DANIELSON 33-17 EBOOK

DECEMBER 2018

A collection of the primary documents associated with the drilling, completion and testing of the Kevin Dome Carbon Sequestration Project's Danielson 33-17 well.

Big Sky Carbon Sequestration Partnership – Phase III
U.S. Department of Energy (DOE)
National Energy Technology Laboratory (NETL)
DOE Award Number: DE-FC26-05NT42587

DANIELSON 33-17 EBOOK

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Permit Documents

Approved original

FORM NO. 22 R 10/09 SUBMIT IN QUADRUPLICATE TO: ARM 36.22.307 ARM 36.22.601

MONTANA BOARD OF OIL AND GAS CONSERVATION
2535 ST. JOHNS AVENUE, BILLINGS, MONTANA 59102

Application for Permit To:

Drill ☑ Deepen ☐ Re-enter ☐
Oil ☐ Gas ☑ Other ☐

Operator: Vecta Oil & Gas, Ltd
Address: PO Box 488
City: Cut Bank State: MT Zip: 59427
Telephone Number: (406) 873-9000

Surface Location of Well (quarter-quarter and footage measurements):
NWSE-Section 17-T35N-R1W
(2300' FSL x 1650' FEL)

Proposed Total Depth and Bottom-hole Location(s) if directional or horizontal well:
4,000' - TD

Lease Name: Danielson 33-17
Lease Type (Private/State/Federal): Private
Well Number: 33-17
Field Name or Wildcat: Kevin/Sunburst
Unit Name (if applicable):
Objective Formation(s): Duperow
Township, Range, and Section: Section 17-T35N-R1W
County: Toole
Elevation (indicate GL or KB): 3566' GL

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APR 28 2014
MONTANA BOARD OF OIL & GAS CONSERVATION - BILLINGS

Size and description of drilling/spacing unit and applicable order, if any: 640 acres Sec 17 Mt ~~Kevin/Sunburst~~ STATEWIDE
Formation at total depth: Duperow
Anticipated Spud Date: 5/16/2014

Hole Size	Casing Size	Weight / Foot	Grade (API)	Depth	Sacks of Cement	Type of Cement
17-1/2"	13-3/8"			40'	Gravel Pack	Control Set "C"
12-1/4"	9-5/8"	40#/ft	J55	500'	165 Sacks	Control Set "C"
8-3/4"	5-1/2"	17#/ft	J55	4000'	775 Sacks	Control Set "C"

Describe Proposed Operations:
Describe or attach labeled diagram of blowout preventer equipment. Indicate if air drilled or describe mud program.

Vecta Oil & Gas, Ltd proposes to drill a stratigraphic test. 13-3/8" conductor casing will be set to approximately 40'. 9-5/8" surface casing will be run to approximately 500' with good cement returns to surface. 5-1/2" casing will be run from approximately 500' to Total Depth. All geologic horizons will be evaluated to Total Depth. A core test will be run for approximately 180' from the Upper to the Middle portion of the Duperow formation. The well will be drilled with native water and drilling mud to casing point or TD. Open hole logs will be run from surface to TD. Blowout equipment will be as indicated on the attached exhibit and will be tested at regular intervals.

BOARD USE ONLY

Approved (date) 5/2/2014
By James W Halvorson
Title Geologist
Permit Fee $75.00
Check Number 16383 (Attached)
Permit Expires NOV - 2 2014
Permit Number 31368

THIS PERMIT IS SUBJECT TO THE CONDITIONS OF APPROVAL STATED ON THE BACK

API Number: 25 - 101 - 24243

The undersigned hereby certifies that the information contained on this application is true and correct.
Signed (Agent)
Title Patrick M. Montalban - Agent
Date 4/22/14
Telephone Number (406) 873-2235

Samples Required: NONE ____ ALL X FROM ____ feet to ____ feet
Core chips to address below, full cores to USGS, Core Laboratory, Arvada, CO. Required samples must be washed, dried and delivered prepaid to:
Montana Board of Oil and Gas Conservation
2535 St. Johns Avenue
Billings, MT 59102

FORM NO. 22 R 10/09

SUBMIT IN QUADRUPLICATE TO:

ARM 36.22.307
ARM 36.22.601

MONTANA BOARD OF OIL AND GAS CONSERVATION
2535 ST. JOHNS AVENUE, BILLINGS, MONTANA 59102

Application for Permit To:

Drill ✓ Deepen ☐ Re-enter ☐
Oil ☐ Gas ☐ Other _____ ☐

Operator: Vecta Oil & Gas, Ltd
Address: PO Box 488
City: Cut Bank State: MT Zip: 59427
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NWSE-Section 17-T35N-R1W
(2300' FSL x 1650' FEL)

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4,000' - TD

Lease Name:
Danielson 33-17

Lease Type (Private/State/Federal):
Private

Well Number:
33-17

Field Name or Wildcat:
Kevin/Sunburst

Unit Name (if applicable):

Objective Formation(s):
Duperow

Township, Range, and Section:
Section 17-T35N-R1W

County:
Toole

Elevation (indicate GL or KB):
3566' GL

Size and description of drilling/spacing unit and applicable order, if any:	Formation at total depth:	Anticipated Spud Date:
Kevin/Sunburst	Duperow	5/16/2014

Hole Size	Casing Size	Weight / Foot	Grade (API)	Depth	Sacks of Cement	Type of Cement
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BOARD USE ONLY

Approved (date) _____ Permit Fee _____
By _____ Check Number _____
Permit Expires _____
Title _____ Permit Number _____

THIS PERMIT IS SUBJECT TO THE CONDITIONS OF APPROVAL STATED ON THE BACK

API Number: 25 - _____ - _____

The undersigned hereby certifies that the information contained on this application is true and correct.

Signed (Agent) _____

Title Patrick M. Montalban - Agent

Date 4/22/14

Telephone Number (406) 873-2235

Samples Required: NONE _____ ALL _____ FROM _____ feet to _____ feet

Core chips to address below, full cores to USGS, Core Laboratory, Arvada, CO. Required samples must be **washed, dried** and delivered prepaid to:

Montana Board of Oil and Gas Conservation
2535 St. Johns Avenue
Billings, MT 59102

SUPPLEMENTAL INFORMATION

Note: Additional information or attachments may be required by Rule or by special request.

1. Attach a survey plat certified by a registered surveyor. The survey plat must show the location of the well with reference to the nearest lines of an established public survey.

2. Attach an 8 1/2 x 11" photocopy of that portion of a topographic map showing the well location, the access route from county or other established roads, residences, and water wells within a 1/2 mile radius of the well.

3. Attach a sketch of the well site showing the dimensions and orientation of the site, the size and location of pits, topsoil stockpile, and the estimated cut/fill at the corners and centerstake. (Note: the diagram need not be done by an engineer or surveyor). Attach a sketch of a top view and two side views of the reserve pit(s), if utilized. The reserve pit sketch must show the length, width, depth, cut and fill, amount of freeboard, area of topsoil stockpile, and the height and width of berms.

4. Describe the type and amount of material or liner, if any, to be used to seal the reserve pit. If a synthetic liner is used, indicate the liner thickness (mils), bursting strength, tensile strength, tear strength, puncture resistance, hydrostatic resistance, or attach the manufacturer's specifications.
   N/A
5. Describe the proposed plan for the treatment and/or the disposal of reserve pit fluids and solids after the well is drilled. If the operator intends to dispose of or treat the reserve pit contents off-site, specify the location and the method of waste treatment and disposal. (Note: The operator must comply with all applicable federal, state, county, and local laws and regulations with regard to the handling, transportation, treatment, and disposal of solid wastes.)
   Water to be hauled off site.
6. Does construction of the access road or location, or some other aspect of the drilling operation require additional federal, state, or local permits or authorizations? If yes, indicate the type of permit or authorization required:

- [✓] No additional permits needed
- [ ] Stream crossing permit (apply through county conservation district)
- [ ] Air quality permit (apply through Montana Department of Environmental Quality)
- [ ] Water discharge permit (apply through Montana Department of Environmental Quality)
- [ ] Water use permit (apply through Montana Department of Natural Resources and Conservation)
- [ ] Solid waste disposal permit (apply through Montana Department of Environmental Quality)
- [ ] State lands drilling authorization (apply through Montana Department of Natural Resources and Conservation)
- [ ] Federal drilling permit (specify agency)
- [ ] Other federal, state, county, or local permit or authorization: (specify type) _____

NOTICES:

1. Date and time of spudding must be reported to the Board verbally or in writing within 72 hours after the commencement of drilling operations.

2. The operator must give notice of drilling operations to the surface owner as required by Section 82-10-503, MCA, before the commencement of any surface activity.

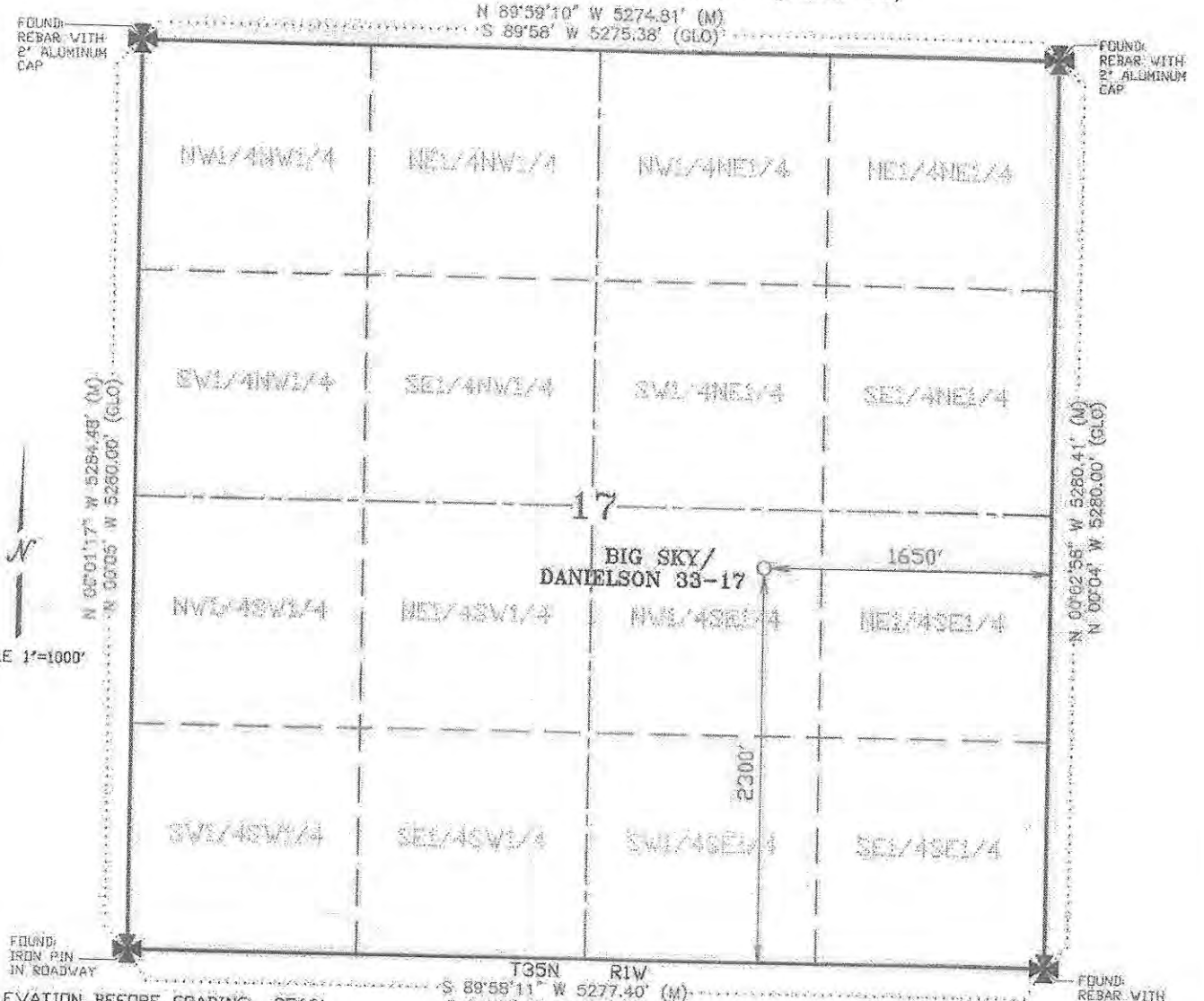
BOARD USE ONLY | CONDITIONS OF APPROVAL

The operator must comply with the following condition(s) of approval:

WARNING: Failure to comply with conditions of approval may void this permit.

WELL LOCATION

BIG SKY/DANIELSON 33-17
NW1/4SE1/4 SECTION 17, T35N, R1W, P.M.M.
TOOLE COUNTY, MONTANA
2300' FSL X 1650' FEL
ELEVATION BEFORE GRADING: 3566' (NAVD 88)



ELEVATION BEFORE GRADING: 3566'
BASIS - NAVD 88 / GEOID 12A

GEOGRAPHIC COORDINATES OF SURFACE LOCATION:
48°47'23.52" N 111°45'37.58" W (NAD 83 BASIS)

BASE POSITION FOR GEOGRAPHIC COORDINATES:
48°47'00.43" N 111°44'50.42" W (NAD 83 BASIS)
(OPUS DERIVED)

LOCAL GRID CENTER POSITION:
48°45'15.94" N 111°46'30.90" W (NAD 83 BASIS)

LAND USE: CULTIVATION

NO ATTEMPT HAS BEEN MADE BY THE SURVEYOR TO LOCATE UNDERGROUND STRUCTURES OR BURIED UTILITIES, AND APPROPRIATE AGENCIES AND SURFACE LANDOWNERS MUST BE CONTACTED FOR FIELD LOCATION OF ANY UNDERGROUND STRUCTURES OR BURIED UTILITIES BEFORE ANY CONSTRUCTION COMMENCES. CALL 1-800-424-5555 BEFORE ANY CONSTRUCTION COMMENCES.

NOTE: SUBDIVISION LINES AND GOVERNMENT LOT BOUNDARIES ARE SHOWN FOR DEPICTIVE PURPOSES ONLY AND SHOULD NOT BE USED FOR SCALING OR LOCATION PURPOSES.

ON THE BASIS OF MY KNOWLEDGE, INFORMATION AND BELIEF, I CERTIFY THAT AS A RESULT OF A SURVEY MADE ON THE GROUND TO THE NORMAL STANDARD OF CARE OF PROFESSIONAL LAND SURVEYORS PRACTICING IN THE STATE OF MONTANA, I FIND THE LOCATION DEFINED, BIG SKY/DANIELSON 33-17, AS SHOWN ON THE SUBJOINED DRAWING.

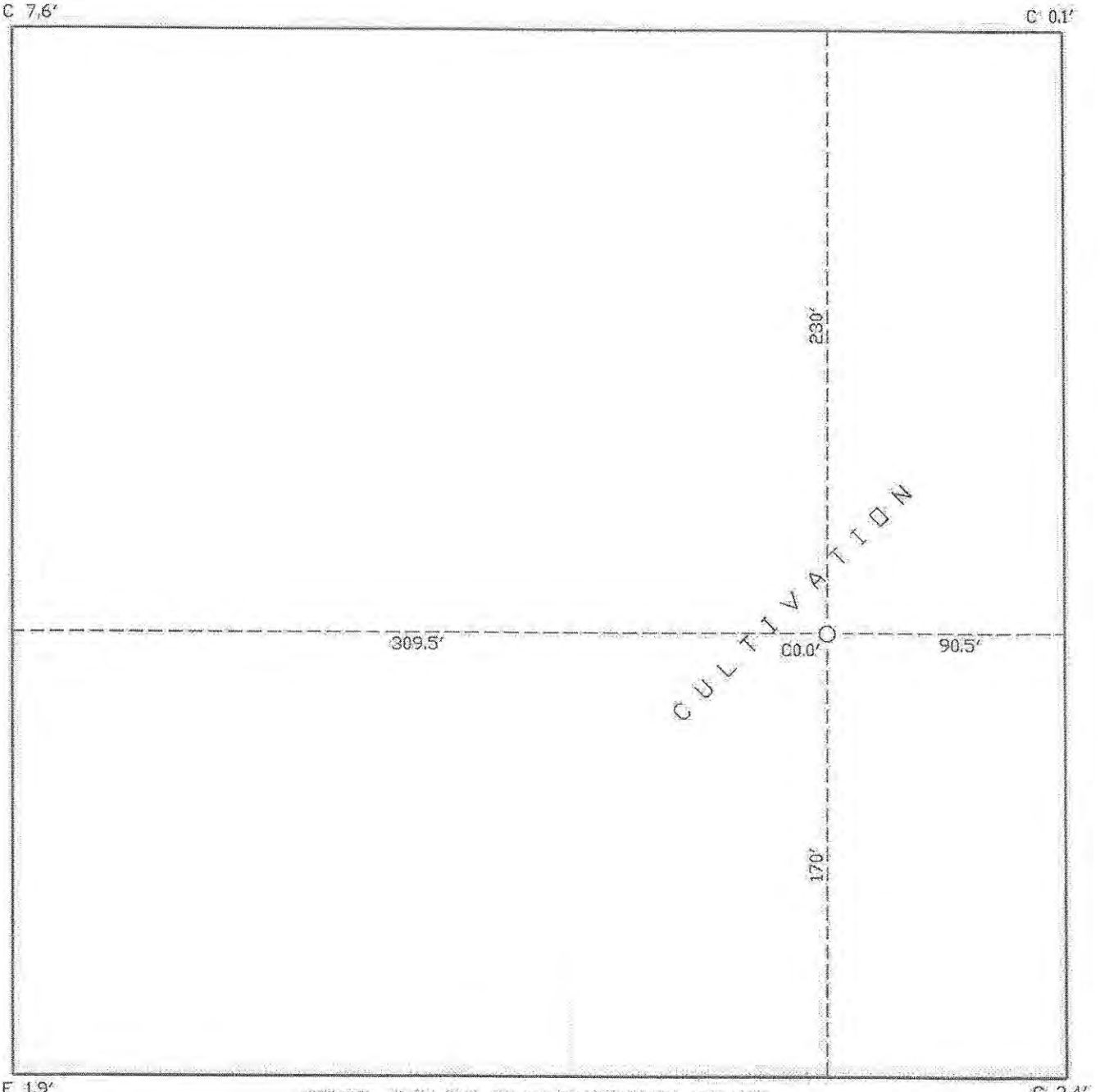
JOHN M. CICON

REGISTERED LAND SURVEYOR
JOHN M. CICON
No. 4039 LS
STATE OF MONTANA

REQUESTED BY: ALTAMONT OIL & GAS, INC. P.O. BOX 488 CUT BANK, MONTANA 59427	SCALE 1"=1000'
BIG SKY/DANIELSON 33-17 NW1/4SE1/4 SECTION 17, T35N, R1W, P.M.M.	04-15-14
CICON AND ASSOCIATES BOX 541 CHESTER, MONTANA 59522	JOB NO. 14-025
DRAWING NO. 14025ALTA.DWG	SHEET 1 OF 3

RIG PAD SITE

BIG SKY/DANIELSON 33-17
NW1/4SE1/4 SECTION 17, T35N, R1W, P.M.M.
TOOLE COUNTY, MONTANA



GENERAL CUTS AND FILLS OF PROPOSED RIG PAD

LAND USE: CULTIVATION

ELEVATION OF LOCATION BEFORE GRADING: 3566'
BASIS OF ELEVATIONS: NAVD 88

N

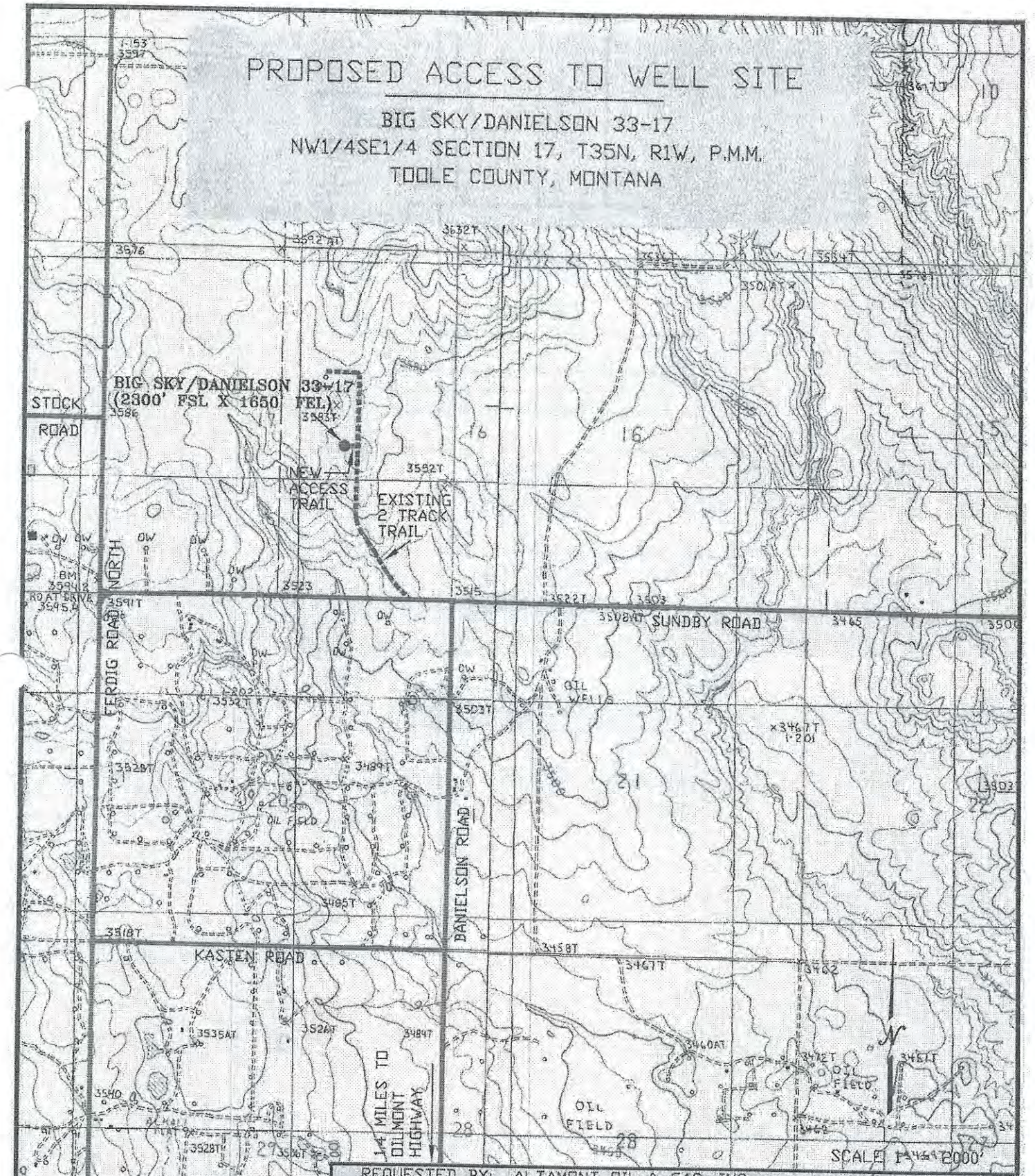
SCALE 1" = 60'

NOTE:
CUTS AND FILLS NOTED ARE FOR PURPOSES OF DESCRIBING THE GENERAL TOPOGRAPHY OF THE PROPOSED RIG PAD AND ARE NOT INTENDED FOR CALCULATION OF DIRTWORK QUANTITIES OR OTHER CALCULATIONS.

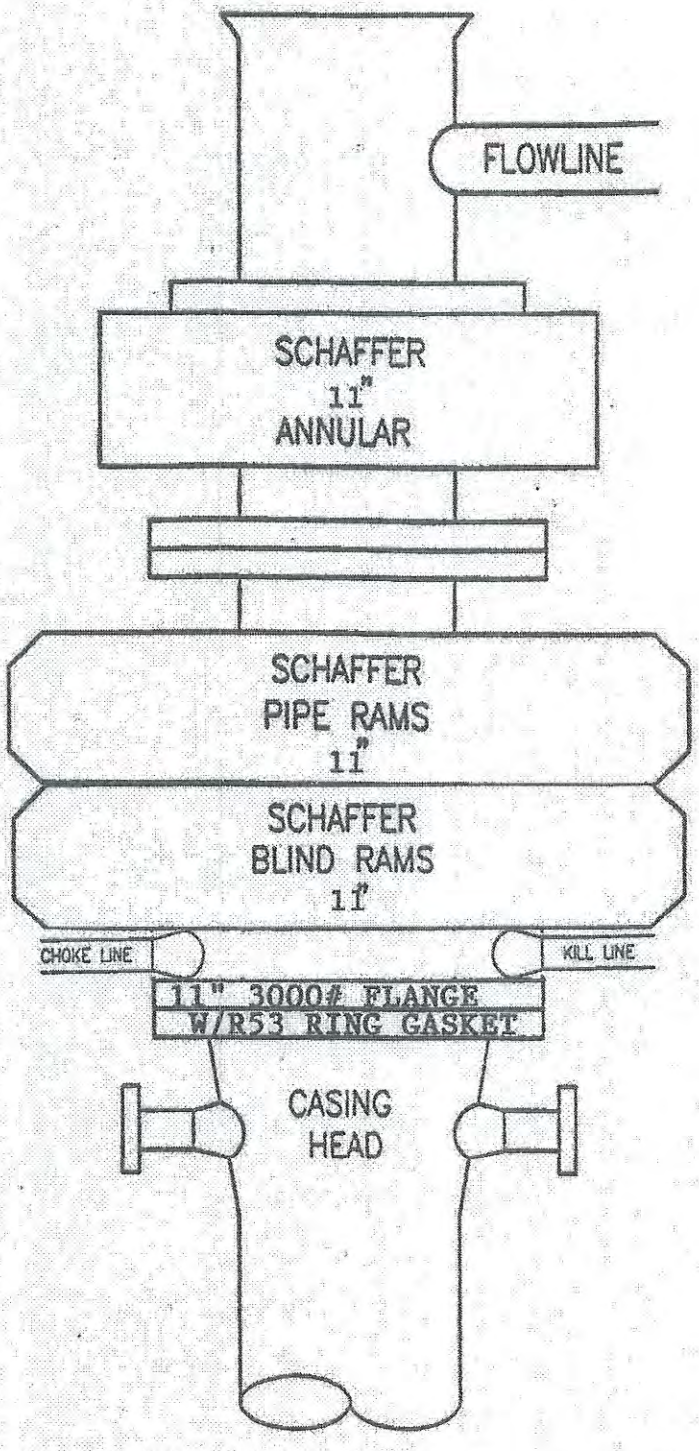
REQUESTED BY: ALTAMONT OIL & GAS, INC. P.O. BOX 488 CUT BANK, MONTANA 59427	SCALE 1"=60'
BIG SKY/DANIELSON 33-17 NW1/4SE1/4 SECTION 17, T35N, R1W, P.M.M.	04-15-14
CICON AND ASSOCIATES BOX 541 CHESTER, MONTANA 59522 DRAWING NO. 13070bCON.DWG	JOB NO. 14-025 SHEET 2 OF 3

