



MACONDO
 Permanent Abandonment
 for
 MC252-1
**Operational Note #5:
 Surface Cement Plug Changes**

Changes to "MC252 #1 Permanent Abandonment" Procedure

**BOEM
APPROVAL:**

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In reference to Procedure 2200-T2-DO-PR-4734

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**GoM Exploration Wells
Plug and Abandon Team**



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Special Instructions

MC252

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Note: Add 9-ft to MD/TVD for Development Driller II

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- Attachment 2: Detailed BHAs
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Note: Add 9-ft to MD/TVD for Development Driller II

MC252-1

Operational Note #5 Changes to "MC252-1 Permanent Abandonment" Procedure

Date: October 13, 2010

Ref. Procedure: 2200-T2-DO-PR-4734

Discussion

This procedure is based on the approved P&A program (#4734) and is intended to provide the bridge from previously approved Ops notes back to this program. All further steps are included in this Ops note to prevent jumping back to the previous procedures and ops notes. The procedure will begin with the steps to set the 16-in bridge plug at ~9,050-ft after previous ops notes have been completed.

Procedure

1.1. 16-in EZSV-B Bridge Plug on Drill Pipe

Evidence preservation and chain of custody requirements must be followed regarding all equipment recovered from the well. Refer to Attachment 8.

Note: Prior to retrieving the 16-in liner, liner hanger, and seal assembly, a video record of the 16-in supplemental wellhead adapter area may be required. Consultation with BOEM will be necessary before proceeding.

1. RIH with 16-in casing scraper BHA (Attachment 2, BHA#1) and scrape to planned bridge plug setting depth at 9,050-ft.
2. TIH with a 16-in, 97-ppf Halliburton EZSV-B bridge plug dressed for Q-125 casing on drill pipe.
3. Set the bridge plug at ~9,050-ft MD, about 50-ft above the planned 13 3/8-in wash-over assembly liner top. Do not set packer deeper than the scraper was run in previous operations.
4. Close annular preventer and trap 1,000 psi above bridge plug.
5. Pressure test primary cement plug to 1,000-psi for 15 minutes.
 - Zonal Isolation during Drilling Operations and Well Abandonment and Suspension Section 26.3.3 of the *BP Drilling and Well Operations Practice* states: Weight testing should be up to at least 15K lb. Pressure testing shall be 0.1psi/ft above the leak off test (LOT) (or predicted fracture gradient at the shoe) or 500 psi, whichever is the greater. The pressure test is acceptable where pressure drop is <10% over 15 minutes.
 - BOEM will require the following for testing of the cement plug: The plug must pass the following tests to verify plug integrity. (1) A pipe weight of at least

Note: Add 9-ft to MD/TVD for Development Driller II

15,000-pounds on the plug; and (2) A pump pressure of at least 1,000-pounds per square inch. Ensure that the pressure does not drop more than 10-percent in 15-minutes. The District Manager may require you to test other plug(s).

- BP testing requirement is based on 11,585-ft TVD * 0.1 psi/ft= 1,158-psi above calculated frac gradient at 16-in shoe. The 13.1-ppg DHE (downhole equivalent) frac gradient vs 14.45-ppg DHEMW which implies 13.1-14.45*.052*11,585-ft = -813 psi. Therefore test pressure =1,158 psi - 813 psi= 345-psi. Therefore test to 1,000-psi.
6. Bleed off pressure, open annular and release from bridge plug.
 7. Slack-off and set 5-10k-lbs down on packer to confirm setting was successful.
 8. POOH.

1.2. Balanced Cement Plug 9,050-8,350-ft

Preparation: Make up cementing stand with Blackhawk Cementing head (loaded with 2 each, Halliburton 5 1/2-in hard black wiper balls to be used on this job.

1. TIH with 5 7/8-in drill pipe, Halliburton 5 1/2-in Indicating Ball Catcher (IBC) tool, and cementing diverter.
 - Spaceout IBC to be at ~ 7,050-ft (15-bbbls, 664-ft above expected TOC of 8,211-ft with DP still in cement)
2. RIH to bridge plug at 9,050-ft MD. Tag-up with 5,000-lbs to verify bridge plug location and space-out.
3. Make-up cementing head and cementing stand, cementing line and top drive. Rig up and pressure test cementing equipment and test to 250 psi low and 5,000 psi high for 5 minutes after the pressure has stabilized. Acceptance criteria for the high test is a 5 min interval of no pressure bleed off with a minimum of 5000 psi.
4. Circulate bottoms up with 14.3-ppg SMW SOBMs at >15-bpm with top drive.
5. Close upper TIW on cementing stand and trap 1,000-psi on top drive.
6. Mix and pump 125-bbbls of 15.4-ppg spacer. Drop 1st ball and follow with 160-bbbls of 16.4-ppg class H cement. Drop 2nd wiper ball and follow with 16-bbbls of 15.4-ppg spacer.
 - Halliburton cement recipes and cement/spacer volumes are included in Attachment 4 and are subject to revision after final lab test results are completed.
7. Displace cement at >15-bpm rate using the mud pump via the top drive. Rotate at 25-rpm as cement exits the drill string.
 - Displace using two-pit system without returns into the suction pit for positive verification of displacement volumes.
 - Slow pump rate to 4-bpm as balls approach the IBC. Shear-out pressures of ~3,000-psi can be expected above circulating rate.

Note: Add 9-ft to MD/TVD for Development Driller II

- Under-displace cement balanced plug by 10-bbbls. After top ball indicates arrival at IBC pump an additional 5-bbbls and allow cement to fall to balance.
 - Planned top of cement is at 8,350-ft MD.
8. Rig down cementing equipment. POOH at 3-min/stand to 7,850-ft (~500-ft above top of cement).
 9. Circulate bottoms up utilizing wiper balls to clean drill pipe.
 10. TOOH while WOC.
 11. TIH with 14 3/4-in bit and BHA while WOC. Clean out to ~8,350-ft MD or top of hard cement-after WOC for at least 150% of the time required to build 500-psi compressive strength.
 - Refer to Attachment 3, BHA #2 for detailed Bottom Hole Assembly information.
 12. Close annular preventer. Pressure test primary cement plug to 1,000-psi for 15-minutes. Open annular preventer.
 - Zonal Isolation during Drilling Operations and Well Abandonment and Suspension Section 26.3.3 of the *BP Drilling and Well Operations Practice* states: Weight testing should be up to at least 15K lb. Pressure testing shall be 0.1-psi/ft above the leak off test (LOT) (or predicted fracture gradient at the shoe) or 500-psi whichever is the greater. The pressure test is acceptable where pressure drop is <10% over 15-minutes.
 - BOEM will require the following for testing of the cement plug: The plug must pass the following tests to verify plug integrity. (1) A pipe weight of at least 15,000-pounds on the plug; and (2) A pump pressure of at least 1,000-pounds per square inch. Ensure that the pressure does not drop more than 10-percent in 15-minutes. The District Manager may require you to test other plug(s).
 13. Slack off while pumping slowly at 2-bpm. Weight test plug with 15,000-lbs for 5 minutes. POOH.

1.3. Balanced Cement Plug 8,350-7,600-ft

Preparation: Make up cementing stand with Blackhawk Cementing head (loaded with 2 each, Halliburton 5 1/2-in hard black wiper balls to be used on this job.

1. TIH with 5 7/8-in drill pipe, Halliburton 5 1/2-in Indicating Ball Catcher (IBC) tool, and cementing diverter.
 - Spaceout IBC to be at ~ 6,800-ft (15-bbbls, 664-ft above expected TOC of 7,461-ft with DP still in cement)
2. RIH to top of cement at 8,350-ft MD. Tag-up with 5,000-lbs to verify location and space-out.
3. Make-up cementing head and cementing stand, cementing line and top drive. Rig up and pressure test cementing equipment and test to 250 psi low and 5,000 psi high for 5 minutes after the pressure has stabilized. Acceptance criteria for the high test is a 5 min interval of no pressure bleed off with a minimum of 5000 psi.

