# AGENDA
## LOVELAND CITY COUNCIL STUDY SESSION
## TUESDAY, JULY 14, 2015
## CITY COUNCIL CHAMBERS
## 500 EAST THIRD STREET
## LOVELAND, COLORADO

**The City of Loveland is committed to providing an equal opportunity for citizens and does not discriminate on the basis of disability, race, age, color, national origin, religion, sexual orientation or gender. The City will make reasonable accommodations for citizens in accordance with the Americans with Disabilities Act. For more information, please contact the City's ADA Coordinator at bettie.greenberg@cityofloveland.org or 970-962-3319.**

**STUDY SESSION 6:30 P.M. - STUDY SESSION AGENDA**

**1. WATER AND POWER (presenters: Chris Matkins and Roger Berg, 60 min)**

**WASTEWATER TREATMENT PLANT PROCESS & FINANCING PROJECT**

**Wastewater Treatment Plant (WWTP) 10-Year Capital Improvement Plan Requirements**

This is an information only item. Driven primarily by regulatory changes, capacity needs, and aging infrastructure, the Wastewater utility's 10-year capital improvement program (CIP) includes several capital projects with costs exceeding projected revenues and fund balances over the next ten years. To have sufficient funds to complete these necessary projects, the utility will need to secure $6,000,000 in debt financing in 2016. Three financing options that are available include bank loans, state revolving fund (SRF), and revenue bonds. In addition, the CIP includes several major projects from 2019 through 2024 that will likely require an additional $20,000,000 in debt financing in 2020. This 10-year capital plan was unanimously approved by the LUC at their June 2015 meeting. Staff's presentation will focus on the project drivers with the financial information to follow at a July 28, 2015 City Council Study Session.

**ADJOURN**

**CITY OF LOVELAND**
WATER & POWER DEPARTMENT
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(970) 962-3000 • FAX (970) 962-3400 • TDD (970) 962-2620

**AGENDA ITEM:** 1
**MEETING DATE:** 7/14/2015
**TO:** City Council
**FROM:** Steve Adams, Water and Power Director
Chris Matkins, Water Utilities Manager
Roger Berg, Water & Power
**PRESENTER:** Chris Matkins, Water Utilities Manager & Roger Berg, Senior Civil Engineer

**TITLE:**
Wastewater Treatment Plant (WWTP) 10-Year Capital Improvement Plan Requirements

**RECOMMENDED CITY COUNCIL ACTION:**
Information only item.

**SUMMARY:**
This is an information only item. Driven primarily by regulatory changes, capacity needs, and aging infrastructure, the Wastewater utility's 10-year capital improvement program (CIP) includes several capital projects with costs exceeding projected revenues and fund balances over the next ten years. To have sufficient funds to complete these necessary projects, the utility will need to secure $6,000,000 in debt financing in 2016. Three financing options that are available include bank loans, state revolving fund (SRF), and revenue bonds. In addition, the CIP includes several major projects from 2019 through 2024 that will likely require an additional $20,000,000 in debt financing in 2020. This 10-year capital plan was unanimously approved by the LUC at their June 2015 meeting. Staff's presentation will focus on the project drivers with the financial information to follow at a July 28, 2015 City Council Study Session.

**BUDGET IMPACT:**
☐ Positive
☒ Negative
☐ Neutral or negligible

Securing long-term financing to fund these necessary capital projects will have a negative impact on the 10-year Wastewater Financial Plan. On July 28, 2015, Staff will present findings on the current status of the 2015 Draft Water and Wastewater Cost of Service/Rate Study and what financial alternatives exist.

**BACKGROUND:**

The Wastewater 10-Year CIP includes three major capital projects at the Wastewater Treatment Plant (WWTP) in 2016 and 2017 that are driving the need to seek loan funding. Each project is described below:

**1) Biological Nutrient Removal (BNR) and Organic Capacity Increase**

This project is driven by:

a. *Reduce Point Source Nutrient Loadings to Receiving Streams Required by EPA Regulations:* To discharge treated wastewater effluent to the Big Thompson River, the City is authorized by a National Pollutant Discharge Elimination System permit through the Colorado Department of Public Health and Environment (CDPHE). The City's current permit expires in October of this year and is currently in the renewal stage. CDPHE, in accordance with Regulation 85, has advised that the new permit will include discharge limits on total phosphorus (1 mg/L) and total inorganic nitrogen (15 mg/L). Both are new limits being added to our permit to improve water quality in the Big Thompson River. In 2013, we were awarded a $1,000,000 grant from CDPHE to help fund the improvements needed to meet these new effluent limits. The improvements will generally consist of additional secondary treatment volume, replacement of diffusers in existing basins, aeration (blower) improvements, and modifications to the existing clarifiers to improve efficiency.