PROPOSED ACCESS TO WELL SITE

BIG SKY/DANIELSON 33-17
NW1/4SE1/4 SECTION 17, T35N, R1W, P.M.M.
TOOLE COUNTY, MONTANA

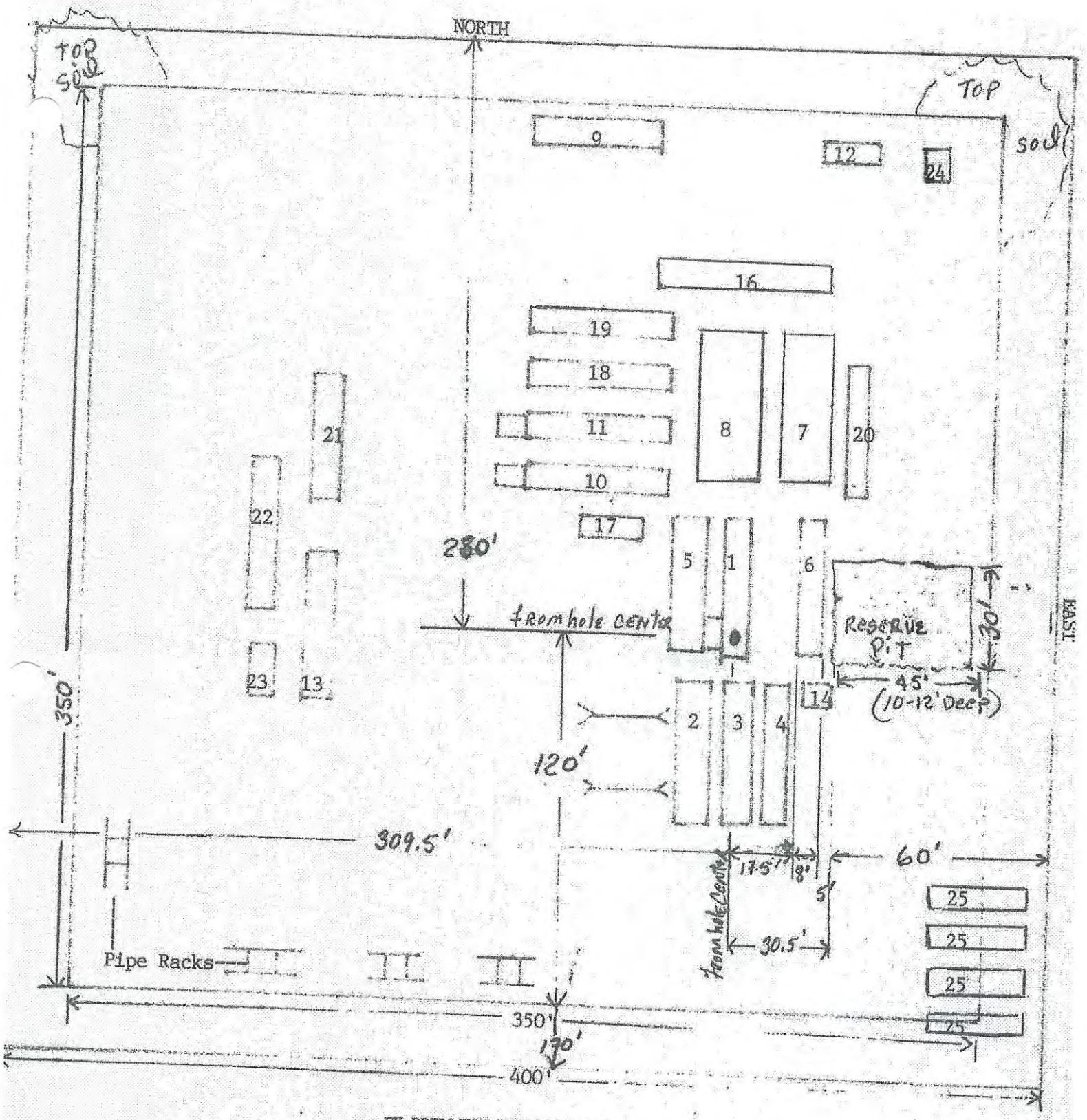


REQUESTED BY: ALTAMONT OIL & GAS, INC. P.O. BOX 488 CUT BANK, MONTANA 59427	SCALE 1"=2000'
BIG SKY/DANIELSON 33-17 NW1/4SE1/4 SECTION 17, T35N, R1W, P.M.M.	04-15-14
CICON AND ASSOCIATES BOX 541 CHESTER, MONTANA 59522	JOB NO. 14-025
DRAWING NO. 14025TOPO.DWG	PAGE 3 OF 3



3M

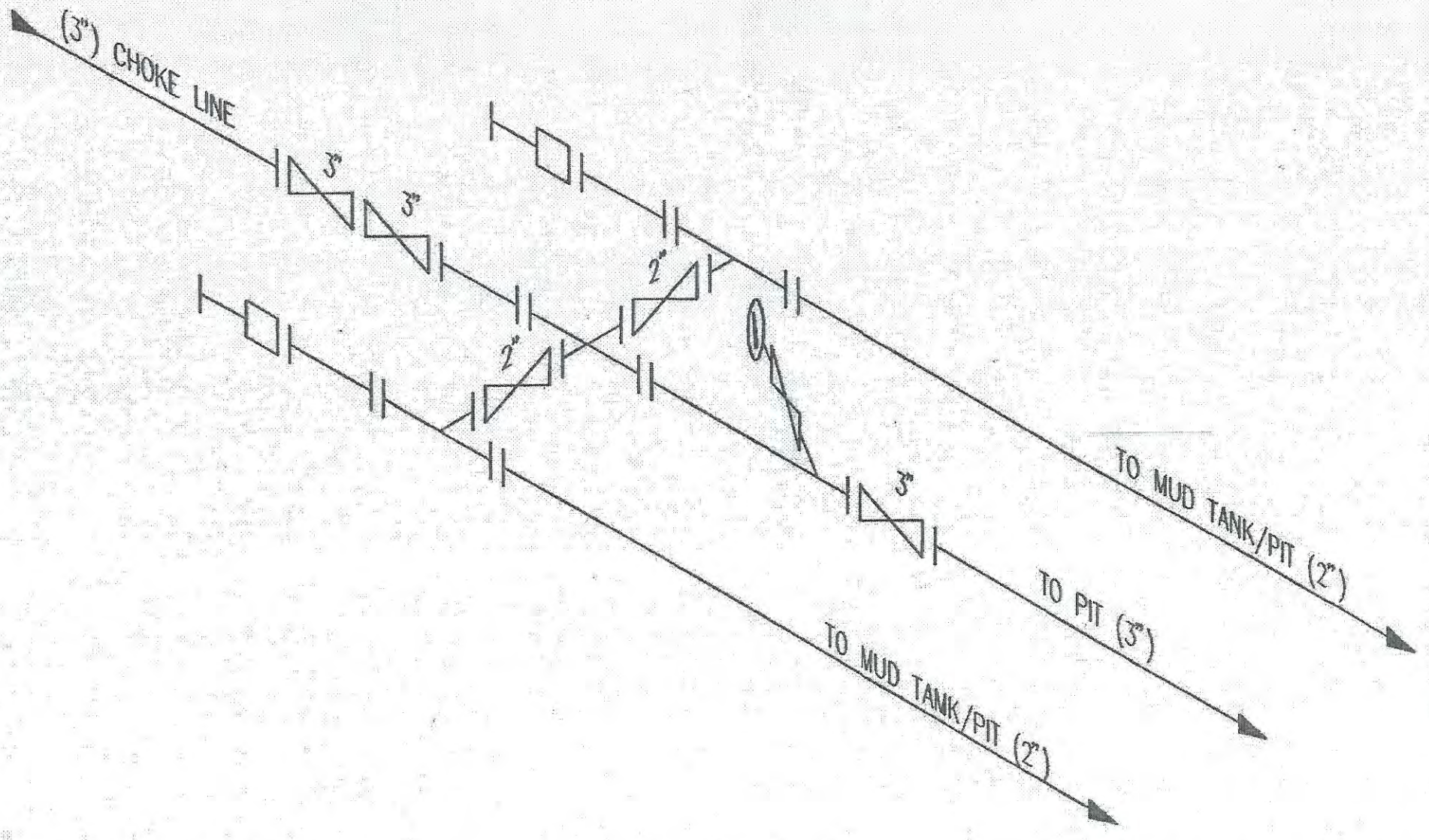
BLOWOUT PREVENTER
EQUIPMENT



FX DRILLING COMPANY, INC.,
Rig #5 Drilling Pad

● - hole

1. Substructure & Rig 5
2. Pipe Tub w/Casing Racks
3. Collar Tub
4. Collar Tub/Pipe Tub
5. Doghouse/Water Tank
6. Mud Tank #1
7. Mud Pump #1
8. Mud Pump #2
9. Mud Trailer
10. Generators, Accum.,/ Fuel Tanks
11. Generator #2
12. Trash Cage
13. Accum. Trailer-FX
14. BOP Valve Shack-Chock Manifold
15. Reserve Pit
16. Boiler
17. Air Heater
18. Hydraulic Power Unit/ Parts House
19. Tool House
20. Premix Mud Tank
21. Mud Logger Trailer
22. Directional Trailer
23. Sewage System
24. Portable Toilets



3 M

CHOKE MANIFOLD EQUIPMENT
SKID MOUNTED
ENCLOSED IN STEEL BUILDING

FORM NO. 2 R 10/09

ARM 36.22.307, 601, 605, 1003, 1004, 1011, 1013, 1103, 1222, 1240, 1301, 1306, 1309, and 1417

Submit In Quadruplicate To:

MONTANA BOARD OF OIL AND GAS CONSERVATION
2535 ST. JOHNS AVENUE
BILLINGS, MONTANA 59102

RECEIVED
MAY - 8 2014
MONTANA BOARD OF OIL & GAS CONSERVATION - BILLINGS

SUNDRY NOTICES AND REPORT OF WELLS

Operator Vecta Oil & Gas Ltd

Address PO Box 488

City Cut Bank State MT Zip Code 59427

Telephone (406) 873-9000 Fax (406) 873-2835

Location of well (1/4-1/4 section and footage measurements):
NWSE-Section 17-T35N-R1W
(2300' FSL x ~~1640'~~ 1650' FEL)

Lease Name: Danielson

Type (Private/State/Federal/Tribal/Allotted): Private

Well Number: #33-~~17~~ 17

Unit Agreement Name:

Field Name or Wildcat: Kevin/Sunburst

Township, Range, and Section: Section 17-T35N-R1W

County: Toole

API Number: 25 | 101 | 24243
State County Well

Well Type (oil, gas, injection, other): Gas

Indicate below with an X the nature of this notice, report, or other data:

Notice of Intention to Change Plans	✓	Subsequent Report of Mechanical Integrity Test	
Notice of Intention to Run Mechanical Integrity Test		Subsequent Report of Stimulation or Treatment	
Notice of Intention to Stimulate or to Chemically Treat		Subsequent Report of Perforation or Cementing	
Notice of Intention to Perforate or to Cement		Subsequent Report of Well Abandonment	
Notice of Intention to Abandon Well		Subsequent Report of Pulled or Altered Casing	
Notice of Intention to Pull or Alter Casing		Subsequent Report of Drilling Waste Disposal	
Notice of Intention to Change Well Status		Subsequent Report of Production Waste Disposal	
Supplemental Well History		Subsequent Report of Change in Well Status	
Other (specify) _____		Subsequent Report of Gas Analysis (ARM 36.22.1222)	

Describe Proposed or Completed Operations:

Describe planned or completed work in detail. Attach maps, well-bore configuration diagrams, analyses, or other information as necessary. Indicate the intended starting date for proposed operations or the completion date for completed operations.

Following is a change in the drilling program for the Danielson 33-17:

Wyoming Casing to drill and set 40' of 20" conductor casing. FX Drilling to drill 16-7/8" hole and run 13-3/8" surface casing to approximately 270' cementing with 165 sacks of cement with good returns to surface. FX Drilling to drill 1630' of 10-5/8" hole to accommodate approximately 1900' of 8-5/8" intermediate casing to be cemented with 325 sacks cement. FX Drilling to drill 1900' of 7-7/8" hole to accommodate approximately 3800' of 5-1/2" production casing to be cemented with 315 sacks of cement.

BOARD USE ONLY

Approved MAY 09 2014
Date

Name CHIEF FIELD INSPECTOR
Title

The undersigned hereby certifies that the information contained on this application is true and correct.

5/6/2015
Date

Signed (Agent)

Patrick M. Montalban - Agent
Print Name and Title

Telephone: (406) 873-9000

RECEIVED

FORM NO. 2 R 10/09 MAY 21 2014

MOUNTAINVIEW ENERGY LTD

ARM 36.22.307, 601, 605, 1003, 1004, 1011, 1013, 1103, 1222, 1240, 1301, 1306, 1309, and 1417

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2535 ST. JOHNS AVENUE
BILLINGS, MONTANA 59102

RECEIVED
5/21/2014 MAY 15 2014

MONTANA BOARD OF OIL & GAS CONSERVATION • BILLINGS

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State County Well

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Type (Private/State/Federal/Tribal/Allotted): Private

Well Number: #33-17

Unit Agreement Name:

Field Name or Wildcat: Kevin/Sunburst

Township, Range, and Section: Section 17-T35N-R1W

County: Toole

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Notice of Intention to Stimulate or to Chemically Treat		Subsequent Report of Perforation or Cementing	
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Notice of Intention to Abandon Well		Subsequent Report of Pulled or Altered Casing	
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Other (specify) _____		Subsequent Report of Gas Analysis (ARM 36.22.1222)	

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Following is a change in the drilling program for the Danielson 33-17:

On the north edge of the Danielson 33-17 location, a 12' x 20' pit is to be dug to a depth of 16' and lined. The pit liner will be 70'x120' of 25 mil thick (J25DT1).

Ran approximately 1,812' of 8-5/8", 24#/ft, J55, intermediate casing and cemented with 325 sacks cement. Good returns to surface with 15 bbls of cement to pit.

BOARD USE ONLY

Approved MAY 15 2014
Date

Original Signed By
David Popp, Chief Field Inspector
Name Title

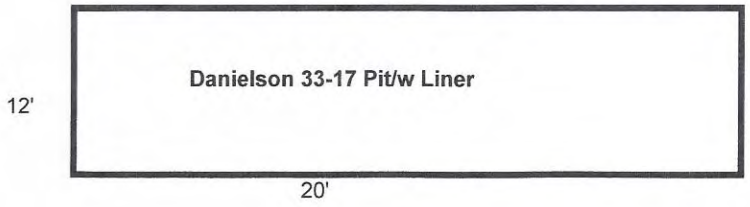
The undersigned hereby certifies that the information contained on this application is true and correct.

5/12/2014 [signature]
Date Signed (Agent)

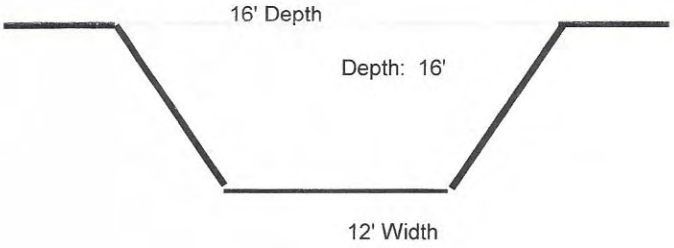
Patrick M. Montalban - Agent
Print Name and Title

Telephone: (406) 873-9000

Danielson 33-17
Earthen Pit/w Liner



20'



RECEIVED

SEP 08 2014

9/9/2014

FORM NO. 2 R 10/09

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MOUNTAINVIEW ENERGY LTD

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2535 ST. JOHNS AVENUE
BILLINGS, MONTANA 59102

RECEIVED

SEP - 2 2014

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Well Number:
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Field Name or Wildcat:
Kevin/Sunburst

Township, Range, and Section:
Section 17-T35N-R1W

County:
Toole

API Number:
25 | 101 | 24243
State County Well

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GAS

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Notice of Intention to Change Well Status		Subsequent Report of Production Waste Disposal	
Supplemental Well History		Subsequent Report of Change in Well Status	
Other (specify) Well Completion Procedure	✓	Subsequent Report of Gas Analysis (ARM 36.22.1222)	

Describe Proposed or Completed Operations:

Describe planned or completed work in detail. Attach maps, well-bore configuration diagrams, analyses, or other information as necessary. Indicate the intended starting date for proposed operations or the completion date for completed operations.

See Attached Completion Procedure

BOARD USE ONLY

Approved SEP 03 2014
Date

Original Signed By
David Popp, Chief Field Inspector
Name Title

The undersigned hereby certifies that the information contained on this application is true and correct:

8/28/14 Patrick M. Montalban
Date Signed (Agent)

by Jessica Vermulm

Patrick M. Montalban -Agent
Print Name and Title

Telephone: (406) 873-9000

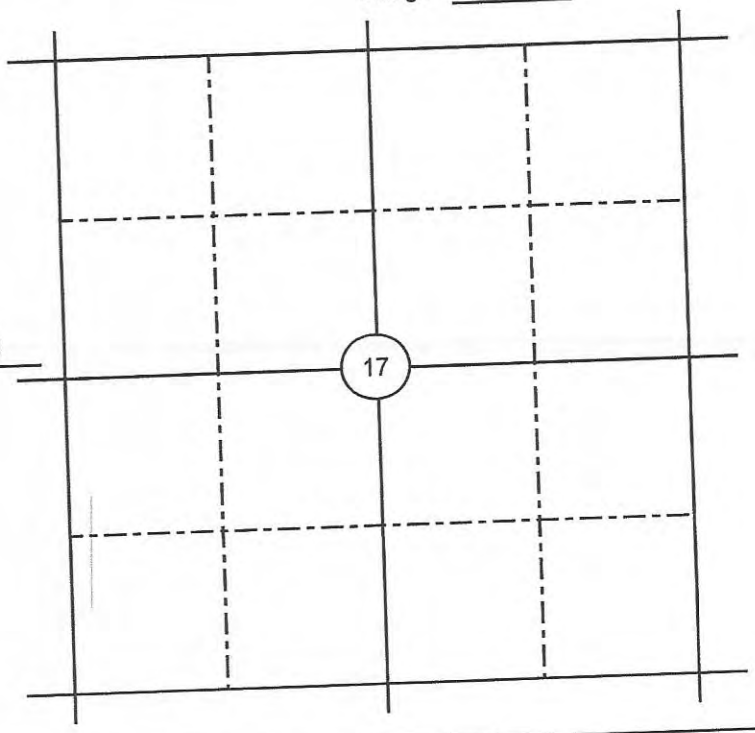
SUPPLEMENTAL INFORMATION

NOTE: Additional information or attachments may be required by Rule or by special request.

Plot the location of the well or site that is the subject of this notice or report.

Range 1W

Township 35N



BOARD USE ONLY	CONDITIONS OF APPROVAL

The operator must comply with the following condition(s) of approval:

Failure to comply with the conditions of approval may void this permit.

Procedure

1. Move in completion rig and support equipment and rig up. Rig up pump and tank. Spot frac tank on location. Install rig anchors if required.
2. Offload 2 7/8'' EUE 8rd 6.5#/ft. work string. Have enough tubing pup joints to space out packer and plug settings if needed.
3. Install 11'' 3000 psi by 7 1/16'' 3000 psi tubing head adapter.
4. Nipple up 7 1/16'' 3000 psi double ram BOP. Pressure test BOP and casing to 1500 psi high and 750 psi low.
5. Pick up 4 ¾'' rock bit and 2 7/8'' X 5 ½'' casing scraper on 2 7/8'' tubing and trip in hole strapping tubing in hole.
6. Tag up on PBTD at approximately 3800 ft.
7. Reverse circulate well with clean fresh water.
8. Trip out of hole laying down bit and scraper.
9. Rig up H2S monitoring company.
10. Rig up test separator with liquid line to frac tank and gas line to a blouey pit or vent stack. If digital orifice meter is used make sure it is calibrated for CO2 and not methane.
11. Run Correlation Strip Log from TD to 100'-200' above top perfs with 250 psi applied to casing. ***Schlumberger had a CBL- need to discuss further for their reasoning.**
12. Rig perforators to well. Run full lubricator.
13. Perforate first set of Lower Duperow perfs: 3669'-3678', 3658'-3665' with 4 shots per foot using 3 1/8' gun. All depths based on open hole logs. ***Note- Schlumberger had 6 shots per foot, need to discuss reasoning at CWOP.**
14. If well kicks off flowing allow well to flow up casing to frac tank. Flow well until dead or if no flow proceed to next step. If well flows for extended time then kill with 2% KCL water.
15. Pick up test packer and retrievable bridge plug. Run a four foot 2 7/8 '' pup joint, 1.75'' X-nipple, a four foot 2 7/8'' pup joint and 1.75'' X-N profile above bridge plug retrieving tool. Test packer should have minimum 2'' bore. Above packer run standard 2 7/8'' seating nipple (2.21''-2.28''). Trip testing assembly into well on 2 7/8'' tubing. ***Note- we might not need to run bridge plug as we are would already have isolation with the packer above the perfs and TD below the perfs.**
16. Isolate first set of Lower Duperow perforations by setting packer at 3625' isolating perforations at 3669'-3678' and 3659'-3665'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
17. Rig to swab directly to frac tank. Put check valve in line at frac tank to prevent fluid siphoning back into well. (Best to swab into mix line) Rig lines in such a way that if well kicks off it can be switched to test separator. Keep accurate swab records.
18. Swab test well to frac tank. If well kicks off turn through test separator and obtain gas analysis. Flow test well overnight to get gas rate, gas samples, and liquid samples.
19. If no fluid entry is obtained then proceed to step 20.
20. After determining fluid entry and getting gas/liquid rate kill well with fresh water
21. Release packer and retrieve bridge plug. Trip out 2 7/8" tubing working string and BHA.
22. Rig perforators to well. Run full lubricator.
23. Perforate next set of Lower Duperow perfs: 3588'-3593', 3597'-3602' with 4 shots per foot using 3 1/8' gun. All depths based on open hole logs.

24. If well kicks, repeat steps 14 & 15.
25. Isolate this set of perforations by setting bridge plug at +/- 3610' and packer at 3565' isolating perforations at 3588'-3593', 3597'-3602'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
26. Repeat steps 17-21
27. Rig perforators to well. Run full lubricator.
28. Perforate next set of Lower Duperow perfs: 3491'-3498', 3502'-3513', 3536'-3542' with 4 shots per foot using 3 1/8' gun. All depths based on open hole logs.
29. If well kicks, repeat steps 14 & 15.
30. Isolate this set of perforations by setting bridge plug at +/- 3550' and packer at 3480' isolating perforations at 3491'-3498', 3502'-3513', 3536'-3542'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
31. Repeat steps 17-21
32. Rig perforators to well. Run full lubricator.
33. Perforate next set of Lower Duperow perfs: 3354'-3374', 3403'-3414' with 4 shots per foot using 3 1/8' gun. All depths based on open hole logs.
34. If well kicks, repeat steps 14 & 15.
35. Isolate this set of perforations by setting bridge plug at +/- 3420' and packer at 3345' isolating perforations at 3354'-3374', 3403'-3414'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
36. Repeat steps 17-21
37. Rig perforators to well. Run full lubricator.
38. Perforate next set of Lower Duperow perfs: 3288'-3336' with 4 shots per foot using 3 1/8' gun. All depths based on open hole logs.
39. If well kicks, repeat steps 14 & 15.
40. Isolate this set of perforations by setting bridge plug at +/- 3280' and packer at 3340' isolating perforations at 3288'-3336'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
41. Repeat steps 17-21
42. Rig perforators to well. Run full lubricator.
43. Perforate next set of Lower Duperow perfs: 3208'-3222' with 4 shots per foot using 3 1/8' gun. All depths based on open hole logs.
44. If well kicks, repeat steps 14 & 15.
45. Isolate this set of perforations by setting bridge plug at +/- 3230'' and packer at 3345' isolating perforations at 3208'-3222'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
46. Repeat steps 17-21
47. After initially testing each zone and based on the outcome of the tests a decision might be made to acidize the perforations. If required then isolate and acidize each set of perforations with 250- 1000 gallons 15% breakdown acid. After acidizing each zone separately then move bridge plug below all perforations and packer above all perforations and swab and flow test as in Steps 17 and 18. Based on the outcome there may be a need for individual re- testing of all the zones. If required repeat settings above to test.
48. **After testing all four of the Lower Duperow intervals depending upon outcome a flow test may be performed. If so a procedure will be provided as to the length of flow period and shut in time. The**

flow test will require gauges and will be similar to the procedure starting in Step 48 below. If zones are unproductive or wet then Lower Duperow perforations should be abandoned by setting a cast iron bridge plug with an appropriate amount of cement dump bailed on top of the plug or by setting a cement retainer and squeezing perfs with cement. Consult State regulators as to plugging method.

49. **Note: After acidizing if lower zones are thought to be wet then additional testing might be required to confirm production. If lower zones are wet then depending upon how the Lower Duperow perforation produced a mitigation strategy will need to be developed. If all zones are gas producing the procedure follows:**
50. Shut well in and rig slickline to well. Trip in well with slickline and hang tandem memory gauges in X-nipple profile below packer. Rig down slickline.
51. Open well up flowing through test separator. Attempt to stabilize gas rate at approximately 300-500 MCF/D. Control flow with choke on separator and use line heater to prevent freeze off. Flow test well approximately 72 hours **Note:** A detailed test procedure will be provided.
52. Shut well in for buildup. Make sure there are no surface leaks. Bull plug connections as necessary.
53. After 96-120 hours retrieve memory gauges with slickline. Download data and send out for interpretation. 5d (Standby time)
54. Load tubing with fresh water.
55. Release packer and trip in hole to latch onto bridge plug and trip out of hole with bridge plug and packer.
56. If required set CIBP above perforations 3354-3374. **Note: This step may not be required.**
57. Trip in hole with production packer. Production packer detail previously identified. Have plug in profile on top of packer.
58. Set packer and lower completion assembly at +/- 3270'. Reverse circulate well with 2% KCL water with oxygen scavenger and corrosion inhibitor.
59. Trip out of hole laying down work string.
60. Nipple down BOP and upper tree assembly.
61. Rig down all test equipment. Haul off fluids to disposal well.
62. Release rig and move off location.

Shelby

FORM NO. 20 R 10/09

SUBMIT IN QUADRUPLICATE TO

ARM 36.22.307
36.22.1308

MONTANA BOARD OF OIL AND GAS CONSERVATION
2535 ST. JOHNS AVENUE BILLINGS, MONTANA 59102

RECEIVED
MAR 30 2018
MONTANA BOARD OF OIL & GAS CONSERVATION • BILLINGS

Notice of Intent to Change Operator

The undersigned Transferor hereby notifies the Board of Oil and Gas Conservation of its intention to transfer ownership and/or operation of the following wells to the undersigned Transferee.

Lease Name:	Lease type:(Private, State, Federal, Indian)
Danielson	Private
County:	**Field name:**
Toole	Kevin Sunburst

Description of wells: Include API well number, well name and number, and exact location of the well including Township, Range, Section, quarter-quarter and footage measurements, and lease type . (Federal, Indian, Private, State) Attach additional sheets as necessary.

API No. 25-101-24243-0000
Danielson 33-17
NWSE-Section 17-T35N-R1W
(2300' FSL x 1650' FEL)

Lease Type: Private

RECEIVED
APR 26 2018
Montana Board of Oil
Gas Cons. - Shelby

Number of Wells to be Transferred: 1

Effective Date of Transfer: 2/22/18

Transferor's Statement:

I hereby designate the Transferee named herein as the owner and/or operator of record of the above described well(s). I acknowledge that the Transferor continues to be responsible for said well(s) and all associated equipment and facilities until such time as this transfer is approved by the Montana Board of Oil and Gas Conservation. I certify that the information contained herein is true and correct:

Company: Vecta Oil and Gas Ltd
Street Address: 1450 Lake Robbins Drive, Suite 305
P.O. Box:
City, State, ZIP: The Woodlands, TX 77380-3263
Signed:
Print Name: Bryan DeVault
Title: President & CEO
Telephone: (281) 466-1961
Date: 3/7/18

Transferee's Statement:

I hereby accept the designation of operator/owner for the above described well(s). I understand that this transfer will not be approved until the Transferee has complied with the Board's bonding requirements. I acknowledge that under Section 82-11-101 MCA, the Transferee herein is responsible for the costs of proper plugging and restoration of the surface of the well(s) described above. I certify that the information contained herein is true and correct:

Company: Montalban Oil & Gas Operations, Inc
Street Address: 33 - 1st Avenue SW
P.O. Box: PO Box 200
City, State, ZIP: Cut Bank, MT 59427
Signed:
Print Name: Joseph P. Montalban
Title: Vice President
Telephone: (406) 873-2235
Date: 2/22/18

BOARD USE ONLY

Approved: APR 17 2018
Original Signed By:
Jennifer Breton, Program Specialist
Name / Title

Oper. No. / Bond No.

Field Office Review	Date	Initial
Inspection	4/10/18	GK
Records Review		
Operations		

Oper No. / Bond No.

