

2016 Recycled Water Use Summary

City of Molalla Wastewater Treatment Plant

Introduction:

The City of Molalla operates a (2) cell lagoon system with Pre-Aeration. Lagoon #1 is approximately 11.4 acres and lagoon #2 is approximately 13.6 acres. They are operated in series and are designed to hold 12 feet of water, max. The lagoon effluent is further treated by (2) Dissolved Air Flotation units, then (4) sand/anthracite coal mixed media gravity filters to polish the final effluent. After filtration, the final effluent is disinfected with calcium hypochlorite. The irrigation effluent is chlorinated prior to entering the chlorine contact basin by way of an inline injector. It receives short contact time before entering the Effluent Pump Station where further contact time is available.

Maintenance:

Moisture blocks were replaced throughout the summer as needed. Hand line headers that were leaking were repaired by Steve Coleman. "Big Gun" #1 had its motor replaced with an Isuzu 4 cylinder diesel. Small issues were resolved quickly, ie broken springs, new hose guide wheels, etc. Oil on both "big guns" were changed every 250 hours. Oil filters were changed every 500 hours. The fuel filters were changed once this summer for both "big guns". At the WWTP, gravity filter #1 and #4 had the tank bottoms welded to seal the holes that arose. After repairs were done, both tanks were seal coated to prevent future leaks. Gravity filter #1, #2 and #4 received new sand and anthracite coal. Various pneumatic air valve repairs were done throughout the summer. The Chlorine Contact Basin was drained, pressure washed and squeegeed twice this summer to remove algae growth on the basin walls. See attached sheets for more information on Coleman Ranch field repairs.

Operations:

Operations staff took another proactive approach to the irrigation season. Everything from ordering and replacing moisture blocks, replacing piezometers, protecting moisture blocks and piezometers from cattle damage, moving the "big guns" ourselves, hand line monitoring and turning them off prior to shifts ending, continuation of proper maintenance practices, good recordkeeping, etc. We ran the "big guns" six days a week to keep lagoon levels down, by splitting summer hire hours for June and some Saturdays in July. There were some mechanical issues that arose throughout the irrigation season, but with proper communication and fast response, those downtimes were lessened significantly. Due to the short contact time in the plant's Chlorine Contact Basin, I continued to keep chlorination dosing and output higher than normal. The higher dosing also scoured the 24" irrigation line making for a more successful transition to Molalla River discharge, starting October 12th.

Month	Influent (Million Gallons)	Effluent irrigation (Million Gallons)	Rain (inches)
June	30.014	18.731	2.05"
July	26.465	32.469	1.06"
August	24.071	34.493	0.00"
September	23.947	23.134	1.77"
October	59.070	1.582	11.91"
Total	163.567	110.049	16.79"

Monitoring:

The WWTP had difficulty producing Class A effluent throughout the summer irrigation season due to downed mixed media gravity filters and the hot weather. 24 hour coliform tests were prepared and the results were recorded. Daily Cl₂ and turbidity was recorded. Effluent pH was tested twice a week. Ammonia, nitrites/nitrates, TKN of the final effluent was tested quarterly and recorded. Influent BOD was tested twice a week. Moisture block readings were taken prior to the "big guns" being moved to a new section of Coleman Ranch. Moisture block readings were also taken prior to irrigating. Fuel usage, oil changes, filter changes, total effluent, inches irrigated, AWC (available water capacity) were all recorded. Throughout the weekly shifts, operations staff monitored the irrigation sites for any possible issues that may have arisen. No irrigation was conducted on Saturday's and Sunday's, with the exception of June and July to bring lagoon levels to design capacity.

We currently monitor for the following parameters during the irrigation season:

<u>Parameter</u>	<u>Frequency required</u>	<u>Frequency tested</u>
Total coliforms	Daily when irrigating	Daily when irrigating
pH	2 per week	2x weekly
TKN, NO ₂ , NO ₃ , NH ₃	Twice per season	June and September
Chlorine Residual	Daily when irrigating	Daily when irrigating
Pounds of Chlorine used	Daily when irrigating	Daily when irrigating
Quantity irrigated	Daily when irrigating	Daily when irrigating
Flow meter Calibration	Annually	Annually
Turbidity	Hourly	Continuous

The City of Molalla uses a HACH DR3900 Spectrophotometer to test for TKN, NO2, NO3, ammonia, alkalinity and total phosphorous. The following are the laboratory results:

Test	Limit	Max	Average	Number of tests
Total Coliforms	2.2/100ml, 7 day avg 23/100mL any sample	TNTC	8.26	97
pH	6-9 S.U.	7.6	7.12	2x weekly
Chlorine Residual	N/A	8.8 ppm	5.09	When irrigating
NO2+ NO3	N/A	8.27 ppm	7.95	2 (June, Sept)
Ammonia	16.7 ppm monthly avg 25.9 ppm daily max	16.4 ppm	13.55	2 (June, Sept)
TKN	N/A	7.95 ppm	7.54	2 (June, Sept)
Turbidity	2.0 NTU	>10.0 ppm	2.78	Continuous

During the irrigation season the City of Molalla used a total of 10,649 pounds of Calcium Hypochlorite.

