Log Book
Campaign 10

2015-02-23

07:43 Process/Potable ON
07:54 Warming up Steam pipes
08:27 Heating up Rinse Tank so some of green hoses can be ensured as clean.
09:15 WW Pump ON in Recirc Loop @ 49.7%
10:29 Began SIP Procedures on Prop 2B
10:31 Prop 2B @ +5 psi, Steam OFF, Vac Pump ON
10:32 Prop 2B @ -10 psi, Vac Pump OFF, Steam ON
11:00 Reached 250°F in Prop 2B. Began 90-minute timer
Began SIP Procedures on Prop 2A
11:02 Prop 2A @ +5 psi, Steam OFF, Vac Pump ON
11:03 Prop 2A @ -10 psi, Vac Pump OFF, Steam ON
11:07 Caustic Systems ON, tank heating up.
11:15 Too much pressure for current temp in Prop 2A. 12.4 psi @ 230°F
11:17 Prop 2A @ +13 psi, Steam OFF, Vac Pump ON
11:18 Prop 2A @ -10 psi, Vac Pump OFF, Steam ON
11:24 WW pH=6.92 @ 54.8% Level
11:40 Reached 250°F in Prop 2A. Began 90-minute timer
11:41 CO_2 Scrubber Pump ON (Level @ 85%)
11:44 CO_2 Scrubber Pump OFF
11:47 Prop 2A/B transfer lines OPEN. Will reset timers as a result
11:54 Reached 250°F in Prop 2A/B. Began 90-minute timer
13:30 Finished SIP wait periods for 2A/B
13:43 Prop 2A/B SVs CLOSED
14:03 Prop 2B TC→"NORMAL" in Auto
14:05 Prop 2A TC→"NORMAL" in Auto
14:09 C5 Pump confirmed to have new oil by Joe
14:12 C5 Pump ON @ 60% (Initial Level=58.4%)
Doing 50-50 split for Hydrolyzate and UV Water
Prop 2A/B numbers:
Tank Hz; Hz+UV
2A 5.1%; 30.4%
2B 21.0%; 43.2%
15:03 Doing Hz addition first to both tanks (20 gal)
Then 17 gallons UV Water
Antifoam added as needed
15:40 Began Hz→Prop 2A (C5 @ 58.4%)
Flow confirmed by field
15:43 Proactively adding ALL the Antifoam now.
15:53 Stopping Hz add→Prop 2A. Still no level shown in Prop 2A
15:54 Prop 2A AG ON and OFF (Prop 2A level now = 0.4%)
C5 Tank @ 52.7%
Based off of Ismael's calculation, added ~23 gal
Will try adding some more
16:13 Resuming Hz→Prop 2A

C5 Tank @ 52.7%
Getting level reading
Foaming reported

16:16 Prop 2A @ 5.1% to 5.5%, AG ON @ 100%
16:17 Prop 2A AG OFF
16:19 Prop 2A AG ON @ 25% and OFF
16:21 Prop 2A Hz add DONE. Level~5.4% (20.2 gallons)
16:22 Began UV Water Add→Prop 2A
16:23 Prop 2A AG ON @ 100% (20.1% Level)
16:24 Paused UV add→Prop 2A (29.5% to 30.5%)
16:28 Resuming UV add→Prop 2A
And stopped, valve was cracked open, but level had shot up fast. Level~33.5% to 34.5%
Prop 2A pH=3.44
16:37 BBP#4 ON @ 30%, Began conditioning Prop 2A→pH=8
16:54 Prop 2A pH=8.00. BBP#4 OFF. Conditioning complete.
16:56 Began adding Hz→Prop 2B C5 Tank Initial=51.7%
16:58 Preemptively adding Antifoam→Prop 2B
17:08 Paused Hz addition→Prop 2B
Level went from 18→26% (Dead Zone?)
C5 Tank level @ 47.2%, no foaming yet in Pro 2B
17:10 Resuming Hz add→Prop 2B
17:11 Paused Hz addition→Prop 2B
17:12 Resuming Hz add→Prop 2B
17:13 Paused again. C5 Tank @ 46.7%, Prop 2B between 20.1 and 23.6%
pH reading very strange
It does match field reading though.
17:16 Waiting for level to settle down.
Field reports no chance for agitation right now
17:26 Going to add UV water to Prop 2B (10 second) to see if it settles out level readings
17:29 2nd burst of UV water
17:30 Prop 2B AG ON @ 50%
Doing 3rd burst of UV Water now
17:35 Began adding UV Water→Prop 2B
Paused after a few seconds
17:36 4th 10-second burst into Prop 2B
17:38 Doing 5-second burst→Prop 2B with UV Water
17:39 Doing 2nd 5-burst of UV Water
17:40 Doing bare minimum burst into Prop 2B. pH=3.16
17:43 Prop 2B AG→100%
17:44 BBP#5 ON @ 30%. Conditioning Prop 2B→pH=8.0
17:46 Knifegate to Liq Tank OPEN. RevScr ON in FORWARD
Rinsing out line between RevScr and Liq Tank
17:51 BBP#5→20%. Field reports level seems VERY off in Prop 2B. Will compare C5 Level drops

