

STEVENSON WASTE WATER CLARIFIERS

Big Improvements • Better Bottom Lines

Meeting Agenda

Date:Thursday, August 31st, 2017Time:5:00 PM to 6:30 PMLocation:Stevenson City Hall

"We can no longer afford to consider air and water common property, free to be abused by anyone without regard to the consequences. Instead, we should begin now to treat them as scarce resources, which we are no more free to contaminate than we are free to throw garbage into our neighbor's yard."

> -Richard Nixon 1970 State of the Union Address

Preliminary Matters

- 1. INTRODUCE YOURSELF:
 - a. Who you are
 - b. What your interest is
- 2. FLUSH IT DOWN:
 - a. Identify clogs, past successes, past failures, continued grievances

<u>Today's Work</u>

- 3. DEFINE WASTE WATER CLARIFIERS' SUCCESS:
 - a. Who we are
 - b. Why we are here
 - c. What we will accomplish
 - d. What we will avoid
- 4. JUMP DOWN THE MANHOLE:
 - a. INTRODUCE KEY ASSUMPTIONS, DESIGN CRITERIA, DECISIONS ETC.:

Upcoming Work

- 5. BEFORE THE NEXT MEETING:
 - a. Review City Website <u>www.ci.stevenson.wa.us/cleanwater</u>
- 6. At the Next Meeting (Tentatively):
 - a. Agree on Clarifier Ground Rules
 - b. Describe Information Gaps on Website Discuss Key Assumptions, Design Criteria, Decisions
 - c. Introduce Preliminary Funding Strategy
 - d. Identify Next Steps

<u>Adjourn</u>

STEVENSON WASTE WATER CLARIFIERS



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KEY ASSUMPTIONS, DESIGN CRITERIA, DECISIONS



Process/Equipment Description Existing Design Recommended Design Flow	Table 9-3. Design Criteria for Treatment Plant Facilities				
Treatment Plant Rated Capacity Flow 0.24 mgd 0.48 mgd Base (Dry Weather Average) 0.24 mgd 0.48 mgd Maximum Month 0.45 mgd 0.90 mgd Peak Day 1.0 mgd 2.0 mgd Peak Hourly 1.5 mgd 2.7 mgd Pollutarl Loadings 0.000 ppd 0.000 ppd Maximum-Month Bichemical Oxygen Demand 611 ppd 2.000 ppd Maximum-Month Total Suspended Solids 611 ppd 2.000 ppd Headworks 1 + manual screen bypass 1 + manual screen bypass Mumber 1 + manual screen bypass 1 + manual screen bypass Type Automatic bar screen 6 mm automatic fine screen Peak Flow Capacity per Screen 1.5 mgd 2.7 mgd Washer Compactor (matched with mechanical fine screen) Number 1 Number None 1 80% Organic Constituents Removal from Screenings n/a 95% Grit Chambers 7/pe None Vortex Number n/a 1 1 Type None Horizontal recessed impeller N	Process/Equipment Description	Existing Design	Recommended Design		
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Biological ReactorsTypeOxidation ditchConventional activated sludgeNumber12Volume (each)300,000 gallons300,000 gallonsDimonsions (oach)103 foot long80 foot long	Secondary Treatment				
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Number12Volume (each)300,000 gallons300,000 gallonsDimonsions (oach)103 foot long80 foot long	Туре	Oxidation ditch	Conventional activated sludge		
Volume (each) 300,000 gallons 300,000 gallons Dimonsions (oach) 103 foot long 80 foot long	Number	1	2		
Dimonsions (oach) 102 foot long 90 foot long	Volume (each)	300,000 gallons	300,000 gallons		
	Dimensions (each)	103 feet long	80 feet long		
39 feet Wide 25 feet Wide 25 feet Wide 20 foot side water denth 20 foot side water denth		39 feet Wide 12-foot side water denth	25 feet WIDe 20-foot side water denth		
Detention Time (total maximum month) 16 hours 16 hours	Detention Time (total maximum month)				
Type selector zone inside ovidation ditch Selector basins		selector zone inside ovidation ditch	Selector basins		
Number 1 2	Number		2		
Volume Included in oxidation ditch 100.000 gallons	Volume	Included in ovidation ditch	2 anollen 000 001		
Denth 12 foot side water denth 12 foot side water denth	Denth	12-foot side water denth	12-foot side water denth		
Detention Time (maximum month) Included in oxidation ditch datention time	Detention Time (maximum month)	Included in ovidation ditch detention time	5 hours		
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Total biological reactor datention time (may month) 16 hours 21 hours 21 hours	Total biological reactor volume		21 hours		
Nixed Liquor Suspended Solids (max month) 3 000 mg/l 3 000 mg/l	Mixed Liquor Suspended Solids (max month)	3 000 mg/l	2 1 10013 2 000 mg/l		

