupant
205 Mississippi St NE
Minneapolis, MN 55432-4322

Business Occupant
203 Mississippi St NE Ste 1
Minneapolis, MN 55432-4352

Business Occupant
201 Mississippi St NE
Minneapolis, MN 55432-4322

Business Occupant
6501 E River Rd Ste 100
Minneapolis, MN 55432-4211

Business Occupant
6501 E River Rd Ste 200
Minneapolis, MN 55432-4211

Business Occupant
6501 E River Rd Ste 202
Minneapolis, MN 55432-4211

Resident
6551 E River Rd Apt 101
Minneapolis, MN 55432-4278

Resident
6551 E River Rd Apt 102
Minneapolis, MN 55432-4278

Resident
6551 E River Rd Apt 103
Minneapolis, MN 55432-4278

Resident
6551 E River Rd Apt 201
Minneapolis, MN 55432-4276

Resident
6551 E River Rd Apt 202
Minneapolis, MN 55432-4276

Resident
6551 E River Rd Apt 203
Minneapolis, MN 55432-4276

Resident
6551 E River Rd Apt 204
Minneapolis, MN 55432-4276

Resident
6551 E River Rd Apt 301
Minneapolis, MN 55432-4277

Resident
6551 E River Rd Apt 302
Minneapolis, MN 55432-4277

Resident
6551 E River Rd Apt 303
Minneapolis, MN 55432-4277

Resident
6551 E River Rd Apt 304
Minneapolis, MN 55432-4277

Resident
6631 E River Rd
Minneapolis, MN 55432-4230

Resident
6661 E River Rd
Minneapolis, MN 55432-4230

Resident
6675 E River Rd
Minneapolis, MN 55432-4231

Resident
98 Rice Creek Way NE
Minneapolis, MN 55432-4239

Resident
6660 Hickory St NE
Minneapolis, MN 55432-4234

Resident
6640 Hickory St NE
Minneapolis, MN 55432-4234

Resident
6600 Hickory St NE
Minneapolis, MN 55432-4234

Resident
6580 Hickory St NE
Minneapolis, MN 55432-4233

Resident
6570 Hickory St NE
Minneapolis, MN 55432-4233

Resident
6560 Hickory St NE
Minneapolis, MN 55432-4233

Resident
6544 Hickory St NE
Minneapolis, MN 55432-4233

Resident
6530 Hickory St NE
Minneapolis, MN 55432-4233

Resident
6506 Hickory St NE
Minneapolis, MN 55432-4233

Resident
6502 Hickory St NE
Minneapolis, MN 55432-4233

Resident
95 Mississippi St NE
Minneapolis, MN 55432-4319

Business Occupant
61 Mississippi St NE
Minneapolis, MN 55432-4318

Resident
11 65 1/2 Way NE
Minneapolis, MN 55432-4241

Resident
21 65 1/2 Way NE
Minneapolis, MN 55432-4241

Resident
31 65 1/2 Way NE
Minneapolis, MN 55432-4241

Resident
51 65 1/2 Way NE
Minneapolis, MN 55432-4241

Resident
61 65 1/2 Way NE
Minneapolis, MN 55432-4241

Resident
71 65 1/2 Way NE
Minneapolis, MN 55432-4241

Resident
81 65 1/2 Way NE
Minneapolis, MN 55432-4241

Resident
91 65 1/2 Way NE
Minneapolis, MN 55432-4241

Resident
90 66th Way NE
Minneapolis, MN 55432-4201

Resident
91 66th Way NE
Minneapolis, MN 55432-4202

Resident
81 66th Way NE
Minneapolis, MN 55432-4202

Resident
80 66th Way NE
Minneapolis, MN 55432-4201

Resident
71 66th Way NE
Minneapolis, MN 55432-4202

Resident
65 66th Way NE
Minneapolis, MN 55432-4202

Resident
70 66th Way NE
Minneapolis, MN 55432-4201

Resident
62 66th Way NE
Minneapolis, MN 55432-4201

Resident
55 66th Way NE
Minneapolis, MN 55432-4202

Resident
49 66th Way NE
Minneapolis, MN 55432-4202

Resident
41 66th Way NE
Minneapolis, MN 55432-4202

Resident
54 66th Way NE
Minneapolis, MN 55432-4201

Resident
46 66th Way NE
Minneapolis, MN 55432-4201

Resident
33 66th Way NE
Minneapolis, MN 55432-4202

Resident
38 66th Way NE
Minneapolis, MN 55432-4201

Resident
25 66th Way NE
Minneapolis, MN 55432-4202

Resident
28 66th Way NE
Minneapolis, MN 55432-4201

Resident
17 66th Way NE
Minneapolis, MN 55432-4202

Resident
18 66th Way NE