b. *Increase the WWTP Organic Treatment Capacity of the Plant to Facilitate Continued Growth:* CDPHE Regulations require that design be underway when 80% of capacity is reached and that construction be under way at 95% of capacity. In 2014, the maximum month organic loading at the WWTP was 86% of capacity.

   So far in 2015 organic loading continues to increase, which gives the Utility an opportunity to combine nutrient and capacity increases to give our ratepayers excellent economies of scale for construction costs. Under a worst-case scenario, if capacity expansion is not in place prior to the 95% metric, the City could be faced with a restriction in the ability to grant building permits until the plant capacity is addressed. As part of the BNR project, the goal is to increase the organic loading capacity from 20,700 lb/day of biological oxygen demand (BOD) to 27,800 lb/day of BOD, which will be in-line with a future hydraulic expansion from 10 to 12 million gallons per day (MGD).

The total estimated project cost is $9,000,000. Design work has just begun and construction is planned for 2016 and 2017.

**2) Anaerobic Digester Renovation**

As part of a planned project in 2013, a consulting engineering firm (Brown and Caldwell) was selected to conduct a condition assessment and evaluation of the existing anaerobic digester system built in 1986. While some components have been replaced over the years, much of the facility is original and nearing the end of its useful life. The report recommended completing a total facility renovation, including the following primary items:

- Construct a pre-digestion storage tank to blend the primary and secondary sludge (homogenization of sludge) and allow a more constant feed rate into the digesters
- Replace the gas mixing system with a pumped mixing system
- Replace original boiler/heat exchanger with a segregated boiler and heat exchanger
- Fire Code Compliance (safety): Replace all electrical equipment in a separate room, and replace the HVAC system to provide sufficient air exchanges
- Replace all piping and valves
- Replace gas flare
- Rehabilitate corroded digester covers (sand blast and re-coat)
- Install computerized remote monitoring and control system (SCADA)

The total estimated project cost is $8,800,000. Design work is nearly complete and construction is planned for 2016. This investment will ensure this component of the system functions reliably, allowing the City to continue to meet the State permit requirements for solids disposal.

**3) Installation of Headworks Step Screens.**

This project includes replacing the existing influent grinders with a more robust screening system called Step Screens to more reliably protect all plant equipment and processes. Mechanical screening to remove rags, trash, and other debris from the flow entering the wastewater treatment plant is the first treatment action taken by the plant. Currently some rags, plastic, and other debris pass through the grinders and bind up in pumps, pipes, mixers, and other locations.

New influent screens will help:

- Protect all downstream pipes and equipment from clogs and damage
- Improve the efficiency of the biological process and thereby improve effluent quality and reduce the potential for discharge violations
- Eliminate the annual cost of refurbishing the grinders ($75,000/year)
- Reduce energy consumption by improving efficiency of pumps and mixers (which run 24/7)
- Greatly reduce Operations & Maintenance (O&M) efforts needed to remove the material from pumps, mixers and piping
- Eliminate the weekly O&M efforts needed to clean the existing grinders

The total estimated project cost is $2,000,000, and construction is planned for 2017.

**FUNDING**

In order to maintain the required fund balances at the end of 2016 and 2017 and complete all proposed capital projects, the Wastewater Utility will need to secure debt financing in the amount of $6,000,000 in 2016. Potential sources of loan money include bank loans, State Revolving Fund (SRF), and revenue bonds. The 10-year Financial Plan includes debt service payments based on a 20-year loan at 3.2% interest. The Utility has been seeking other grant opportunities, but so far has not been successful in receiving grant funding for these projects.

