5-STAGE WASH
PREVENTATIVE MAINTENANCE
PROCEDURE

Attachments: Daily P.M. Check sheet
Weekly P.M. Check sheet
Nozzle Orientation (2 pages)

DAILY PREVENTATIVE MAINTENANCE

This is to be done every shift by the Wash Operator and the Daily Preventative Maintenance Checklist filled out accurately and with detail. It must be handed in at the end of the week to the Supervisor.

1. Record the Name, Date and Time (including AM/PM)

2. Ensure all tote tank ball valves are fully opened prior to operating the 5- stage wash.

3. Wash Hours
   a) Record the total hours (current wash hour meter reading).
   b) Record the amount of time the wash has run since the last inspection (current hour reading - previous inspection hour reading = run time since last inspection).

Safety: Follow all lock-out procedures prior to entering the wash, locking out each stage individually. Never check a stage when “blast - only” parts are in it.

4. Nozzle inspection by stage. (Nozzle inspection is only required once per day on evening shift.)
   Inspect, clean and adjust as necessary all nozzles one stage at a time.
   a) Record the following for each stage:
      i) Condition of nozzles (overall).
      Rate according to the following guide:
      5 = Excellent - no plugging etc.
      4 = Good - 1 - 3 plugged nozzles
      3 = Average - 4 - 6 plugged/partially plugged nozzles.
      2 = Fair - 7 - 10 plugged nozzles.
      1 = Poor - more than 10 plugged/partially plugged nozzles.
      ii) Nozzles cleaned.
      - Record the number of nozzles taken out and cleaned/replaced.
      - If a nozzle is replaced due to wear or damage, add a comment as to type and cause of damage.

iii) Nozzles adjusted. (Percentage of nozzles per stage out of alignment.)
Rate according to the following guide:
5 = Excellent - no nozzles out of alignment
4 = Good - 0 - 10% of nozzles out of alignment
3 = Average - 10 - 20% of nozzles out of alignment
2 = Fair - 20 - 30% of nozzles out of alignment
1 = Poor - 30% plus of nozzles out of alignment

b) Add any comments related to the nozzles and nozzle condition.

5. Riser Sections/Bath Solutions
   a) Record the condition of the riser sections as well as any comments on condition of bath.
   b) Be sure to comment on contaminants in the solutions.

6. Filter Screens
   Record by stage the filter screens that required cleaning and were cleaned (if a filter is dirty it must be cleaned). If a filter screen does not require cleaning, record that screen as "good" and screens that were cleaned, record with a check mark. **These screens are to be cleaned one at a time. Both screens in a bath should never be out at the same time because with both screens removed contaminants and debris can enter the pump and damage it. For this reason at least one screen must always be in place.**

7. Water Feed System
   a) Record whether or not the solution levels are okay and record any adjustments that are required.
   b) Record the overflow rate in stages 2 and 4. Stages 2 and 4 should be overflowing at a rate of 7 gallons per minute. All other stages do not require overflowing unless corrective action is being taken to solve another problem (i.e.: high TDS or very high concentration). The float meter is located above the right corner of the tanks.

8. PSI
   a) Record by stage the solution flow PSI as shown on the pump gauges.
   b) Required PSI is listed on the Wash Parameter Chart.
   c) Adjust accordingly. There is a tap to the left of the gauge. Turn this either open/close until you get the desired pressure.

9. In order to prevent accidental tote tank drainage or spillage, close all tote tank ball valves at the end of the production work day.

10. Additional Comments

11. Add any miscellaneous comments etc. that should be recorded in relation to the wash.

WEEKLY PREVENTATIVE MAINTENANCE

The following is to be done when needed and the Weekly Preventative Maintenance Sheet filled out.

1. The Daily Preventative Maintenance Check Sheet is to be done thoroughly.
   Add the following inspections and record in comments sections:
   a) Visually inspect each tip with a good light. If there is any debris blocking the nozzle tip in any way, the nozzle must be disassembled, cleaned out and reassembled. (Put debris in pail rather than the holding tank.)
   b) Check the condition of the risers by inspecting the outside and inside of 2 risers in each stage. Look for slime, sludge etc. Record any findings.
   c) Inspect the walls for slime, sludge, and foreign material.

2. Solution Cleanliness (Friday)
   Check tank solution by visually inspecting the solution in each stage. Lift the lid on each tank to inspect the appearance of the bath, and take a clear glass beaker and get a sample to observe. Stages 2, 4, and 5 should be clean and clear, stage 1 should be slightly brown and hard to see through, and stage 3 will be yellowish and not see through. Rate the appearance of the solutions according to the following scale.

1 - extremely dirty; lots of scum and contaminants; smelly
2 - quite dirty; some scum and contaminants
3 - fairly clean; traces of contaminants
4 - good; fairly clear
5 - very good; clean and pure

3. Sludge Build-up.
   Using the sludge scoop check to see how much sludge is in the bottom of each holding tank.
   a) Scoop sludge from each tank through the hole on top of each tank.
   b) Start at stage 1 and work your way through the wash to stage 5.
   c) Record your answer as an average (approximately) in inches of sludge.

4. (TLPT Only) Clean Jenco pH Probe.
   The probe should be cleaned once a week or when the bulb becomes hazy, using a cleaning solution of 0.1N HCL (Hydrochloric Acid - Testing Solution #2). Calibrate to match a grab sample if pH is out of range greater than 0.1.

5. (TLPT Only) Clean Great Lakes Conductivity probe using distilled water.

6. Clean TDS meter.
   Once a month, verify the calibration of the meter. Calibrate if out ∀5 ppm.

7. Clean the exterior of the wash (including the holding tanks etc.), titration table and all titration equipment. Clean the Hanna pH meter daily with deionized water and low lint tissue.

8. Inform Supervisor of any non-conformance.

9. Sweep out any abrasive on the floor inside the wash cabinet.

5 STAGE WASH
DAILY PREVENTATIVE MAINTENANCE

NAME: _____ **DATE:**_____

Do the following as stated in the procedure.

Tote Tank Ball Valves Open

Stage 1: _____ Stage 3: _____ Stage 5: _____

Wash Hours:

Current meter reading (taken at end of evening shift): _____

Run Time Since Last Inspection: _____

Filter Screens

Stage 1: South Pump: __*__ __*__ North Pump: __*__ __*__

Stage 2: __*__ Stage 3: __*__ __*__ Stage 4: __*__ Stage 5: __*__

Water Feed System

Stage 1 Level: _____ Adjustments: _____

Stage 2 Level: _____ Adjustments: _____ GPM: _____

Stage 3 Level: _____ Adjustments: _____

Stage 4 Level: _____ Adjustments: _____ GPM: _____

Stage 5 Level: _____ Adjustments: _____

Pump Pressure **Time Recorded:**

Stage 1: South Pump (25 PSI): _____ North Pump (25 PSI): _____

Stage 2 (15 PSI): _____ Stage 3 (17 PSI): _____ Stage 4 (15 PSI): _____ Stage 5 (12 PSI):

Tote Tank Ball Valves Closed (at end of production day)

Stage 1: _____ Stage 3: _____ Stage 5: _____

Comments:

_____

TILLAGE PAINT LINE 5 STAGE WASH

WEEKLY PREVENTATIVE MAINTENANCE

WEEK OF _____ to _____ Year _____

Initial following items when complete and file with the Daily Preventative Maintenance Sheet.

Do the following as stated in the procedure.

_____ Daily Preventative Maintenance Check Sheet.
- Including added inspections

_____ Solution Cleanliness (Friday) Stage 1 _____

Stage 2 _____

Stage 3 _____

Stage 4 _____

Stage 5 _____

_____ Sludge build - up: Stage 1 _____ inches

Stage 2 _____ inches

Stage 3 _____ inches

Stage 4 _____ inches

Stage 5 _____ inches

____ Clean Jenco pH probe.

____ Clean Great Lakes Conductivity probe

____ Clean TDS meter by wiping exterior with deionized water and a low lint tissue.

_____ Clean: 1) exterior of 5 Stage Wash, 2) titration table, 3) titration equipment.

____ Tuesday clean filter screen above Stage 3 circulating pump.

____ Thursday clean filter screen above Stage 3 circulating pump.

_____ Record any non-conformance and inform (Company) Supervisor.

_____ Other.

PAINT LINE 5 STAGE WASH
WEEKLY PREVENTATIVE MAINTENANCE

WEEK OF _____ to _____ Year _____

Initial following items when complete and file with the Daily Preventative Maintenance Sheet.

Do the following as stated in the procedure.

_____ Daily Preventative Maintenance Check Sheet.
- Including added inspections

_____ Solution Cleanliness (Friday) Stage 1 _____ _____
Stage 2 _____ _____
Stage 3 _____ _____
Stage 4 _____ _____
Stage 5 _____ _____

_____ Sludge build - up: Stage 1 _____ inches
Stage 2 _____ inches
Stage 3 _____ inches
Stage 4 _____ inches
Stage 5 _____ inches

____ Clean Stage 1 front drain trough.

____ Clean drain trough along wash when necessary.

____ Clean and calibrate 894 pH meter.

_____ Clean TDS meter by wiping exterior with deionized water and a low lint tissue.

_____ Clean: 1) exterior of 5 Stage Wash, 2) titration table, 3) titration equipment

_____ Record any non-conformance and inform Front Line Supervisor.

_____ Other