Tank	Theoretical Volume	C5 Tank Level Change	C5 Level Difference
2A	28.8 gallons	58.24%-52.1%	6.14%
2B	26.0 gallons	52.1%-46.6%	5.5%

Possible some of the volume loss was re-priming the lines
18:10 Will sample Prop 2B to figure out exact concentration using HPLC.

Worried about not enough UV water in Prop 2B
18:13 Prop 2B @ pH=8. BBP#5 OFF. Conditioning complete
18:14 RevScr OFF. Liq Tank Knifegate CLOSED
18:23 WW pH=11.51 Cond=6.05 mS/cm @ 72.4% Level
18:42 Heating up WW pick heater and sending it out. Level=82.5%
19:06 Doing Rinse CIP of green connector hoses
19:12 CIP Systems OFF
Shift Change
21:00 Pre-emptive draining of Cooling Water Tank (63.4% Level)

2015-02-24
00:43 WW Pumping stop @ 10%
Pump finished and isolated.
03:38 Steam to Liq
03:47 Pulling Vac to Liq
03:57 Vac done, steam back on
04:21 Opening lines associated with Liq
04:43 Liq @ 250°F, 90 min hold
05:09 C5 Pump OFF
06:15 Liq Wait complete
07:05 Steam into jacket pHA
07:08 Steam to pHA
07:13 Vac Pulled, steam back ON
pHA made it to 9.90 and stopped, base line was OPEN
07:43 Lines to 3A/B steaming
Shift Change
07:57 Prop 3A Level alarm disabled
09:32 Checking Distillation Pump (last checked 2/3/15)
09:44 Reached 250°F in pHA. Began 90 min timer
11:20 Finished SIP wait for pHA. Steam OFF
12:40 Lab having problems with seed flasks apparently?

2015-02-26
07:43 Process/Potable/UV/Cooling/Hot Water Pumps ON
07:47 Prop 2A/B TC ON for "NORMAL" in Auto
07:51 Warming up steampipes
08:00 Prop 2A/B @ 98.6°F
08:36 UV Water Pump OFF
11:49 UV Water Pump ON and OFF
11:59 UV Water Pump ON
12:45 UV Water Pump OFF.
Still leaking like crazy.
13:03 UV Pump ON
13:07 UV Pump OFF
13:09 UV Pump ON
Appears to not be leaking anymore
14:07 Prop 2A Inoculation will be in next 30-60 minutes
14:17 Pre-Inoc Prop 2A values