**LONG TERM WWTP PROJECTS**

The 10-year CIP also includes four major projects at the WWTP between 2019 and 2024 that will require significant rate increases, an additional loan, or a combination. The current 10-year Financial Plan includes modest rate increases through those years and a $20,000,000 loan in 2020 in order to fund the proposed projects. The projects and drivers are listed in the table below:

| *Project* | *Cost* | *Year* | *Driver* |
|---|---|---|---|
| Anaerobic Digester No. 3 | $20.6 M | 2020 | Capacity & Regulatory |
| Final Clarifier No. 4 | $5.4 M | 2022 | Capacity |
| Digested Sludge Dewatering | $16.5 M | 2023 | Sludge Hauling Cost |
| Primary Clarifier No. 3 | $5.7 M | 2024 | Capacity |

**REVIEWED BY CITY MANAGER:**

William D. Cahill

**LIST OF ATTACHMENTS:**

PowerPoint Slides

Loveland Water and Power

# Wastewater Treatment Plant 10-Year Capital Improvement Plan Requirements

Roger Berg, Senior Civil Engineer
Chris Matkins, Water Utilities Manager

City Council Study Session
July 14, 2015

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# Agenda

Loveland Water and Power

1. Discuss capital drivers
2. Regulatory – nutrients
3. Regulatory – organic capacity
4. Aging infrastructure
5. Headworks screening issues
6. Project costs and timeline
7. Questions

*Please note that this presentation will focus on the project drivers with the financial information to follow at a July 28, 2015 City Council Study Session.*

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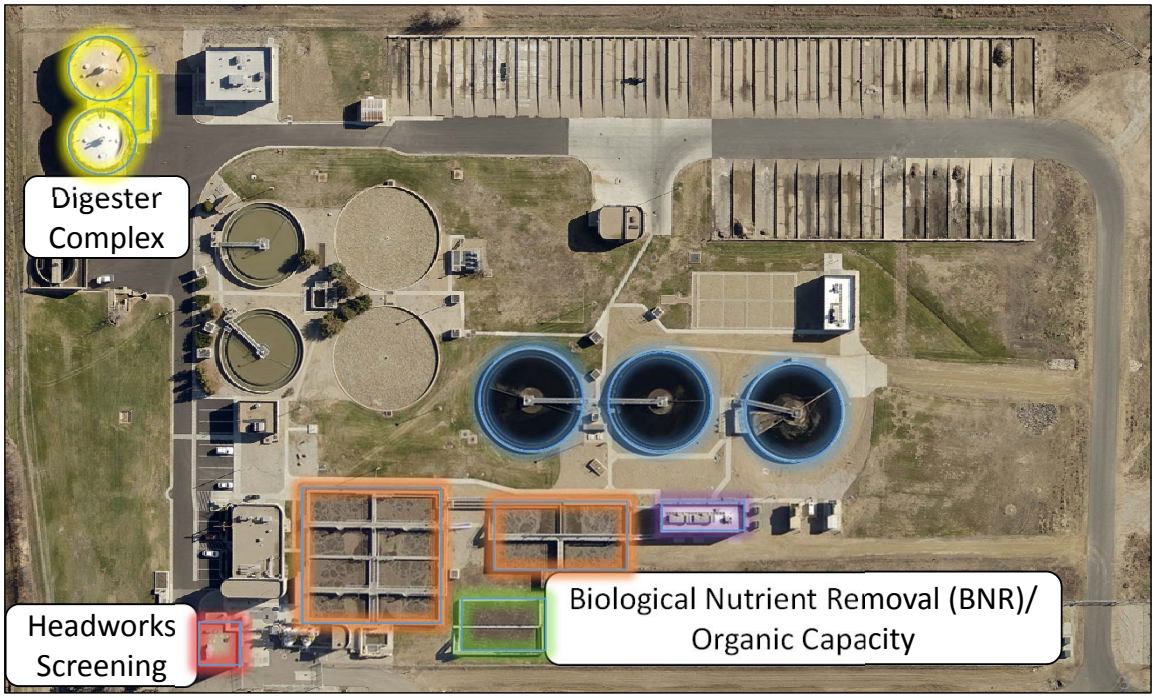
# Wastewater Treatment Plant Aerial Photo

Loveland Water and Power



# Wastewater Capital Drivers (2016-2017)

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- **Regulatory:** Nutrient Limits & Organic Capacity
- **Aging Infrastructure:** Existing Anaerobic Digester Complex
- **Headworks Screening Issues**