Note: Add 9-ft to MD/TVD for Development Driller II

4. Circulate bottoms up with 14.3-ppg SMW SOBMs at >15-bpm with top drive.
5. Close upper TIW on cementing stand and trap 1,000-psi on top drive.
6. Mix and pump 125-bbls of 15.4-ppg spacer. Drop 1st ball and follow with 171-bbls of 16.4-ppg class H cement. Drop 2nd wiper ball and follow with 16-bbls of 15.4-ppg spacer.
 - Halliburton cement recipes and cement/spacer volumes are included in Attachment 4 and are subject to revision after final lab test results are completed.
7. Displace cement at >15-bpm rate using the mud pump via the top drive. Rotate at 25-rpm as cement exits the drill string.
 - Displace using two-pit system without returns into the suction pit for positive verification of displacement volumes.
 - Slow pump rate to 4-bpm as balls approach the IBC. Shear-out pressures of ~3,000-psi can be expected above circulating rate.
 - Under-displace cement balanced plug by 10-bbls. After top ball indicates arrival at IBC pump an additional 5-bbls and allow cement to fall to balance.
 - Planned top of cement is at 7,600-ft MD.
8. Rig down cementing equipment. POOH at 3-min/stand to 7,100-ft (~500-ft above top of cement).
9. Circulate bottoms up utilizing wiper balls to clean drill pipe.
10. TOOHS while WOC.
11. TIH with 14 3/4-in bit and BHA while WOC. Clean out to ~7,600-ft MD or top of hard cement-after WOC for at least 150% of the time required to build 500-psi compressive strength.
 - Refer to Attachment 3, BHA #2 for detailed Bottom Hole Assembly information.
12. Close annular preventer. Pressure test primary cement plug to 1,000-psi for 15-minutes. Open annular preventer.
 - Zonal Isolation during Drilling Operations and Well Abandonment and Suspension Section 26.3.3 of the *BP Drilling and Well Operations Practice* states: Weight testing should be up to at least 15K lb. Pressure testing shall be 0.1-psi/ft above the leak off test (LOT) (or predicted fracture gradient at the shoe) or 500-psi whichever is the greater. The pressure test is acceptable where pressure drop is <10% over 15-minutes.
 - BOEM will require the following for testing of the cement plug: The plug must pass the following tests to verify plug integrity. (1) A pipe weight of at least 15,000-pounds on the plug; and (2) A pump pressure of at least 1,000-pounds per square inch. Ensure that the pressure does not drop more than 10-percent in 15-minutes. The District Manager may require you to test other plug(s).
13. Slack off while pumping slowly at 2-bpm. Weight test plug with 15,000-lbs for 5 minutes.

Note: Add 9-ft to MD/TVD for Development Driller II

1.4. Cut Mud Weight to 11.1-ppg, Cut and Pull 16-in Casing

1. Close upper GX annular preventer with 3,000-psi applied closing pressure.
2. Line cement unit up to pump down standpipe #2.
3. Using the cement unit, pump 70-bbbls of base oil (6.8-ppg) down the DP to approximately 3,090-ft, taking returns up the choke-line. Close choke line failsafe valve.
4. DP shut-in pressure with 14.3-ppg SMW in the choke will be approximately 1,200-psi.
5. With cement unit bleed pressure down in ~200-psi steps to 200-psi and monitor on chart.
6. After bleeding down and leaving 200-psi on the DP, the differential pressure above the annular will be approximately 830-psi

Note: After discussion with Hydril Technical Support, the GX annular with 3,000-psi applied closing pressure can support up to 2,000-psi from the top side.

7. Monitor the pressure for 15-minutes. Monitor riser on trip tank. Monitor pressure reading on HPHT sensor on BOP stack.
8. Bleed DP to zero and record the volume bled back. Open and monitor for flow back to the cement unit for 60 minutes. Monitor riser on trip tank. Monitor pressure reading on HPHT sensor on BOP stack. A successful negative test is defined as a no-flow condition for 60 minutes

Note: Differential below the annular will be approximately 1,200-psi.

9. If flow observed, shut in and record pressures while determining forward plan.
10. After a successful negative test, pressure up on the DP to the initial pressure of approximately 1,200-psi.
11. Line up to route returns through the mud gas separator. Open kill line failsafe and reverse out the base oil.
12. Open annular preventer. Observe well for flow for 15-minutes. Circulate bottoms up at cement plug with 14.3-ppg SMW SOBMs.
13. Displace cased hole with 11.1-ppg SMW SOBMs. TOOH.
 - 16-in casing was run in 11.1-ppg SMW SOBMs.
14. RIH and mechanically cut 16-in casing at 7,439-ft MD with casing cutter assembly. Monitor well for 30-minutes.
 - Refer to Attachment 3, BHA #2 for detailed Bottom Hole Assembly information.
15. RIH with spear/pack-off assembly on 6 5/8-in landing string. Engage spear in top of 16-in casing.
 - Refer to Attachment 3, BHA #7 for detailed Bottom Hole Assembly information.
 - 22-in x 16-in supplemental adapter at 5,227-ft MD.

Note: Add 9-ft to MD/TVD for Development Driller II

- Shearable 6 5/8-in drill pipe will be spaced out across the shear rams.
16. Close annular preventer with minimal operating pressure to prepare for stripping drill pipe. Line up to circulate up choke and kill lines simultaneously.
 17. Pull 16-in hanger above 22-in supplemental adapter (stripping drill pipe through annular). Attempt to circulate bottoms up via choke/kill lines. Monitor returns until clean mud has been circulated around.
 - Per Dril-Quip, the 16-in casing hanger is predicted to pull free of the 22-in adapter with the seal assembly in place at ~20,000-lbs of over-pull.
 - Dril-Quip Service representative to be present on rig floor.
 18. Open annular preventer. Monitor well. POOH and lay down 16-in casing.

1.5. Isolate 16-in Casing Stub and 18-in Liner Top

Preparation: Make up cementing stand with Blackhawk Cementing head (loaded with 2 each, Halliburton 5 1/2-in hard black wiper balls to be used on this job.

1. TIH with 5 7/8-in drill pipe, Halliburton 5 1/2-in Indicating Ball Catcher (IBC) tool, and cementing diverter.
 - Spaceout IBC to be at ~ 6,050-ft (15-bbbls, 664-ft above expected TOC of 6,714-ft with DP still in cement)
2. Cautiously re-enter 16-in casing stub. RIH to cement plug at 7,600-ft MD. Tag-up with 5,000-lbs to verify location and space-out.
3. Make-up cementing head and cementing stand, cementing line and top drive. Rig up and pressure test cementing equipment and test to 250 psi low and 5,000 psi high for 5 minutes after the pressure has stabilized. Acceptance criteria for the high test is a 5 min interval of no pressure bleed off with a minimum of 5000 psi.
4. Circulate bottoms up with 11.1-ppg SMW SOBMs at >15-bpm with top drive.
5. Close annular and pressure test casing to 1,150-psi.
 - BP testing requirement is based on 8,969-ft TVD * 0.1 psi/ft= 897-psi above calculated frac gradient at 18-in shoe.
 - The 11.6-ppg DHE (downhole equivalent) frac gradient vs 11.1-ppg DHEMW which implies $(11.6-11.1) \cdot 0.052 \cdot 8,969\text{-ft} = 233\text{-psi}$. Therefore test pressure = 897 psi + 233-psi=1,130-psi. Equivalent shoe pressure at 18-in shoe is 13.5 ppg or 1.9 ppg over frac gradient.
 - $11.1 + (1,130\text{ psi} / (8,969 \cdot 0.052)) = 13.5\text{ ppg}$
 - If casing test fails due to pressure communication with 18-in shoe, establish an injection rate for cementing of at least 2 bpm.
6. Close upper TIW on cementing stand and trap 1,000-psi on top drive.
7. Mix and pump 150-bbbls of 13.8-ppg spacer. Drop 1st ball and follow with 304-bbbls of 16.4-ppg class H cement. Drop 2nd wiper ball and follow with 10-bbbls of 13.8-ppg spacer.

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- Halliburton cement recipes and cement/spacer volumes are included in Attachment 4 and are subject to revision after final lab test results are completed.
8. Displace cement at >15-bpm rate using the mud pump via the top drive. Rotate at 25-rpm as cement exits the drill string.
 - Displace using two-pit system without returns into the suction pit for positive verification of displacement volumes.
 - Slow pump rate to 4-bpm as balls approach the IBC. Shear-out pressures of ~3,000-psi can be expected above circulating rate.
 - Under-displace cement balanced plug by 10-bbls. After top ball indicates arrival at IBC pump an additional 5-bbls and allow cement to fall to balance.
 - Planned top of cement is at 6,790-ft MD, 650-ft above the 16-in stub.
 9. Rig down cementing equipment. POOH at 3-min/stand to 6,290-ft (~500-ft above top of cement).
 - If injection was established in step #5 above, close annular and squeeze 50-bbls of cement into 18-in x 16-in casing annulus and 50-ft above 22-in x 18-in adapter.
 - Do not exceed 750-psi injection pressure as pipe could be forced through the BOP by the pressure.
 - Hold final squeeze pressure for at least 150% of the time required to build 500-psi compressive strength.
 - 50-bbls of cement will decrease top of cement in the 22-in by ~100-ft which will be made up by increasing the volume on the next jobs by 50-bbls.
 10. Circulate bottoms up utilizing wiper balls to clean drill pipe.
 11. TOOH while WOC.
 12. TIH with 18 1/8-in bit and brush assemblies while WOC. Clean out to 6,790-ft MD or top of hard cement-after WOC for at least 150% of the time required to build 500-psi compressive strength.
 - Refer to Attachment 3, BHA #8 for detailed Bottom Hole Assembly information.
 13. Close annular preventer. Pressure test primary cement plug to 1,100-psi for 15-minutes. Open annular preventer.
 - Zonal Isolation during Drilling Operations and Well Abandonment and Suspension Section 26.3.3 of the *BP Drilling and Well Operations Practice* states: Weight testing should be up to at least 15K lb. Pressure testing shall be 0.1-psi/ft above the leak off test (LOT) (or predicted fracture gradient at the shoe) or 500-psi whichever is the greater. The pressure test is acceptable where pressure drop is <10% over 15-minutes.
 - BOEM will require the following for testing of the cement plug: The plug must pass the following tests to verify plug integrity. (1) A pipe weight of at least 15,000-pounds on the plug; and (2) A pump pressure of at least 1,000-pounds per square inch. Ensure that the pressure does not drop more than 10-percent in 15-minutes. The District Manager may require you to test other plug(s).

