

Regeneration Log (Concurrent Series)

Date: 5/26/08

Time: 12:23

Run length: $214,000 - 12,000 = 202,000$ gallons

Service Water pressure: 89 psi Temp. 80 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target															
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #					
1	SA	BW	15	60	50	57	66	68	66	110					
2	SA	Settle	3	60							3%= 1.0215				
3	SC	BW	10	59	75	87	97	101	102	97	5%=1.0417				
4	PA	BW	15	59	50	57	62	64	64	53	Hydrometer		Dilution Water		
5	PC	BW	15	59	120	140	153	158	158	36	Target	Actual	Target	Actual	
6a	SA	5% NaOH	29	60	10				10	155	1.0417		290	300	
6b	SA to PA	5% NaOH	66	60	10				10	155	1.0417	1.044	950	940	
6c	SA to PA	SR	32	60	20					156		Total:	1590	1590	
6d	PC	Settle	3	60	0										
6e	SC to PC	1.5% Acid	12	59	85				85	191/206	1.0084	1.0090	1020	1110	
6f	SC to PC	3.0% Acid	9	59	85				85	191/207	1.0184	1.020	1785	1870	
6g	SC to PC	5.0% Acid	6	59	85				85	191/208	1.0317	1.032	2295	2380	
6h	SC to PC	SR	8	59	85				85	191		Total:	2975	3050	
6i	PC	FR	16	59	165				165	29					
7	PA	FR	22	60	165				164	49					
8	PC to PA	Recycle	30/CT-1 < 20	60	165				164	82					
9	SC	FR	17	60	165				148	91	Caustic Pump # <u>5A</u>				
10	SA	FR	14/CT-3 < 100	60	165				150	103	Setting: <u>400</u>				
11	Rinse Recycle		13/CT-5 < 2.00	60	165				142	116	Caustic Temp. <u>120°F</u>				
12	Mandatory Recycle		10		165				142	116	Target = 49° C or 120° F				
	Service				150					122					

Neutralization Basin pH: 4.0

Corrections: 4 min Caustic

Dump ph: 6.5

Notes: IN Service 1703

Caustic Pump # 5A

Setting: 400

Caustic Temp. 120°F

Target = 49° C or 120° F

NOTE

Regeneration Log (Concurrent Series)

Date: 4-27-08

Time: 1333

Run length: 214,000 - 12,000 = 202,000 gallons

Service Water pressure: 65 psi Temp. 80 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #
1	SA	BW	15	60	50	57	66	68	<u>66</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>97</u>	97
4	PA	BW	15	59	50	57	62	64	<u>62</u>	53
5	PC	BW	15	59	120	140	153	158	<u>153</u>	36
6a	SA	5% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20				156
6d	PC	Settle	3	60		0			-	
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>165</u>	29
7	PA	FR	22	60		165			<u>165</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>165</u>	82
9	SC	FR	17	60		165			<u>165</u>	91
10	SA	FR	14/CT-3 < 100	60		165			<u>165</u>	103
11	Rinse Recycle		13/CT-5 < 2.00	60		165			<u>160</u>	116
12	Mandatory Recycle		10			165			<u>160</u>	116
	Service					150			<u>150</u>	122

3%= 1.0215

5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	✓	290	<u>300</u>
1.0417	<u>1.042</u>	950	
	Total:	1590	
1.0084	<u>1.008</u>	1020	<u>1080</u>
1.0184	<u>1.020</u>	1785	<u>1820</u>
1.0317	<u>1.032</u>	2295	<u>2310</u>
	Total:	2975	<u>3120</u>

Caustic Pump # A

Setting: 400

Caustic Temp. 120°F

Target = 49° C or 120° F

Neutralization Basin pH: 7.4

Corrections: NONE

Dump pH: 7.4

Notes: _____

Regeneration Log (Concurrent Series)

Date: 4-25-08

Time: 10:00

Run length: 214,000 - 9000 = 205,000 gallons

Service Water pressure: 88 psi Temp. 76 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

					GPM Target				Actual	RSV #				
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°						
55	1	SA	BW	15	60	50	57	66	68	57	110			
	2	SA	Settle	3	60									
11	3	SC	BW	10	59	75	87	97	101	87	97			
21	4	PA	BW	15	59	50	57	62	64	57	53	Hydrometer		Dilution Water
36	5	PC	BW	15	59	120	140	153	158	140	36	Target	Actual	Target
36	6a	SA	5% NaOH	29	60	10				10	155	1.0417		290
05	6b	SA to PA	5% NaOH	66	60	10				10	155	1.0417		950
	6c	SA to PA	SR	32	60	20					156	Total:		1590
	6d	PC	Settle	3	60	0								
54	6e	SC to PC	1.5% Acid	12	59	85				85	191/206	1.0084	1.008	1020
57	6f	SC to PC	3.0% Acid	9	59	85				85	191/207	1.0184	1.018	1785
06	6g	SC to PC	5.0% Acid	6	59	85				85	191/208	1.0317		2295
	6h	SC to PC	SR	8	59	85					191	Total:		2975
	6i	PC	FR	16	59	165					29			
	7	PA	FR	22	60	165				165	49			
	8	PC to PA	Recycle	30/CT-1 < 20	60	165				165	82			
	9	SC	FR	17	60	165				165	91			
	10	SA	FR	14/CT-3 < 100	60	165					103			
	11	Rinse Recycle		13/CT-5 < 2.00	60	165					116			
	12	Mandatory Recycle		10		165					116			
		Service				150					122			

Caustic Pump # 3

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 7.0

Corrections: 0

Dump ph: 7.0

Notes: _____

Regeneration Log (Concurrent Series)

Date: 4/19/08
 Time: 1935
 Run length: 214,000 - 13K = 261K gallons
 Service Water pressure: 89 psi Temp. 72 degrees F

