

"Making a difference through excellence of service"



CITY OF WARRENTON

WORK SESSION

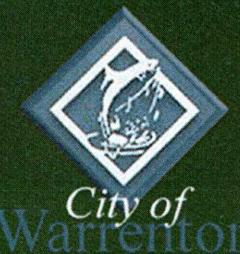
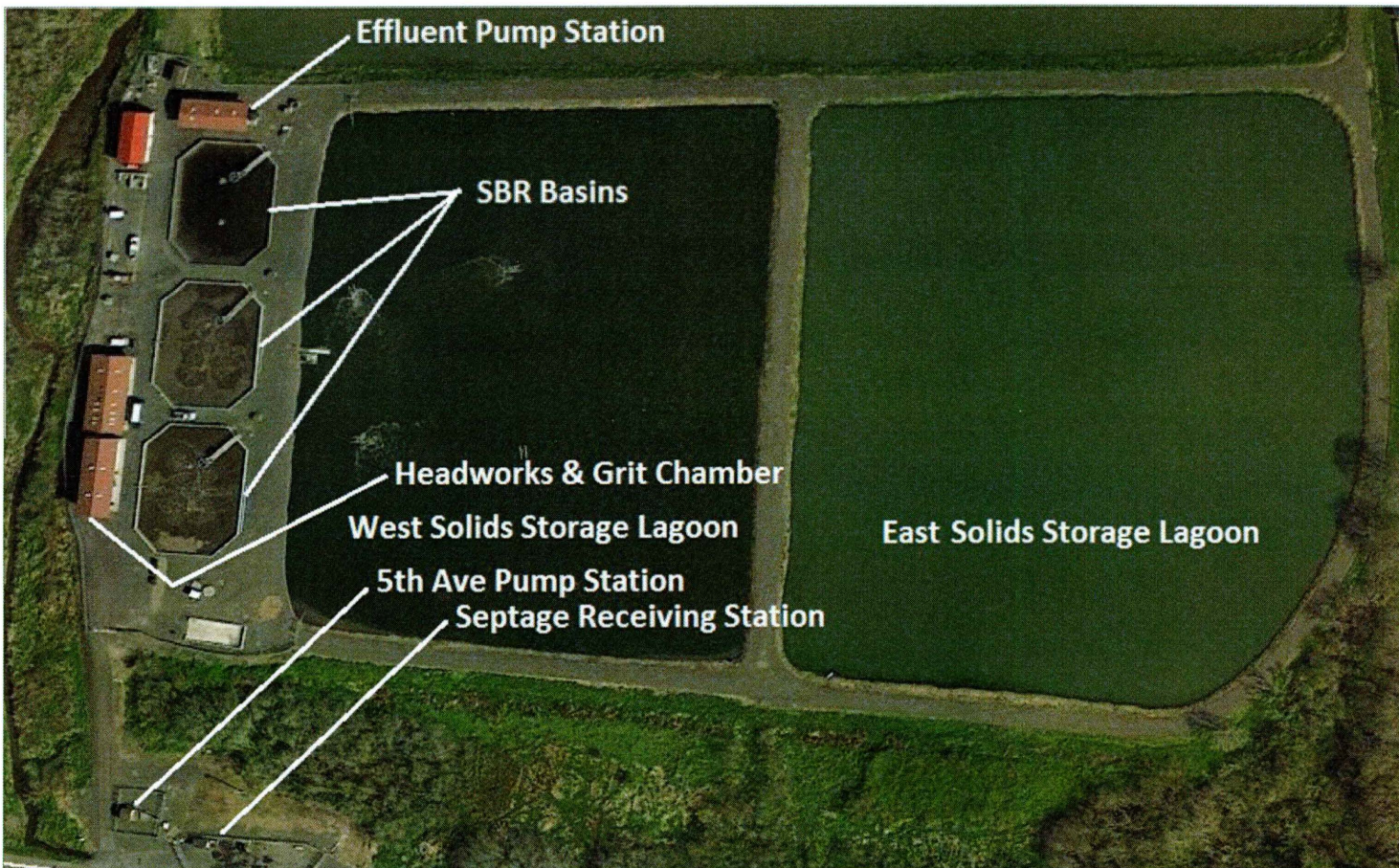
AGENDA

**City Commission of the City of Warrenton
Tuesday, March 12, 2019 – 5:15 P.M.**

**Warrenton City Commission Chambers
225 South Main Avenue
Warrenton, OR 97146**

- 1. Call to Order**
- 2. Roll Call**
- 3. WWTP Capacity Analysis and I&I Study**
- 4. Adjourn**

Warrenton City Hall is accessible to the disabled. An interpreter for the hearing impaired may be requested under the terms of ORS 192.630 by contacting Dawne Shaw, City Recorder, at 503-861-0823 at least 48 hours in advance of the meeting so appropriate assistance can be provided.