Minneapolis, MN 55432-4201

Resident
11 66th Way NE
Minneapolis, MN 55432-4202

Resident
10 66th Way NE
Minneapolis, MN 55432-4201

Resident
10 66 1/2 Way NE
Minneapolis, MN 55432-4203

Resident
11 66 1/2 Way NE
Minneapolis, MN 55432-4204

Resident
16 66 1/2 Way NE
Minneapolis, MN 55432-4203

Resident
17 66 1/2 Way NE
Minneapolis, MN 55432-4204

Resident
24 66 1/2 Way NE
Minneapolis, MN 55432-4203

Resident
25 66 1/2 Way NE
Minneapolis, MN 55432-4204

Resident
33 66 1/2 Way NE
Minneapolis, MN 55432-4204

Resident
32 66 1/2 Way NE
Minneapolis, MN 55432-4203

Resident
40 66 1/2 Way NE
Minneapolis, MN 55432-4203

Resident
41 66 1/2 Way NE
Minneapolis, MN 55432-4204

Resident
48 66 1/2 Way NE
Minneapolis, MN 55432-4203

Resident
56 66 1/2 Way NE
Minneapolis, MN 55432-4203

Resident
58 Rice Creek Way NE
Minneapolis, MN 55432-4237

Resident
40 Rice Creek Way NE
Minneapolis, MN 55432-4237

Resident
22 Rice Creek Way NE
Minneapolis, MN 55432-4235

Resident
16 Rice Creek Way NE
Minneapolis, MN 55432-4235

Resident
10 Rice Creek Way NE
Minneapolis, MN 55432-4235

Resident
16 67th Way NE
Minneapolis, MN 55432-4205

Resident
11 67th Way NE
Minneapolis, MN 55432-4206

Resident
17 67th Way NE
Minneapolis, MN 55432-4206

Resident
25 67th Way NE
Minneapolis, MN 55432-4206

Resident
24 67th Way NE
Minneapolis, MN 55432-4205

Resident
32 67th Way NE
Minneapolis, MN 55432-4205

Resident
35 67th Way NE
Minneapolis, MN 55432-4206

Resident
6651 Ashton Ave NE
Minneapolis, MN 55432-4207

Resident
6673 Ashton Ave NE
Minneapolis, MN 55432-4207

Resident
6685 Ashton Ave NE
Minneapolis, MN 55432-4207

Resident
6696 Ashton Ave NE
Minneapolis, MN 55432-4256

Resident
6699 Ashton Ave NE
Minneapolis, MN 55432-4207

Resident
6701 Ashton Ave NE
Minneapolis, MN 55432-4208

Resident
6705 Ashton Ave NE
Minneapolis, MN 55432-4208

Resident
6709 Ashton Ave NE
Minneapolis, MN 55432-4208

Resident
6715 Ashton Ave NE
Minneapolis, MN 55432-4208

Resident
11 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
15 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
17 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
23 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
29 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
35 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
41 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
47 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
53 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
59 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
64 Rice Creek Way NE
Minneapolis, MN 55432-4238

Resident
65 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
71 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
72 Rice Creek Way NE
Minneapolis, MN 55432-4238

Resident
75 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
80 Rice Creek Way NE
Minneapolis, MN 55432-4238

Resident
77 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
81 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
84 Rice Creek Way NE
Minneapolis, MN 55432-4238

Resident
90 Rice Creek Way NE
Minneapolis, MN 55432-4238

Resident
85 Rice Creek Way NE
Minneapolis, MN 55432-4236

Resident
101 Hartman Cir NE
Minneapolis, MN 55432-4122

Resident
105 Hartman Cir NE
Minneapolis, MN 55432-4122

Resident
106 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
109 Hartman Cir NE
Minneapolis, MN 55432-4122

