



State of Utah

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Environmental Quality

Alan Matheson  
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Date Received: June 6, 2016

Date to be presented to the WQB: June 22, 2016

WATER QUALITY BOARD  
FEASIBILITY REPORT FOR WASTEWATER TREATMENT PROJECT  
**INTRODUCTION**

APPLICANT: Salem City  
30 West 100 South, PO Box 901  
Salem, Utah 84653  
Telephone: 801-423-2770 EIN#: 87-6000-277

PRESIDING OFFICIAL: Mayor Randy Brailsford

CONTACT PERSON: Bruce Ward, City Engineer

TREASURER: Jeffrey Nielson, Finance Director/Recorder

CONSULTING ENGINEER: Jason Broome, Senior Project Manager  
Forsgren Associates, Inc.  
370 East 500 South, Suite 200  
Salt Lake City, Utah 84111  
801-364-4785

CITY ATTORNEY: S. Junior Baker, Salem City  
30 West 100 South, PO Box 901  
Salem, Utah 84653  
Telephone: 801-423-2770

BOND COUNSEL: Randall Larsen  
Ballard Sparh  
201 S. Main Street, Suite 800  
Salt Lake City, Utah 84111  
801-531-3000

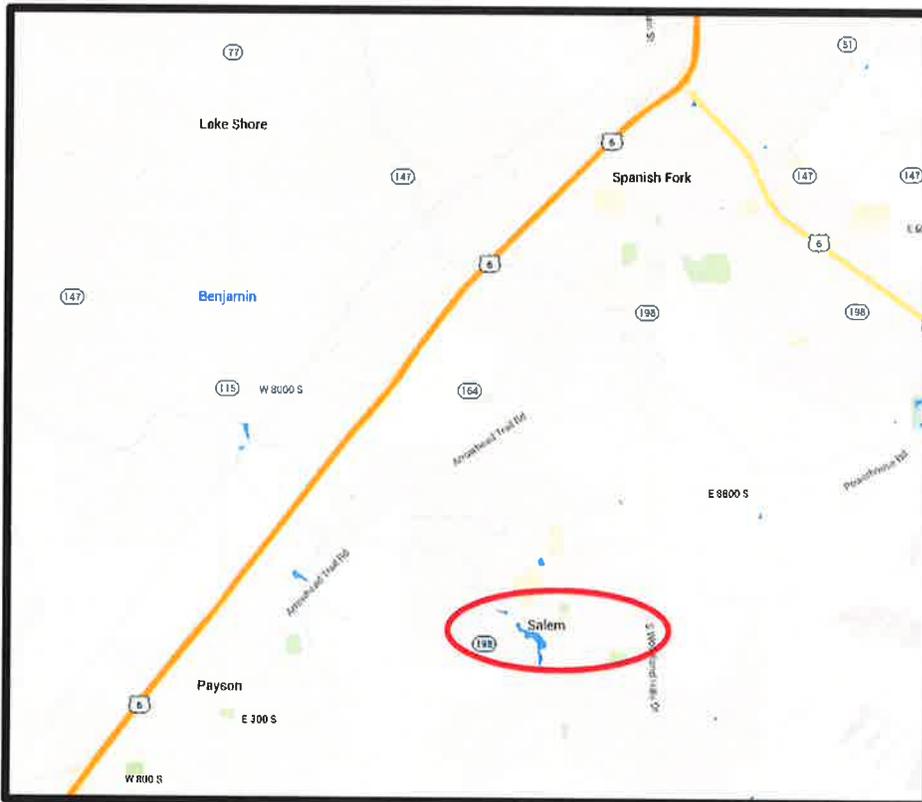
**APPLICANT'S REQUEST:**

Salem City requests a **loan in the amount of \$13,000,000 at 1.15% for a term of 20 years** to construct a new mechanical wastewater treatment plant. This new treatment plant is necessary to meet the current EPA ammonia standard. The City is also requesting an **\$875,000 advance** to help fund the upfront pre-construction costs (design, environmental, property, easements and rights-of-way).

**APPLICANT’S LOCATION:**

Salem City is located in Utah County approximately 60 miles south of Salt Lake City.