WWTP Capacity Evaluation

March 12, 2019



Kennedy Jenks

Presenter | Shawn Spargo
| Dean Wood

Agenda

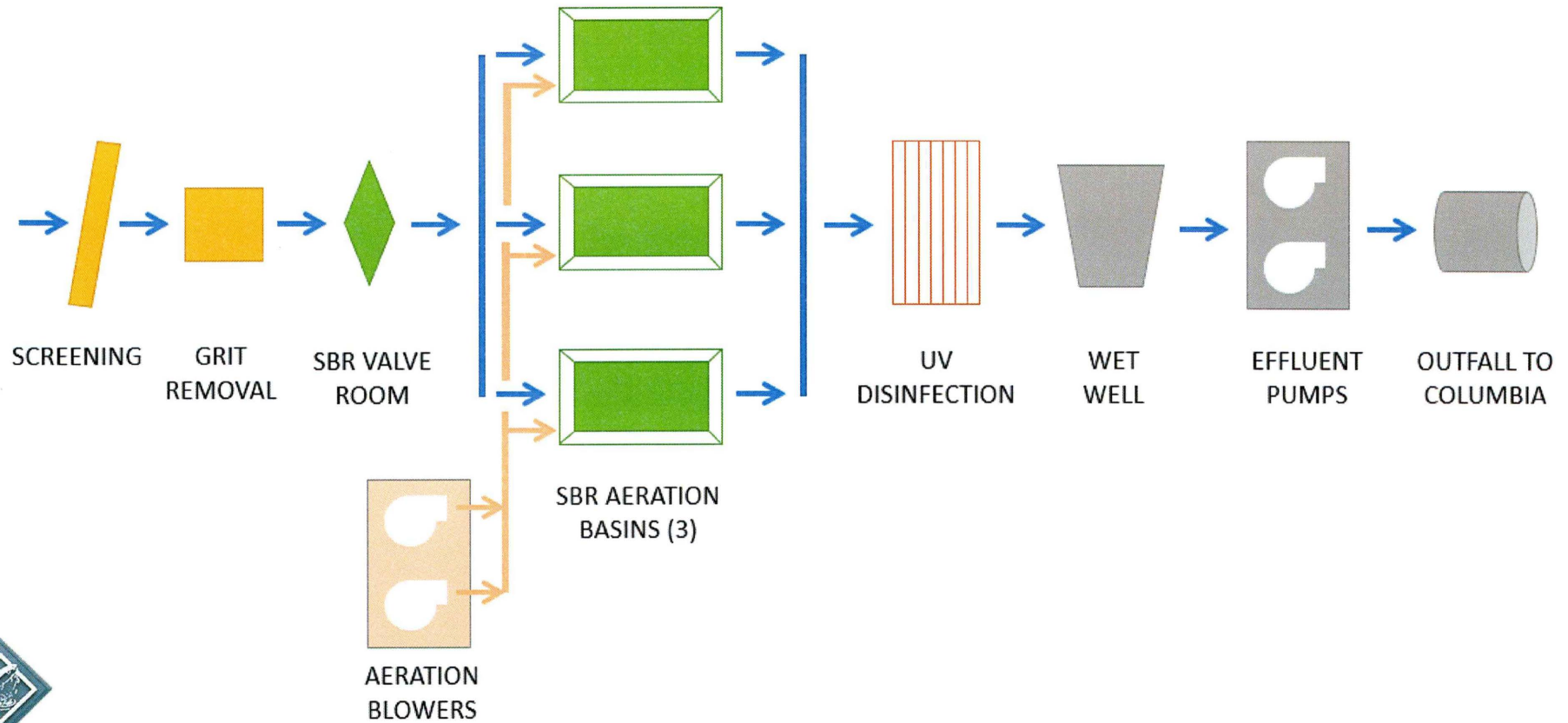
- Existing WWTP
- Discuss Current Capacity Limitations
- Options for Increasing Capacity
- Next Steps