City of Stevenson General Sewer Plan and Wastewater Facilities Plan Update

Process/Equipment Description	Existing Design	Recommended Design
Mixed Liquor Volatile Solids Concentration (max month)	2550mg/L	2600 mg/L
Mixed Liquor Volatile Solids % of Total (max month)	85%	87%
F/M (max month)	0.10 pounds BOD per pound MLVSS	0.11 pounds BOD per pound MLVSS
Sludge Age (max month)	15 days	10 days
Aeration		
Туре	Brush aerators	Blowers and fine bubble diffusers
Number	2 (1 active, 1 standby)	3 (2 active, 1 standby)
Duty HP	40	50
Total HP	80	75
Capacity cfm (each)		400 cfm
Anoxic Mixers		
Number per reactor anoxic zone		1
HP each		4
HP total		8
Recirculation pumps		
Number per reactor		1
HP each		5
HP total		10
Clarifiers		
Number	2	2 existing + 1 new
Diameter	35 feet	2 @ 35 feet + 1 @ 50 feet
Depth	14 feet	14 feet
Area (total)	1,924 square feet	3,887 square feet
Overflow Rate		
Maximum month	230 gallons/day/square foot	230 gallons/day/square foot
Peak Day	520 gallons/day/square foot	510 gallons/day/square foot
Peak Hour	780 gallons/day/square foot	700 gallons/day/square foot
Solids Loading Rate		
Maximum month + RAS @ 100% of MM	12	12
Peak Day + RAS @ 100% of MM	19	19
Peak Hour + RAS @ 100% of MM	25	23
Return Activated Sludge Pumping		I.
Туре	Non-clog, centrifugal	Non-clog, centrifugal
Number	3	3 existing + 2 new
Capacity (each)	350 gpm	500 gpm (new pumps only)
Drive	Variable frequency drives	Variable frequency drives
Disinfection		
Reactor Type	Open channel	Open channel
Number	1	2
Peak Flow Capacity (each)	1.5 mgd	2.7mgd
Light transmittance	65%	65%
Minimum UV dose	_	30 mJ per square cm
Lamp type	Low-pressure, low-output	Low-pressure, high-output

Process/Equipment Description	Existing Design	Recommended Design
Solids Handling		
Sludge Thickening		
Туре	Gravity Decant	Rotary drum screen
Number	1	1
Capacity	n/a	150 gpm
Sludge Pumps		
Thickener feed pumps	n/a	
Туре		Progressive Cavity w/ variable frequency drive
Number		2
Capacity		150 gpm
HP each		10
Thickened sludge pumps		
Туре		Progressive Cavity w/ variable frequency drive
Number		2
Capacity each		60 gpm
HP each		5 HP
Sludge Holding Tank (Thickener Feed Tank)		
Thickener Feed Tank		
Tank depth	14.25 feet	14.25 feet
Volume	33,000 gallons	33,000 gallons
Hydraulic Detention time (MM)	2.8 days	0.7 days
Solids concentration	5,000 mg/L	5,000 mg/L
Sludge Digester		
Tank Depth	14.25 feet	14.25 feet
Volume	134,000 gallons	134,000 gallons
Hydraulic Detention Time	31 days	34 days
Solids concentration	1,400 mg/L	3,000 mg/L
Total sludge tank volume	134,000 gallons	134,000 gallons
Sludge Tank Aeration System		
Туре	Sock diffusers	Porous diffusers
Aeration blowers		
Number	1 duty + 1 standby	2 duty + 1 standby
Capacity each	_	400
HP each	20 hp	20 hp
HP total	40 hp	60 hp

Notes: MLVSS = mixed-liquor volatile suspended solids