WellSharp Surface Baker #1

Hole Dimensions		
Depth (MD/TVD)	10800	feet
9 $^{5}/_{8}$" Casing shoe	8950	feet
Hole size	8 ½	inch
Current mud weight	11.3	ppg
Internal Capacities		
6 $^{1}/_{2}$" Drill collars (length 600 feet)	0.00768	bbl/foot
5" Drill pipe - capacity	0.01776	bbl/foot
5" Drill pipe - metal displacement	0.00650	bbl/foot
5" Drill pipe- closed end displacement	0.02426	bbl/foot
5” HWDP (length 500feet) - capacity	0.0088	bbl/foot
Annular Capacities		
Open hole / Drill collar	0.0292	bbl/foot
Open hole / Drill pipe	0.0459	bbl/foot
Casing / Drill pipe	0.0505	bbl/foot
LOT		
Shoe test mud weight	10.5	ppg
Leak off pressure	1850	psi
Pump Details		
Pump Output	0.119	bbl/stk
SCR at 40 SPM	450	psi
Shut in data		
SIDPP	500	psi
SICP	700	psi
Pit gain	12	bbls

Intertek

Vertical Kill Sheet

Well Name: Surface Baker #1

Date:

Well Info:

A. Hole TVD: 10800

B. Current MW ppg: 11.3

C. Slow Pump Pressure: 450

D. Slow Pump SPM: 40

Kick Info:

E. (SIDP): 500

F. (SICP): 700

G. Pit Gain bbls: 12

KWM = (SIDP ÷ .052 ÷ TVD) + Current Mud Weight

Round up **KWM**

(500 (E) ÷ .052 ÷ 10800 (A)) + 11.3 (B) = **12.2**

ICP = Slow Pump Pressure + SIDP

ICP

450 (C) + 500 (E) = **950**

FCP = KWM ÷ CMW x Slow Pump Pressure

FCP

12.2 (KWM) ÷ 11.3 (B) x 450 (C) = **486**

Stks to Bit ÷ 10 = 152 stks

Strokes to Bit

(ICP—FCP) ÷ 10 = 46 psi

	Strokes	Pressure	
	0	950	◀ ICP
(1)	152	904	
(2)	304	858	
(3)	456	812	
(4)	608	766	
(5)	760	720	
(6)	912	674	
(7)	1064	628	
(8)	1216	582	
(9)	1368	536	
(10)	1523	486	◀ FCP

Shoe Pressures:

H. Shoe TVD: 8950

I. LOT Pressure: 1850

J. Test MW: 10.5

Or

K. Frac. Gradient:

Round down **MAMW**

(1850 (I) LOT ÷ .052 ÷ 8950 (H) Shoe TVD) + 10.5 (J) TMW = **14.4**

Or _____ (Frac. G. (K)) ÷ .052 =

(14.4 (MAMW) - 11.3 (B) CMW x .052 x 8950 (H) Shoe TVD) = 1442 = **MASP before kick with Current MW**

(14.4 (MAMW) - 12.2 (KWM) x .052 x 8950 (H) Shoe TVD) = 1023 = **MASP after kill with Kill MW**

Volume Info:

a) Hole MD: 10800

b) Shoe MD: 8950

Pump Output (bbls/stk)

c) 0.119

Choke Line Length

d)

Riser Length

e)

f) DC Length: 600

Drillstring Volume (surface to bit)

	Length (ft)		Internal Capacity			
(1)	9700	X	0.01776	=	172.27	+
(2)	500	X	0.0088	=	4.40	+
(3)	600	X	0.00768	=	4.61	+
(4)		X		=		+
				=		

Total Drillstring Volume: 181.28 ÷ 0.119 (c) = **Strokes Surface to Bit**: 1523

Miscellaneous Calculations:

Pressure drop per step (one-tenth of strokes to bit):

(ICP—FCP) ÷ 10 = 46

Pressure drop per 100 strokes to bit:

(ICP—FCP) x 100 ÷ Strokes to Bit = 30

(Subsea)

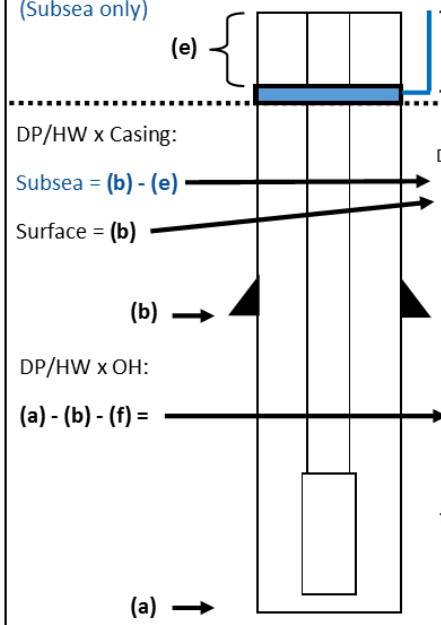
Dynamic (adjusted) casing pressure after pump start-up:

(SICP - CLF) =

Annular Volumes and Strokes

(Subsea only)

(e) (d) _____ X Choke Line Capacity = ÷ (c) = **Strokes to displace Choke line** (g)



DP/HW x Casing:

DP/HW Length x Casing: 8950 X Csg. Annular Capacity: 0.0505 = Volume: 451.98 ÷ (c) 0.119 = **DP/HW x Casing Strokes**: 3798 (h)

DP/HW x OH:

DP/HW Length OH: 1250 X OH Annular Capacity: 0.0459 = Volumes: 57.38

+

f) DC Length x OH: 600 X OH Annular Capacity: 0.0292 = 17.52

=

Bit to Shoe Volume: 74.9 ÷ (c) 0.119 = **Bit to Shoe Strokes**: 629 (i)

(Subsea)

Strokes from bit to surface through choke line:

= (g) + (h) + (i) =

(Surface Only) **Strokes from bit to surface:**

= (h) + (i) = 4427

1) *Maximum allowable mud weight before the kick*

MAMW = (LOT pressure ÷ 0.052 ÷ Casing Shoe TVD) + Test Mud Weight

(1850 psi ÷ 0.052 ÷ 8950) + 10.5 = 14.4 ppg

2) *MAASP before the kick*

MAASP = (MAMW ppg – Current MW ppg) x 0.052 x Casing Shoe TVD

(14.4 – 11.3) x 0.052 x 8950 = 1442 psi

3) *Kill mud Weight*

12.2 ppg

4) *Initial Circulating Pressure*

950 psi

5) *Final Circulating Pressure*

486 psi

6) *Strokes from surface to Bit*

1523 strokes

7) Pressure drop per step (one-tenth of strokes to Bit)

46 psi

8) Pressure drop per 100 strokes from surface to Bit

(ICP – FCP) x 100 ÷ Strokes from surface to Bit

(950 – 486) x 100 ÷ 1523 = 30.46 psi (round down to 30 psi)

9) MAASP after well has been killed

MAASP = (MAMW ppg – KWM ppg) x 0.052 x Casing Shoe TVD

(14.4 – 12.2) x 0.052 x 8950 = 1023 psi

10) Strokes from bit to surface

4427 strokes

11) Strokes from bit to shoe

Open Hole Annular Volume ÷ Pump Output

(57.38 + 17.52) ÷ 0.119 = 629 strokes

WellSharp Surface Baker #2

Hole Dimensions		
Depth MD 12,200 feet :	TVD 11,850	feet
9 5/8" Casing shoe	8750	feet
Hole size	8 ½	inch
Current mud weight	10	ppg
Internal Capacities		
6 1/2" Drill collars (length 600 feet)	0.0077	bbl/foot
5" Drill pipe - capacity	0.01776	bbl/foot
5" Drill pipe - metal displacement	0.0065	bbl/foot
5" Drill pipe- closed end displacement	0.0246	bbl/foot
5” HWDP (length 650feet) - capacity	0.0086	bbl/foot
Annular Capacities		
Open hole / Drill collar	0.0292	bbl/foot
Open hole / Drill pipe	0.0459	bbl/foot
Casing / Drill pipe	0.0489	bbl/foot
LOT		
Shoe test mud weight	10	ppg
Leak off pressure	1175	psi
Pump Details		
Pump Output	0.119	bbl/stk
SCR at 40 SPM	695	psi
Shut in data		
SIDPP	580	psi
SICP	840	psi
Pit gain	20	bbls

Intertek

Vertical Kill Sheet

Well Name: Surface Baker #2

Date:

Well Info:

A. Hole TVD: 11850

B. Current MW ppg: 10.0

C. Slow Pump Pressure: 695

D. Slow Pump SPM: 40

Kick Info:

E. (SIDP): 580

F. (SICP): 840

G. Pit Gain bbls: 20

KWM = (SIDP ÷ .052 ÷ TVD) + Current Mud Weight

Round up **KWM**

(580 (E) ÷ .052 ÷ 11850 (A)) + 10.0 (B) = **11.0**

ICP = Slow Pump Pressure + SIDP

ICP

695 (C) + 580 (E) = **1275**

FCP = KWM ÷ CMW x Slow Pump Pressure

FCP

11.0 (KWM) ÷ 10.0 (B) x 695 (C) = **765**

Stks to Bit ÷ 10 = 172 stks

(ICP—FCP) ÷ 10 = 51 psi

Strokes	Pressure	
0	1275	◄ ICP
(1) 172	1224	
(2) 344	1173	
(3) 516	1122	
(4) 688	1071	
(5) 860	1020	
(6) 1032	969	
(7) 1204	918	
(8) 1376	867	
(9) 1548	816	
(10) 1720	765	◄ FCP

Strokes to Bit ►

Shoe Pressures:

H. Shoe TVD: 8750

I. LOT Pressure: 1175

J. Test MW: 10.0

Round down **MAMW**

(1175 (I) LOT ÷ .052 ÷ 8750 (H) Shoe TVD) + 10.0 (J) TMW = **12.5**

Or K. Frac. Gradient: ____

Or ____ (Frac. G. (K)) ÷ .052 =

(12.5 (MAMW) - 10.0 (B) CMW x .052 x 8750 (H) Shoe TVD) = 1137 = **MASP before kick with Current MW**

(12.5 (MAMW) - 11.0 (KWM) x .052 x 8750 (H) Shoe TVD) = 682 = **MASP after kill with Kill MW**

Volume Info:

a) Hole MD: 12200

b) Shoe MD: 8750

Pump Output (bbls/stk)

c) 0.119

Choke Line Length

d)

Riser Length

e)

f) DC Length: 600

Drillstring Volume (surface to bit)

	Length (ft)		Internal Capacity			
(1)	10950	X	0.01776	=	194.47	+
(2)	650	X	0.0086	=	5.59	+
(3)	600	X	0.0077	=	4.62	+
(4)		X		=		+
				=		

Total Drillstring Volume: 204.68 ÷ 0.119 (c) = **Strokes Surface to Bit**: 1720

Miscellaneous Calculations:

Pressure drop per step (one-tenth of strokes to bit):

(ICP—FCP) ÷ 10 = 51

Pressure drop per 100 strokes to bit:

(ICP—FCP) x 100 ÷ Strokes to Bit = 29

(Subsea)

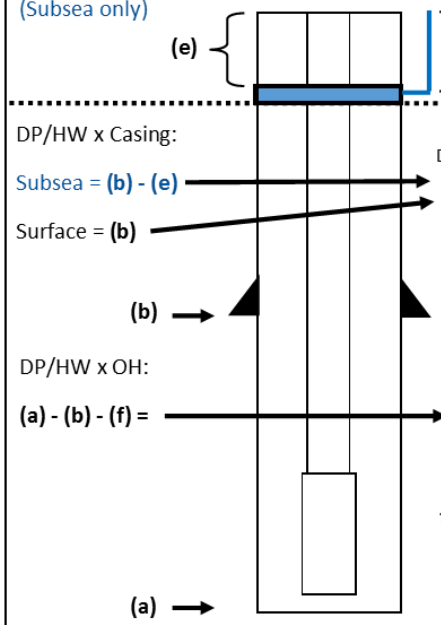
Dynamic (adjusted) casing pressure after pump start-up:

(SICP - CLF) =

Annular Volumes and Strokes

(Subsea only)

(e) (d) _____ X Choke Line Capacity = ÷ (c) = **Strokes to displace Choke line** (g)



DP/HW x Casing:

DP/HW Length x Casing		Csg. Annular Capacity		Volume		(c)		DP/HW x Casing Strokes	
8750	X	0.0489	=	427.88	÷	0.119	=	3596	(h)

DP/HW x OH:

DP/HW Length OH		OH Annular Capacity		Volumes	
2850	X	0.0459	=	130.82	
DC Length x OH		OH Annular Capacity			+
f) 600	X	0.0292	=	17.52	
					=

Bit to Shoe Volume: 148.34 ÷ (c) 0.119 = **Bit to Shoe Strokes**: 1247 (i)

(Subsea)

Strokes from bit to surface through choke line:

= (g) + (h) + (i) =

(Surface Only) **Strokes from bit to surface:**

= (h) + (i) = 4843

1) Maximum allowable mud weight before the kick

MAMW = (LOT pressure ÷ 0.052 ÷ Casing Shoe TVD) + Test Mud Weight

(1175 psi ÷ 0.052 ÷ 8750) + 10.0 = 12.5 ppg

2) MAASP before the kick

MAASP = (MAMW ppg – Current MW ppg) x 0.052 x Casing Shoe TVD

(12.5 – 10.0) x 0.052 x 8750 = 1137 psi

3) Kill mud Weight

11.0 ppg

4) Initial Circulating Pressure

1275 psi

5) Final Circulating Pressure

765 psi

6) Strokes from surface to Bit

1720 strokes

7) Pressure drop per step (one-tenth of strokes to Bit)

51 psi

8) Pressure drop per 100 strokes from surface to Bit

(ICP – FCP) x 100 ÷ Strokes from surface to Bit

(1275 – 765) x 100 ÷ 1720 = 29.65 psi (round down to 29 psi)

9) MAASP after well has been killed

MAASP = (MAMW ppg – KMW ppg) x 0.052 x Casing Shoe TVD

(12.5 – 11.0) x 0.052 x 8750 = 682 psi

10) Strokes from bit to surface

4842 strokes

11) Strokes from bit to shoe

Open Hole Annular Volume ÷ Pump Output

(130.82 + 17.52) ÷ 0.119 = 1247 strokes