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KJ | Kennedy Jenks

Existing WWTP



Capacity Evaluation Findings

WWTP Capacity

- Reach capacity in ~2022 (ahead of the 20 year design life)
 - BOD/TSS are measures of waste strength
 - BOD/TSS loads to be exceeded in 2022
 - Hydraulic flow capacity to be exceeded in 2024

Permit Limits

- Plant currently meets discharge permit requirements despite nearing capacity

Peak Flows Challenges

- Require all three sequencing batch reactor basins to be in service
 - Extra effort is required to maintain effluent quality each time it rains



Capacity Projections

Parameter		2026 Plant Design Loads/Flows ^a (ppd/MGD)	Current (2017) Loads/Flow (ppd/MGD)	Future (2026) Loads/Flow (ppd/MGD)	Current (2017) % of Design Capacity	Future (2026) % of Design Capacity
TSS	Max Monthly Average	3,600	4,139	5,268	115%	146%
	Annual Average	2,500	2,179	3,290	87%	132%
BOD	Max Monthly Average	3,100	2,701	3,438	87%	111%
	Annual Average	2,200	2,025	2,913	92%	132%
Flow	Max Day	2.3	2.6	3.4	112%	147%
	MMWWF	1.5	1.3	1.6	85%	108%
	Annual Average	1.1	1.0	1.2	88%	110%

a) Design Data & Criteria Mechanical Equipment List and Piping, Conformed, City of Warrenton, OR Wastewater Improvement Projects, HLB & Associates Incorporated, February 7, 2007.

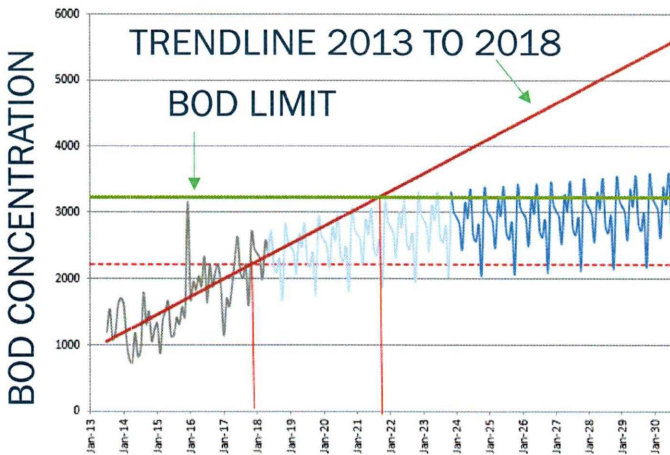
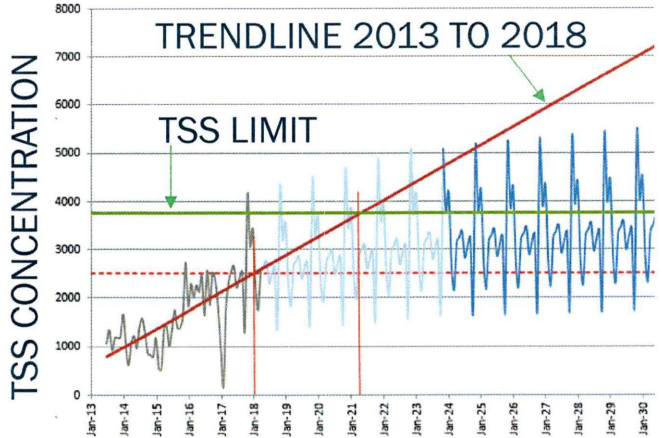


