

Date of Meeting: January 3, 2019

Meeting Topic: City of Stevenson Additional Wastewater Alternatives Analysis - Workshop 2

In Attendance: Cyndy Bratz (Tetra Tech), Hunter Bennett-Daggett (Tetra Tech), Matt Huxley (Tetra Tech), Bruce Nissen (LDB Beverage Company), Tabatha Wiggins (Walking Man Brewing), Leanna Kinley (City of Stevenson), Ken Daugherty (Skamania Lodge), Ben Shumaker (City of Stevenson), Steve Waters (Backwoods Brewing), Dan Donoho (Skunk Brothers), Mary Repar (citizen), Philip Watness (The Pioneer)
 On Phone: John Mercer (Brewery Wastewater Design), Jim Santroch (Tetra Tech), Troy Vassos (Integrated Sustainability Consultants)

Prepared by: Cyndy Bratz (Tetra Tech)

Project: Additional Wastewater Alternatives Analysis

Project Number: 200-48600-19001

These minutes summarize items discussed and issues resolved at the subject meeting to the best of the recorder's recollection. Recipients with different recollections or understandings of the meeting are asked to contact the recorder as soon as possible so that corrections can be made.

Hunter opened the workshop and described that Tetra Tech has prepared a detailed evaluation comparing the short-listed alternatives from Workshop No. 1, which was held in Stevenson on December 3, 2018. The objective of Workshop No. 2 was to review and discuss these alternatives and to select one or more alternatives to take to the January 10 Council Meeting for them to discuss and vote on what the City shall proceed with.

The four short-listed alternatives are:

Waterfront Area Alternatives	
A-1	Use low effort on-site BMPs at SIUs
	Use equalization at SIUs
	Use medium effort on-site BMPs at SIUs
A-2	Use minimal on-site BMPs at SIUs + construct shared satellite pretreatment facility
Existing Wastewater Treatment Plant Alternatives	
C-1	Use on-site BMPs at SIUs + install primary filtration at WWTP
C-2	Use on-site BMPs at SIUs + install selector basin at WWTP and request permit modification

A packet of handouts was provided for the meeting attendees and is also attached to these notes. In this packet, a Fact Sheet was provided for each of the four alternatives. Hunter described the Fact Sheets for each alternative.

Discussion of Projections and Background Information

2018 DMR data showed a max month BOD of 1439 lbs/day. The Stevenson WWTP permit limit for influent BOD is 612 lbs/day. Data for the SIUs is from the sampling data collected in 2016 and 2018 (2 months worth of data). It was assumed that the 2018 sampling data was maximum month, and this SIU data was used in this analysis.

Steve questioned growth projections which the beverage producers provided to Tetra Tech and which were included in the projections. Steve thought Backwood's projections are likely. Hunter reminded the group that the SIUs have grown faster than the growth assumptions, which were provided by the SIUs themselves, that were used in the Facilities Plan.

Discussion of Alternatives

Alternative A-1 – Best Management Practices (BMPs) at Significant Industrial Users.

BMPs were discussed in detail. Steve Waters asked whether the City would consider assisting the SIUs with implementation of BMPs, including financial assistance. Steve said that Alternative A-1 would be extremely attractive if the hauling costs were lower. Hauling costs would be significant. Matt stated that he and Eric Hansen are discussing the possibility of hauling high load wastewater to the Camas Wastewater Treatment Plant. Camas is open to considering accepting this high load wastewater, but nothing is settled yet.

Leana stated that some level of BMPs will be required even with the Stevenson WWTP upgrade being built.

The group asked John Mercer about what level of BMPs is typical for other cities? John said that even side streaming trub and yeast is site specific, and that every town is different. Most commonly, breweries do not do anything other than side stream spent grain and pH adjustment. Less than 20% of breweries haul high strength wastewater. Bend and Hood River have surcharges based on strength, which incentivizes hauling – it's side stream or pay the surcharge. This is typical for most cities with SIUs. Steve would like to see a blended surcharge (some paid by the City, some by industry).

Alternative A-2 – Low-Effort BMPs + Shared Satellite Pretreatment Facility

Operation and maintenance of the Satellite Facility was discussed. Hunter stated that Tetra Tech assumed that it would be operated by the City or the City's contract operator. Depending on the complexity of the satellite facility, it may need to be operated/overseen by a level III or IV operator. Steve asked whether they could install the Satellite Facility and have the SIUs do no BMPs? Cyndy and Hunter answered with a hesitant yes, saying it would cost more and would reduce beneficial reuse opportunities.