Resident
110 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
113 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
117 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
120 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
121 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
125 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
129 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
137 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
128 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
141 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
140 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
145 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
149 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
153 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
157 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
150 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
160 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
161 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
170 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
165 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
169 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
173 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
177 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
181 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
180 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
185 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
190 Hartman Cir NE
Minneapolis, MN 55432-4121

Resident
191 Hartman Cir NE
Minneapolis, MN 55432-4112

Resident
100 Hartman Cir NE
Minneapolis, MN 55432-4121

Business Occupant
6666 E River Rd
Minneapolis, MN 55432-4229

Resident
6664 E River Rd
Minneapolis, MN 55432-4229

Resident
6668 E River Rd
Minneapolis, MN 55432-4229

Resident
6654 E River Rd
Minneapolis, MN 55432-4229

Resident
6652 E River Rd
Minneapolis, MN 55432-4229

Business Occupant
6520 E River Rd
Minneapolis, MN 55432-4213

Business Occupant
6530 E River Rd Ste 1
Minneapolis, MN 55432-4275

Resident
6550 E River Rd Apt 101
Minneapolis, MN 55432-4220

Resident
6550 E River Rd Apt 102
Minneapolis, MN 55432-4220

Resident
6550 E River Rd Apt 103
Minneapolis, MN 55432-4220

Resident
6550 E River Rd Apt 104
Minneapolis, MN 55432-4220

Resident
6550 E River Rd Apt 105
Minneapolis, MN 55432-4220

Resident
6550 E River Rd Apt 106
Minneapolis, MN 55432-4220

Resident
6550 E River Rd Apt 213
Minneapolis, MN 55432-4224

Resident
6550 E River Rd Apt 214
Minneapolis, MN 55432-4224

Resident
6550 E River Rd Apt 215
Minneapolis, MN 55432-4224

Resident
6550 E River Rd Apt 216
Minneapolis, MN 55432-4224

Resident
6550 E River Rd Apt 217
Minneapolis, MN 55432-4224

Resident
6550 E River Rd Apt 218
Minneapolis, MN 55432-4224

Resident
6550 E River Rd Apt 107
Minneapolis, MN 55432-4220

Resident
6550 E River Rd Apt 108
Minneapolis, MN 55432-4220

Resident
6550 E River Rd Apt 109
Minneapolis, MN 55432-4221

Resident
6550 E River Rd Apt 110
Minneapolis, MN 55432-4221

Resident
6550 E River Rd Apt 111
Minneapolis, MN 55432-4221

Resident
6550 E River Rd Apt 219
Minneapolis, MN 55432-4224

Resident
6550 E River Rd Apt 220
Minneapolis, MN 55432-4224

Resident
6550 E River Rd Apt 221
Minneapolis, MN 55432-4212

Resident
6550 E River Rd Apt 222
Minneapolis, MN 55432-4212

Resident
6550 E River Rd Apt 301
Minneapolis, MN 55432-4212

Resident
6550 E River Rd Apt 112
Minneapolis, MN 55432-4221

Resident
6550 E River Rd Apt 113
Minneapolis, MN 55432-4221

Resident
6550 E River Rd Apt 114
Minneapolis, MN 55432-4221

Resident
6550 E River Rd Apt 115
Minneapolis, MN 55432-4221

Resident
6550 E River Rd Apt 116
Minneapolis, MN 55432-4221

Resident
6550 E River Rd Apt 302
Minneapolis, MN 55432-4212

Resident
6550 E River Rd Apt 303
Minneapolis, MN 55432-4212

Resident
6550 E River Rd Apt 304
Minneapolis, MN 55432-4212

Resident
6550 E River Rd Apt 305
Minneapolis, MN 55432-4212

Resident
6550 E River Rd Apt 306
Minneapolis, MN 55432-4212

Resident
6550 E River Rd Apt 117
Minneapolis, MN 55432-4222

Resident
6550 E River Rd Apt 118
Minneapolis, MN 55432-4222

Resident
6550 E River Rd Apt 119
Minneapolis, MN 55432-4222

Resident
6550 E River Rd Apt 120
Minneapolis, MN 55432-4222

Resident
6550 E River Rd Apt 201
Minneapolis, MN 55432-4222

Resident
6550 E River Rd Apt 307
Minneapolis, MN 55432-4225

Resident