(L) 30.0%; pH=6.45; (T) 99.5°F; (P) 0.98 psi
14:28 Beginning Inoculation of Prop 2A
14:42 t=0hr Prop 2A Sample Taken
(L) 34.5%; pH=6.44; (T) 99.5°F; (P) 0.98 psi
14:47 Bleach Scrubber Pump and CO_2 Scrubber Fan ON
15:04 Began SIP Procedures on Liq Tank
15:16 Liq Tank @+5 psi, Steam OFF. VacPump ON
15:25 Liq Tank @-10 psi. VacPump OFF, Steam ON
15:52 Reached 250°F in Liq Tank. Began 90 min timer
16:10 Liq Tank transfer lines getting steam now
16:18 Nutrients going into Prop 2B
16:30 Pre-Inoc Prop 2B values
(L) 39.0%; pH=6.47; (T) 97.9°F; (P) 2.00 psi
16:41 t=0hr Prop 2B Sample Taken
(L) 42.6%; pH=6.46; (T) 99.7°F; (P) 0.10 psi
16:46 Reached 250°F in Liq Tank again. Began 90 min timer
18:16 Finished SIP of Liq Tank. Steam OFF
18:32 Tested tension sensors for CVs. #1 had an issue
18:33 CV#1 Tension sensor is good now.
18:39 CV Metal detector working fine.
18:46 Began SIP Procedures on pHA
18:55 pHA @ +5 psi, Steam OFF, VacPump ON
pHA @ -10 psi, Steam OFF, VacPump OFF
19:31 HP Seal Water Pump ON
19:32 RevScr to BTAG ON
19:34 C5 Discharger to HSMC ON
19:35 Metso Steam ON, CV#1&2ON
19:36 FBCC ON
19:46 T-pipe Vent CLOSED, T_U=212°F
Shift Change
20:09 CO_2 Scrubber ON, Acid Agitator ON
20:13PSF and PSBTC ON
20:16 Adding UV→Liq
20:17 WW in Recirc
20:20 Switched Metso Pressure→150 psi (185°C)
20:27 Feeding Metso, PSBLB→50%, PSF→100%
20:30 Acid→Metso
20:38 PSF→90%
20:51 PSBLBs→60%
21:05 Metso @ Temp and Press
21:25 PSBLBs→70%
21:29 Temp Control ON Liq
21:53 PSF→95%
21:58 Steam into 3B Jacket
22:00 PSBLBs→80%
22:02 Steam in 3A Jacket
22:04 Liq AG ON
22:08 PSF→100%

22:11 UV OFF to Liq, should be~20%, level erratic
22:17 PSF→105%
22:20 Steam ON to 3A and 3B (skipping Vac because of filters)
22:25 PSF→108%
22:36 3B @ 250°F
22:37 2A Sample
(L) 33.0%; pH=6.36; (T) 99.3°F; 0.00 psi
22:48 Metso Settings
FBLBs @ 100% (M); PSF→110% (M)
CV#1&2 @ 100% (M); Hyd @ 150 psi (A), 365°F/185°C
PSB→Level (Visual); Steam @ 50%; Speed @ 80%
ScPr @ 9.0 RPMs
22:54 WW pH=7.03 Cond=988 µS/cm
22:57 3A @ 250°F
3B Came to Temp MUCH faster with less steam (~15%); 3A was 40%, no leaks found
23:37 WW→Buckeye

2015-02-27
00:07 3B SIP Complete
00:36 2B Sample Taken
(L) 43.9%; pH=6.39; (T) 98.0°F; 0.00 psi
02:04 Starting 2hr Flow Rate Test
02:12 3A/B Temp Control ON
02:21 pHA in Temp Control
02:31 FBLB cut off @ 95% Level, visually doesn't look that high
02:37 PSF→105→100%, probably new biomass
Bypass ON for FBLB to keep PSB filled
02:49 PSF→105→110%, maybe was small clog
03:05 Blow Tank Sample and first hour flow test done
03:10 FBLB bypass normal
PAMP#2 not flowing as consistently as it did before
03:53 pH Control ON 2A, pH→6.32, Pump #4 set to 10% (M), set pH=6.34
Liq Hot Water Valve alarming
04:05 Flow Rate Test Done
04:08 Sanitizing Gluconase lines
04:17 WW dropped 28→20GPM
WW plug must have cleared, now 29 GPM
Liq Starting Values:
Level=19.6%, 396 gallons
Enzyme rate=0.015 GPM→18% pump spedd
05:22 Going with what we have in Liq, looks ~20%, in a Very Bad Spot for indicator
05:24 Bypass ON for Rev Conveyor and gates
05:30 Metso→Liq
05:35 Enzyme Pump ON, AA#1 Pump ON
Liq Target: 33.9% Level, 728 gallons
UV Water Addition on pump out=1.1 GPM
06:02 First alarm on Liq Valve in a while.
06:24 Livebottoms wasn't bypassed and Liq was spiking and [Jeff] didn't notice right away.

