# IADC Driller's Method Worksheet

IADC

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

## KICK DATA

**SIDPP:** __________ **kPa** **SICP:** __________ **kPa**

**PIT GAIN:** __________ **$m^3$** **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 __________ kPa @ 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 __________ kPa
7. Calculate Kill Mud Weight.

   KMW = __________ $kg/m^3$
8. Increase surface mud system to required KMW density.

**Second Circulation to balance well:**

1. Bring pump(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.

   __________ kPa
4. Hold pump 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:** [ $kg/m^3$ ]

**SLOW CIRCULATION RATE (SCR):**

SCR taken @ ______________ (m)

| | Stks/min | Pressure(kPa) | $m^3$/min | Pressure(kPa) |
|---|---|---|---|---|
| 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**
________ (kPa) @ Test MW of ________ (kg/l)

**Depth #2**
________ (kPa) @ Test MW of ________ (kg/l)

**Depth #3**
________ (kPa) @ 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 ]

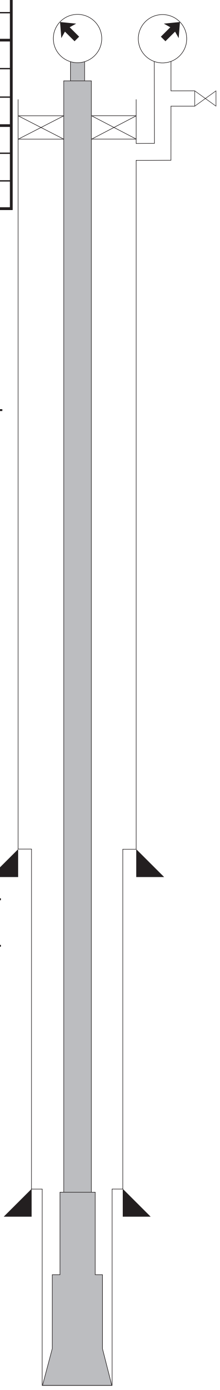
LINER #1 SHOE DEPTH [ m ]

LINER #2 SHOE DEPTH [ m ]

TVD CASING or LINER [ m ]

**HOLE DATA:**

BIT SIZE [ inches ]



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## CALCULATIONS

### KILL FLUID DENSITY (kg/m³)

[ ______ SIDPP (kPa) ÷ ( 0.00981 x ______ TVD (m) )] + ______ Original Fluid Density (kg/m³) = ______ kg/m³ KILL FLUID DENSITY

### INITIAL CIRCULATING PRESSURE (ICP)

______ SIDPP (kPa) + ______ Pump Pressure (kPa) @ SCR of ______SPM = ______ kPa INITIAL CIRCULATING PRESSURE

### TRUE PUMP OUTPUT:

______ m³/Stk @ 100% x ______ % Efficiency = ______ TPO (m³/Stk)

### DRILL STRING CAPACITY:

| | Size (mm) | Weight (kg/m) | m³/m | x Length (m) | = | |
|---|---|---|---|---|---|---|
| Drill #1: Pipe | ______ | ______ | ______ | x ______ | = ______ DP | m³ |
| Drill #2: Pipe | ______ | ______ | ______ | x ______ | = ______ DP | m³ |
| HWDP: | ______ | ______ | ______ | x ______ | = ______ HWDP | m³ |
| Drill #1: Collars | ______ | ______ | ______ | x ______ | = ______ DC | m³ |
| Drill #2: Collars | ______ | ______ | ______ | x ______ | = ______ DC | m³ |
| Surface: Line | ______ | ______ | ______ | x ______ | = ______ SL | m³ |