6550 E River Rd Apt 308
Minneapolis, MN 55432-4225

Resident
6550 E River Rd Apt 309
Minneapolis, MN 55432-4225

Resident
6550 E River Rd Apt 310
Minneapolis, MN 55432-4225

Resident
6550 E River Rd Apt 311
Minneapolis, MN 55432-4225

Resident
6550 E River Rd Apt 202
Minneapolis, MN 55432-4222

Resident
6550 E River Rd Apt 203
Minneapolis, MN 55432-4222

Resident
6550 E River Rd Apt 204
Minneapolis, MN 55432-4222

Resident
6550 E River Rd Apt 205
Minneapolis, MN 55432-4223

Resident
6550 E River Rd Apt 206
Minneapolis, MN 55432-4223

Resident
6550 E River Rd Apt 312
Minneapolis, MN 55432-4225

Resident
6550 E River Rd Apt 313
Minneapolis, MN 55432-4225

Resident
6550 E River Rd Apt 314
Minneapolis, MN 55432-4225

Resident
6550 E River Rd Apt 315
Minneapolis, MN 55432-4226

Resident
6550 E River Rd Apt 316
Minneapolis, MN 55432-4226

Resident
6550 E River Rd Apt 207
Minneapolis, MN 55432-4223

Resident
6550 E River Rd Apt 208
Minneapolis, MN 55432-4223

Resident
6550 E River Rd Apt 209
Minneapolis, MN 55432-4223

Resident
6550 E River Rd Apt 210
Minneapolis, MN 55432-4223

Resident
6550 E River Rd Apt 211
Minneapolis, MN 55432-4223

Resident
6550 E River Rd Apt 212
Minneapolis, MN 55432-4223

Resident
6550 E River Rd Apt 317
Minneapolis, MN 55432-4226

Resident
6550 E River Rd Apt 318
Minneapolis, MN 55432-4226

Resident
6550 E River Rd Apt 319
Minneapolis, MN 55432-4226

Resident
6550 E River Rd Apt 320
Minneapolis, MN 55432-4226

Resident
6550 E River Rd Apt 321
Minneapolis, MN 55432-4226

Resident
6550 E River Rd Apt 322
Minneapolis, MN 55432-4226

Business Occupant
6550 E River Rd Ofc Ofc
Minneapolis, MN 55432-5393

Resident
6540 E River Rd Apt 124
Minneapolis, MN 55432-4200

Resident
6540 E River Rd Apt 125
Minneapolis, MN 55432-4200

Resident
6540 E River Rd Apt 126
Minneapolis, MN 55432-4200

Resident
6540 E River Rd Apt 127
Minneapolis, MN 55432-4200

Resident
6540 E River Rd Apt 128
Minneapolis, MN 55432-4200

Resident
6540 E River Rd Apt 232
Minneapolis, MN 55432-4254

Resident
6540 E River Rd Apt 233
Minneapolis, MN 55432-4254

Resident
6540 E River Rd Apt 234
Minneapolis, MN 55432-4254

Resident
6540 E River Rd Apt 235
Minneapolis, MN 55432-4254

Resident
6540 E River Rd Apt 236
Minneapolis, MN 55432-4254

Resident
6540 E River Rd Apt 129
Minneapolis, MN 55432-4253

Resident
6540 E River Rd Apt 130
Minneapolis, MN 55432-4253

Resident
6540 E River Rd Apt 131
Minneapolis, MN 55432-4253

Resident
6540 E River Rd Apt 132
Minneapolis, MN 55432-4253

Resident
6540 E River Rd Apt 133
Minneapolis, MN 55432-4253

Resident
6540 E River Rd Apt 134
Minneapolis, MN 55432-4253

Resident
6540 E River Rd Apt 237
Minneapolis, MN 55432-4264

Resident
6540 E River Rd Apt 238
Minneapolis, MN 55432-4264

Resident
6540 E River Rd Apt 239
Minneapolis, MN 55432-4264

Resident
6540 E River Rd Apt 240
Minneapolis, MN 55432-4264

Resident
6540 E River Rd Apt 241
Minneapolis, MN 55432-4264

Resident
6540 E River Rd Apt 242
Minneapolis, MN 55432-4264

Resident
6540 E River Rd Apt 135
Minneapolis, MN 55432-4258

Resident
6540 E River Rd Apt 136
Minneapolis, MN 55432-4258

Resident
6540 E River Rd Apt 137
Minneapolis, MN 55432-4258

Resident
6540 E River Rd Apt 138
Minneapolis, MN 55432-4258

Resident
6540 E River Rd Apt 139
Minneapolis, MN 55432-4258

Resident
6540 E River Rd Apt 140
Minneapolis, MN 55432-4258

Resident
6540 E River Rd Apt 243
Minneapolis, MN 55432-4266

Resident
6540 E River Rd Apt 244
Minneapolis, MN 55432-4266

Resident
6540 E River Rd Apt 245
Minneapolis, MN 55432-4266

Resident
6540 E River Rd Apt 246
Minneapolis, MN 55432-4266

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6540 E River Rd Apt 247
Minneapolis, MN 55432-4266

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6540 E River Rd Apt 248
Minneapolis, MN 55432-4266

Resident
6540 E River Rd Apt 141
Minneapolis, MN 55432-4267

Resident
6540 E River Rd Apt 142
Minneapolis, MN 55432-4267

Resident
6540 E River Rd Apt 143
Minneapolis, MN 55432-4267

Resident
6540 E River Rd Apt 144
Minneapolis, MN 55432-4267

Resident
6540 E River Rd Apt 145
Minneapolis, MN 55432-4267

Resident
6540 E River Rd Apt 146
Minneapolis, MN 55432-4267

Resident
6540 E River Rd Apt 323
Minneapolis, MN 55432-4273

Resident
6540 E River Rd Apt 324
Minneapolis, MN 55432-4273

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6540 E River Rd Apt 325
Minneapolis, MN 55432-4273