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Capacity Projections

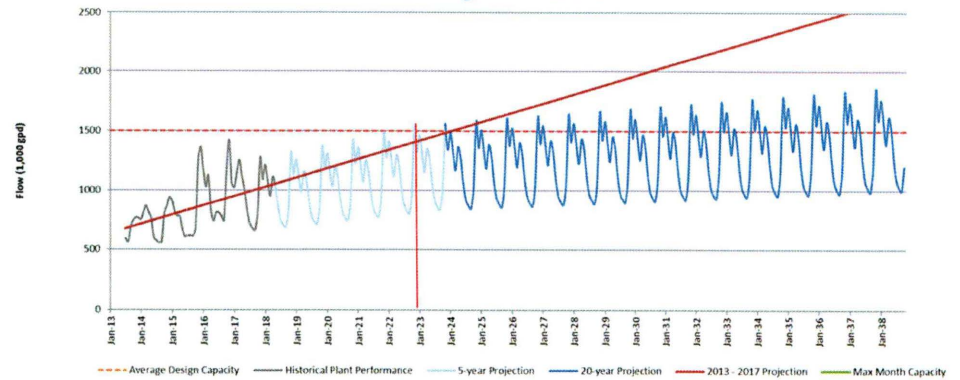


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Existing Plant Capacity

INFLUENT WASTEWATER FLOW & LOADING DESIGN CRITERIA			
	Current WWTP Influent	Design Year	
POPULATION EQUIVALENTS	8,000	12,000	
FLOWS, million gallons/day, mgd			
MMDWF	0.70	1.0 mgd	
Annual Average	0.76	1.1	
MMWWF	1.1	<u>1.5</u>	
Maximum day	1.6	2.3	
Hydraulic, PIF	3.7	4.7	
LOADING, pounds per day			
BOD, annual average	1,600	2,200	
Max mon avg	2,210	3,100	
TSS, annual average	1,600	2,500	
Max mon avg. summer	2,400	3,600	
Ammonia, max mon avg. summer	180	300	
SEPTAGE NOT ALLOWED			
EPA RELIABILITY CLASS I			
NPDES PERMITTED EFFLUENT WASTE LOAD ALLOCATION/DISCHARGE LIMITS			

Figure 2-3 Historical Plant Performance and Future Capacity Projections: Average Annual Flow



Three SBR Capacity VS A Fourth SBR

PARAMETER	2026 WWTP DESIGN (PPD)	FOURTH SBR WARRENTON WWTP FLOW AND LOADS LIMITS (PPD)
	EXISTING PLANT CAPACITY	ADDING A FOURTH SBR
MAX MONTH TSS	3,600	4,800
AVG TSS	2,500	3,333
MAX MONTH BOD	3,100	4,133
AVG BOD	2,200	2,933
2026 DESIGN FLOW (MGD)		
MAX DAY	2.3	3.07
MWMWWF	1.5	2.0
AVG FLOW	1.1	1.47

2018 Population

5,500

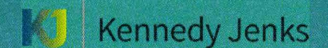
Equivalent Dwelling Units (EDU's)

5,051 – 3 SBR Design

2,020 consumed by I/I

2,850 current domestic load

~0.5 EDU Per Capita



Anticipated Growth

Based on Development

Year	Average Flow		
	Projected EDUs	Development Based Growth Rate	Water Master Plan Annual Growth Rate*
2018-2023	1,106	3.9%	1.3%
2023-2038	1,246	1.2%	1.5%
2018-2038	2,352	1.9%	1.4%

*Source: Water Master Plan, MurraySmith, January 2018, Adjusted for revised EDUs provided by City on 6/25/18

