

## 1. Procedure summary

The purpose of this SOP is to describe procedures for determining the polymer dose needed to DAF harvest using the ECE Mini mix Laboratory Mixer (jar test instrument) with four 500mL sample containers.

### Related Procedures

### Procedure impacts and concerns

Safety	Standard PPE, nitrile gloves, dust mask
Quality	Incorrect concentration could affect efficiency of harvest
Delivery	Refer to MSDS for precautions
Environmental	Polymer is bio-degradable
Cost	
Compliance	Monitoring the polymer dosing rate is critical to ensuring target harvest efficiency throughout the process

### Responsibilities and owners

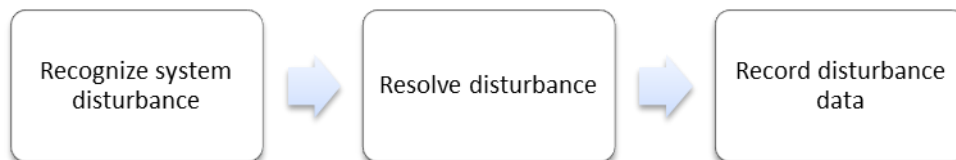
Document Owner	Manage content and distribution	Alejandro Pacheco
Process Owner	Responsible for content and process validation	Dhawal Dhonde
Site Manager	Responsible for implementation and conformance	Dhawal Dhonde

## 2. Process

### Process description

The purpose of this SOP is to describe procedures for determining the polymer dose needed to DAF harvest using a jar test instrument .You will need to look at these SOP'S also (Calibrating Turbidity Meter and using Turbidity Meter)

### Process diagram: Work Instruction



### Process steps

Use a 1L sample bottle to collect harvest culture samples directly from the ponds. Use a 5 gallon bucket when sampling from the DFP channel (AH-V202, AH-V402, AH-V602), or DFP port and bring the sample(s) to polymer room to start the jar test. Make sure the samples are not settled due to affecting efficiency's.

2.3.4 Assemble jar testing equipment.

**Note:** Sampling location may vary dependent on QAQC or Daily Instructions.

**Note:** Composite jar testing will only be done if samples are taken directly from ponds.

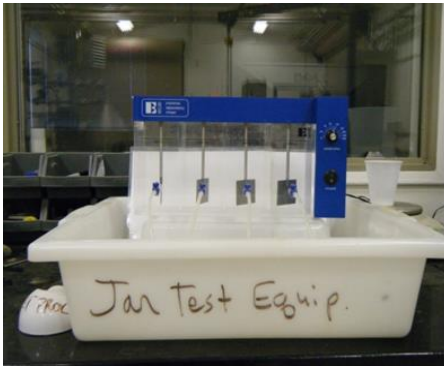


Figure 1: Shows jar test mixer.

2.3.4.1. Combine all 1L sample bottles into clean 5 gallon bucket and stir prior to adding 500mL to each jar. **NOTE: When sample taken from DFP or DFP port just stir with 1L sample bottle.**

2.3.4.2. Add 500mL composite sample to each jar.

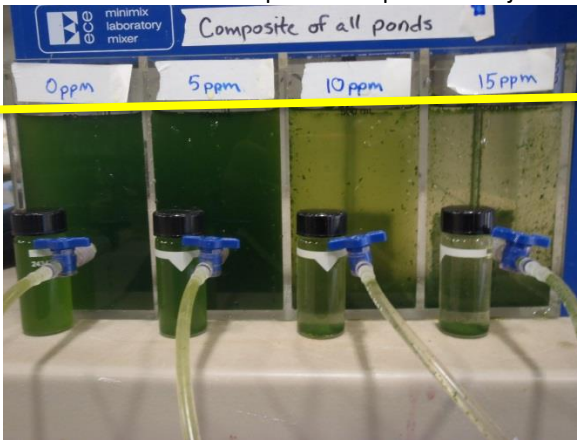


Figure 2-mixer has overflow line do not exceed with culture.

2.3.4.3 Turn stir apparatus on to 100 RPM.

2.3.4.4. Immediately after turning on stir apparatus take a sample using turbidity vial from jar 1 located on the far left to establish your baseline. See Figure 3 below.

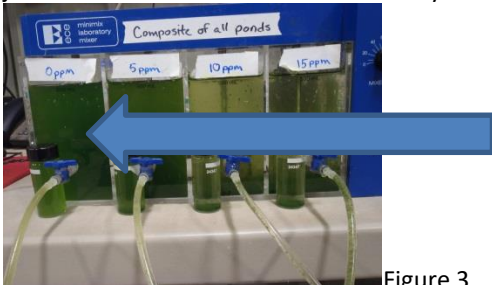


Figure 3

2.3.4.5. Immediately after taking sample from jar 1 using turbidity vial place in turbidity meter and push button located on the upper right for baseline reading. See Figure 4 below.