PC=Primary Cation
 PA=Primary Anion
 SC=Secondary Cation
 SA=Secondary Anion
 BW=Back Wash
 SR=Slow Rinse
 FR=Fast Rinse
 RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #				
					60°	(70°)	80°	83°						
1	SA	BW	15	60	50	57	66	68	56	110				
2	SA	Settle	3	60										
3	SC	BW	10	59	75	87	97	101	86	97				
4	PA	BW	15	59	50	57	62	64	56	53				
5	PC	BW	15	59	120	140	153	158	139	36				
6a	SA	5% NaOH	29	60	10				10	155	1.0417		290	
6b	SA to PA	5% NaOH	66	60	10				10	155	1.0417	1.043	950	
6c	SA to PA	SR	32	60	20				20	156		Total:	1590	
6d	PC	Settle	3	60	0									
6e	SC to PC	1.5% Acid	12	59	85				84	191/206	1.0084	1.0079	1020	
6f	SC to PC	3.0% Acid	9	59	85				85	191/207	1.0184	1.016	1785	
6g	SC to PC	5.0% Acid	6	59	85				85	191/208	1.0317	1.030	2295	
6h	SC to PC	SR	8	59	85				85	191		Total:	2975	
6i	PC	FR	16	59	165				165	29				
7	PA	FR	22	60	165				165	49				
8	PC to PA	Recycle	30/CT-1 < 20	60	165				160	82				
9	SC	FR	17	60	165				165	91				
10	SA	FR	14/CT-3 < 100	60	165				160	103				
11	Rinse Recycle		13/CT-5 < 2.00	60	165				140	116				
12	Mandatory Recycle		10		165				142	116				
	Service				150					122				

3%= 1.0215
 5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
		290	
		950	
		Total:	1590
		Total:	2975

Caustic Pump # 8
 Setting: 400
 Caustic Temp. 120
 Target = 49° C or 120° F

Neutralization Basin pH: 5
 Corrections: 2 min CAUSTIC
 Dump pH: 7

Notes: _____

Regeneration Log (Concurrent Series)

Date: 4-15-08

Time: 1126

Run length: 214,000 - 10000 = 204000 gallons

Service Water pressure: 92 psi Temp. 70 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #
1	SA	BW	15	60	50	57	66	68	<u>57</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>87</u>	97
4	PA	BW	15	59	50	57	62	64	<u>57</u>	53
5	PC	BW	15	59	120	140	153	158	<u>140</u>	36
6a	SA	5% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20			<u>20</u>	156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>165</u>	29
7	PA	FR	22	60		165			<u>165</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>165</u>	82
9	SC	FR	17	60		165			<u>165</u>	91
10	SA	FR	14/CT-3 < 100	60		165			<u>165</u>	103
11	Rinse Recycle	13/CT-5 < 2.00	60			165			<u>140</u>	116
12	Mandatory Recycle		10			165				116
	Service					150				122

3%= 1.0215
5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417		290	<u>320</u>
1.0417	<u>1.041</u>	950	<u>990</u>
	Total:	1590	<u>1630</u>
1.0084	<u>1.008</u>	1020	
1.0184	<u>1.018</u>	1785	
1.0317	<u>1.031</u>	2295	<u>2440</u>
	Total:	2975	<u>3140</u>

Caustic Pump # B

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 5

Corrections: caustic 2mins

Dump pH: 6.0

Notes: Low Regeneration level @ step 10 opened recirc valve

Regeneration Log (Concurrent Series)

Date: 4-12-08

Time: 0900

Run length: 214,000 - 7 = 206K gallons

Service Water pressure: 86 psi Temp. 90 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #
1	SA	BW	15	60	50	57	66	68	<u>65</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>97</u>	97
4	PA	BW	15	59	50	57	62	64	<u>61</u>	53
5	PC	BW	15	59	120	140	153	158	<u>153</u>	36
6a	SA	5% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20			<u>20</u>	156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>165</u>	29
7	PA	FR	22	60		165			<u>165</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>165</u>	82
9	SC	FR	17	60		165			<u>168</u>	91
10	SA	FR	14/CT-3 < 100	60		165			<u>168</u>	103
11	Rinse Recycle		13/CT-5 < 2.00	60		165				116
12	Mandatory Recycle		10			165				116
	Service					150				122

3%= 1.0215

5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417		290	
1.0417	<u>1.0411</u>	950	
	Total:	1590	
1.0084	<u>1.008</u>	1020	
1.0184	<u>1.018</u>	1785	
1.0317	<u>1.031</u>	2295	
	Total:	2975	

Caustic Pump # B

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 5

Corrections: 1/min caustic

Dump ph: 6

Notes: _____

Regeneration Log (Concurrent Series)

Date: 4/11/08

Time: 0034

Run length: 214,000 - 10,000 = 204,000 gallons

Service Water pressure: 92 psi Temp. 80 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										Actual	RSV #			
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°						
1	SA	BW	15	60	50	57	66	68	65	110				
2	SA	Settle	3	60							3%= 1.0215			
3	SC	BW	10	59	75	87	97	101	96	97	5%=1.0417			
4	PA	BW	15	59	50	57	62	64	61	53	Hydrometer	Dilution Water		
5	PC	BW	15	59	120	140	153	158	152	36	Target	Actual	Target	Actual
6a	SA	5% NaOH	29	60		10			10	155	1.0417		290	
6b	SA to PA	5% NaOH	66	60		10			10	155	1.0417		950	
6c	SA to PA	SR	32	60		20			20	156		Total:	1590	
6d	PC	Settle	3	60		0								
6e	SC to PC	1.5% Acid	12	59		85			85	191/206	1.0084	1.00	1020	
6f	SC to PC	3.0% Acid	9	59		85			85	191/207	1.0184	1.01	1785	
6g	SC to PC	5.0% Acid	6	59		85			85	191/208	1.0317	1.03	2295	
6h	SC to PC	SR	8	59		85			85	191		Total:	2975	
6i	PC	FR	16	59		165			165	29				
7	PA	FR	22	60		165			165	49				
8	PC to PA	Recycle	30/CT-1 < 20	60		165			165	82				
9	SC	FR	17	60		165			165	91				
10	SA	FR	14/CT-3 < 100	60		165			164	103				
11	Rinse Recycle		13/CT-5 < 2.00	60		165			142	116				
12	Mandatory Recycle		10			165				116				
	Service					150				122				

