



Wastewater Treatment Final Master Plan 2015

Logan City
October 20, 2015

Project Update

- After a year of study, 6 member cities have agreed to participate in the project.
- DWQ has finalized wastewater permit, project funding, and required implementation scheduled.
- Master plan for wastewater treatment needs City Council approval to secure DWQ funding and allow design to start.
- Environmental permitting on proposed site to be complete by the end of 2015.
- Design of facility must be complete by December 31, 2016

Implementation Schedule

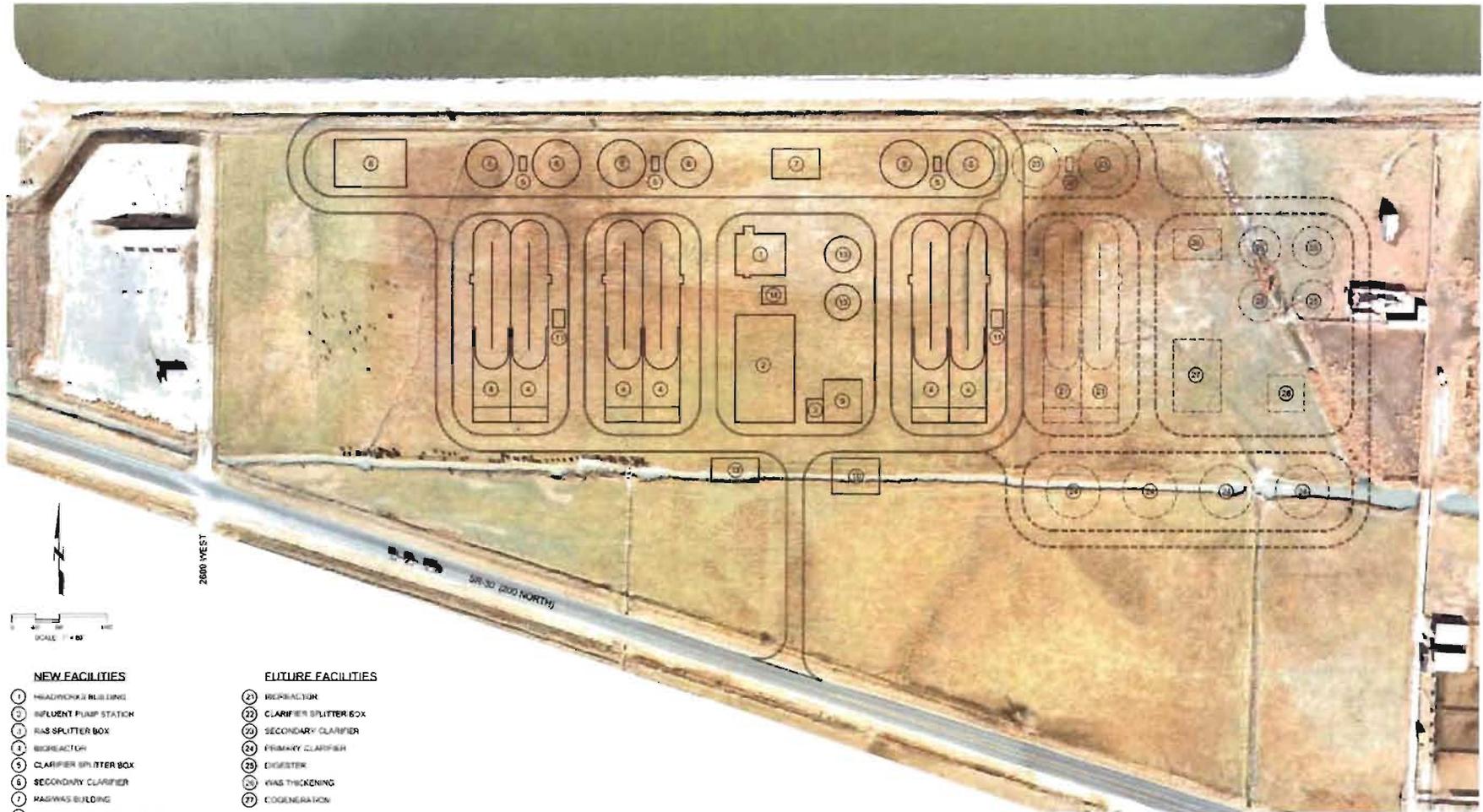
**Table 4.5 Implementation Schedule
Wastewater Treatment Final Master Plan 2015
City of Logan**

	2015				2016				2017				2018				2019				2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Master Plan Review/Approval			■																					
Project Design				■	■	■	■	■																
Project Review/Approval									■															
Bid Period/Award										■														
Construction										■	■	■	■	■	■	■	■	■	■	■				
Startup and Optimization																							■	■