Resident
6540 E River Rd Apt 326
Minneapolis, MN 55432-4273

Resident
6540 E River Rd Apt 327
Minneapolis, MN 55432-4273

Resident
6540 E River Rd Apt 328
Minneapolis, MN 55432-4273

Resident
6540 E River Rd Apt 147
Minneapolis, MN 55432-4268

Resident
6540 E River Rd Apt 148
Minneapolis, MN 55432-4268

Resident
6540 E River Rd Apt 223
Minneapolis, MN 55432-4268

Resident
6540 E River Rd Apt 224
Minneapolis, MN 55432-4268

Resident
6540 E River Rd Apt 225
Minneapolis, MN 55432-4268

Resident
6540 E River Rd Apt 226
Minneapolis, MN 55432-4268

Resident
6540 E River Rd Apt 329
Minneapolis, MN 55432-4269

Resident
6540 E River Rd Apt 330
Minneapolis, MN 55432-4269

Resident
6540 E River Rd Apt 331
Minneapolis, MN 55432-4269

Resident
6540 E River Rd Apt 332
Minneapolis, MN 55432-4269

Resident
6540 E River Rd Apt 333
Minneapolis, MN 55432-4269

Resident
6540 E River Rd Apt 334
Minneapolis, MN 55432-4269

Resident
6540 E River Rd Apt 227
Minneapolis, MN 55432-4270

Resident
6540 E River Rd Apt 228
Minneapolis, MN 55432-4270

Resident
6540 E River Rd Apt 229
Minneapolis, MN 55432-4270

Resident
6540 E River Rd Apt 230
Minneapolis, MN 55432-4270

Resident
6540 E River Rd Apt 231
Minneapolis, MN 55432-4270

Resident
6540 E River Rd Apt 335
Minneapolis, MN 55432-4271

Resident
6540 E River Rd Apt 336
Minneapolis, MN 55432-4271

Resident
6540 E River Rd Apt 337
Minneapolis, MN 55432-4271

Resident
6540 E River Rd Apt 338
Minneapolis, MN 55432-4271

Resident
6540 E River Rd Apt 339
Minneapolis, MN 55432-4271

Resident
6540 E River Rd Apt 340
Minneapolis, MN 55432-4272

Resident
6540 E River Rd Apt 341
Minneapolis, MN 55432-4272

Resident
6540 E River Rd Apt 342
Minneapolis, MN 55432-4272

Resident
6540 E River Rd Apt 343
Minneapolis, MN 55432-4272

Resident
6540 E River Rd Apt 344
Minneapolis, MN 55432-4272

Resident
6540 E River Rd Apt 345
Minneapolis, MN 55432-4272

Resident
6540 E River Rd Apt 346
Minneapolis, MN 55432-4272

Resident
6540 E River Rd Apt 347
Minneapolis, MN 55432-4272

Resident
6540 E River Rd Apt 348
Minneapolis, MN 55432-4272

Resident
6441 Riverview Ter NE
Minneapolis, MN 55432-4255

Resident
6431 Riverview Ter NE
Minneapolis, MN 55432-4255

Resident
6417 Riverview Ter NE
Minneapolis, MN 55432-4255

Resident
6419 Riverview Ter NE
Minneapolis, MN 55432-4255

Business Occupant
6582 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6578 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6570 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6562 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6558 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6554 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6538 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6536 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6534 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6532 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6530 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6528 University Ave NE Ste 1
