IADC Driller's Method Worksheet

Well Name: _____ **Completed By:** _____ **Date:** _____ / _____ / _____

KICK DATA

SIDPP: _____ **bar** **SICP:** _____ **bar**

PIT GAIN: _____ **Liters** **Time of Incident:** ____ : ____

PROCEDURE

First Circulation to clear influx from well:

1. Bring pump(s) up to slow circulation rate and attempting to hold casing pressure constant by manipulating or adjusting the choke. The slow circulation rate will normally be 50% of the rate used in drilling operations.
2. Read and record Initial Circulating Pressure on Drill Pipe. This pressure should equal the SIDPP plus the slow circulation rate pressure.

   Recorded ICP _____ bar @ rate _____ spm
3. Maintain pump rate and drill pipe pressure constant until influx is circulated out of well.
4. Shut down pump(s) while holding casing pressure constant closing the choke as required. The trapped SIDPP will represent formation pressure.
5. With the pumps off and choke closed, the casing pressure and drill pipe pressures should be equal. If not, continue to circulate out the influx.
6. Record the new shut in casing pressure.

   SICP _____ bar
7. Calculate Kill Mud Weight.

   KMW = _____ kg/l
8. Increase surface mud system to required KMW density.

Second Circulation to balance well:

1. Bring bump(s) up to slow circulation rate and open choke as required while holding new casing pressure contant.
2. Adjust the choke to hold the new casing pressure constant until the drill pipe is full of kill mud of the required density.
3. After drill pipe is full of kill mud, record drill pipe pressure.

   _____ bar
4. Hold pipe rate constant and drill pipe pressure by adjusting the choke until the annulus is filled with kill mud.
5. When kill mud reaches the surface, choke pressure, if any, is bled off.
6. Stop circulating and check for flow.

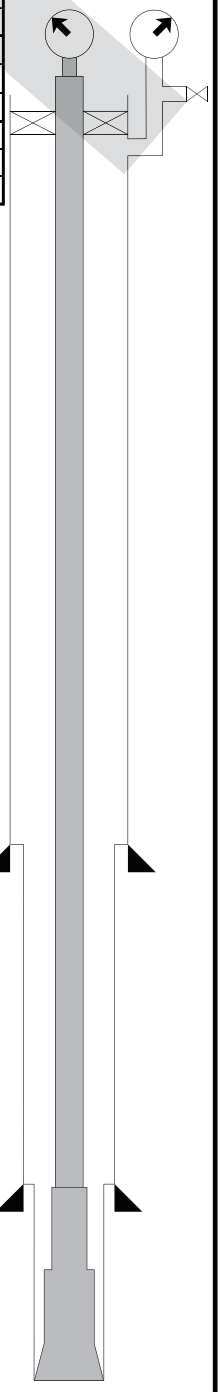
CURRENT WELL DATA

PRESENT MUD WEIGHT: _____ kg/l

SLOW CIRCULATION RATE (SCR):

SCR taken @ _____ (m)

	Stks/min	Pressure(bar)	Liter/min	Pressure(bar)
Pump #1				
Pump #2				
Pump #3				



TOTAL DEPTH (MD) _____ m

TOTAL DEPTH (TVD) _____ m

CASING DATA:

CASING _____ (size) , _____ (ID) , _____ (weight)

CASING SHOE DEPTH _____ m

SHOE TEST DATA:

_____ **Depth #1** _____ (bar) @ Test MW of _____ (kg/l)

_____ **Depth #2** _____ (bar) @ Test MW of _____ (kg/l)

_____ **Depth #3** _____ (bar) @ Test MW of _____ (kg/l)

LINER #1 _____ (size) , _____ (ID) , _____ (weight)

LINER #2 _____ (size) , _____ (ID) , _____ (weight)

LINER #1 TOP DEPTH _____ m

LINER #2 TOP DEPTH _____ m

LINER #1 SHOE DEPTH _____ m

LINER #2 SHOE DEPTH _____ m

TVD CASING or LINER _____ m

HOLE DATA:

BIT SIZE _____ inches

Metric Units (bar, Liters, kg/l)

CALCULATIONS

KILL MUD WEIGHT (KMW)

(_____ ÷ 10.2 ÷ _____) + _____ = _____ kg/l **KILL MUD WEIGHT**

SIDPP (bar) | True Vertical Depth (m) | Present Mud Weight (kg/l)

INITIAL CIRCULATING PRESSURE (ICP)

_____ + _____ = _____ bar **INITIAL CIRCULATING PRESSURE**

SIDPP (bar) | Pump Pressure (bar) @ SCR of _____SPM

TRUE PUMP OUTPUT:

_____ x _____ = _____

Liters/Stk @ 100% | % Efficiency | TPO (Liters/Stk)

DRILL STRING CAPACITY:

Drill #1 Pipe: _____ Size (mm) _____ Weight (kg/m) _____ Liters/m x _____ Length (m) = _____ DP Liters

Drill #2 Pipe: _____ Size (mm) _____ Weight (kg/m) _____ Liters/m x _____ Length (m) = _____ DP Liters

HWDP: _____ Size (mm) _____ Weight (kg/m) _____ Liters/m x _____ Length (m) = _____ HWDP Liters