Alternative C-1 – Low-Effort BMPs + Install Primary Filtration at WWTP

Troy described the Primary Filtration option for the WWTP. He described it's capability to remove a portion of the domestic BOD and stated that it doesn't work as well with high strength flow containing soluble BOD, due to the lack of particulate matter contributing BOD.

Alternative C-2 – Low-Effort BMPs + Equalization + Selector Basin

The selector basin is an alternative that Ecology likes. It's part of the approved Facilities Plan and was broken out as a separate alternative in order to see if it would provide enough capacity that, in conjunction with BMP load reductions, it might facilitate lifting the moratorium or postponing the next WWTP construction phase. However, the analysis indicates that the selector basin with BMPs will not provide enough additional capacity and load reduction to get influent load lower than WWTP treatment capacity – secondary treatment capacity upgrades

(along with solids handling, disinfection and other upgrades as described in the 2017 Facilities Plan Update) would be needed.

Comparison of Alternatives

The Alternative Comparison Relative Costs per Pound to Remove Maximum Month BOD handout indicated that the most cost-effective alternatives (with the best BOD removal) are low effort BMPs and the baseline project as described in the General Sewer Plan Update, including the selector basin.

The Alternative Comparisons Maximum Month BOD Loading Projections (lbs/day) indicates that only the baseline project as described in the General Sewer Plan Update would provide sufficient liquid treatment capacity to justify an NPDES permit modification.

There was considerable discussion on the Max Month BOD Loading Projections table. Current loading is high enough so there is no alternative solution that would allow delaying the WWTP Improvements.

Consensus

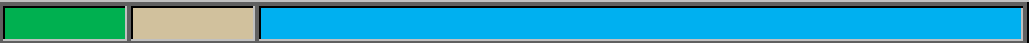
The group agreed that Alternative A-1 (BMPs) and the phased WWTP Improvements Project described in the Facilities Plan Update are the alternatives that will work and that should be brought to the Council at the January 10 meeting for their consideration and action.

