

# Rush Strong School Wastewater Treatment Improvements

## Scope of Work:

- Bring the system into compliance with TDEC regulations
- Perform engineering calculations and analysis
- Provide a cost-effective solution



## Water Chemistry:

- Primary biochemical process is nitrification performed via bacteria to remove ammonia
- Limiting reagents are alkalinity and oxygen
- Current wastewater has an ammonia concentrations in excess of 100 mg/L (typical is 50 mg/L)
- Ammonia effluent concentration is 2-10X times TDEC limit

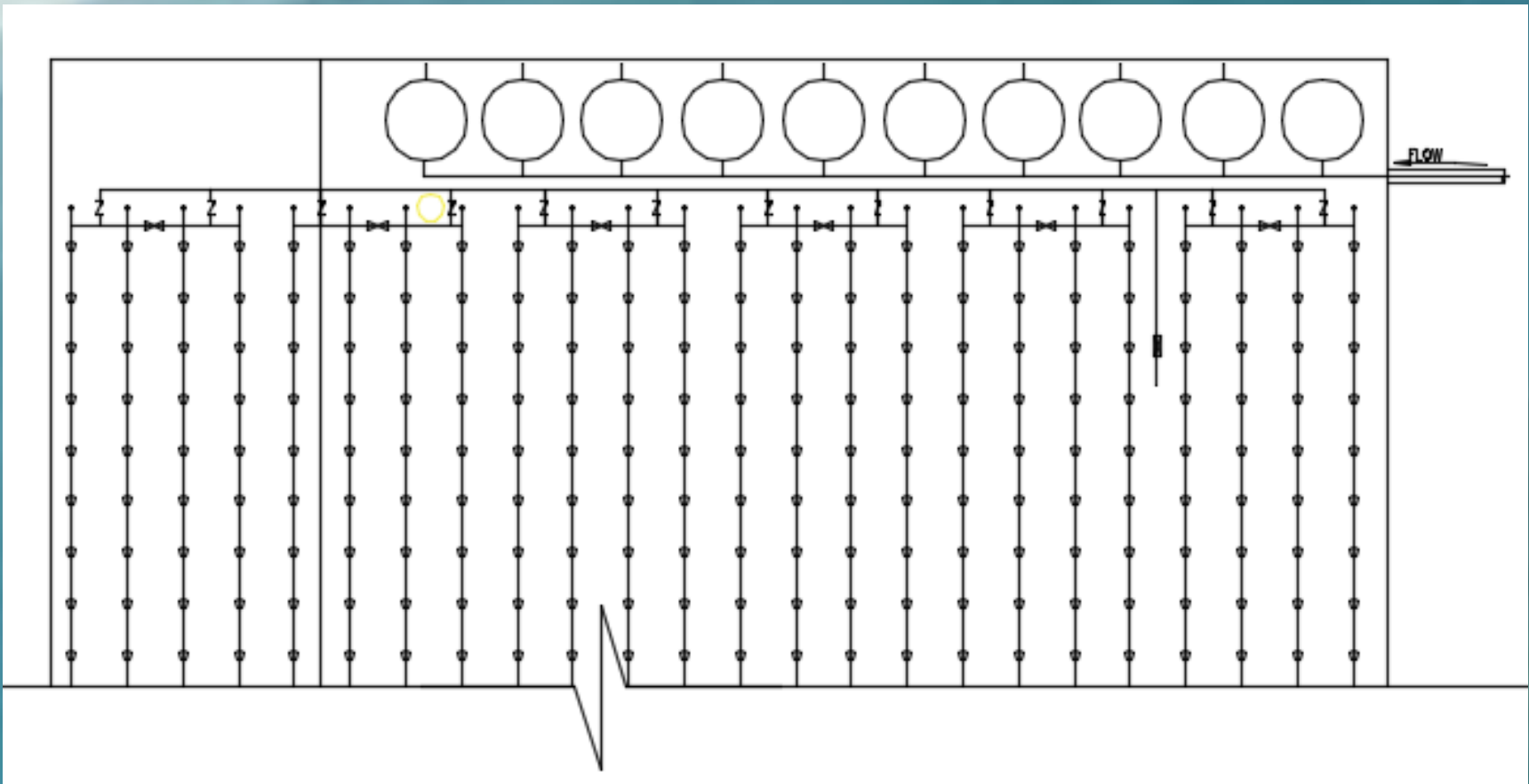
Table 3.1: Effluent Properties and Limitations								
	BOD (max)	Suspended Solids (max)	DO (min)	Ammonia as N in summer (max)	Ammonia as N in winter (max)	pH (max)	pH (min)	E. coli (max)
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(SU)	(SU)	(CFU/100mL)
Rush Strong Output	15.12	6.10	4.42	62.66	55.44	7.70	6.77	674.65
TDEC's Criteria	≤ 25.00	≤ 45.00	≥ 6.00	≤ 4.00	≤ 10.00	≤ 9.00	≥ 6.00	≤ 941.00



## Engineering Analysis and Calculations:

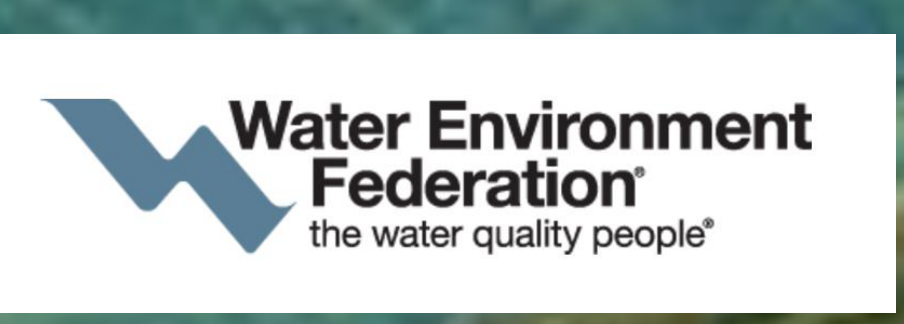
- Analysis of Flow Data from monthly reports
- Filter Bed Analysis using Orenco design Manual
- Analyzed variety of options for implementation
- Cost analysis

Table 9.1: Cost Analysis				
Item	Quantity	Unit	Cost/Unit	Cost
1-1/2" check valves	6	Ea.	11.58	69.48
1-1/2" gate valves	6	Ea.	11.06	66.36
2" pvc pipe	2.25	20 LF	16.33	36.74
2" pvc 90deg elbow	12	Ea.	2.44	29.28
2" pvc Tee	9	Ea.	3.67	33.03
1-1/2" pvc Tee	6	Ea.	2.18	13.08
2" pvc ball valves	10	Ea.	6.68	66.8
2" pvc cap	1	Ea.	0.70	0.70
Total Cost:				315.47
Price (w/ Tax):				346.23



## Final Design:

- Implement 100% recirculation during summer
- Increase the recirculation ratio
- Reroute the recirculation line to the access risers
- Clean the filter laterals
- Separate zones
- Extend the flushing valve system



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