**HALLIBURTON**

# ACOUSTIC CEMENT BOND LOG

Company MINERAL RESOURCES, INC.
Well DT-HABITAT 5-5-6
Field WATTENBERG
County WELD State CO

Company MINERAL RESOURCES, INC.
Well DT-HABITAT 5-5-6
Field WATTENBERG
County WELD State CO

API No.: 05-123-38291-0000 Serv #: 901118690
Location: SURFACE HOLE LOCATION:
0363' FNL & 1834' FEL

Other Services
GAUGE RING
CAST

Sec: 05 Twp: 05N Rge: 65W

Permanent Datum GROUND LEVEL Elevation 4642'
Log Measured From KB , 22 Ft. above perm. datum
Drilling Measured From KB

Elevation
K.B. 4664'
D.F. 4663'
G.L. 4642'

| | | | |
|---|---|---|---|
| Date @ Time Logged | 14 FEB 2014 | Type Fluid in Hole | WATER |
| Run No. | ONE | Density of Fluid | 8.4# |
| Depth - Driller | 14679' | Fluid Level | FULL |
| Depth - Logger | 7386' | Cement Top Est. Logged | SEE LOG |
| Bottom - Logged Interval | 7386' | Equipment / Location | 10971668 / G.J. |
| Top - Log Interval | SURFACE | Recorded by | D. SOLIS |
| Max. Recorded Temp. | 280 DEG F | Witnessed by | C. RICHARDSON |

| CEMENTING DATA | Surface String | Protection String | Production String | Liner |
|---|---|---|---|---|
| Date / Time Cemented | N/A | N/A | N/A | N/A |
| Primary / Squeeze | | | | |
| Expected Compressive Strength | psi@ hrs | psi@ hrs | psi@ hrs | psi@ hrs |
| Cement Volume | | | | |
| Cement Type / Weight | / | / | / | / |
| Formulation | | | | |
| Mud Type / Mud Wgt. | / | / | / | / |

| Borehole Record | | | | Casing & Tubing Record | | | |
|---|---|---|---|---|---|---|---|
| Run Number | Bit | From | To | Size | Weight | From | To |
| ONE | 12.25" | SURFACE | 1041' | 9.625" | 36.0# | SURFACE | 1041' |
| TWO | 8.75" | 1041' | 7630' | 7.0" | 29.0# | SURFACE | 7630' |
| THREE | 6.125" | 7630' | 14679' | 4.5" | 13.5" | 7406' | 14679' |

<<< Fold Here >>>

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

Comments

HES CEMENT BOND LOG IS THE PRIMARY DEPTH REFERENCE FOR THIS WELL.

GR-CBL-CAST RAN IN COMBINATION.

LOG INTERVALS PER CUSTOMER REQUEST.

***THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES.***

Service Ticket No. 901118690 API No. 05-123-38291-0000 PGM Ver 12.7.23001_R2

The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client

EQUIPMENT DATA

| TELEMETRY | | CEMENT BOND TOOL | | CAST ELECTRONICS | | CAST MANDREL | |
|---|---|---|---|---|---|---|---|
| Run No. | ONE | Run No. | ONE | Run No. | ONE | Run No. | ONE |
| Serial No. | 10000286 | Serial No. | 11794522 | Serial No. | 11537153 | Serial No. | 438_422 |
| Model No. | TTTC-U-002 | Model No. | CBL-M | Model No. | CAST-M | Model No. | CAST-M |
| Diameter | 1.688" | Diameter | 2.75" | Diameter | 2.75" | Diameter | 3.125" |

LOGGING DATA

General Data

| Pass No. | Depths From | Depths To | Well Head Pressure | Speed Ft/Min | Logging Run Comments |
|---|---|---|---|---|---|
| ONE | 7386' | SURFACE | 0 | 20 | MAIN LOG SECTION |

| Pass | GAMMA RAY Scale | | TRAVEL TIME Scale | | AMPLITUDE Scale | | MSG Scale | |
|---|---|---|---|---|---|---|---|---|
| No. | L | R | L | R | L | R | L | L |
| ONE | 0 | 150 | 450 | 250 | 0 | 100 | 200 | 1160 |

