IADC WellCAP Well Control Worksheet
Surface Stack - Wait and Weight Method

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

PRE-RECORDED INFORMATION

TRUE PUMP OUTPUT: _____ (Liters/Stk @ 100%) x _____ (% Efficiency) = _____ (TPO (Liters/Stk))

Surface Line: _____ (Liters) Surface Line Capacity ÷ _____ True Pump Output (Liters/Stk) = _____ Strokes to Pump

DRILL STRING CAPACITY:

	Size (mm)	Weight (kg/m)	Liters/m		Length (m)			
Drill Pipe #1:	_____	_____	_____	x	_____	=	_____ DP	Liters
Drill Pipe #2:	_____	_____	_____	x	_____	=	_____ DP	Liters
HWDP:	_____	_____	_____	x	_____	=	_____ HWDP	Liters
Drill Collars #1:	_____	_____	_____	x	_____	=	_____ DC	Liters
Drill Collars #2:	_____	_____	_____	x	_____	=	_____ DC	Liters

_____ Total Drill String Capacity (Liters)

STROKES FROM 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
Between Liner #1 and DP:	_____ Liters/m	x	_____ m	=	_____ Liters
Between Liner #2 and DP:	_____ Liters/m	x	_____ m	=	_____ Liters
Between OH and DP/HWDP:	_____ Liters/m	x	_____ m	=	_____ Liters
Between OH and DC:	_____ Liters/m	x	_____ m	=	_____ Liters

STROKES FROM BIT TO SHOE:

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

STROKES FROM BIT TO SURFACE:

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

TOTAL STROKES FROM SURFACE TO SURFACE:

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

MAXIMUM ALLOWABLE FLUID DENSITY (kg/l)

[(_____ Surface LOT Pressure (bar) x 10.2) ÷ _____ Shoe TVD (m)] + _____ LOT Fluid Density (kg/l) = _____ kg/l MAX. ALLOWABLE FLUID DENSITY

MAXIMUM ALLOWABLE ANNULAR SURFACE PRESSURE (MAASP) (bar)

[(_____ Max. Allowable Fluid Density (kg/l) - _____ Current Fluid Density (kg/l)) x _____ Shoe TVD (m)] ÷ 10.2 = _____ bar MAX. ALLOWABLE ANNULAR SURFACE PRESSURE

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				

CASING DATA:

CASING _____ size , _____ ID , _____ weight

SHOE DEPTH @ MD / TVD _____ / _____ 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

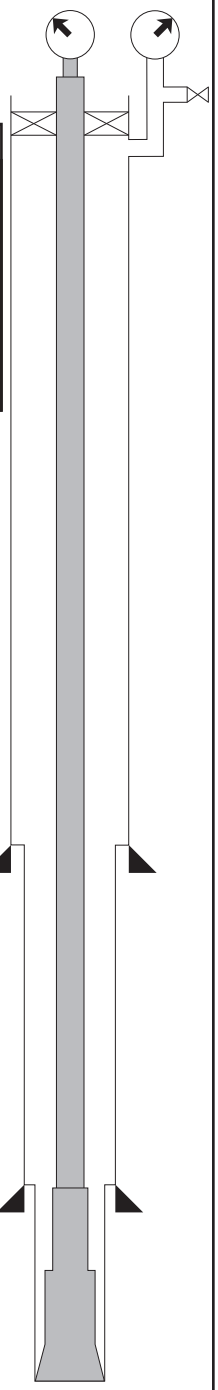
HOLE DATA:

TOTAL DEPTH (MD) _____ m

TOTAL DEPTH (TVD) _____ m

BIT DEPTH @ MD / TVD _____ / _____ m

BIT SIZE _____ inches



KICK DATA

SIDPP: _____ **bar** **SICP:** _____ **bar** **PIT GAIN:** _____ **Liters** **Time of Incident:** ____ : ____

CALCULATIONS

KILL FLUID DENSITY (kg/l)

[(_____ **x** 10.2) ÷ _____] **+** _____ **=** _____ kg/l KILL FLUID DENSITY

SIDPP (bar) | TVD (m) | Original Fluid Density (kg/l)

INITIAL CIRCULATING PRESSURE (ICP)

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

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

FINAL CIRCULATING PRESSURE (FCP)

