

Lake Huron Water Treatment Plant, Raw Sludge Clarifier and Raw Sludge Pumping System

- ☐ Innovation
- ☐ Conceptual WW MP
- ☐ Water MP Right Sizing
- ☐ Reliability/Redundancy
- ☐ NEWTP Repurposing

Project Status Active

CIP Type Project

☐ **Project New To CIP**

Raw sludge clarifier at
Lake Huron WTP



Project Engineer/Manager Brian VanHall

Director Grant Gartrell

Managing Dept Water Eng

Date Original Business Case Prepared 8/7/2015

Year Project Added to CIP 2016

Budget Water

Class Lvl 1 Water

Class Lvl 2 Treatment Plants and Facilities

Class Lvl 3 Lake Huron

Location Saint Clair County

Fund and Cost Center Water - 5519-882111

Problem Statement

The existing WWRB and clarifiers have noticeable deteriorating concrete and walls that have permanently deflected. There is also concrete deterioration in the sludge pumping station as well as difficulties with maintenance and operation of the existing pumps. For example, the existing pumps are not equipped with permanent lifting mechanisms. A truck with a crane has to be mobilized to the plant to pull an existing pump when maintenance or repairs are needed. The new sludge pumping units will be equipped with permanent lifting mechanisms so that pumps can be pulled by plant staff without mobilizing a specialty crew to perform these types of tasks.

Spent filter backwash is conveyed to the Waste Wash Water Retention Basin (WWRB) that was constructed in the early 1970s. Twice yearly, as part of the settling basin cleaning, the flush water and alum sludge from the Lake Huron Water Treatment Plant settling basins are drained to the clarifiers that are adjacent to the WWRB. Clarifiers Nos. 1 and 2 were constructed at the same time as the WWRB. Sludge is discharged from these clarifiers to drying lagoons using a sludge pumping station. The clarifiers also serve as redundant waste wash water retention volume during normal plant operations.

Scope of Work / Project Alternatives

This project will be delivered using a design-bid-build project delivery method. GLWA retained an engineering consultant under GLWA Contract No. CS-171 "Raw Sludge Clarifiers and Raw Sludge Pumping Station Improvements" to conduct a condition assessment and design improvements for LH raw sludge handling. The WWRB, Clarifier Nos. 1 and 2, and the sludge pumping station all require improvement. The scope of construction involves:

1. Demolish existing clarifiers and sludge pumping station



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- 2. Construct new cast-in-place reinforced concrete waste wash water retention basin
- 3. Construct new cast-in-place reinforced concrete sludge pumping station equipped with new pump lifting mechanisms
- 4. Install new diversion gate structures between sludge drying lagoons
- 5. Install new junction structures between existing and new waste wash water retention basins
- 6. Install new yard lighting around the WWRB and clarifiers

Other Important Info

This project should be completed prior to cessation of treatment at the Northeast WTP.

Project History: The clarifier/backwash structure is original to the plant. The tank walls appear to have been inadequately designed and/or constructed to withstand the loading of the surround soils.

Challenges: Improvements will require coordination with plant operations (filter backwashing, sedimentation basin cleaning) and requires bypass pumping due to significant leakage from filter outlet valves.

Primary Driver

1 - Condition

Driver Explanation

The existing raw sludge clarifier has significant structural concrete deterioration and wall deflections to the point where it is beyond repair. Existing raw sludge pumping station not adequately sized.

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**PM Weighted
Score**

62.4

Criteria	Score	Comment
Condition	5	
Performance (Service Level/Reliability)	5	
Regulatory (Environmental/Legal)	2	
Operations and Maintenance	4	
Public Health and Safety	3	
Public Benefit	1	
Financial	2	
Efficiency and Innovation	2	

**RC Weighted
Score**

53.2

Criteria	Score	Comment
Condition	5	
Performance (Service Level/Reliability)	5	
Regulatory (Environmental/Legal)	1	
Operations and Maintenance	2	
Public Health and Safety	2	
Public Benefit	1	
Financial	4	
Efficiency and Innovation	1	



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Phase GLWA Employees Project management

Contract NA

Status Active

Title GLWA Salaries

Phase Budget Water

Phase Status Active

Start Date

End Date

Cost Estimation Information

5

Cost Est. Class

1/1/2016

Cost Est. Date

GLWA

Cost Est. Source

GLWA

Cost Est. Prepared By

Cost Allocation

CTA

Funding Source

Bond Proceeds

Fund

Construction Bond Fund

Useful Life >20Yrs?