DIRECTIONAL INFORMATION

| | | | | | |
|---|---|---|---|---|---|
| Maximum Deviation | 92.2 | deg. @ | 7692' | KOP | 327' |

**HALLIBURTON**

## MAIN LOG SECTION

5" = 100'

Database File: habitat_5_5_6_cast.db
Dataset Pathname: CBL_FINAL
Presentation Format: hcbl
Dataset Creation: Fri Feb 14 22:33:03 2014
Charted by: Depth in Feet scaled 1:240

**HALLIBURTON**

## MAIN LOG SECTION

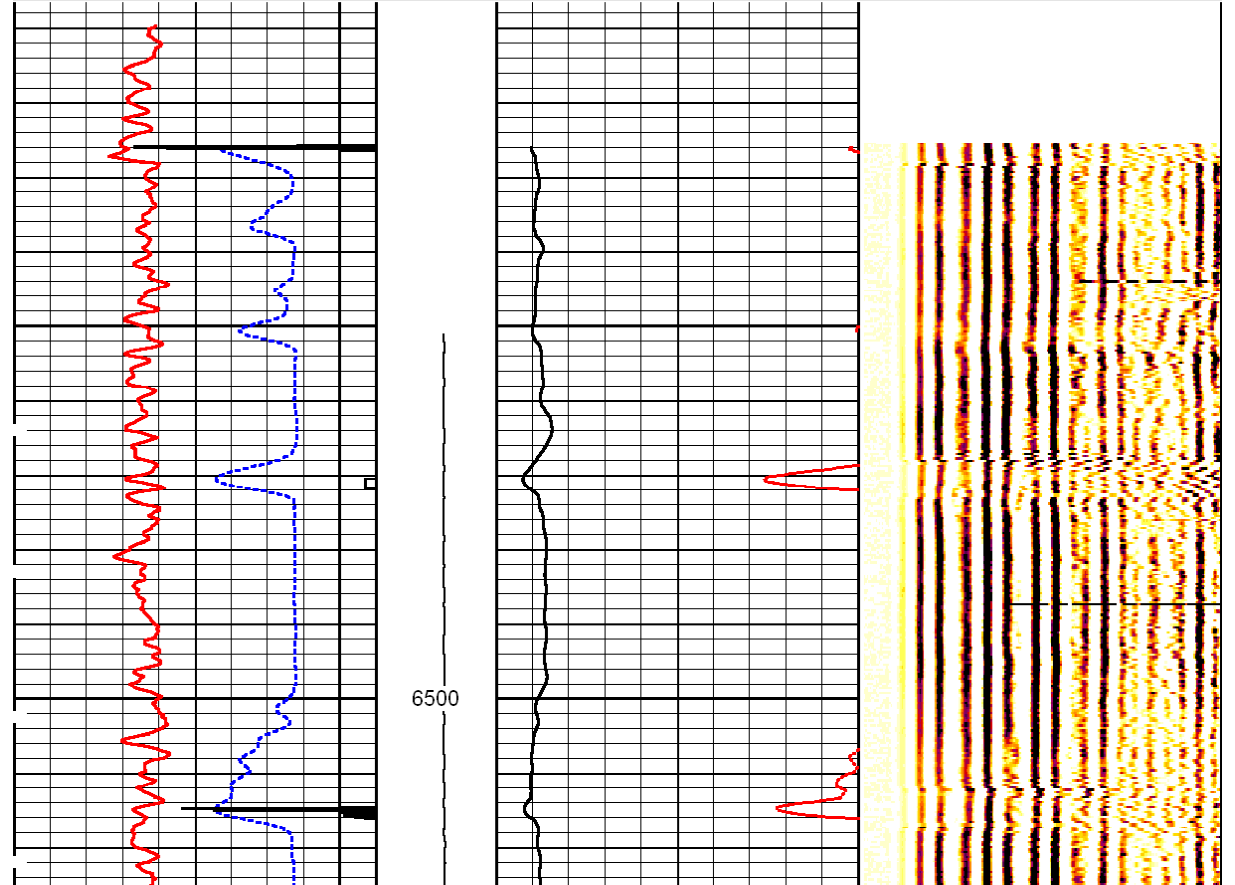
5" = 100'