Drill #1 Collars: _____ Size (mm) _____ Weight (kg/m) _____ Liters/m x _____ Length (m) = _____ DC Liters

Drill #2 Collars: _____ Size (mm) _____ Weight (kg/m) _____ Liters/m x _____ Length (m) = _____ DC Liters

Surface Line: _____ Size (mm) _____ Weight (kg/m) _____ Liters/m x _____ Length (m) = _____ SL Liters

_____ Total Drill String Capacity (Liters)

STROKES, SURFACE TO BIT:

_____ Total Drill String Capacity (Liters) ÷ _____ True Pump Output (Liters/Stk) = _____ Strokes, Surface to Bit

ANNULAR CAPACITY (Between):

CSG and DP: _____ Liters/m x _____ m = _____ Liters

Liner #1 and DP: _____ Liters/m x _____ m = _____ Liters

Liner #2 and DP: _____ Liters/m x _____ m = _____ Liters

OH and DP/HWDP: _____ Liters/m x _____ m = _____ Liters

OH and DC: _____ Liters/m x _____ m = _____ Liters

STROKES, BIT TO SHOE:

_____ Open Hole Annular Volume (Liters) ÷ _____ True Pump Output (Liters/Stk) = _____ Strokes, Bit to Shoe

STROKES, BIT TO SURFACE:

_____ Total Annular Volume (Bbls) ÷ _____ True Pump Output (Liters/Stk) = _____ Strokes, Bit to Surface

TOTAL STROKES, SURFACE TO SURFACE:

_____ Strokes, Surface to Bit + _____ Strokes, Bit to Surface = _____ Strokes, Surface to Surface

MAXIMUM ALLOWABLE ANNULUS SURFACE PRESSURE (MAASP)

(_____ - _____) x 10.2 x _____ = _____ bar **MAASP**

Max. MW from Shoe Test (kg/l) | Present Mud Weight (kg/l) | True Vertical Depth Shoe (m)

MAXIMUM ALLOWABLE ANNULUS SURFACE PRESSURE (MAASP) WITH KILL MUD

(_____ - _____) x 10.2 x _____ = _____ bar **MAASP WITH KILL MUD**

Max. MW from Shoe Test (kg/l) | Kill Mud Weight (kg/l) | True Vertical Depth Shoe (m)

COMMENTS

FORMULAS

1. Pressure Gradient (bar/m) = Mud Weight (kg/l) x 10.2

2. Hydrostatic Pressure (bar) = Mud Weight (kg/l) x 10.2 x Depth (m, TVD)

3. Capacity (l/m) = Inside Diameter^2 (mm) ÷ 1273

4. Annular Capacity(l/m) = (Inside Diameter of Casing^2 (mm) or Hole Diameter^2(mm) - Outside Diameter of Pipe^2 (mm)) ÷ 1273

5. Pipe Displacement (l/m) = (Outside Diameter of pipe^2 (mm) - Inside Diameter of pipe^2 (mm)) ÷ 1273

6. Maximum Allowable Mud Weight (kg/l) = $\frac{\text{Surface LOT Pressure (bar)}}{\text{Shoe Depth (m, TVD) x 10.2}}$ + LOT Mud Weight (kg/l)

7. MAASP (bar) = [Maximum Allowable Mud Weight (kg/l) - Present Mud Weight (kg/l)] x 10.2 x Shoe TVD (m)

8. Pressure Drop per Foot Tripping Dry Pipe (bar/m) = $\frac{\text{Drilling Mud Weight (kg/l) x 10.2 x Metal Displacement (l/m)}}{\text{Casing Capacity (l/m) - Metal Displacement (l/m)}}$

9. Pressure Drop per Foot Tripping Wet Pipe (bar/m) = $\frac{\text{Drilling Mud Weight (kg/l) x 10.2 x Closed End Displacement (l/m)}}{\text{Casing Capacity (l/m) - Closed End Displacement (l/m)}}$

10. Formation Pressure (bar) = Hydrostatic Pressure Mud in Hole (bar) + SIDPP (bar)

11. EMW (kg/l) @ Shoe = (SICP (bar) ÷ 10.2 ÷ Shoe Depth (m, TVD)) + Present Mud Weight (kg/l)

12. Kg of Barite Needed to Weight-Up Mud = $\frac{\text{Liters of Mud in System x 4.25 x (KMW - OMW)}}{\text{(4.25 - KMW)}}$

13. Volume Increase from Adding Barite (l) = $\frac{\text{Kg of Barite Needed to Weight-Up Mud}}{4.25}$

14. Equivalent Mud Weight (kg/l) @ _____ depth (m) = $\frac{\text{Pressure (bar)}}{\text{Depth (m, TVD) x 10.2}}$

15. Estimated New Pump Pressure at New Pump Rate (bar) = Old Pump Pressure (bar) x $\left[\frac{\text{New Pump Rate (SPM)}}{\text{Old Pump Rate (SPM)}}\right]^2$

16. Estimated New Pump Pressure with New Mud Weight (bar) = Old Pump Pressure (bar) x $\frac{\text{New Mud Weight (kg/l)}}{\text{Old Mud Weight (kg/l)}}$

COMMENTS