PSF got 7.8 Amps and [Jeff] shut it off, restarted with bypass on bottoms
06:30 (16hr) 2A Sample
(L) 31.9%; pH=6.29; (T) 99.0°F; 0.01 psi
EtOH=0.46 g/L
06:36 Now transfer acting up, related to above [Jeff is] sure.
Turned up vibe, beat on chute, PSF→120%
07:00 2A called for base and with pump @ ONLY 10%, spiked pH to 6.5.
This happened last time on first pulse, put pH back in manual
07:01 PSF→110%
07:11 Liq Level definitely, going to take a visual
07:16 Liq AG 100→75% to see if it helps
07:19 Acid pump leaking again so flow back to erratic
07:22 Liq AG back to 100%, didn't help
08:00 Drop in Acid Flow, leak reported as worse
Shift Change
08:04 Pulse Dampener valve CLOSED
08:18 Steam ON to Prop 2B Sample Port
08:21 Liquefaction Hot Water Supply Valve alarm Disabled.
08:32 t=16hr 2B Sample Taken
(L) 42.1%; pH=6.34; (T) 97.9°F; 0.21 psi
08:36 FBLBs→80%
08:43 Liq Tank Level reading ~27%. Ismael says it's good.
09:19 Alarm for PSB Level (was fine on camera)
FBLBs OFF as a result
09:22 FBLBs ON @ 120% in Override
Visual level was dropping rapidly. HMI level NOT changing
09:25 WW Pump OFF and rinsed out.
09:26 FBLBs→85%
09:41 FBLBs→80%
09:50 FBLBs→75%
10:03 FBLBs→65→70%
10:20 PSF→107%
10:44 FBLBs→80→90%
10:55 FBLBs→100%
11:04 FBLBs→120%
Will be sampling Prop 2A ~11:30 to check Ethanol numbers.
Will start Prop 3A if numbers are good, regardless of Liq Tank Level per Ismael
11:07 PSF→110%
11:13 FBLBs→95%
11:24 PSB SV→MAN @ 70%, can't see anything in the camera right now
11:40 t=21hr Prop 2A Sample Taken
(L) 30.5%; pH=6.38; (T) 98.1°F; 0.00 psi
11:48 PER ISMAEL, start adding UV Water to Liq Tank at noon, even if it's not at the level mark (33.9%)
12:09 Prop 2A t=21hr [Ethol]=0.8 g/L
12:16 Liq Tank @ 33.9%, UV Water ON @ 1.1 GPM
12:18 FBLBs→85%
12:24 WW Pump ON in Recirc Loop @ 56%
12:26 FBLBs→70%

12:27 t=0hr Liq Tank Sample Taken
(L) 34.9%; pH=5.00; (T) 120.7°F; 1.14 psi
12:38 FBLBs→80%
12:50 Noticed issues in Metso with Temp and Pressure.
12:52 Metso SV→MAN @ 70%
12:56 Metso SV→65%, Might be clogging in C5 Hydrolyzer
12:58 Vented out via Hydrolyzer Vent, Metso SV→Auto
13:00 ESTOP Metso. Hydrolyzer Discharger was OFF
UV Water and Enzyme to Liq OFF
13:02 FBLBs OFF
13:05 HP Seal Water Pump ON
C5 Discharger ON and OFF. Appears to not be moving
13:07 Biomass Handling OFF
13:08 HP Seal Water Pump OFF
Liq Tank=36.8%
13:14 WW pH=6.50
13:15 Acid Systems OFF
13:17 C5 Dischager ON and OFF
13:24 Adding Caustic to WW Sump for six minutes
UV Water drain open ¼ turn
13:34 RevScr and ScrPr ON
13:36 HP Seal Water Pump ON
13:37 SPFS and BTAG ON, starting washdown
Knifegate→Liq Tank CLOSED
13:42 Metso and HP Seal Water Pump OFF
14:16 According to field shaft for C5 Discharger 'locked up'
14:26 Prop 2A pH Control→Auto, set @ 6.35
14:32 t=24hr Prop 2A Sample Taken
(L) 30.5%; pH=6.35; (T) 99.1°F; 0.00 psi
14:37 Noticed that level in Liq Tank has been going up despite nothing being added to the tank and all valves except AA closed
Slurry less dense than raw biomass? Sign of Enzyme doing work on the biomass?
14:57 Level in Liq Tank still going up
15:04 WW pH=9.7 Cond=660 µS/cm @ 74.3% Level
15:07 Sending out WW to Buckeye
15:12 CO_2 Scrubber Pump OFF
15:23 Prop 2A t=24hr [Ethol]=1.08 g/L
15:40 ALL Liq Tank manual valves CLOSED now.
Level was still rising prior to this.
15:47 Liq Tank solids concentration=16.0%
16:08 C5 Hydrolyzer ON (in Reverse) and OFF after 15 seconds
16:10 C5 Hydrolyzer ON (Rev). OFF after 15 seconds when amps hit 1.8 amps (MUCH higher than normal)
16:39 t=24hr Prop 2B Sample Taken
(L) 39.4%; pH=6.30; (T) 98.4°F; 0.05 psi
18:30 t=6hr Liq Tank Sample Taken
(L) 39.8%; pH=5.05; (T) 121.6°F; 1.52 psi
18:55 Began refilling Rinse Tank. Will hear back about needing to heat up tanks