Final Change of Operator List

From **723** **Vecta Oil & Gas, Ltd.** **To** **111** **Montalban Oil & Gas Operations, Inc.** **Wells Listed:** **1** **Job:** **7801** **Approved:** **4/17/2018**

Well		Location					District	Requested	Current Bond	*Not Transferred*
101-24243	Danielson 33-17	35 N	1 W	17	NW SE	SI GAS	14	723 / M1 To: 111 / G2	(111 / G2)	☐

Montana Department of
ENVIRONMENTAL QUALITY

Steve Bullock, Governor
Tracy Stone-Manning, Director

P. O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • Website: www.deq.mt.gov

April 29, 2014

LEE SPANGLER
MSU - ALTAMONT
PO BOX 173905
BOZEMAN MT 59717

RE: **Confirmation Letter, Notice of Intent (NOI) Number MTR105528**
MSU ALTAMONT - BIG SKY DANIELSON 33-7

Dear LEE SPANGLER:

The Department of Environmental Quality (DEQ) is acknowledging receipt on 4/25/2014 of your complete Notice of Intent (NOI) for permit coverage under the January 1, 2013, *General Permit for Storm Water Discharges Associated with Construction Activity* (General Permit). For administrative purposes, you have been assigned permit number MTR105528. Please include this permit number on any future correspondence with DEQ regarding this site.

This letter acknowledges receipt of the complete NOI and does not provide a DEQ determination of the validity of the information you provided. Your eligibility for coverage under the General Permit is based on the validity of the certification you provided. Your signature on the NOI certifies that you have read, understood, and are implementing all of the applicable requirements.

The General Permit requires you to implement the Storm Water Pollution Prevention Plan (SWPPP) and defines inspection and record keeping requirements. Records defined in Part 2.5 are required to be maintained on-site with the designated SWPPP Administrator. An electronic copy of the Permit and additional guidance materials can be viewed and downloaded at http://deq.mt.gov/wqinfo/mpdes/stormwaterconstruction.mcpx.

Coverage under the General Permit remains effective until you submit a complete Notice of Termination (NOT). Your signature on the NOT certifies that you have achieved final stabilization, removed your temporary Best Management Practices, and have paid all applicable fees. Failure to submit a complete NOT will result in the assessment of additional annual permit fees, which must be paid by the owner or operator.

Coverage under this General Permit does not waive your obligation to obtain coverage under other applicable permits.

If you have any questions regarding the requirements of the General Permit, please feel free to contact the Water Protection Bureau at (406) 444-3080.

Sincerely,

Janie Petaja

Janie Petaja
Data Control Tech
Water Protection Bureau
jpetaja@mt.gov

Attachments: General Permit

GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

PERMIT NUMBER MTR100000

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

AUTHORIZATION TO DISCHARGE UNDER THE MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with Section 75-5-101 *et seq.*, Montana Codes Annotated (MCA), Administrative Rules of Montana (ARM) 17.30.1301 *et seq.*, and ARM 17.30.1101 *et seq.*, owners and operators (permittees) with authorization under this "General Permit for Storm Water Discharges Associated with Construction Activity" (permit) are authorized to discharge storm water in accordance with the conditions set forth in Parts 1, 2, 3, 4, and 5 of this permit.

This permit shall become effective January 1, 2013.

This permit and the authorization to discharge shall expire at midnight, December 31, 2017.

FOR THE MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Paul Skubinna, Program Manager
Water Quality Discharge Permit Section
Water Protection Bureau
Permitting & Compliance Division

Issuance date: October 25, 2012

DEQ
Montana Department
of Environmental Quality

May 18, 2015

LEE SPANGLER
MSU - ALTAMONT
PO BOX 173905
BOZEMAN MT 59717

RE: **Confirmation Letter, Termination of Permit Authorization Number MTR105528**
MSU ALTAMONT - BIG SKY DANIELSON 33-7

Dear LEE SPANGLER:

This letter serves as confirmation that the Department has received a complete Notice of Termination (NOT) form on 5/12/2015. This termination is for the authorization to discharge storm water from the above site in accordance with the Department's *General Permit for Storm Water Discharges Associated with Construction Activity* (General Permit) and the information provided in your Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP). The reason for terminating this permit authorization is because the construction project site has achieved "Final Stabilization" as defined in the General Permit.

Termination of this permit authorization does not relieve the owner or operator from responsibility for compliance with any other applicable federal, state, or local law, rule, standard, ordinance, order, judgment or decree. Termination of this permit authorization does not remove the owner or operator from their obligation to obtain and maintain other permit(s) to discharge sewage, industrial wastes, or other wastes into any state waters, or from associated liability for discharging wastes into state waters.

Permittees are required to pay the applicable annual fee of the calendar year in which they have permit coverage, as defined in 75-5-516, MCA and 17.30.201, ARM. Your NOT has been processed and your authorization is terminated. To bring your account current, an invoice for outstanding fees is enclosed.

The Department will keep this information on file. If you have any questions, please contact the Water Protection Bureau at (406) 444-3080. Thank you for your cooperation in protecting Montana's waters.

Sincerely,

Janie Petaja

Janie Petaja
Data Control Tech
Water Protection Bureau
jpetaja@mt.gov

encl: invoice

DANIELSON 33-17 EBOOK

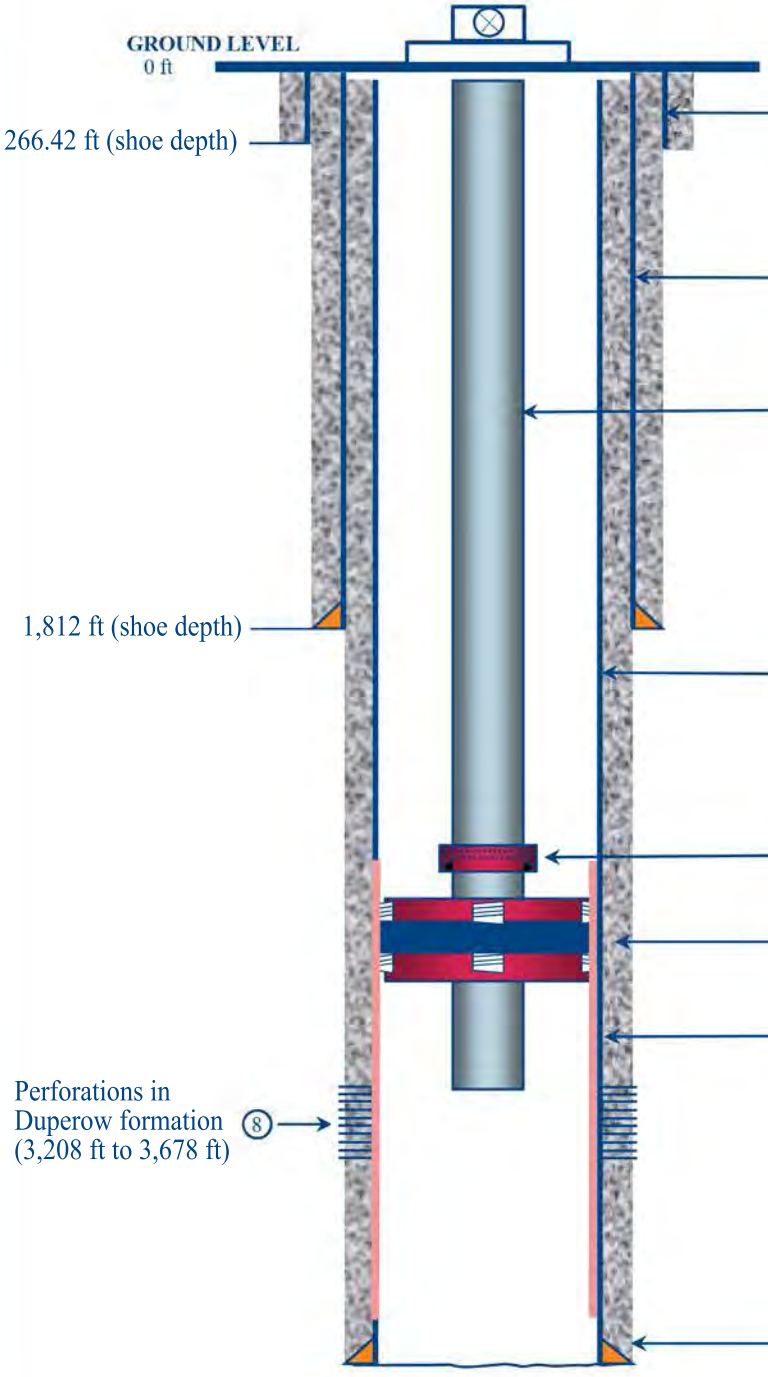
Drilling Documents

BIG SKY CARBON SEQUESTRATION PARTNERSHIP

Schlumberger Carbon Services

Producing Well 1

COMPLETION DETAIL



1. 13-3/8" 54.5 lb/ft J-55 surface casing in 16-7/8" open hole to 266.42 ft (shoe depth) and cemented to surface
2. 8-5/8" 24 lb/ft J-55 intermediate casing in a 10-5/8" open hole to 1,812 ft (shoe depth) and cemented to surface in two stages
3. 2-7/8" 6.5 lb/ft L-80 or J-55 production tubing w/ premium gas-tight connections (possibly lined)
4. 5-1/2" 17 lb/ft J-55 long string casing from surface to 3,799 ft
5. On/off tool above 5-1/2" x 27/8 Packer
6. 5-1/2" x 27/8 Packer
7. 5-1/2" 17 lb/ft, 13CH chrome casing from 3,226.9 ft to 3,543.94 ft in 7-7/8" open hole and cemented to surface
8. Perforations in Duperow formation (3,208 ft to 3,678 ft)
9. Total Depth: 3,799 ft (shoe depth)

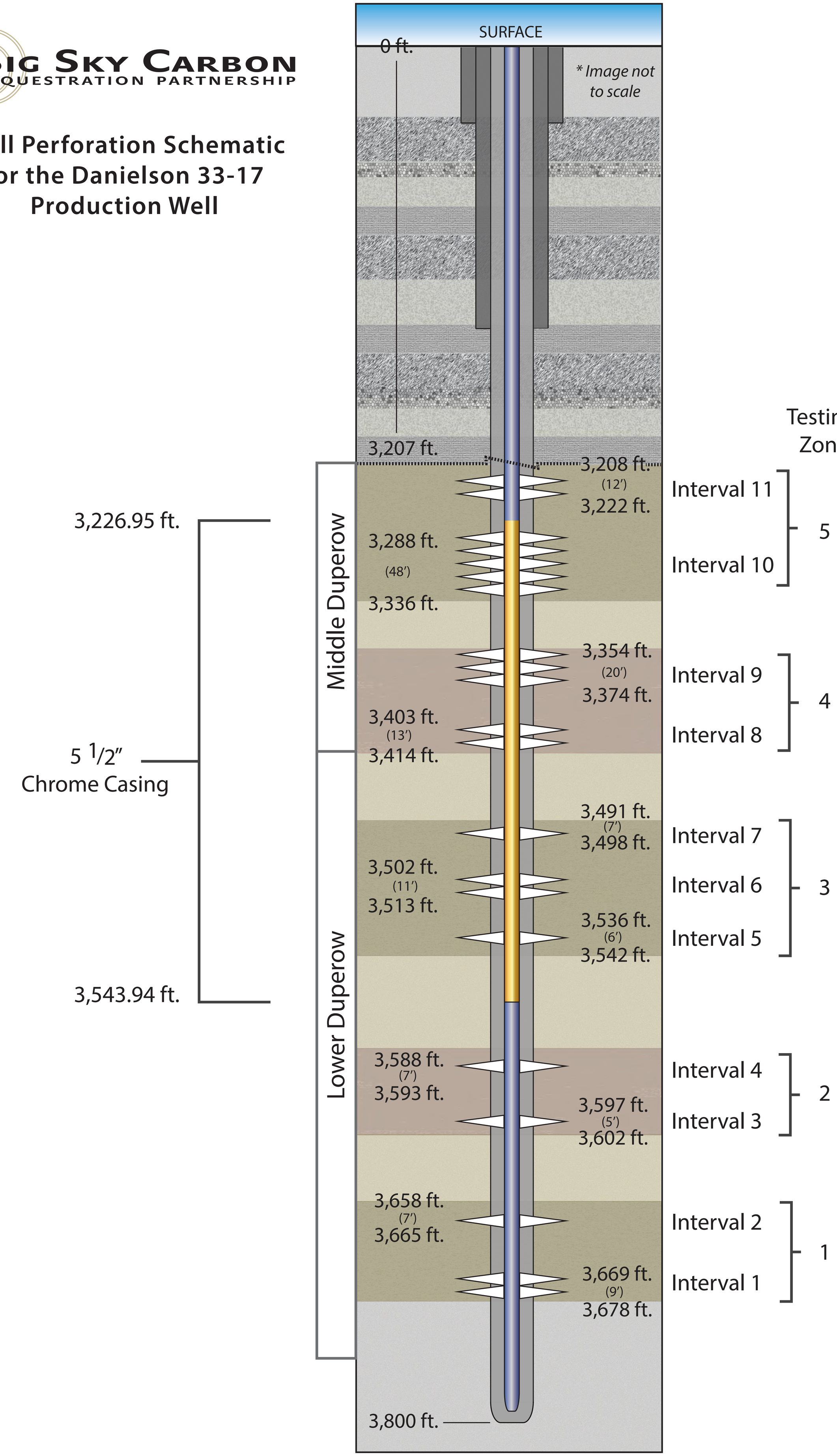
Note: All Casings Cemented to Surface
Drawing not to scale

Date: 12/10/2014

Drawing not to scale

BIG SKY CARBON
SEQUESTRATION PARTNERSHIP

Well Perforation Schematic for the Danielson 33-17 Production Well



April 29, 2014

ALTAMONT/VECTA OIL & GAS, LTD/BIG SKY
Danielson 33-17

LOCATION: NWSE - SECTION 17 – T35N – R1W
(2300' FSL – 1650' FEL)
TOOLE COUNTY, MONTANA

DRILLING—CORING---LOGGING—CASING—PROGRAM—PROGNOSIS
GROUND ELEVATION (BEFORE GRADING) 3566' GL – 3577' KB

Altamont Oil & Gas Operations, Inc (Altamont) will prepare roads, will make locations, dig reserve pit, install liner under tanks, substructure, set mud tanks, and install liner in reserve pit and line with netting. FX Drilling Company will move in, rig up and spud well May 2, 2014, weather permitting.

CONDUCTOR CASING

Wyoming Casing will drill 40' of 20" conductor casing prior to moving FX Drilling to location. Wyoming Casing to also drill cellar approximately 4ft deep.

SURFACE CASING

1) **Drill about 250' (plus or minus) of 16 7/8" surface hole to accommodate approximately 250' (plus or minus) of 13-3/8" pipe. Run approximately 6 joints of 13-3/8", 54.5#/ft, J55, 8rd, ST&C, Rge 3 surface casing.**

2) **Haul drilling mud from previous well for spud mud when available. Mix gel, lime and LCM as needed to drill surface hole. CONTRACTOR MUST MUD UP WITH 40 – 50 VISCOSITY AND LCM, WHEN NEEDED, PRIOR TO SPUDDING WELL. MAKE DUMMY TRIP PRIOR TO RUNNING SURFACE.**

3) **Run guide shoe on bottom joint and float collar on first joint and four (4) centralizers (every other joint). Cement surface pipe as per Sanjel's program. Obtain good returns to surface. Gravel pack, if needed. Use thread-lock on the shoe and bottom joint. Space out so that 13 5/8 X 13 3/8 SOW and adapter spool and stack will fit beneath rig allowing enough room to pick up and set the casing slips**

4) **DO NOT SLACK OFF BEFORE EIGHT (8) HOURS W.O.C. TIME. Thereafter, nipple up, test BOP's after drilling shoe. DRILL OUT AFTER TWELVE (12) HOURS. Test casing and BOPs to 500 pounds above shoe and 300 pounds below.**

5) **STRAIGHT HOLE SURVEYS: Run every 100' on surface hole and at bottom of surface hole. Thereafter, Contractor and Phoenix Technology Services must perform straight hole surveys every 30'. Maximum surface hole deviation allowed is one half degree per 100' (1/2°/100') hole. Maximum deviation allowed to total depth shall not exceed three degrees (3°).**

INTERMEDIATE CASING

1) **Drill 10-5/8" HOLE FROM 250' – 1900' (plus or minus) to accommodate approximately 1900' (plus or minus) of 8-5/8" Intermediate Casing. Run approximately 1900' of 8-5/8", 32#/ft, J55, 8rd, ST&C Rge 3 and set at 1900'. Wellsite geologist to call Intermediate hole TD.**

2) **Run guide shoe on bottom joint and float collar on the first joint. Run centralizers as directed by drilling engineer. Cement intermediate casing pipe, as per Sanjel's program. Obtain good returns to surface. Gravel pack, if needed. Use thread-lock on the shoe and bottom joint.**

3) **DO NOT SLACK OFF BEFORE EIGHT (8) HOURS W.O.C. TIME. Thereafter, nipple up, test BOP's after drilling shoe. DRILL OUT AFTER TWELVE (12) HOURS OR WHEN SANJEL HAS APPROVED W.O.C. TIME. Test casing to 500 pounds above shoe and 300 pounds below.**

4) **STRAIGHT HOLE SURVEYS: Run surveys every 30'. Maximum deviation allowed to total depth shall not exceed three degrees (3°).**

MAIN HOLE

1) **Drill 7-7/8" hole from 1900'– 3800' (plus or minus) to accommodate approximately 3800' (plus or minus) of 5-1/2" Casing. Core Duperow section as detailed in core plan. Run approximately 3500' of 5-1/2", 17#/ft, J55, 8rd, ST&C Rge 3 casing. Run approximately 300' of 5-1/2", 17#/ft, 80 Ksi CR-13 Chrome Casing across the Duperow interval as instructed by the completion engineer. CHROME CASING HANDLING INSTRUCTIONS FROM SCHLUMBERGER ENGINEERS ARE TO BE STRICTLY FOLLOWED. Wyoming Casing will be running the 5-1/2" casing.**

2) **Run guide shoe on bottom joint and insert float collar on the first joint. Run centralizers as instructed by the drilling engineer. Cement 5-1/2" long string pipe, as per Sanjel's program. Obtain good returns to surface. Use thread-lock on the guide shoe and bottom joint.**

3) **STRAIGHT HOLE SURVEYS: Run surveys every 30', or as close as possible. Maximum deviation allowed to total depth shall not exceed three degrees (3°).**

PIPE MEASUREMENTS

Pipe measurements are the strict responsibility of the Contractor. Pipe must be strapped before reaching any important payzones (Sunburst, Madison & Duperow) and Total Depth. IF MORE THAN THREE (3') FOOT ERROR OCCURS WHILE STRAPPING OUT OF THE HOLE, PIPE WILL BE STRAPPED AGAIN GOING BACK IN THE HOLE. IF ERROR CONTINUES, CORRECT PIPE TALLY BOARD. Dimensions are as follows:

Drill Pipe: 4-1/2" XH
Drill Collars: 8" – 6-5/8" Top and Bottom Tool Joint
Bottom Hole Collar: 6-1/4" – 4" H90 Tool Joint – One BH collar with 4-1/2" Reg

SAMPLES

Begin catching ten (30') foot samples from underneath surface'. Begin catching 10' samples at 1300'. Samples are to be WASHED CLEAN and marked showing well name; Altamont/Vecta/Big Sky Danielson 33-17 and depth. Bundle in lots of 100'. Two sets of all samples should be collected market and stored for Operator. Five (5') foot samples will be caught as instructed by Wellsite Geologist.

DRILLING PROGRAM

Native mud can be carried to about 1,000' or the Kootenai whichever comes first. At this depth, start to mix gel each tour (about 10 sacks) and raise viscosity to the 40-45 range for coring and logging. Water loss NO GREATER THAN SIX (6) c.c. and weight no greater than 9.1 must be obtained and maintained before entering the SUNBURST, MADISON AND DUPEROW PAYZONES. IT IS THE STRICT RESPONSIBILITY OF THE CONTRACTOR TO HAVE THE SHALE SHAKER RUNNING TWENTY-FOUR (24) HOURS DAILY FROM DRILLING OUT SURFACE TO TOTAL DEPTH, IF CONTRACTOR CAN SUPPLY EQUIPMENT. CONTRACTOR MUST MAINTAIN MUD CONDITIONS AS OUTLINED, AND SUPPLY A PROPER HOLE IN GOOD CONDITION FOR CORING AND LOGGING PRIOR TO REACHING THE DUPEROW, WHICH WILL BE EXPECTED AROUND 3,000'. Viscosities, mud weights and water loss are to be taken every FOUR HOURS and marked in the daily log. Before reaching Total Depth, raise viscosity to the 70 – 80 range and a water loss of 5 – 6 range for Open Hole Logging. Prepare the hole for logging.

MUD PROGRAM

The Mud Program is included in the Prognosis packet.

CORING PROGRAM

Core samples will be taken 180' into the Upper and Middle Duperow (plus or minus). Core points will be selected by Geologist on location. The porosity of the Duperow during coring should be approximately 6%.

WELLHEAD ASSEMBLY

The diagram of the wellhead assembly and BOP is included with the Prognosis packet.

HOLE SAFETY

It is the strict responsibility of the Contractor, at all times, to keep the hole full while making trips and running cores and open hole logs to prevent blowout.

LOGGING PROGRAM

OPEN HOLE (INTERMEDIATE SECTION):
Platform Express (PEX) – Array Induction Tool: TD to Surface casing
(note; PEX includes formation Density, compensated neutron, gamma ray and caliper)
Sonic Scanner: TD to Surface casing, Cement Bond Log over surface casing

OPEN HOLE (TOTAL DEPTH):
Platform Express (PEX) – Array Induction Tool: TD to Intermediate casing
(note; PEX includes formation Density, compensated neutron, gamma ray and caliper)
Sonic Scanner: TD to Intermediate casing, Cement Bond Log over Intermediate casing
Combinable Magnetic Resonance (CMR): TD to Madison top
Elemental Capture Spectroscopy (ECS): TD to Madison top
Hostile Environment Natural Gamma Ray Spectroscopy (HNGS): TD to Madison top
Full-bore Micro Imager (FMI): TD to Madison top

CASED HOLE:
Reservoir Saturation Tool (RST): TD to Surface
Isolation Scanner (IBC): PBTD to Surface *(note; this is cement evaluation logging)*
Multi-Finger Caliper (PMIT): PBTD to Surface

The logging program could be changed on site by consulting geologist or engineer.

Contractor shall provide proper and suitable hole for logging with mud and proper condition for logs to reach bottom. Mix gel and raise viscosity to 60 – 70 range for running logs prior to reaching T. D.
Short trip drill pipe (about ten stands) before running log to insure clean hole and logs going to bottom.

COMPLETION PROGRAM

See Sanjel Completion Cement program included in Prognosis packet.

H2S SAFETY

H2S and CO2 monitoring equipment will be present on-site along with a safety supervisor. All hands will be required to attend daily H2S training. The service will be provided by Triple AAA Safety/Training and Darwin Krabbenhoft.

GEOLOGIC FORMATION TOPS

Estimated tops based on Kelly Bushing Elevation 3577' KB:

Formation	Production Well (md-ft)	Datum
Ground Surface Elevation	3566	
Blackleaf_Fm	282	+3295
Bow_Island_Mbr	537	+3040
Kootenai_Fm	1032	+2545
Sunburst_Mbr	1398	+2179
Swift_Fm	1448	+2129
Rierdon_Fm	1542	+2035
Sawtooth_Fm	1632	+1945
Madison_Grp	1652	+1925
Mission Canyon	1830	+1747
Lodgepole	2421	+1156
Banff	2653	+924
Bakken	2768	+809
Three Forks	2792	+785
Potlatch	2805	+772
Nisku	2958	+619
Duperow	3035	+542
Middle_Duperow Porosity	3286	+291
Lower_Duperow Porosity	3552	+25
Base Lower Duperow Porosity	3672	-95
T.D.	3800	-223

*******CALL PATRICK M. MONTALBAN BEFORE RUNNING SURFACE CASING---INTERMEDIATE CASING---CORING---OPEN HOLE LOGS AND BEFORE RUNNING LONG STRING *******

DO NOT DRILL PAST 3800' TOTAL DEPTH!!!!

Altamont Oil and Gas Operations, Inc.

Toole, County- Kevin, Mt. Proposed Wells:

BSCSP Production Well #1
Location Legal Description - Sec. 17 – 35 North – Range 1 West

Prepared for- Pat Montalbon / Jerry Bacon-FX Drilling

Prepared by: Warren K. Lear April 13, 2014

Altamont Oil and Gas Operation, Inc. April 12, 2014
Pat Montalbon
P.O. Box 488
Cut Bank, Mt. 59427

Mr. Pat Montalbon,

MiSwaco a schlumberger company, is pleased to provide this drilling fluids program. Kenneth Smith of Pioneer Drilling Fluids operates a warehouse and services our product for us from Havre, Mt. and covers the High Line region from Cut Bank, Mt to Malta, Mt.

We appreciate the opportunity to submit this drilling fluid program for consideration for the upcoming well-BSCSP Production Well #1 with the legal description of Sec 17, T35N, R1W which you are planning to drill in Toole, County near Kevin, Mt.
.
This following proposed drilling fluid system has been working well for us in the active clay and shale deposits of the area. It is understood that you will have a preset 30 ft. 13⅜ inch conductor pipe and then will be drilling a 12¼ inch surface hole using air- air-mist and set 9⅝ inch surface casing to TD of 500 ft.

It is recommended to use caution drilling this area with air, as surface formations tend to be primarily clays and shale with potential for some surface gravel as you move closer to the river. These surface formations are very water sensitive and if water mist is applied, the clays and shale can become water saturated and begin to swell and squeeze and or slough and cave in. Lost circulation may also be of concern due to the unstable sand and gravels, that if allowed to get wet may slough and cave in. If lost circulation is a problem it is recommended to "Mud Up Immediately" using **Max Gel** bentonite and **Poly Plus Liquid** and **Lime** for viscosity and a blend of various sized LCM for combating the lost circulation (it is recommended to hold a nominal supply of LCM on location to combat this eventuality). .

After Surface has been set to allow the cement to cure for 10 to 12 hours before beginning to nipple up the BOP. It is understood that the open hole section of the well will be drilled with an 8¾ inch bit to TD of 4,000 ft. Prepare to drill out from under surface by pretreating the drilling water with **Bicarbonate of Soda** (3 lb/bbl to 4 lb/bbl) and be prepared to continue to treat with additional applications of Bicarb to control contamination caused form drilling out the surface cement inside and below the surface casing. Divert the contaminated fluid to the reserve pit as it is being drilled to control the worst contamination.
After the cement has been drilled out it is recommended to mud up immediately. To mud up, dump and clean all mud tanks and refill with fresh water.

When drilling the upper section of the open hole caution should be exercised to avoid excessive ROP to prevent issues of excess solids and related hole cleaning issues.

To Mud Up Mix: Soda Ash (.25 to .5 ppb) to control total hardness of drilling fluid, **Max Gel-**for viscosity of 38 to 42 sec/qt. (8 ppb to 10 ppb), **Platinum Pac** (.75 to 1.25 ppb) and **Asphsol Supreme** if desired for extra filtration control 2 to 3 ppb. Control filtrate to less than 6cc at all times**. Clean Faze- (1.5 to 3 ppb)** to aid filtration control. **Drill Detergent** as a surfactant to help control solids and clay buildup such as bit balls and mud rings (1 can over each 8hr shift at the shale shaker). **Caustic Soda to pH** of 9**.5**. (If it is decided to run the **Gypsum/Lime system we will then use Lime instead of Caustic Soda or Soda Ash** for pH of 9.5 to 10 and this will also assist with controlling CO2 which is a possibility in the Souris River formation**)** and **Fed Rheo Smart** as a thinner as needed to control viscosity (.25 to .5 ppb). **Drill Zone L or Rod Ease** surfactant to control torque and aid in control of mud rings and bit balling, **Ring Free** may also be run on connections (1vis cup / connection) or up to 1 bucket per 100 bbl of fresh mud may be mixed directly into the drill fluid to help prevent bit ball, boots and mud rings (apply up stream of the mud hopper). A good practice is to ream each joint in this section twice before making connections and circulate all connections 2-3 minutes while on bottom before making another connection. We will allow the mud weight to climb up and may need to increase the mud weight using **Mi Wate** to as high as 10.3 lbs/gal to help stabilize shale formations such as of the Lodgepole and to control potential water flows, gas and H2S. This will also help to reduce the popping and heaving of the upper shale. We will also be using **Safe Scav HSW** at the first sign of H2S to prevent the H2S from breaking out of solution into a gas form, concentrations of 1to 2 gallons per 100 bbl of fresh mud (Safe Scav HSW can control up to .1 lb/bbl H2S with concentrations of 1 lb per bbl Safe Scav HSW)

The Gypsum/Lime drilling fluid system has been used with very good success for improved control of the reactive clays and shale formations of the region and if chosen for this project may be used to further inhibit the shale and clay that will be encountered on this hole. If chosen the fresh water system may be easily rolled over to the Gypsum /Lime system with simple additions of 3 to 6 lb/bbl **Gypsum** and .25 lb/bbl **Lime** to raise the "Total Hardness" to >880 to 1000 ppm while simultaneously adding thinners such as Fed RheoSmart or Lignite at concentrations of .25 to .5 ppb to control the flocculation and viscosity associated with rolling in the gypsum and lime.