Adding a Fourth SBR

	2026 Design Flow (MGD)
Max Day	3.07
MMWWF	2.0
Average Flow	1.47
EDUs	6,730



Current Population = 5,600

2038 at 1.4% growth, pop. 7,400 = 4,580 EDU

2038 at 1.9% growth, pop. 8,160 = 5,200 EDU

Typical WW Design flow per capita is 240 gal/capita/d

Current ADF = 1.1 MGD

At 1.4% = 1.8 MGD

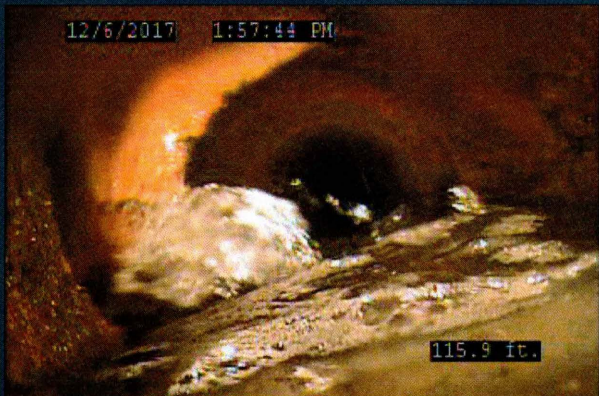
At 1.9% = 1.96 MGD

With Inflow & Infiltration @ 2x base flow = 2,020 EDU

At 1.4% = 3.6 MGD, Max Month = 6,600 EDU

At 1.9% = 3.9 MGD, Max Month = 7,200 EDU

Options to Maintain Compliance



Sewer Inflow on Main St near Hwy 104



Septage Hauling

1

Reduce Inflow & Infiltration in collection system

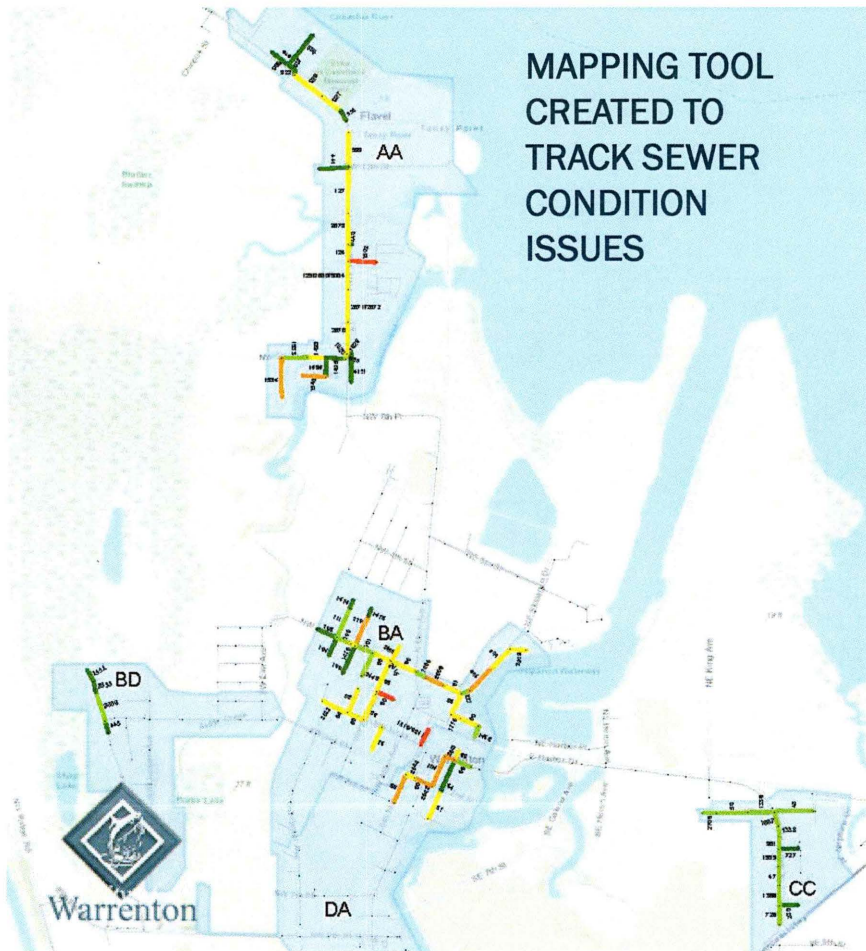
2

Moratorium on development, septage hauling or implementation of Industrial Discharge Program

3

Plan for a near term Plant Expansion

Options to Maintain Compliance



25,000

Feet of pipeline inspected,
~14% of collection System

127

Manholes inspected

~21%

Of Collection System

11 Pipes
14 Manholes

Need immediate repair

\$200K

4-year CIP schedule aimed at reducing I&I
based on repairing the worst problems.

\$30-\$50K

Historical annual spent on collection
system rehabilitation

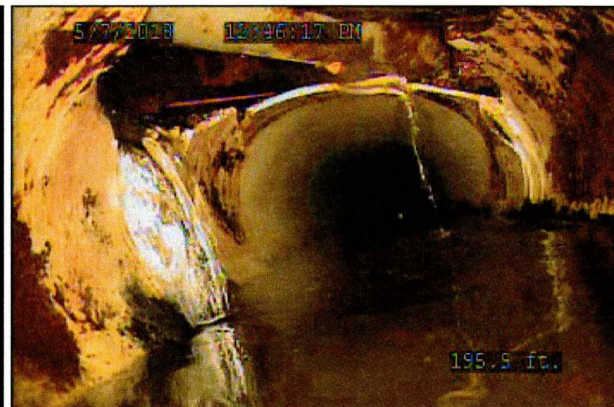
Problems Identified During I/I Study

Main St between 1st and Hwy 104



- Improperly abandoned laterals

NW Warrenton Dr. at NW 11th St.