Project Funding Plan

Financing	Amount (\$M)	Rate	Term	Estimated Monthly Treatment Fee Increase
DWQ Loan	\$70	0.75%	20 Years	\$10-15 (1.19% Blended Rate)
CIB Loan	\$10	1.5%	20 Years	
Project Bond	\$7.6	4.86%	20 Years	
City Cash on Hand	\$24	N/A	N/A	

Conceptual Site Plan for Recommended, Least Cost Alternative



NEW FACILITIES

- 1 HEADWORKS BUILDING
- 2 INFLUENT PUMP STATION
- 3 RAS SPLITTER BOX
- 4 BIOREACTOR
- 5 CLARIFIER SPLITTER BOX
- 6 SECONDARY CLARIFIER
- 7 RAISWAS BUILDING
- 8 TERTIARY TREATMENT - UV BUILDING
- 9 DEWATERING BUILDING
- 10 OPERATIONS BUILDING
- 11 ELECTRICAL BUILDING
- 12 EMERGENCY GENERATOR BUILDING
- 13 WAS STORAGE TANKS
- 14 SCUM CONTROL FACILITY

FUTURE FACILITIES

- 21 BIOREACTOR
- 22 CLARIFIER SPLITTER BOX
- 23 SECONDARY CLARIFIER
- 24 PRIMARY CLARIFIER
- 25 DIGESTER
- 26 WAS THICKENING
- 27 COGENERATION

Questions?

ES.1 BACKGROUND

Logan City (City) owns and operates a lagoon system that provides wastewater treatment for the City and a number of the surrounding communities. A Total Maximum Daily Load (TMDL) study identified water quality impairments to Cutler Reservoir, and as such, the Utah Division of Water Quality (DWQ) has imposed a new phosphorus limit for the City's wastewater facility. Additionally, DWQ has imposed a new effluent ammonia limit for protection of aquatic species in receiving waters. Multiple studies and evaluations have indicated that the current lagoon system is not capable of meeting the new effluent limits for phosphorus and ammonia. Compliance to these new limits requires the City to complete the design of the recommended treatment facility by December 31, 2016. This master plan was written to identify the least cost treatment technology capable of meeting the new requirements, estimate capacity needed for future population, and outline a schedule for funding and construction of the recommended project.

ES.2 POPULATION AND WASTEWATER FLOWS

The service area for the new wastewater treatment facility includes Logan and the surrounding cities of Hyde Park, Nibley, North Logan, Providence, River Heights and Smithfield. In 2010 this service area had a population of approximately 88,000 people and average wastewater flow of 12.3 million gallons per day (mgd). By 2040, the service area population is projected to grow to 138,000 people and average wastewater flow of 18 mgd. The existing lagoons will be used to equalize wet weather flows, reducing the maximum flow to the new mechanical treatment facility.

ES.3 TREATMENT ALTERNATIVES EVALUATION

Treatment alternatives for phosphorus and ammonia removal were evaluated on both an economic and non-economic basis in this master plan in order to identify a preferred alternative. A life-cycle cost was developed for each alternative based on estimated capital cost of construction and annual facility operation and maintenance (O&M) costs. The non-economic evaluation ranked each treatment alternative based on the following factors: 1) ease of operation/simplicity, 2) compatibility with existing lagoons, 3) process reliability, 4) effluent quality, 5) constructability, and 6) energy use/O&M.

The 3 Stage Bardenpho Bioreactor treatment alternative has the lowest lifecycle costs and also rates the highest in the non-economic evaluation for greater process reliability, ease of operation, and effluent quality. Therefore, the 3 Stage Bardenpho Bioreactor is the recommended treatment alternative with a total capital cost of \$112 million and O&M cost of

\$5.02 million annually. DWQ concurs with this recommendation and has approved low interest project funding based on this recommended project.

ES.4 ENVIRONMENTAL IMPACTS

The proposed project site is on City owned property immediately south of the existing wastewater lagoons. Preliminary environmental work is underway, including a wetland permit through the Army Corp of Engineers After proposed mitigation measures, no long-term, adverse, direct or indirect environmental impacts are anticipated. The project will improve the quality of water discharged to Cutler Reservoir resulting in a positive environmental impact on the quality of the water and fish habitat.

ES.5 PROJECT IMPLEMENTATION

The 3 Stage Bardenpho Bioreactor process with tertiary treatment is recommended to meet the City's ammonia and phosphorus permit limits. The anticipated implementation schedule is shown in Table ES.1.

Table ES.1 Implementation Schedule Wastewater Treatment Final Master Plan 2015 City of Logan																											
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Startup and Optimization																								■			

ES.6 FINANCING

The City has increased sewer rates over the past several years in anticipation of this project, and has accumulated \$24 million in capital reserve funds. The remaining balance will be met by low interest loans from UDWQ (\$70 million dollars at 0.75 percent), the State of Utah's Community Impact Board (\$10 million dollars at 1.5 percent), and cash reserves or tax-exempt bonding in the public markets for the balance of the project. The estimated treatment fee increase for users is \$10 to \$15 per month.