Note: Add 9-ft to MD/TVD for Development Driller II

- 1,100 psi based on 8,969-ft TVD * 0.1 psi/ft= 897-psi and frac gradient at 18-in shoe =11.55-ppg DHEMW or (11.55-11.1)*8,969-ft TVD*.052 = 210-psi. Test pressure = 897-psi+210-psi =1,107-psi.
14. Slack off while pumping slowly at 2-bpm. Weight test plug with 15,000-lbs for 5 minutes.
 15. TOOH.

1.6. Isolate 22-in Casing

Preparation: Make up cementing stand with Blackhawk Cementing head (loaded with 2 each, Halliburton, 5 1/2-in hard black wiper balls to be used on this job.

1. TIH with 5 7/8-in drill pipe, Halliburton 5 1/2-in Indicating Ball Catcher (IBC) tool and cementing diverter to 6790-ft MD or cleanout depth per Step 11 in section 1.2.9 above.
 - Spaceout IBC to be at ~ 5,292-ft (15-bbls, 664-ft above expected TOC of 5,956-ft with DP still in cement)
2. Make-up cementing head and cementing stand, cementing line and top drive. Rig up and pressure test cementing equipment and test to 250 psi low and 5,000 psi high for 5 minutes after the pressure has stabilized. Acceptance criteria for the high test is a 5 min interval of no pressure bleed off with a minimum of 5000 psi..
3. Circulate bottoms up with 11.1-ppg SMW SOBMs at >15-bpm with top drive.
4. Close upper TIW on cementing stand and trap 1,000-psi on top drive.
5. Pump 150-bbls of 13.8-ppg spacer. Drop 1st wiper ball followed by 330-bbls of 16.4-ppg class H cement. Drop 2nd wiper ball followed by 10-bbls of 13.8-ppg spacer.
 - Halliburton cement recipes and cement/spacer volumes are included in Attachment 4 and are subject to revision after final lab test results are completed.
6. Displace cement at >15-bpm rate using rig mud pump via the top drive. Rotate 25-rpm as cement exits the drill string.
 - Displace using two-pit system without returns into the suction pit for positive verification of displacement volumes.
 - Slow pump rate to 4-bpm as balls approach the IBC. Shear-out pressures of ~3,000-psi can be expected above circulating rate.
 - Under-displace cement balanced plug by 10-bbls. After top ball indicates arrival at IBC pump an additional 5-bbls and allow cement to fall to balance.
 - Planned top of cement is at 5,991-ft MD (799-ft plug, TOC = 924-ft BML).
7. Rig down cementing equipment. POOH at 3-min/stand to 200-ft above top of cement.
8. Circulate bottoms up utilizing wiper balls to clean drill pipe.
9. TOOH while WOC.

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10. TIH with 18 1/8-in bit and BHA #8 while WOC. Clean out to 5,991-ft MD or top of hard cement-after WOC for at least 150% of the time required to build 500-psi compressive strength.
11. Close annular preventer. Pressure test secondary cement plug to 1,000-psi for 15-minutes. Open annular preventer.
 - Zonal Isolation during Drilling Operations and Well Abandonment and Suspension Section 26.3.3 of the *BP Drilling and Well Operations Practice* states: Weight testing should be up to at least 15K-lb.
 - BOEM will require the following for testing of the cement plug: The plug must pass the following tests to verify plug integrity. (1) A pipe weight of at least 15,000-pounds on the plug; and (2) A pump pressure of at least 1,000-pounds per square inch. Ensure that the pressure does not drop more than 10-percent in 15-minutes. The District Manager may require you to test other plug(s).
12. Slack off while pumping slowly at 2-bpm. Weight test plug with 15,000-lbs for 5 minutes.
13. Close upper GX annular preventer with 3,000-psi applied closing pressure.
14. Line cement unit up to pump down standpipe #2.
15. Using the cement unit, pump 103-bbbls of base oil (6.8-ppg) down the DP to approximately 4,650-ft, taking returns up the choke-line. Close choke line failsafe valve.
16. DP shut-in pressure with 11.1-ppg SMW in the choke line will be approximately 1,030-psi.
17. Confirm system is lined-up to take returns from the standpipe to cement unit where cementer can bleed pressure and chart results.
18. With cement unit bleed pressure down in ~200-psi steps to 200-psi and monitor on chart.
19. After bleeding down and leaving 200-psi on the DP, the differential pressure above the annular will be approximately 830-psi

Note: After discussion with Hydril Technical Support, the GX annular with 3,000-psi applied closing pressure can support up to 2,000-psi from the top side.

20. Monitor the pressure for 15-minutes. Monitor riser on trip tank. Monitor pressure reading on HPHT sensor on BOP stack.
21. Bleed DP to zero and record the volume bled back. Open and monitor for flow back to the cement unit for 60-minutes. Monitor riser on trip tank. Monitor pressure reading on HPHT sensor on BOP stack.

Note 1: Differential below the annular will be approximately 1,030-psi.

Note 2: The pressure inside the BOP will be approximately 360-psi lower than the SW gradient on the outside.

22. If flow observed, shut in and monitor pressure while determining forward plan.

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23. After a successful negative test, pressure up on the DP to the initial pressure of approximately 1,030-psi. A successful negative test is defined as a no-flow condition for 60 minutes as required by step 21 above.
24. Line up to route returns through the mud gas separator. Open kill line failsafe and reverse out the base oil.
25. Open upper annular and monitor wellbore for flow for 15-minutes.
26. Displace well and riser to seawater.
27. TOOH and rack back BHA.

1.7. Set Surface Plug in 22-in Casing

Preparation: Make up cementing stand with Blackhawk Cementing head (loaded with 2 each, Halliburton, 5 1/2-in, hard, black, wiper balls to be used on this job).

1. TIH with 5 7/8-in drill pipe, Halliburton 5 1/2-in Indicating Ball Catcher (IBC) tool and cementing diverter to 5,991-ft MD or cleanout depth as per step 9 in section 1.2.9 above.
 - Space out IBC to be at ~ 4,523-ft (15-bbls, 664-ft above expected ToC of 5,187-ft with DP still in cement)
2. Make-up cementing head and cementing stand, cementing line and top drive. Rig up and pressure test cementing equipment and test to 250 psi low and 5,000 psi high for 5 minutes after the pressure has stabilized. Acceptance criteria for the high test is a 5 min interval of no pressure bleed off with a minimum of 5000 psi.
3. Circulate bottoms up with seawater at >15 bpm with top drive.
4. Close upper TIW on cementing stand and trap 1,000-psi on top drive.
5. Mix and pump 150-bbls of 12.5-ppg spacer and drop 1st ball followed by 327-bbls of 16.4-ppg class H cement. Drop 2nd ball and pump 10-bbls of 12.5-ppg spacer.
 - Halliburton cement recipes and cement/spacer volumes are included in Attachment 4 and are subject to revision after final lab test results are completed.
6. Displace cement at >15-bpm rate with rig pump. Rotate at 25 rpm as cement exits the drill string.
 - Displace using two-pit system without returns into the suction pit for positive verification of displacement volumes.
 - Slow pump rate to 4-bpm as balls approach the IBC. Shear-out pressures of ~3,000-psi can be expected above circulating rate.
 - Under-displace cement balanced plug by 10-bbls. After top ball indicates arrival at IBC pump an additional 5-bbls and allow cement to fall to balance.
 - Planned top of cement is at 5,192-ft MD (799-ft plug, 125-ft BML).
7. Rig down cementing equipment. POOH at 3-min/stand to 100-ft above top of cement.
8. Circulate bottoms up utilizing wiper balls to clean drill pipe.