Minneapolis, MN 55432-4349

Business Occupant
6528 University Ave NE Ste 2
Minneapolis, MN 55432-4349

Business Occupant
6524 University Ave NE
Minneapolis, MN 55432-4330

Business Occupant
6522 University Ave NE
Minneapolis, MN 55432-4330

Resident
6500 2nd St NE
Minneapolis, MN 55432-4304

Resident
6510 2nd St NE
Minneapolis, MN 55432-4304

Resident
6520 2nd St NE
Minneapolis, MN 55432-4304

Resident
6501 Main St NE
Minneapolis, MN 55432-4336

Resident
6525 Main St NE
Minneapolis, MN 55432-4336

Resident
6661 Main St NE
Minneapolis, MN 55432-4335

Resident
6671 Main St NE
Minneapolis, MN 55432-4335

Resident
6681 Main St NE
Minneapolis, MN 55432-4335

Resident
6705 Main St NE
Minneapolis, MN 55432-4345

Resident
6711 Main St NE
Minneapolis, MN 55432-4345

Resident
6715 Main St NE
Minneapolis, MN 55432-4345

Resident
6721 Main St NE
Minneapolis, MN 55432-4345

Resident
6731 Main St NE
Minneapolis, MN 55432-4345

Resident
170 Rice Creek Ter NE
Minneapolis, MN 55432-4327

Resident
171 Rice Creek Ter NE
Minneapolis, MN 55432-4334

Resident
181 Rice Creek Ter NE
Minneapolis, MN 55432-4334

Resident
180 Rice Creek Ter NE
Minneapolis, MN 55432-4327

Resident
191 Rice Creek Ter NE
Minneapolis, MN 55432-4334

Resident
190 Rice Creek Ter NE
Minneapolis, MN 55432-4327

Resident
6530 2nd St NE Apt 1
Minneapolis, MN 55432-4307

Resident
6530 2nd St NE Apt 2
Minneapolis, MN 55432-4307

Resident
6530 2nd St NE Apt 3
Minneapolis, MN 55432-4307

Resident
6530 2nd St NE Apt 4
Minneapolis, MN 55432-4307

Resident
6511 2nd St NE Apt 1
Minneapolis, MN 55432-4332

Resident
6511 2nd St NE Apt 2
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6511 2nd St NE Apt 3
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6511 2nd St NE Apt 4
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6525 2nd St NE Apt 1
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298 67th Ave NE
Minneapolis, MN 55432-4312

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295 67th Ave NE
Minneapolis, MN 55432-4301

Business Occupant
7260 Commerce Cir E
Minneapolis, MN 55432-3103

Business Occupant
7180 Commerce Cir W
Minneapolis, MN 55432-3107

Business Occupant
200 Commerce Cir S
Minneapolis, MN 55432-3105

Business Occupant
7153 Commerce Cir W
Minneapolis, MN 55432-3108

Business Occupant
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Business Occupant
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Minneapolis, MN 55432-3106

Business Occupant
250 Commerce Cir S
Minneapolis, MN 55432-3105

Resident
6890 University Ave NE
Minneapolis, MN 55432-4140

Resident
295 Rice Creek Blvd NE
Minneapolis, MN 55432-4139

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290 Rice Creek Blvd NE
Minneapolis, MN 55432-4137