ATTACHMENT

Workshop 2 Handouts

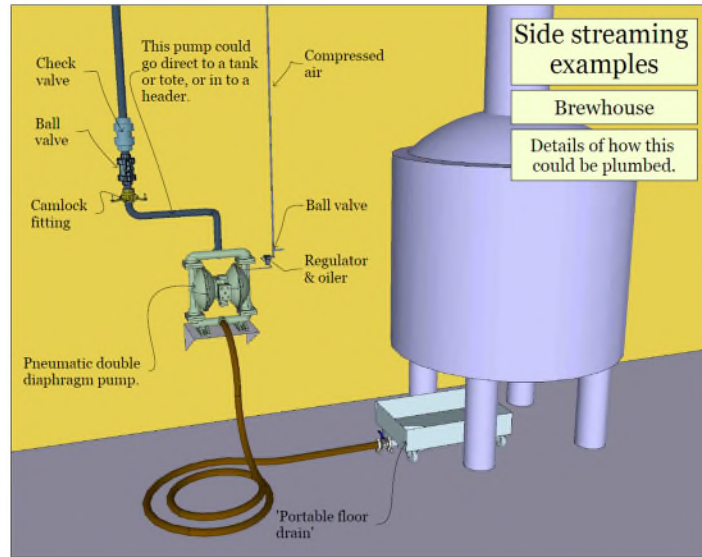
ALTERNATIVE A-1

BEST MANAGEMENT PRACTICES AT SIGNIFICANT INDUSTRIAL USERS

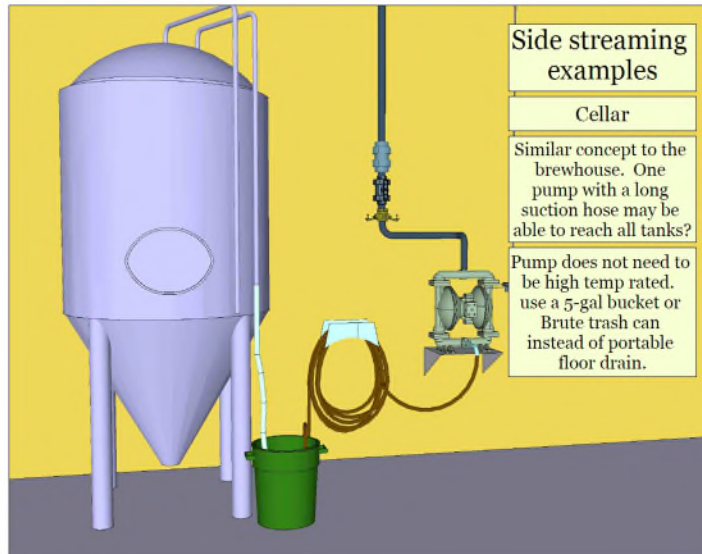
Alternative Description	<p>Best management practices (BMPs) include a range of approaches to reducing the volume and concentration of wastewater discharged to the City sewer. For the purposes of this analysis, we have divided the BMPs into levels of effort.</p> <p>Low-effort BMPs focus on side-streaming the highest-strength and most easily removed byproducts: spent yeast and trub for breweries, and overflow waste from bottlers. These byproducts are low in volume and typically require only a holding tank. After the byproducts are routed to the tank, they would be hauled off site for beneficial reuse or disposal. Low-effort BMPs also include pH adjustment for all flow that is not side-streamed, which requires chemical storage, pumps, and a tank for dosing. pH adjustment is required to meet the City's pretreatment ordinance.</p> <p>An additional low-effort BMP is the installation of equalization tanks at each discharger with capacity for two days' average flow. Providing equalization reduces flow, load, and temperature spikes to the City WWTP that cause operational issues and is required by the City's pretreatment ordinance. Equalization has been included as a separate BMP level because it is not required if satellite pretreatment is selected.</p> <p>Medium-effort BMPs focus on side-streaming bad batches and leftover product to the holding tank for off-site hauling, and screening all liquid streams, with screened material hauled to a landfill.</p>		
Capital Cost	Low-effort BMPs: \$150,000	Equalization tanks: \$220,000	Medium-effort BMPs: \$10,000
Annual Operations and Maintenance Cost	Low-effort BMPs: \$75,000	Equalization tanks: \$10,000	Medium-effort BMPs: \$120,000
Annual Cost (capital cost annualized over 5 year life of equipment, plus O&M Cost)	Low-effort BMPs: \$105,000	Equalization tanks: \$50,000	Medium-effort BMPs: \$120,000
BOD Load Reduction or Capacity Increase (maximum month lbs/day)	Low-effort BMPs: 600 lbs/day	Equalization tanks: 180 lbs/day	Medium-effort BMPs: 120 lbs/day
BOD Removal Efficiency (based on annual cost and daily load modification)	Low-effort BMPs: \$0.48 / lb	Equalization tanks: \$0.80 / lb	Medium-effort BMPs: \$2.85 / lb
Implementation Speed	Low-effort BMPs: 1-3 months	Equalization tanks: 3-6 months	Medium-effort BMPs: 3-6 months
Funding Opportunities	<p>Equipment purchase/operational costs would be up to each business owner. Opportunity for contracting as a group. Opportunity for Port to receive CERB, EDA, or USDA-RD funding if capital improvements to Port facilities are necessary.</p> 		
Phasing Impacts	This alternative does not allow postponement of City WWTP upgrades.		
Rating (based on stakeholder weighting)	Low-effort BMPs: 148 / 213	Equalization tanks: 145 / 213	Medium-effort BMPs: 120 / 213
Pros	<ul style="list-style-type: none"> • Quick implementation speed • High flexibility: BMPs can be expanded to match growing facilities or removed if a discharger moves • Many BMPs allow beneficial reuse for animal feed or other purposes • Low-effort BMPs are very cost-effective 		
Cons	<ul style="list-style-type: none"> • Hauling costs are significant and result in ongoing O&M costs • Medium-effort BMPs are less cost-effective due to smaller reduction in load 		

Images

Side streaming examples from Brewery Wastewater Design:



Side streaming examples
 Brewhouse
 Details of how this could be plumbed.




Side streaming examples
 Cellar
 Similar concept to the brewhouse. One pump with a long suction hose may be able to reach all tanks?
 Pump does not need to be high temp rated. use a 5-gal bucket or Brute trash can instead of portable floor drain.