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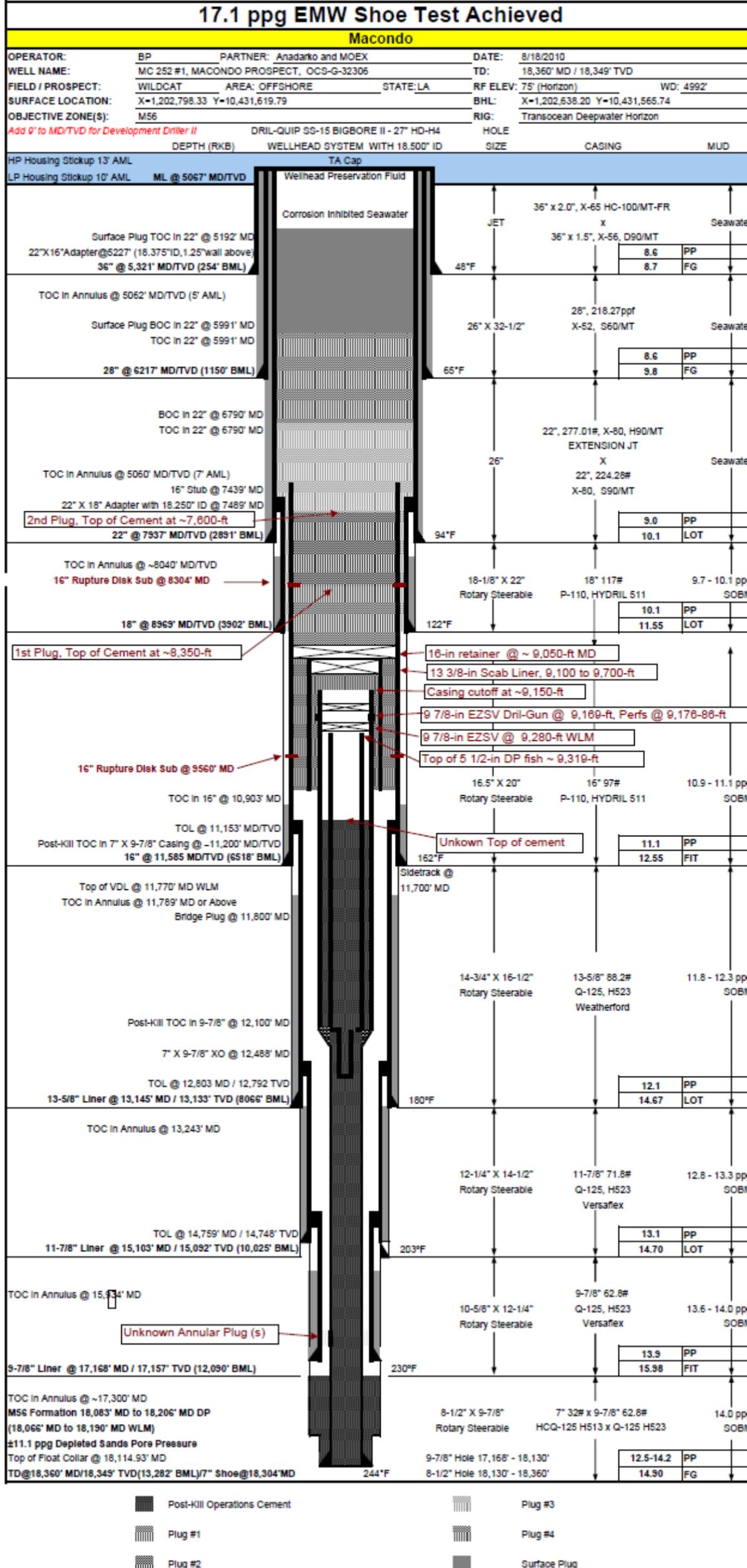
9. TOOH while WOC.
10. TIH with 18 1/8-in bit and BHA while WOC. Clean out to 5,192-ft MD after WOC for at least 150% of the time required to build 500-psi compressive strength.
11. Close annular preventer. Pressure test secondary cement plug to 1,000-psi for 15 minutes. Open annular preventer.
 - Zonal Isolation during Drilling Operations and Well Abandonment and Suspension Section 26.3.3 of the *BP Drilling and Well Operations Practice* states: Weight testing should be up to at least 15K-lb.
 - BOEM will require the following for testing of the cement plug: The plug must pass the following tests to verify plug integrity. (1) A pipe weight of at least 15,000-pounds on the plug; and (2) A pump pressure of at least 1,000-pounds per square inch. Ensure that the pressure does not drop more than 10-percent in 15-minutes. The District Manager may require you to test other plug(s).
12. Slack off while pumping slowly at 2-bpm. Weight test plug with 15,000-lbs for 5 minutes.
 - Top of surface cement plug to be no deeper than 150-ft MD BML.
13. Trip out of hole.

1.8. Pull Riser and Release Rig

1. Release SHD-H4 wellhead connector. Have ROV inject methanol into SHD-H4 wellhead connector as necessary to remove hydrates. Pull riser and BOP stack.
2. Perform an ROV survey of the top and the inner surfaces of the HP housing. Note any scratches, dents, galls or other damage. Record the survey on high resolution video.
3. Install TA cap on wellhead. Have ROV inject MacDermid wellhead preservation fluid into TA cap.
4. Site clearance survey work, seafloor debris recovery and debris mapping work are ongoing. This work is not within the scope of this procedure.
5. Offload equipment. Release rig.

Note: Add 9-ft to MD/TVD for Development Driller II

Attachment 1: Proposed Conditions Schematic



Note: Add 9-ft to MD/TVD for Development Driller II

Attachment 2: BHA #1

 <small>Clean Well™ Technology</small> 				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>PREPARED BY</td><td>M. Fontenot</td><td>REVIEWED BY</td><td></td></tr> <tr><td>CUSTOMER</td><td>BP</td><td>DATE REVIEWED</td><td></td></tr> <tr><td>WELL NAME</td><td>Macondo Prospect</td><td>SALES CONTACT</td><td>S. Squyres</td></tr> <tr><td>WELL NUMBER</td><td># 1</td><td>ENGINEER</td><td></td></tr> <tr><td>Lease/Parish/County</td><td>OCS-G 32305</td><td>JOB TYPE</td><td>Clean out to set P&A Packer</td></tr> <tr><td>REVISION</td><td>0</td><td>MAX DEVIATION</td><td></td></tr> <tr><td>REVISION DATE</td><td></td><td>RIG</td><td>Transocean DD2</td></tr> <tr><td>JOB NUMBER</td><td>TBD</td><td>APPROX. \$HIP DATE</td><td>TBD</td></tr> </table>		PREPARED BY	M. Fontenot	REVIEWED BY		CUSTOMER	BP	DATE REVIEWED		WELL NAME	Macondo Prospect	SALES CONTACT	S. Squyres	WELL NUMBER	# 1	ENGINEER		Lease/Parish/County	OCS-G 32305	JOB TYPE	Clean out to set P&A Packer	REVISION	0	MAX DEVIATION		REVISION DATE		RIG	Transocean DD2	JOB NUMBER	TBD	APPROX. \$HIP DATE	TBD
PREPARED BY	M. Fontenot	REVIEWED BY																																			
CUSTOMER	BP	DATE REVIEWED																																			
WELL NAME	Macondo Prospect	SALES CONTACT	S. Squyres																																		
WELL NUMBER	# 1	ENGINEER																																			
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REVISION	0	MAX DEVIATION																																			
REVISION DATE		RIG	Transocean DD2																																		
JOB NUMBER	TBD	APPROX. \$HIP DATE	TBD																																		
ID Restriction (in.):	ID Restriction Location and Description:	24 HOUR CONTACT NUMBER:		SHOP ADDRESS		6127 Hwy 90 East Broussard, La. 70518																															
Need to Confirm		PROJECT NOTES:	Run 5 Clean Out to set P&A Packer																																		
Clean Well™ Technology WELLSBORE DIAGRAM	DESCRIPTION	Max Extended OD	Max Hard OD	Min ID	Approx. Tool Length	Approx. Depth Top of Tool	Approx. Depth Bottom of Tool																														
Casing 16" 97.0# P-110	5 7/8", 24.2# S-135 Drill Pipe Tube ID: 5.045" XTM-57 Conn (box up)	NA	7.000	5.875	12401.00	0.00	12401.00																														
Provided by Rig	Crossover XTN 57 box x 4 1/2" IF pin	NA	6.625	3.125	3.00	12401.00	12404.00																														
Provided by Rig	6 3/4" 100 ppf Drill Collars w/ 4 1/2" IF (box up)	NA	6.750	2.813	368.00	12404.00	12772.00																														
Provided by Rig	10' Pony Collar w/4 1/2" IF (box up)	NA	6.750	2.500	10.00	12772.00	12782.00																														
Provided by Rig	Crossover 4 1/2" IF box x 6 5/8" Reg pin	NA	6.750	2.500	10.00	12782.00	12782.00																														
Assembly 1 Provided by WES 31'	16" Scraper Tool™ (CSCP) 6 5/8" Reg	20.750	13.500	3.500	6.00	12792.00	12798.00																														
Provided by WES	Crossover 6 5/8" box x 4 1/2" Reg box - Bored for Float	NA	6.625	2.250	3.00	12798.00	12801.00																														
Provided by WES	14 5/8" -Cement Mill w/ 4 1/2" Reg (Pin Up)	NA	14.625	NA	2.00	12801.00	12803.00																														
WES will provide all items illustrated in RED		12,803' PBTD		18,360' MD / 18,349' TVD																																	