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# Regulatory - Nutrients

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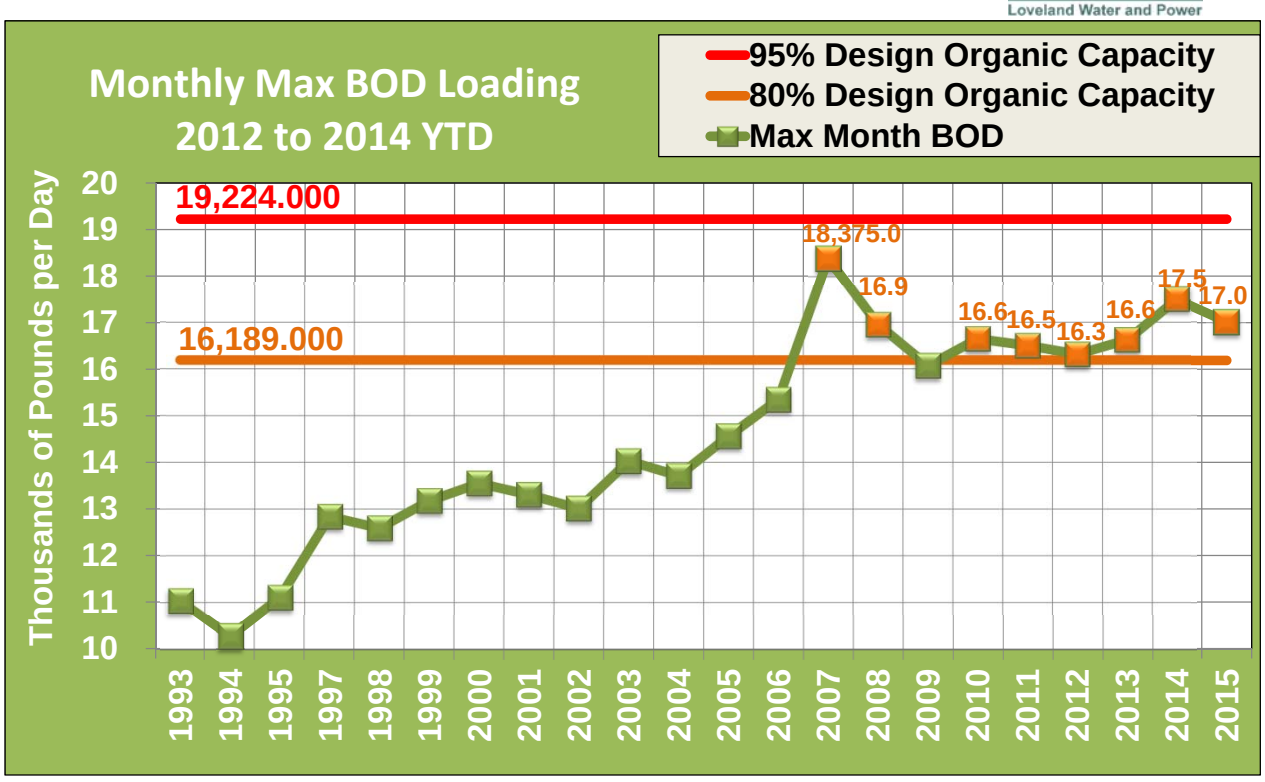
## Addition of Nutrient Limits to Discharge Permit

- Phosphorous Limit: 1 mg/L
- Inorganic Nitrogen Limit: 15 mg/L
- Need to consistently meet regulations by 2020
- CDPHE grant funds expire in 2016



# Regulatory – Organic Capacity



# Regulatory – Organic Capacity

Loveland Water and Power

## Organic Capacity Increase Needed to Meet Demand

- 2015 Max Month at 84% of rated capacity
- Combined organic and nutrient improvements yields overall ratepayer savings

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# Biological Nutrient Removal (BNR) and Organic Expansion