- Pipe Structural Damage

Main St between 2nd and 3rd Streets



- Pipe condition issues and defects

Slide 12

AM1 Anita Marsh, 3/8/2019

Potential Results of Reduced I/I

I/I results in > **2x** average flow during a rain event

or

> **2.0 MGD**

This is **40%** of the plant capacity

For an **\$800,000** investment
~**10%** of total I/I could be reduced

Equivalent to **200 EDUs**

or

\$4,000/EDU of restored capacity

Some I/I will be reduced as a result of pending changes in the WMC that will minimize improper sewer connections

- Rain drains, broken cleanouts, etc.
- Impact is difficult to quantify

Equivalent Dwelling Units (EDU's) occupied
Plant currently represents

5051 EDU

I/I represents **2,020 EDU**

- Law of diminishing returns
- Increasing cost per EDU as most of the easy repairs are made.



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Option 2: Industrial Discharge Program or Limit New Connections

Monitor Industrial users and manage Industrial User Program

- Annual Cost = \$93,000*
- *Assumed 20 restaurants/food processors would represent ~100 EDU*

Extra-strength charges

- Would offset industrial discharge program cost
- Small impact on plant capacity

Reporting and potential pretreatment requirements for industrial users

- Goal to reduce slug loading on WWTP

Suspend septage receiving

- Currently generates \$150K to \$200K/year in revenue from tipping fees
- Reduce slug loads on the plant

Impose limits on new development

- A last resort

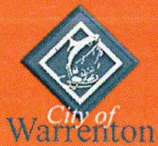


Option 3: WWTP Upgrade

KJ identified two improvement alternatives in 2016 Industrial User Study

Septage Equalization Tank	Limited Plant 4 th Sequencing Batch Reactor Basin
Goal: Continue to receive septage	Goal: Accommodate minor growth
Additional Capacity Created: 400 EDU	Additional Capacity Created: 1,680 EDU
Estimated Capital Cost: \$1.3M	Estimated Capital Cost: \$4.1M

Depending on funding sources more extensive upgrades may be required
Projected 1,750 to 2,350 EDU's added by 2038



Cost Comparison

In Terms of EDUs		
Alternative	Description	Cost
I/I Reduction	Four year CIP to reduce 10% of collection system I/I	\$4,000/EDU ~200 EDU
WWTP Upgrade, Option 1	Septage Equalization Tank	\$3,200/EDU* ~400 EDU
Fourth Sequencing Batch Reactor Basin	Fourth Sequencing Batch Reactor Basin, Headworks Improvements, Piping and Control System upgrades	\$2,400/EDU ~1,680 EDU
Limiting Industrial Discharge	<ul style="list-style-type: none"> • Limited impact due to number of industrial users ~100 EDU • High Strength charges would offset the cost of the IUP • Negative impact on businesses • Not recommended 	

*Including tipping fees, this is a net zero project cost assuming a 10 year project life.

Based on the cost to add capacity we recommend the City begin planning for an upgrade to the WWTP