Note: Add 9-ft to MD/TVD for Development Driller II

Attachment 2: BHA #2

ITEM NO.	QTY.	DESCRIPTION	MAX OD IN.	MIN ID IN.	CONN		LENGTH FT.	ACCUM LENGTH FT.	TENSILE STRENGTH lbs	Vendor
					DOWN	UP				
1	1	11 3/4" OD TS MS Cutter f/ 16" 97#, MM Knives, w/ stop	11.75	nozzle	6 5/8" Reg Box	6 5/8" Reg Box	7.0	7.00	1867K	Baker
2	1	Drift OD, SOD Solid Blade Stabilizer	14.75	3.50	6 5/8" Reg Pin	6 5/8" Reg Box	6.0	13.00	1867K	Baker
3	1	Float Sub	7.75	float	6 5/8" Reg Pin	6 5/8" Reg Box	3.0	16.00	1867K	Baker
4	2	8" Super DownHole String Magnets	8	3.50	6 5/8" Reg Pin	6 5/8" Reg Box	20.0	36.00	1711K	Baker
5	1	X-Over	8	3.50	6 5/8" Reg Pin	5 7/8" XTM 57 Box	3.0	39.00	1138K	Baker
6		Drill pipe	7	4.25	5 7/8" XTM 57 Pin	5 7/8" XTM 57 Box	2200.0	2239.00	1138K	Rig
7	1	X-Over	8.5	3.50	5 7/8" XTM 57 Pin	6 5/8" Reg Box	3.0	2242.00	1138K	Baker
8	1	Marine Swivel	18.55	3.50	6 5/8" Reg Pin	6 5/8" Reg Box	5.0	2247.00	1867K	Baker
9	1	NOV Lubricated Bumper Jar (18" Stroke)	7.75	3.5	6 5/8" Reg Pin	6 5/8" Reg Box	12.0	2259.00	1270K	Baker
10	1	NOV Fishing Jar	7.75	3.0625	6 5/8" Reg Pin	6 5/8" Reg Box	12.0	2271.00	1580K	Baker
11	6	Drill Collars	8	2.875	6 5/8" Reg Pin	6 5/8" Reg Box	180.0	2451.00	1867K	Rig
12	1	NOV Intensifier Jar	7.75	3.0625	6 5/8" Reg Pin	6 5/8" Reg Box	12.0	2463.00	1600K	Baker
13	1	Pump Out Circulation Sub, Ball Drop with 3.25" Ball	8	3.0625	6 5/8" Reg Pin	6 5/8" Reg Box	4.0	2467.00	1867K	Baker
14	1	X-Over	8	3.50	6 5/8" Reg Pin	5 7/8" XTM 57 Box	3.0	2470.00	1138K	Baker
		5 7/8" XTM 57 Drillpipe - RIG Supplied- New	7	4.25	5 7/8" XTM 57 Pin	5 7/8" XTM 57 Box	5500.0	7970.00	1138K	Rig
							TOTAL	7970.00		

NOTE: The BHA assumes 5 7/8" XTM 57 above and below swivel
 measurements for reference only, actuals will be taken on rig
 6 5/8" Reg Pup joint(s) may be needed to space out cutter in the middle of the casing it to be cut - Verify these are on rig
 ***Do not pump while RIH, or cutter will activate. Fill pipe with fill up line only, do not screw in with Top Drive
 ***Pump out Sub will require 3.25" OD ball.
 NOTE: 9 7/8" Hanger and casing down to below 16" cut depth has been removed
 NOTE: 16" Hanger Seals will be pulled with Hanger, per Drill-Quip
 NOTE: Must have Drillpipe across stack during cut - Verify.
 NOTE: 16" Supplemental Adapter at 5227ft, in 22" Extension joint

Note: Add 9-ft to MD/TVD for Development Driller II



Attachment 2: BHA #3



BHA #8 - Spear, Circulate, Freepoint, Jar and Pull 16" 97# - Itco Spear, Packoff, Jars

CUSTOMER:	BP - Macondo
FIELD:	Mississippi Canyon
LEASE:	OCS-G 32306
WELL #:	#1
BP Rep:	L. Saucier / D. Beynon / M. Heironimus / J. Pusch
BOT Rep:	James A. Sonnier

(NOTE: 9 7/8" Hanger and casing down to below 16" cut depth has been removed)
NOTE: 16" Hanger Seal can be pulled with the 16" Hanger, per Dril-Quip.

16" 97#: 14.85" ID, Drift: 14.75", wt .575", P-110, Hydril 511

ITEM NO.	QTY.	DESCRIPTION	MAX OD	MIN ID	CONN		LENGTH	ACCUM LENGTH	TENSILE STRENGTH	Vendor
					DOWN	UP				
			IN.	IN.			FT.	FT.	lbs	
1	1	Spear Packoff	14.85	3.5	6 5/8" Reg Pin	6 5/8" Reg Box	4	4	1867K	Baker
2	1	ITCO Spear	11.75	3.50	6 5/8" Reg Pin	6 5/8" Reg Box	5.0	9.00	1867K	Baker
3	1	Spear Extension (to keep spear out of hanger internal profiles)	7.75	3.50	6 5/8" Reg Pin	6 5/8" Reg Box	5.0	14.00	1867K	Baker
4	1	Spear Stop Sub	16.5	3.50	6 5/8" Reg Pin	6 5/8" Reg Box	3.0	17.00	1867K	Baker
6	1	Float Sub	7.75	float	6 5/8" Reg Pin	6 5/8" Reg Box	3.0	20.00	1867K	Baker
7	1	NOV Lubricated Bumper Jar (18" Stroke)	7.75	3.5	6 5/8" Reg Pin	6 5/8" Reg Box	12.0	32.00	1270K	Baker
8	1	NOV Fishing Jar	7.75	3.0625	6 5/8" Reg Pin	6 5/8" Reg Box	12.0	44.00	1580K	Baker
9	6	Drill Collars	8.25	2.875	6 5/8" Reg Pin	6 5/8" Reg Box	180.0	224.00	1867K	Rig
10	1	NOV Intensifier Jar	7.75	3.0625	6 5/8" Reg Pin	6 5/8" Reg Box	12.0	236.00	1600K	Baker
11	1	X-Over	8.50	3.50	6 5/8" Reg Pin	6 5/8" FH Box	3.0	239.00	1867K	Baker
12		6 5/8" FH Drillpipe - RIG Supplied- New	8.50	4.0	6 5/8" FH Pin	6 5/8" FH Box	5500.0	5739.00	2000K	Rig
							TOTAL		5739.00	

NOTE: The BHA assumes 6 5/8" FH above and below swivel
measurements for reference only, actuals will be taken on rig

Note: Add 9-ft to MD/TVD for Development Driller II

Attachment 2: BHA #8

ID Restriction (In.):		ID Restriction Location and Description:	36 HOUR CONTACT NUMBER: 337-338-8911		SHOP ADDRESS: 9127 Hwy 90 East Broussard, LA 70015				
Need to Confirm		18.60" Wellhead ID	PROJECT NOTES: Run 4 Clean Out to set PSA Packer						
Clean Well™ Technology		WELLBORE DIAGRAM	DESCRIPTION	Max Extended OD	Max Hard OD	Min ID	Approx. Tool Length	Approx. Depth Top of Tool	Approx. Depth Bottom of Tool
21" Rise 6-4.017" ID 19.75" WD - 4.992" ML 5.067"		5 7/8", 24.2# 8-135 Drill Pipe Tube ID: 5.045" XTM-57 Conn (box up)		NA	7.000	4.250	4973.00	0.00	4973.00
BOB AREA 5.017"-5.067" Wellhead ID: 18.60"		5 7/8", 24.2# 8-135 Drill Pipe Tube ID: 5.045" XTM-57 Conn (box up)		NA	7.000	4.250	93.00	4973.00	5066.00
		5 7/8", 24.2# 8-135 Drill Pipe Tube ID: 5.045" XTM-57 Conn (box up)		NA	7.000	4.250	1871.00	5066.00	6937.00
Provided by Rig		Crossover XTM 57 box X 6 5/8" Reg pin		NA	7.750	3.125	4.00	6937.00	6941.00
		8 3/4" 160.4 ppf Drill Collars 6 5/8" Reg (box up)		NA	8.750	2.813	360.00	6941.00	7301.00
Assembly 2 Provided by WES -21		Pony Collar 6 5/8" Reg box up		NA	7.750	2.813	10.00	7301.00	7311.00
		Crossover 6 5/8" Reg box x XTM 57 pin		NA	7.750	3.000	4.00	7311.00	7315.00
		Riser Bristle Tech™ (CWRBT 102) XTM		20.750	18.250	3.000	8.00	7315.00	7323.00
Casing 22" 224.28# X-80		5 7/8", 24.2# 8-135 Drill Pipe Tube ID: 5.045" XTM-57 Conn (box up)		NA	7.000	4.250	93.00	7323.00	7416.00
Assembly 1 Provided by WES 25'		5 7/8" Pup-joint w/ XTM 57 box up		NA	7.000	4.250	10.00	7416.00	7426.00
		Riser Bristle Tech™ (CWRBT 102) XTM 5		20.750	18.250	3.000	8.00	7426.00	7434.00
		Crossover XTM 57 box x 6 5/8" Reg box - Bored for Float Provided by WES Non-Ported Float		NA	7.750	3.000	3.00	7434.00	7437.00
		18.250-Bit / 6 5/8" Reg (Pin Up) Provided by bp		NA	18.250	NA	2.00	7437.00	7439.00
WES will provide all items illustrated in RED				7,439' PBTD (Top of 18" Stub)		18,369' MD / 18,368' TVD			

Note: Add 9-ft to MD/TVD for Development Driller II

Attachment 3: Detailed Cementing Program

HALLIBURTON

**bp America Prod Co-sorac/gom Ebiz
PO Box 22024 - Do Not Mail
Tulsa, Oklahoma 74121-2024**

Macondo Prospect 1
MISSISSIPPI CANYON Bk:252
United States of America

Macondo P&A BoD

Prepared for: Macondo Relief Well Team / P&A Team
Version: 13

Submitted by:
Chris Daigle
Halliburton
10200 Bellaire Blvd
Houston, Texas 77072-5299
1.337.849.5861

HALLIBURTON



HALLIBURTON _____

Job Information

Note: This proposal is a preliminary design and is subject to change. This design is intended for job preparedness. Lab testing and engineering software have not been fully completed and will affect the final outcomes.

