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Crosslake WWTF Improvement Project

Date: March 8, 2018
To: Public Works Committee/City Council
From: Mike Rardin, PE *MR*
Cc: Ted Strand - Public Works Director
Subject: Monthly Project Update

Project Description

The Project can generally be described as follows:

1. Pretreatment improvements including replacing the existing mechanical fine screen, addition of a self-priming grit pump, adding a new blower for the aerated grit removal system, and adding a new handrail and grating system.
2. Construct a new 82,000 gallon equalization basin.
3. Construct a new rapid mix manhole with ferric chloride addition.
4. Construct a new control structure to feed the final clarifiers.
5. Construct a new effluent metering manhole.
6. Miscellaneous electric actuator valve replacements.
7. Re-routing the existing WAS line into the biosolids storage tanks.
8. Furnish and install new blowers for the existing aerated biosolids storage tank
9. Furnish and install a new backwash blower
10. Construct a 30,000 gallon backwash supply water storage tank.

Work Progress - Third Project Update

On September 15, 2017 the City of Crosslake awarded the 2017 Waste Water Treatment Plant Improvement Project to Eagle Construction Company, Inc. of Little Falls, MN for the amount of \$2,227,000.00. The contractor began to mobilize equipment and materials to the site on October 5 in order to prepare for the construction of the treatment plant improvements.

October - excavation for the new water storage tank and also the new equalization basin was completed. Dewatering equipment was used to pump down the ground water in order for the contractor to work in a dry trench. With the trench dry, concrete forms and tied rebar for the main slabs for both tanks were placed.

November - the contractor focused on concrete work for the equalization basin and the water storage tank. They poured the main slabs and sump areas for both tanks. The contractor used a concrete pump truck to effectively place the concrete. A heat tent was used to protect the concrete from the cold weather to allow for it to properly cure. Concrete forms and tied rebar for the water tank walls were placed by month's end with the concrete pour scheduled to be done in December. Field Order #1, adding rebars to the Water Storage Tank base slab was issued. Details and costs for BMI Proposal Request #1, RAS piping relocation, and Eagle Proposal Request #1, oxidation ditch drain piping relocation, were developed.

December - the contractor continued progress on the two tanks. Concrete was poured at the beginning of the month for the walls of both structures. Installation of process piping was started and various plant upgrades were made which will continue to progress throughout the winter. These changes are necessary to begin to incorporate the new equalization basin into the existing treatment system and to improve the operation and functionality of the current plant. A cost of \$2,464.93 for BMI Proposal Request No. 2 to replace three (3) RAS pump inlet valves was obtained. These valves were recently identified as failing when the RAS pumps were replaced as part of the basement flood work (expected to be covered by

insurance). These valves were found to be corroded beyond use. The corrosion is thought to be based on previous ferric chloride overdosing and not a result of the flood, therefore not insurance eligible; the current project revises the ferric chloride feed to prevent overdosing. Overdosing is problematic as it wastes chemical (increasing costs) and is very corrosive to metal at high concentrations. A proposal was sent to Eagle to replace these since they are on-site. The proposed cost is considered reasonable for replacement of these three valves.

January - the contractor focused on equalization basin work. The contractor poured the lid and interior columns for the structure. By month's end they had started the concrete work for the outlet control structure located at the south end of the basin. In addition, process pipe installation to and from the basin continued through the month. Field Order #1 and #2 changes (details below) were authorized by BMI. Finally, it was determined that insulating process piping with a bury depth of less than seven (7) feet was necessary. BMI requested and the Contractor provided a proposal in the amount of \$1,822.51 for piping insulation between the equalization basin and the oxidation ditches. The Eagle proposal and cost is considered reasonable. Insulation costs elsewhere, if needed, remain to be determined.

February - the contractor constructed the top slab of the Water Storage Tank, EQ Basin coatings, pumps, and process piping, and blower and air piping.

Contract changes are summarized in the "Costs" section below.

Project Schedule

Based on the contractor's proposed schedule (**attached - Project Schedule - 02.02.18**), overall construction is estimated to take about forty (40) weeks - with a projected substantial completion date of August 31, 2018. Based on the contractor's proposed schedule, the following is a brief summary of future construction activities:

March - completion and startup of EQ Basin, Filter Room valve replacements, Pre-Treatment Building piping modifications, Mechanical Fine Screen installation, and Pre-Treatment Building stairs, railings, and grating, and blower and air piping.