Funding Opportunities Legend

Funding strategies involve both external or internal money. External funding typically involves either Grants or Subsidized Loans. A **green box** will appear next to those programs providing grants, and a **yellow box** for those providing loans (must be repaid thru sewer rates or other internal funding source). Internal funding sources involve rate payments or direct user payments. A **blue box** indicates direct user payments that offset costs to the system as a whole. The size of the box above is very roughly proportionate to an optimistic scenario where external funds help offset the need for internal funds.

ALTERNATIVE A-2

LOW-EFFORT BEST MANAGEMENT PRACTICES + SHARED SATELLITE PRETREATMENT FACILITY

Alternative Description	<p>A satellite pretreatment facility located adjacent to the waterfront building would allow treatment of the combined effluent from the significant industrial users before it is discharged to the City's sewer. The objective of the satellite facility would be to reduce the strength of the wastewater to residential levels, thereby reducing the load at the City's WWTP. It is assumed that the satellite pretreatment facility would be constructed, operated, and owned by the City.</p> <p>Package treatment facilities based on various aerobic and anaerobic treatment technologies are available from a range of vendors. They typically include most of the needed tanks and equipment within an easily shipped container. Some package facilities require a structure for shelter.</p> <p>Low-effort BMPs would be used in conjunction with the satellite pretreatment facility, due to the high cost-effectiveness of these BMPs. Equalization would be provided at the satellite facility and would not be required at individual dischargers.</p>
Capital Cost	\$2.9 million
Annual Operations and Maintenance Cost	\$55,000
Annual Cost (capital cost annualized over 5 year life of equipment, plus O&M Cost)	\$660,000
BOD Load Reduction or Capacity Increase (maximum month lbs/day)	500 lbs/day
BOD Removal Efficiency (based on annual cost and daily load modification)	\$3.60 / lb
Implementation Speed	~1 year
Funding Opportunities	<p>City-owned facilities are eligible for grants/loans. Typical funding programs include CDBG, CERB, Ecology, EDA, PWB, USDA-RD.</p> 
Phasing Impacts	This alternative does not allow postponement of City WWTP upgrades.
Rating (based on stakeholder weighting)	103 / 213
Pros	<ul style="list-style-type: none"> • Pretreatment facility would be designed to specifically target type and volume of wastewater originating from beverage industries. • Assumed facility would be operated by City, and dischargers need only use BMPs required by pretreatment ordinance.
Cons	<ul style="list-style-type: none"> • Difficult to significantly increase capacity if dischargers grow quickly. • If dischargers move, pretreatment facility may have little to no benefit. • Relative to a larger facility, packaged treatment facilities often have relatively high energy costs relative to volume of wastewater treated. • Operating two treatment facilities at separate locations would result in higher O&M costs. • Wastewater facility on waterfront presents potential visual and odor issues.

Images

Cloacina membrane bioreactor (MBR):



bioprocessH2O moving bed bioreactor (MBBR):




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ALTERNATIVE C-1

LOW-EFFORT BEST MANAGEMENT PRACTICES + INSTALL PRIMARY FILTRATION AT WWTP

Alternative Description	<p>A primary filter located at the wastewater treatment plant would remove solids from the influent. Solids from the filter would be hauled off-site directly or would be added to the existing aerobic digester. The primary filter would be sized for annual average flows to the WWTP, with higher flows bypassing the filter.</p> <p>Polyester (typically 350 mesh) rotating belt filters (RBF) remove influent TSS and associated BOD due to the volatile solids removed. RBFs are not as efficient as conventional primary clarifiers, but they require less area. Manufacturer's estimates for load removal are 40 to 50% for TSS and 20 to 30% for BOD. The removal percentages are highly specific to the waste stream, and pilot testing is strongly recommended.</p> <p>The primary filter would be installed in conjunction with low-effort BMPs and equalization at industrial dischargers.</p>
Capital Cost	\$837,500
Annual Operations and Maintenance Cost	\$30,000
Annual Cost (capital cost annualized over 20 year life of equipment, plus O&M Cost)	\$77,500
BOD Load Reduction or Capacity Increase (maximum month lbs/day)	150 lbs/day (assumes 25% reduction of annual average non-beverage BOD influent load)
BOD Removal Efficiency (based on annual cost and load modification)	\$1.41 / lb
Implementation Speed	~1 year
Funding Opportunities	<p>City-owned WWTP eligible for grants/loans. Typical funding programs include CDBG, CERB, Ecology, EDA, PWB, USDA-RD.</p> 
Phasing Impacts	This alternative does not allow postponement of City WWTP upgrades.
Rating (based on stakeholder weighting)	127 / 213
Pros	<ul style="list-style-type: none"> • Requires little land area. • Removal of primary solids reduces net biosolids handling loads. • Removal of primary volatile solids reduces BOD loading to the oxidation ditch and proportionately reduces secondary waste biomass production. • Filters can be used to dewater solids to ~ 25% solids content, reducing waste biosolids hauling costs. • Primary solids have a higher volatile content and can generate more biogas using anaerobic digestion.