Note: Add 9-ft to MD/TVD for Development Driller II

HALLIBURTON**Plug 5 Balanced Plug on 16" Retainer at 9100 to 8350 ft****Detailed Pumping Schedule**

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	Tuned Spacer III	15.4	6.0	125 bbl
2	Cement	Premium Cement	16.4	5.0	160 bbl
3	Spacer	Tuned Spacer III	15.4	6.0	16 bbl
4	Mud	Displacement Fluid	14.3	8.0	xx bbl

****Note: Cement volume includes an additional 50 ft of volume to account for contamination ****

Job Procedure

1. Perform bit & scraper run before setting EZSV-B
2. RIH with EZSV-B to 9050 ft
3. Circulate 40 bbls mud before setting retainer
4. Set EZSV-B at 9050 ft
5. RIH with 5 7/8" drill pipe with 5 1/2" IBC to 9050 ft
 - a. Space out IBC 15 bbls above TOC (drill pipe in)
6. RU cement head with swivel & two 5 1/2" hard rubber drill pipe wiper balls
7. RU cement lines and pressure test
8. Circulate bottoms up
9. Close upper TIW valve & trap 1000 psi with Top Drive
10. Pump 125 bbls 15.4 ppg Tuned Spacer III
11. Drop 1st wiper ball
12. Mix and pump 160 bbls Premium cement
13. Drop 2nd wiper ball
14. Pump 16 bbls 15.4 ppg Tuned Spacer III
15. Displace 14.3 ppg mud
 - a. Slow down to 4 bpm as wiper balls approach IBC
 - b. Rotate while cement exits workstring
12. RD cement head & lines
13. Pull out of cement at 3 minutes per stand
14. POOH at least 500 ft above cement
15. Circulate using foam wiper balls to clean dp

Note: Add 9-ft to MD/TVD for Development Driller II

HALLIBURTON**Plug 4 16-in Casing from 8350 ft to 7600 ft****Detailed Pumping Schedule**

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	Tuned Spacer III	15.4	6.0	125 bbl
2	Cement	Premium Cement	16.4	5.0	171 bbl
3	Spacer	Tuned Spacer III	15.4	6.0	16 bbl
4	Mud	Displacement Fluid	14.3	8.0	xx bbl

Note: Cement volume includes 50ft of volume to account for contamination *

Job Procedure

1. RIH with 5 7/8" workstring with 5 1/2" IBC and diverter sub to 8350 ft
 - a. Space out IBC 15 bbl above TOC (drill pipe in).
2. RU cementing head with swivel & two 5 1/2" rubber wiper balls
3. RU cement lines and pressure test
4. Circulate bottoms up
5. Close upper TIW valve & trap 1000 psi with Top Drive
6. Pump 125 bbls 15.4 ppg Tuned Spacer III
7. Drop 1st wiper ball
8. Mix and pump 171 bbls Premium cement
9. Drop 2nd wiper ball
10. Pump 16 bbls 15.4 ppg Tuned Spacer III
11. Displace with 14.3 ppg mud
 - a. Slow down to 4 bpm as wiper balls approach IBC
 - b. Rotate while cement exits workstring
12. RD cement head & lines
13. Pull out of cement at 3 minutes per stand.
14. POOH at least 500 ft above cement
15. Circulate using foam wiper balls to clean dp

Note: Add 9-ft to MD/TVD for Development Driller II

HALLIBURTON***Plug 3 Isolate 16-in Casing Stub and 18-in Liner Top*****Detailed Pumping Schedule**

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	Tuned Spacer III	13.8	6.0	150 bbl
2	Cement	Premium Cement	16.4	5.0	304 bbl
3	Spacer	Tuned Spacer III	13.8	6.0	10 bbl
4	Mud	Displacement Fluid	11.1	8.0	xx bbl

Note: Cement volume includes 50ft of volume to account for contamination *

Job Procedure

1. After 16" casing is cut & pulled TIH with 5 7/8" workstring with 5 1/2" IBC and diverter sub to 7600 ft
 - a. Space out IBC 15 bbl above TOC (drill pipe in).
2. RIH to cement plug at 7600 ft. Tag-up with 5000 lbs down
3. Establish injection rates.
4. RU cementing head with swivel & two 5 1/2" rubber wiper balls
5. RU cement lines and pressure test
6. Circulate bottoms up
7. Close upper TIW valve & trap 1000 psi with Top Drive
8. Pump 150 bbls 13.8 ppg Tuned Spacer III
9. Drop 1st wiper ball
10. Mix and pump 304 bbls Premium cement
11. Drop 2nd wiper ball
12. Pump 10 bbls 13.8 ppg Tuned Spacer III
13. Displace with 11.1 ppg mud
 - a. Slow down to 4 bpm as wiper balls approach IBC
 - b. Rotate while cement exits workstring
14. RD cement head & lines
15. Pull out of cement at 3 minutes per stand.
16. POOH at least 500 ft above cement
17. Squeeze 50 bbls cement into annulus
18. Circulate using foam wiper balls to clean dp

Note: Add 9-ft to MD/TVD for Development Driller II

HALLIBURTON**Plug 4 Surface Plug****Detailed Pumping Schedule**

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	Tuned Spacer III	13.8	6.0	150 bbl
2	Cement	Premium Cement	16.4 to 17.0	5.0	330 bbl
3	Spacer	Tuned Spacer III	13.8	6.0	10 bbl
4	Mud	Displacement Fluid	11.1	8.0	xx bbl

Note: Cement volume includes 50ft of volume to account for contamination

Job Procedure

1. TIH with 5 7/8" workstring with 5 1/2" IBC and diverter sub to 6790 ft
 - a. Space out IBC 15 bbl above TOC (drill pipe in).
2. RU cementing head with swivel & two 5 1/2" rubber wiper balls
3. RU cement lines and pressure test
4. Circulate bottoms up
5. Close upper TIW valve & trap 1000 psi with Top Drive
6. Pump 150 bbls 13.8 ppg Tuned Spacer III
7. Drop 1st wiper ball
8. Mix and pump 330 bbls (16.4 to 17.0) ppg Premium cement
9. Drop 2nd wiper ball
10. Pump 10 bbls 13.8 ppg Tuned Spacer III
11. Displace with 11.1 ppg mud
 - a. Slow down to 4 bpm as wiper balls approach IBC
 - b. Rotate while cement exits workstring
12. RD cement head & lines
13. Pull out of cement at 3 minutes per stand.
14. POOH at least 500 ft above cement
15. Circulate using foam wiper balls to clean dp

Note: Add 9-ft to MD/TVD for Development Driller II

HALLIBURTON**Plug 5 Surface Plug****Detailed Pumping Schedule**

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Estimated Avg Rate bbl/min	Downhole Volume
1	Spacer	Tuned Spacer III	12.5	6.0	150 bbl
2	Cement	Premium Cement	16.4 to 17.0	5.0	327 bbl
3	Spacer	Tuned Spacer III	12.5	6.0	10 bbl
4	Sea Water	Sea Water	8.54	8.0	xx bbl

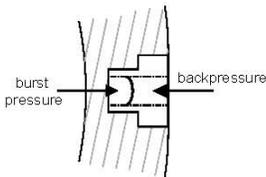
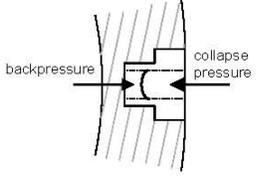
****Note: Cement volume includes 50ft of volume to account for contamination****

Job Procedure

1. TIH with 5 7/8" workstring with 5 1/2" IBC and diverter sub to 5990 ft
 - a. Space out IBC 15 bbl above TOC (drill pipe in).
2. RU cementing head with swivel & two 5 1/2" rubber wiper balls
3. RU cement lines and pressure test
4. Circulate bottoms up
5. Close upper TIW valve & trap 1000 psi with Top Drive
6. Pump 150 bbls 12.5 ppg Tuned Spacer III
7. Drop 1st wiper ball
8. Mix & pump 327 bbls (16.4 to 17.0) ppg Premium Cement
9. Drop 2nd wiper ball
10. Pump 10 bbls 12.5 ppg Tuned Spacer III
11. Displace with sea water
 - a. Slow down to 4 bpm as wiper balls approach IBC
 - b. Rotate while cement exits workstring
12. RD cement head & lines
13. Pull out of cement at 3 minutes per stand.
14. POOH at least 100 ft above cement
15. Circulate using foam wiper balls to clean dp