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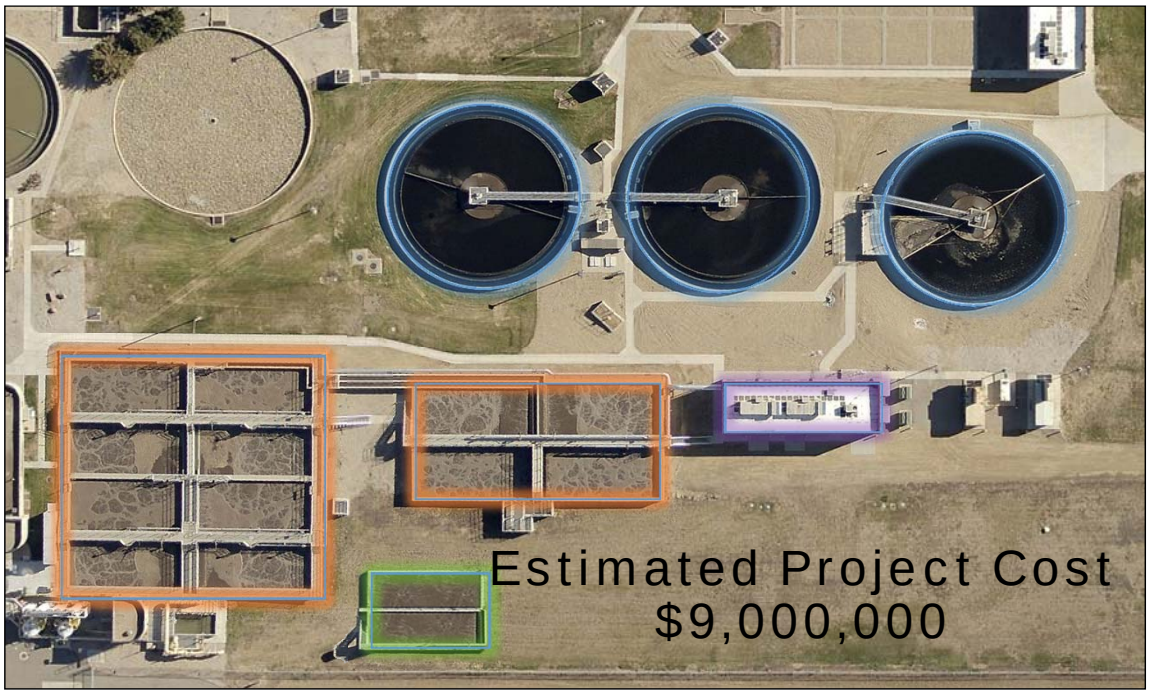


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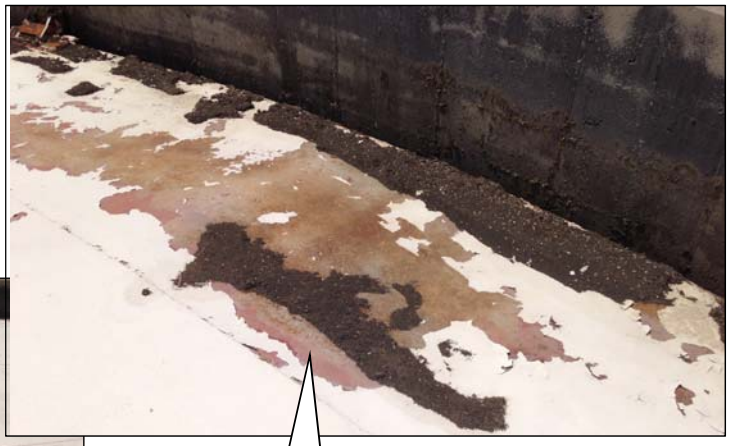
# Digester Complex

Loveland Water and Power

# Digester Cover

Loveland Water and Power



Odor Concerns

Paint Corrosion

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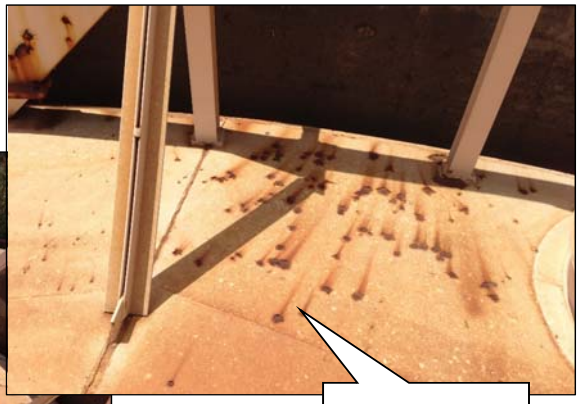
# Digester Cover

