

## The Road to Excellence Starts with Safety

Sold To #: 306454	Ship To #: 3649000	Quote #:	Sales Order #: 0902681827
Customer: BLACK HILLS EXPLORATION & PROD-EBIZ		Customer Rep: DAN FRIEND	
Well Name: HOMER DEEP UNIT	Well #: 7-23BH	API/UWI #: 05-045-22810-00	
Field: SOUTH SHALE RIDGE	City (SAP): PARACHUTE	County/Parish: GARFIELD	State: COLORADO
Legal Description: NE SW-7-8S-98W-1851FSL-2420FWL			
Contractor: ENSIGN DRLG		Rig/Platform Name/Num: ENSIGN 161	
Job BOM: 7523			
Well Type: HORIZONTAL GAS			
Sales Person: HALAMERICA\HAM2616		Srvc Supervisor: DAVID CAMPBELL	
Job			

Formation Name	
Formation Depth (MD)	Top
Form Type	BHST
Job depth MD	17600 FT
Water Depth	Wk Ht Above Floor
Perforation Depth (MD)	From

## Well Data

Description	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Casing		5.5	4.778	20			0	6190		
Casing		7.625	6.875	29.7			0	6560		
Casing		4.5	3.92	13.5		P-110	6190	17588	0	6750
Open Hole Section			6.75				6560	17600	0	6750

## Tools and Accessories

Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make
Guide Shoe	4.5	1		17588	Top Plug	4.5 + 5.5		WTH
Float Shoe	4.5				Bottom Plug			
Float Collar	4.5	1		17490	SSR plug set			
Insert Float	4.5				Plug Container	5.5		HES
Stage Tool	4.5				Centralizers			

## Fluid Data

Stage/Plug #: 1

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	12.8 lb/gal Tuned Spacer III	Tuned Spacer III	40	bbl	12.2	2.95	17.31	3.5	
	1.10 gal/bbl	MUSOL A, 330 GAL TOTE - (790828)							
	1.10 gal/bbl	SEM-7, 55 GAL DRUM (100001626)							
	221.61 lbm/bbl	BARITE, BULK (100003681)							
	31.80 gal/bbl	FRESH WATER							

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
2	TergoVis	CMT PKG TERGOVIS I	40	bbl	12.2	2.42	14.38	3.5	
137 lbm/bbl		BARITE, BULK (100003681)							
0.85 lbm/bbl		SA-1015, 50 LB SACK (102077046)							
137 lbm/bbl		ENHANCER 923, BULK (101894003)							
1.10 lbm/bbl		CFR-3, W/O DEFOAMER, 50 LB SK (100003653)							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
3	EconoCem	ECONOCEM (TM) SYSTEM	120	sack	12.2	1.93	9.98	3.5	
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
4	ExpandaCem	EXPANDACEM (TM) SYSTEM	130	sack	12.2	1.98	10.6	3.5	
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
5	ExpandaCem	EXPANDACEM (TM) SYSTEM	1170	sack	14	1.35	5.91	3.5	
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/mi n	Total Mix Fluid Gal
6	Displacement Fluid	Displacement Fluid	305.2	bbl	8.4			3.5,3	
0.10 gal/bbl		MICRO MATRIX CEMENT RETARDER, 1 GAL PAIL (100003780)							
Cement Left In Pipe		Amount	98 ft		Reason			Shoe Joint	



## 1.0 Real-Time Job Summary

## 1.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	Call Out	8/27/2015	07:00:00	USER					ELITE # 4
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/27/2015	09:00:00	USER					ALL HES EMPLOYEES
Event	3	Arrive At Loc	Arrive At Loc	8/27/2015	10:30:00	USER					ARRIVED 1 1/2 HOURS EARLY DID NOT START CHARGING TIME UNTIL REQUESTED ON LOCATION TIME
Event	4	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	8/27/2015	10:45:00	USER					ALL HES EMPLOYEES
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	8/27/2015	11:00:00	USER					ALL HES EMPLOYEES
Event	6	Rig-Up Equipment	Rig-Up Equipment	8/27/2015	11:15:00	USER					1 HT-400 PUMP TRUCK ( ELITE # 4) 1 660 BULK TRUCK 1 BODY LOAD 1 IRON TRUCK 1 WASHUP TRUCK 1 F-550 PICKUP
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	8/28/2015	13:30:00	USER					ALL HES EMPLOYEES AND RIG CREW RIG PUMPED 60 BBLs DIESEL PRIOR TO JOB
Event	8	Start Job	Start Job	8/28/2015	13:56:00	COM5					TD: 17600 TP: 17588 TVD: 6750 CSG: 4 1/2 13.5# (11398) 5 1/2 20# (6190) SJ: 98 MW: 12.2 PPG OH: 6 3/4 INTER CSG: 7 5/8 29.7# SET @ 6560
Event	9	Prime Pumps	Fill Lines	8/28/2015	13:57:21	COM5	12.20	2.0	700	2.0	FILL LINES WITH TUNED SPACER III