19:24 CIP Systems ON, heating up tanks
19:38 WW Pump OFF. Pump rinsed and valve closed.
Shift Change
20:17 Adding Water/Caustic Soda to Tank
20:27 2B in pH Control
20:37 t=30hr Prop 2A Sample Taken
(L) 29.8%; pH=6.34; (T) 97.9°F; 0.04 psi
21:05 Adding 400 lbs H_2O to Mix Tank
21:10 Caustic DONE, 75% Level, 1076 lbs Caustic Soda
Plan is to add 5 g/L glucose solution to 2A, sample at 4:30 and see where we are.
22:18 Glucose in 2A, sample taken @ 22:40
22:41 Pumping ~184 lbs Acid→Mix
22:49 Acid in, Cond-25.0 mS/cm. Topping off to 5000 lbs
23:09 Mix Tank 500 lbs, Cond 21.9, Level→64.7%
23:31 Chasing Acid Line
23:56 Line Clear, topping off through top.

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00:04 Acid DONE, Level→76.5%; Cond=21.9 mS/cm; W→5641 lbs
00:40 t=30hr Prop 2B Sample Taken
(L) 39.8%; pH=6.32; (T) 97.9°F; 0.18 psi
00:58 Rinse @ Temp
04:30 Sampling 2A and 2B
t=36hr Prop 2A Sample Taken; Ethol=2.6 g/L
(L) 30.6%; pH=6.41; (T) 99.4°F ;0.01 psi
t=34hr Prop 2B Sample Taken; Ethol=1.24 g/L
(L) 38.8%; pH=6.30; (T) 99.8°F ;0.15 psi
07:30 Sampling Liq, 2A, and 2B
t=19hr Liq Tank Sample Taken
(L) 39.5%; pH=5.01 ;(T) 121.5°F ;1.81 psi
t=39hr Prop 2A Sample Taken
(L) 29.1%; pH=6.31; (T) 98.0°F ;0.02 psi
t=37hr Prop 2B Sample Taken
(L) 37.3%; pH=6.30; (T) 99.8°F; 0.13 psi
Plan is to pump to 3A as quickly as we can until ~18%, then slow down and inoculate.
07:50 Liq Pump ON @ 2 GPM to start, get pHA settled then speed up.
Shift Change
08:02 LP→3.0 GPM, trying to push through
08:07 AAP#3 ON in CAS (pHA pH control still OFF).
08:08 pHA AG finally submerged according to field, so ON
Still not showing a level in the tank though on HMI
08:12 pHA pH probe submerged @ 7.2% Level
pH control ON
08:20 AAP#3→20→25→30→25%
08:21 AAP#3→60% for ten seconds then→30%
pH final going up.
08:23 AAP#3→35%
08:24 AAP#3→25→CAS