Continue drilling to TD while maintaining drilling fluid specs, using: **Max Gel**- (10 to 12 lbs/bbl) to increase viscosity of 42 to 48 seconds per quart, by the time we reach TD or as needed to clean and stabilize the hole. Maintain filtration control at less than 6cc with **Platinum Pac or Platinum Pac UL** at .75 to 1.5 lbs/bbl and **Asphasol Supreme** at 3 to 4 lbs/bbl and **Clean Faze-** for extra filtration if desired at concentrations of 1.5 to 3 lbs / bbl. to control filtrate of 4 cc to 6cc or less at all times**. Drill Detergent (**1 bucket per 100 bbls over 6 to 8 hour dribble at shale shaker) as a surfactant to control solids and sticking shale and clay's**.**

For running any wire line logs or for running any casing it is recommend to raise the viscosity up to 65 to 75 seconds per quart to improve successful logging activity. To cement any casing it is then recommended to thin the drilling fluid back to a viscosity of 40 to 42 seconds per quart using fresh water and products such as Tackle or Ring Free or Fed RheoSmart which will allow for improved cement bond.

Note: The Madison and Duperow Formations commonly contain deposits of Anhydrite as well as a possibility for concentrations of up to 1.7% H2S.. Additions of Caustic Soda to pH

of 10 to 11 will assist in controlling the H2S from breaking out of solution into a gas form. Note also that the Duperow and Souris River have a possibility of containing CO2 This will be controlled with additions of Lime

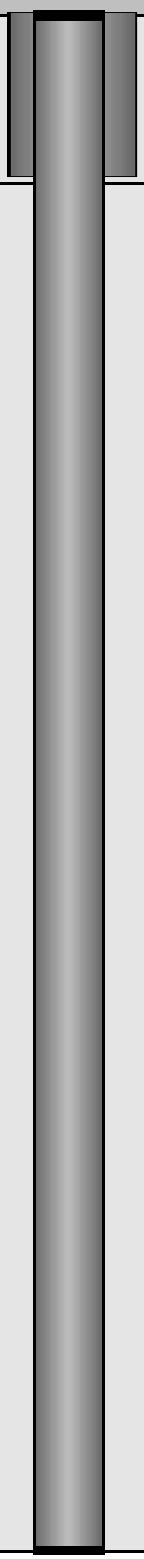
If using a fresh water non dispersed fluid without Gypsum and lime for inhibition then it will be necessary when encountering any anhydrite formation to pre-treat with addition of **Soda Ash** at ½ to 1 lb/bbl, to control excess total hardness, viscosity and loss of filtration control, along with additions of **Lignite** and/or **Fed Rheo Smart** as needed to help control Viscosity. Additions of **Ring Free** at the flow line as needed to assist in controlling viscosity. **Drill Zone** surfactant will assist in controlling mud rings and bit balling at additions of 1 bucket per 100 bbls of mud added at the suction over 6 to 8 hour dribble. It is a good practice to ream each joint twice before making connections and circulate all connections 2-3 minutes on bottom before making another connection. We will allow the mud weight to climb up to 10.2 lbs/gallon and may need to increase the weight using **Mi Wate** as needed to control potential water flows and natural gas and H2S. This will also help to reduce the popping and heaving of the upper shale's. Be sure to control ROP at all times to control mud weight and solids content and to insure adequate hole cleaning and mud cleaning with surface equipment.

Maintain filtrate below 4cc to 6cc at all times. In which case we prevent a lot of the problems associated with issues such as drilling Anhydrite. NOTE: If the Gypsum / Lime system is chosen "Do Not use Soda Ash for pH control" as this will reduce the total hardness, which we are looking to achieve with the Gypsum and Lime. The implementation of a premix tank will be required for subsequent additions of Bentonite and other products that mix better in a fresh water. After pre-hydration of these products they may be introduced easily into the main drilling fluid system as needed for mud maintenance, after the system has been flipped to a gyp/lime mud. (We recommend holding the pre-hydrated fluid at a viscosity of 50 to 55 so that it may then be blended into the main drilling fluid system and mixed with the fresh water addition for solids control and hole cleaning needs.)

Please review this drilling fluid proposal and respond as soon as possible for any changes or additions.

For any questions regarding any of the information within this proposal or if you wish to discuss it further, please contact Warren K. Lear Office (406) 323-2702 Cell (406) 208-8151 or Tommy Soennichsen Cell (406-350-0715). M-I SWACO appreciates the opportunity to contribute the success of the project.

Sincerely,
Warren K. Lear
NAM Tech Manager
MI / Swaco
A Schlumberger Company

Casing Size (in)	Hole Size (in)	Casing Program	Depth (ft) MD	Formation Tops (ft)	Mud System
9 ⅝" Surface Casing	12 ¼" -0- To 500 ft		surface 280 ft 535 ft.	**Cretaceous** Blackleaf Bow Island	Water W/ fresh water and Poly Plus sweeps for hole Cleaning as needed
Long String Casing 5½" To 3,120 ft.	8 ¾" Open Hole 500 ft To 3120 ft		1,,030 ft 1,396 ft 1,446 ft 1,540 ft 1,630 ft 1,650 ft 1,828ft 2,419 ft 2,651 ft 2,766 ft 2,790 ft 2,803 ft 2,956 ft 3,033 ft 3,284 ft 3,550 ft 3,670 ft 3,770 ft	Kootenai Sunburst **Jurassic** Swift Rierdon Sawtooth **Mississippian** Madison (Sun RiverDolomite) Mission Canyon Lodgepole Banff Bakken (Oil/gas/water) **Devonian** Threeforks Potlatch (anhydrite) Nisku Duperow Porosity Middle Duperow Porosity Lower Duperow Porosity Base Lower Duperow Porosity **TD**	**This section can drills very fast, watch ROP Don"t over drill and cause tight hole due to solids build up. Ream joints twice and circulate hole for 2 to 3 minutes before each connection**. *Sodium Bicarb .25 to .5 lb/bbl, before drilling out cement shoe.** **Dump and clean tanks before mud up.** Soda Ash .25 to 1 lb/bbl, to pH 9.5, Max Gel,-10 to 12 lbs/bbl to viscosity of 42 to 46 seconds per quart. Fed Rheo Smart or Lignite-.15 to.25 lbs.bbl, Phosphate or Ring Free if needed 1 qt-down drill pipe on connections to control bit ball and mud rings. Platinum Pac- or Platinum Pac UL.75 to 1 lb/bbl, Asphasol Supreme up to 3 to 4 lbs / bbl. Clean Faze-1 to 2.5 lb/bbl to 4cc to 6cc. Drill Zone-.25 to .5 lb/bbl as lubricant and to control boots and mud rings**. D-D 1 can/tour 8 hr dribble** for solids control. ***At first sign of HWS treat mud with Safe Scav HSW 1½ to 2 gallons per 100 bbl for H2S Zones-Cautic Soda to pH of 11 to 11.5 to aid in control H2S** (If CO2 is encountered treat with Lime) Mud Wt 10.2 to 10.3 lb/ga. have plenty of Mi Wate (Barite) on location to increase mud weight to13 lb/ga. if formation pressures require. Viscosity 42 to 46 sec/quart (to suspend Barite). Filtrate 4cc to 6cc or less Maintain drilling fluid++Pre-treat w/Soda Ash ½ to 1 lb/bbl.-to prepare for drilling Anhydrite-continue treatment to control excess total hardness as needed (or roll system over ot Gypsum/Lime system with total hardness at 880 to 1000 ppm) and use Fed Rheosmart-thinner to help control viscosity. D-D (drilling detergent) or Drill Zone at the flow line for solids control. To **inhibit the uphole shales roll the system over to a Gypsum/Lime fluid-Maintian Total Hardness >880 ppm to 1000 ppm using Gypsum at 2 to 3 lbs/bbl and Lime at .25 to .5 lbs/bbl. (at this point a premix tank will be necisary for any additional Max Gel applications. And discontinue use of Soda Ash for pH and use Lime for pH from here on).**

(0 – 500 ft. MD) –Surface Casing	
Drilling Fluid System	Air / Air Mist-Fresh Water , Poly Plus / Spud Mud
Key Products	Platinum Pac And Poly Plus LV injection fluid –If Mud up is required for any reason use Soda Ash, Max Gel, Platinum Pac and or Platinum Pac UL. With Poly Plus Liquid, Lime if needed.
Solids Control	N/A with air drilling, if mud up is required-Shale Shaker and RESERVE PIT and De-Sander / Desilter if mudded up.
Potential Problems	Hole Cleaning, Seepage Losses, Surface gravel possible. Possible Lost Circulation

Interval Drilling Fluid Properties						
Depth Interval (ft)	**Mud Weight (ppg)**	**Funnel Viscosity Sec/qt**	**Plastic Viscosity (cp)**	**Yield Point ($lb/100ft^2$)**	**API Fluid Loss (ml/30min)**	**Drill Solids (%)**
0 – 500ft.	8.4 – 8.8	38 to 40	N/A	N/A	N/A	N/A

- As the surface formations in this area are very reactive clays and shale it is recommended to control the free water that is available to the formations without the benefit of an inhibitor to prevent the hydration of the formation's from the injection water of an air/mist injection program.
- **Drill with Air/Air Mist and Platinum Pac with Poly Plus LV injection fluid.** (Platinum Pac .75 ppb Poly Plus LV .25 to .5 ppb) this will yield an injection fluid with physical properties - viscosity approximately 38 to 40 seconds per quart. This slurry will then be ready if addition of **Platinum Foam Plus** drilling foam is required at ratio of ¼ qt to ½ qt per bbl of polymer slurry. This slurry may then be injected at a rate to provide the foam quality as desired.
- Lost circulation may be problematic in this area, Keep a good supply of fibrous lost circulation materials (**Fed Seal, Cotton Seed Hulls, Mica, Sawdust, and Poly Swell** etc.) on location for any mud losses. Mud up as needed if lost circulation is encountered while drilling surface.
- **As drilling conditions dictate or if mud up is need**ed (such as for lost circulation) **Mud Up as follows: Spud Mud**-Mix **Soda Ash** .25 to .5 ppb or to pH of 9 then mix **Max Gel** to viscosity as needed drilling (10 to 14 ppb thru mixing hopper) **Poly Plus Liquid** polymer as need to reach desired viscosity for drilling conditions. (.25 to .5 ppb) **Lime** may be to increase viscosity with this spud mud as desired. Mix LCM if or as needed up to 30 % by volume using various sized products such as Mica, Fed Seal, Saw Dust, Drillers Paper an Cedar Fiber Etc.

- **To run casing it is recommended to Mud up and circulate the hole full of drilling fluid to stabilize and cushion the hole while running surface casing. For running casing bring Viscosity up to 60 to 65 sec/qt .using Max Gel and Poly Plus Liquid then before pumping cement thin back the fluid to viscosity of 40 to 42 seconds per quart then sweep the hole with fresh water in front of the cement to improved cement bond.**

Open Hole-Interval Drilling Fluid Properties						
Depth Interval (ft)	**Mud Weight (ppg)**	**Funnel Viscosity Sec/qt**	**Plastic Viscosity (cp)**	**Yield Point (lb/100ft²)**	**API Fluid Loss (ml/30min)**	**Drill Solids (%)**
500 ft. to 3,120 ft.	10.2 to 13 as needed	42 to 46	18 to 20	12 to 14	4cc to 6cc	.5 to 3.5

Open Hole-Interval Product discussion	
Drilling Fluid System	LSND Gypsum/Lime Inhibitive system
Key Products	Max Gel, Platinum Pac, Platinum Pac UL, Asphasol Supreme, Clean Faze, Fed Rheo-Smart, Mica Fine & Ring Free, Drill Zone L, D-D, Rod Ease, Fed RheoSmart, Lignite, Tackle. Gypsum, Lime, Caustic Soda and Mi Wate
Solids Control	Shale Shaker, De-Sander/De-silter cones, and Hydo-cyclone if Available
Potential Problems	Lost circulation, Sloughing Shale, and high solids

- For mud-up; Based on 200 bbl pit, Pretreat mud with 4-6 sacks Bicarbonate of soda prior to drilling out cement, after drilling cement from surface dump and clean mud tanks. Then mix**, Soda Ash** .25 to .5 ppb or to pH of 9 to 9.5. **Max Gel** as needed for viscosity 38 to 42 seconds per quart (up to 8 to 12 lbs/bbl)., and 2 to 3 sacks **Platinum Pac** or **Platinum Pac UL,** (slowly over 1 hour per sack to control filtrate of <6cc per 30 minute API filtration test). **Asphasol Supreme** may be added in addition to improve filtration control if desired 1 to 2 ppb as desired or as needed. **Clean Faze** 2 to 3 lb/bbl if and/or as needed for additional filtration Control. **D-D with spout or Platinum D-D** to assist with controlling sticky clay and shale issues-1 to 2 buckets per 150 bbls of fresh fluid added at or near the shale shaker to help control solids. 1 bucket **Poly Plus-**mixed near suction end of the pit (up to .25 to .5 ppb mixed slowly over a 4 to 6 hr dribble) to inhibit clays and shale and to aid in viscosity. **Fed Rheo-smart** thru mud hopper .25 to .5 ppb to control viscosity as needed and to assist bentonite to form thin firm, smooth filter cake. 1 bucket **Drill Zone** per 100 to 150 bbls of fresh mud (slowly 6 to 8 hr dribble). **Ring Free** thinner dispersant to help control bit balls and mud rings either 1 to 2 quarts per connection down drill pipe or add directly to the drilling fluid 1 bucket per 100 bbls of fluid (add just above the mixing hopper discharge at suction end of the mud pits.
- **If the Gypsum/Lime inhibitive system is chosen**- after fresh mud is mixed in main drilling mud pits, roll the system over to the inhibit system. Add 2-3 50 lb sacks of **Gypsum** and 1 sack **Lime** per 150 bbls of mud thru mud hopper over 2 full circulations. While adding Gypsum/lime at the same time add 1 to 2 - 50 lbs sacks of **Lignite or Fed Rheo-smart** to prevent flocculation of the system.

- Maintain pH at 9.5 to 10 while drilling with continued additions of **Lime** ½ to 1 sack per 150 bbls (be sure to add **Fed Rheo Smart or lignite** to control flocculation as needed). Do **not use any further Soda Ash for pH after rolling the system over,** as this will lower the Total Hardness which we are trying to achieve for our inhibition with Gypsum/Lime. to total hardness of >880 ppm. To 1000 ppm.
- ROP should be watched, do not over drill, this allows for good hole cleaning. Ream all joints twice before making the next connection and circulate the hole for 2 to three minutes before making the next connection.
- Add **Ring Free** on connections (1 vis cup down the drill pipe) for controlling bit balling and booting.
- Continuous stream (3/4-1" stream) H2O for thinning and prevention of dehydration and to aid in solids control at all times.
- **Note- Use of a premix tank will be needed after the addition of the Gypsum/Lime to the system it will be necessary to use a pre-hydration tank to mix all additional bentonite to the system before adding them to the main drilling pits this may also be used as a pill tank or as mud storage for weighted system if needed.**

  It is recommended to maintain premixed fluid specs as follows: viscosity of around 50 to 55 sec/quart, which may then be diluted back as needed with fresh water after additions of the premixed slurry is added to the main drilling system tanks. Additions of **Fed RheoSmart** and/or lignite (as needed) up to 1 **sack** per every 2 Gypsum/1 Lime added to maintain total hardness between 880 to 1,000 ppm. Once the pre-hydrated mud has been added to the main drilling fluid system maintain the filtrate at 4cc to 6cc's. using additions of **Platinum Pac UL** 1 t 2 sacks per 100 bbls, and if desired **Asphasol Supreme** at 2 to 3 lbs/bbl for additional filtration control and hole stability. Add **Drill Zone** 1 bucket per tour for control of solids sticking to BHA and **Poly Plus** up to 1 bucket per tour to aid viscosity and Filtrate control, **Ring Free** on connections as needed to help control bit ball as needed.

  To Log or to Run Casing: Bring viscosity up to 65 to 70 seconds per quart, insure that filtrate is down to less than 6cc using Platinum Pac and Total Hardness is greater than 880 ppm using Gypsum and pH is 9.5 to 10 using Lime. Weight should be 10.2 lb/ga. or as needed to control formation pressures and H2S and CO2. For TOH for any reason, circulate hole for 1 to 1½ hours to insure the hole is clean and cuttings have cleaned up coming over the shale shaker then trip drill pipe gently and keep the hole full at all times. Watch for flows or gas kicks while tripping out of the hole for any reason and while on the bank while logs are being run. To cement long string or to plug and abandon the hole, thin back the viscosity of the drilling fluid using Fed RheoSmart and water as needed to viscosity of 40 to 42 seconds per quart to allow for improved cement bonds.

  If there are any questions about this mud program please feel free to contact myself or Tommy Soennichsen. Office phone 406-323-2702, Warren K. Lear Cell 406-208-2819, Tommy cell phone 406-350-0715

Mud pricing will be provided upon request thru separate cover, based on delivery from nearest delivering warehouse.

- **Engineering charges @** $675.00 Drive By Check/ Plus mileage @ $ .98 per mile

  For 24 hour onsite Engineering and Consultant engineering if workload requires $975.00 per day plus housing provided on location and mileage @ $ .98 per mile

Cost Estimate for pricing and charges may be provided on separate coverage if required.

This suggested program is advisory only and may be rejected in the sole discretion of any and all parties receiving it. In addition all parties receiving this program recognize, agree, and acknowledge that M-I Drilling Fluids L.L.C. (M-I) has no care, custody or control of the well, the drilling equipment at the well, nor the premises about the well. Also, there are obviously many conditions within and associated with a well of which M-I can have no knowledge and over which it does not and cannot have control. Therefore, M-I shall not be liable for the failure of any equipment to perform in a particular way or the failure to obtain any particular results from carrying out this program by any party receiving it. Furthermore, the owner and operator of the well and the drilling contractor in consideration of the recommendations contained in this suggested program agree to indemnify and save M-I harmless from all claims and costs for loss, damage or injury to persons or property including, without limitations: subsurface damage, subsurface trespass or injury to the well or reservoir allegedly caused by M-I's operations or reliance by anyone upon this program unless such personal injuries or damage shall be caused by the willful misconduct or gross negligence of M-I.

Big Sky Carbon Sequestration Project

Primary Cementing Proposal

State 23-16_ - Production Well

Toole County, Montana

Primary Cement Version 3 (04.14.14)

Prepared for: Patrick Montalban
Phone: [redacted]
Mobile:
Email: [redacted]

Prepared by: Justin Hill
Phone: [redacted]
Mobile:
Email: [redacted]

Service Center: Miles City, Montana, 406.357.3399

13 3/8 inch Surface Casing

Hole Size:	17 inch.
Casing Size:	13 3/8 inch, 54.5 lb/ft, J/K 55, STC.
Depth	250 ft.
Excess	70 % (gauge)

Cement Blends

Lead	ControlSet 'C' + 0.25 lbs./sack Polyflake

Cement Data

	Lead:
Water requirements :gal/sk	9.16
Yield : ft^3/sk	1.74
Density: lbs/gal	13.5
Thickening Time: hr: min	1:30
Compressive Strength: psi/hrs	1400/12 2200/24
Temperature °F	70

Calculations

Lead	0.6005 ft^3/ft x 250 ft.= 150.125 ft^3 150.125 ft^3 x 70 % (gauge) = 255.21 ft^3 255.21 ft^3 ÷ 1.74 ft^3/sk =146.95
Shoe Joint	.8679 ft^3/ft x 40' = 34.7 ft^3 34.7 ft^3 ÷ 1.74= 19.95

Total Cement Volume **165 sacks**

Surface Casing Cementing procedure

1. Make up float equipment and centralizers as required on 13 3/8 inch casing and run into total depth.

2. Break circulation and condition hole and drilling fluid prior to cementing.

3. Rig in Sanjel Cementing Unit, Surface treating lines, and a 13 3/8 inch head to casing.

4. Fill Surface treating lines with water and pressure test lines to 1500 psi.

5. Mix and pump the following:
   A. 20 bbls fresh water
   B. 165 sks CSC plus additives mixed @ 13.5 lb/gal

6. Drop a Top Rubber Plug and displace plug to insert float with water. Bump plug with a minimum of 500 psi over final pumping pressure.

7. Hold pressure for 1 minute(s), then bleed back casing pressure to ensure float is holding.

8. Rig down Sanjel, W.O.C. a minimum of 12 hours.

NOTE:
This recommendation is to be used as a guide. Job conditions and field experience must dictate job procedures. Please check all calculations on location.

COST ESTIMATE: **F.O.B.** **MILES CITY, MT**

PRODUCTION CASING **13 5/8 inch**

SERVICES								
1380	Pumping Unit Travel			300	miles	[redacted]	/ mile	[redacted]
1000	Pumping Unit Base Charge			250	feet	[redacted]	/ 6 hours	[redacted]
1150	Twin Unit Surcharge					[redacted]	/ 6 hours	[redacted]
1480	Bulk Cement Blending			167	ft^3	[redacted]	/ ft^3	[redacted]
1484	Bulk Cement Delivery			8.3	tons	[redacted]	/ ton*mile	[redacted]
1497	SAM III - Data Acquisition			1	job	[redacted]	/ job	[redacted]
LEAD CEMENT								
3030	Control Set 'C'			165	sacks	[redacted]	/ sack	[redacted]
3247	Polyflake	0.25	lbs/sk	42	lbs	[redacted]	/ lb	[redacted]
OTHER MATERIALS								
1492	Envirobag	1	bag			[redacted]	/ bag	[redacted]
3262	DF-3	2	gals			[redacted]	/ gal	[redacted]
NON-DISCOUNTED ITEMS								
1493	Environmental Surcharge	1	job			[redacted]	/ job	[redacted]
2992	Fuel Surcharge	2	trucks			[redacted]	/ truck	[redacted]
NON-DISCOUNTED TOTAL								[redacted]
						DISCOUNT:		[redacted]
GRAND TOTAL								[redacted]
FLOAT EQUIPMENT (NON-DISCOUNTED)								
	13 3/8" Guide Shoe	1	unit			[redacted]	/ unit	[redacted]
	13 3/8" Float Collar	1	unit			[redacted]	/ unit	[redacted]
	13 3/8" Limit Clamp	1	unit			[redacted]	/ unit	[redacted]
	13 3/8" Centralizer	4	units			[redacted]	/ unit	[redacted]
4400	Threadlok	1	unit			[redacted]	/ unit	$ [redacted]
4437	13 3/8" Rubber Plug	1	unit			[redacted]	/ unit	[redacted]
FLOAT EQUIPMENT TOTAL								[redacted]
NON-DISCOUNTED TOTAL								[redacted]
						DISCOUNT:		[redacted]
DISCOUNTED TOTAL								[redacted]
GRAND TOTAL								[redacted]

A minimum of two additional hours of pumping time per pumping operation will be charged after initial 6 hours location time. Hours will be charged as follows:

Additional hours on location will be charged (non-discounted) as follows:

Twin Cement Pumping Unit – per unit, per hour
Pumping Time..... [redacted]
Standby Time..... [redacted]

8 5/8 inch Long String Casing

Hole Size:	11 inch.
Casing Size:	8 5/8 inch, 32 lb/ft, J-55
Depth	2000'
Excess	30 % (gauge)
Stage Tool	~1700'

Cement Blends

First Stage

Lead	1-1-0 'Poz:G' + 1% CaCl + 0.25% CFL-3 + 0.25% CFR-2 + 2 lb/sk PS Flake 2000 ft to 1700 ft = 300 ft

Second Stage

Lead	Control Set 'C' + .25 lb/sk Poly Flake mixed at 11.5 lbs/gal 1200 ft to Surface = 1200 ft
Tail	Control Set 'C' + .25 lb/sk Poly Flake Mixed at 13.5 lbs/gal 1700 ft to 1200 ft = 500 ft

Cement Data, First Stage

	Lead:
Water requirements :gal/sk	4.45
Yield : ft^3/sk	1.1
Density: lbs/gal	14.9
Thickening Time: hr: min	3:00
Compressive Strength: psi/hrs	
Temperature °F	75^0 F

Cement Data, Second Stage

	Lead:	Tail:
Water requirements :gal/sk	17.38	9.16
Yield : ft^3/sk	2.84	1.74
Density: lbs/gal	11.5	13.5
Thickening Time: hr: min	3:35	2:45
Compressive Strength: psi/hrs	500/6 950/12	500/6 1400/12
Temperature °F	70^0 F	

Calculations

First Stage

Lead

0.2542 ft^3/ft x 300 ft.= 76.26 ft^3
76.26 ft^3 x 30 % (gauge) = 99.14 ft^3
99.14 ft^3 ÷ 1.1 ft^3/sk = **90 sks**

Second Stage

Lead

0.2542 ft^3/ft x 1200 ft.= 305.04 ft^3
305.04 ft^3 x 30 % (gauge) = 396.55 ft^3
396.55 ft^3 ÷ 2.84 ft^3/sk = **140 sks**

Tail

0.2542 ft^3/ft x 500 ft.= 127.1 ft^3
127.1 ft^3 x 30 % (gauge) = 165.23 ft^3
165.23 ft^3 ÷ 1.74 ft^3/sk = **95 sks**

Intermediate Casing Procedure

1. Make up float equipment and centralizers as required on 8 5/8 inch casing and run into total depth. Run Stage Tool at ~1700'.

2. Break circulation and condition hole and drilling fluid prior to cementing.

3. Rig in Sanjel Cementing Unit, Surface treating lines, and a 8 5/8 inch head to casing.

4. Fill Surface treating lines with water and pressure test lines to 2500 psi.

5. Mix and pump the following:
   A. 20 bbls fresh water
   B. 20 bbls Mud Flush
   C. 5 bbls fresh water
   B. 90 sks 1-1-0 'G' plus additives mixed @ 14.9 lb/gal

6. Drop first stage Top Rubber Plug and start displacement with water switching to mud after 40 bbls of water displacement. **Slow rate to 1 bpm while plug passes stage tool.** Bump plug with a minimum of 500 psi over final pumping pressure.

7. Hold pressure for 1 minute(s), then bleed back casing pressure to ensure float is holding.

8. Drop tool opening plug.

9. Wait X minutes for plug to land. Pressure up on tool as per tool directions to open tool. Pump 10 bbls of mud then turn circulation over to drilling rig.

10. **Circulate for 12 hours waiting on cement**.

11. Rig in Sanjel Cementing Unit, Surface treating lines to 8 5/8 inch head.

12. Fill Surface treating lines with water and pressure test lines to 2500 psi.

13. Mix and pump the following:
   A. 20 bbls fresh water
   B. 10 bbls Mud Flush
   C. 5 bbls fresh water
   B. 140 sks CSC plus additives mixed @ 11.5 lb/gal (Lead Cement Blend)
   C. 95 sks CSC plus additives mixed @ 13.5 lb/gal (Tail Cement Blend)

14. Drop second stage Closing Plug and displace with water at +/- 6 bpm. Bump plug 500 psi over final pumping pressure.

15. Hold pressure for 1 minute(s), then bleed back casing pressure to ensure tool is holding.

NOTE:
This recommendation is to be used as a guide. Job conditions and field experience must dictate job procedures. Please check all calculations on location.

