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**Pure #1 & 1D SWD**

**Reactivation Procedure**

**AFE #: xxxx**

**API #: 42-039-32843**

**Field: Martin Ranch**

**BRAZORIA CO, TX**

**Version 1**

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**Note:**

* Modifications to this procedure may be necessary as the job progresses. All changes need to be approved by Criterion EP Management prior to proceeding.
* All invoices, reports and miscellaneous paperwork should reflect the **PURE #1 Reactivation**, and AFE number **# xxxx**. This information should be communicated to service personnel.
* Safety is the top priority. All service personnel need to be familiar with CEP safety policies and practices. Job Safety meetings should be held and documented with all crews and Criterion Energy Partners’ Contractors at the start of every day and documented in the daily report. These meetings should also be held during the day if the work task/application was not talked about during the pre-tour meeting and after every tour change. Criterion Energy Partners’ representative shall attend all JSA and safety meetings.
* Well control and overall work safety is imperative. In order to assure a safe working environment, the wellsite supervisor must provide safe and effective leadership and exercise good judgment. If at any time you feel a situation is inordinately dangerous and additional measures are required, STOP and confer with CEP Management before proceeding. Losing control of a well is not acceptable and the onsite individual is responsible for the safe management of the well at all times. Unless otherwise authorized by CEP Management, never begin operation without proper onsite supervision. Unless otherwise authorized by SWN Management, the wellsite supervisor will be the first person on location at the beginning of a workday and the last to leave the location once the well is secured for the night.
* At least one Company Representative on location should call into the morning conference call and be prepared to discuss job progress, plans, well control and overall safety. The call takes place **at 8 a.m. EST** on weekdays. The conference call number is: xxxxx, ext. xxxx#. A Company Representative on location is also required to confer with CEP Engineering throughout the day to provide an update and especially if issues with the job arise.

**Team Contact Information**

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**Addresses**

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**PROCEDURE**

**Facilities Inspection & Testing – Producing wellsite**

1. Hold safety meeting – review job requirements, equipment and any potential dangers. Ensure proper PPE (steel toes, safety glasses, hard hats, FRC, hearing protection and gas detector(s)) is used during the duration of the job.
2. Obtain information on production tree and wellheads for future use.
   * Make note of mismatched pressure ratings or improper fittings
   * Check for choke in wing
   * ESD functionality
   * Leaks or missing parts
3. Check pressures on all strings and report same.
   * Ensure threads are clean and there is no debris on top of needle valves that could plug the pressure gauge **before** installing a 10ksi pressure gauge.
   * Make note of any abnormalities on each valve.
     1. Number of turns to open and close
     2. Difficulty manipulating valve
     3. No pressure could be indicative of an installed VR plug. These must be identified
     4. Indication of communication between tubing and annulus
     5. Annular pressure build-up
4. Assess condition of separators (need assistance of facilities SME)
   * Document the dimensions and specifications of each unit
   * Perform inspection with regard to functionality
   * Schedule repair as necessary

1. Assess condition of liquid storage tanks
   * Check fluid levels
   * Identify type of fluid in tanks and document
   * Label tanks if necessary
   * Inspect for potential leak areas
2. Assess condition of dehydration unit (need assistance from facilities SME)
   * Document physical dimensions, capacities and specifications
   * Perform inspection with regard to functionality
   * Note all lines that are disconnected
   * Note any penetrating corrosion
   * Inspect condition of KimRay pump and associated equipment
   * What is condition of the tower?
3. Assess condition of flowline from well to separator and from separator to tanks
   * Any indications of leaks?
   * Note the location of all isolation valves and ensure that they are closed.
   * Any reason that the lines can’t be pressure tested?
4. If visual inspection of flowlines is acceptable, RU kill truck loaded w/ lease water. Tie into flowline.
5. Walk the flowline to ensure all valves are open between well and tank battery.
   * If possible, bypass the separator for this test
6. Engage pump and proceed to fill the flowline @ ~1 bpm. **Pmax = 250 psi**
   * If the line pressures up, terminate the injection
   * Course of action to be determined, proceed to **Step 16**
7. If injection is established, pump ~10-20 bbls through flowline, then shut down pump.
   * Walk the flowline while pumping to identify any leak locations
   * Gauge the tank to ensure water went where it’s supposed to go
8. Close the isolation valve closest to the storage tank.
9. Engage pump and pressure up on the flowline to **500 psi**. SD pump and monitor for 15 minutes. Bleed off pressure.
10. Open valves to put the separator in service.
11. Ensure all valves are open to storage tank.
12. Engage pump and fill separator. Observe function of the separator. Once satisfied, SD pump and RD from flowline.
    * Testing of separator should be done per instructions from facilities SME
    * Does it work??
    * Is it dumping appropriately??
    * Any leaks??