Note: Add 9-ft to MD/TVD for Development Driller II

Attachment 4: Burst/Collapse Disc Sub Specifications

Rupture Disk Sub Worksheet – Statement of Requirements				
Business Unit		Well Charge		Date
Purchase Number		Item Number		Material Number
Description	16" Burst & Collapse subs 3 subs plus 1 back-up for a total of 4 subs		Drawing Number	
Casing String Designation <i>Description of string that will include burst disk sub</i>	<i>OD, Weight / Wall, Grade, Connection, Special Drift Requirements</i> 16" 97.0 (0.575" wall) P-110 Hydril 511			
	<i>Burst (MIYP) Rating</i> 6,920 psi		<i>Collapse Rating</i> 2,340 psi	
Burst Disk Description <i>Typical tolerance is ± 5%</i> <i>Rating is at 150°F unless noted otherwise</i> <i>Disks should be installed 2 per sub, 180° apart</i>			<i>Burst Disks per Sub</i> 2 at 180°; HES AO6239-3 <i>Burst Pressure (e.g. 5,000 psi ± 5%)</i> 7,500 psi ± 5% at 200°F <i>Minimum Backpressure</i> 5,250 psi	
Collapse Disk Description <i>Typical tolerance is ± 5%</i> <i>Rating is at 150°F unless noted otherwise</i> <i>Disks should be installed 2 per sub, 180° apart</i>			<i>Collapse Disks per Sub</i> 2 at 180°; new disk item <i>Collapse Pressure (e.g. 2,000 psi ± 5%)</i> 1,600 psi ± 5% at 150°F <i>Minimum Backpressure</i> 7,000 psi	
O-Ring Material <i>Verify compatibility with mud</i> http://ut.bpweb.bp.com/elastomers/	<i>O-Ring Material (e.g. Viton or Buna-N)</i> Viton			
Sub Geometry <i>Vendor to supply drawing</i> <i>All disks shall be installed with thread lock compound</i>	<input type="checkbox"/> Pin x Pin <input checked="" type="checkbox"/> Pin x Box <input type="checkbox"/> Box x Box		<i>Additional Requirements (e.g. minimum tong area, number of recuts, minimum length requirements)</i>	
Pressure Test Parameters <i>Hunting's tester allows for different burst disk and collapse disk test values</i>	<i>Test Pressure – Specify the minimum of:</i> - Casing test pressure - 85% of nominal rupture pressure for burst disks - 90% of minimum backpressure for collapse disks 6,300 psi		<i>Hold Time (e.g. 10 minutes)</i> 10 minutes	
Number of Additional Disks <i>For reworking field returns</i>	<i>Total Additional Burst Disks</i> 2 additional disks		<i>Total Additional Collapse Disks</i> 2 additional disks	
Special Marking or Identification Requirements				

Note: Add 9-ft to MD/TVD for Development Driller II

Attachment 5: Evidence Handling and Chain of Custody Protocols for Casing Recovery

References

- a) USCG-BOEMRE Joint Investigation Protocols for Physical Collection of Evidence
- b) Procedure for permanent abandonment, 2200-T2-DO-PR-4734.

Purpose

Per the subpoenas issued by the USCG-BOEMRE Joint Investigation, all equipment and materials recovered from the MC252 #1 well and the MODU DEEPWATER HORIZON shall be considered evidence. Recognizing this fact, the purpose of this document is to further amplify the procedures in references (a) and (b).

Recovery and Preservation of Evidence

Recognizing that the procedures for the recovery of evidence are developed by ICP Houston, a member of the USCG-BOEMRE Joint Investigation Team (JIT member) shall be embedded with the planning groups at ICP Houston to ensure that recovery procedures ensure the integrity and preservation of evidence in as much as possible.

The U.S. Navy, Supervisor of Salvage & Diving (SUPSALV) has been designated by the Department of Justice to provide technical oversight on evidence preservation procedures on behalf of the U.S. Government.

During evidence recovery planning, the ICP planning group will ensure that the JIT is aware of any plans to change the condition of evidence during recovery (i.e. cutting, cleaning, decontamination and disassembly of equipment before shipping). Any plans to change the condition of evidence must be brought to the attention of and approved by the JIT member assigned to the ICP Houston planning group.

Identification and Documentation of Evidence

Per the subpoenas issued by the JIT, all equipment and materials recovered from the MC252 #1 well and the MODU DEEPWATER HORIZON shall be considered evidence.

The FBI Evidence Recovery Team (ERT) has been designated by the JIT to document evidence on behalf of the U.S. Government, including the JIT. As such, ERT procedures will be followed for documentation of evidence.

The ERT will begin documentation as soon as the procedure for recovery of evidence has commenced. As such, members of the JIT and the ERT must be on scene during recovery efforts. The ERT will rely on ROV footage to document sub-sea efforts. As such, ERT members must be in a position to monitor recovery efforts via ROV. ROV footage will be

Note: Add 9-ft to MD/TVD for Development Driller II

recorded and, upon completion of operations, ROV footage will be turned over to the JIT/ERT as evidence.

Once evidence has been recovered and is at the water's surface, the ERT must be on scene to witness and document the evidence that has been raised.

Custody and Tagging of Evidence

The JIT will take custody of the evidence from the time it is removed from the well, and will maintain custody through the lifting and transport process. As such, a member of the JIT must be on scene during recovery efforts.

As part of the ERT documentation process, the ERT will tag the evidence and document transfer of evidence from BP to the JIT on a Chain of Custody form (attached).

Delivery and Storage

Unless otherwise agreed to, BP will arrange for safe transport of evidence from the recovery site to the evidence storage site at USCG Base Support Unit, which is on the NASA Michoud facility in New Orleans, LA.

During transport of evidence, the JIT and BP will ensure that precautions are taken to ensure that evidence is secure and safe for transport and storage. Cradles for lift, transport and storage shall be used as much as possible to preserve the evidence. Furthermore, BP shall ensure that the JIT is aware of such specifications and requirements to facilitate movement of evidence on land.

During the delivery of evidence from the recovery site to shore, members of the JIT and/or the FBI or other federal agents must be onboard the transport vessel or on a supporting escort vessel to maintain custody and control of the evidence.

The USCG will be responsible for arranging and providing a safety zone around the transporting vessel if required by the JIT.

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Primary Points of Contact for Evidence Matters

Phase	JIT POC
Recovery	Michael Saucier michael.saucier@boemre.gov 985-856-5703
Preservation	Dave Williams David_williams@doioig.gov 504-593-1800
Identification & Documentation	Howard Stewart howard.stewart@usdoj.gov 504-593-1800
Tagging & Custody	Howard Stewart howard.stewart@usdoj.gov 504-593-1800
Delivery & Storage	CAPT Suzanne Englebert, USCG Suzanne.e.engagebert@uscg.mil 202-604-1230

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19. CHAIN OF CUSTODY (CONT'D)					
Items	Date/Time	Released By		Received By	Purpose
		Name	Organization	Name	
		Signature	Signature	Signature	
		Organization	Organization	Organization	
		Name	Name	Name	
		Signature	Signature	Signature	
		Organization	Organization	Organization	
		Name	Name	Name	
		Signature	Signature	Signature	
		Organization	Organization	Organization	
		Name	Name	Name	
		Signature	Signature	Signature	
		Organization	Organization	Organization	
		Name	Name	Name	
		Signature	Signature	Signature	
		Organization	Organization	Organization	

20. FINAL DISPOSITION		
Final Disposition Authority		
_____	_____	_____
Name (Printed)	Grade/Rank	Organization
Persons Witnessing Destruction (Print)	Organization	Signature and Date
1 _____	_____	_____
2 _____	_____	_____
<p>NOTE: You MUST indicate in Disposal Action Column (on front) by two number or letter code, persons receiving or witnessing action and the type of action</p> <p>CODES: (R) Person receiving (W) Witness to Action (A) Turned over to another Agency</p> <p> (1) Returned to Individual Owner (C) Returned to Command (S) Turned into Supply</p> <p> (D) Destroyed (M) Another method (explain in Remarks section)</p> <p>EXAMPLE: Code R1 = person receiving the item was the owner;</p> <p> WD = person witnessed the destruction of the item;</p> <p> RC = person receiving item returned it to the command</p>		
21. REMARKS		

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Attachment 6: DD2 Drill Pipe Sheet