COST ESTIMATE: **F.O.B.** **MILES CITY, MT**

PRODUCTION CASING **8 5/8 inch**

SERVICES								
1380	Pumping Unit Travel			300	miles	[redacted]	/ mile	[redacted]
1000	Pumping Unit Base Charge			2000	feet	[redacted]	/ 6 hours	[redacted]
1150	Twin Unit Surcharge					[redacted]	/ 6 hours	[redacted]
1480	Bulk Cement Blending			334	ft^3	[redacted]	/ ft^3	$[redacted]
1484	Bulk Cement Delivery			15.7	tons	[redacted]	/ ton*mile	[redacted]
1497	SAM III - Data Acquisition			1	job	$[redacted]	/ job	[redacted]
1310	Multiple Stage Cementing			1	stage	[redacted]	/ stage	[redacted]
PREFLUSHES AND SPACERS								
3195	MUDFLUSH			1260	gals	[redacted]	/ gal	[redacted]
LEAD CEMENT - STAGE 1								
3002	1:1:0 'Poz:G'			90	sacks	[redacted]	/ sack	[redacted]
3132	CFL-3	0.25	%	19	lbs	[redacted]	/ lb	[redacted]
3161	CFR-2	0.25	%	19	lbs	[redacted]	/ lb	[redacted]
3100	CaCl2	1.00	%	75	lbs	[redacted]	/ lb	[redacted]
3264	CDF-4P	0.40	%	30	lbs	[redacted]	/ lb	[redacted]
3250	PS Flake	2.00	lbs/sk	180	lbs	[redacted]	/ lb	[redacted]
LEAD CEMENT - STAGE 2								
3030	Control Set 'C'			140	sacks	[redacted]	/ sack	[redacted]
3247	Polyflake	0.25	lbs/sk	35	lbs	[redacted]	/ lb	[redacted]
TAIL CEMENT - STAGE 2								
3030	Control Set 'C'			95	sacks	[redacted]	/ sack	[redacted]
3247	Polyflake	0.25	lbs/sk	24	lbs	[redacted]	/ lb	[redacted]
OTHER MATERIALS								
1492	Envirobag	1	bag			[redacted]	/ bag	[redacted]
3262	DF-3	4	gals			[redacted]	/ gal	[redacted]
NON-DISCOUNTED ITEMS								
1493	Environmental Surcharge	1	job			[redacted]	/ job	[redacted]
2992	Fuel Surcharge	2	trucks			[redacted]	/ truck	[redacted]
1395	Twin Unit - Add. Pumping	4	hours			[redacted]	/ hour	[redacted]
1398	Bulk Unit- Standby	4	hours			[redacted]	/ hour	[redacted]
NON-DISCOUNTED TOTAL								[redacted]
							DISCOUNT:	[redacted]
GRAND TOTAL								[redacted]

FLOAT EQUIPMENT (NON-DISCOUNTED)					
4433	8 5/8" Float Collar	1	unit	/ unit	
	8 5/8" Guide Shoe	1	unit	/ unit	
4440	8 5/8" Limit Clamp	1	unit	/ unit	
4438	8 5/8" Centralizer	15	units	/ unit	
4400	Threadlok	2	units	/ unit	
2999	8 5/8" Stage Tool	1	unit	/ unit	
FLOAT EQUIPMENT TOTAL					
NON-DISCOUNTED TOTAL					
				DISCOUNT:	
DISCOUNTED TOTAL					
GRAND TOTAL					

A minimum of two additional hours of pumping time per pumping operation will be charged after initial 6 hours location time. Hours will be charged as follows:

Additional hours on location will be charged (non-discounted) as follows:

Twin Cement Pumping Unit – per unit, per hour
Pumping Time.....
Standby Time.....

Bulk Cement Unit – per unit, per hour
Standby Time.....

Additional location time will be charged (undiscounted) for periods exceeding four hours on location. The additional time includes both pumping and standby time.

NOTE:
Travel charges are an estimate only. Invoice price will be based upon actual distance traveled. Equipment charges are for specified operating times. Hourly rates will be charged for operating times greater than specified. Federal and State taxes where applicable are additional. Quote is valid for 30 days from the date it is submitted.

5 1/2 inch Production Casing

Hole Size:	7 7/8 inch.
Casing Size:	5 1/2 inch, 17 lb/ft, J-55
Depth	3700'
Excess	30 % (gauge)

Cement Blends

First Stage

Lead	Control Set 'C' + .25 lb/sk Poly Flake + 2 lb/sk PS Flake 3200 ft to Surface = 2900 ft
Tail	Custom 'G' (ARC) + 0.30% CFR-2 + 1.50% LDP-C-137 + 2 lb/sk PS Flake 3700 ft to 3200 ft = 500 ft

Cement Data

	Lead:	Tail:
Water requirements :gal/sk	17.38	9.22
Yield : ft^3/sk	2.84	2.07
Density: lbs/gal	11.5	14.65
Thickening Time: hr: min	3:00	3:39
Compressive Strength: psi/hrs	500/6 950/12	195/6 643/12 1700/48
Temperature °F	90^0 F	

Calculations

First Stage

Lead	0.1732 ft^3/ft x 3200 ft.= 554.24 ft^3 554.24 ft^3 x 30 % (gauge) = 720.51 ft^3 720.51 ft^3 ÷ 2.84 ft^3/sk = **255 sks**
Tail	0.1732 ft^3/ft x 500 ft.= 86.6 ft^3 86.6 ft^3 x 30 % (gauge) = 112.58 ft^3 112.58 ft^3 ÷ 2.07 ft^3/sk = **60 sks**

Production Casing Cementing Procedure

1. Make up float equipment and centralizers as required on 5 1/2 inch casing and run into total depth.

2. Break circulation and condition hole and drilling fluid prior to cementing.

3. Rig in Sanjel Cementing Unit, Surface treating lines, and a 5 1/2 inch head to casing.

4. Fill Surface treating lines with water and pressure test lines to 2500 psi.

5. Mix and pump the following:
   A. 20 bbls fresh water
   B. 20 bbls Mud Flush
   C. 5 bbls fresh water
   B. 255 sks CSC plus additives mixed @ 11.5 lb/gal (Lead Cement Blend)
   C. 60 sks Custom 'G' plus additives mixed @ 14.65 lb/gal (Tail Cement Blend)

6. Drop Plug and displace with water at +/- 6 bpm. Bump plug 500 psi over final pumping pressure.

7. Hold pressure for 1 minute(s), then bleed back casing pressure to ensure tool is holding.

8. Rig down Sanjel.

NOTE:
This recommendation is to be used as a guide. Job conditions and field experience must dictate job procedures. Please check all calculations on location.

COST ESTIMATE: **F.O.B.** **MILES CITY, MT**

PRODUCTION CASING		**5 1/2**	**inch**					
SERVICES								
1380	Pumping Unit Travel			300	miles	[redacted]	/ mile	[redacted]
1004	Pumping Unit Base Charge			3700	feet	[redacted]	/ 6 hours	[redacted]
1150	Twin Unit Surcharge					[redacted]	/ 6 hours	[redacted]
1480	Bulk Cement Blending			333	ft^3	[redacted]	/ ft^3	[redacted]
1484	Bulk Cement Delivery			16.3	tons	[redacted]	/ ton*mile	[redacted]
1497	SAM III - Data Acquisition			1	job	[redacted]	/ job	[redacted]
PREFLUSHES AND SPACERS								
3195	MUDFLUSH			840	gals	[redacted]	/ gal	[redacted]
LEAD CEMENT								
3030	Control Set 'C'			255	sacks	$[redacted]	/ sack	[redacted]
3247	Polyflake	0.25	lbs/sk	64	lbs	[redacted]	/ lb	[redacted]
3250	PS Flake	2.00	lbs/sk	510	lbs	[redacted]	/ lb	[redacted]
TAIL CEMENT								
2999	Custom 'G' (ARC)			60	sacks	[redacted]	/ sack	[redacted]
3161	CFR-2	0.30	%	19	lbs	$[redacted]	/ lb	[redacted]
2999	LDP-C-137	1.50	%	94	lbs	[redacted]	/ lb	[redacted]
3250	PS Flake	2.00	lbs/sk	120	lbs	[redacted]	/ lb	[redacted]
OTHER MATERIALS								
1492	Envirobag	1	bag			[redacted]	/ bag	[redacted]
3262	DF-3	4	gals			[redacted]	gal	[redacted]
NON-DISCOUNTED ITEMS								
1493	Environmental Surcharge	1	job			[redacted]	/ job	[redacted]
2992	Fuel Surcharge	2	trucks			[redacted]	/ truck	[redacted]
NON-DISCOUNTED TOTAL								[redacted]
						DISCOUNT:		[redacted]
GRAND TOTAL								[redacted]

FLOAT EQUIPMENT (NON-DISCOUNTED)								
4442	5 1/2 " Float Collar - L-80	1	unit			[redacted]	/ unit	[redacted]
	5 1/2 " Guide shoe	1	unit			[redacted]	/ unit	[redacted]
4420	5 1/2 " Limit Clamp	1	unit			[redacted]	/ unit	[redacted]
4418	5 1/2 " Centralizer	33	units			[redacted]	/ unit	[redacted]
4400	Threadlok	2	units			[redacted]	/ unit	[redacted]
2999	5 1/2 " Top Plug	1	unit			[redacted]	/ unit	[redacted]
FLOAT EQUIPMENT TOTAL								[redacted]
NON-DISCOUNTED TOTAL								[redacted]
						DISCOUNT:		[redacted]
DISCOUNTED TOTAL								[redacted]
GRAND TOTAL								[redacted]

A minimum of two additional hours of pumping time per pumping operation will be charged after initial 6 hours location time. Hours will be charged as follows:

Additional hours on location will be charged (non-discounted) as follows:

Twin Cement Pumping Unit – per unit, per hour
Pumping Time..…… [redacted]
Standby Time..…… [redacted]

Bulk Cement Unit – per unit, per hour
Standby Time..…… [redacted]

Additional location time will be charged (undiscounted) for periods exceeding four hours on location. The additional time includes both pumping and standby time.

NOTE:
Travel charges are an estimate only. Invoice price will be based upon actual distance traveled. Equipment charges are for specified operating times. Hourly rates will be charged for operating times greater than specified. Federal and State taxes where applicable are additional. Quote is valid for 30 days from the date it is submitted.

Please refer to the General Terms and Conditions contained on the last page of this proposal. The provision of goods or services to the Customer, whether described in this proposal or otherwise provided, is governed by the General Terms and Conditions unless a written master service agreement is in place between the Customer and Sanjel. By accepting this proposal (either expressly or by allowing Sanjel to perform services or provide goods) the Customer agrees to be bound by the General Terms and Conditions, or where applicable, the master service agreement in place. Such acceptance shall constitute an acknowledgment by the Customer that it has reviewed and understands the General Terms and Conditions and has had the opportunity to seek independent legal advice. Such terms take precedence over any subsequent or supplemental terms provided by the Customer, including any terms found on a purchase order, which shall not apply regardless of whether or not they are signed by Sanjel.

General Terms and Conditions

Under these terms and conditions ("**T&C's**") Sanjel (USA) Inc. ("**Sanjel**") agrees to provide, and you agree to purchase, the goods and services in the attached proposal or work order ("**goods**," "**services**" or "**goods and services**"). You understand and agree that the T&Cs govern and control the provision of all goods or services Sanjel provides to you, including any goods or services Sanjel provides or performs under written or oral requests for goods or services. You accept the T&Cs by informing Sanjel or allowing Sanjel to provide goods and services, whichever is first. You cannot change the T&Cs, and Sanjel rejects any proposals on your forms or otherwise. When used in the T&Cs, "**we**," "**us**," and "**our**" refer to both you and Sanjel, collectively.

1. **Entire Agreement.** If we have signed an agreement applicable to the goods and services, that agreement will apply and the T&Cs do not. If no signed agreement exists between us, the T&Cs are our entire agreement for the goods and services, and no prior discussion, agreement, conduct, or industry practice will affect them. The T&Cs may not be changed, superseded or replaced by any other agreement (including any terms in a purchase order, service order, invoice or other similar document) unless specifically agreed by each of us in writing.

2. **Acknowledgment.** You understand that interpretations, research, analysis, advice or interpretational data furnished by Sanjel ("**Recommendations**") are opinions based on inferences from measurements, empirical relationships and assumptions and industry practice and that Recommendations are not infallible, and the opinions of professional geologists, engineers, drilling consultants and analysts may differ. Sanjel does not warrant the accuracy, correctness, or completeness of the Recommendations, or that your or any third party's reliance on the Recommendations will accomplish any particular results. You assume full responsibility for the use of and decisions based on the Recommendations, and you hereby agree to release, defend, indemnify and hold Sanjel harmless from Claims arising from the use of the Recommendations.

3. **Payment**. You will pay Sanjel for the goods and services at the rates in the applicable proposal or work order (which are good for 90 days) in US dollars within 30 days of receipt of performance or a correct invoice, whichever is later. Sanjel may charge interest at 18% per year on all overdue amounts, and you will bear all costs of collection of overdue accounts, including legal fees.

4. **Services**. You acknowledge and agree that the services Sanjel may perform are of such a nature that results cannot be guaranteed, and Sanjel makes no representations, warranties or guarantees with respect to the results of the services. Sanjel's only warranty with regard to the services is that they will conform to the material aspects of the applicable scope of work.

5. **Goods.** Sanjel may provide goods to you under the T&Cs or in connection with the services. Sanjel warrants that goods will (a) substantially conform to the applicable scope of work (b) be free of defects and of good quality and workmanship, and (c) not be subject to any liens, claims or encumbrances. There are no warranties, express or implied, of merchantability, use, and fitness that extend beyond those expressly stated herein.

6. **Warranty Remedies.** Sanjel will re-perform any non-conforming services if Sanjel is notified before leaving the work site, and will repair or replace any non-conforming or defective goods you notify Sanjel of within 30 days after Sanjel provided them to you free of charge. If Sanjel is unable to repair the non-conforming services, Sanjel will reimburse you for costs of a third party to repair such services, up to 10% of the original work order for such services. If fishing services are required to retrieve goods, Sanjel may specify the provider and be present during recovery. The remedies will not apply if damage is caused by: (i) your failure to properly store or maintain the goods, (ii) abnormal well conditions, abrasive materials, corrosion due to aggressive fluids or incorrect specifications, (iii) unauthorized alteration or repair of the goods, (iv) loss of goods while on your site due to your or any third party's negligence, vandalism or force majeure, (v) Sanjel's lack of or incorrect information regarding well conditions, or (vi) use or handling of the goods in a manner inconsistent with Sanjel's recommendations. Sanjel's warranty obligations will terminate if you fail to perform your obligations, including your failure to pay on time.

7. **Delay and Cancellation.** If Sanjel cannot provide goods or services to you due to circumstances beyond its control, Sanjel may charge you actual costs incurred, including but not limited to: mileage; blending; materials (including handling and hauling); return delivery and restocking charges; and all location time in excess of the location time allowance. Orders for goods or services that you cancel after Sanjel has procured the required materials may be subject to a 25% restocking fee. If Sanjel provides materials to your specifications and you cancel for any reason (including an uncontrollable event) you will be charged a cancellation fee plus actual costs incurred as a result of such cancellation.

8. **Taxes**. Prices are exclusive of any municipal, state, federal, special or use taxes or levies imposed on the sale of goods or services. You will be responsible for all taxes applicable to the provision of the goods or services.

9. **Additional Services Requests**. You will pay for services, equipment or materials not listed in a proposal but purchased or rented by Sanjel at your request at cost plus 25%. Sanjel has no liability to you for such services, equipment or materials.

10. **Proprietary Rights.** You acknowledge that any intellectual property Sanjel uses in connection with the T&Cs, or that is created or developed by Sanjel in the course of performing under the T&Cs, is the property of Sanjel at all times, and you understand that you are not entitled to any intellectual property rights in any of Sanjel's intellectual property, except as required to receive the benefit of the goods or services.

11. **Confidentiality.** Any non-public information that we learn about eachother in connection with the T&Cs, including our relationship, is confidential information of the disclosing party, and neither of us may disclose confidential information of the other to any third party without the prior written consent of the disclosing party. We may each use confidential information of the other to perform under the T&Cs, and may share it only on a need-to-know basis with employees.

12. **Indemnity. (A) Subject to Section 12(b) below, each of us ("Indemnitor") hereby agrees to release, defend, indemnify and hold the other, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier ("Indemnitee Group") harmless for all losses, claims, demands, causes of action, costs and expenses (including reasonable legal fees) (collectively, "Claims"), for personal injury, death and property damage to Indemnitor, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier arising out of or incident to the T&Cs or any goods or services provided hereunder, without regard to whether such Claim is caused, in whole or in part, by the negligence (whether sole, joint or concurrent, active or passive), contractual liability or other fault of any member of the Indemnitee Group or by any defect or pre-existing condition (whether known or unknown, patent or otherwise). (B) You hereby agree to release, defend, indemnify and hold Sanjel harmless for any Claims Sanjel may suffer or incur arising out of or incident to: well blowout or any uncontrolled well condition, fire, cratering, redrill or sidetracking, seepage or reservoir damage, loss or damage to the hole, pollution and contamination (except sudden and accidental pollution originating above the service of the earth and emanating from Sanjel's equipment while in Sanjel's care, custody and control), and loss or damage to Sanjel's (or its contractors') equipment while down the hole at new replacement value; even if caused in whole or in part by the sole, joint or concurrent negligence or other fault (active or passive) of Sanjel or any other person.**

13. **Consequential Damages Exclusion: Notwithstanding anything to the contrary, neither of us will be liable to the other for business interruptions, punitive, indirect or consequential damages relating to the goods or services (including but not limited to any loss of profit, loss of expected revenue, loss of hydrocarbons or loss of rig time).**

14. **Disposal of Chemicals.** You will arrange and be responsible for the disposal of any used chemicals and hazardous materials related to the goods or services.

15. **Insurance.** Each of us will maintain, at its own cost, commercial general liability insurance covering its indemnification obligations under the T&Cs with combined single limits of at least $5,000,000 per occurrence and in the aggregate. We will obtain insurance from carriers with AM Best ratings of at least A-VII (or equivalent), ensure the other party is named as an additional insured, and ensure that our carriers waive rights of subrogation against the other party.

16. **Uncontrollable Events.** Except for payment obligations, if either of us is unable to comply with the T&Cs because of events beyond our reasonable control, we will promptly notify the other in writing and will make reasonable efforts to restore our ability to perform as soon as possible. If the inability to perform continues for more than 10 days, the other party may cancel the applicable job immediately, by giving written notice to the affected party.

17. **Waiver.** Failure to enforce any or all of the T&Cs will not relieve either party of its rights or obligations or constitute a waiver or prevent further enforcement.

18. **Assignment.** You will not assign any of your rights or obligations under this PO without Sanjel's approval, which Sanjel may not unreasonably withhold. Any assignment in violation of this provision will be null and void.

19. **Governing Law.** We agree that the laws of the State of Colorado govern the T&Cs, without the application of choice of law rules. Each of us voluntarily submits to the jurisdiction and venue of the federal or state courts (as applicable) of the State of Colorado for the adjudication of all disputes under the T&Cs.

Sanjel

Big Sky Carbon Sequestration Project

Surface Cementing Proposal

Danielson 33-17

Toole County, Montana

Primary Cement Version 3 (04.14.14)

Prepared for: Patrick Montalban
Phone: [redacted]
Mobile:
Email: [redacted]

Prepared by: Justin Hill
Phone: [redacted]
Mobile:
Email: [redacted]

Service Center: Miles City, Montana, 406.357.3399

13 3/8 inch Surface Casing

Hole Size:	17 inch.
Casing Size:	13 3/8 inch, 54.5 lb/ft, J/K 55, STC.
Depth	250 ft.
Excess	70 % (gauge)

Cement Blends

Lead	ControlSet 'C' + 0.25 lbs./sack Polyflake

Cement Data

	Lead:
Water requirements :gal/sk	9.16
Yield : ft^3/sk	1.74
Density: lbs/gal	13.5
Thickening Time: hr: min	1:30
Compressive Strength: psi/hrs	1400/12 2200/24
Temperature °F	70

Calculations

Lead

0.6005 ft^3/ft x 250 ft.= 150.125 ft^3
150.125 ft^3 x 70 % (gauge) = 255.21 ft^3
255.21 ft^3 ÷ 1.74 ft^3/sk =146.95

Shoe Joint

.8679 ft^3/ft x 40' = 34.7 ft^3
34.7 ft^3 ÷ 1.74= 19.95

Total Cement Volume **165 sacks**

Surface Casing Cementing procedure

1. Make up float equipment and centralizers as required on 13 3/8 inch casing and run into total depth.

2. Break circulation and condition hole and drilling fluid prior to cementing.

3. Rig in Sanjel Cementing Unit, Surface treating lines, and a 13 3/8 inch head to casing.

4. Fill Surface treating lines with water and pressure test lines to 1500 psi.

5. Mix and pump the following:
   A. 20 bbls fresh water
   B. 165 sks CSC plus additives mixed @ 13.5 lb/gal

6. Drop a Top Rubber Plug and displace plug to insert float with water. Bump plug with a minimum of 500 psi over final pumping pressure.

7. Hold pressure for 1 minute(s), then bleed back casing pressure to ensure float is holding.

8. Rig down Sanjel, W.O.C. a minimum of 12 hours.

NOTE:
This recommendation is to be used as a guide. Job conditions and field experience must dictate job procedures. Please check all calculations on location.

COST ESTIMATE: **F.O.B.** **MILES CITY, MT**

PRODUCTION CASING **13 3/8 inch**

SERVICES							
1380	Pumping Unit Travel			300	miles	[redacted] / mile	[redacted]
1000	Pumping Unit Base Charge			250	feet	[redacted] / 6 hours	
1150	Twin Unit Surcharge					/ 6 hours	
1480	Bulk Cement Blending			167	ft^3	/ ft^3	
1484	Bulk Cement Delivery			8.3	tons	/ ton*mile	
1497	SAM III - Data Acquisition			1	job	/ job	
LEAD CEMENT							
3030	Control Set 'C'			165	sacks	[redacted] / sack	[redacted]
3247	Polyflake	0.25	lbs/sk	42	lbs	/ lb	
OTHER MATERIALS							
1492	Envirobag	1	bag			[redacted] / bag	[redacted]
3262	DF-3	2	gals			/ gal	
NON-DISCOUNTED ITEMS							
1493	Environmental Surcharge	1	job			[redacted] / job	[redacted]
2992	Fuel Surcharge	2	trucks			/ truck	
NON-DISCOUNTED TOTAL							[redacted]
						DISCOUNT:	
GRAND TOTAL							[redacted]

FLOAT EQUIPMENT (NON-DISCOUNTED)							
	13 3/8" Insert Baffle Plate	1	unit			[redacted] / unit	[redacted]
	13 3/8" Limit Clamp	1	unit			/ unit	
	13 3/8" Rubber Plug	1	unit			/ unit	
	13 3/8" Centralizer	5	units			/ unit	
4400	Threadlok	2	units			/ unit	
4437	13 3/8" Float Collar	1	unit			/ unit	
FLOAT EQUIPMENT TOTAL							[redacted]
NON-DISCOUNTED TOTAL							
						DISCOUNT:	[redacted]
DISCOUNTED TOTAL							
GRAND TOTAL							[redacted]

A minimum of two additional hours of pumping time per pumping operation will be charged after initial 6 hours location time. Hours will be charged as follows:

Additional hours on location will be charged (non-discounted) as follows:

Twin Cement Pumping Unit – per unit, per hour
Pumping Time.....
Standby Time.....

Bulk Cement Unit – per unit, per hour
Standby Time.....

[redacted]

Additional location time will be charged (undiscounted) for periods exceeding four hours on location. The additional time includes both pumping and standby time.

NOTE:
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General Terms and Conditions

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1. **Entire Agreement.** If we have signed an agreement applicable to the goods and services, that agreement will apply and the T&Cs do not. If no signed agreement exists between us, the T&Cs are our entire agreement for the goods and services, and no prior discussion, agreement, conduct, or industry practice will affect them. The T&Cs may not be changed, superseded or replaced by any other agreement (including any terms in a purchase order, service order, invoice or other similar document) unless specifically agreed by each of us in writing.

2. **Acknowledgment.** You understand that interpretations, research, analysis, advice or interpretational data furnished by Sanjel ("**Recommendations**") are opinions based on inferences from measurements, empirical relationships and assumptions and industry practice and that Recommendations are not infallible, and the opinions of professional geologists, engineers, drilling consultants and analysts may differ. Sanjel does not warrant the accuracy, correctness, or completeness of the Recommendations, or that your or any third party's reliance on the Recommendations will accomplish any particular results. You assume full responsibility for the use of and decisions based on the Recommendations, and you hereby agree to release, defend, indemnify and hold Sanjel harmless from Claims arising from the use of the Recommendations.

3. **Payment**. You will pay Sanjel for the goods and services at the rates in the applicable proposal or work order (which are good for 90 days) in US dollars within 30 days of receipt of performance or a correct invoice, whichever is later. Sanjel may charge interest at 18% per year on all overdue amounts, and you will bear all costs of collection of overdue accounts, including legal fees.

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6. **Warranty Remedies.** Sanjel will re-perform any non-conforming services if Sanjel is notified before leaving the work site, and will repair or replace any non-conforming or defective goods you notify Sanjel of within 30 days after Sanjel provided them to you free of charge. If Sanjel is unable to repair the non-conforming services, Sanjel will reimburse you for costs of a third party to repair such services, up to 10% of the original work order for such services. If fishing services are required to retrieve goods, Sanjel may specify the provider and be present during recovery. The remedies will not apply if damage is caused by: (i) your failure to properly store or maintain the goods, (ii) abnormal well conditions, abrasive materials, corrosion due to aggressive fluids or incorrect specifications, (iii) unauthorized alteration or repair of the goods, (iv) loss of goods while on your site due to your or any third party's negligence, vandalism or force majeure, (v) Sanjel's lack of or incorrect information regarding well conditions, or (vi) use or handling of the goods in a manner inconsistent with Sanjel's recommendations. Sanjel's warranty obligations will terminate if you fail to perform your obligations, including your failure to pay on time.

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12. **Indemnity. (A) Subject to Section 12(b) below, each of us ("Indemnitor") hereby agrees to release, defend, indemnify and hold the other, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier ("Indemnitee Group") harmless for all losses, claims, demands, causes of action, costs and expenses (including reasonable legal fees) (collectively, "Claims"), for personal injury, death and property damage to Indemnitor, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier arising out of or incident to the T&Cs or any goods or services provided hereunder, without regard to whether such Claim is caused, in whole or in part, by the negligence (whether sole, joint or concurrent, active or passive), contractual liability or other fault of any member of the Indemnitee Group or by any defect or pre-existing condition (whether known or unknown, patent or otherwise). (B) You hereby agree to release, defend, indemnify and hold Sanjel harmless for any Claims Sanjel may suffer or incur arising out of or incident to: well blowout or any uncontrolled well condition, fire, cratering, redrill or sidetracking, seepage or reservoir damage, loss or damage to the hole, pollution and contamination (except sudden and accidental pollution originating above the service of the earth and emanating from Sanjel's equipment while in Sanjel's care, custody and control), and loss or damage to Sanjel's (or its contractors') equipment while down the hole at new replacement value; even if caused in whole or in part by the sole, joint or concurrent negligence or other fault (active or passive) of Sanjel or any other person.**

13. **Consequential Damages Exclusion: Notwithstanding anything to the contrary, neither of us will be liable to the other for business interruptions, punitive, indirect or consequential damages relating to the goods or services (including but not limited to any loss of profit, loss of expected revenue, loss of hydrocarbons or loss of rig time).**

14. **Disposal of Chemicals.** You will arrange and be responsible for the disposal of any used chemicals and hazardous materials related to the goods or services.

15. **Insurance.** Each of us will maintain, at its own cost, commercial general liability insurance covering its indemnification obligations under the T&Cs with combined single limits of at least $5,000,000 per occurrence and in the aggregate. We will obtain insurance from carriers with AM Best ratings of at least A-VII (or equivalent), ensure the other party is named as an additional insured, and ensure that our carriers waive rights of subrogation against the other party.

16. **Uncontrollable Events.** Except for payment obligations, if either of us is unable to comply with the T&Cs because of events beyond our reasonable control, we will promptly notify the other in writing and will make reasonable efforts to restore our ability to perform as soon as possible. If the inability to perform continues for more than 10 days, the other party may cancel the applicable job immediately, by giving written notice to the affected party.

17. **Waiver.** Failure to enforce any or all of the T&Cs will not relieve either party of its rights or obligations or constitute a waiver or prevent further enforcement.

18. **Assignment.** You will not assign any of your rights or obligations under this PO without Sanjel's approval, which Sanjel may not unreasonably withhold. Any assignment in violation of this provision will be null and void.