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181 69th Ave NE
Minneapolis, MN 55432-4103

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191 69th Ave NE
Minneapolis, MN 55432-4103

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194 69th Ave NE
Minneapolis, MN 55432-4103

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217 69th Ave NE
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218 69th Ave NE
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225 69th Ave NE
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242 69th Ave NE
Minneapolis, MN 55432-4104

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210 69th Pl NE
Minneapolis, MN 55432-4107

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215 69th Pl NE
Minneapolis, MN 55432-4141

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218 69th Pl NE
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225 69th Pl NE
Minneapolis, MN 55432-4141

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224 69th Pl NE
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238 69th Pl NE
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252 69th Pl NE
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257 69th Ave NE
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249 69th Ave NE
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266 69th Ave NE
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267 69th Ave NE
Minneapolis, MN 55432-4105

Resident
274 69th Ave NE
Minneapolis, MN 55432-4106

Resident
280 69th Ave NE
Minneapolis, MN 55432-4106

Business Occupant
6401 University Ave NE Ste 100
Minneapolis, MN 55432-4342

Business Occupant
6401 University Ave NE Ste 200
Minneapolis, MN 55432-4343

Business Occupant
6401 University Ave NE Ste 300
Minneapolis, MN 55432-4344

Business Occupant
6401 University Ave NE Ste 304
Minneapolis, MN 55432-4344

Resident
7632 W River Rd
Minneapolis, MN 55444-2513

Resident
7628 W River Rd
Minneapolis, MN 55444-2513

Resident
7624 W River Rd
Minneapolis, MN 55444-2513

Resident
7616 W River Rd
Minneapolis, MN 55444-2513

Resident
7608 W River Rd
Minneapolis, MN 55444-2513

Resident
7448 W River Rd
Minneapolis, MN 55444-2641

Resident
7520 W River Rd
Minneapolis, MN 55444-2511

Resident
7530 W River Rd
Minneapolis, MN 55444-2511

Resident
7550 W River Rd
Minneapolis, MN 55444-2511

Resident
7600 W River Rd
Minneapolis, MN 55444-2513

Resident
315 76th Ave N
Minneapolis, MN 55444-2545

Resident
314 76th Ave N
Minneapolis, MN 55444-2502

Resident
309 76th Ave N
Minneapolis, MN 55444-2545

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308 76th Ave N
Minneapolis, MN 55444-2502

Resident
301 76th Ave N
Minneapolis, MN 55444-2545

Resident
304 76th Ave N
Minneapolis, MN 55444-2502

Resident
7535 Riverdale Dr N
Minneapolis, MN 55444-2506

Resident
300 75th Ave N
Minneapolis, MN 55444-2516

Resident
308 75th Ave N
Minneapolis, MN 55444-2516

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316 75th Ave N
Minneapolis, MN 55444-2516

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309 75th Ave N
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301 75th Ave N
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Resident
115 75th Ave N
Minneapolis, MN 55444-2574

Resident
103 75th Ave N
Minneapolis, MN 55444-2574

Resident
104 75th Ave N
Minneapolis, MN 55444-2572

Resident
128 75th Ave N
Minneapolis, MN 55444-2572

Resident
7540 Riverdale Dr N
Minneapolis, MN 55444-2507

Resident
7550 Riverdale Dr N
Minneapolis, MN 55444-2507

Resident
225 76th Ave N
Minneapolis, MN 55444-2517

Resident
7524 Brooklyn Park Dr
Minneapolis, MN 55444-2563

Resident
7600 Brooklyn Park Dr
Minneapolis, MN 55444-2503

Resident
7608 Brooklyn Park Dr
Minneapolis, MN 55444-2503

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7616 Brooklyn Park Dr
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7609 Brooklyn Park Dr
Minneapolis, MN 55444-2503

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7601 Brooklyn Park Dr
Minneapolis, MN 55444-2503

Resident
300 76th Ave N
Minneapolis, MN 55444-2502

Resident
7609 Riverdale Dr N
Minneapolis, MN 55444-2508

Resident
7600 Riverdale Dr N
Minneapolis, MN 55444-2509

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7617 Riverdale Dr N
Minneapolis, MN 55444-2508

