

1. Procedure summary

This procedure describes how to harvest pond dropping whether it be a production harvest or weed harvest at the IABR in Columbus, N.M.

Related Procedures

Pond Access	CB-03-006-001
Culture Sampling	CB-01-001-001
Gravity transfer	CB-03-004-001

Procedure impacts and concerns

Safety	Standard PPE & Nitrile gloves
Quality	Inaccurate pond drop could lead to pond lose or will result in changes of culture health.
Delivery	N/A
Environmental	Loss of containment
Cost	N/A
Compliance	Compliance with OSHA's Hazardous Waste Operations and Response, and Hazardous Communication Standard in addition to the Sapphire Energy, Inc. Chemical Hygiene Plan is required. See 29 CFR 1910.120 and 1200. An AUL list, MSDSs and label information will be available for easy reference in a binder in the administration building.

Responsibilities and owners

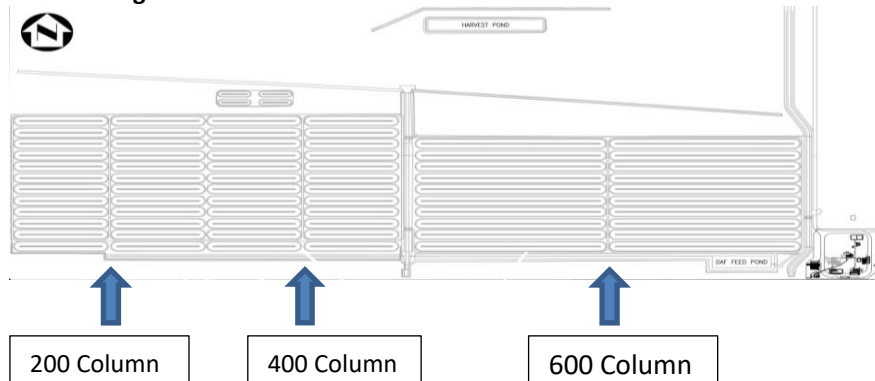
Document Owner	Manage content and distribution	Magdalena Pacheco
Process Owner	Responsible for content and process validation	Rebecca White
Site Manager	Responsible for implementation and conformance	Rebecca White

2. Process

Process description

This process describes how to properly and safely harvest a pond. Pond health and productivity can be affected by over dropping a pond or not dropping the correct amount properly which affects the dry weights.

Process diagram: Work Instruction



Process steps

Production Pond Drop

2.1. Pond drop procedures for 1.1 and or 2.2 acre pond(s) "Production Harvest".

2.2. Make/print checklist for pond drop. Obtain checklist from Columbus drive (L:) /Field Operations/checklist/Harvesting.

2.3. Prep valves for harvest using checklist whether harvesting from 200, 400, or 600 column. Once valves are prepped, verify harvest is ready for culture and number of ponds to start harvest via email or radio.

2.4. Open slide gate(s) (see figure 1) to pond and advise to HMI operator and team lead which pond(s) you have opened.



Figure 1. (Slide gate)



Figure 1. (valves are color coated-AH-V201 with key)

Make sure that as you are opening and closing AH-V valves that you are logging everything down on checklist along with relaying work status to team lead or HMI operator.

2.5. Verify that there is flow at the channel. If there is no flow in the channel then culture is going somewhere it shouldn't be and you should re-check all valves and checklist **IMMEDIATELY**.

3. Monitor depth periodically dependent on desired depth. Refer to Daily Data Collection Summer/Winter and Paddlewheel Operations SOP for accurate depth measurement (see figure 2.).

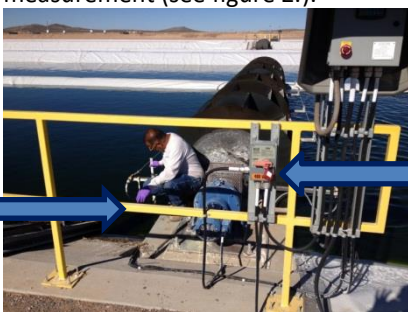


Figure 2. (Proper LOTO and PPE)

Once pond has hit its target depth turn paddlewheel back on refer to Paddlewheel Operations SOP. Advise HMI operator or team lead when complete. Should then move on to next desired pond on checklist immediately after closing previous valves. Repeat steps **2.4.-3.** for the remaining ponds.