19. **Governing Law.** We agree that the laws of the State of Colorado govern the T&Cs, without the application of choice of law rules. Each of us voluntarily submits to the jurisdiction and venue of the federal or state courts (as applicable) of the State of Colorado for the adjudication of all disputes under the T&Cs.

Big Sky Carbon Sequestration Project

2-Stage Cementing Proposal

Danielson 33-17_ - Production Well

Toole County, Montana

Primary Cement Version 4 (05.7.14)

Prepared for: Patrick Montalban
Phone: [redacted]
Mobile:
Email: [redacted]

Prepared by: Justin Hill
Phone: [redacted]
Mobile:
Email: [redacted]

Service Center: Miles City, Montana, 406.357.3399

8 5/8 inch 2-Stage Casing

Hole Size:	11 inch.
Casing Size:	8 5/8 inch, 32 lb/ft, J-55
Depth	2000'
Excess	30 % (gauge)
Stage Tool	~1700'

Cement Blends

First Stage

Lead	1-1-0 'Poz:G' + 1% CaCl + 0.25% CFL-3 + 0.25% CFR-2 + 0.4% CDF-4P + 2 lb/sk PS Flake 2000 ft to 1700 ft = 300 ft

Second Stage

Lead	Control Set 'C' + 0.15% LTR + 0.25 lb/sk Poly Flake mixed at 11.5 lbs/gal 1200 ft to Surface = 1200 ft
Tail	Control Set 'C' +0.15% LTR + 0.25 lb/sk Poly Flake Mixed at 13.5 lbs/gal 1700 ft to 1200 ft = 500 ft

Cement Data, First Stage

	Lead:
Water requirements :gal/sk	4.45
Yield : ft^3/sk	1.10
Density: lbs/gal	14.9
Thickening Time: hr: min	3:00
Compressive Strength: psi/hrs	
Temperature °F	75^0 F

Cement Data, Second Stage

	Lead:	Tail:
Water requirements :gal/sk	10.56	9.16
Yield : ft^3/sk	1.93	1.74
Density: lbs/gal	13.0	13.5
Thickening Time: hr: min	3:00	2:30
Compressive Strength: psi/hrs	473/6	500/6
	1121/12	1400/12
	1551/24	2400/24
Temperature °F	70^0 F	

Calculations

First Stage

Lead

0.2542 ft^3/ft x 300 ft.= 76.26 ft^3
76.26 ft^3 x 30 % (gauge) = 99.14 ft^3
99.14 ft^3 ÷ 1.10 ft^3/sk = **90 sks**

Second Stage

Lead

0.2542 ft^3/ft x 1200 ft.= 305.04 ft^3
305.04 ft^3 x 30 % (gauge) = 396.55 ft^3
396.55 ft^3 ÷ 1.93 ft^3/sk = **205 sks**

Tail

0.2542 ft^3/ft x 500 ft.= 127.1 ft^3
127.1 ft^3 x 30 % (gauge) = 165.23 ft^3
165.23 ft^3 ÷ 1.74 ft^3/sk = **95 sks**

Intermediate Casing Procedure

1. Make up float equipment and centralizers as required on 8 5/8 inch casing and run into total depth. Run Stage Tool at ~1700'.

2. Break circulation and condition hole and drilling fluid prior to cementing.

3. Rig in Sanjel Cementing Unit, Surface treating lines, and a 8 5/8 inch head to casing.

4. Fill Surface treating lines with water and pressure test lines to 2500 psi.

5. Mix and pump the following:
   A. 20 bbls fresh water
   B. 20 bbls Mud Flush
   C. 5 bbls fresh water
   B. 90 sks 1-1-0 'G' plus additives mixed @ 14.9 lb/gal

6. Drop first stage Top Rubber Plug and start displacement with water switching to mud after 40 bbls of water displacement. **Slow rate to 1 bpm while plug passes stage tool.** Bump plug with a minimum of 500 psi over final pumping pressure.

7. Hold pressure for 1 minute(s), then bleed back casing pressure to ensure float is holding.

8. Drop tool opening plug.

9. Wait X minutes for plug to land. Pressure up on tool as per tool directions to open tool. Pump 10 bbls of mud then turn circulation over to drilling rig.

10. **Circulate for 12 hours waiting on cement**.

11. Rig in Sanjel Cementing Unit, Surface treating lines to 8 5/8 inch head.

12. Fill Surface treating lines with water and pressure test lines to 2500 psi.

13. Mix and pump the following:
   A. 20 bbls fresh water
   B. 10 bbls Mud Flush
   C. 5 bbls fresh water
   B. 205 sks CSC plus additives mixed @ 13.0 lb/gal (Lead Cement Blend)
   C. 95 sks CSC plus additives mixed @ 13.5 lb/gal (Tail Cement Blend)

14. Drop second stage Closing Plug and displace with water at +/- 6 bpm. Bump plug 500 psi over final pumping pressure.

15. Hold pressure for 1 minute(s), then bleed back casing pressure to ensure tool is holding.

NOTE:
This recommendation is to be used as a guide. Job conditions and field experience must dictate job procedures. Please check all calculations on location.

COST ESTIMATE: **F.O.B.** **MILES CITY, MT**

PRODUCTION CASING **8 5/8 inch**

SERVICES								
1380	Pumping Unit Travel			300	miles	[redacted]	/ mile	[redacted]
1000	Pumping Unit Base Charge			2000	feet	[redacted]	/ 6 hours	[redacted]
1150	Twin Unit Surcharge					[redacted]	/ 6 hours	[redacted]
1480	Bulk Cement Blending			401	ft^3	[redacted]	/ ft^3	[redacted]
1484	Bulk Cement Delivery			18.9	tons	[redacted]	/ ton*mile	[redacted]
1497	SAM III - Data Acquisition			1	job	[redacted]	/ job	[redacted]
1310	Multiple Stage Cementing			1	stage	[redacted]	/ stage	[redacted]
PREFLUSHES AND SPACERS								
3195	MUDFLUSH			1260	gals	[redacted]	/ gal	[redacted]
LEAD CEMENT - STAGE 1								
3002	1:1:0 'Poz:G'			90	sacks	[redacted]	/ sack	[redacted]
3132	CFL-3	0.25	%	19	lbs	[redacted]	/ lb	[redacted]
3161	CFR-2	0.25	%	19	lbs	[redacted]	/ lb	[redacted]
3100	CaCl2	1.00	%	75	lbs	[redacted]	/ lb	[redacted]
3264	CDF-4P	0.40	%	30	lbs	[redacted]	/ lb	[redacted]
3250	PS Flake	2.00	lbs/sk	180	lbs	[redacted]	/ lb	[redacted]
LEAD CEMENT - STAGE 2								
3030	Control Set 'C'			205	sacks	[redacted]	/ sack	[redacted]
3247	Polyflake	0.25	lbs/sk	52	lbs	[redacted]	/ lb	[redacted]
3110	LTR	0.15	%	31	lbs	[redacted]	/ lb	[redacted]
TAIL CEMENT - STAGE 2								
3030	Control Set 'C'			95	sacks	[redacted]	/ sack	[redacted]
3247	Polyflake	0.25	lbs/sk	24	lbs	[redacted]	/ lb	[redacted]
3110	LTR	0.15	%	15	lbs	[redacted]	/ lb	[redacted]
OTHER MATERIALS								
1492	Envirobag	1	bag			[redacted]	/ bag	[redacted]
3262	DF-3	5	gals			[redacted]	/ gal	[redacted]
NON-DISCOUNTED ITEMS								
1493	Environmental Surcharge	1	job			[redacted]	/ job	[redacted]
2992	Fuel Surcharge	2	trucks			[redacted]	/ truck	[redacted]0
1395	Twin Unit - Add. Pumping	4	hours			[redacted]	/ hour	[redacted]
1398	Bulk Unit- Standby	4	hours			[redacted]	/ hour	[redacted]
NON-DISCOUNTED TOTAL								[redacted]
							DISCOUNT:	[redacted]
GRAND TOTAL								[redacted]

FLOAT EQUIPMENT (NON-DISCOUNTED)					
4438	8 5/8" Centralizer	15	units	[redacted] / unit	[redacted]
	8 5/8" Float Collar	1	unit	[redacted] / unit	[redacted]
4431	8 5/8" Guide Shoe	1	unit	[redacted] / unit	[redacted]
4440	8 5/8" Limit Clamp	1	unit	[redacted] / unit	[redacted]
4400	Threadlok	2	units	[redacted] / unit	[redacted]
2999	8 5/8" Stage Tool	1	unit	[redacted] / unit	[redacted]
FLOAT EQUIPMENT TOTAL					[redacted]
NON-DISCOUNTED TOTAL					[redacted]
				DISCOUNT:	[redacted])
DISCOUNTED TOTAL					[redacted] 1
GRAND TOTAL					[redacted]

A minimum of two additional hours of pumping time per pumping operation will be charged after initial 6 hours location time. Hours will be charged as follows:

Additional hours on location will be charged (non-discounted) as follows:

Twin Cement Pumping Unit – per unit, per hour
Pumping Time..... [redacted]
Standby Time..... [redacted]

Bulk Cement Unit – per unit, per hour
Standby Time..... [redacted]

Additional location time will be charged (undiscounted) for periods exceeding four hours on location. The additional time includes both pumping and standby time.

NOTE:
Travel charges are an estimate only. Invoice price will be based upon actual distance traveled. Equipment charges are for specified operating times. Hourly rates will be charged for operating times greater than specified. Federal and State taxes where applicable are additional. Quote is valid for 30 days from the date it is submitted.

Please refer to the General Terms and Conditions contained on the last page of this proposal. The provision of goods or services to the Customer, whether described in this proposal or otherwise provided, is governed by the General Terms and Conditions unless a written master service agreement is in place between the Customer and Sanjel. By accepting this proposal (either expressly or by allowing Sanjel to perform services or provide goods) the Customer agrees to be bound by the General Terms and Conditions, or where applicable, the master service agreement in place. Such acceptance shall constitute an acknowledgment by the Customer that it has reviewed and understands the General Terms and Conditions and has had the opportunity to seek independent legal advice. Such terms take precedence over any subsequent or supplemental terms provided by the Customer, including any terms found on a purchase order, which shall not apply regardless of whether or not they are signed by Sanjel

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Altamont

Big Sky Carbon Sequestration Project

Production Cementing Proposal

Danielson 33-17_ - Production Well

Toole County, Montana

Primary Cement Version 3 (05.11.14)

Prepared for: Patrick Montalban
Phone:
Mobile:
Email:

Prepared by: Justin Hill
Phone:
Mobile:
Email:

Service Center: Miles City, Montana, 406.357.3399

5 1/2 inch Production Casing

Hole Size:	7 7/8 inch.
Casing Size:	5 1/2 inch, 17 lb/ft, J-55
Depth	3700'
Excess	30 % (gauge)

Cement Blends

Lead	Control Set 'C' + 0.15% LTR + 0.25 lb/sk Poly Flake 3200 ft to Surface = 3200 ft
Tail	Custom 'G' (ARC) + 0.30% CFR-2 + 1.50% LDP-C-137 3700 ft to 3200 ft = 500 ft

Cement Data

	Lead:	Tail:
Water requirements :gal/sk	10.56	9.22
Yield : ft^3/sk	1.93	2.07
Density: lbs/gal	13.0	14.65
Thickening Time: hr: min	3:00	3:39
Compressive Strength: psi/hrs	473/6	195/6
	1121/12	643/12
	1551/24	1700/48
Temperature °F	90^0 F	

Calculations

Lead

0.1732 ft^3/ft x 3200 ft.= 554.24 ft^3
554.24 ft^3 x 30 % (gauge) = 720.51 ft^3
720.51 ft^3 ÷ 1.93 ft^3/sk = **375 sks**

Tail

0.1732 ft^3/ft x 500 ft.= 86.6 ft^3
86.6 ft^3 x 30 % (gauge) = 112.58 ft^3
112.58 ft^3 ÷ 2.07 ft^3/sk = **60 sks**

Production Casing Cementing Procedure

1. Make up float equipment and centralizers as required on 5 1/2 inch casing and run into total depth.

2. Break circulation and condition hole and drilling fluid prior to cementing.

3. Rig in Sanjel Cementing Unit, Surface treating lines, and a 5 1/2 inch head to casing.

4. Fill Surface treating lines with water and pressure test lines to 2500 psi.

5. Mix and pump the following:
   A. 20 bbls fresh water
   B. 20 bbls Mud Flush
   C. 5 bbls fresh water
   B. 375 sks CSC plus additives mixed @ 13.0 lb/gal (Lead Cement Blend)
   C. 60 sks Custom 'G' plus additives mixed @ 14.65 lb/gal (Tail Cement Blend)

6. Drop Plug and displace with water at +/- 6 bpm. Bump plug 500 psi over final pumping pressure.

7. Hold pressure for 1 minute(s), then bleed back casing pressure to ensure tool is holding.

8. Rig down Sanjel.

NOTE:
This recommendation is to be used as a guide. Job conditions and field experience must dictate job procedures. Please check all calculations on location.

COST ESTIMATE: **F.O.B.** **MILES CITY, MT**

PRODUCTION CASING **5 1/2** **inch**

SERVICES								
1380	Pumping Unit Travel			300	miles	[redacted]	/ mile	[redacted]
1004	Pumping Unit Base Charge			3700	feet	[redacted]	/ 6 hours	[redacted]
1150	Twin Unit Surcharge					[redacted]	/ 6 hours	[redacted]
1480	Bulk Cement Blending			443	ft^3	[redacted]	/ ft^3	[redacted]
1484	Bulk Cement Delivery			22	tons	[redacted]	/ ton*mile	[redacted]
1497	SAM III - Data Acquisition			1	job	[redacted]	/ job	[redacted]
PREFLUSHES AND SPACERS								
3195	MUDFLUSH			840	gals	[redacted]	/ gal	[redacted]
LEAD CEMENT								
3030	Control Set 'C'			375	sacks	[redacted]	/ sack	[redacted]
3110	LTR	0.15	%	57	lbs	[redacted]	/ lb	[redacted]
3247	Polyflake	0.25	lbs/sk	94	lbs	[redacted]	/ lb	[redacted]
TAIL CEMENT								
2999	Custom 'G' (ARC)			60	sacks	[redacted]	/ sack	[redacted]
3161	CFR-2	0.30	%	19	lbs	[redacted]	/ lb	[redacted]
2999	LDP-C-137	1.50	%	94	lbs	[redacted]	/ lb	[redacted]
OTHER MATERIALS								
1492	Envirobag	1	bag			[redacted]	/ bag	[redacted]
3262	DF-3	5	gals			[redacted]	/ gal	[redacted]
NON-DISCOUNTED ITEMS								
1493	Environmental Surcharge	1	job			[redacted]	/ job	[redacted]
2992	Fuel Surcharge	2	trucks			[redacted]	/ truck	[redacted]
NON-DISCOUNTED TOTAL								[redacted]
						DISCOUNT:		[redacted]
GRAND TOTAL								[redacted]

FLOAT EQUIPMENT (NON-DISCOUNTED)								
4442	5 1/2 " Float Collar - L-80	1	unit			[redacted]	/ unit	[redacted]
	5 1/2 " Guide shoe	1	unit			[redacted]	/ unit	[redacted]
4420	5 1/2 " Limit Clamp	1	unit			[redacted]	/ unit	[redacted]
4418	5 1/2 " Centralizer	33	units			[redacted]	/ unit	[redacted]
4400	Threadlok	2	units			[redacted]	/ unit	[redacted]
2999	5 1/2 " Top Plug	1	unit			[redacted]	/ unit	[redacted]
FLOAT EQUIPMENT TOTAL								[redacted]
NON-DISCOUNTED TOTAL								[redacted]
						DISCOUNT:		[redacted]
DISCOUNTED TOTAL								[redacted]
GRAND TOTAL								[redacted]

A minimum of two additional hours of pumping time per pumping operation will be charged after initial 6 hours location time. Hours will be charged as follows:

Additional hours on location will be charged (non-discounted) as follows:

Twin Cement Pumping Unit – per unit, per hour
Pumping Time..…… [redacted]
Standby Time..…… [redacted]

Bulk Cement Unit – per unit, per hour
Standby Time..…… [redacted]

Additional location time will be charged (undiscounted) for periods exceeding four hours on location. The additional time includes both pumping and standby time.

NOTE:
Travel charges are an estimate only. Invoice price will be based upon actual distance traveled. Equipment charges are for specified operating times. Hourly rates will be charged for operating times greater than specified. Federal and State taxes where applicable are additional. Quote is valid for 30 days from the date it is submitted.

Please refer to the General Terms and Conditions contained on the last page of this proposal. The provision of goods or services to the Customer, whether described in this proposal or otherwise provided, is governed by the General Terms and Conditions unless a written master service agreement is in place between the Customer and Sanjel. By accepting this proposal (either expressly or by allowing Sanjel to perform services or provide goods) the Customer agrees to be bound by the General Terms and Conditions, or where applicable, the master service agreement in place. Such acceptance shall constitute an acknowledgment by the Customer that it has reviewed and understands the General Terms and Conditions and has had the opportunity to seek independent legal advice. Such terms take precedence over any subsequent or supplemental terms provided by the Customer, including any terms found on a purchase order, which shall not apply regardless of whether or not they are signed by Sanjel.

General Terms and Conditions

Under these terms and conditions ("**T&C's**") Sanjel (USA) Inc. ("**Sanjel**") agrees to provide, and you agree to purchase, the goods and services in the attached proposal or work order ("**goods**," "**services**" or "**goods and services**"). You understand and agree that the T&Cs govern and control the provision of all goods or services Sanjel provides to you, including any goods or services Sanjel provides or performs under written or oral requests for goods or services. You accept the T&Cs by informing Sanjel or allowing Sanjel to provide goods and services, whichever is first. You cannot change the T&Cs, and Sanjel rejects any proposals on your forms or otherwise. When used in the T&Cs, "**we**," "**us**," and "**our**" refer to both you and Sanjel, collectively.

1. **Entire Agreement.** If we have signed an agreement applicable to the goods and services, that agreement will apply and the T&Cs do not. If no signed agreement exists between us, the T&Cs are our entire agreement for the goods and services, and no prior discussion, agreement, conduct, or industry practice will affect them. The T&Cs may not be changed, superseded or replaced by any other agreement (including any terms in a purchase order, service order, invoice or other similar document) unless specifically agreed by each of us in writing.

2. **Acknowledgment.** You understand that interpretations, research, analysis, advice or interpretational data furnished by Sanjel ("**Recommendations**") are opinions based on inferences from measurements, empirical relationships and assumptions and industry practice and that Recommendations are not infallible, and the opinions of professional geologists, engineers, drilling consultants and analysts may differ. Sanjel does not warrant the accuracy, correctness, or completeness of the Recommendations, or that your or any third party's reliance on the Recommendations will accomplish any particular results. You assume full responsibility for the use of and decisions based on the Recommendations, and you hereby agree to release, defend, indemnify and hold Sanjel harmless from Claims arising from the use of the Recommendations.

3. **Payment**. You will pay Sanjel for the goods and services at the rates in the applicable proposal or work order (which are good for 90 days) in US dollars within 30 days of receipt of performance or a correct invoice, whichever is later. Sanjel may charge interest at 18% per year on all overdue amounts, and you will bear all costs of collection of overdue accounts, including legal fees.

4. **Services**. You acknowledge and agree that the services Sanjel may perform are of such a nature that results cannot be guaranteed, and Sanjel makes no representations, warranties or guarantees with respect to the results of the services. Sanjel's only warranty with regard to the services is that they will conform to the material aspects of the applicable scope of work.

5. **Goods.** Sanjel may provide goods to you under the T&Cs or in connection with the services. Sanjel warrants that goods will (a) substantially conform to the applicable scope of work (b) be free of defects and of good quality and workmanship, and (c) not be subject to any liens, claims or encumbrances. There are no warranties, express or implied, of merchantability, use, and fitness that extend beyond those expressly stated herein.

6. **Warranty Remedies.** Sanjel will re-perform any non-conforming services if Sanjel is notified before leaving the work site, and will repair or replace any non-conforming or defective goods you notify Sanjel of within 30 days after Sanjel provided them to you free of charge. If Sanjel is unable to repair the non-conforming services, Sanjel will reimburse you for costs of a third party to repair such services, up to 10% of the original work order for such services. If fishing services are required to retrieve goods, Sanjel may specify the provider and be present during recovery. The remedies will not apply if damage is caused by: (i) your failure to properly store or maintain the goods, (ii) abnormal well conditions, abrasive materials, corrosion due to aggressive fluids or incorrect specifications, (iii) unauthorized alteration or repair of the goods, (iv) loss of goods while on your site due to your or any third party's negligence, vandalism or force majeure, (v) Sanjel's lack of or incorrect information regarding well conditions, or (vi) use or handling of the goods in a manner inconsistent with Sanjel's recommendations. Sanjel's warranty obligations will terminate if you fail to perform your obligations, including your failure to pay on time.

7. **Delay and Cancellation.** If Sanjel cannot provide goods or services to you due to circumstances beyond its control, Sanjel may charge you actual costs incurred, including but not limited to: mileage; blending; materials (including handling and hauling); return delivery and restocking charges; and all location time in excess of the location time allowance. Orders for goods or services that you cancel after Sanjel has procured the required materials may be subject to a 25% restocking fee. If Sanjel provides materials to your specifications and you cancel for any reason (including an uncontrollable event) you will be charged a cancellation fee plus actual costs incurred as a result of such cancellation.

8. **Taxes**. Prices are exclusive of any municipal, state, federal, special or use taxes or levies imposed on the sale of goods or services. You will be responsible for all taxes applicable to the provision of the goods or services.

9. **Additional Services Requests**. You will pay for services, equipment or materials not listed in a proposal but purchased or rented by Sanjel at your request at cost plus 25%. Sanjel has no liability to you for such services, equipment or materials.

10. **Proprietary Rights.** You acknowledge that any intellectual property Sanjel uses in connection with the T&Cs, or that is created or developed by Sanjel in the course of performing under the T&Cs, is the property of Sanjel at all times, and you understand that you are not entitled to any intellectual property rights in any of Sanjel's intellectual property, except as required to receive the benefit of the goods or services.

11. **Confidentiality.** Any non-public information that we learn about eachother in connection with the T&Cs, including our relationship, is confidential information of the disclosing party, and neither of us may disclose confidential information of the other to any third party without the prior written consent of the disclosing party. We may each use confidential information of the other to perform under the T&Cs, and may share it only on a need-to-know basis with employees.

12. **Indemnity. (A) Subject to Section 12(b) below, each of us ("Indemnitor") hereby agrees to release, defend, indemnify and hold the other, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier ("Indemnitee Group") harmless for all losses, claims, demands, causes of action, costs and expenses (including reasonable legal fees) (collectively, "Claims"), for personal injury, death and property damage to Indemnitor, its affiliates, officers, directors, agents, partners, joint venturers, employees and contractors of every tier arising out of or incident to the T&Cs or any goods or services provided hereunder, without regard to whether such Claim is caused, in whole or in part, by the negligence (whether sole, joint or concurrent, active or passive), contractual liability or other fault of any member of the Indemnitee Group or by any defect or pre-existing condition (whether known or unknown, patent or otherwise). (B) You hereby agree to release, defend, indemnify and hold Sanjel harmless for any Claims Sanjel may suffer or incur arising out of or incident to: well blowout or any uncontrolled well condition, fire, cratering, redrill or sidetracking, seepage or reservoir damage, loss or damage to the hole, pollution and contamination (except sudden and accidental pollution originating above the service of the earth and emanating from Sanjel's equipment while in Sanjel's care, custody and control), and loss or damage to Sanjel's (or its contractors') equipment while down the hole at new replacement value; even if caused in whole or in part by the sole, joint or concurrent negligence or other fault (active or passive) of Sanjel or any other person.**

13. **Consequential Damages Exclusion: Notwithstanding anything to the contrary, neither of us will be liable to the other for business interruptions, punitive, indirect or consequential damages relating to the goods or services (including but not limited to any loss of profit, loss of expected revenue, loss of hydrocarbons or loss of rig time).**

14. **Disposal of Chemicals.** You will arrange and be responsible for the disposal of any used chemicals and hazardous materials related to the goods or services.

15. **Insurance.** Each of us will maintain, at its own cost, commercial general liability insurance covering its indemnification obligations under the T&Cs with combined single limits of at least $5,000,000 per occurrence and in the aggregate. We will obtain insurance from carriers with AM Best ratings of at least A-VII (or equivalent), ensure the other party is named as an additional insured, and ensure that our carriers waive rights of subrogation against the other party.

16. **Uncontrollable Events.** Except for payment obligations, if either of us is unable to comply with the T&Cs because of events beyond our reasonable control, we will promptly notify the other in writing and will make reasonable efforts to restore our ability to perform as soon as possible. If the inability to perform continues for more than 10 days, the other party may cancel the applicable job immediately, by giving written notice to the affected party.

17. **Waiver.** Failure to enforce any or all of the T&Cs will not relieve either party of its rights or obligations or constitute a waiver or prevent further enforcement.

18. **Assignment.** You will not assign any of your rights or obligations under this PO without Sanjel's approval, which Sanjel may not unreasonably withhold. Any assignment in violation of this provision will be null and void.

19. **Governing Law.** We agree that the laws of the State of Colorado govern the T&Cs, without the application of choice of law rules. Each of us voluntarily submits to the jurisdiction and venue of the federal or state courts (as applicable) of the State of Colorado for the adjudication of all disputes under the T&Cs.