_____ **x** _____ ÷ _____ **=** _____ bar FINAL CIRCULATING PRESSURE

Pump Pressure (bar) @ SCR of _____SPM | Kill Mud Weight (kg/l) | Present Mud Weight (kg/l)

PRESSURE CHART

Stroke or Volume	Theoretical Drill Pipe Pressure	Actual Drill Pipe Pressure	Actual Casing Pressure	Actual Pit Volume Deviation
SURFACE 0	ICP			
BIT	FCP			

_____ **÷ 10 =** _____ _____ **-** _____ **÷ 10 =** _____

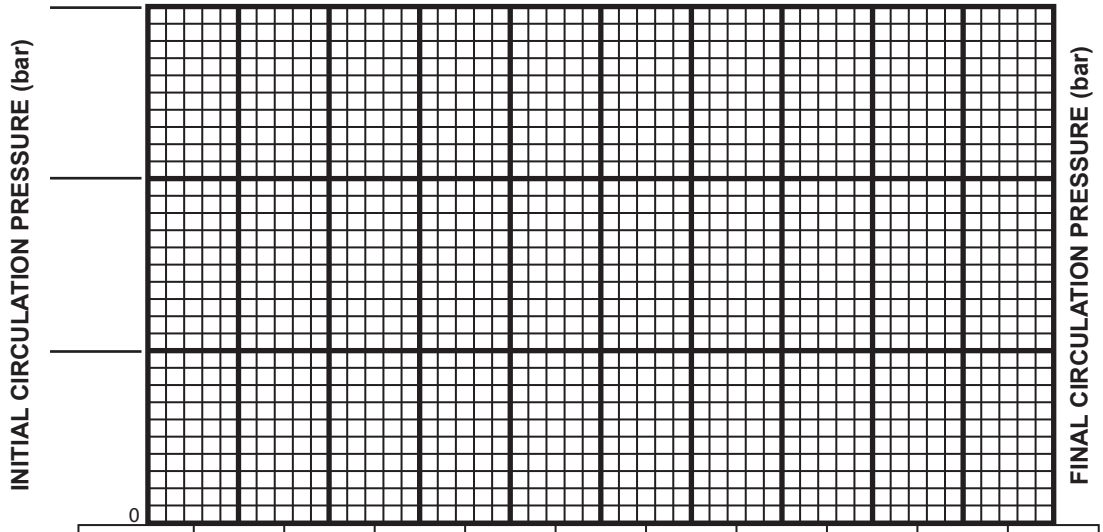
Strokes Surface to Bit | Strokes per Step | Initial Circulation Pressure | Final Circulation Pressure | PSI per Step

BIT	FCP			
SURFACE				

_____ **÷ 10 =** _____

Strokes Bit to Surface | Strokes per Step

GRAPHIC ANALYSIS



Stroke										
Pressure										
Time										

1. Pressure Gradient (bar/m) = Fluid Density (kg/l) ÷ 10.2

2. Hydrostatic Pressure (bar) = (Fluid Density (kg/l) x TVD (m)) ÷ 10.2

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. $$\text{Maximum Allowable Fluid Density (kg/l)} = \frac{\text{Surface LOT Pressure (bar)} \times 10.2}{\text{Shoe TVD (m)}} + \text{LOT Fluid Density (kg/l)}$$

7. MAASP (bar) = [(Maximum Allowable Fluid Density (kg/l) - Current Fluid Density (kg/l)) x Shoe TVD (m)] ÷ 10.2

8. $$\text{Pressure Drop per Metre Tripping Dry Pipe (bar/m)} = \frac{\text{Drilling Fluid Density (kg/l)} \times \text{Metal Displacement (l/m)}}{[\text{Riser/Casing Capacity (l/m)} - \text{Metal Displacement (l/m)}] \times 10.2}$$

9. $$\text{Pressure Drop per Metre Tripping Wet Pipe (bar/m)} = \frac{\text{Drilling Fluid Density (kg/l)} \times \text{Closed End Displacement (l/m)}}{[\text{Riser/Casing Capacity (l/m)} - \text{Closed End Displacement (l/m)}] \times 10.2}$$

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

11. $$\text{Equivalent Circulating Density (kg/l)} = \frac{\text{Annular Pressure Loss (bar)} \times 10.2}{\text{TVD (m)}} + \text{Fluid Density (kg/l)}$$

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

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

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

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