Log Book
Campaign 11

2015-03-09

08:05 Proc/Pot/Steam ON
08:15 UV/Cooling/Hot ON
08:40 Rinsing Rev Conveyor→Liq
08:55 Steam to 2B
08:57 Steam to 2A
09:42 2A @ 250°F
09:47 2B @ 250°F
11:18 Both Prop SIP done, steam OFF
12:02 2A Temp Control ON
12:04 2B Temp Control ON -
12:09 C5 Pump ON in Recirc. Level @ 45.3%
13:10 pH probes calibrated and in Props.
13:24 Sending Hz→2B~21% (20 gallons)
14:29 Sending Hz→2B~5.1% (20 gallons)
Both look good, both have Anti-Foam
Had to drain a little from 2B, overshot
14:48 UV→2B, AG ON
Both Props are 17 gal UV and 20-gal Hz
14:51 UV→2A, AG ON
15:09 Conditioning 2A
15:10 Conditioning 2B
15:31 Props all set
Shift Change
20:06 UV Pump OFF
20:40 UV Water Pump ON

2015-03-10

05:43 C5 Pump OFF
Shift Change
08:25 Start Liquefaction SIP Procedures
09:01 Start wastewater pump in loop
09:36 WW pH=5.87, flow through loop=60 GPM
Liquefaction T= 208°F, P= 3.4 psi
09:49 T=243°F, P= 16 psi
Open transfer lines to start sterilizing
10:04 T=250°F, P= 15.67 psi
13:21 WW Pump OFF
14:34 T=250°F in PHAT
16:00 Inoculated 2A, pH=6.66 Temp=98.6°F; Level=32.6% (Post=36.2%)
17:30 Inoculated 2B, pH=6.65 Temp=97.6°F; Level=46.5%
Shift Change
19:53 Metso starting and Liq start~22:00, midnight
Will do a flow rate test
Should be able to use Liq numbers from last campaign.

20:04 Bleach Scrubber Pump and CO_2 Scrubber Fan ON
20:07 Prop 2A/B Vacuum Breakers OFF. Monitoring pressure in tanks
20:53 POWER OUTAGE
20:54 Prop 2A/B AGs ON, Potable and Process ON
20:56 Hot, Cooling, UV Water Pumps ON
Air Compressors and Chiller confirmed fine
20:58 Blach Pump and CO_2 Scrubber Fan back ON
21:50 Going to be proactive and verify Liq Tank sealed properly
Then will switch on Temp Control
Test Flow Meter/Level Sensor by adding UV Water at steady rates up to 350 gallons, 17.6% Level
21:56 Liq Tank TC→"NORMAL" in Auto
22:00 Began adding UV Water→Liq Tank @ 2.0 GPM
Started 2-hour, 50-minute timer
Giving time for response lag if other things come up.
23:27 Metso Boiler ON
23:43 Testing tension sensors on CVs
23:50 Metso Boiler water hardness is good.
23:58 t=8hr Prop 2A Sample Taken 0.05 ACFM
(L) 36.7%; pH=6.55; (T) 100.0°F; (P)0.02 psi

2015-03-11
00:15 HP Seal Water Pump ON
00:18 RevScr to BTAG ON
00:20 dump Chamber Cycle started
Maybe slightly rough
00:22 PAHT AG and PAMP#2 ON
00:23 C5 Discharger ON
Confirmed turning
00:24 C5 Hydrolyzer and HSMC ON
00:25 Metso Steam ON
00:32 Liq Tank suddenly jump 5% to 20.6% and hasn't really budged from there
00:37 T-pipe Vent CLOSED @T_U 217°F
00:41 Start Steam to Jacket of Prop 3A
00:42 All Metso vents now CLOSED
00:43 CV#2 ON
00:44 CV#1 ON
00:45 FBCC ON
00:49 Stopped UV Water→Liq Tank as timer finished
Level currently holding at 23.6% as it has done for the last ten minutes
Will visually check to see if AG can be switched on
00:58 PSF (@100%) and PSBTC ON at 51 psi
01:01 Prop 2A 8hr [Ethol]=0.18 g/L
01:06 CO_2 Scrubber Pump ON
Began SIP Procedures on Prop 3A
01:08 FBLBs ON @ 50→25%
01:12 PSBLBS ON @ 50%, PAMP#2→CAS at 112 psi
01:13 FBLBs→40%
01:14 Prop 3A at +5 psi, Steam OFF, VacPump ON

01:15 VacPump OFF by field request
01:16 VacPump ON
01:21 Prop 3A at -10 psi, VacPump OFF, Steam ON
01:23 FBLBs→60%
01:25 Metso at Temp and Pressure
01:32 C5 Hydrolyzer Vent barely cracked open
01:33 t=8hr Prop 2B Sample Taken 0.07 ACFM
(L) 45.0%; pH=6.55; (T) 98.8°F; (P) 0.28 psi
01:35 FBLBs→65%
01:41 Prop 3A pressure about 9.0 psi @ 227°F
01:43 FBLBs→75%
01:44 PSBLBs→60%, Acid→4.00 GPH
01:46 Began SIP Procedures on Prop 3B
FBLBs→120%
01:48 Vents on Prop 3A OPEN
01:49 Prop 3B at +5 psi, Steam OFF, VacPump ON
01:51 Reached 250°F in Prop 3A. Began 90-minute timer
02:01 Prop 3B at -10 psi, VacPump OFF, Steam ON
02:05 LTAG ON @ 50%, field reports that it is just barely touching tip of bottom impeller
And LTAG OFF
Approximately 350 gallons full, briefly matched new calibration chart @ 17.6% Level
02:10 Prop 3B vents cracked open
T=8hr Prop 2B [Ethol]= 0.2 g/L
02:13 WW Pump ON and OFF. No flow really.
02:14 PSBLBs→70%, Acid→4.67 GPH
02:15 WW Pump ON @ 42.7% Level
02:16 PSF→105%
02:21 FBLBs→105%
02:22 Reached 250°F in Prop 3B. Began 90-minute timer
02:26 FBLBs→95%
02:41 FBLBs→85%
02:43 PSBLBs→70%, Acid→4.67 GPH, PSF→108%
02:56 PAMP#2→MAN@45→45.4%
02:58 Acid Flow Sensor starting to show weird numbers. Granted, there is a small leak at the acid inlet.
02:59 FBLBs→95→105%
03:00 Field reports that no change to leak, PAMP#2→CAS
03:01 FBLBs→120%
03:05 PSF→112%
03:10 PSF→108%
03:14 Metso Settings:
Temp=185°C=366°F; Pressure=150 psi (A)
FBLBs @ 120% (M); PSF @ 108% (M)
CV#1&2 @ 100% (M); ScPr @ 9.0 RPMs (A)
PAMP#2 CAS; Acid Cond=22.4 mS/cm; Acid Flow @ 5.33 GPH (CAS)
PSBLBs @ 80% (M); PSB Level-Camera; Temp=110°F (A)
03:15 Ended Prop 3B SIP early due to 'wet spargers'
Prop 3B SV CLOSED (had 39 minutes left)
03:18 Acid Flow meter doing funky stuff again

03:21 Prop 3A SIP timer done
03:26 Joe is going to open up Pulse Dampener to see if that helps Acid Flow
WW pH=6.77 @ 56% Level
03:29 PAMP#2→Auto @ 820 RPMs (45.5%)→MAN @ 40%
03:31 PAMP#2→45.5%, freaking out badly at flow meter
03:33 Ended SIP on Prop 3A.
SV CLOSED
PAMP#2→44→40%
03:35 Began adding 5 minutes of Caustic to WW Tank.
UV Water drain ¼ open
03:36 PAMP#2→40.5%
03:38 PAMP#2→42%
03:40 Finished adding Caustic to WW Tank.
30 min Recirc timer
03:41 PAMP#2→42.4%
03:44 PAMP#2→41%
03:48 Began 10-min add of UV Water→Liq Tank @ 2.0 GPM (should bring to 370 gal/18.5%)
03:49 Prop 3B TC→"NORMAL" in Auto
Need to cool in order to remove sparger
03:57 Starting Metso flow rate test soon (1-hr sampling)
03:59 Finished 2nd UV add to Liq Tank, still reading 24.1%
04:00 LTAG ON @ 30% for 30 seconds and OFF
Was reading 18.9% before switching OFF
Went right back to 24.1%
04:04 FBLBs→40%
04:06 PAMP#2→39.8%
04:12 PAMP#2 stroke length adjusted from 50→30% now.
PAMP#2 speed→50%
04:14 PA flow still freaking out. PAMP→48%
04:18 PAMP#2 speed→20%, increasing stroke length now to 90%
04:20 FBLBs→90%
04:21 PAMP#2→25%
04:24 WW pH=10.20 Cond=923 µS/cm; Level @72.2%
04:26 PAMP→29%
04:28 Heating up WW pick heater. Sending out WW @ 72.4% Level
Flow~32 GPM
04:31 PAMP#2→31%
04:44 PAMP#2→31.5% (close to mark now)
04:46 LTAG ON and OFF. Just barely touching.
04:47 Third UV→LT addition. Now @ 3.6 GPM
Doing 5-minute addition. Should put volume @ 406 gallons
04:50 PAMP#2→31.7%
04:52 Starting to see more likely level readings in Liq Tank.
04:53 Stopped UV→Liq Tank. LTAG ON @ 30% and OFF
05:00 LTAG ON @ 30→60%. Level between 19.8% and 20.2%
LTAG OFF
05:11 Going to do another 1-hr flow rate test for Metso.
Numbers were varying almost as much as those for Acid Flow.

05:14 Prop 3B TC OFF. Will be redoing SIP entirely.
05:21 PSF→112%
05:25 Prop 3B sparger re-installed.
05:36 FBLBs→105%
05:42 Began SIP Procedures on Prop 3B
05:45 Prop 3B @ +5 psi, Steam OFF, VacPump ON
05:47 FBLBs→120%
05:51 Prop 3B @ -10 psi, VacPump OFF, Steam ON
06:01 Metso dry weight=39.3%, Flow rate~153lbs/hr
06:03 Began addition of UV Water→Liq Tank @ 3.6 GPM
Target=452.6 gallons @ 22.2% Level
06:10 Reached 250°F in Prop 3B. Began 90-minute timer.
06:14 Stopped UV→Liq Tank. Level was showing decently reliablr @ 22.9%
Volume SHOULD be around 430 gallons
06:21 GP ON @ 50%
06:30 Liq Tank AG ON @ 60% (almost completely covered when level ~ 22%)
06:32 Doing 10 minute add UV Water→Liq Tank @ 3.6 GPM
06:32 LIQ TANK SETTINGS:
GP @ 0.015 GPM (18.0% speed)
"Filled" Level=34.1%, Volume = 733.8 gallons
6-hour retention time
452.6 gallons of UV Water initial (22.6% Level), 1.3 GPM when pumping out
06:35 GP→85%
06:36 GP OFF
06:39 FBLBs→100%, GP ON @ 60%
06:41 GP OFF
06:46 LTAG ON @ 100%
06:47 FBLBs→85%
Blow Tank Sample will be @ 07:00
06:49 Knifegate to Liquefaction Tank OPEN
RevScr→"STOP", Direction set to "FORWARD"
RecScr→"RUN FORWARD"
Now Feeding Liq Tank
06:51 AAP#1 ON, but not pumping yet, just on stand-by
06:58 GP ON @ 7%%, priming line
Flow Confirmed, GP→30%, Flow good!
07:01 GP→18%
07:04 Liq Tank pH Control→Auto, AAP#1→CAS
07:05 Just got (first?) level spike in Liq Tank
07:06 FBLBs→75%
07:15 FBLBs→50%.
Yep, Liq Tank level is going nuts now.
07:17 Metso Blow Tank Sample Finished
07:32 Worried about Liq Tank level sensor issues
Re-enabled Liq Tank level alarm
07:38 Adding another 20 minutes to Prop 3B SIP timer.
07:59 Ended SIP on Prop 3B. Steam OFF
08:02 Liq Tank Level Sensor is being very difficult

08:07 t=16hr Prop 2A Sample Taken
(L) 36.1%; pH=6.47; (T) 100.0°F; (P) 0.00 psi
Next shift note: 0.57 g/L Ethanol Concentration
08:10 PSF→108%
Shift Change
08:15 PSF→100%
08:39 BYPASS ON PSBLB!
Liq Level going Crazy!
08:49 PSF→95%, Liq sensor still unreliable
09:08 Disable Liq Sensor Alarm
09:10 Increased Prop flow rate for air
0.05 CFM→0.11 CFM
09:23 PSF→105%
09:30 Jacket Recirculation Pumps ON the 2s for steadier temp (hopefully)
09:36 t=16hr Prop 2B Sample Taken
(L) 43.5%; pH=6.47; (T) 98.7°F; (P) 0.25 psi
9:45 PSF→95%, BIG dip in amps
10:15 Liq Sensor been good for an hour
11:57 Heating up Rinse Water (97°F), take a while
12:20 WW OFF, pump secured
Basically, put 160 gallons in and innoc to 200 gallons, then put in loop for 4 hours, then 50 gallons slurry additions to 400 gallons each time.
13:01 3B and 3A Temp Control ON, Cooling transfer lines
13:17 Trying to run jacket pumps for the 3s, pumps not starting
13:22 Jacket Pump Running→NOPE! No power to it.
13:28 PSF→100%
13:41 Now Jacket Pump to 3s ON, contactor was sticking
OFF again, leaking.
13:44 pHA Temp Control ON
13:46 PSF→95%
14:00 Liq→pHA @ 1.9 GPM (Auto @ 2.0). H_2O ON @ 1.3 GPM
When pHA base lines opened, some 'nasty stuff' came out.
Not running Liq on Level Control, doing steady 1.9 GPM, shut down Metso when there is enough level
14:07 Liq Pump to 50%, "Pop" line
14:10 No flow to pHA, reversing Liq Pump
14:14 Liq Pump→90%
14:24 3s' spargers set to 1.1
14:27 Agitator on pHA (confirmed)
14:30 Liq Sample Taken
(L)34.6%; pH=4.99; (T) 122.1°F; 0.52 psi
14:38 pHAA pH control ON
We are going to run Liq on Level control until Metso done
15:26 Trying Liq Pump @ 4 GPM, noting keeping up with levels, numbers very different than usual
15:37 pHA→3A
15:40 Trying 5.0 from Liq (56.8%)
t=0hr pHA Sample
(L) 37.2%; pH=6.50; (T) 99.1°F; 4.17 psi

15:53 WW in Recirc
16:00 t=24hr Prop 2A Sample Taken
(L) 34.3%; pH=6.43; (T) 97.6°F; (P) 0.23 psi
1.1 g/L
16:14 Liq Pump @ 4.5 GPM (54%), pHA @ 2.2 GPM (25%), appears Liq struggling a bit
16:45 3A Agitator ON
3A Level jumped from 15→19%
16:53 pHA→3B
17:25 PSF→90→85%
17:30 t=24hr Prop 2B Sample
(L) 43.8%; pH=6.44; (T) 99.6°F; (P) 0.36 psi
17:43 3B Agitator ON
17:50 WW pH=9.28 Cond=627 µS/cm
18:06 pHA/Liq in Recirc, pHA base OFF
18:14 Spiking on transfer. Vib to 80 psi, PSF→105→110%
18:16 Sending out WW
18:25 PSF→100→95%
18:54 Metso→Bin, Water/Enzyme OFF to Liq
18:57 Feed/Steam OFF to Metso
Sample Taken before shutdown.
18:59 Handling OFF, Acid OFF
19:36 Liq and pHA pumps OFF, not pumping
19:38 Liq and pHA pumps back ON
Pumping more 'normally' now.
Shift Change
20:06 t=6hr Liq Tank Sample Taken
(L) 40.9%; pH=4.99; (T) 121.8°F; (P) 1.46 psi
20:10 pAP→2.2 GPM
20:31 Metso less than 20 psi, Both Dump Valves OPEN.
PSF (@100%) and PSBTC ON. Running out the plug
20:34 CO_2 Scrubber Pump OFF
20:46 pAP→2.1 GPM
20:51 PSBTC to C5 Discharger OFF
20:57 Metso and HP Seal Water Pump OFF
22:27 WW Pump OFF. Pump rinsed out and valve closed.
22:49 pAP→2.2 GPM

2015-03-12
00:04 t=32hr Prop 2A Sample Taken
(L) 33.3%; pH=6.45; (T) 97.6°F; (P) 0.21 psi
00:11 Heating up Caustic Tank
00:22 t=32hr Prop 2A [Ethol]=1.62 g/L
01:33 t=32hr Prop 2B Sample
(L) 44.6%; pH=6.42; (T) 98.0°F; (P) 0.30 psi
01:47 Adding glucose to Prop 2A (5 g/L)
01:51 t=32hr Prop 2B [Ethol]=2.00 g/L
01:55 pAP→2.3 GPM
01:58 t=12hr Liq Tank Sample Taken

(L) 40.9%; pH=5.05; (T) 122.0°F; (P) 1.51 psi
02:22 5g/L added to Prop 2B; pAP→2.2 GPM
02:38 Potable Water Pump OFF. Greasing the pump
02:51 Potable Water Pump ON (15-minute test)
03:06 Potable Water Pump OFF
03:22 pAP→2.3 GPM
03:39 Potable Water Pump ON
03:40 Process Water Pump OFF. Re-greasing the pump now.
03:56 Process Water Pump ON (15-minute test)
04:11 Process Water Pump OFF
04:15 pAP→2.2 GPM, Process Water Pump ON
05:23 pAP→2.3 GPM
06:39 Prop 2B pH Control ON in Auto, set @ 6.37; BBP#5 set @ 10%
Shift Change
08:15 t=40hr Prop 2A Sample Taken
(L) 34.3%; pH=6.36; (T) 99.8°F; (P) 0.26 psi
EtOH=2.28 g/L
08:16 Liq Sample
(L) 40.2%; pH=5.15; (T) 121.9°F; (P) 1.52 psi
09:30 t=40hr Prop 2B Sample
(L) 46.1%; pH=6.42; (T) 98.0°F; (P) 0.30 psi
10:04 Nutrients being added to 3B
10:09 Nutrients in 3B
10:13 pH control OFF 2B
10:24 pH control ON 3B
To get close (pH=6.0) 95% on pump
2B Agitator and temp OFF
10:30 t=0hr Prop 3B Sample
(L) 24.9%; pH=6.19; (T) 98.7°F; (P) 0.43 psi
10:39 3B pH control ON
10:52 2A pH control ON
11:27 Rinse Cycle of 2B, holding there until 2A is empty.
12:09 2B Rinse complete
14:30 Liq Sample
(L) 40.0%; pH=5.10; (T) 121.9°F; (P) 1.38 psi
15:55 t=48hr Prop 2A Sample Taken
(L) 32.9%; pH=6.42; (T) 97.9°F; (P) 0.21 psi
EthOH=3.55 g/L
16:02 Pumping Liq→pHA→3B @ 2 GPM (1.9)
Now pumping 75 gallons @ a time
275 gallons=29.7%
350 gallons=36.8%
425 gallons=43.9%
16:11 Nutrients in 3B
Changed base pump 20→50% while pumping and it held well.
16:26 Liq Level going a little nuts
16:30 Liq/pHA back in Recirc, base pump back @ 20%
16:33 Killing 2A, temp set 140°F, hold for 3 hours.

10:30 t=6hr Prop 3B Sample
(L) 29.6%; pH=6.31; (T) 98.3°F; (P) 0.41 psi
16:59 2A @ 140°F
17:22 Sending 3A→Decanter Tank with Ferm A Pump
17:24 DFT Agitator ON, 3A Agitator/Temp OFF
17:45 Rinsed solids to floor
17:53 Rinse Cycle of 3A
18:42 3A Rinse done, putting in Rinse ~ 40% for 2A
Shift Change
20:05 Finished Prop 2A kill timer. Waiting on Rinse temp.
20:24 t=30hr Liq Tank Sample Taken
(L) 40.9%; pH=4.99; (T) 121.8°F; (P) 1.46 psi
20:29 Prop 2A TC OFF
21:51 Began draining Prop 2A to sump
Prop 2A AG OFF
21:53 Going to get TWO samples of Prop 3B
One BEFORE slurry addition and one AFTER
21:57 pAP→2.3 GPM
22:00 WW Pump ON @ 53.0% Level
22:07 t=12hr (INITIAL) Prop 3B Sample Taken
(L) 29.6%; pH=6.31; (T) 98.3°F; (P) 0.41 psi
22:32 Holding off on adding slurry to Prop 3B until 04:00 sample
t=12hr [Ethol]=1.00 g/L
22:47 Began 5-min Rinse of Prop 2A. Rinse Pump→85%
22:51 Finished 5-min Rinse of Prop 2A. Rinse Pump→55%
23:10 Rinse CIP of Prop 2A transfer lines and dead legs
23:55 Began Rinse CIP of Prop 2A for 15 minutes through sprayballs
Rinse Pump→85%

2015-03-13
00:01 Rinse Pump→55%, Paused Prop 2A
00:09 Rinse Pump→85%, Resumed Rinse CIP of Prop 2A
00:12 Rinse Tank AG OFF (below 15% level)
00:16 Finished Rinse CIP of Prop 2A. Rinse Pump→55%
00:25 WW pH=11.59 Cond=4.41 mS/cm Level=66.4%
00:31 Refilling and Reheating Rinse Tank→90%, 180°F
00:52 pAP→2.2 GPM
01:18 Flipping CIP Header→Caustic
01:30 Caustic CIP of C5 Line→Prop 2A.
Ferm A Pump ON
01:38 Ferm A Pump OFF
01:48 Ferm A Pump ON
01:58 Ferm A Pump OFF
02:00 Ferm A Pump ON
02:02 Ferm A Pump OFF
02:05 Began Caustic CIP of Prop 2A through sprayballs for 15 minutes
Ferm A Pump ON, Caustic Pump→85%
02:07 Popped Prop 2A's Acid and Base lines for 10-15 seconds each

02:09 Prop 2A SV→50% and CLOSED
02:23 t=36hr Liq Tank Sample Taken
(L) Unknown; pH=5.02; (T) 120.5°F; (P) 1.45 psi
02:28 Finished Caustic CIP of Prop 2A
Caustic Pump→55%
02:37 Ferm A Pump OFF
02:51 Ferm A Pump ON, Caustic CIP on Prop 2B lines
02:59 Ferm A Pump OFF and ON
03:07 Ferm A Pump OFF
03:09 Ferm A Pump ON; pAP→2.3 GPM
03:11 Ferm A Pump OFF; pAP→2.4 GPM
03:14 Began Caustic CIP of Prop 2B through sprayballs for 15 minutes
Ferm A Pump ON, Caustic Pump→85%
03:16 Popping Prop 2B's Acid and Base lines for 10-15 seconds each
03:17 Prop 2B SV→50% and CLOSED
03:30 Caustic Pump→55%
Finished Caustic CIP of Prop 2B
03:33 pAP→2.3 GPM
03:57 pAP→2.2 GPM
04:02 t=18hr (INITIAL) Prop 3B Sample Taken
(L) 30.0%; pH=6.30; (T) 98.8°F; (P) 0.42 psi
04:09 Ferm A Pump ON, Caustic CIP of Prop 3A Lines
04:18 Began Caustic CIP of Prop 3A through sprayballs for 15 minutes
Caustic Pump→85%
04:24 Popped Prop 3A's Acid and Base lines for 10-15 seconds each
04:25 Prop 3A SV→50% and CLOSED
04:35 Finished Caustic CIP of Prop 3A; Caustic Pump→55%
04:43 Ferm A Pump OFF
04:53 Caustic Systems OFF
05:07 Heating up WW pick heater. Sending ot WW, flow~36 GPM
05:12 Ferm A Pump ON
05:25 pAP→2.3 GPM
05:26 Began UV Rinse of Prop 3A through sprayballs for 25 minutes
05:29 Popping Acid and Bases lines→Prop 3A
05:30 Prop 3A SV→50% and CLOSED
05:51 Finished UV Rinse of Prop 3A
05:54 Ferm A Pump OFF
06:15 Ferm A Pump ON
06:17 Ferm A Pump OFF
06:20 Ferm A Pump ON
06:26 Began UV Rinse of Prop 2A through sprayballs for 25 minutes
06:28 Popping Acid and Bases lines→Prop 2A
Prop 2A SV→50% and CLOSED
06:53 Finished UV Rinse of Prop 2A, Ferm A Pump OFF
07:14 Ferm A Pump ON
07:30 Began UV Rinse of Prop 2B through sprayballs for 25 minutes
07:32 Popping Acid and Bases lines→Prop 2B
07:33 Prop 2B SV→50% and CLOSED

07:38 t=21.5hr (INITIAL) Prop 3B Sample Taken
(L) 30.3%; pH=6.30; (T) 98.1°F; (P) 0.33 psi
07:55 Finished UV Rinse of Prop 2B
07:59 Ferm A Pump OFF
08:01 t=21.5hr Prop 3B [Ethol]=1.82 g/L
Shift Change
08:19 Sending Liq→Decanter Feed Tank, pH back to Liq, pumps sped up to 4 GPM
08:23 pH Control OFF Liq, Temp OFF pHA and Liq
08:31 Cracking drain on Cooling Water Tank
08:55 pHA Pump and Agitator OFF, done pumping, drain the rest
Don't know Liq level, hoping indicator comes along.
09:12 Rinsing Reversing Screw→Liq
09:17 Pre-rinsing transfer lines into pHA
09:20 Caustic Systems ON
09:38 Clog somewhere in 3B transfer
10:24 Liq Pump OFF, looks like around 21%, Decanter 64.8%
10:30 Draining remainder of Liq→Sump
10:45 t=24hr Prop 3B Sample Taken
(L) 30.1%; pH=6.30; (T) 97.9°F; (P) 0.32 psi
11:26 pHA sprayballs. Already did all transfers, still draining Liq.
11:30 Liq Agitator OFF
11:51 WW done
12:13 Liq sprayballs
12:41 Liq complete (rinse) had to deal with some clogs
14:10 Caustic Cycle on all transfer lines of pH/Liq
14:35 pHA sprayballs
15:15 Liq sprayballs
15:21 Pausing for leaking hose
15:41 Resuming Liq (cam fitting arm broke)
16:07 UV Cycle of transfer lines
16:08 Caustic Systems down
16:33 t=30hr Prop 3B Sample Taken
(L) 30.2%; pH=6.30; (T) 97.9°F; (P) 0.28 psi
17:08 3B s.p. 140°F. Base OFF
No growth
17:41 Turning Caustic/Rinse back ON, heating Rinse
18:05 UV Cycles pHA and Liq complete
18:24 3B @ 140°F
19:36 WW in Recirc (just in case)
Shift Change
20:30 UV Pump and CIP systems OFF
20:46 WW Pump OFF. Rinsed out
21:24 Finished heat-kill of Prop 3B timer
21:26 Prop 3B TC OFF
Cooling and Hot Water Pumps OFF
21:27 Scrubbers OFF
21:29 Chiller OFF
21:31 Steam OFF, Process and Potable Water Pumps 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