Sanjel

Pumping Service Report

9192501

Client Name	Well Name	Rig	Job Date	Call Sheet
Altamont Oil & Gas Inc.	Danielson 33-17		May 06,2014	1041713
Client Representative	**Surface Well Location**	**Down Hole Well Location**	**Job Type**	
Mr. Patrick Montalban	Get on location.		Surface Casing	

Well Profile

Maximum Treating Pressure (psi):	---		
Predicted Bottom Hole Static Temperature (°F):	70.00	@	--
Bottom Hole Circulating Temperature (°F):	---	@	--
Bottom Hole Logged Temperature (°F):	---	@	--

Open Hole

Size (in)	Excess (%)	TMD From (ft)	TMD To (ft)	TVD From (ft)	TVD To (ft)
17.000	70.000	0.000	250.000	--	--

Casing

Size (in)	Weight (lb/ft)	Grade	Collapse Pressure (psi)	Internal Yield Pressure (psi)	Capacity (bbl)	I.D. (in)	O.D. (in)	Depth From (ft)	Depth To (ft)
13.375	54.500	J-55	1,130.0	2,730.0	41.18	12.615	14.375	0.0	266.4

Products

Stage 1

From Depth (ft): 0

To Depth (ft): 250

Acids/Blends/Fluids :

Tail: 165 Sacks of Control Set C, Density = 13.5 lb/gal, Volume Pumped = 51.4 (bbl)
Water Temperature(°F) = 45 , Bulk Temperature(°F) = 50 , Slurry Temperature(°F) = 50
+ 0.25 lb/sack of Polyflake (Preblend)

Fluid & Cement Data

Expected Cement Top: --

Wellbore Fluid

Fluid Type	Viscosity (cP)	Density (lbs/gal)	Yield Point (psi)	Temperature (°F)	Recorded@
Water	--	--	--	--	May 04, 2014 11:49

Attachment & Tools

Down Hole Tools

Tool Type	Depth (ft)	Supplier
Float Insert	208.000	Sanjel

Sanjel

Pumping Service Report

9192501

Units & Personnel

Units

Truck Unit No.	Main Type	Sub Type	Tractor Unit No.	Main Type	Sub Type	Time On Location	Time Off Location
200568	PICKUP	1/2 Ton				05/05/2014 23:30	05/06/2014 03:40
740071	BODY JOB	C & A				05/05/2014 23:30	05/06/2014 03:40
446090	TRAILER	Bulker	746090	TRACTOR	Tandem - Tractor	05/05/2014 23:30	05/06/2014 03:40

Crew and Bonuses

Employee	Start Shift	End Shift	Second Start Shift	Second End Shift
Hill, Justin	05/05/2014 23:30	05/06/2014 03:40		
Venn, Jason	05/05/2014 23:30	05/06/2014 03:40		
Emeline, Douglas	05/05/2014 23:30	05/06/2014 03:40		
Thomas, Lonny	05/05/2014 23:30	05/06/2014 03:40		
Gray, Brian	05/05/2014 23:30	05/06/2014 03:40		
Williams, Ronnie	05/05/2014 23:30	05/06/2014 03:40		

Treatment Reports & Remarks

Volume To Formation

Stage/Plug/Treatment Interval Name	Volume To Formation (bbl)
Stage1	--

Sanjel

Pumping Service Report

9192501

Treatment Reports & Remarks

Treatment Report

Event #	Event Time	Event Description	Fluid Type	Rate (bbl/min)	Tubular Pressure (psi)	Annular Pressure (psi)	Stage Volume (bbl)	Total Volume (bbl)
1	May 05,2014 23:30	Arrive On Location		--	--	--	--	0.00
2	May 05,2014 23:30	Tailgate Meeting		--	--	--	--	0.00
3	May 05,2014 23:45	Rig In		--	--	--	--	0.00
4	May 06,2014 01:00	Safety Meeting		--	--	--	--	0.00
5	May 06,2014 01:20	Sign-off on Safety		--	--	--	--	0.00
6	May 06,2014 01:30	Pressure Test	Water	--	--	--	--	0.00
	Remarks: Tested surface line to 2000 psi							
7	May 06,2014 01:37	Pump	Water	5.00	50.0	--	20.00	20.00
8	May 06,2014 01:52	Mix Cement	Control Set C	5.00	150.0	--	51.40	71.40
	Remarks: 165 sacks @ 13.5 ppg, yield -1.74							
9	May 06,2014 02:05	Stop		--	--	--	--	71.40
10	May 06,2014 02:06	Drop Plug		--	--	--	--	71.40
11	May 06,2014 02:11	Displace Plug	Water	5.00	200.0	--	24.00	95.40
12	May 06,2014 02:16	Stop		--	--	--	--	95.40
13	May 06,2014 02:18	Displace Plug	Water	1.00	200.0	--	3.00	98.40
14	May 06,2014 02:21	Stop		--	--	--	--	98.40
15	May 06,2014 02:23	Displace Plug	Water	1.00	90.0	--	7.00	105.40
16	May 06,2014 02:30	Bump Plug	Water	--	590.0	--	--	105.40
17	May 06,2014 02:32	Check Float		--	--	--	--	105.40
18	May 06,2014 02:35	Job Complete		--	--	--	--	105.40
19	May 06,2014 02:35	Wash		--	--	--	--	105.40
20	May 06,2014 02:50	Rig Out		--	--	--	--	105.40
21	May 06,2014 03:30	Pre-Departure Meeting		--	--	--	--	105.40
22	May 06,2014 03:40	Leave Location		--	--	--	--	105.40

Did Float Hold: Yes

Fluid Returns : Yes

Type : Cement

Volume (bbl) : 17

Temperature (°F) : 70

FDAS Functioning Correctly : Yes

Was the Program Followed As Per Design? : Yes

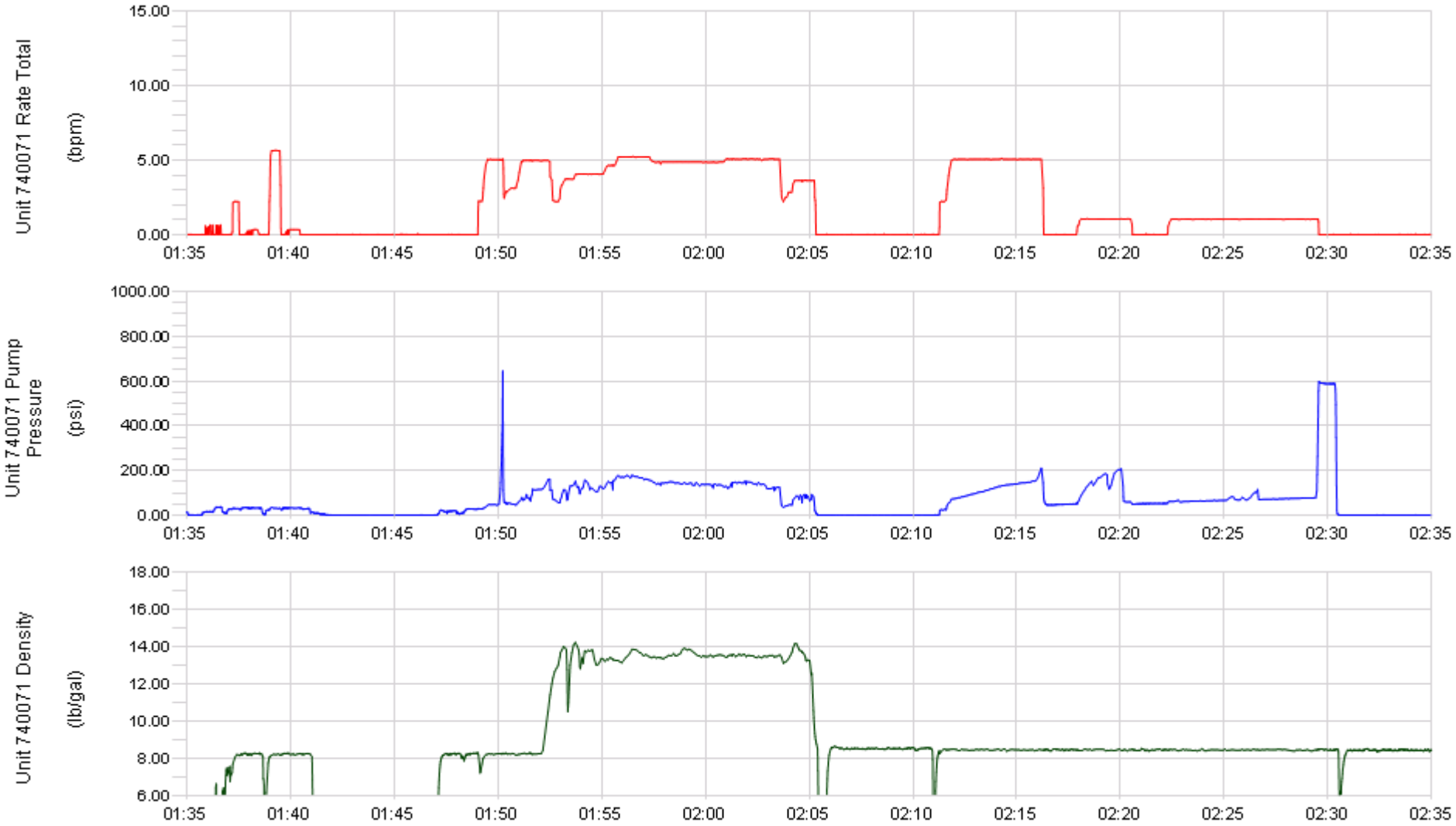
Material Transfer Sheet Number

Material Transfer Sheet Number

25250

55136

Client	Altamont Oil & Gas	Client Rep	Mr. Patrick Montalban	Supervisor	Justin Hill
Ticket No.	9192501	Well Name	Danielson 33-17	Unit No.	740071
Location	Sec 17 T35N R1W	Job Type	Surface Casing	Service District	Miles City
Comments				Job Date	05/06/2014



Sanjel

Pumping Service Report

9188520

Client Name	Well Name	Rig	Job Date	Call Sheet
Altamont Oil & Gas Inc.	Danielson 33-17		May 09,2014	1041843
Client Representative	**Surface Well Location**	**Down Hole Well Location**	**Job Type**	
Mr. Ed Heck	Sec 17:T35N:R1W		2-Stage Production	

Well Profile

Maximum Treating Pressure (psi):	---		
Predicted Bottom Hole Static Temperature (°F):	70.00	@	--
Bottom Hole Circulating Temperature (°F):	---	@	--
Bottom Hole Logged Temperature (°F):	---	@	--

Open Hole

Size (in)	Excess (%)	TMD From (ft)	TMD To (ft)	TVD From (ft)	TVD To (ft)
17.000	70.000	0.000	250.000	--	--
11.000	30.000	0.000	2,000.000	--	--

Casing

Size (in)	Weight (lb/ft)	Grade	Collapse Pressure (psi)	Internal Yield Pressure (psi)	Capacity (bbl)	I.D. (in)	O.D. (in)	Depth From (ft)	Depth To (ft)
13.375	54.500	J-55	1,130.0	2,730.0	38.65	12.615	14.375	0.0	250.0
8.625	32.000		--	--	--	--	--	0.0	2,000.0

Products

Stage 1

From Depth (ft): 2000

To Depth (ft): 1700

Acids/Blends/Fluids :

Tail: 90 Sacks of 1:1:0 Poz:G', Density = 14.9 lb/gal, Volume Pumped = 18 (bbl)
Water Temperature(°F) = 60 , Bulk Temperature(°F) = 50 , Slurry Temperature(°F) = 65
+ 1 % of CaCl2 (Preblend),
+ 0.25 % of CFL-3 (Preblend),
+ 0.25 % of CFR-2 (Preblend),
+ 0.4 % of CDF-4P (Preblend),
+ 0.25 lb/sack of Polyflake (Preblend)

Lead 1: 205 Sacks of Control Set C, Volume Pumped = 70 (bbl)
Water Temperature(°F) = 60 , Bulk Temperature(°F) = 50 , Slurry Temperature(°F) = 65

Fluid & Cement Data

Expected Cement Top: --

Wellbore Fluid

Fluid Type	Viscosity (cP)	Density (lbs/gal)	Yield Point (psi)	Temperature (°F)	Recorded@
Water	--	--	--	--	May 04, 2014 11:49
Water Based Mud	--	--	--	--	May 09, 2014 22:59

Attachment & Tools

Down Hole Tools

Tool Type	Depth (ft)	Supplier
Stage Tool Mechanical (MSCC)	1,700.000	Sanjel

Sanjel

Pumping Service Report

9188520

Units & Personnel

Units

Truck Unit No.	Main Type	Sub Type	Tractor Unit No.	Main Type	Sub Type	Time On Location	Time Off Location
200582	PICKUP	3/4 Ton				05/09/2014 17:00	05/10/2014 09:00
740069	BODY JOB	C & A				05/09/2014 17:00	05/10/2014 09:00
446095	TRAILER	Bulker	746095	TRACTOR	Tandem - Tractor	05/09/2014 17:00	05/10/2014 09:00

Crew and Bonuses

Employee	Start Shift	End Shift	Second Start Shift	Second End Shift
Melchior, Brandon	05/09/2014 17:00	05/10/2014 09:00		
Nansel, Thomas	05/09/2014 17:00	05/10/2014 09:00		
Regalado, David	05/09/2014 17:00	05/10/2014 09:00		
Stigen, John	05/09/2014 17:00	05/10/2014 09:00		

Treatment Reports & Remarks

Treatment Report

Event #	Event Time	Event Description	Fluid Type	Rate (bbl/min)	Tubular Pressure (psi)	Annular Pressure (psi)	Stage Volume (bbl)	Total Volume (bbl)
1	May 09,2014 19:00	Arrive On Location		--	--	--	--	0.00
2	May 09,2014 19:00	Tailgate Meeting		--	--	--	--	0.00
3	May 09,2014 19:00	Sign-off on Safety		--	--	--	--	0.00
4	May 09,2014 20:30	Safety Meeting		--	--	--	--	0.00
5	May 09,2014 20:40	Pressure Test		--	--	--	--	0.00
	Remarks: pressure tested lines to 3000 psi							
6	May 09,2014 20:42	Pump	Water	4.00	100.0	--	10.00	10.00
7	May 09,2014 20:45	Pump	Water	4.00	100.0	--	10.00	20.00
	Remarks: mud flush ahead							
8	May 09,2014 20:50	Pump	Water	4.00	100.0	--	5.00	25.00
9	May 09,2014 20:51	Pump	1:1:0 Poz:G'	4.00	100.0	--	18.00	43.00
10	May 09,2014 20:56	Stop		--	--	--	--	43.00
11	May 09,2014 20:58	Drop Plug		--	--	--	--	43.00
12	May 09,2014 21:02	Pump	Water	4.00	100.0	--	40.00	83.00
13	May 09,2014 21:12	Pump	Water Based Mud	4.00	150.0	--	72.60	155.60
	Remarks: at 95 bbls away slowed to 2 bpm to pass through tool and bump plug							
14	May 09,2014 21:35	Bump Plug	Water Based Mud	--	760.0	--	--	155.60
15	May 09,2014 21:37	Check Float		--	--	--	--	155.60
	Remarks: float held							
16	May 09,2014 21:42	Stop		--	--	--	--	155.60
	Remarks: droped bomb and wait 15 minutes							
17	May 09,2014 21:57	Open Stage Tool - Hydraulic	Water Based Mud	2.50	750.0	--	1.00	156.60
	Remarks: tool opened at 750 psi							
18	May 09,2014 22:01	Pump	Water Based Mud	4.00	100.0	--	20.00	176.60

Sanjel

Pumping Service Report

9188520

Treatment Report

Event #	Event Time	Event Description	Fluid Type	Rate (bbl/min)	Tubular Pressure (psi)	Annular Pressure (psi)	Stage Volume (bbl)	Total Volume (bbl)
19	May 09,2014 22:06	Stop		--	--	--	--	176.60
	Remarks: shut down and let rig take over							
20	May 09,2014 22:30	Wait on Cement		--	--	--	--	176.60
	Remarks: Rig circulate 8 hours							
21	May 10,2014 07:00	Pump	Water	5.00	100.0	--	20.00	196.60
	Remarks: Fresh							
22	May 10,2014 07:05	Pump	Water	5.00	100.0	--	20.00	216.60
	Remarks: Mud Flush							
23	May 10,2014 07:06	Pump	Water	5.00	100.0	--	5.00	221.60
	Remarks: Fresh							
24	May 10,2014 07:07	Pump	Control Set C	5.00	100.0	--	70.00	291.60
	Remarks: Lead							
25	May 10,2014 07:20	Pump	Control Set C	5.00	100.0	--	29.00	320.60
	Remarks: Tail @ 13.5							
26	May 10,2014 07:30	Stop		--	--	--	--	320.60
27	May 10,2014 07:35	Drop Plug		--	0.0	--	--	320.60
28	May 10,2014 07:37	Pump	Water	5.00	0.0	--	20.00	340.60
29	May 10,2014 07:41	Pump	Water Based Mud	5.00	100.0	--	81.70	422.30
30	May 10,2014 08:02	Bump Plug		--	--	--	--	422.30
	Remarks: Bump plug at 1200psi							
31	May 10,2014 08:05	Check Float		--	--	--	--	422.30
32	May 10,2014 08:05	Job Complete		--	--	--	--	422.30
33	May 10,2014 08:30	Rig Out		--	--	--	--	422.30
34	May 10,2014 09:00	Pre-Departure Meeting		--	--	--	--	422.30
35	May 10,2014 09:30	Leave Location		--	--	--	--	422.30

Did Float Hold: Yes

Fluid Returns : Yes

Type : Cement

Volume (bbl) : 20

Temperature (°F) : 60

FDAS Functioning Correctly : Yes

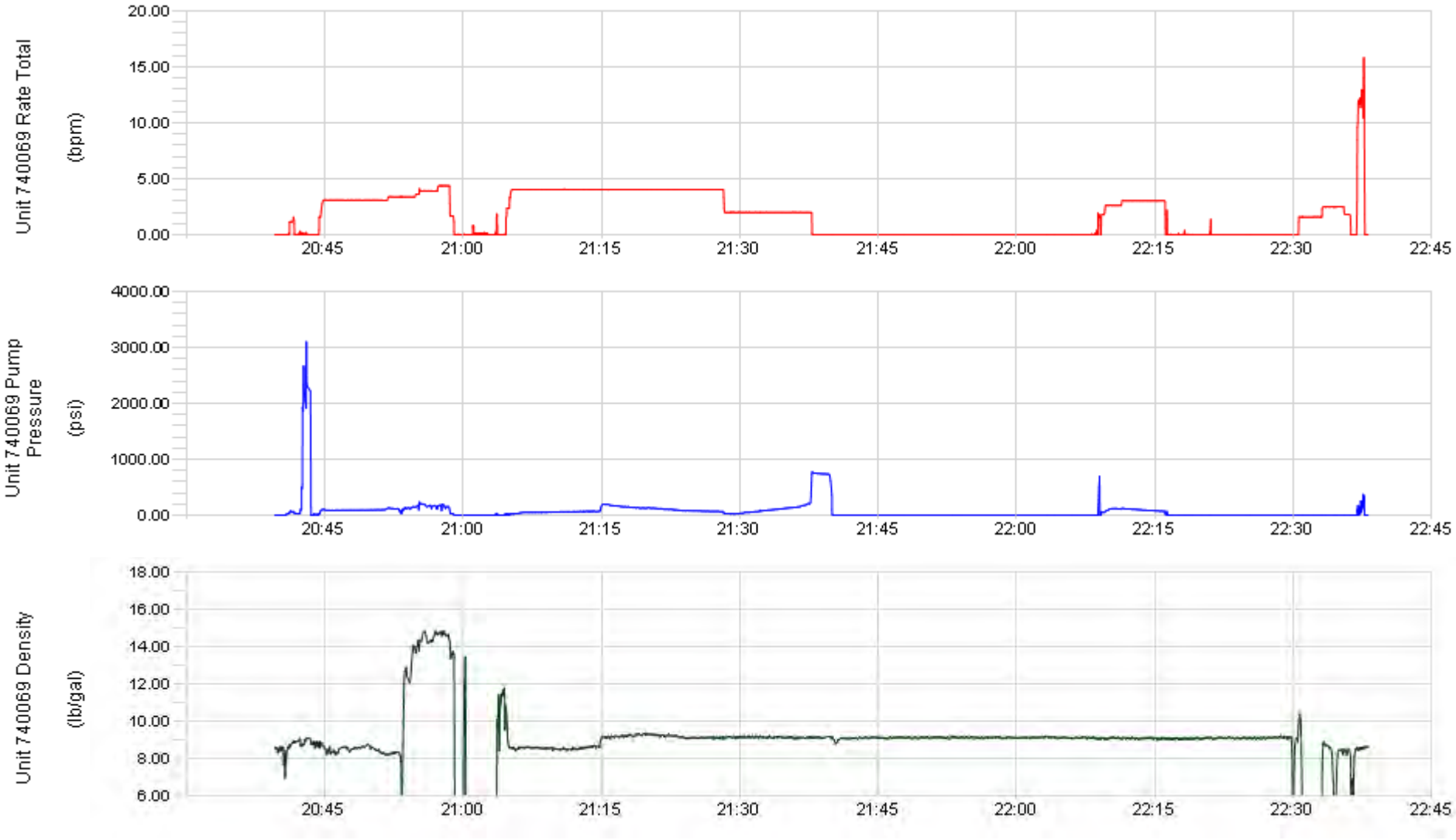
Was the Program Followed As Per Design? : Yes

Material Transfer Sheet Number

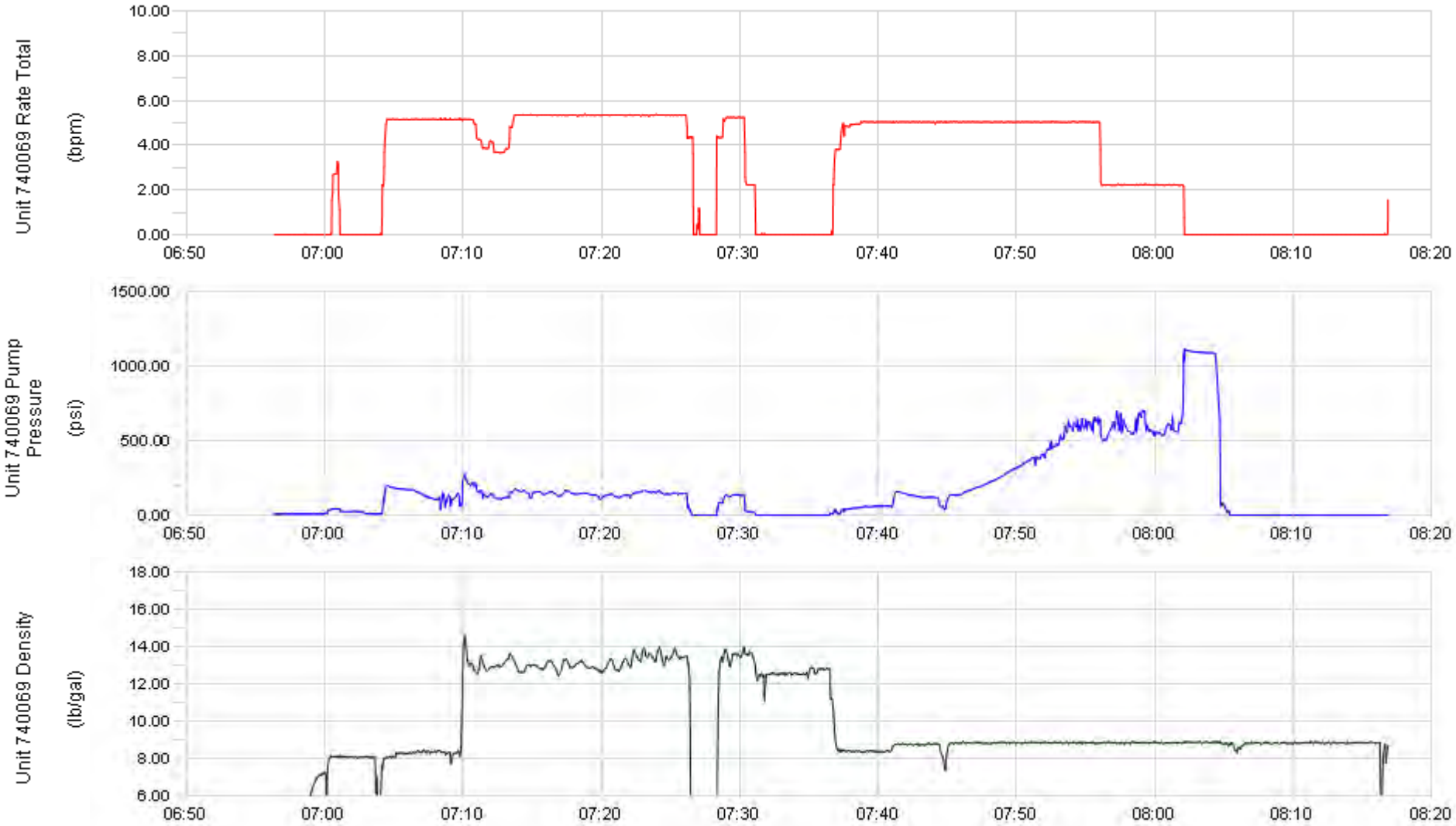
Material Transfer Sheet Number

25270

Client	Altamont	Client Rep	Ed Heck	Supervisor	Brandon Melchior
Ticket No.	9188520	Well Name	Danielson 33-17	Unit No.	740069
Location	SEC	Job Type	2-Stage Intermediate	Service District	Miles City
Comments				Job Date	05/09/2014



Client	Altamont	Client Rep	Ed Heck	Supervisor	Brandon Melchior
Ticket No.	9188520	Well Name	Danielson 33-17	Unit No.	740069
Location	SEC	Job Type	2-Stage Intermediate	Service District	Miles City
Comments				Job Date	05/10/2014



Sanjel

Pumping Service Report

9193101

Client Name	Well Name	Rig	Job Date	Call Sheet
Altamont Oil & Gas Inc.	Danielson 33-17		May 17,2014	1042052
Client Representative	**Surface Well Location**	**Down Hole Well Location**	**Job Type**	
Mr. Patrick Montalban	Sec 17:T35N:R1W		Production Casing	

Well Profile

Maximum Treating Pressure (psi):	---		
Predicted Bottom Hole Static Temperature (°F):	90.00	@	--
Bottom Hole Circulating Temperature (°F):	---	@	--
Bottom Hole Logged Temperature (°F):	---	@	--

Open Hole

Size (in)	Excess (%)	TMD From (ft)	TMD To (ft)	TVD From (ft)	TVD To (ft)
17.000	70.000	0.000	250.000	--	--
7.875	30.000	0.000	3,800.000	--	--

Casing

Size (in)	Weight (lb/ft)	Grade	Collapse Pressure (psi)	Internal Yield Pressure (psi)	Capacity (bbl)	I.D. (in)	O.D. (in)	Depth From (ft)	Depth To (ft)
13.375	54.500	J-55	1,130.0	2,730.0	38.65	12.615	14.375	0.0	250.0
5.500	17.000	J-55	4,910.0	5,320.0	88.34	4.892	6.050	0.0	3,800.0

Products

Stage 1

From Depth (ft): 0

To Depth (ft): 3800

Acids/Blends/Fluids :

Lead 1: 214 Sacks of Control Set C, Density = 13 lb/gal, Volume Pumped = 73.5 (bbl)
Water Temperature(°F) = 70 , Bulk Temperature(°F) = 70 , Slurry Temperature(°F) = 80
+ 0.25 lb/sack of Polyflake (Preblend),
+ 0.15 % of LTR (Preblend)

Tail: 208 Sacks of Custom 'G' (ARC), Density = 14.65 lb/gal, Volume Pumped = 76.7 (bbl)
Water Temperature(°F) = 70 , Bulk Temperature(°F) = 70 , Slurry Temperature(°F) = 80
+ 0.3 % of CFR-2 (Preblend),
+ 1.5 % of LDP-C-137 (Preblend)

Fluid & Cement Data

Expected Cement Top: Surface

Wellbore Fluid

Fluid Type	Viscosity (cP)	Density (lbs/gal)	Yield Point (psi)	Temperature (°F)	Recorded@
Water	--	--	--	--	May 04, 2014 11:49

Attachment & Tools

Down Hole Tools

Tool Type	Depth (ft)	Supplier
Guide Shoe	3,760.000	Third Party

Units & Personnel

Units

Truck Unit No.	Main Type	Sub Type	Tractor Unit No.	Main Type	Sub Type	Time On Location	Time Off Location
446090	TRAILER	Bulker	746909	TRACTOR	Tandem - Tractor	05/17/2014 08:30	05/17/2014 16:35
200848	PICKUP	3/4 Ton				05/17/2014 08:30	05/17/2014 16:35
740077	BODY JOB	C & A				05/17/2014 08:30	05/17/2014 16:35
446076	TRAILER	Bulker	746076	TRACTOR	Tandem - Tractor	05/17/2014 08:30	05/17/2014 16:35

Crew and Bonuses

Employee	Start Shift	End Shift	Second Start Shift	Second End Shift
Williams, Ronnie	05/17/2014 08:30	05/17/2014 16:35		
Briggs, Zachary	05/17/2014 08:30	05/17/2014 16:35		
Pedersen, Justin	05/17/2014 08:30	05/17/2014 16:35		
Thompson, Bradi	05/17/2014 08:30	05/17/2014 16:35		
Dewitt Jr, Jerry	05/17/2014 08:30	05/17/2014 16:35		
Luff, Aaron	05/17/2014 08:30	05/17/2014 16:35		

Treatment Reports & Remarks

Treatment Report

Event #	Event Time	Event Description	Fluid Type	Rate (bbl/min)	Tubular Pressure (psi)	Annular Pressure (psi)	Stage Volume (bbl)	Total Volume (bbl)
1	May 17,2014 08:30	Arrive On Location		0.00	0.0	0.0	0.00	0.00
	Remarks: 0							
2	May 17,2014 08:35	Tailgate Meeting		0.00	0.0	0.0	0.00	0.00
	Remarks: 0							
3	May 17,2014 08:40	Safety Meeting		0.00	0.0	0.0	0.00	0.00
	Remarks: 0							
4	May 17,2014 08:45	Sign-off on Safety		0.00	0.0	0.0	0.00	0.00
	Remarks: 0							
5	May 17,2014 09:30	Rig In		0.00	0.0	0.0	0.00	0.00
	Remarks: 0							
6	May 17,2014 10:00	Wait On Instructions		0.00	0.0	0.0	0.00	0.00
	Remarks: 0							
7	May 17,2014 12:45	JSA		0.00	0.0	0.0	0.00	0.00
	Remarks: 0							
8	May 17,2014 13:35	Pressure Test	Water	0.25	2,500.0	0.0	0.25	0.25
	Remarks: 0							
9	May 17,2014 13:38	Injection Test	Water Based Mud	4.00	100.0	0.0	5.00	5.25
	Remarks: 0							
10	May 17,2014 13:44	Drop Plug		0.00	0.0	0.0	0.00	5.25
	Remarks: DROPPED WIPER BOTTOM PLUG							
11	May 17,2014 13:50	Injection Test	Water Based Mud	4.00	100.0	0.0	15.00	20.25
	Remarks: 0							