<p>Cons</p>	<ul style="list-style-type: none"> • Beverage wastewater is low in solids – primary filtration is unlikely to effectively reduce this BOD load. • Technology manufacturer claims of energy savings due to reduced BOD loads are unlikely for oxidation ditch system, where mixing energy is expected to govern operating costs. • Energy savings due to reduced BOD loading to the oxidation ditch are likely to be offset by energy cost to stabilize (i.e. percent volatile reduction) the filtered primary solids by aerobic digestion. • Increased capital and operating costs may not be justified by energy savings or waste biosolids handling cost reductions, particularly if current aerobic digester continues to be used for solids. • BOD load reduction may be significantly less than 20 to 30% based on pilot results from The Dalles.
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Images

Trojan Salsnes:




Nexom EcoBelt:



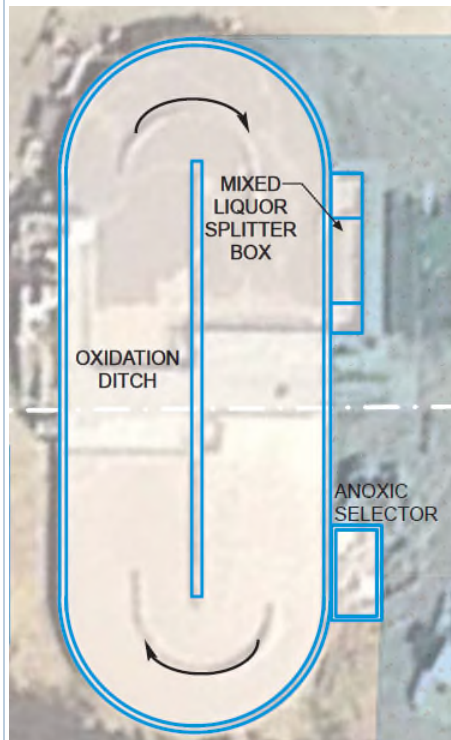
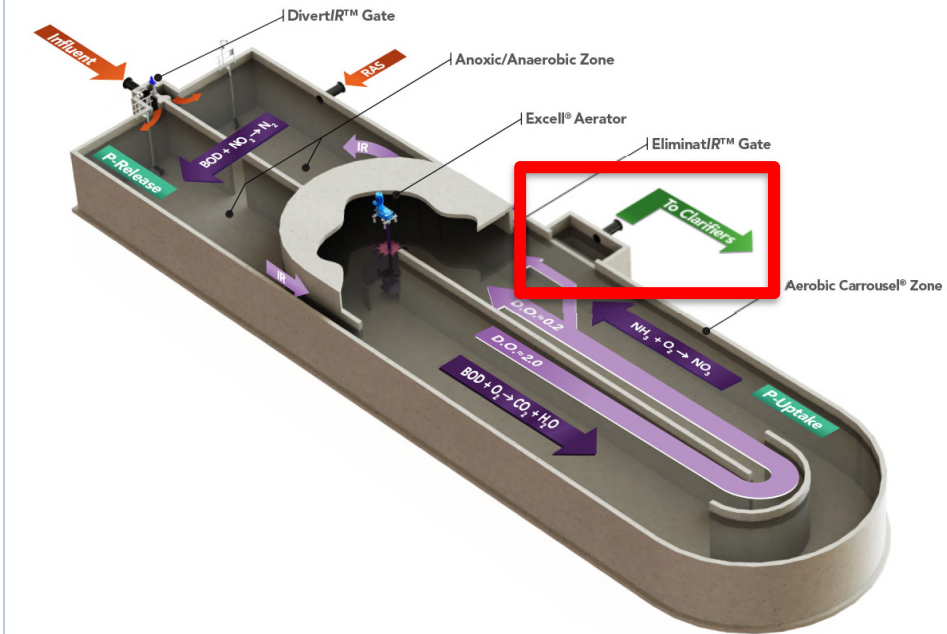
<p>Funding Opportunities Legend</p>	<p>Funding strategies involve both external or internal money. External funding typically involves either Grants or Subsidized Loans. A green box will appear next to those programs providing grants, and a yellow box for those providing loans (must be repaid thru sewer rates or other internal funding source). Internal funding sources involve rate payments or direct user payments. A blue box indicates direct user payments that offset costs to the system as a whole. The size of the box above is very roughly proportionate to an optimistic scenario where external funds help offset the need for internal funds.</p>
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ALTERNATIVE C-2