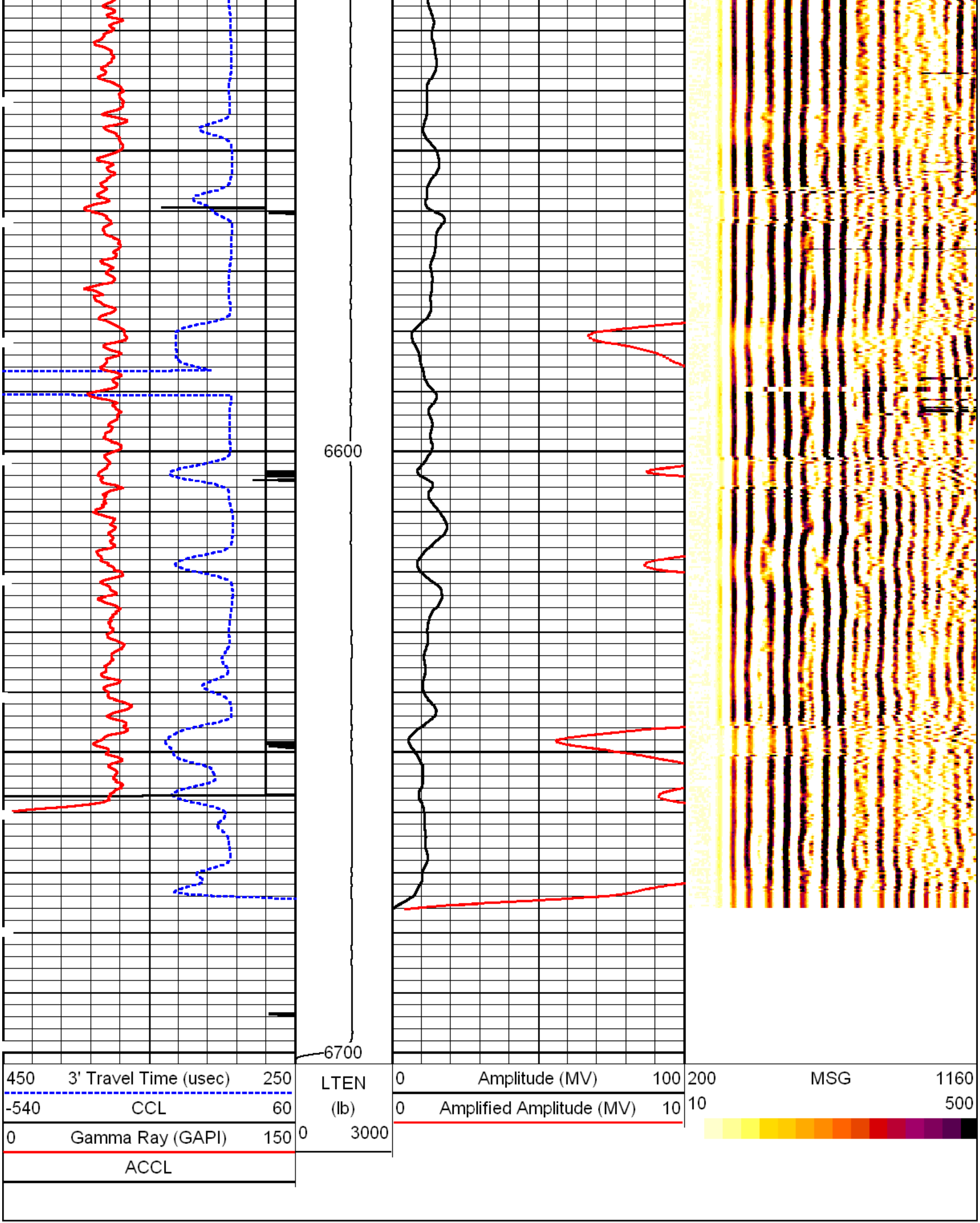
**HALLIBURTON**

## REPEAT LOG SECTION

5" = 100'

Database File: habitat_5_5_6_cast.db
Dataset Pathname: CBL_REP
Presentation Format: hcbl
Dataset Creation: Fri Feb 14 22:37:24 2014
Charted by: Depth in Feet scaled 1:240





HALLIBURTON

## REPEAT LOG SECTION

5" = 100'

## Log Variables

Database:D:\Warrior_data\habitat_5_5_6_cast.db
Dataset: field/well/run1/RPT2

**Top - Bottom**

| MSGGN | USERFTT<br>usec/ft | ZREF<br>MRayl | MudWgt<br>lb/gal | CASEWGHT<br>lb/ft | CASEOD<br>in | PERFS |
|---|---|---|---|---|---|---|
| 1 | 0 | 1.7 | 8.4 | 29 | 7 | 0 |

| TDEPTH<br>ft | BOTTEMP<br>degF | BITSIZE<br>in |
|---|---|---|
| 0 | 100 | 8.75 |

### Calibration Report

Database File: habitat_5_5_6_cast.db
Dataset Pathname: RPT3
Dataset Creation: Fri Feb 14 22:43:54 2014 by Log Halliburton Casedho

### Circumferential Acoustic Scanning Tool Shop Calibration Report

Serial-Model: 438_422-4 3/8 SCAN

Calibration Performed: Fri Feb 14 13:28:13 2014

| | Mudcell Transducer | | Main Transducer | | |
|---|---|---|---|---|---|
| | Measured | Expected | Measured | Expected | Units |
| W/O Calibrator | 48.60 | 44.00 | N/A | N/A | usec |