NOTE: Do not leave paddlewheel off for more than 10 minutes. Due to culture settling and not enough biomass will be processed.

NOTE: Will also need checklists for HRP and AH-V valve(s) sampling. Obtained under Columbus drive (L:)/Field Operations/Checklists/Harvesting/Harvest sampling sheet or HRP sampling sheet. Sample time will be as per QAQC.

NOTE: Keep in mind the 600 column are the 2.2 acre ponds and will take more time to drop to desired depth due to length of pond.

NOTE: It is very important that you or your team member has a radio on hand for good communication and task status.

NOTE: You CAN NOT open two pond slide gates right next to each other.

NOTE: When doing weed harvest paddlewheel needs to be off for at least 1 hour. No longer than 3 hours. Due to culture and weed settling.

NOTE: Keep in mind the 600 column are the 2.2 acre ponds and will take more time to drop to desired depth due to length of pond.

NOTE: You CAN NOT open two pond slide gates right next to each other.

NOTE: Will also need checklists for HRP and AH-V valves sampling. Obtained under Columbus drive (L:)/Field Operations/Checklists/Harvesting/Harvest

3.1. Once **ALL** ponds have been harvested to their target depths, advise HMI operator and team lead that pond drop is complete via email or radio. Complete checklist and turn into team lead.

Weed pond drop

4. Pond drop procedures for 1.1 and or 2.2 acre pond(s) "Weed harvest".

4.1. When doing Daily Data Sampling you should have turned off 2 or 3 paddlewheels in ponds depending on location so that production is not delayed. You will then have to time all other ponds during harvest.

4.2. Make/print checklist for pond drop. Obtain checklist from Columbus drive (L:) /Field Operations/Checklists/ Harvesting.

4.3. Prep valves for weed harvest using checklist whether harvesting from 200,400, or 600 column. Once valves are prepped, verify harvest is ready for culture and number of ponds to start harvest via email or radio.

4.4. Open slide gate(s) (see figure 1 above) to pond and advise to HMI operator and team lead which pond(s) you have opened. Make sure that as you are opening and closing AH-V valves that you are logging everything down on checklist along with relaying work status to team lead or HMI operator.

4.5. If you are timing well, by the time one pond is completed, next pond paddlewheel should be off for about 1 hour and ready to open so there is no production delay. Verify that there is flow at the channel. If there is no flow in the channel then culture is going somewhere it shouldn't be and should re-check all valves and checklist **IMMEDIATELY**.

4.6. Monitor depth periodically dependent on desired depth. Refer to Daily Data Collection Summer/Winter and Paddlewheel Operations SOP for accurate depth measurement (see figure 2 above). Once pond has hit its target depth turn paddlewheel back on refer to Paddlewheel Operations SOP. Advise HMI operator or team lead when complete. Repeat steps **4.4-4.6** for remaining ponds.

4.7. Once **ALL** ponds have been harvested to their target depths, advise HMI operator and team lead that pond drop is complete via email or radio. Complete checklist and turn into team lead.

sampling sheet or HRP sampling sheet.

5. Required documents

Input documents

Harvest Checklist
Harvest Sample Sheet
HRP Sample Sheet

Output documents

Harvest Checklist
Harvest Sample Sheet
HRP Sample Sheet
Production log

3. Document control

Revision history

R0 – Initial Release – <Editor name>	<Date>
R1 – Magdalena Pacheco	02/10/2015

Document approval

<Name>

<Approval date>

Document reviewers

<Name>

<Last reviewed date>

<Name>

<Last reviewed date>

4. Risk analysis

<Risk name>

<Mitigation plan>

<Owner>

<RPN>