Caustic Pump # B

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

3%= 1.0215

5%= 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417		290	
1.0417		950	
	Total:	1590	
1.0084	1.00	1020	
1.0184	1.01	1785	
1.0317	1.03	2295	
	Total:	2975	

Caustic Pump # B

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 5

Corrections: 2 min. over

Dump pH: 7.5

Notes:

Regeneration Log (Concurrent Series)

Date: 4-9-08

Time: 1911

Run length: $214,000 - 17,000 = 197,000$ gallons

Service Water pressure: 92 psi Temp. 78 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #
1	SA	BW	15	60	50	57	66	68	66	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	97	97
4	PA	BW	15	59	50	57	62	64	62	53
5	PC	BW	15	59	120	140	153	158	153	36
6a	SA	5% NaOH	29	60	10				10	155
6b	SA to PA	5% NaOH	66	60	10				10	155
6c	SA to PA	SR	32	60	20				18	156
6d	PC	Settle	3	60	0					
6e	SC to PC	1.5% Acid	12	59	85				85	191/206
6f	SC to PC	3.0% Acid	9	59	85				85	191/207
6g	SC to PC	5.0% Acid	6	59	85				85	191/208
6h	SC to PC	SR	8	59	85				85	191
6i	PC	FR	16	59	165				165	29
7	PA	FR	22	60	165				165	49
8	PC to PA	Recycle	30/CT-1 < 20	60	165				165	82
9	SC	FR	17	60	165				165	91
10	SA	FR	14/CT-3 < 100	60	165				165	103
11	Rinse Recycle		13/CT-5 < 2.00	60	165				165	116
12	Mandatory Recycle		10		165				143	116
	Service				150				142	122

3%= 1.0215
5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417		290	
1.0417	1.041	950	990
	Total:	1590	1620
1.0084	1.008	1020	
1.0184	1.018	1785	
1.0317	1.031	2295	
	Total:	2975	3130

Caustic Pump # 9

Setting: Y00

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 5.0

Corrections: caustic 3 mins

Dump ph: 6.5

Notes:

Regeneration Log (Concurrent Series)

Date: 3/26/08

Time: 1130

Run length: 214,000 - 17000 = 197000 gallons

Service Water pressure: 98 psi Temp. 78 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #				
					60°	70°	80°	83°						
1	SA	BW	15	60	50	57	66	68	67	110				
2	SA	Settle	3	60										
3	SC	BW	10	59	75	87	97	101	97	97				
4	PA	BW	15	59	50	57	62	64	60	53				
5	PC	BW	15	59	120	140	153	158	150	36				
6a	SA	5% NaOH	29	60	10				10	155	1.0417		290	
6b	SA to PA	5% NaOH	66	60	10				10	155	1.0417		950	
6c	SA to PA	SR	32	60	20					156		Total:	1590	1620
6d	PC	Settle	3	60	0									
6e	SC to PC	1.5% Acid	12	59	85				85	191/206	1.0084	1.0084	1020	
6f	SC to PC	3.0% Acid	9	59	85				85	191/207	1.0184	1.0184	1785	
6g	SC to PC	5.0% Acid	6	59	85				85	191/208	1.0317	1.0317	2295	
6h	SC to PC	SR	8	59	85				85	191		Total:	2975	3160
6i	PC	FR	16	59	165				165	29				
7	PA	FR	22	60	165				160	49				
8	PC to PA	Recycle	30/CT-1 < 20	60	165				165	82				
9	SC	FR	17	60	165				145	91				
10	SA	FR	14/CT-3 < 100	60	165				125	103				
11	Rinse Recycle		13/CT-5 < 2.00	60	165				120	116				
12	Mandatory Recycle		10		165					116				
	Service				150					122				

Caustic Pump # 13

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 6.5

Corrections:

Dump pH: 6.5

Notes:



Regeneration Log (Concurrent Series)

Date: 3-21-08

Time: 20:00

Run length: 214,000 - 8,000 = 206,000 gallons

Service Water pressure: 90 psi Temp. 76 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #
1	SA	BW	15	60	50	57	66	68	166	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	94	97
4	PA	BW	15	59	50	57	62	64	60	53
5	PC	BW	15	59	120	140	153	158	150	36
6a	SA	5% NaOH	29	60	10				10	155
6b	SA to PA	5% NaOH	66	60	10				10	155
6c	SA to PA	SR	32	60	20				20	156
6d	PC	Settle	3	60	0					
6e	SC to PC	1.5% Acid	12	59	85				85	191/206
6f	SC to PC	3.0% Acid	9	59	85				85	191/207
6g	SC to PC	5.0% Acid	6	59	85				85	191/208
6h	SC to PC	SR	8	59	85				85	191
6i	PC	FR	16	59	165				165	29
7	PA	FR	22	60	165				165	49
8	PC to PA	Recycle	30/CT-1 < 20	60	165				165	82
9	SC	FR	17	60	165				165	91
10	SA	FR	14/CT-3 < 100	60	165				165	103
11	Rinse Recycle		13/CT-5 < 2.00	60	165				145	116
12	Mandatory Recycle		10		165				143	116
	Service				150					122

3%= 1.0215	
5%=1.0417	

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417		290	300
1.0417	1.042	950	960
	Total:	1590	1610
1.0084		1020	1030
1.0184		1785	1900
1.0317		2295	2420
	Total:	2975	3120

Caustic Pump # A

Setting: 400

Caustic Temp. _____

Target = 49° C or 120° F

3%= 1.0215

5%= 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417		290	300
1.0417	1.042	950	960
	Total:	1590	1610
1.0084		1020	1030
1.0184		1785	1900
1.0317		2295	2420
	Total:	2975	3120