Slide 16

AM1

Anita Marsh, 3/8/2019

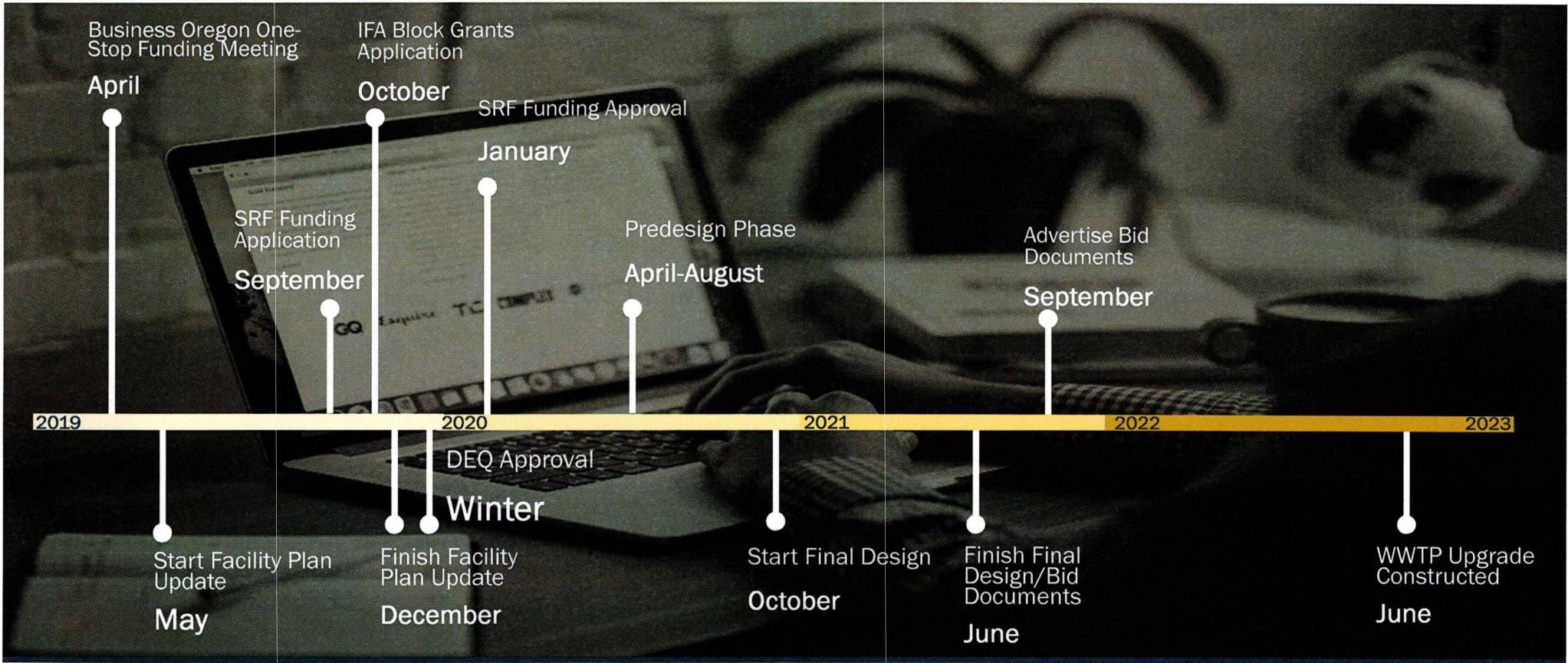
Next Steps

- Facility Plan/Rate Study
- Funding Applications
- Predesign
- Design
- Bid Documents
- Construction

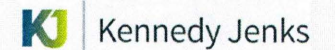


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Timeline to Complete Upgrades



Questions/General Discussion



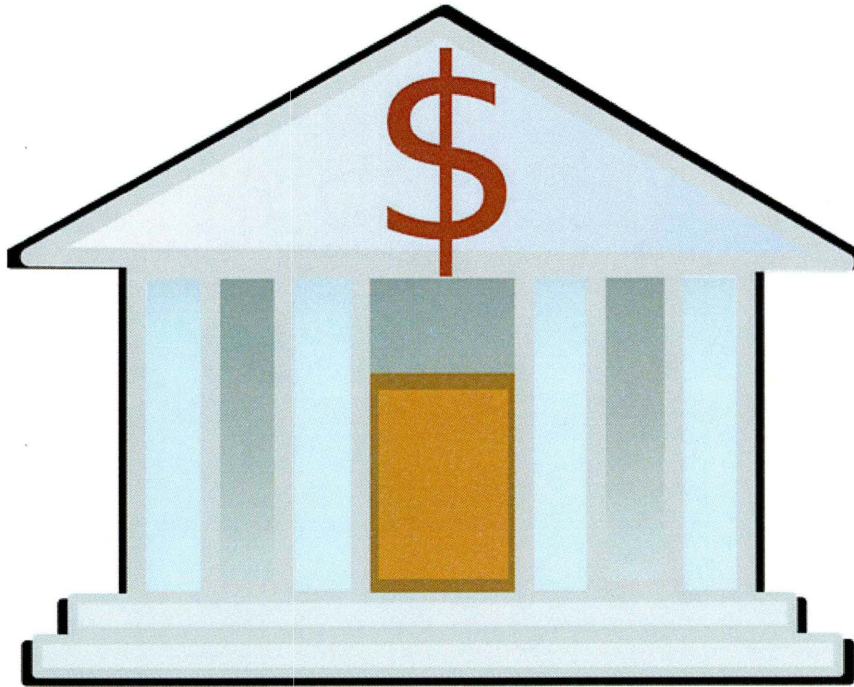
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Funding Options



- Business Oregon, One-Stop Meeting
- Oregon DEQ – State Revolving Fund – up to \$500k principle forgiveness for “green projects”
- USDA – Rural Program Loans
- IFA – Block Grants (used to finance Capacity Evaluation and Inflow/Infiltration Study)
- Municipal Bond –
 - ~ 5 years of debt obligation remains on 2006 WWTP upgrade loan



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