LOW-EFFORT BEST MANAGEMENT PRACTICES + EQUALIZATION + INSTALL SELECTOR BASIN AT WWTP

Alternative Description	<p>Installing a selector basin at the City's WWTP would increase its rated capacity for BOD loading. A selector basin could provide flexibility for the extent of BMPs and pretreatment that the industrial users choose to undertake in the short term. Selector basin may assist the plant in meeting its future capacity expansion and redundancy requirements.</p> <p>The selector basin would be installed between the existing headworks and oxidation ditch and would include a 15,000-gallon concrete tank, mechanical mixer, and piping modifications.</p> <p>The selector basin would be installed in conjunction with low-effort BMPs and equalization at industrial dischargers.</p>
Capital Cost	\$375,000
Annual Operations and Maintenance Cost	\$4,000
Annual Cost (capital cost annualized over 20 year life of equipment, plus O&M Cost)	\$25,000
BOD Load Reduction or Capacity Increase (maximum month lbs/day)	~200 lbs/day
BOD Removal Efficiency (based on annual cost and load modification)	\$0.35 / lb
Implementation Speed	~2 years
Funding Opportunities	<p>City-owned WWTP eligible for grants/loans. Typical funding programs include CDBG, CERB, Ecology, EDA, PWB, USDA-RD.</p> 
Phasing Impacts	This alternative does not allow postponement of City WWTP upgrades.
Rating (based on stakeholder weighting)	164 / 213
Pros	<ul style="list-style-type: none"> • Cost effective. High BOD removal efficiency. • Low up-front and annual operating cost. May not require funding assistance to implement. • Selector basin is operated by City and dischargers need only use BMPs required by pretreatment ordinance • Low risk. Provides benefits even if dischargers move. • Can be done in conjunction with other phased plant upgrades. • Minimal disruption to City WWTP operation during construction.
Cons	<ul style="list-style-type: none"> • Modification to plant influent load limit is contingent upon Ecology determination.

Images



Funding Opportunities Legend

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ALTERNATIVE COMPARISONS

RELATIVE COSTS PER POUND TO REMOVE MAXIMUM MONTH BOD

Alternative	Assumed Lifetime of Equipment	Capital Cost ¹		Additional Annual O&M Costs ¹	Total Annual Cost ¹	BOD Load Reduction / Capacity Increase, Max Month lbs/day ¹	Annual Cost per Pound of BOD, Max Month	
		Total	Annual					
A-1	Low effort BMPs	5 years	\$148,512	\$30,790	\$74,737	\$105,527	597	\$0.48
	Equalization Only	5 years	\$219,232	\$45,440	\$6,230	\$51,670	178	\$0.80
	Medium effort BMPs	5 years	\$7,072	\$1,470	\$120,065	\$121,535	117	\$2.85
A-2	On-site pretreatment	5 years	\$2,900,830	\$601,220	\$56,200	\$657,420	500	\$3.60
C-1	Primary filtration at WWTP	20 years	\$837,406	\$47,350	\$30,000	\$77,350	150	\$1.41
C-2	Selector basin at WWTP	20 years	\$375,000	\$21,210	\$4,000	\$25,210	200	\$0.35
Baseline	Phase 1 upgrades from General Sewer Plan Update - Secondary Expansion Only	20 years	\$2,453,000	\$138,690	\$51,086 ²	\$189,776	800	\$0.65
Baseline	Phase 1 upgrades from General Sewer Plan Update	20 years	\$9,104,700	\$514,760	\$162,510 ²	\$677,270	800	\$2.32

Notes:

1. Costs and BOD load changes apply to the listed alternative only, and do not include other alternatives that may be used together with the listed alternative.
2. Operations and maintenance costs at the WWTP are in addition to existing costs.