Caustic Pump # A

Setting: 400

Caustic Temp. _____

Target = 49° C or 120° F

Neutralization Basin pH: 4

Corrections: 3 min CAUSTIC

Dump pH: 7

Notes: _____

Regeneration Log (Concurrent Series)

Date: 3/19/08

Time: 1900

Run length: 214,000 - 12000 = 202,000 gallons

Service Water pressure: 90 psi Temp. 80 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target

Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #
1	SA	BW	15	60	50	57	66	68	65	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	96	97
4	PA	BW	15	59	50	57	62	64	62	53
5	PC	BW	15	59	120	140	153	158	151	36
6a	SA	3% NaOH	29	60		10			10	155
6b	SA to PA	3% NaOH	66	60		10			10	155
6c	SA to PA	SR	32	60		20			20	156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			85	191/206
6f	SC to PC	3.0% Acid	9	59		85			85	191/207
6g	SC to PC	5.0% Acid	6	59		85			85	191/208
6h	SC to PC	SR	8	59		85			85	191
6i	PC	FR	16	59		165			165	29
7	PA	FR	28	60		165			165	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			165	82
9	SC	FR	17	60		165			165	91
10	SA	FR	14/CT-3 < 100	60		165			160	103
11	Rinse Recycle		13/CT-5 < 2.00	60		165			160	116
12	Mandatory Recycle		10			165			160	116
	Service					150				122

3%= 1.0215

5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	N/A	290	
1.0417		950	
	Total:	1590	
1.0084		1020	
1.0184		1785	
1.0317		2295	
	Total:	2975	

Caustic Pump # 13

Setting: 400

Caustic Temp. 119

Target = 49° C or 120° F

Neutralization Basin pH: 4.0

Corrections: 2 min Caustic

Dump pH: 7.0

Notes: _____

Regeneration Log (Concurrent Series)

Date: 4-20-08

Time: 1900

Run length: 214,000 - 20,000 = _____ gallons

Service Water pressure: 98 psi Temp. 80 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										Actual	RSV #
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°			
1	SA	BW	15	60	50	57	66	68	66	110	
2	SA	Settle	3	60							
3	SC	BW	10	59	75	87	97	101	97	97	
4	PA	BW	15	59	50	57	62	64	65	53	
5	PC	BW	15	59	120	140	153	158	152	36	
6a	SA	5% NaOH	29	60	10				10	155	
6b	SA to PA	5% NaOH	66	60	10				10	155	
6c	SA to PA	SR	32	60	20				20	156	
6d	PC	Settle	3	60	0						
6e	SC to PC	1.5% Acid	12	59	85				85	191/206	
6f	SC to PC	3.0% Acid	9	59	85				86	191/207	
6g	SC to PC	5.0% Acid	6	59	85				86	191/208	
6h	SC to PC	SR	8	59	85				86	191	
6i	PC	FR	16	59	165				164	29	
7	PA	FR	22	60	165				162	49	
8	PC to PA	Recycle	30/CT-1 < 20	60	165				165	82	
9	SC	FR	17	60	165				162	91	
10	SA	FR	14/CT-3 < 100	60	165				165	103	
11	Rinse Recycle		13/CT-5 < 2.00	60	165				145	116	
12	Mandatory Recycle		10		165				145	116	
	Service				150					122	

3%= 1.0215
5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	1.0418	290	300
1.0417	1.0417	950	
	Total:	1590	
1.0084	1.0082	1020	
1.0184	1.0183	1785	
1.0317	1.0318	2295	
	Total:	2975	

Caustic Pump # A

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

3%= 1.0215

5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	<u>1.0418</u>	290	<u>300</u>
1.0417	<u>1.0417</u>	950	
	Total:	1590	
1.0084	<u>1.0082</u>	1020	
1.0184	<u>1.0183</u>	1785	
1.0317	<u>1.0318</u>	2295	
	Total:	2975	

Caustic Pump # A

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 6.8

Corrections: _____

Dump pH: _____

Notes: _____

Regeneration Log (Concurrent Series)

Date: 3/17/08

Time: 1900

Run length: $214,000 - \frac{23000}{1000} = 191,000$ gallons

Service Water pressure: 95 psi Temp. 80 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #				
					60°	70°	80°	83°						
1	SA	BW	15	60	50	57	66	68	66	110				
2	SA	Settle	3	60										
3	SC	BW	10	59	75	87	97	101	97	97				
4	PA	BW	15	59	50	57	62	64	60	53				
5	PC	BW	15	59	120	140	153	158	150	36				
6a	SA	3% NaOH	29	60	10				10	155	1.0417	N/A	290	
6b	SA to PA	3% NaOH	66	60	10				10	155	1.0417		950	960
6c	SA to PA	SR	32	60	20				20	156		Total:	1590	1600
6d	PC	Settle	3	60	0									
6e	SC to PC	1.5% Acid	12	59	85				85	191/206	1.0084	1.008	1020	
6f	SC to PC	3.0% Acid	9	59	85				85	191/207	1.0184	1.020	1785	
6g	SC to PC	5.0% Acid	6	59	85				85	191/208	1.0317	1.032	2295	2410
6h	SC to PC	SR	8	59	85				85	191		Total:	2975	3100
6i	PC	FR	16	59	165				164	29				
7	PA	FR	28	60	165				162	49				
8	PC to PA	Recycle	30/CT-1 < 20	60	165				162	82				
9	SC	FR	17	60	165				150	91				
10	SA	FR	14/CT-3 < 100	60	165				152	103				
11	Rinse Recycle		13/CT-5 < 2.00	60	165				143	116				
12	Mandatory Recycle		10		165				145	116				
	Service				150				142	122				

3%= 1.0215
5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	N/A	290	
1.0417		950	960
	Total:	1590	1600

2050
2052

Caustic Pump # 13

Setting: 400

Caustic Temp. 121

Target = 49° C or 120° F

Neutralization Basin pH: 7

Corrections: None

Dump ph: _____

Notes: _____

Regeneration Log (Concurrent Series)