| W Calibrator | 40.00 | 35.00 | 54.70 | 50.00 | usec |

Calibrated Offsets

| Name | Value | Units |
|---|---|---|
| TCAL | 4.6995 | usec |
| MCAL | 5.5992 | usec |

### XY Accelerometers Calibration Report

Performed: Not Performed

| | Low Read. | High Read. | | Low Ref. | High Ref. | |
|---|---|---|---|---|---|---|
| X Accelerometer | 0.000 | 1.000 | gee | 0.000 | 1.000 | gee |
| Y Accelerometer | 0.000 | 1.000 | gee | 0.000 | 1.000 | gee |

### Cement Bond Log Shop Calibration Report

Serial-Model: 11794522-A

Calibration Performed: Fri Feb 14 22:24:17 2014

Free Pipe Calibration

| | Measured | Units |
|---|---|---|
| TT | 0.0 | usec |
| Amplitude | 826.3 | mV |
| Log Base Line | 23.4 | mV |

Calibration References and Gain

| Name | Value | Units |
|---|---|---|
| Pipe O.D. | 0.000 | in |
| Pipe Weight | 0.0 | lb/ft |
| Pipe Ref. Amp. | 62.2 | mV |
| Amp. Gain | 0.077 | |

### Gamma Ray Calibration Report

Type / Serial: 002 / 10000286

SHOP CALIBRATION Fri Feb 14 13:22:31 2014

| | Counts/Sec. | Gain | Offset | Jig | Units |
|---|---|---|---|---|---|
| Background | 46.6 | | | | cps |
| Calibrator | 344.6 | | | | cps |
| | | 1.3695 | | | GAPI/cps |