Drill Pipe & Collars Reference Chart															
	String	Grade	Body ID	Range	Lengths		Weights		Body Tensile Premium	Type	Connection		Torsional Strength	Make Up Torque	
					Ave Jt	Ave Std	Nominal	Adjusted			OD	ID		Min	Max
Drill String	5 7/8 Drill Pipe 0.5 wt	S-135T	4 7/8	R2	32.22ft	129.91ft	28.67#	34.01#	894,900	XTM57	7	4 1/4	84,000	33,800	50,400
	5 7/8 HVDCP	Std HW	4	R2	30.85ft	123.33ft	49.38#	64.89#	827,843	XTM57	7	4		48,900	58,700
Landing Strings	6 5/8 FH 0.813 wt	S-135	5	R3	42.18ft	126.56ft	50.39#	56.63#	1,557,600	FH	8 1/2	4	119,400	55,800	55,800
	6 5/8 XTM 0.415 wt	S-135T	5.795	R3	42.11ft	126.34ft	27.50#	34.23#	862,700	XTM69	8 1/2	5 1/4	100,600	50,300	60,400
Drill Collars	9 1/2	-	3	R2	30.92ft	123.70ft	216.71#	-	-	7 5/8 Reg	9 1/2	3		88,500	97,500
	8 1/4	-	2.778	R2	30.95ft	123.80ft	159.49#	-	-	6 5/8 Reg	8 1/4	2.778		52,500	58,000

Casing Reference Chart														
Casing Size	Grade	Nom. ID	Drift Ø	Casing Properties				Type	Connection	ID	Opt MU Torque ft lbs	Volumes		
				Weight	Burst	Collapse	Tensile Strength					Capacity	Metal Disp	Closed-End
20 in	X56	18.376"	-	166.4#	3990 psi	2510 psi	2,741,000	XLW	20	18.376	-	0.3280	0.0606	0.3886
20 in	X56	18.73"	-	131.3#	3060 psi	1500 psi	2,125,000	XLW	20	18.730	-	0.3408	0.0478	0.3886
16 in	N80	15.01"	14.822	84#	4330 psi	1480 psi	1,929,000	HYDRIL 521	16.257	14.935	43,000	0.2188	0.0306	0.2494
13 5/8 in	HCO125	12.375"	12.250	88.2#	10,030 psi	4,800 psi	2,393,000	SLIJ II	13.875	12.317	34,400	0.1488	0.0321	0.1809
10 3/4 in	C110	9.45"	9.294	71.1#	11,640 psi	9,300 psi	1,778,000	SLIJ II	11.045	9.370	30,700	0.0868	0.0259	0.1127
9 7/8 in	C110	8.625"	8.500	62.8#	12,180 psi	10,290 psi	1,551,000	SLIJ II	10.151	8.559	28,900	0.0723	0.0229	0.0952
6 1/2 in	13Cr-85	4.67"	4.545	23#	11,220 psi	11,810 psi	564,000	VAM TOP HC	6.156	4.607	10,850	0.0212	0.0084	0.0296

Annular Capacities												Pipe Volumes							
String	Riser	20" hole	20"166#	20"131#	16 1/2" hole	16"	Inside					9 7/8"	Volumes						
							14 1/2" hole	13 5/8"	12 1/2" hole	10 1/2"	Capacity		Metal Disp	MD 6 stds	Closed-End	CE 6 stds	Drift Ø		
Drill String	5 7/8 Drill Pipe	0.3284	0.3537	0.2832	0.3059	0.2296	0.1840	0.1694	0.1139	0.1109	0.0519	0.0374	5 7/8 Drill pipe	0.0226	0.0124	6.0	0.0350	22.5	4.1/8
	5 7/8 HVDCP	0.3242	0.3495	0.2890	0.3017	0.2254	0.1798	0.1652	0.1097	0.1067	0.0477	0.0332	5 7/8 HVDCP	0.0166	0.0236	14.5	0.0391	24.1	3 7/8
Landing Strings	6 5/8 Casing LS	0.3190	-	-	-	-	-	-	-	-	-	-	6 5/8 FH	0.0238	0.0206	13.0	0.0444	28.1	3 7/8
	6 5/8 Completion LS	0.3183	-	-	-	-	-	-	-	-	-	-	6 5/8 XTM	0.0326	0.0125	7.9	0.0451	28.5	5 5/8
Drill Collars	9 1/2	0.2757	0.3010	0.2405	0.2532	0.1769	-	0.1107	-	-	-	-	9 1/2 DC	0.0097	0.0789	-	0.0876	-	2 7/8
	8 1/4	0.2973	0.3225	0.2620	0.2747	0.1984	-	0.1382	-	0.0797	-	-	8 1/4 DC	0.0080	0.0581	-	0.0961	-	2 1/4

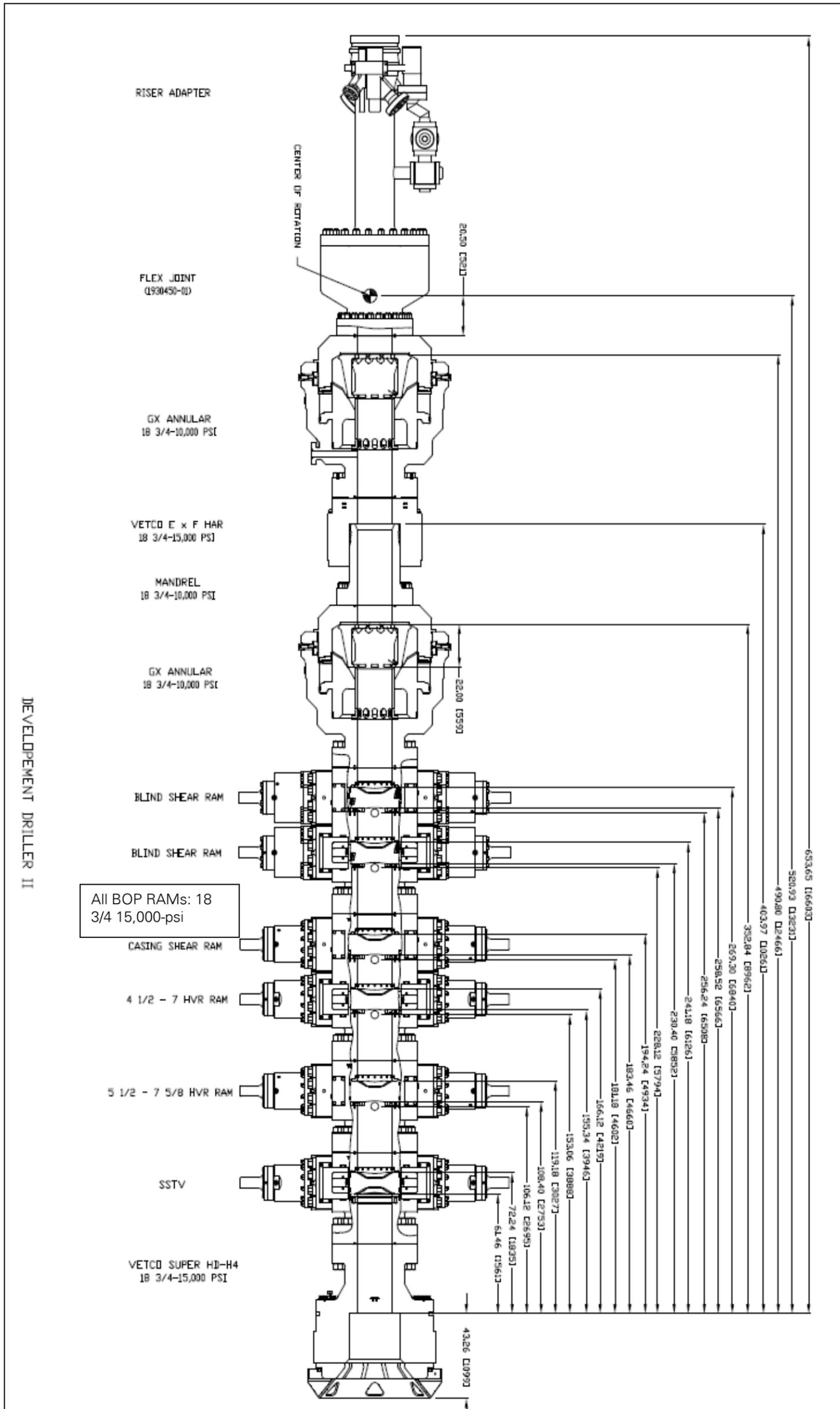
Capacities	
Open holes	Capacity
20 in	0.3886
17 in	0.2807
16 1/2 in	0.2645
14 1/2 in	0.2043
12 1/2 in	0.1458
Riser	Capacity ID
21" 0.813wt, 280, 720	0.3947 19 3/4"
31" 0.879wt, 280, 290	0.3600 19 3/4"
Average	0.3834 19 3/4"
Outlets	Capacity ID
C & K lines, 5.905"	0.0156 4"
Boost line, 7"	0.0350 6"

Pipe	External Upsets		Tong Lengths	
	Pin-end	Box-end	Pin	Box
5 7/8 XTM57	6.000"	6.000"	16"	17"
5 7/8 HVDCP XTM57	-	-	24"	24"
6 5/8 FH	6.906"	6.906"	12"	15"
6 5/8 XTM69	7.125"	7.031"	14"	15"

Mud Pumps: National 14-P-220 (14" Stroke)			
Liner	bbls/ftk	gal/ftk	MAX psi
5 1/2"	0.1029	4.32	7475
6"	0.1223	5.14	6285
6 1/2"	0.1436	6.03	5360
7"	0.1668	7.00	4615

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Attachment 7: DD2 BOP Schematic



Note: Add 9-ft to MD/TVD for Development Driller II