Date: 3/14/08

Time: 0645

Run length: 214,000 - 21 = 193000 gallons

Service Water pressure: 82 psi Temp. 78 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #				
					60°	70°	80°	83°						
1	SA	BW	15	60	50	57	66	68	<u>65</u>	110				
2	SA	Settle	3	60					<u>✓</u>					
3	SC	BW	10	59	75	87	97	101	<u>97</u>	97				
4	PA	BW	15	59	50	57	62	64	<u>62</u>	53	Hydrometer		Dilution Water	
5	PC	BW	15	59	120	140	153	158	<u>153</u>	36	Target	Actual	Target	Actual
6a	SA	5% NaOH	29	60		10			<u>10</u>	155	1.0417		290	
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155	1.0417	<u>1.0417</u>	950	
6c	SA to PA	SR	32	60		20			<u>20</u>	156		Total:	1590	<u>1600</u>
6d	PC	Settle	3	60		0								
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206	1.0084	<u>1.0084</u>	1020	
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207	1.0184	<u>1.0184</u>	1785	
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208	1.0317	<u>1.0317</u>	2295	
6h	SC to PC	SR	8	59		85			<u>85</u>	191		Total:	2975	<u>3120</u>
6i	PC	FR	16	59		165			<u>165</u>	29				
7	PA	FR	22	60		165			<u>165</u>	49				
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>165</u>	82				
9	SC	FR	17	60		165			<u>160</u>	91				
10	SA	FR	14/CT-3 < 100	60		165			<u>160</u>	103				
11	Rinse Recycle		13/CT-5 < 2.00	60		165			<u>135</u>	116				
12	Mandatory Recycle		10			165			<u>135</u>	116				
	Service					150				122				

Caustic Pump # A

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 9.0

Corrections: 2 mins Acid

Dump pH: 7.0

Notes:

Regeneration Log (Concurrent Series)

Date: 3-10-08

Time: 2225

Run length: 214,000 - 21,000 = 193,000 gallons

Service Water pressure: 85 psi Temp. 78 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										Actual	RSV #
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°			
1	SA	BW	15	60	50	57	66	68	64	110	
2	SA	Settle	3	60					—		
3	SC	BW	10	59	75	87	97	101	94	97	
4	PA	BW	15	59	50	57	62	64	60	53	
5	PC	BW	15	59	120	140	153	158	152	36	
6a	SA	5% NaOH	29	60		10			10	155	
6b	SA to PA	5% NaOH	66	60		10			10	155	
6c	SA to PA	SR	32	60		20			20	156	
6d	PC	Settle	3	60		0			—		
6e	SC to PC	1.5% Acid	12	59		85			85	191/206	
6f	SC to PC	3.0% Acid	9	59		85			85	191/207	
6g	SC to PC	5.0% Acid	6	59		85			85	191/208	
6h	SC to PC	SR	8	59		85			85	191	
6i	PC	FR	16	59		165			165	29	
7	PA	FR	22	60		165			165	49	
8	PC to PA	Recycle	30/CT-1 < 20	60		165			165	82	
9	SC	FR	17	60		165			165	91	
10	SA	FR	14/CT-3 < 100	60		165			165	103	
11	Rinse Recycle		13/CT-5 < 2.00	60		165			145	116	
12	Mandatory Recycle		10			165			145	116	
	Service	0308				150				122	

3%= 1.0215	
5%=1.0417	

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	—	290	300
1.0417	1.0415	950	990
	Total:	1590	
1.0084	1.009	1020	1130
1.0184	1.019	1785	1900
1.0317	1.033	2295	2420
	Total:	2975	3110

Caustic Pump # B

Setting: 400

Caustic Temp. 120°F

Target = 49° C or 120° F

3%= 1.0215

5%= 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	—	290	300
1.0417	1.0415	950	990
	Total:	1590	
1.0084	1.009	1020	1130
1.0184	1.019	1785	1900
1.0317	1.033	2295	2420
	Total:	2975	3110

Caustic Pump # B

Setting: 400

Caustic Temp. 120°F

Target = 49° C or 120° F

Neutralization Basin pH: 9.0
Corrections: 2 min acid
Dump pH: 6.0

Notes: _____

Regeneration Log (Concurrent Series)

Date: 3/6/08

Time: 856

Run length: 214,000 - 22000 = 192000 gallons

Service Water pressure: 86 psi Temp. 80 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #
					60°	70°	80°	83°		
1	SA	BW	15	60	50	57	66	68	<u>65</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>96</u>	97
4	PA	BW	15	59	50	57	62	64		53
5	PC	BW	15	59	120	140	153	158		36
6a	SA	5% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20			<u>20</u>	156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>165</u>	29
7	PA	FR	22	60		165			<u>163</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>165</u>	82
9	SC	FR	17	60		165			<u>165</u>	91
10	SA	FR	14/CT-3 < 100	60		165			<u>165</u>	103
11	Rinse Recycle		13/CT-5 < 2.00	60		165			<u>165</u>	116
12	Mandatory Recycle		10			165				116
	Service					150				122

3%= 1.0215

5%= 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
	<u>1.04</u>	290	
		950	
	Total:	1590	
	<u>1.008</u>	1020	
	<u>1.18</u>	1785	
	<u>1.03</u>	2295	
	Total:	2975	

Caustic Pump # B

Setting: _____

Caustic Temp. _____

Target = 49° C or 120° F

Neutralization Basin pH: 8
Corrections: 2 min Acid
Dump pH: 7

Notes: _____

Regeneration Log (Concurrent Series)

Date: 3/3/08

Time: 0720

Run length: 214,000 - 19000 = 195000 gallons

Service Water pressure: 99 psi Temp. 75 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #
					60°	70°	80°	83°		
1	SA	BW	15	60	50	57	66	68	62	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	90	97
4	PA	BW	15	59	50	57	62	64	59	53
5	PC	BW	15	59	120	140	153	158	145	36
6a	SA	5% NaOH	29	60		10			10	155
6b	SA to PA	5% NaOH	66	60		10			10	155
6c	SA to PA	SR	32	60		20				156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			85	191/206
6f	SC to PC	3.0% Acid	9	59		85			85	191/207
6g	SC to PC	5.0% Acid	6	59		85			85	191/208
6h	SC to PC	SR	8	59		85			85	191
6i	PC	FR	16	59		165			165	29
7	PA	FR	22	60		165			165	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			165	82
9	SC	FR	17	60		165			165	91
10	SA	FR	14/CT-3 < 100	60		165			152	103
11	Rinse Recycle		13/CT-5 < 2.00	60		165			155	116
12	Mandatory Recycle		10			165			137	116
	Service					150			150	122