April - Filter Room valve replacements, Pre-Treatment Building piping modifications, Mechanical Fine Screen installation, blower and air piping, 6" water main from Water Storage Tank to loadout, and water main from Water Storage Tank to clarifier, and 4" water main from well to Water Storage Tank.

May - Water Storage Tank pump installation and control structure concrete and piping.

June - Rapid Mix Manhole and piping construction, Meter Manhole and piping construction, and Sludge Storage Tank piping and modifications.

July - blower and air piping, Sludge Storage Tank piping and modifications.

August - Site Grading/ Fencing/ Restoration and punchlist items.

Scheduling of the SCADA and control system and associated electrical work remains undetermined due to equipment procurement difficulties. Equipment has been designed and ordered, but there is a 10 to 20 week window for delivery due to nationwide demand for this type of equipment. Of most importance, the EQ Basin is essentially complete and will be in operation for the St. Patrick's Day weekend in the City.

The contractor generally appears to be on the schedule they proposed for this project. No schedule concerns are noted at this time.

Completion Dates

The contract calls for substantial completion (defined as operation of all new structures and equipment with the ability to treat wastewater as intended) by August 31, 2018.

Costs

Construction costs to date for the waste water portions of the project have increased approximately \$12,413.30 due to the following:

Item	Cost
1 - Field Order #1 - Add Rebar: Water Storage Tank Base Slab	\$ 424.00
2 - Field Order #2:	
A - RAS Piping Relocation to EQ Basin	\$ 11,923.13
B - Remove and Replace Three (3) Four Inch Plug Valves	\$ 2,464.93
C - Relocate 6" Oxidation Ditch Drain Line	\$ (4,221.27)
3 - Field Order #3 - Pipe Insulation (Eq Basin to Oxidation Ditch)	\$ 1,822.51
4 - Relocate 6" RW Piping to South Oxidation Ditch	TBD
5 - Pipe Insulation (extra as needed)	TBD

The following information is provided for the items identified above:

1. During construction review of the Water Storage Tank plans, additional rebars were needed for the base slab - cost determined to be \$424.00.
- 2.A Staff found the existing 6" RW piping to be improperly installed and full of solids. As a result, it was decided the existing RAS piping should be relocated / extended to the EQ Basin to avoid future use of this piping - cost estimated at \$11,923.13.
- 2.B RAS pump inlet isolation valves (3) have been identified by staff as failing. These can be replaced as a part of the project - cost determined to be \$2,464.93.
- 2.C The oxidation ditch drains are being relocated to a location which avoids a building conflict - contractor has offered a credit (deduct) of \$4,221.27 for this change.
3. EQ Basin and Oxidation Ditch pipe connections will result in less than 7-ft of bury depth. To prevent freezing, 4-inch thick insulation 4-ft wide is to be placed over these pipes where there is less than 7-ft of cover.
4. The new 12" EQ basin pipe appears to conflict with the existing 6" RW pipe to the south oxidation ditch. No records from the original construction plan were found during design or by City staff that show the RW pipe elevation. The 6" RW pipe will be raised / reinstalled when it is encountered - cost to be determined at that time.
5. Some existing tank and pipe connections will result in less than 7-ft of bury depth. To prevent freezing, 4-inch thick insulation 4-ft wide is to be placed over pipe locations with less than 7-ft of cover - costs to be determined where situation encountered.

Field Orders #1 thru #3 changes have been reviewed by staff and City Council and found to be acceptable. These changes have been authorized by BMI and have been incorporated into pay requests as appropriate. Piping changes and additional insulation costs, listed in the table above, remain to be determined.

A construction allowance of \$75,000 to pay for possible contract changes was incorporated into the construction contract for this project. So far, \$12,413.30 has been charged towards that allowance.

Well construction has been completed and final costs are \$67,940, which is \$455 less than contracted for.

Engineering services for the project have been continuing as agreed to according to the existing "Not to Exceed" contract. No cost changes are anticipated at this time.

Total project costs to date and estimated final costs can be summarized as follows:

Total Estimated Project Cost	Original Cost	Changes	Costs to Date	Estimated Final Amounts
WWTF Construction	\$ 2,152,000	\$ 12,413	\$751,641	\$ 2,164,413
Well Construction	\$ 68,395	\$ (455.00)	\$ 67,940	\$ 67,940
Engineering	\$ 198,400	\$ (514.00)	\$179,339	\$ 197,886
Totals	\$ 2,418,795	\$ 11,444	\$998,919	\$ 2,430,239
Other City Costs (pre 2018)			\$188,016	\$2,618,255

Please see project cost summary (**attached - Project Cost Summary - 03.08.18**) for project cost details.