**MAP OF APPLICANT’S LOCATION**



**PROJECT NEED:**

On January 28, 2015, the Water Quality Board (“Board”) authorized a planning advance to Salem City to develop a Facility Plan to address the deficiencies of their lagoon system and investigate alternatives. The City’s current UPDES permit includes a compliance schedule for the City to meet the EPA ammonia limit. The Technology Based Phosphorus Effluent Limit (TBPEL) also implements a cap of 125% on the City’s current baseline for phosphorus.

Salem City currently owns and operates a three cell discharging facultative lagoon which was constructed in 1988, designed for an average flow of 1.25 MGD and a peak flow of 2 MGD. The facility discharges to Beer Creek then ultimately flows to Utah Lake which is listed as impaired on EPA’s 303d list for total phosphorus and total dissolved solids. The City’s lagoons are unable to meet EPA’s ammonia standard and with the projected growth for the City, the

TBPEL cap will be exceeded within 5 to 6 years after the cap is established. A TMDL for total phosphorus would likely necessitate an upgrade of the lagoon system for phosphorus removal as well.

### **ALTERNATIVES EVALUATION**

Regional options were thoroughly explored and evaluated but with the selection criteria factored in, including capital and lifecycle costs, the recommended alternative was for Salem to replace their existing lagoon with a new mechanical treatment plant. The following are the alternatives that were evaluated:

- Upgrade existing lagoon
- Regional Alternatives
  - Salem/Payson/Spanish Fork Plant
  - Salem/Payson Plant
  - Salem/Spanish Fork Plant.
- Mechanical Treatment Systems
  - BNR-Oxidation Ditch (the Recommended Alternative)
  - BNR-Activated Sludge
  - BNR-Membrane Bioreactor (MBR)
  - BNR-Sequencing Batch Reactor (SBR)