3%= 1.0215

5%= 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417		290	
1.0417	1.0417	950	
	Total:	1590	1620
1.0084	1.0084	1020	
1.0184	1.0184	1785	
1.0317	1.0317	2295	
	Total:	2975	3100

Caustic Pump # A

Setting: 400

Caustic Temp. 121

Target = 49° C or 120° F

Neutralization Basin pH: 9.0

Corrections: 2 min. acid

Dump pH: 7.0

Notes: _____

Regeneration Log (Concurrent Series)

Date: 2-24-08

Time: 0525

Run length: 214,000 - 29,000 = _____ gallons

Service Water pressure: _____ psi Temp. 80 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #
1	SA	BW	15	60	50	57	66	68	<u>60</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>98</u>	97
4	PA	BW	15	59	50	57	62	64	<u>58</u>	53
5	PC	BW	15	59	120	140	153	158	<u>153</u>	36
6a	SA	5% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20			<u>20</u>	156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>160</u>	29
7	PA	FR	22	60		165			<u>160</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>164</u>	82
9	SC	FR	17	60		165			<u>152</u>	91
10	SA	FR	14/CT-3 < 100	60		165			<u>147</u>	103
11	Rinse Recycle		13/CT-5 < 2.00	60		165			<u>135</u>	116
12	Mandatory Recycle		10			165			<u>135</u>	116
	Service					150			<u>151</u>	122

3% = 1.0215
5% = 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417		290	
1.0417	<u>1.0410</u>	950	
	Total:	1590	<u>1610</u>
1.0084	<u>1.007</u>	1020	
1.0184	<u>1.018</u>	1785	
1.0317	<u>1.0300</u>	2295	
	Total:	2975	<u>3070</u>

Caustic Pump # A
Setting: 400
Caustic Temp. 120
Target = 49° C or 120° F

Neutralization Basin pH: 7.0

Corrections: None

Dump pH: 7.0

Notes: _____

Regeneration Log (Concurrent Series)

Date: 2/21/08

Time: 1980

Run length: 214,000 - 36000 = 178000 gallons

Service Water pressure: 82 psi Temp. 75 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #
					60°	70°	80°	83°		
1	SA	BW	15	60	50	57	66	68	<u>60</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>83</u>	97
4	PA	BW	15	59	50	57	62	64	<u>60</u>	53
5	PC	BW	15	59	120	140	153	158	<u>144</u>	36
6a	SA	5% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20			<u>20</u>	156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>164</u>	29
7	PA	FR	22	60		165			<u>160</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>164</u>	82
9	SC	FR	17	60		165			<u>152</u>	91
10	SA	FR	14/CT-3 < 100	60		165			<u>147</u>	103
11	Rinse Recycle		13/CT-5 < 2.00	60		165			<u>135</u>	116
12	Mandatory Recycle		10			165			<u>135</u>	116
	Service					150				122

3%= 1.0215

5%= 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
		290	
		950	
	Total:	1590	<u>1590</u>
		1020	
		1785	
		2295	
	Total:	2975	<u>3070</u>

Caustic Pump # B

Setting: 400

Caustic Temp. 120°F

Target = 49° C or 120° F

Neutralization Basin pH: 9.0

Corrections: 2 min Acid

Dump pH: 7.0

Notes: _____

Regeneration Log (Concurrent Series)

Date: 2/13/08

Time: 23:5

Run length: 214,000 - 31,000 = 183,000 gallons

Service Water pressure: 69 psi Temp. 75 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #
					60°	70°	80°	83°		
1	SA	BW	15	60	50	57	66	68	<u>60</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>92</u>	97
4	PA	BW	15	59	50	57	62	64	<u>60</u>	53
5	PC	BW	15	59	120	140	153	158	<u>145</u>	36
6a	SA	5% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20				156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>165</u>	29
7	PA	FR	22	60		165			<u>165</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>165</u>	82
9	SC	FR	17	60		165				91
10	SA	FR	14/CT-3 < 100	60		165				103
11	Rinse Recycle		13/CT-5 < 2.00	60		165				116
12	Mandatory Recycle		10			165				116
	Service					150				122

3%= 1.0215

5%= 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
		290	
		950	
	Total:	1590	<u>1600</u>
			1600
1.0084	1.0088	1020	
1.0184		1785	
1.0317		2295	
	Total:	2975	<u>3150</u>

Caustic Pump # A

Setting: 400

Caustic Temp. 120

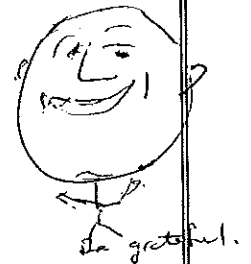
Target = 49° C or 120° F

Neutralization Basin pH: 9.0

Corrections: Acid 3 min

Dump pH: 7.0

Notes:



Regeneration Log (Concurrent Series)

Date: 2-11-08

Time: 0410

Run length: 214,000 - 26,000 = 188,000 gallons

Service Water pressure: 88 psi Temp. 77 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #
					60°	70°	80°	83°		
1	SA	BW	15	60	50	57	66	68	<u>60</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>96</u>	97
4	PA	BW	15	59	50	57	62	64	<u>60</u>	53
5	PC	BW	15	59	120	140	153	158	<u>150</u>	36
6a	SA	3% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	3% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20			<u>20</u>	156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>165</u>	29
7	PA	FR	28	60		165			<u>165</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>165</u>	82
9	SC	FR	17	60		165			<u>160</u>	91
10	SA	FR	14/CT-3 < 100	60		165			<u>160</u>	103
11	Rinse Recycle		13/CT-5 < 2.00	60		165			<u>145</u>	116
12	Mandatory Recycle		10			165			<u>145</u>	116
	Service					150				122