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7646 Riverdale Dr N
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7641 Riverdale Dr N
Minneapolis, MN 55444-2508

Resident
309 Brookdale Dr
Minneapolis, MN 55444-2115

Resident
209 Brookdale Dr
Minneapolis, MN 55444-2113

Resident
201 Brookdale Dr
Minneapolis, MN 55444-2113

Resident
135 Brookdale Dr
Minneapolis, MN 55444-2111

Resident
109 Brookdale Dr
Minneapolis, MN 55444-2111

Resident
7624 Mississippi Ln
Minneapolis, MN 55444-2504

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7800 Mississippi Ln
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7851 Mississippi Ln
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7878 Mississippi Ln
Minneapolis, MN 55444-2152

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7859 Mississippi Ln
Minneapolis, MN 55444-2151

Resident
92 Brookdale Dr
Minneapolis, MN 55444-2110

Resident
108 Brookdale Dr
Minneapolis, MN 55444-2112

Resident
7704 Riverdale Dr N
Minneapolis, MN 55444-2161

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7708 Riverdale Dr N
Minneapolis, MN 55444-2161

Resident
7712 Riverdale Dr N
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7709 Riverdale Dr N
Minneapolis, MN 55444-2162

Resident
118 Brookdale Dr
Minneapolis, MN 55444-2163

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132 Brookdale Dr
Minneapolis, MN 55444-2163

Resident
200 Brookdale Dr
Minneapolis, MN 55444-2114

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208 Brookdale Dr
Minneapolis, MN 55444-2114

Resident
7800 W River Rd
Minneapolis, MN 55444-2148

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7810 W River Rd
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7814 W River Rd
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7818 W River Rd
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7836 W River Rd
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7850 W River Rd
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Resident
7849 Sunkist Blvd
Minneapolis, MN 55444-2143

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7835 Sunkist Blvd
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7817 Sunkist Blvd
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Resident
7809 Sunkist Blvd
Minneapolis, MN 55444-2143

Resident
308 78th Ave N
Minneapolis, MN 55444-2109

Resident
309 78th Ave N
Minneapolis, MN 55444-2108

Resident
301 78th Ave N
Minneapolis, MN 55444-2108

Resident
7805 Sunkist Blvd
Minneapolis, MN 55444-2143

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7800 Sunkist Blvd
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7808 Sunkist Blvd
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7824 Sunkist Blvd
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7842 Sunkist Blvd
Minneapolis, MN 55444-2144

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7860 Sunkist Blvd
Minneapolis, MN 55444-2144

Appendix E

Council Resolution Adopting Facility Plan

Appendix E. Metropolitan Council Resolution Adopting Facility Plan

- Metropolitan Council Resolution 2021-5 adopting the Facility Plan.

METROPOLITAN COUNCIL

390 North Robert Street, St. Paul, Minnesota 55101-1634

Phone (651) 602-1000 · TDD (651) 291-0904 · FAX (651) 602-1550 · Metro Info (651) 602-1888

RESOLUTION NO. 2021-5
RESOLUTION APPROVING AND ADOPTING THE
Facility Plan for New Lift Station L32A (Fridley)
PROJECT NO. 809400

WHERE AS:

1. The Metropolitan Council is a public corporation and political subdivision of the State of Minnesota and has statutory responsibility for operating the Twin Cities Metropolitan Area regional wastewater collection and treatment system, and
2. The Metropolitan Council has determined it is necessary and convenient for the fulfillment of its statutory responsibilities to construct the Lift Station L32A Project, Project Number 809400, and
3. A draft Facility Plan for the project has been completed and a public hearing was held on December 17, 2020 to discuss the proposed project and the draft Facility Plan

NOW, THEREFORE, BE IT RESOLVED BY THE METROPOLITAN COUNCIL,

that the Facility Plan for the

New Lift Station L32A (Fridley)
PROJECT NO. 809400

is hereby approved and adopted.

Adopted this 24th day of February 2021.

Charles A Zelle, Chair

Liz Sund

Liz Sund, Recording Secretary

390 Robert Street North
Saint Paul, MN 55101-1805Saint Paul, MN 55101-1805

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