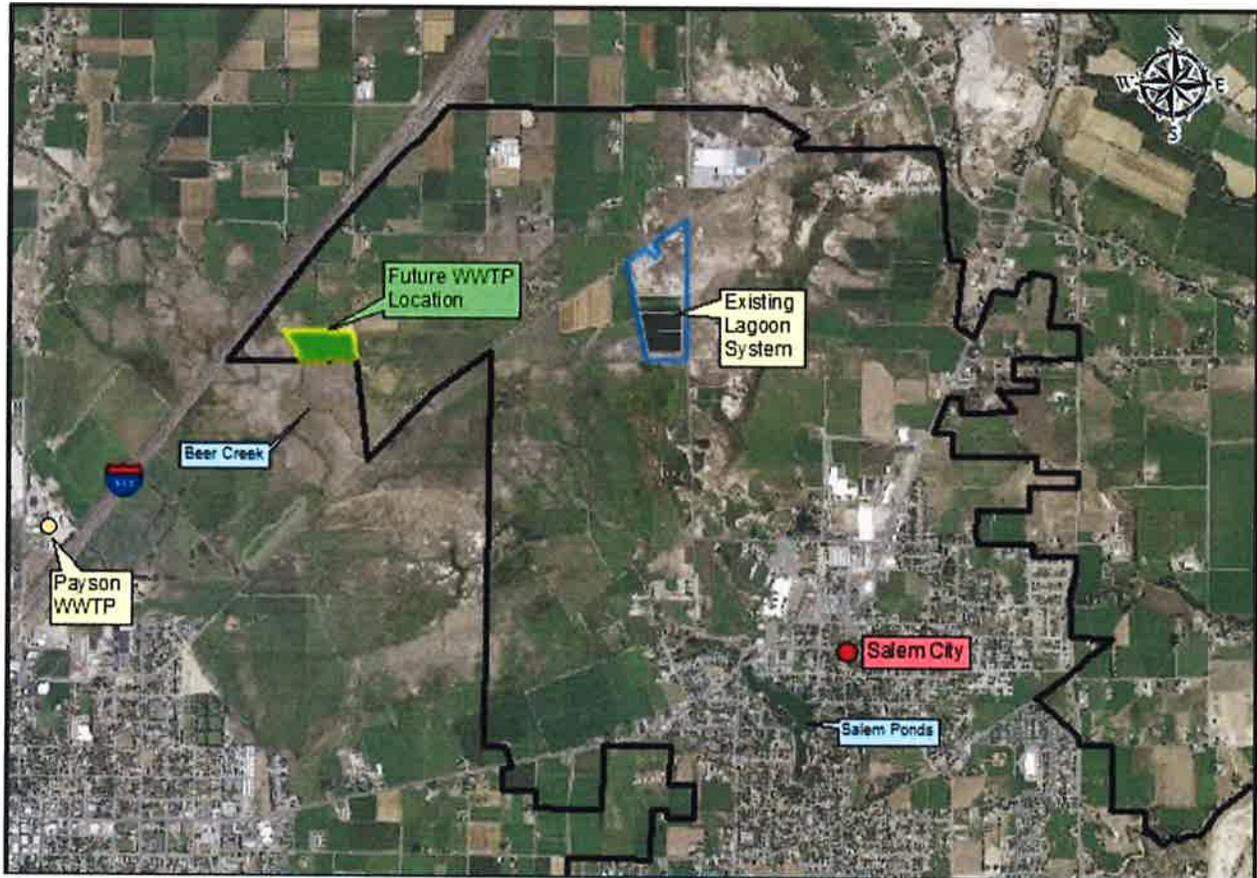
### **PROJECT DESCRIPTION:**

The recommended alternative for the City is to construct a new 1.5 mgd mechanical treatment plant (Oxidation Ditch with Biological Nutrient Removal). This alternative was selected after evaluating and ranking criteria such as capital costs, life cycle costs, effluent disposal, expandability, public perception as well as process stability, flexibility and complexity.

The treatment process will be divided into two (2) separate trains to provide for flexibility in treating varying flows and to allow for maintenance work. The following are the components of the recommended project:

- Influent Lift Station
- Headworks building, screened effluent
- Process Tank
  - Anaerobic Zone
  - Anoxic Zone
  - Aerobic Zone
- Secondary Clarifiers
- RAS/WAS Pump Station
- Scum Pump Station
- UV Disinfection
- Biosolids System

**Diagram 1**



**POSITION ON PROJECT PRIORITY LIST:**

The Salem City project is ranked No. 6 out of 16 projects on the FY 2016 Wastewater Treatment Project Priority List.

**POPULATION GROWTH:**

Population growth through the year 2040 was estimated using a 4% growth rate.

<u>Year</u>	<u>ERUs</u>	<u>Total Population</u>
2016	2,228	7,237
2020	2,818	9,157
2040	6,174	20,064

**PUBLIC PARTICIPATION AND DEMONSTRATION OF PUBLIC SUPPORT:**

On May 26, 2016 the City hosted an Open House for the residents of Salem City that staff attended.

**IMPLEMENTATION SCHEDULE:**

Public Meeting	May 26, 2016
Introduction to WQB for Funding:	June 22, 2016
WQB Funding Authorization:	August 24, 2016
* Submit Facility Plan to DWQ	August 1, 2016
Advertise EA (FONSI):	September 2016
Commence Design:	September 2016
Facility Plan Approval	October 2016
* Submit Plans & Specs	February 1, 2018
Issue Construction Permit:	March 2018
Bid Opening:	May 2018
* Commence Construction:	February 1, 2019
* Startup	August 1, 2021
* Complete Construction:	August 1, 2022

*(Dates with an asterisk are from the Compliance Schedule in the UPDES permit)*

**COST ESTIMATE:**

Task	Cost Estimate
Financial/Legal	\$ 60,000
Repay Planning Advance	\$ 75,000
Engineering – Environmental (NEPA, ADR, Surveying)	\$ 115,000
Engineering-Design	\$ 760,000
Engineering – CMS and Startup	\$ 1,010,000
Construction	\$ 9,631,000
Contingency	\$ 1,419,000
Utility Extensions (Electric, Gas, Etc.,)	\$ 300,000
Property/Rights-of-Way	\$ 500,000
DWQ Origination Fee	\$ 130,000
<b>Total:</b>	<b>\$ 14,000,000</b>

**COST SHARING:**

Salem City requests the following cost sharing approach for the project:

<b>Funding Source</b>	<b>Funding Amount</b>	<b>Percent of Project</b>
Salem City (Cash)	\$ 500,000	
Salem City (upfront costs)	\$ 500,000	7%
<u>WQB Loan</u>	<u>\$ 13,000,000</u>	<u>93%</u>
<b>Total Amount:</b>	<b>\$ 14,000,000</b>	<b>100%</b>

**ESTIMATED ANNUAL COST FOR SEWER SERVICE:**

Salem City 2014 MAGI	\$ 54,213
Affordable Monthly Rate (1.4% of MAGI)	\$ 63.25
Operation & Maintenance - Annual	\$ 1,100,000
WQB Debt Service (1.15%; 20 yrs)	\$ 731,327
WQB Required Reserves (1½ pmt/6 yr)	\$ 182,832
Existing Sewer Debt Service	\$ 0
Total Annual Cost	\$ 1,421,159
Monthly Cost / ERU	\$ 59.56
Cost calculated as % of MAGI (\$54,213)	1.32%

**STAFF RECOMMENDATION:**

This funding request is being presented as an introduction of the project. Staff comments and recommendations will be included when Salem returns with their request for funding authorization however, staff is anticipating a recommendation that the Board authorize a loan in the amount of \$13,000,000 at 1.15% with a term of 20 years.

ATTACHMENT 1

**Salem City - Water Quality Board**  
20 Year Loan Static Cost Model

Project Costs		
Financial/Legal	\$	60,000
Repay Planning Advance	\$	75,000
Engineering - Environmental	\$	115,000
Engineering - Design	\$	760,000
Engineering - CMS	\$	1,010,000
Construction	\$	9,631,000
Contingency (~15% const. cost)	\$	1,419,000
Utility Extensions (Electric, Gas, etc)	\$	300,000
Property/Rights-of-Way	\$	500,000
DWQ Origination Fee	\$	130,000
<b>Total Project Cost:</b>	<b>\$</b>	<b>14,000,000</b>

Project Funding		
Local Contribution (Cash)	\$	500,000
Local Contribution (upfront expenses)	\$	500,000
WQB Loan	\$	13,000,000
<b>Total Project Cost:</b>	<b>\$</b>	<b>14,000,000</b>

Current Customer Base & User Charges	
Total ERU's (Projected 2020)	2,818
Salem City MAGI (2014):	\$54,213
Affordable Monthly Rate at 1.4%	\$63.25
Current Impact Fee	\$1,792.00
<sup>1</sup> Current Monthly Fee (per ERU)	\$24.00
Existing O&M expenses Treatment & Collection	\$507,000
New O&M expenses Treatment & Collection	\$1,100,000
Existing Sewer Debt Service	\$82,000

<sup>1</sup> Calculated assuming 10,000 gal/month usage \$24 base + \$0.50/1000 (over 10,000 gal)

Funding Conditions	
Loan Repayment Term:	20
Reserve Funding Period:	6

**ESTIMATED COST OF SEWER SERVICE**

WQB Loan Amount	WQB Loan Interest Rate	Annual WQB Loan Debt Service	WQB Loan Reserve	WQB Debt Service & Loan Reserves	Annual Sewer O&M Cost	Total Annual Sewer Cost	Monthly Sewer Cost/ERU	Sewer Cost as a % of MAGI
13,000,000	0.00%	650,000	162,500	812,500	1,100,000	1,912,500	56.56	1.25%
13,000,000	1.00%	720,399	180,100	900,499	1,100,000	2,000,499	59.16	1.31%
<b>13,000,000</b>	<b>1.15%</b>	<b>731,327</b>	<b>182,832</b>	<b>914,159</b>	<b>1,100,000</b>	<b>2,014,159</b>	<b>59.56</b>	<b>1.32%</b>
13,000,000	1.25%	738,665	184,666	923,331	1,100,000	2,023,331	59.83	1.32%
13,000,000	1.50%	757,195	189,299	946,493	1,100,000	2,046,493	60.52	1.34%
13,000,000	2.00%	795,037	198,759	993,797	1,100,000	2,093,797	61.92	1.37%
13,000,000	2.50%	833,913	208,478	1,042,391	1,100,000	2,142,391	63.35	1.40%
13,000,000	3.00%	873,804	218,451	1,092,255	1,100,000	2,192,255	64.83	1.43%