3%= 1.0215

5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	N/A	290	<u>310</u>
1.0417	<u>1.04</u>	950	
Total:		1590	<u>1660</u>
1.0084	<u>1.010</u>	1020	<u>1160</u>
1.0184	<u>1.020</u>	1785	<u>1880</u>
1.0317	<u>1.033</u>	2295	<u>2440</u>
Total:		2975	<u>3140</u>

Caustic Pump # 1

Setting: 400

Caustic Temp. 121

Target = 49° C or 120° F

Neutralization Basin pH: 10

Corrections: acid 3 mins

Dump ph: 7.0

Notes: _____

Regeneration Log (Concurrent Series)

Date: 2/6/08

Time: 2020

Run length: 214,000 - 25,000 = 189,000 gallons

Service Water pressure: 86 psi Temp. 84 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										Actual	RSV #
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°			
1	SA	BW	15	60	50	57	66	68	68	110	
2	SA	Settle	3	60							
3	SC	BW	10	59	75	87	97	101	100	97	
4	PA	BW	15	59	50	57	62	64	64	53	
5	PC	BW	15	59	120	140	153	158	157	36	
6a	SA	5% NaOH	29	60	10				10	155	
6b	SA to PA	5% NaOH	66	60	10				10	155	
6c	SA to PA	SR	32	60	20				20	156	
6d	PC	Settle	3	60	0				0		
6e	SC to PC	1.5% Acid	12	59	85				85	191/206	
6f	SC to PC	3.0% Acid	9	59	85				85	191/207	
6g	SC to PC	5.0% Acid	6	59	85				85	191/208	
6h	SC to PC	SR	8	59	85				85	191	
6i	PC	FR	16	59	165				165	29	
7	PA	FR	22	60	165				165	49	
8	PC to PA	Recycle	30/CT-1 < 20	60	165				165	82	
9	SC	FR	17	60	165				150	91	
10	SA	FR	14/CT-3 < 100	60	165				150	103	
11	Rinse Recycle			13/CT-5 < 2.00	60	165				134	116
12	Mandatory Recycle			10		165				134	116
	Service				150				134	122	

3%= 1.0215	
5%=1.0417	

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	✓	290	
1.0417	✓	950	
	Total:	1590	
1.0084	✓	1020	
1.0184	✓	1785	
1.0317		2295	
	Total:	2975	

Regulate/For Degas Level
Caustic Pump # B
Setting: 400
Caustic Temp. 120°
Target = 49° C or 120° F

3%= 1.0215

5%= 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	✓	290	
1.0417	✓	950	
	Total:	1590	
1.0084	✓	1020	
1.0184	✓	1785	
1.0317	✓	2295	
	Total:	2975	

Regulate / For Degas Level
Caustic Pump # B

Setting: 460

Caustic Temp. 120°

Target = 49° C or 120° F

Neutralization Basin pH: 7.4

Corrections: None

Dump ph: 7.4

Notes: Regulate Valve 91 to 150gpm to maintain

Degasifier level (Step #9) & Step #10 150gpm
Valve 103

Regeneration Log (Concurrent Series)

Date: 1/20/08

Time: 1245

Run length: 214,000 - 24000 = 190000 gallons

Service Water pressure: 92 psi Temp. 70 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #				
					60°	70°	80°	83°						
1	SA	BW	15	60	50	57	66	68	<u>57</u>	110				
2	SA	Settle	3	60										
3	SC	BW	10	59	75	87	97	101	<u>87</u>	97				
4	PA	BW	15	59	50	57	62	64	<u>57</u>	53				
5	PC	BW	15	59	120	140	153	158	<u>140</u>	36				
6a	SA	3% NaOH	29	60	10				<u>10</u>	155	1.0417	N/A	290	
6b	SA to PA	3% NaOH	66	60	10				<u>10</u>	155	1.0417	<u>1.042</u>	950	
6c	SA to PA	SR	32	60	20				<u>20</u>	156	Total:		1590	<u>1630</u>
6d	PC	Settle	3	60	0									
6e	SC to PC	1.5% Acid	12	59	85				<u>85</u>	191/206	1.0084	<u>1.008</u>	1020	
6f	SC to PC	3.0% Acid	9	59	85				<u>85</u>	191/207	1.0184	<u>1.018</u>	1785	
6g	SC to PC	5.0% Acid	6	59	85				<u>85</u>	191/208	1.0317	<u>1.032</u>	2295	
6h	SC to PC	SR	8	59	85				<u>85</u>	191	Total:		2975	<u>3060</u>
6i	PC	FR	16	59	165				<u>165</u>	29				
7	PA	FR	28	60	165				<u>165</u>	49				
8	PC to PA	Recycle	30/CT-1 < 20	60	165				<u>160</u>	82				
9	SC	FR	17	60	165				<u>160</u>	91				
10	SA	FR	14/CT-3 < 100	60	165				<u>160</u>	103				
11	Rinse Recycle		13/CT-5 < 2.00	60	165				<u>150</u>	116				
12	Mandatory Recycle		10		165				<u>150</u>	116				
	Service				150					122				

Caustic Pump # A

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 8.0

Corrections: ✓

Dump ph: ✓

Notes: _____

Regeneration Log (Concurrent Series)

Date: 01/15/08
 Time: 2000
 Run length: 214,000 - 24,000 = 190,000 gallons
 Service Water pressure: 91 psi Temp. 77 degrees F

PC=Primary Cation
 PA=Primary Anion
 SC=Secondary Cation
 SA=Secondary Anion
 BW=Back Wash
 SR=Slow Rinse
 FR=Fast Rinse
 RSV=Rate Set Valve

