Service Report

Water Solutions ENGINEERING LLC

Water Solutions Engineering Customer						
System	**Testing Parameters**					
Towers	**Conductivity (mmhos)**	**pH**	**Cycles (calculated)**	**MB (CFU)**	**Moly (PPM)**	**Comments**
Make-up	264	7.2				
(Limits)	(200 - 400)	(6 - 8)				
Tower 1	927	8.6	3.5	10	0.73	
(Limits)	(800 - 1000)	(8 - 9)	(3 - 4)	(below 10^4)	(0.5 - 1.0)	
Tower 2	642	8.3	2.4	100	0.42	BD valve stuck open--operator notified
(Limits)	(800 - 1000)	(8 - 9)	(3 - 4)	(below 10^4)	(0.5 - 1.0)	
Tower 3	981	8.7	3.7	0	0.81	
(Limits)	(800 - 1000)	(8 - 9)	(3 - 4)	(below 10^4)	(0.5 - 1.0)	
Tower 4	421	7.6	1.6	10	0.21	Basin overflowing to drain--operator notified
(Limits)	(800 - 1000)	(8 - 9)	(3 - 4)	(below 10^4)	(0.5 - 1.0)	
Tower 5	974	8.7	3.7	10	0.83	
(Limits)	(800 - 1000)	(8 - 9)	(3 - 4)	(below 10^4)	(0.5 - 1.0)	
Boilers	**Conductivity (mmhos)**	**pH**	**Total Hardness (PPM)**	**P-Alk (PPM)**	**Sulfite (PPM)**	**Comments**
Softened MU	275	7.1	0			
(Limits)	(200 - 400)	(6 - 8)	(0 - 2)			
Boiler 1	2762	10.7		524	48	
(Limits)	(2000 - 3000)	(9 - 11)	(Less than 20)	(300 - 600)	(30 - 60)	
Feedwater	267	8.7	11			
(Limits)	(200 - 400)	(8 - 9)	(0 - 2)			
Condensate	18	8.6				
(Limits)	(Less than 30)	(8 - 9)				
Package Boiler	1724	10.2	7	260	24	Increase chemical pump setting 10%
(Limits)	(1000 - 2000)	(9 - 11)	(Less than 10)	(300 - 600)	(30 - 60)	

Summary

Towers: Towers #2 and #4 require operator attention especially #4. All other towers were operating within limits. All controller readings were within 10% of handheld meter.

Boilers: Pump setting on package boiler chemical should be increased by 10% to get P-Alkalinity and sulfite back within limits. Boiler scale, corrosion and oxygen pitting could result over time if these levels are below our lower limits.

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Closed Loops	**Conductivity (mmhos)**	**pH**	**Microbiological (CFU)**	**Nitrite (PPM)**	**Comments**
Loop MU	271	7.3			
(Limits)	(200 - 400)	(6 - 8)			
Loop #2	327	7.6	10	928	Reduce chemical feed.
(Limits)	(200 - 500)	(7 - 8)	(below 10^4)	(500 - 900)	
Loop #3	377	7.7	100	782	
(Limits)	(200 - 500)	(7 - 8)	(below 10^4)	(500 - 900)	

Summary

Closed Loops: Chemical level in Loop #2 is just above our upper limit but this should drop when make-up water is added. This will not damage the system but adds unnecessary cost to your chemical treatment program. All other systems were operating within control limits.

Additional Comments

Overflow from Tower #4 should be addressed as soon as possible as this system is not adequately protected from scale and corrosion. In addition, operating under these conditions will result in additional cost for your program due to the water and chemical overflowing to drain. Please correct immediately and let us know if we can be of assistance. Tower #2 and the Package Boiler should be addressed also but these two systems are not in need of attention as quickly as Tower #4.

Thank you for your business!