PRIMARY VERIFICATION Fri Feb 14 13:25:09 2014

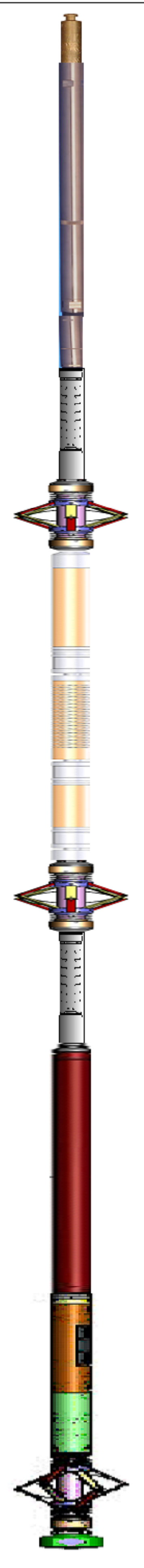
| | | | |
|---|---|---|---|
| Background | 64.0 | | cps |
| Calibrator | 471.2 | | cps |
| Difference | | 407.2 | GAPI |

BEFORE SURVEY VERIFICATION

| | | | |
|---|---|---|---|
| Background | 0.0 | | cps |
| Calibrator | 0.0 | | cps |
| Difference | | 0.0 | GAPI |

AFTER SURVEY VERIFICATION

| | | | |
|---|---|---|---|
| Background | 0.0 | | cps |
| Calibrator | 0.0 | | cps |
| Difference | | 0.0 | GAPI |

| Sensor | Offset (ft) | Schematic | Description | Len (ft) | OD (in) | Wt (lb) |
|---|---|---|---|---|---|---|
| | |  | STND_CH<br>1.4375 IN CABLE HEAD | 1.50 | 1.44 | 1.00 |
| CCL | 42.97 | | | | | |
| GR | 40.71 | | TTTCU-002 (10000286)<br>Through Tubing Telemetry Cartridge - Ultrawire | 7.66 | 1.69 | 37.00 |
| | | | XHU-003 (11721043)<br>Crossover Halliburton 1553 to Ultrawire | 1.58 | 1.69 | 7.00 |
| | | | FLEX<br>TMDL FLEX | 3.38 | 1.69 | 25.00 |
| | | | CASTM-CENT<br>CAST M INLINE CENTRALIZER | 2.16 | 3.13 | 25.00 |
| Temp | 27.62 | | | | | |
| AMP3FT | 25.37 | | HCBLM-A (11794522)<br>Halliburton HCBLM Tool | 9.38 | 2.75 | 116.00 |
| TT3FT | 25.37 | | | | | |
| | | | CASTM-CENT<br>CAST M INLINE CENTRALIZER | 2.16 | 3.13 | 25.00 |
| | | | FLEX<br>TMDL FLEX | 3.38 | 1.69 | 25.00 |
| | | | HAL-CAST-M-ELECT-CAST-M-Elect (11537<br>CAST M ELECTRONIC | 7.58 | 2.75 | 30.00 |
| LLMTEN | 0.00 | | | | | |
| UTCTIM | 0.00 | | | | | |
| LOCTIM | 0.00 | | | | | |
| SCAN | 0.00 | | HAL-CAST-M-4 3/8 SCAN (438_422)<br>4 3/8 SCAN CASTM | 7.78 | 4.38 | 276.00 |
| AccX1 | 0.00 | | | | | |
| AccY1 | 0.00 | | | | | |
| AccX2 | 0.00 | | | | | |
| AccY2 | 0.00 | | | | | |

Dataset: habitat_5_5_6_cast.db: field/well/run1/RPT2
Total Length: 46.55 ft
Total Weight: 567.00 lb
O.D. 4.38 in

| | |
|---|---|
| Company | MINERAL RESOURCES, INC. |
| Well | DT-HABITAT 5-5-6 |
| Field | WATTENBERG |
| County | WELD |
| State | CO |

HALLIBURTON

ACOUSTIC CEMENT
BOND LOG