ALTERNATIVE COMPARISONS

MAXIMUM MONTH BOD LOADING PROJECTIONS (LBS / DAY)

	Existing (No Changes)	Existing (Without Beverage Industry)	Alternative A-1			Alternative A-2	Alternative C-1
			Low Effort BMPs	Low Effort BMPs + Equalization	Low + Medium Effort BMPs + Equalization	Low Effort BMPs + Satellite Pretreatment	Low Effort BMPs + Primary Filtration at WWTP
2018	1,439	711	1,439	1,439	1,439	1,439	1,439
2019	1,564	718	1,149	1,031	955	818	887
2024	2,092	781	1,449	1,266	1,148	936	1,110
2030	2,365	855	1,625	1,414	1,278	1,034	1,243
2040	2,859	949	1,923	1,656	1,484	1,176	1,466

Current max month permit limit is 612 lbs/day

Alternative C-2 is expected to raise max month permit limit to 800 lbs/day


Phase 1 WWTP upgrades are expected to raise max month permit limit to 1,600 lbs/day



Workshop #2 – Funding Opportunities by Alternatives Component



ALT	ALT. COMPONENT	FUNDING OPPORTUNITIES
A-1	On-Site BMP at SIU	Equipment purchase/operational costs would be up to each business owner. Opportunity for contracting as a group. Opportunity for Port to receive CERB, EDA, or USDA-RD funding if capital improvements to Port facilities are necessary.
		
A-2	Minimal On-Site BMP at SIU	Equipment purchase/operational costs would be up to each business owner. Opportunity for contracting as a group. Opportunity for Port to receive CERB, EDA, or USDA-RD funding if capital improvements to Port facilities are necessary.
		
A-2	+ Construct Shared Satellite Pretreatment Facility	Eligibility for grant/loan program would depend on owner of facility - City and Port would have the most opportunities for grant/loan to fund capital costs. Typical Funding Programs include CDBG, CERB, Ecology, EDA, PWB, USDA-RD.
		
C-1	On-Site BMP at SIU	Equipment purchase/operational costs would be up to each business owner. Opportunity for contracting as a group. Opportunity for Port to receive CERB, EDA, or USDA-RD funding if capital improvements to Port facilities are necessary.
		
C-1	+ Install Primary Filtration at WWTP	City owned WWTP eligible for grants/loans - Typical Funding Programs include CDBG, CERB, Ecology, EDA, PWB, USDA-RD.
		
C-2	On-Site BMP at SIU	Equipment purchase/operational costs would be up to each business owner. Opportunity for contracting as a group. Opportunity for Port to receive CERB, EDA, or USDA-RD funding if capital improvements to Port facilities are necessary.
		
C-2	+ Install Selector Basin at WWTP	City owned WWTP eligible for grants/loans - Typical Funding Programs include CDBG, CERB, Ecology, EDA, PWB, USDA-RD.
		


At-a-Glance: Funding strategies involve both external or internal money. External funding typically involves either Grants or Subsidized Loans. A **green box** will appear next to those programs providing grants, and a **yellow box** for those providing loans (must be repaid thru sewer rates or other internal funding source). Internal funding sources involve rate payments or direct user payments. A **blue box** indicates direct user payments that offset costs to the system as a whole. The size of the box above is very roughly proportionate to an optimistic scenario where external funds help offset the need for internal funds.


Typical Funding Programs – External to City Funds


 **CDBG-GP, Community Development Block Grant General Purpose**, WA State Dept. of Commerce – Cities are eligible, grant up to \$750,000 federal funding, projects must principally benefit low- to moderate- income people, infrastructure in support of economic development or construction of wastewater, side connections or community facilities, annual application in June. *The City is not currently eligible. Any funding through this source would need to be for a direct purpose.*



  **CERB, Community Economic Revitalization Board**, WA State Dept. of Commerce – public agencies are eligible (e.g. city, port), primarily loan with small grant, requires cash match, applications year-round.