Loveland Water and Power



Corrosion

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# Safety Concerns

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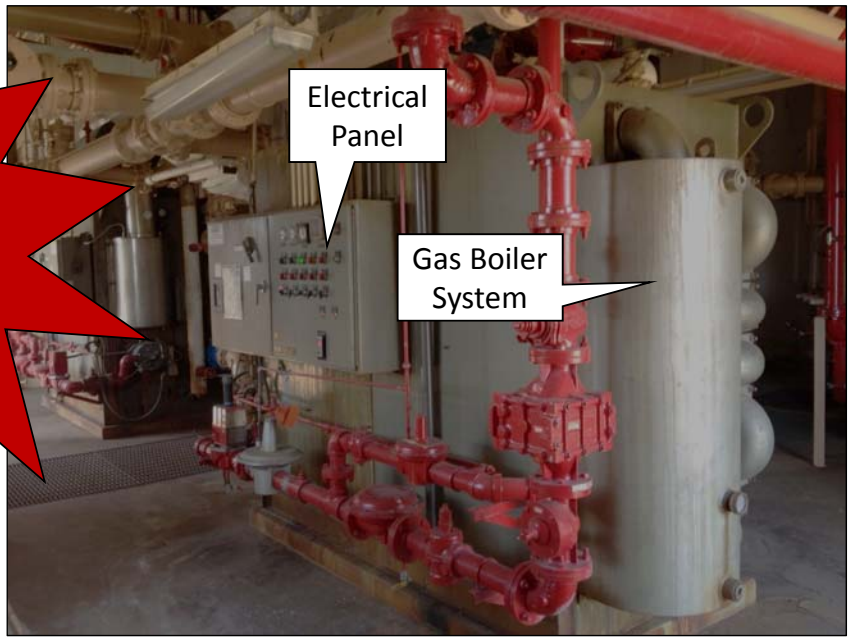
The close proximity of the electrical control panel to the gas boiler system creates an arc explosion safety hazard.

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# Aging Infrastructure

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## Anaerobic Digester 1 & 2 Renovations

- Update 30-year old facility
- Become compliant with current code and improve safety
- Improve efficiency
- Replace critical equipment
- Process optimization with new electronics

***Estimated Project Cost $8,800,000***

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# Headworks Screening

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# Existing Channel Grinder

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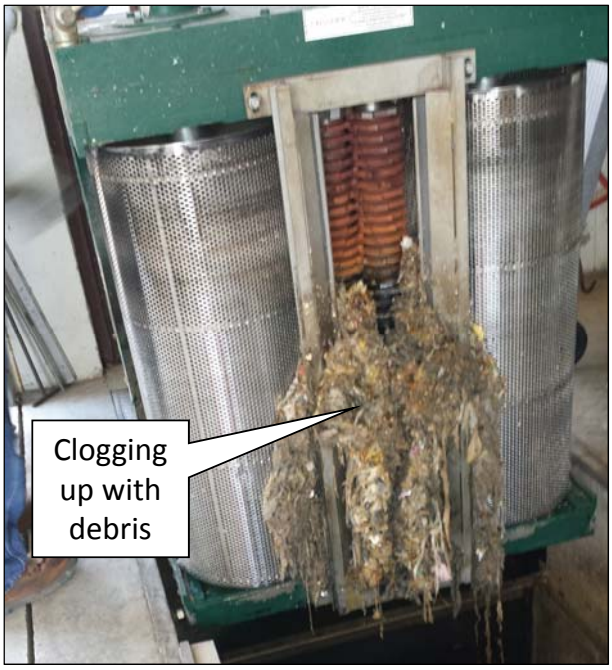


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# Submersible Pump

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Debris clog the submersible pumps

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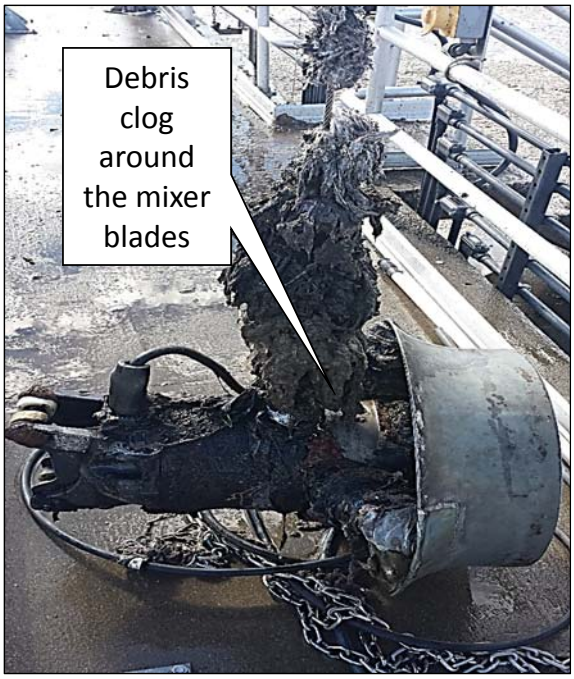
# Mixer from Aeration Basin