No

Tot. Federal Loan Amount

\$0

Program/Allowance Task Information

Project Manager

CIP Number

Description

Cost Type	Fiscal Year	Expense	Fringe Benefit	NonPersonnel	Comment
GLWA Salaries CIP2021	FY19-	\$17			2021CIP
GLWA Salaries CIP2021	FY20	\$150			2021CIP
GLWA Salaries CIP2021	FY21	\$139			2021CIP

Phase Total Expenses By FY (All figures are in \$1,000's)

Prior Yr Actual	FY20	FY21	FY22	FY23	FY24	FY25	FY26+	Total	5-Yr Total
17	150	139	0	0	0	0	0	306	139

Phase Task Dates



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Phase Construction

Contract 1803823

Status Active

Title Construction

1803823 awarded to Weiss with NTP 6/12/19

Phase Budget Water

Cost Allocation CTA

Phase Status Active

Funding Source Federal Loan Programs

Start Date

Fund Construction Bond Fund

End Date

Useful Life >20Yrs? Yes

Cost Estimation Information

Tot. Federal Loan Amount

1

Cost Est. Class

3/8/2019

Cost Est. Date

Weiss

Cost Est. Source

Weiss

Cost Est. Prepared By

Program/Allowance Task Information

Project Manager

CIP Number

Description

Cost Type	Fiscal Year	Expense	Fringe Benefit	NonPersonne	Comment
Construction	FY19-	\$9			2021 CIP
Construction	FY20	\$4,187			2021 CIP
Construction	FY21	\$2,870			2021 CIP

Phase Total Expenses By FY (All figures are in \$1,000's)

Prior Yr Actual	FY20	FY21	FY22	FY23	FY24	FY25	FY26+	Total	5-Yr Total
9	4,187	2,870	0	0	0	0	0	7,066	2,870

Phase Task Dates

Phase Task Name	Start Date	End Date	Duration
Procurement	12/28/2018	7/11/2019	195
Project Execution	7/11/2019	3/1/2021	599
Project Closeout	3/2/2021	5/30/2021	89



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Phase Study and Design and Construction Assistance

Contract CS-171

Status Active

Title Study, Design and Construction Administration

Phase Budget Water

Phase Status Active

Start Date 10/2/2017

End Date

Cost Allocation CTA

Funding Source Revenue Financed Capital

Fund Improvement & Extension Fun

Useful Life >20Yrs? No

Cost Estimation Information

1

Cost Est. Class

1/1/2016

Cost Est. Date

GLWA

Cost Est. Source

GLWA

Cost Est. Prepared By

Tot. Federal Loan Amount

Program/Allowance Task Information

Project Manager

CIP Number

Description

Cost Type	Fiscal Year	Expense	Fringe Benefit	NonPersonne	Comment
Engineering Services	FY19-	\$623			2021CIP
Engineering Services	FY20	\$559			2021CIP
Engineering Services	FY21	\$383			2021CIP

Phase Total Expenses By FY (All figures are in \$1,000's)

Prior Yr Actual	FY20	FY21	FY22	FY23	FY24	FY25	FY26+	Total	5-Yr Total
623	559	383	0	0	0	0	0	1,565	383

Phase Task Dates

Phase Task Name	Start Date	End Date	Duration
Pre-Procurement	3/7/2017	3/14/2017	7
Procurement	3/14/2017	9/1/2017	171
Project Execution	9/1/2017	3/1/2021	1277
Project Closeout	3/2/2021	5/30/2021	89



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Project Total Expenses By FY Compared to Prior CIPs (All figures are in \$1,000's)

CIP Alias	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	Total	5-Yr Total
2021	0	0	0	649	4,896	3,392	0	0	0	0	0	8,937	3,392
2020	0	0	284	194	4,660	4,661	0	0	0	0	0	9,799	9,321
2019	0	9	422	212	1,612	3,608	1,221			0	0	7,084	6,653
2018			50	920	6,163				0	0	0	7,133	7,133

Description of CIP Changes

Construction contract 1803823 was awarded and the CIP was updated this year to reflect the actual contract value for the construction contract. In addition, funds have been added to this CIP this year for additional resident project representation (RPR) and project management services under the consulting engineering services contract CS-171. BPV 8/1/2019