**Facilities Inspection & Testing – SWD well**

1. Hold safety meeting – review job requirements, equipment and any potential dangers. Ensure proper PPE (steel toes, safety glasses, hard hats, FRC, hearing protection) is used during the duration of the job.
2. Obtain information on SWD tree and wellheads for future use.
   * Make note of mismatched pressure ratings or improper fittings
   * Check for choke in wing
   * ESD functionality
   * Leaks or missing parts
3. Check pressures on all strings and report same.
   * Ensure threads are clean and there is no debris on top of needle valves that could plug the pressure gauge **before** installing a 10ksi pressure gauge.
   * Make note of any abnormalities on each valve.
     1. Number of turns to open and close
     2. Difficulty manipulating valve
     3. No pressure could be indicative of an installed VR plug. These must be identified
     4. Indication of communication between tubing and annulus
     5. Annular pressure build-up
4. Assess condition of any separators.
   * Document the dimensions and specifications of each unit
   * Perform inspection with regard to functionality
   * Schedule repair as necessary

1. Assess condition of any liquid storage tanks
   * Check fluid levels
   * Identify type of fluid in tanks and document
   * Label tanks if necessary
   * Inspect for potential leak areas
2. Assess condition of flowline from well to facilities
   * Walk the line from the SWD pad to the producing well facility
   * Any indications of leaks?
   * Note the location of all isolation valves and ensure that they are open to the storage tanks.
   * Any reason that the lines can’t be pressure tested?
3. If visual inspection of flowlines is acceptable, RU kill truck loaded w/ lease water at the producing well facility flowline that connects the two (2) wellpads.
   * Have one (1) person at the pump and one (1) at the SWD storage tanks.
4. Engage pump and proceed to fill the flowline @ ~1 bpm. **Pmax = 150 psi**
   * If the line pressures up, terminate the injection
   * Terminate the diagnostic evaluation and proceed to **Step**
5. If injection is established, pump ~30-40 bbls through flowline, then shut down pump.
   * Walk the flowline while pumping to identify any leak locations
   * Gauge the tank to ensure water went where it’s supposed to go
6. Close the isolation valve closest to the storage tank on SWD pad.
7. Engage pump and pressure up on the flowline to **250 psi**. SD pump and monitor for 15 minutes. Bleed off pressure.
8. Repeat Steps 22 through 27 for all line segments from producing well pad to the SWD wellhead.

**Determine if Pure #1 will flow**

Assumptions:

1. The production separator is in working order – alternative will be rental equipment
2. Storage tanks at the producing well pad are functional – alternative will be frac / open-top tanks
3. Flowlines on the producing pad from wellhead to the storage tanks are useable – alternative is rental iron
4. The dehydration unit is functional (if necessary per gas contract)
5. The gas line is hooked up to sales point – alternative is a flare stack
6. Set 1-200 bbl open top tank with gas buster. Lay line to accessible tie-in point of the flowline upstream of the separator. Tie-in to the flowline with 2” valve(s) to isolate the flowline from the open-top line just laid.
7. Ensure all flowline valves are open from wellhead to the test tank. The separator and storage tanks should be isolated at this juncture.
8. It is preferred to have an adjustable choke on the tree if possible. If not, a suitable choke would be around 14/64”.
9. Ensure wing valves are closed on the production tree.
10. Slowly open bottom master valve and observe pressure response. There should be no reaction on the pressure gauge. If there is, then the bottom master may be leaking
    * Count number of turns to completely open the valve
11. Slowly open the top master valve. Record the SITP.
    * Count number of turns to completely open this valve
12. If well has adjustable choke, ensure it is closed.
13. Open inside wing valve, counting number of turns. Open outside wing valve, again counting number of turns.
    * Note any anomalies in pressure or valve manipulation
14. If well has adjustable choke, open the choke while observing the open-top tank until acceptable flow is noted.
15. Flow well to open-top tank until it is deemed acceptable to put down sales line. At this point, shut in wing valves.
16. Manipulate valves to isolate the open top tank and turn through separator and storage tanks.
17. Manipulate valves to open SWD line from producing well pad to the SWD facilities.
    * Have 1 person at the SWD facility to watch for anomalies.
18. Open the master valves on the SWD. Record pressure. Open wing valves to the SWD flowline.
19. Re-open well and put to sales. Monitor well pressures, flow rates and water levels until continuous flow has been confirmed for GT demo.
    * Gauge all tanks to determine produced volumes
      1. H2S hazards??
20. Note how SWD well took water and record pressures if possible.
21. Shut-in wing valves and master valves on Pure #1 producing well.
22. Shut-in wing and master valves on SWD well. Close valves to isolate SWD line between producing and SWD pads.
23. Release all rental equipment and secure locations until GT demo is conducted.

**Contingency #1: Pure #1 will not flow**

1. RU slickline unit w/ 5ksi lubricator. PU & TIH w/ 2-1/2” sample bailer to refusal. Obtain sample & POH.
2. If no sample is recovered, PU & TIH w/ 2-1/2” lead impression block. Set down on obstruction and POH. RD SLU.
3. If tubing is collapsed, remedial procedure will be constructed, otherwise analysis of sample material will dictate next steps. If CaCO3 or CaSO4, a chemical / acid treatment will be designed to dissolve the scale.
4. Depending on sample composition, a coiled tubing unit may be used to clean-out the obstruction.
5. CTU will be 1-1/4” unit. Downhole BHA to be Bico SS150 motor w/ xxx mill.
6. RU CTU & associated equipment. Pull test….. etc.
7. RIH w/ BHA and tag obstruction. Engage pump and drill through obstruction.
8. Continue RIH to 15,100’ (top of junk). CBU & POH. RD CTU
9. Repeat steps xxxxxx
10. Once flow is established from the Pure #1, send to SWD.

**Contingency #2: SWD pressures up**

1. RU pump truck. Pressure up and see if it will take fluid. **Pmax = 600 psi**
2. No injectivity RU SLU. RIH w/ sample bailer and tag PBTD. POH w/ bailer. Analyze material recovered.
3. If sand accumulation, RU CTU & RIH w/ wash tip. CBU until clean.
4. If paraffin, a remedial treatment will be designed.