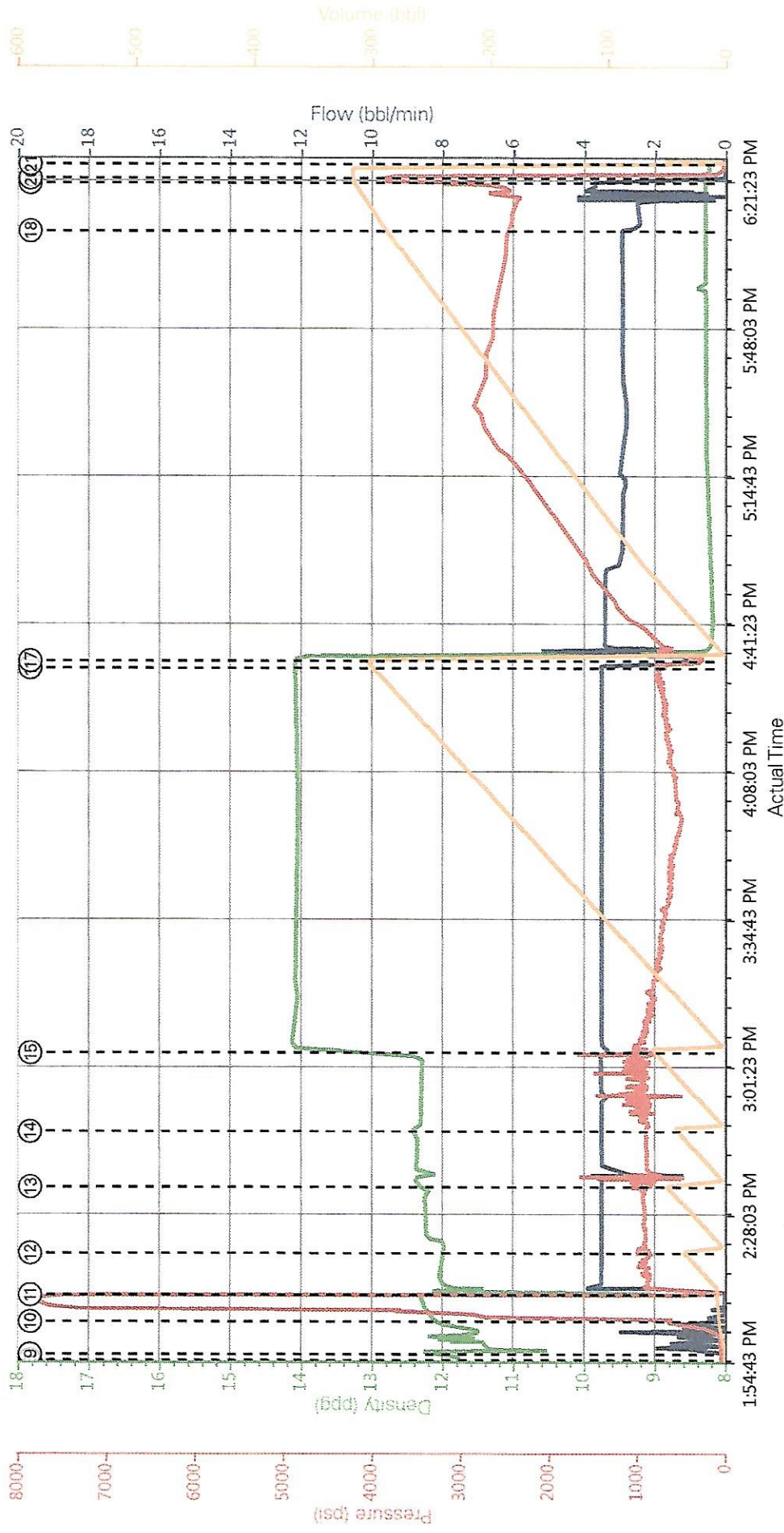
Event	10	Test Lines	Test Lines	8/28/2015	14:04:43	COM5	12.20	7759	2.0	PRESSURE TEST OK
										40 BBLs 12.2 PPG 2.95 YIELD 17.31 GAL/SK TUNED SPACER III WEIGHT VERIFIED VIA PRESSURIZED MUD SCALES 44 GALS MUSOL A, 44 GAL SEM-7 ADDED THROUGHOUT TUNED SPACER III
Event	11	Pump Spacer	Tuned Spacer III	8/28/2015	14:10:47	USER	12.20	950	3.5	40.0
Event	12	Pump Spacer 2	Tergovis	8/28/2015	14:20:13	COM5	12.20	930	3.5	40.0
Event	13	Pump Lead Cement	Pump Lead Cement	8/28/2015	14:35:06	COM5	12.20	875	3.5	41.2
Event	14	Pump Tail Cement	Pump 12.2 PPG Tail Cement	8/28/2015	14:47:39	COM5	12.20	960	3.5	45.8
Event	15	Pump Tail Cement	Pump 14.0 PPG Tail Cement	8/28/2015	15:05:23	COM5	14.0	854	3.5	281.3
Event	16	Drop Top Plug	Drop Top Plug	8/28/2015	16:32:19	USER				
Event	17	Pump Displacement	Pump Displacement	8/28/2015	16:33:53	COM5	8.4	2750	3.5	305.2
Event	18	Slow Rate	Slow Rate	8/28/2015	18:10:52	USER	8.4	2440	2.5	285.2