**NOTE: If culture is settled you may use a 1L sample bottle to stir the culture in 5 gallon bucket so that it is properly mixed.**

**NOTE: Once baseline recorded dispense product from turbidity vial into waste bucket.**

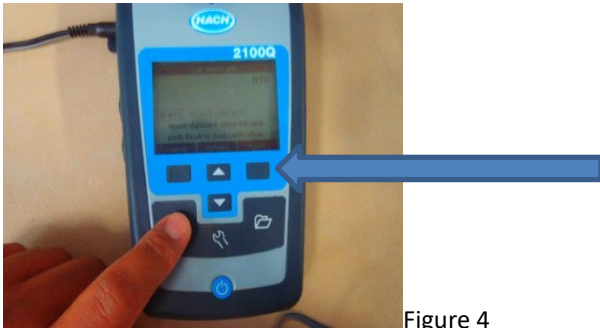


Figure 4

2.3.4.6. Record data on Jar Testing Template. Located on L:\Field Operations\Harvest Check Lists\Jar Test Record Template. Once file open click File Save As L:\Field Operations\Harvest area logs and records\Jar Testing Records\2015\current month\Save with current date.

### 2.3.5 Polymer Addition

2.3.5.1. Get polymer sample from desired Tank 1 or 2 from valves (POL-200 or POL-201) with sample cup. See Figure 5 below.



Valve POL-200



Sample cup

**NOTE:** Polymer should feel like a syrup type texture and look semi-transparent.

**Note:** Dosage may vary depending on daily instructions or QAQC.

2.3.5.2. Fill syringe with desired dosage for each jar separately.



Figure 6- Syringe

2.3.5.3. Continue to stir at 100 RPM setting.

2.3.5.4. Jar 2 will take 0.5 ml of polymer. Jar 3 will take 1 ml of polymer and Jar 4 will take 1.5 ml of polymer.

2.3.5.5. Place syringe opening slightly under the composite sample surface.



Figure 7

2.3.5.4 Slowly inject polymer to Jar 2, 3, and 4 in desired increments. See table below.

	ML's	Dosing
Jar 1	0	0 ppm
Jar 2	0.5	5 ppm
Jar 3	1	10 ppm

Jar 4	1.5	15 ppm
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2.3.5.4 Record total polymer added to jars to Jar Test Template see 2.3.4.6



Figure 8

2.3.5.5 Immediately after polymer is added mix on max speed of 300 RPM for 30 seconds. See Figure 9 below.



Figure 9

NOTE: Save photo to L:/Field Operations/EOD/2015 Jar test photos/current month/current date.

2.3.5.6 Slow stirring apparatus back to 100 RPM for 2 minutes.

2.3.5.7 Turn stirring apparatus OFF after 2 minutes and let settle for 5 minutes this will reflect the time in DAF.



Figure 10- Flock build-up after adding Polymer

2.3.5.8 Observe flocculation response and take photo.

2.3.6 Final Turbidity

2.3.6.1 Make sure turbidity test is calibrated refer to (Calibrating Turbidity Meter and using Turbidity Meter SOP)

2.3.6.2 Fill turbidity sample vial from sample jar 2 and put in turbidity meter. Push button on upper right of turbidity meter and record data on Jar Testing Template repeat the process for remaining jars. See Figure 10 and 11.



Figure 11-Filled turbidity vial



Figure 12-Turbidity

NOTE: Manual Formula for Jar Test Efficiency's:  $F = 1 - SN/DFP =$

2.3.6.3 Flush-out turbidity vial with water bottle in 5 gallon waste bucket after each recording and repeat for remaining jars.

2.3.6.4 Measure and record final turbidity of composite sample on Jar Test Template. See Figure 12 below of completed Jar Test Record Sheet.

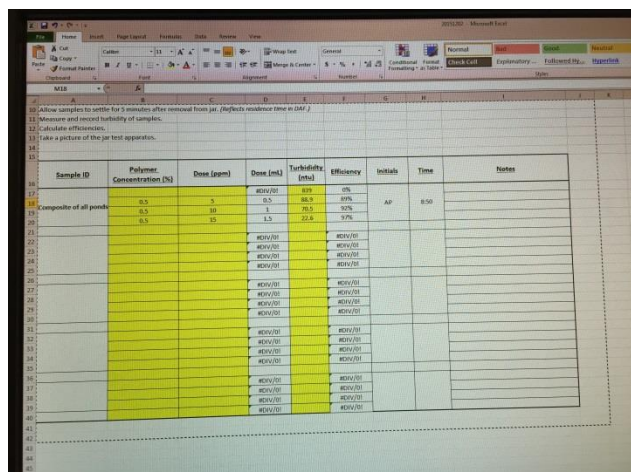


Figure 13

2.3.6.5. Once Jar Test Record saved send via email as attachment to the Daily Instructions chain along with jar test photo.

2.3.6.6. Clean up area, jar test apparatus and any tools used during jar test.

**NOTE: Upload jar test efficiencies and photos via email to Daily Instructions when completed.**

### 3. Required documents

#### Input documents

Jar Test Record

<Input document number>

#### Output documents

Jar Test Record

<Output document number>

### 4. Document control

#### Revision history

R0 – Initial Release – Tom Johnson	May 10, 2012
R1 – Updated procedure – Marcos Delgado	September 4, 2012
R3- Jose/Leo	January 19,2015

#### Document approval

<Name>

<Approval date>

#### Document reviewers

<Name>

<Last reviewed date>

<Name>

<Last reviewed date>

#### Risk analysis

<Risk name>

<Mitigation plan>

<Owner>

<RPN>