______ Total Drill String Capacity (m³)

### STROKES, SURFACE TO BIT:

______ Total Drill String Capacity (m³) ÷ ______ True Pump Output (m³/Stk) = ______ Strokes, Surface to Bit

### ANNULAR CAPACITY (Between):

| | | | | |
|---|---|---|---|---|
| CSG and DP: | ______ m³/m | x ______ m | = ______ | m³ |
| Liner #1 and DP: | ______ m³/m | x ______ m | = ______ | m³ |
| Liner #2 and DP: | ______ m³/m | x ______ m | = ______ | m³ |
| OH and DP/HWDP: | ______ m³/m | x ______ m | = ______ | m³ |
| OH and DC: | ______ m³/m | x ______ m | = ______ | m³ |

### STROKES, BIT TO SHOE:

______ Open Hole Annular Volume (m³) ÷ ______ True Pump Output (m³/Stk) = ______ Strokes, Bit to Shoe

### STROKES, BIT TO SURFACE:

______ Total Annular Volume (m³) ÷ ______ True Pump Output (m³/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)(kPa)

( ______ Max. Allowable Fluid Density (kg/m³) - ______ Current Fluid Density (kg/m³) ) x 0.00981 x ______ Shoe TVD (m) = ______ kPa MAASP

### MAXIMUM ALLOWABLE ANNULUS SURFACE PRESSURE (MAASP) WITH KILL MUD

( ______ Max. Allowable Fluid Density (kg/m³) - ______ Kill Mud Weight (kg/m³) ) x 0.00981 x ______ Shoe TVD (m) = ______ kPa MAASP WITH KILL MUD

## COMMENTS

## FORMULAS

1. Pressure Gradient (kPa/m) = Fluid Density (kg/m³) x 0.00981

2. Hydrostatic Pressure (kPa) = Fluid Density (kg/m³) x 0.00981 x TVD (m)

3. Capacity (m³/m) = Inside Diameter² (mm) ÷ 1273

4. Annular Capacity (m³/m) = (Inside Diameter of Casing² (mm) or Hole Diameter² (mm) - Outside Diameter of Pipe² (mm)) ÷ 1273

5. Pipe Displacement (m³/m) = (Outside Diameter of pipe² (mm) - Inside Diameter of pipe² (mm)) ÷ 1273

6. Maximum Allowable Fluid Density (kg/m³) = $\frac{\text{Surface LOT Pressure (kPa)}}{\text{Shoe TVD (m)} \times 0.00981}$ + LOT Fluid Density (kg/m³)

7. MAASP (kPa) = [Maximum Allowable Fluid Density (kg/m³) - Current Fluid Density (kg/m³)] x 0.00981 x Shoe TVD (m)

8. Pressure Drop per Metre Tripping Dry Pipe (kPa/m) = $\frac{\text{Drilling Fluid Density (kg/m}^3\text{)} \times 0.00981 \times \text{Metal Displacement (m}^3\text{/m)}}{\text{Riser/Casing Capacity (m}^3\text{/m)} - \text{Metal Displacement (m}^3\text{/m)}}$

9. Pressure Drop per Metre Tripping Wet Pipe (kPa/m) = $\frac{\text{Drilling Fluid Density (kg/m}^3\text{)} \times 0.00981 \times \text{Closed End Displacement (m}^3\text{/m)}}{\text{Riser/Casing Capacity (m}^3\text{/m)} - \text{Closed End Displacement (m}^3\text{/m)}}$

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

11. Equivalent Circulating Density (kg/m³) = $\frac{\text{Annular Pressure Loss (kPa)}}{\text{TVD (m)} \times 0.00981}$ + Fluid Density (kg/m³)

12. Kg of Barite Needed to Weight-Up Mud = $\frac{\text{m}^3 \text{ of Mud in System} \times 4250 \times (\text{KMW} - \text{OMW})}{(4250 - \text{KMW})}$

13. Volume Increase from Adding Barite (m³) = $\frac{\text{Kg of Barite Needed to Weight-Up Mud}}{4250}$

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

15. Estimated New Pump Pressure with New Mud Weight (kPa) = Old Pump Pressure (kPa) x $\frac{\text{New Mud Weight (kg/m}^3\text{)}}{\text{Old Mud Weight (kg/m}^3\text{)}}$

## COMMENTS