08:29 Prop 2A AG tripped. TWICE.
08:30 pAP ON @ 40%
08:31 Prop 2A AG reset and tripped third time. Not ramping up properly
08:33 Prop 2A pH control OFF
08:34 Prop 2A AG probably has overheated really bad.
LP→51%
08:35 LP→60%
08:36 Prop 2A AG OFF for good. Amps were about four times more than normal
LP→75%, pAP→70%
08:41 Will only be inoculating Prop 3A with Prop 2A
08:49 After inoculation, slow down LP and pAP to 1.9 GPM
08:53 Prop 3A AG ON @ 50%, 12.5% Level
08:55 Prop 3A AG→95%, official mark is 14.5%
09:03 Liq Tank @ 25.9%, pump might be struggling now.
LP and pAP→1.9 GPM (20%)
09:07 Liq Tank level sensor starting to behave oddly.
09:10 Adding nutrients to Prop 3A, level between 18.5% and 19.1%
09:11 Prop 3A @ 20% Level
09:18 Inoculating Prop 3A with Prop 2A
Prop 2A Pre-Inoculation:
(L) 29.1%; pH=6.28; (T) 100.0°F; 0.01 psi
Prop 3A Pre-Inoculation:
(L) 20.2%; pH=6.36; (T) 100.5°F; 0.77 psi
09:19 Prop 2A TC OFF
09:20 Prop 3A pH Control ON, BBP#7 set @ 20→25%
09:23 t=0hr Prop 3A Sample Taken
(L) 25.5%; pH=6.23; (T) 98.4°F; 1.05 psi
09:25 BBP#7→50%, having issues around 25% level?
09:31 LP→90%
09:53 Flipping CIP Header to Rinse over by Ferm A
09:58 LTAG→80%
10:00 LP OFF
Confirmed dry by Joe. Level~23% estimated.
10:05 Rinse CIP of Prop 2A transfer/C5 lines
Ferm A Pump ON
10:06 Liq Tank pH Control, Temp Control, and AAP#1 OFF
10:07 LT AG OFF
10:16 Ferm A Pump OFF
10:17 Ferm A Pump ON
10:21 Ferm A Pump OFF.
Slurry looked 'liquidy' according to Joe.
10:24 Liq Tank empty
10:27 pHA pH control (and AAP#3) OFF, 5.5-6.2% Level
10:28 pAP OFF @ 5.0% Level, Prop 3A @ 35.2%, may be not?
10:30 Nutrient addition to Prop 3A complete
10:33 Ferm A Pump ON, pHA TC OFF, Rinsing Prop 2A
10:40 pHA AG OFF
10:41 Ferm A Pump OFF

10:42 Ferm A Pump ON
10:43 Began Rinse CIP of Prop 2A for 15 minutes through sprayballs
Rinse Pump→85%
10:59 WW Pump ON and OFF. Ferm A Pump OFF
Finished Rinse CIP of Prop 2A, Rinse Pump→55%
11:01 WW Pump ON @ 42.4% Level and OFF. Low flow
11:05 WW Pump ON @ 45.7% Level
11:19 WW pH=6.3.
Adding Caustic for 5 minutes.
11:22 Rinsing out Liq→ pHA lines
11:34 BBP#7→35%
12:07 Began Rinse CIP of pHA through sprayball for 15 minutes
Rinse Pump→85%
12:22 WW pH=9.23 at 65.0%
Conductivity probe not working
12:24 Heating up WW pick heater. Sending out WW to Buckeye @ 66.2% Level
12:27 WW Flow~35 GPM now, compared to 24 GPM in Recirc Loop.
12:28 Finished Rinse CIP of pHA. Rinse Pump→55%
Refilling and reheating Rinse Tank
14:01 Going to fill Prop 2A to 27% Level and switch on AG to see if it is running better now
14:21 Prop 2A filled to ~ 45.2% Level. Waiting for it to stabilize
14:23 Prop 2A AG ON @ 100% (Amps around 0.5)
14:33 Prop 2A AG OFF. Will be draining to the floor soon.
14:54 Knifegate to Liquefaction OPEN
Knifegate to C6 Dumpster CLOSED
RevScr set to "Forward" (but still OFF)
15:05 GP ON @ 30%
15:20 GP OFF
15:34 t=6hr Prop 3A Sample Taken
(L) 36.1%; pH=6.31; (T) 98.8°F; 0.04 psi
15:39 Began Rinse CIP of Liq Tank through sprayballs for 15 minutes
Rinse Pump→85%
15:48 Paused Rinse cIP of Liq Tank. Rinse Pump→55%
16:08 Resuming Rinse CIP of Liq Tank. Rinse Pump→85%
16:17 Paused Rinse CIP
16:18 Rinse Pump OFF, Putting UV Water→Liq Tank to flush out any remaining fibers
16:37 RevScr and ScPr ON (going→Liq Tank)
16:40 ScPr and RecScr OFF. Valve to Liq Tank CLOSED
16:47 t=48hr Prop 2B Sample Taken
(L) 38.2%; pH=6.31; (T) 98.1°F; 0.31 psi
17:10 Flipping CIP Header to Caustic
17:18 Caustic step of pHA Lines
17:39 Began Caustic CIP of pHA for 15 minutes
Caustic Pump→85%
17:49 pHA SV→50% and CLOSED
17:50 AAP#3 ON for 20 seconds @ 10% and OFF
17:55 Finished Caustic CIP for pHA
Caustic Pump→55%