Attachments

1. Project Schedule - 02.02.18
2. Project Cost Summary - 03.08.18

City of Crosslake
Waste Water Treatment Facility Project
 BMI Project # - M25.113425

Project Cost Summary
 March 8, 2018

Item	Contract Amounts	Changes	Estimated Final Amounts
Eagle - Construction Costs			
Construction	\$ 2,152,000.00		\$ 2,152,000.00
Allowance	\$ 75,000.00		
Contract Changes			
1 - Field Order #1 - Add Rebar: Water Storage Tank Base Slab		\$ 424.00	\$ 424.00
2 - Field Order #2:			
BMI Proposal Request #1 - RAS Piping Relocation to EQ Basin		\$ 11,923.13	\$ 11,923.13
BMI Proposal Request #2 - Remove and Replace Three (3) Four Inch Plug Valves		\$ 2,464.93	\$ 2,464.93
Eagle Proposal Request #1 - Relocate 6" Oxidation Ditch Drain Line		\$ (4,221.27)	\$ (4,221.27)
3 - Field Order #3 - Pipe Insulation (Eq Basin to Oxidation Ditch)		\$ 1,822.51	\$ 1,822.51
4 - Relocate 6" RW Piping to South Oxidation Ditch		TBD	TBD
5 - Pipe Insulation (additional - as needed)		TBD	TBD
Totals	\$ 2,227,000.00	\$ 12,413.30	\$ 2,164,413.30
Pay Request # / Date	#6 - 02/26/18		
Eagle - Work Completed to Date	\$ 751,640.50		
Eagle - Paid to Date	\$ 533,707.63		
Eagle - Retainage	\$ 37,582.03		
Eagle - Pay Request	\$ 180,350.85		

Item	Contract Amounts	Changes	Final Amounts
Blue Water Wells - Construction Costs			
Construction	\$ 68,395.00	\$ -	\$ 68,395.00
Contract Changes			
1 - Test Pump		\$ (2,000.00)	\$ (2,000.00)
2 - Water Analysis		\$ (1,750.00)	\$ (1,750.00)
3 - Casing		\$ (1,080.00)	\$ (1,080.00)
4 - Open Hole		\$ (1,125.00)	\$ (1,125.00)
5 - Increase Pump and Casing Sizes (to 500 gpm capacity)		\$ 5,500.00	\$ 5,500.00
Totals	\$ 68,395.00	\$ (455.00)	\$ 67,940.00
Pay Request # / Date	#1 (Final) - 9/18/17		\$ 67,940.00

Item	Contract Amount	Changes	Cost to Date	Estimated Final Amounts
BMI - Design Costs				
Task 1 - Site Work Design	\$ 8,400.00	\$ (9.00)	\$ 8,391.00	\$ 8,391.00
Task 2 - Waste Water Facility Design	\$ 82,000.00	\$ -	\$ 82,000.00	\$ 82,000.00
Task 3 - Bidding Services	\$ 8,000.00	\$ (505.00)	\$ 7,495.00	\$ 7,495.00
Task 4 - Water Supply Well and Storage Tank Design (Alternate)	\$ 30,000.00	\$ -	\$ 30,000.00	\$ 30,000.00
BMI - Construction Observation Costs	\$ 70,000.00	\$ -	\$ 51,452.93	\$ 70,000.00
Totals	\$ 198,400.00	\$ (514.00)	\$ 179,338.93	\$ 197,886.00

Total Estimated Project Cost	Original Cost	Changes	Costs to Date	Estimated Final Amounts
WWTF Construction	\$ 2,152,000.00	\$ 12,413.30	\$ 751,640.50	\$ 2,164,413.30
Well Construction	\$ 68,395.00	\$ (455.00)	\$ 67,940.00	\$ 67,940.00
Engineering	\$ 198,400.00	\$ (514.00)	\$ 179,338.93	\$ 197,886.00
Totals	\$ 2,418,795.00	\$ 11,444.30	\$ 998,919.43	\$ 2,430,239.30

Other Related City Costs:			Costs to Date	Estimated Final Amounts
City costs prior to 2016 - WIP at 12/31/2016			\$ 142,416.61	\$ 142,416.61
Other 2017 City Costs - USA Bluebook, Fiber Upgrades, Elite Fence and Deck, Etc			\$ 45,599.90	\$ 45,599.90
Totals			\$ 188,016.51	\$ 188,016.51

TOTAL CITY COSTS \$ **1,186,935.94** \$ **2,618,255.81**