  **Ecology, Integrated Water Quality Funding Program**, WA State Dept. of Ecology – municipalities and other levels of government, primarily low-interest loan program with grant opportunity and interest rate reductions available for hardship communities (cost of wastewater > 2% of medium household income).

 **Energy Efficiency & Solar Grants**, WA St Dept. of Commerce – local governments are eligible (city, port district), energy efficiency grants up to \$500,000.

 **EDA-Public Works Program**, US Economic Development Administration – governments or non-profits except education (city, port, Economic Development Council) are eligible, grant/loan combinations up to \$3 million grant for up to 50% of project cost, open year round when funding is available.

 **PWB Public Works Board**, WA St. Dept. of Commerce – municipalities are eligible, low interest loan program has been on hiatus with WA legislature redirecting funds, potential funding in the upcoming 2019 legislative session, open year round if funded.

  **USDA-Rural Development**, US Dept. of Agriculture – cities and towns with less than 10,000 population, federal loan program with portion grants available, design & construction in one application, applications year round.

 **.09 Rural County Tax**, Skamania County – Each County operates a program that may have grants available for prioritized economic development projects. *There are minimal funds available through this program and recently the group decided to withhold projects to build-up the balance.*

OTHER EXTERNAL - BPA Energy Smart Industrial, Bonneville Power Administration – BPA customers eligible for technical assistance to improve energy efficiency.

OTHER INTERNAL – Latecomer agreements – City- or developer-funded projects receive a proportionate fee for new connections to infrastructure. Local improvement districts – City-funded projects are repaid through property taxes over a defined period. Tourism Fund – tax funding specifically used to increase tourism/overnight stays. General/Capital Improvement/Timber Fund – divert other flexible City funds to subsidize sewer system.

Stevenson Satellite Alternatives
Assessment Table – Workshop #2

Criterion		Affordable to Community				Adaptable to Changing Conditions			Meets Community Values			Combined Scoring		
		Capital Cost	O&M Cost	Funding Opportunities	Cost-Effective BOD Reduction	Impact on Project Phasing	Risk Associated With Industry Fluctuation	Ease of Operation	Implementation Speed	Aesthetics (Visual, Odor)	Resource Recovery	Cooperation with Local Businesses	Total Score	Total Weighted Score
Stakeholders' Average Weight		4.6	4.9	4.0	4.5	3.6	3.5	4.1	4.0	3.0	2.4	3.9		
Waterfront Area Alternatives														
A-1	Use low effort on-site BMPs at SIUs	4	2	2	5	1	5	3	5	4	5	3	39	147.8
	Use equalization at SIUs	4	5	2	5	1	4	3	4	4	1	3	36	145.4
	Use medium effort on-site BMPs at SIUs	5	1	2	1	1	4	3	4	4	4	3	32	119.6
A-2	Use minimal on-site BMPs at SIUs + construct shared satellite pretreatment facility	2	3	4	3	1	2	1	3	2	2	3	26	102.6
Existing Wastewater Treatment Plant Alternatives														
C-1	Use on-site BMPs at SIUs + install primary filtration at WWTP	3	4	4	2	1	5	3	3	3	1	3	32	126.9
C-2	Use on-site BMPs at SIUs + install selector basin at WWTP and request permit modification	4	5	4	5	1	5	5	3	5	1	3	41	164.1

Glossary:

BOD – Biochemical Oxygen Demand; a measure of wastewater strength based on the oxygen needed to break down organic material

BMPs – Best Management Practices; for beverage producers these may include side streaming of high BOD liquid and solid wastes, installing equalization tanks to smooth out high and low flows, and adjusting pH

Class A – most stringent requirement for reclaimed water in the State of Washington; safe for human contact due to high level of treatment

SIU – Significant Industrial User; non-residential wastewater discharger that has the potential to adversely impact municipal wastewater treatment plants

WWTP – wastewater treatment plant

Weighting Scale:

1 = Least important to stakeholders

5 = Most important to stakeholders

Ranking Scale:

1 = Least desirable for stakeholders

5 = Most desirable for stakeholders