Irrigation Sites:

Site	North Coleman Ranch	South Coleman Ranch	Wastewater Plant
Total Million Gallons	55.640	52.112	2.297
Average Daily use MGD	0.592	0.4472	1.148
Total inches/ Acre	7.41	10.6	2.054
Average Inches/Acre/day	0.049	0.118	0.033

Compliance:

The 2016 irrigation season went extremely well. There were no reported incidents of puddling/ponding throughout the irrigation season, with the exception of one October report that had no merit. No runoff occurred into Bear Creek and equipment failures ceased. The WWTP had exceeded coliform counts during the irrigation period due to unseasonably hot weather and no filtration until late into the irrigation season (June 11, July 16). Appropriate steps were taken when coliform counts were exceeded: Shut down the plant and resample the final effluent prior to re-irrigation. Due to early rain in October, the WWTP was forced to discharge to the Molalla River earlier than the permit allowed to protect the structural integrity of the lagoons. Discharge started 10/12. Signs were posted according to the consent decree, DEQ was notified and the city's website posted the early discharge.

Summary:

Despite the early river discharge and 2 high coliforms, operations staff solved all problems that we were confronted with exceptionally well. Plant operation and maintenance will continue to improve, plant upgrades will continue as budget allows and operations staff will continue to stay positive and motivated to make the city's WWTP successful.

A handwritten signature in black ink that reads "Jason Clifford". The signature is written in a cursive, flowing style.

Jason Clifford

Lead Treatment Plant Operator

City of Molalla

Coleman Ranch Repairs, April 2016

North Side

Section #1

- ✓ Replaced 6" moisture block, placed 1.5" SCH 40 over "T" post and painted green
- ✓ Replaced 18" moisture block, placed 1.5" SCH 40 over "T" post and painted blue

Section #2

- ✓ Replaced 6" moisture block, placed 1.5" SCH 40 over "T" post and painted green
- ✓ Replaced 18" moisture block, placed 1.5" SCH 40 over "T" post and painted blue
- ✓ Marked piezometer with orange paint
- ✓ Marked setback with orange paint
- ✓ Hydrant head needs replacing – purchased (6) hydrants from Ernst Irrigation

Section #3

- ✓ Replaced 6" moisture block, placed 1.5" SCH 40 over "T" post and painted green
- ✓ Replaced 18" moisture block, placed 1.5" SCH 40 over "T" post and painted blue
- ✓ Marked setbacks with orange paint

Section #4

- ✓ Painted moisture blocks – 6" green, 18" blue
- ✓ Waiting for ground to dry out to add additional markers
- ✓ Repaired valve @ the gate between section #4 & #5. Needs additional fill and concrete for protection *Will ask Steve Coleman @ the meeting if he could possibly move the gate 25-30' to prevent the irrigation valve from being run over with equipment*

Section #5

- ✓ Painted moisture blocks – 6" green, 18" blue

South Side

Section #6

- ✓ Replaced 6" moisture block, placed 1.5" SCH 40 over "T" post and painted green
- ✓ Marked hydrants with orange paint
- ✓ Marked setbacks with orange paint
- ✓ Marked valves with orange paint

Section #7

- ✓ Replaced 6" moisture block, placed 1.5" SCH 40 over "T" post and painted green
- ✓ Replaced 18" moisture block, placed 1.5" SCH 40 over "T" post and painted blue
- ✓ Marked piezometer with orange paint
- ✓ Marked setbacks with orange paint
- ✓ Marked valves with orange paint
- ✓ Marked hydrants orange where cows knocked over marker post

General Notes

- ✓ Removed bent and abandoned "T" posts to eliminate safety hazards
- ✓ Collected broken and abandoned wood posts
- ✓ Added new color code chart to designate moisture blocks
- ✓ As noted in the sections, SCH 40 PVC was used to cover the "T" posts and moisture block wires so Coleman's cattle couldn't chew them and knock over the "T" posts trying to scratch