Loveland Water and Power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# Headworks Screening Issues

Loveland Water and Power

- **Existing System: Channel grinders**
- **Rags, plastic, trash, and other debris enters plant treatment process**
- **Reducing unwanted material will reduce potential for discharge violations**

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# Proposed Improvement: Step Screen

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***Estimated Project Cost: $2,000,000***

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# Conceptual Identification of Funding Options

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**Proposed Loan Amount in 2016: $6,000,000**

## Funding Options

- Bank Loan
- State Revolving Fund Loan (SRF)
- Revenue Bond

***Debt Service in currently proposed 10-year Wastewater Financial Plan is based on 20-year loan at 3.2% interest***

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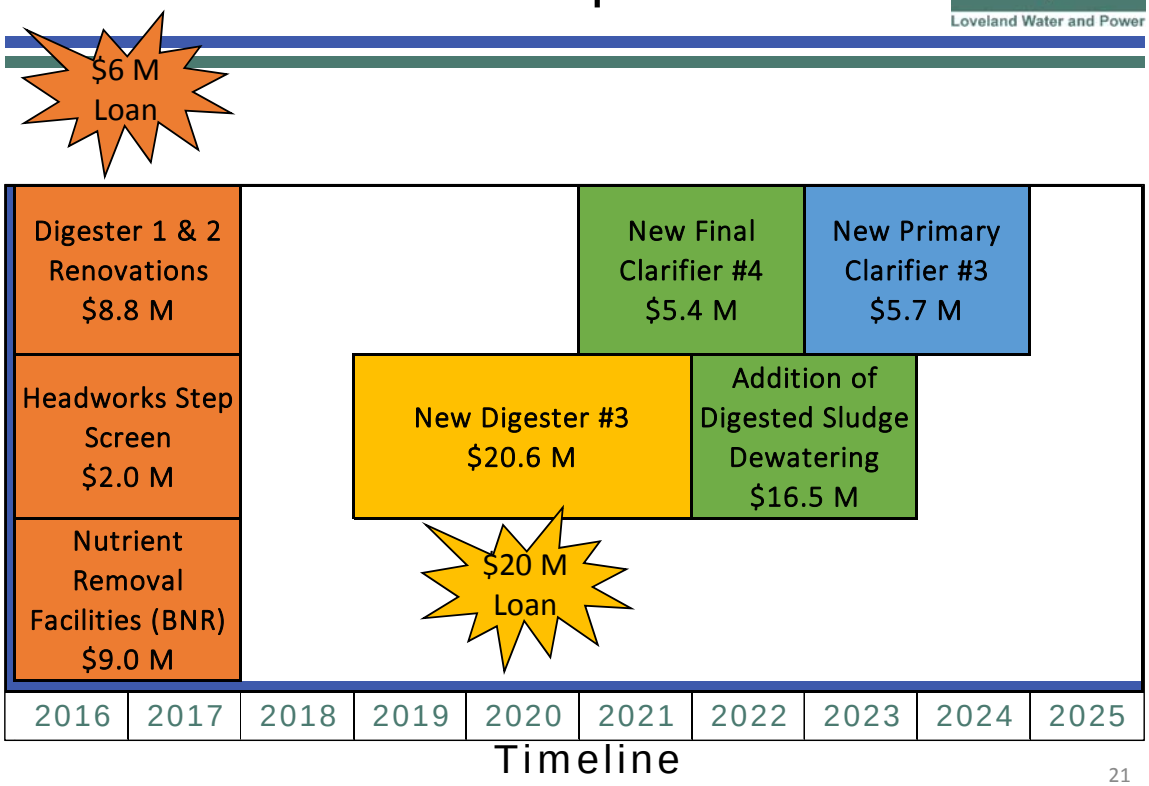
# 10-Year WWTP Capital Plan

Loveland Water and Power

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Loveland Water and Power

# Questions?

*Please note that this presentation will focus on the project drivers with the financial information to follow at a July 28, 2015 City Council Study Session.*