Step	Vessel	Process	Time	Add.	GPM Target				Actual	RSV #
					60°	70°	80°	83°		
1	SA	BW	15	60	50	57	66	68	<u>66</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>97</u>	97
4	PA	BW	15	59	50	57	62	64	<u>62</u>	53
5	PC	BW	15	59	120	140	153	158	<u>153</u>	36
6a	SA	5% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20			<u>20</u>	156
6d	PC	Settle	3	60		0			<u>0</u>	
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>160</u>	29
7	PA	FR	22	60		165			<u>161</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>162</u>	82
9	SC	FR	17	60		165			<u>160</u>	91
10	SA	FR	14/CT-3 < 100	60		165			<u>160</u>	103
11	Rinse Recycle		13/CT-5 < 2.00	60		165			<u>160</u>	116
12	Mandatory Recycle		10			165				116
	Service					150				122

3%= 1.0215
 5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417	<u>1.040</u>	290	
1.0417	<u>1.0426</u>	950	
	Total:	1590	<u>1660</u>
1.0084	<u>1.0082</u>	1020	
1.0184	<u>1.0084</u>	1785	
1.0317	<u>1.0300</u>	2295	
	Total:	2975	<u>3060</u>

Caustic Pump # A
 Setting: 400
 Caustic Temp. 120
 Target = 49° C or 120° F

Neutralization Basin pH: 8.0

Corrections:

Dump ph: 8.0

Notes:

22-38

Regeneration Log (Concurrent Series)

Date: 1-5
 Time: 2200
 Run length: 214,000 - 22000 = 192000 gallons
 Service Water pressure: 88 psi Temp: 70 degrees F

PC=Primary Cation
 PA=Primary Anion
 SC=Secondary Cation
 SA=Secondary Anion
 BW=Back Wash
 SR=Slow Rinse
 FR=Fast Rinse
 RSV=Rate Set Valve

					GPM Target					
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #
1	SA	BW	15	60	50	57	66	68	60	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	87	97
4	PA	BW	15	59	50	57	62	64	57	53
5	PC	BW	15	59	120	140	153	158	140	36
6a	SA	5% NaOH	29	60	10				10	155
6b	SA to PA	5% NaOH	66	60	10				10	155
6c	SA to PA	SR	32	60	20				20	156
6d	PC	Settle	3	60	0					
6e	SC to PC	1.5% Acid	12	59	85				85	191/206
6f	SC to PC	3.0% Acid	9	59	85				85	191/207
6g	SC to PC	5.0% Acid	6	59	85				85	191/208
6h	SC to PC	SR	8	59	85				85	191
6i	PC	FR	16	59	165				165	29
7	PA	FR	22	60	165				165	49
8	PC to PA	Recycle	30/CT-1 < 20	60	165				165	82
9	SC	FR	17	60	165				165	91
10	SA	FR	14/CT-3 < 100	60	165				165	103
11	Rinse Recycle		13/CT-5 < 2.00	60	165				140	116
12	Mandatory Recycle		10		165				134	116
	Service				150					122

3% = 1.0215
 5% = 1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
1.0417		290	
1.0417	1.041	950	
	Total:	1590	1540
1.0084	1.008	1020	
1.0184	1.018	1785	
1.0317	1.030	2295	
	Total:	2975	3120

Caustic Pump # B
 Setting: 400
 Caustic Temp. 120
 Target = 49° C or 120° F

Neutralization Basin pH: 9.0
 Corrections: 1 minute ACID.
 Dump ph: 7.0

Notes: Timers 59 + 60 Don't work

1038

220

233

242

Regeneration Log (Concurrent Series)

Date: 9/01-02/08

Time: 2025

Run length: 214,000 - 24K = 190K gallons

Service Water pressure: 92 psi Temp. 80 degrees F

PC=Primary Cation
PA=Primary Anion
SC=Secondary Cation
SA=Secondary Anion
BW=Back Wash
SR=Slow Rinse
FR=Fast Rinse
RSV=Rate Set Valve

GPM Target										
Step	Vessel	Process	Time	Add.	60°	70°	80°	83°	Actual	RSV #
1	SA	BW	15	60	50	57	66	68	<u>64</u>	110
2	SA	Settle	3	60						
3	SC	BW	10	59	75	87	97	101	<u>96</u>	97
4	PA	BW	15	59	50	57	62	64	<u>61</u>	53
5	PC	BW	15	59	120	140	153	158	<u>150</u>	36
6a	SA	5% NaOH	29	60		10			<u>10</u>	155
6b	SA to PA	5% NaOH	66	60		10			<u>10</u>	155
6c	SA to PA	SR	32	60		20			<u>20</u>	156
6d	PC	Settle	3	60		0				
6e	SC to PC	1.5% Acid	12	59		85			<u>85</u>	191/206
6f	SC to PC	3.0% Acid	9	59		85			<u>85</u>	191/207
6g	SC to PC	5.0% Acid	6	59		85			<u>85</u>	191/208
6h	SC to PC	SR	8	59		85			<u>85</u>	191
6i	PC	FR	16	59		165			<u>162</u>	29
7	PA	FR	22	60		165			<u>164</u>	49
8	PC to PA	Recycle	30/CT-1 < 20	60		165			<u>163</u>	82
9	SC	FR	17	60		165			<u>166</u>	91
10	SA	FR	14/CT-3 < 100	60		165			<u>164</u>	103
11	Rinse Recycle	13/CT-5 < 2.00	60			165			<u>165</u>	116
12	Mandatory Recycle		10			165			<u>165</u>	116
	Service					150			<u>148</u>	122

3%= 1.0215
5%=1.0417

Hydrometer		Dilution Water	
Target	Actual	Target	Actual
		290	
		950	
	Total:	1590	
1.0084	<u>1.0078</u>	1020	
1.0184	<u>1.018</u>	1785	
1.0317	<u>1.030</u>	2295	
	Total:	2975	

Caustic Pump # B

Setting: 400

Caustic Temp. 120

Target = 49° C or 120° F

Neutralization Basin pH: 7.8

Corrections: N/A

Dump pH: 7.8

Notes: