1. Procedure summary

This procedure describes maintenance of the DAF.

Related Procedures

DAF Operations	CB-02-004-004
DAF Harvest Monitoring	CB-02-004-003
DFP Basket Strainer Replacement	CB-02-004-006
Polymer Station Operations	CB-02-002-002
Antifoam Operations	CB-02-003-001
TA Basket Strainer Replacement	CB-02-004-007
Saturation Tank Operations	CB-02-005-003

Procedure impacts and concerns

Safety	Only operators who have been trained in the safety procedures included in the Safety Instructions of the WesTech O&M Manual should be allowed to work on or around this equipment. Limit access to authorized personnel.	<Additional notes>
Quality	Keep an Installation, Operation and Maintenance manual in the area where operators can familiarize themselves and have it for reference.	<Additional notes>
Delivery	DAF product is delivered to the decanter via the DAF float box and the TA pump. The consistency of the DAF product is very important to the quality of the decanter feed. Large debris needs to be removed from the DAF feed at the DFP strainers to ensure quality of the DAF product.	<Additional notes>
Environmental	Spills in the DAF area need to be reported and cleaned up as soon as possible. Proper procedures should be followed in order to avoid spills during operations.	<Additional notes>
Cost	Preventative Maintenance is important to the overall operations of the DAF equipment. If the DAF is shutdown for significant periods of time, regular harvesting can not be performed and this effects our cost of operations.	<Additional notes>
Compliance	The DAF should be operated within the guidelines outlined in the WesTech O&M manual.	<Additional notes>

Responsibilities and owners

Document Owner	Manage content and distribution	Timothy Langer
Process Owner	Responsible for content and process validation	Marcos Delgado
Site Manager	Responsible for implementation and conformance	Gil Jones

2. Process

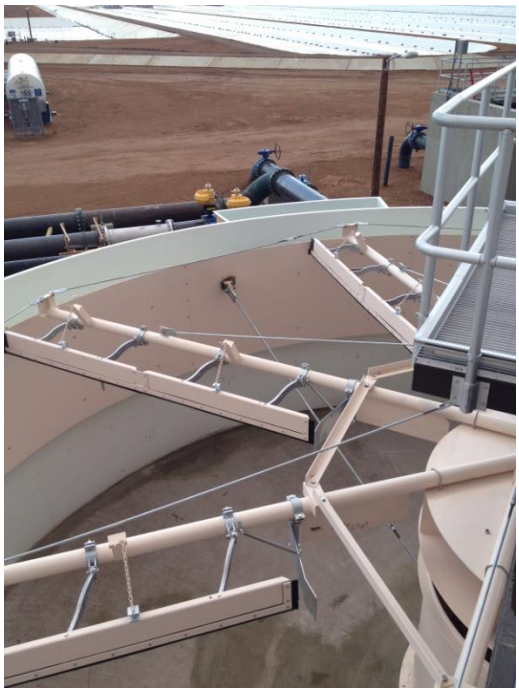
2.1 Process description

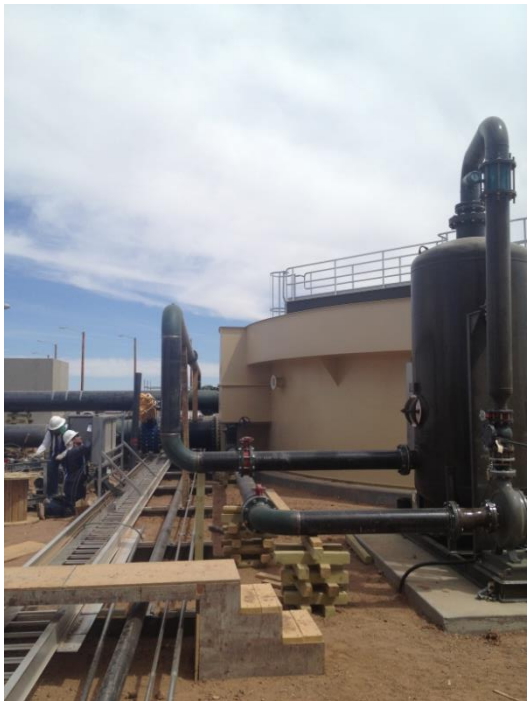
Maintenance and replacement of worn or damaged machine parts will ensure safe operation of the DAF. Maintenance and repair work may only be carried out by qualified personnel and should be performed regularly. <Additional notes>

2.2 Process diagram: Work Instruction

The Preventative Maintenance of the DAF and supporting equipment is detailed in the WesTech O&M Manual. The photos below show the rotating skimmer arms on the top of the main DAF tank and the Saturation Tank that supplies dissolved air to the main DAF tank.

<Additional notes>





2.3 Maintenance

2.3.1 Equipment Maintenance

2.3.1.1All bolts and nuts should be kept tight and original alignments and adjustments maintained. Inspection should be made monthly or as needed.

2.3.1.2 Examine all wearing parts weekly to determine whether excessive wear is taking place.

2.3.1.3 Keep the mechanism and surroundings clean and free from any accumulation of trash or debris.

2.3.1.4 Test the limit switches on the Torque Control at least once per week to make sure the mechanism is protected. Refer to the Torque Control Maintenance Instructions in the Maintenance and Parts section of the WesTech Installation, Operation and Maintenancne Manual.

Warning: Do not attempt to perform maintenance on any equipment without first properly locking out the power.

2.3.1.5 Lubrication instructions and recommended lubricants as specified in the WesTech Installation, Operation and Maintenance Manual are to be followed. This will provide long life and trouble-free operation of the drive unit.

2.3.1.6 Manufacturer's recommendations for maintenance and lubrication of the speed reducers are included and should be followed in order to maintain warranties.

2.3.1.7 Check the drive unit oil level weekly. The oil level should be at the middle of the sight glass. Replenish oil as required. Refer to the Lubrication Instructions in the Drive Unit manual in the Accessory Equipment section of the WesTech Installation, Operation and Maintenance Manual.

2.3.1.8 If oil is noticeably discolored, it should be drained and filtered through a fine-mesh cloth. Any sediment or contaminants should be measured and recorded to preclude future contamination. Change the oil if necessary.
2.3.1.9 Check drive unit for accumulated condensation at least weekly and in high humidity areas as often as daily. Any condensation must be promptly removed to prevent accumulation of moisture in the drive unit housing or main bearing.
2.3.1.10 If the power is shut off or if the mechanism is stopped for any reason longer than an hour for light sediment and 15 minutes for a heavier sediment load, bypass the flow until the machine is started again.
2.3.1.11 Drain the tank at least every six months to remove particulate deposits from the mechanism (e.g., lime scale buildup). Inspect the entire mechanism above and below the water line. This is a good opportunity to touch up all rust spots with paint.
2.3.1.12 Any unusual or irregular noise should be investigated immediately as this could be an indication of a problem.
2.3.1.13 Any irregular or jerking motion in the operation of the mechanism must be immediately investigated and the cause determined and remedied. The mechanism must not be allowed to continue operation if this problem is present.

2.3.2 Start-up and Maintenance Services

2.3.2.1 WesTech service personnel are available to assist in the start-up and continued maintenance of the WesTech equipment and the WesTech O&M manual should be reviewed for detailed information on the DAF system.

2.3.3 Spare Parts Orders

2.3.3.1 WesTech replacement parts are to be used be sure to note the following information with the order: WesTech Job Number, Parts List Number, Part Number, and Description.

2.3.4 Maintenance Log Sheet

2.3.4.1 Refer to the Maintenance Log Sheet in the Maintenance section of the WesTech Installation, Operation and Maintenance Manual for Preventative Maintenance and Inspection Requirements.

2.3.5 Emergency Procedures and Trouble Shooting

2.3.5.1 External emergencies such as a power failure, flow surges exceeding design conditions, or failure of part of the treatment systems are conditions which should be treated in the master plan for the whole plant.
2.3.5.2 Internal emergencies within the unit will be indicated if the overload alarm sounds or the drive motor stops.
2.3.5.3 Immediately bypass the feed to the thickener.
2.3.5.4 If possible, allow the mechanism to continue running as long as there is no build-up of indicated torque. This should result in an elimination of accumulated sludge.
2.3.5.5 If the overload is so heavy that the cut-out switch continues to stop the mechanism, it will be necessary to drain the tank and remove the excessive buildup or obstruction.
2.3.5.6 Shut down the recycle system by turning off the pressurization pumps. This also deactivates the air supply system through the solenoid valve in the air control panel.

2.3.6 Trouble Shooting (Mechanical)

2.3.6.1 Refer to the Trouble Shooting Instructions in the Maintenance section of the WesTech Installation, Operation and Maintenance Manual (pages 71-74).

2.3.7 Storage and Shutdown Precautions

2.3.7.1 It is preferable to store mechanical and electrical items indoors in a dry, well ventilated enclosure with a relatively constant temperature.
2.3.7.2 The equipment should be adequately supported to prevent distortion and undue stress.
2.3.7.3 The equipment should be at least six inches off the floor.
2.3.7.4 Refer to the Short Term and Long Term Storage or Shutdown Instructions in the Maintenance section of the WesTech Installation, Operation and Maintenance Manual (page 75-77).

<Additional notes>

3. Required documents

Input documents

DAF P&ID	<Input document number>
WesTech Installation, Operation and Maintenance Manual	

Output documents

<Output document and storage instructions>	<Output document number>

4. Document control

Revision history

R0 – Initial Release – Marcos Delgado	May 6, 2012
R1 – Updated procedure – Marcos Delgado	September 5, 2012

Document approval

<Name>	<Approval date>

Document reviewers

<Name>	<Last reviewed date>
<Name>	<Last reviewed date>

5. Risk analysis

<Risk name>	<Mitigation plan>	<Owner>	<RPN>