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(v. 4.1.107)

Event	19	Bump Plug	Bump Plug	8/28/2015	18:21:43	COM5	8.4	3.5	2870	305.2	PRESSURE PRIOR TO BUMPING PLUG @ 2870 BUMPED PLUG UP TO 3902 PSI
Event	20	Other	Check Floats	8/28/2015	18:22:48	COM5	8.4		3902	305.2	FLOATS HOLDING 5 1/2 BBLs RETURNED BACK TO TRUCKS TANKS
Event	21	End Job	End Job	8/28/2015	18:26:00	USER					GOOD RETURNS THROUGHOUT JOB UNTIL LAST 40 BBLs OF DISPLACEMENT CIRCULATED 10 BBLs TUNED SPACER III TO SURFACE
Event	22	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	8/28/2015	19:30:00	USER					ALL HES EMPLOYEES
Event	23	Rig-Down Equipment	Rig-Down Equipment	8/28/2015	19:45:00	USER					
Event	24	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	8/28/2015	20:45:00	USER					ALL HES EMPLOYEES
Event	25	Crew Leave Location	Crew Leave Location	8/28/2015	21:00:00	USER					THANKS FOR USING HALLIBURTON CEMENT DAVID CAMPBELL AND CREW



BLACK HILLS - HDU 7-23BH - 5 1/2 PRODUCTION



DH Density (ppg)    Comb Pump Rate (bbl/min)    PS Pump Press (psi)    Pump Stg Tot (bbl)

- |   |                          |                             |                                |                        |
|---|--------------------------|-----------------------------|--------------------------------|------------------------|
| ① Call Out                              | ⑦ Pre-Job Safety Meeting | ⑬ Pump Lead Cement          | ⑲ Bump Plug                    | 25 Crew Leave Location |
| ② Pre-Convoy Safety Meeting             | ⑧ Start Job              | ⑭ Pump 12.2 PPG Tail Cement | 20 Check Floats                |                        |
| ③ Arrive At Loc                         | ⑨ Fill Lines             | ⑮ Pump 14.0 PPG Tail Cement | 21 End Job                     |                        |
| ④ Assessment Of Location Safety Meeting | ⑩ Test Lines             | ⑯ Drop Top Plug             | 22 Pre-Rig Down Safety Meeting |                        |
| ⑤ Pre-Rig Up Safety Meeting             | ⑪ Tuned Spacer III       | ⑰ Pump Displacement         | 23 Rig-Down Equipment          |                        |
| ⑥ Rig-Up Equipment                      | ⑫ Tergovis               | ⑱ Slow Rate                 | 24 Pre-Convoy Safety Meeting   |                        |

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Created: 2015-08-27 08:06:16, Version: 4.1.107

Edit

Customer: BLACK HILLS EXPLORATION & PROD-EBIZ

Job Date: 8/28/2015

Well: HDU 7-23BH

Representative: DAN FRIEND

Sales Order #: 0902681827

ELITE # 4: DAVID CAMPBELL / RYAN MARTIN

# BLACK HILLS - HDU 7-23BH - 5 1/2 PRODUCTION