18:56 Began Caustic CIP of Liq Tank for 15 minutes through Sprayball#1
Caustic Pump→85%
Liq Level not reliable right now.
19:12 Caustic Pump→55%, switching Liq Tank's sprayballs
19:13 Began Caustic CIP Sprayball#2 for Liq Tank
Caustic Pump→85%
19:25 LT SV OPEN @ 50% and CLOSED
19:29 Finished Caustic CIP of Liq Tank
Caustic Pump→55%
19:45 Ferm A Pump ON
19:56 Ferm A Pump OFF
19:57 Began Caustic CIP of Prop 2A for 15 minutes
Caustic Pump→85%
Ferm A Pump ON
Shift Change
20:30 Flipping Headers (ALL) to UV
21:30 t=12hr Prop 3A Sample Taken
(L) 36.4%; pH=6.32; (T) 98.4°F; 0.01 psi
22:15 Liq UV Cycle complete
22:37 Rest of UV Cycles to Floor, Rinse 85%
23:30 pHA UV complete

2015-03-01
00:30 t=56hr Prop 2B Sample Taken
(L) 39.2%; pH=6.30; (T) 99.8°F; 0.20 psi
03:20 t=18hr Prop 3A Sample Taken, Ethol=0.87
(L) 34.9%; pH=6.32; (T) 98.7°F; 0.05 psi
Shift Change
08:39 t=64hr Prop 2B Sample Taken
(L) 39.2%; pH=6.31; (T) 98.0°F; 0.21 psi
09:33 t=24hr Prop 3A Sample Taken
(L) 36.2%; pH=6.32; (T) 98.7°F; 0.03 psi
10:06 t=24hr Prop 3A [Ethol]=1.12 g/L
11:00 t=64hr Prop 2B [Ethol]=1.65 g/L
14:17 Draining down Cooling Water Tank (overflowing)
14:48 WW Pump ON @ 54.5% Level
15:13 WW pH=11.43, Cond=2.74 mS/cm; Level @ 61.3%
15:15 Sending out WW @ 61.8% Level
15:32 t=30hr Prop 3A Sample Taken
(L) 35.9%; pH=6.31; (T) 98.3°F; 0.03 psi
16:35 t=72hr Prop 2B Sample Taken
(L) 39.2%; pH=6.30; (T) 98.4°F; 0.28 psi
16:40 t=30hr Prop 3A [Ethol]=1.45 g/L
16:56 Prop 2B and 3A pH and Temp controls OFF
16:57 Cooling and Hot Water Pumps OFF
16:58 UV Water Pump OFF
17:02 Props 2B and 3A are now sealed
CO_2 Scrubber Fan and Cleach Scrubber Pump OFF

17:10 WW Pump→Recirc Loop and OFF and ON to rinse out pump
17:13 WW Pump OFF
17:24 Steam OFF
17:36 Process and Potable Water Pumps OFF
Prop 2B, 3A and C5 Tank AGs ON

Log Book Keys

Color Coding

blue text	tank refill log (i.e., bleach, caustic acid)
green text	notes from field
purple text	problems
red text	sampling/inoculation-related information
yellow highlight	process notes, major issues

Abbreviations

AAP	Aqueous Ammonia Pump
AG	Agitator
BT	Blow Tank
BW	Beerwell
BWP	Beerwell Pump
C5 Discharger	Hydrolyzer Discharge Screw
CIP	Clean in Place
CV	CableVey-Cable conVeyors
DFP	Decanter Feed Pump
FBLBs	Feed Bin Live Bottoms
FBTC/FBCC	Feed Bin Transfer/Collection Conveyor
GP	Gluconase Pump
HPSWP	High Pressure Seal Water Pump
HSMC	High Shear Mixing Conveyor
LIQ	Liquefaction Tank
LP/LIQP	Liquefaction Tank Pump
PA	Phosphoric Acid
PAHT	Phosphoric Acid Holding Tank
PAMP	Phosphoric Acid Metering Pump
PAMT	Phosphoric Acid Mix Tank
pAP	pH Adjustment Tank Pump
PATP	Phosphoric Acid Tote Pump
pHA	pH Adjustment Tank
Prop	Propagator
PSBLBs	Pre-Steam Bin Live Bottoms
PSF	Plug Screw Feeder
RevSc	Reversing Screw
ScPr	Screw Press
SIP	Sterilize in Place
SV	Steam Valve
WW	Waste Water