Sanjel

Pumping Service Report

9193101

Treatment Report

Event #	Event Time	Event Description	Fluid Type	Rate (bbl/min)	Tubular Pressure (psi)	Annular Pressure (psi)	Stage Volume (bbl)	Total Volume (bbl)
12	May 17,2014 14:03	Pump	Water Based Mud	4.50	160.0	0.0	30.00	50.25
	Remarks: PUMPED 30 BBLS MUD FLUSH							
13	May 17,2014 14:10	Pump	Water	5.40	160.0	0.0	5.00	55.25
	Remarks: 5 BBLS FRESH WATER SPACER							
14	May 17,2014 14:13	Pump	Control Set C	5.40	165.0	0.0	73.50	128.75
	Remarks: LEAD CEMENT 214 SKS							
15	May 17,2014 14:31	Pump	Custom 'G' (ARC)	5.40	150.0	0.0	76.70	205.45
	Remarks: TAIL CEMENT 208 SKS							
16	May 17,2014 14:53	Wash	Water	1.00	0.0	0.0	10.00	215.45
	Remarks: 0							
17	May 17,2014 15:04	Drop Plug		0.00	0.0	0.0	0.00	215.45
	Remarks: 0							
18	May 17,2014 15:06	Pump Displacement	Water Based Mud	5.40	1,100.0	0.0	78.00	293.45
	Remarks: 0							
19	May 17,2014 15:25	Pump Displacement	Water Based Mud	2.00	1,300.0	0.0	10.00	303.45
	Remarks: 0							
20	May 17,2014 15:31	Bump Plug	Water	2.00	1,700.0	0.0	0.00	303.45
	Remarks: 0							
21	May 17,2014 15:34	Check Float		0.00	0.0	0.0	0.00	303.45
	Remarks: FLOATS HELD							
22	May 17,2014 15:45	Rig Out		0.00	0.0	0.0	0.00	303.45
	Remarks: 0							
23	May 17,2014 15:55	Job Complete		0.00	0.0	0.0	0.00	303.45
	Remarks: 0							
24	May 17,2014 16:30	Pre-Departure Meeting		0.00	0.0	0.0	0.00	303.45
	Remarks: 0							
25	May 17,2014 16:35	Leave Location		0.00	0.0	0.0	0.00	303.45
	Remarks: 0							

Did Float Hold:

Fluid Returns : Yes

Type : Cement

Volume (bbl) : 10

Temperature (°F) : 80

FDAS Functioning Correctly : Yes

Was the Program Followed As Per Design? : Yes

Material Transfer Sheet Number

Material Transfer Sheet Number

44850

25280

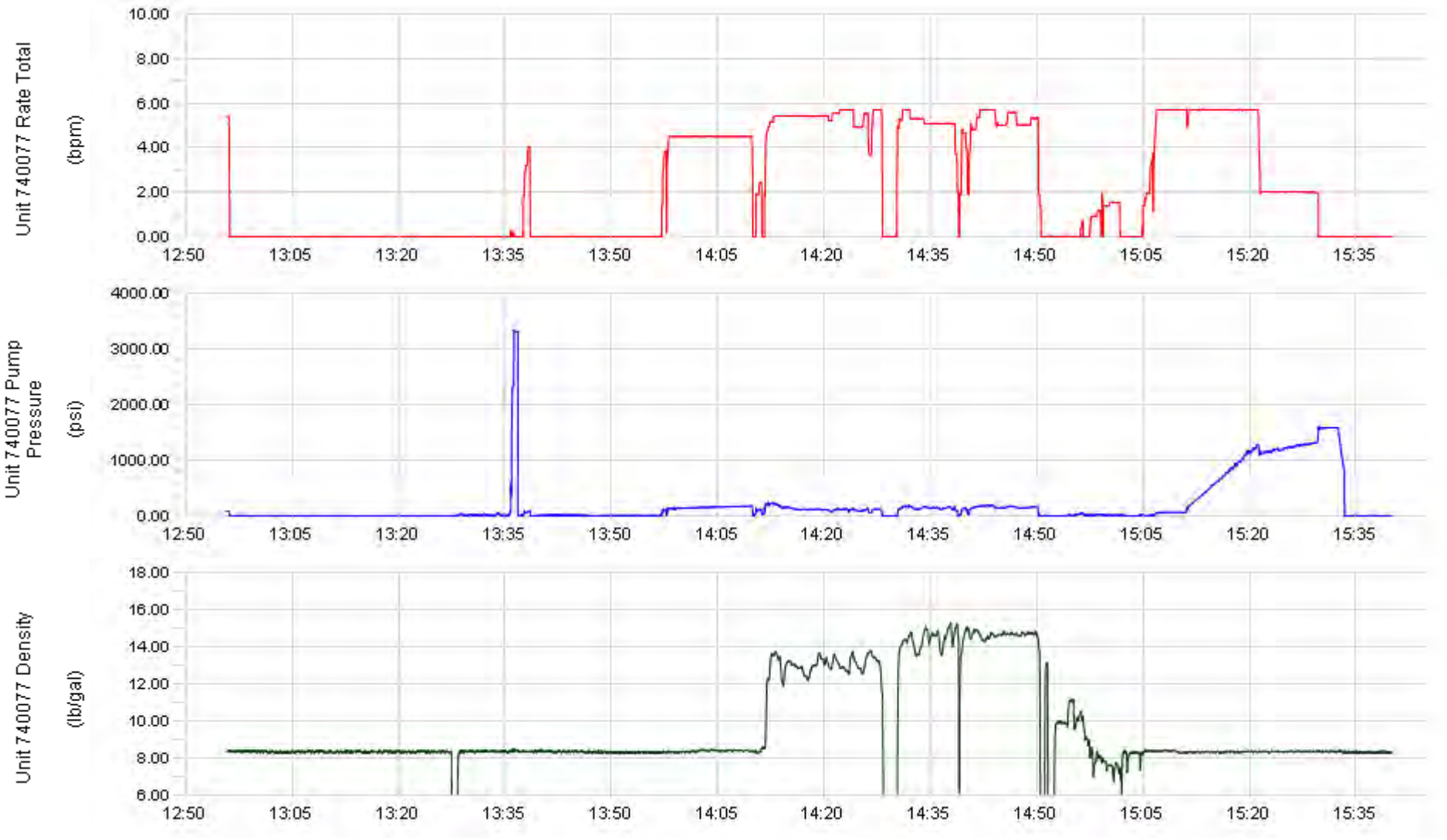
55144

Sanjel

Pumping
Service Report

9193101

Client	Altamont Oil&Gas Inc	Client Rep	Mr. Patrick Montalban	Supervisor	Justin Pedersen
Ticket No.	9193101	Well Name	Danielson 33-17	Unit No.	740077
Location	Sec17:T35N:R1W	Job Type	Production Casing	Service District	D503
Comments	Production Casing			Job Date	05/17/2014



Big Sky Carbon Sequestration Partnership (BSCSP)
Kevin Dome Carbon Sequestration Project
Toole County, Montana

The Danielson 33-17 Final Isolation Scanner Cement Evaluation Report is available for download through the U.S. Department of Energy (DOE) EDX website: https://edx.netl.doe.gov/dataset

Altamont Oil & Gas, Inc.

Toole County, MT
Sec 17, T35N, R1W, P.M.M. Survey
Danielson 33-17

WB#1/Job#:1420740

Survey: Phoenix MWD Surveys

Standard Survey Report

17 July, 2014

Survey Report

Company:	Altamont Oil & Gas, Inc.	**Local Co-ordinate Reference:**	Well Danielson 33-17
Project:	Toole County, MT	**TVD Reference:**	GL @ 3576.00usft
Site:	Sec 17, T35N, R1W, P.M.M. Survey	**MD Reference:**	GL @ 3576.00usft
Well:	Danielson 33-17	**North Reference:**	Grid
Wellbore:	WB#1/Job#:1420740	**Survey Calculation Method:**	Minimum Curvature
Design:	WB#1/Job#:1420740	**Database:**	Compass 5000 RMR DB

Project Toole County, MT

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Montana		

Site Sec 17, T35N, R1W, P.M.M. Survey

Site Position:		**Northing:**	1,663,043.942 usft	**Latitude:**	48° 47' 23.520 N
From:	Lat/Long	**Easting:**	1,423,712.140 usft	**Longitude:**	111° 45' 37.580 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	-1.65 °

Well Danielson 33-17

Well Position	**+N/-S**	0.00 usft	**Northing:**	1,663,043.942 usft	**Latitude:**	48° 47' 23.520 N
	+E/-W	0.00 usft	**Easting:**	1,423,712.140 usft	**Longitude:**	111° 45' 37.580 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,566.00 usft

Wellbore WB#1/Job#:1420740

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	05/03/14	13.16	72.17	55,926

Design WB#1/Job#:1420740

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	0.00

Survey Program **Date** 07/17/14

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
302.00	3,800.00	Phoenix MWD Surveys (WB#1/Job#:1420	MWD	MWD - Standard

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
302.00	0.30	313.00	302.00	0.54	-0.58	0.54	0.10	0.10	0.00
First Phoenix MWD Survey									
331.00	0.30	313.80	331.00	0.64	-0.69	0.64	0.01	0.00	2.76
364.00	0.20	357.70	364.00	0.76	-0.75	0.76	0.63	-0.30	133.03
395.00	0.10	358.40	395.00	0.84	-0.76	0.84	0.32	-0.32	2.26
427.00	0.00	330.10	427.00	0.87	-0.76	0.87	0.31	-0.31	0.00
459.00	0.10	355.90	459.00	0.90	-0.76	0.90	0.31	0.31	0.00
491.00	0.10	314.80	491.00	0.95	-0.78	0.95	0.22	0.00	-128.44
522.00	0.30	297.00	522.00	1.00	-0.87	1.00	0.67	0.65	-57.42
554.00	0.30	278.00	554.00	1.05	-1.03	1.05	0.31	0.00	-59.38

Survey Report

Company:	Altamont Oil & Gas, Inc.	**Local Co-ordinate Reference:**	Well Danielson 33-17
Project:	Toole County, MT	**TVD Reference:**	GL @ 3576.00usft
Site:	Sec 17, T35N, R1W, P.M.M. Survey	**MD Reference:**	GL @ 3576.00usft
Well:	Danielson 33-17	**North Reference:**	Grid
Wellbore:	WB#1/Job#:1420740	**Survey Calculation Method:**	Minimum Curvature
Design:	WB#1/Job#:1420740	**Database:**	Compass 5000 RMR DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
586.00	0.30	292.00	586.00	1.09	-1.19	1.09	0.23	0.00	43.75
617.00	0.20	268.10	617.00	1.12	-1.32	1.12	0.46	-0.32	-77.10
649.00	0.20	299.60	649.00	1.15	-1.42	1.15	0.34	0.00	98.44
680.00	0.20	292.00	680.00	1.20	-1.52	1.20	0.09	0.00	-24.52
712.00	0.30	267.80	712.00	1.21	-1.66	1.21	0.45	0.31	-75.63
744.00	0.20	298.60	744.00	1.24	-1.79	1.24	0.51	-0.31	96.25
776.00	0.30	281.10	776.00	1.28	-1.92	1.28	0.39	0.31	-54.69
807.00	0.40	300.90	806.99	1.35	-2.09	1.35	0.50	0.32	63.87
839.00	0.60	300.40	838.99	1.49	-2.33	1.49	0.63	0.63	-1.56
871.00	0.40	283.60	870.99	1.60	-2.59	1.60	0.77	-0.63	-52.50
903.00	0.50	284.00	902.99	1.66	-2.83	1.66	0.31	0.31	1.25
933.00	0.60	299.20	932.99	1.77	-3.09	1.77	0.59	0.33	50.67
964.00	0.60	300.60	963.99	1.93	-3.38	1.93	0.05	0.00	4.52
996.00	0.70	287.10	995.99	2.08	-3.71	2.08	0.57	0.31	-42.19
1,028.00	0.60	290.00	1,027.98	2.19	-4.05	2.19	0.33	-0.31	9.06
1,059.00	0.80	298.50	1,058.98	2.35	-4.39	2.35	0.73	0.65	27.42
1,091.00	0.80	297.40	1,090.98	2.56	-4.79	2.56	0.05	0.00	-3.44
1,122.00	0.70	302.40	1,121.98	2.76	-5.14	2.76	0.39	-0.32	16.13
1,154.00	0.80	302.40	1,153.97	2.99	-5.49	2.99	0.31	0.31	0.00
1,186.00	0.70	296.00	1,185.97	3.19	-5.86	3.19	0.41	-0.31	-20.00
1,217.00	0.80	300.60	1,216.97	3.38	-6.22	3.38	0.38	0.32	14.84
1,249.00	0.90	297.80	1,248.96	3.61	-6.63	3.61	0.34	0.31	-8.75
1,281.00	0.90	297.80	1,280.96	3.85	-7.07	3.85	0.00	0.00	0.00
1,312.00	0.90	297.00	1,311.96	4.07	-7.51	4.07	0.04	0.00	-2.58
1,343.00	0.80	295.90	1,342.95	4.28	-7.92	4.28	0.33	-0.32	-3.55
1,375.00	0.90	299.60	1,374.95	4.50	-8.34	4.50	0.36	0.31	11.56
1,406.00	0.90	299.40	1,405.95	4.74	-8.76	4.74	0.01	0.00	-0.65
1,437.00	0.80	297.00	1,436.94	4.96	-9.17	4.96	0.34	-0.32	-7.74
1,469.00	0.90	299.20	1,468.94	5.18	-9.59	5.18	0.33	0.31	6.88
1,501.00	0.80	299.60	1,500.94	5.41	-10.00	5.41	0.31	-0.31	1.25
1,532.00	0.90	298.60	1,531.93	5.64	-10.40	5.64	0.33	0.32	-3.23
1,564.00	0.90	298.10	1,563.93	5.88	-10.84	5.88	0.02	0.00	-1.56
1,594.00	0.90	298.00	1,593.92	6.10	-11.26	6.10	0.01	0.00	-0.33
1,626.00	0.90	296.80	1,625.92	6.33	-11.71	6.33	0.06	0.00	-3.75
1,657.00	0.90	296.70	1,656.92	6.55	-12.14	6.55	0.01	0.00	-0.32
1,689.00	0.90	295.70	1,688.91	6.77	-12.59	6.77	0.05	0.00	-3.13
1,721.00	1.00	293.50	1,720.91	6.99	-13.07	6.99	0.33	0.31	-6.88
1,752.00	0.90	295.80	1,751.90	7.20	-13.54	7.20	0.35	-0.32	7.42
1,784.00	0.90	298.90	1,783.90	7.44	-13.99	7.44	0.15	0.00	9.69
1,815.00	1.00	289.00	1,814.90	7.64	-14.46	7.64	0.62	0.32	-31.94
1,843.00	1.00	300.20	1,842.89	7.84	-14.90	7.84	0.70	0.00	40.00
1,879.00	0.90	259.40	1,878.89	7.95	-15.45	7.95	1.86	-0.28	-113.33
1,911.00	1.00	301.40	1,910.88	8.05	-15.93	8.05	2.15	0.31	131.25

Company:	Altamont Oil & Gas, Inc.	**Local Co-ordinate Reference:**	Well Danielson 33-17
Project:	Toole County, MT	**TVD Reference:**	GL @ 3576.00usft
Site:	Sec 17, T35N, R1W, P.M.M. Survey	**MD Reference:**	GL @ 3576.00usft
Well:	Danielson 33-17	**North Reference:**	Grid
Wellbore:	WB#1/Job#:1420740	**Survey Calculation Method:**	Minimum Curvature
Design:	WB#1/Job#:1420740	**Database:**	Compass 5000 RMR DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,940.00	0.90	302.60	1,939.88	8.30	-16.34	8.30	0.35	-0.34	4.14
1,971.00	1.00	298.50	1,970.87	8.56	-16.78	8.56	0.39	0.32	-13.23
2,003.00	0.70	300.00	2,002.87	8.79	-17.20	8.79	0.94	-0.94	4.69
2,034.00	0.80	292.00	2,033.87	8.97	-17.56	8.97	0.47	0.32	-25.81
2,066.00	0.70	292.30	2,065.87	9.13	-17.95	9.13	0.31	-0.31	0.94
2,097.00	0.80	288.20	2,096.86	9.27	-18.33	9.27	0.37	0.32	-13.23
2,129.00	0.80	287.00	2,128.86	9.40	-18.76	9.40	0.05	0.00	-3.75
2,161.00	0.80	297.00	2,160.86	9.57	-19.17	9.57	0.44	0.00	31.25
2,192.00	0.70	288.80	2,191.85	9.73	-19.54	9.73	0.47	-0.32	-26.45
2,224.00	0.80	283.70	2,223.85	9.84	-19.94	9.84	0.38	0.31	-15.94
2,256.00	0.70	296.00	2,255.85	9.98	-20.34	9.98	0.59	-0.31	38.44
2,287.00	0.70	278.40	2,286.85	10.09	-20.69	10.09	0.69	0.00	-56.77
2,319.00	0.60	283.90	2,318.84	10.16	-21.05	10.16	0.37	-0.31	17.19
2,350.00	0.80	275.40	2,349.84	10.22	-21.42	10.22	0.73	0.65	-27.42
2,382.00	0.70	268.60	2,381.84	10.24	-21.84	10.24	0.42	-0.31	-21.25
2,413.00	0.70	266.80	2,412.84	10.22	-22.22	10.22	0.07	0.00	-5.81
2,445.00	1.00	268.80	2,444.83	10.21	-22.69	10.21	0.94	0.94	6.25
2,476.00	1.00	267.90	2,475.83	10.19	-23.24	10.19	0.05	0.00	-2.90
2,507.00	1.10	274.70	2,506.82	10.21	-23.80	10.21	0.51	0.32	21.94
2,539.00	1.10	267.30	2,538.82	10.22	-24.42	10.22	0.44	0.00	-23.13
2,571.00	1.00	263.40	2,570.81	10.17	-25.00	10.17	0.38	-0.31	-12.19
2,602.00	1.00	253.10	2,601.81	10.06	-25.53	10.06	0.58	0.00	-33.23
2,634.00	1.00	257.80	2,633.80	9.92	-26.07	9.92	0.26	0.00	14.69
2,665.00	1.00	246.10	2,664.80	9.75	-26.58	9.75	0.66	0.00	-37.74
2,697.00	1.00	242.30	2,696.79	9.51	-27.08	9.51	0.21	0.00	-11.88
2,729.00	1.10	242.80	2,728.79	9.24	-27.60	9.24	0.31	0.31	1.56
2,761.00	0.90	244.60	2,760.78	8.99	-28.10	8.99	0.63	-0.63	5.63
2,792.00	0.90	235.50	2,791.78	8.75	-28.52	8.75	0.46	0.00	-29.35
2,824.00	1.00	243.60	2,823.77	8.48	-28.98	8.48	0.52	0.31	25.31
2,856.00	1.00	236.10	2,855.77	8.20	-29.46	8.20	0.41	0.00	-23.44
2,887.00	1.00	233.40	2,886.76	7.89	-29.90	7.89	0.15	0.00	-8.71
2,919.00	0.90	242.70	2,918.76	7.61	-30.35	7.61	0.57	-0.31	29.06
2,950.00	0.80	236.10	2,949.76	7.38	-30.75	7.38	0.45	-0.32	-21.29
2,981.00	1.00	240.10	2,980.75	7.12	-31.16	7.12	0.68	0.65	12.90
3,013.00	1.10	238.60	3,012.75	6.82	-31.67	6.82	0.32	0.31	-4.69
3,045.00	1.00	231.50	3,044.74	6.49	-32.15	6.49	0.51	-0.31	-22.19
3,076.00	1.10	230.20	3,075.74	6.13	-32.59	6.13	0.33	0.32	-4.19
3,108.00	1.00	234.20	3,107.73	5.77	-33.05	5.77	0.39	-0.31	12.50
3,138.00	1.00	224.90	3,137.73	5.43	-33.45	5.43	0.54	0.00	-31.00
3,170.00	1.20	227.90	3,169.72	5.01	-33.89	5.01	0.65	0.63	9.38
3,201.00	1.20	223.30	3,200.71	4.55	-34.35	4.55	0.31	0.00	-14.84
3,232.00	1.10	217.30	3,231.71	4.08	-34.76	4.08	0.50	-0.32	-19.35
3,264.00	1.10	210.80	3,263.70	3.57	-35.10	3.57	0.39	0.00	-20.31

Survey Report

Company:	Altamont Oil & Gas, Inc.	**Local Co-ordinate Reference:**	Well Danielson 33-17
Project:	Toole County, MT	**TVD Reference:**	GL @ 3576.00usft
Site:	Sec 17, T35N, R1W, P.M.M. Survey	**MD Reference:**	GL @ 3576.00usft
Well:	Danielson 33-17	**North Reference:**	Grid
Wellbore:	WB#1/Job#:1420740	**Survey Calculation Method:**	Minimum Curvature
Design:	WB#1/Job#:1420740	**Database:**	Compass 5000 RMR DB

Survey

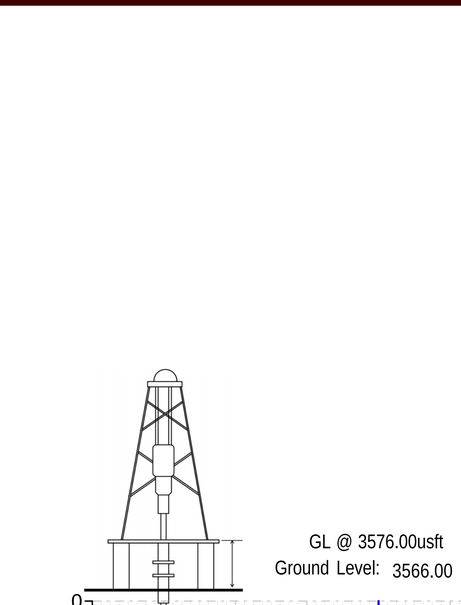
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,296.00	1.10	211.20	3,295.70	3.05	-35.42	3.05	0.02	0.00	1.25
3,326.00	1.20	208.90	3,325.69	2.53	-35.72	2.53	0.37	0.33	-7.67
3,358.00	1.40	207.70	3,357.68	1.89	-36.06	1.89	0.63	0.63	-3.75
3,388.00	1.50	212.00	3,387.67	1.23	-36.44	1.23	0.49	0.33	14.33
3,418.00	1.50	209.50	3,417.66	0.55	-36.84	0.55	0.22	0.00	-8.33
3,448.00	1.50	205.10	3,447.65	-0.14	-37.20	-0.14	0.38	0.00	-14.67
3,479.00	1.30	209.90	3,478.64	-0.82	-37.55	-0.82	0.75	-0.65	15.48
3,510.00	1.10	203.60	3,509.64	-1.39	-37.84	-1.39	0.77	-0.65	-20.32
3,542.00	1.40	207.30	3,541.63	-2.02	-38.15	-2.02	0.97	0.94	11.56
3,573.00	1.40	200.50	3,572.62	-2.71	-38.45	-2.71	0.54	0.00	-21.94
3,605.00	1.50	194.50	3,604.61	-3.49	-38.69	-3.49	0.57	0.31	-18.75
3,636.00	1.50	201.40	3,635.60	-4.26	-38.94	-4.26	0.58	0.00	22.26
3,668.00	1.50	198.70	3,667.59	-5.04	-39.23	-5.04	0.22	0.00	-8.44
3,699.00	1.60	199.80	3,698.58	-5.83	-39.51	-5.83	0.34	0.32	3.55
3,731.00	1.60	198.50	3,730.56	-6.68	-39.80	-6.68	0.11	0.00	-4.06
3,745.00	1.60	197.90	3,744.56	-7.05	-39.92	-7.05	0.12	0.00	-4.29
Final Phoenix MWD Survey									
3,800.00	1.60	197.90	3,799.54	-8.51	-40.39	-8.51	0.00	0.00	0.00
Projection to TD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
302.00	302.00	0.54	-0.58	First Phoenix MWD Survey
3,745.00	3,744.56	-7.05	-39.92	Final Phoenix MWD Survey
3,800.00	3,799.54	-8.51	-40.39	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

Project: Toole County, MT
Site: Sec 17, T35N, R1W, P.M.M. Survey
Well: Danielson 33-17
Wellbore: WB#1/Job#:1420740
Design: Plan#1
Rig:



Azimuths to Grid North
True North: 1.65°
Magnetic North: 14.81°

Magnetic Field
Strength: 55926.0snT
Dip Angle: 72.17°
Date: 05/03/2014
Model: BGGM2013

Map System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone Name:	Montana
Local Origin:	Well Danielson 33-17, Grid North
Latitude:	48° 47' 23.520 N
Longitude:	111° 45' 37.580 W
Grid East:	1423712.139
Grid North:	1663043.942
Scale Factor:	1.000
Geomagnetic Model:	BGGM2013
Sample Date:	03-May-14
Magnetic Declination:	13.16°
Dip Angle from Horizontal:	72.17°
Magnetic Field Strength:	55926

To convert a Magnetic Direction to a Grid Direction, Add 14.81°
To convert a Magnetic Direction to a True Direction, Add 13.16° East
To convert a True Direction to a Grid Direction, Add 1.65°

WELL DETAILS

Ground Level: 3566.00

+N/-S	+E/-W	Northing	Easting	Latittude	Longitude
0.00	0.00	1663043.942	1423712.139	48° 47' 23.520 N	111° 45' 37.580 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	3900.00	0.00	0.00	3900.00	0.00	0.00	0.00	0.00	0.00		TD at 3900.0

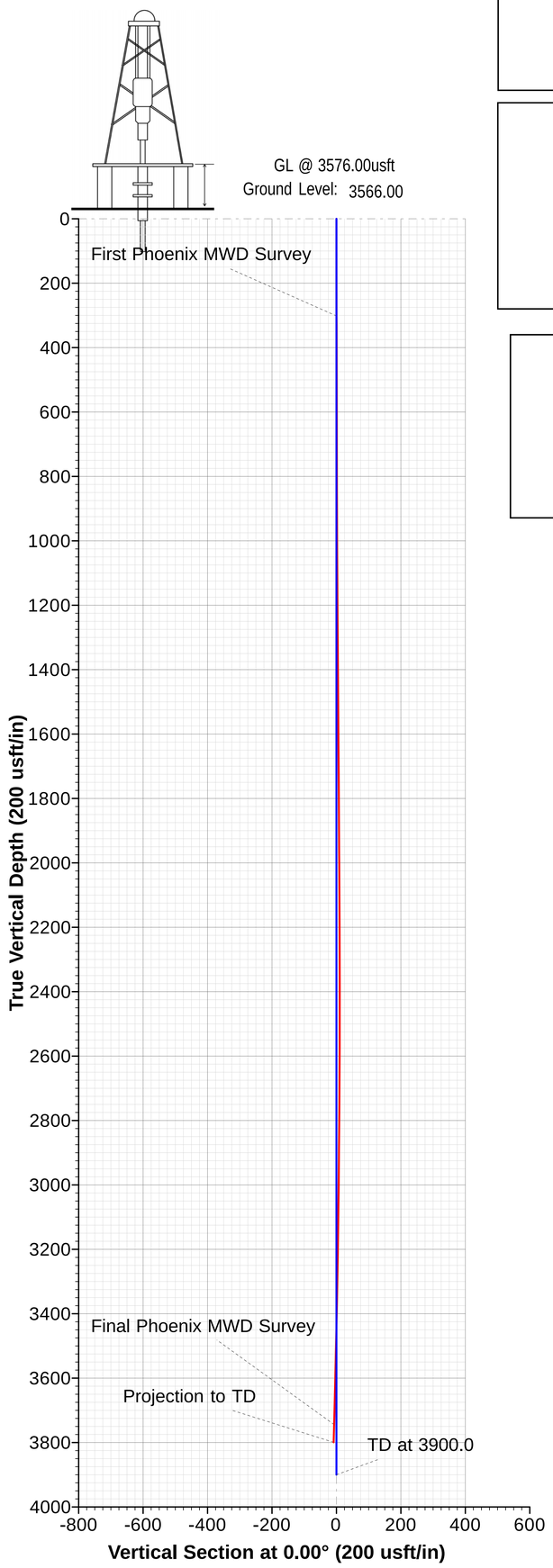
SITE DETAILS: Sec 17, T35N, R1W, P.M.M. Survey

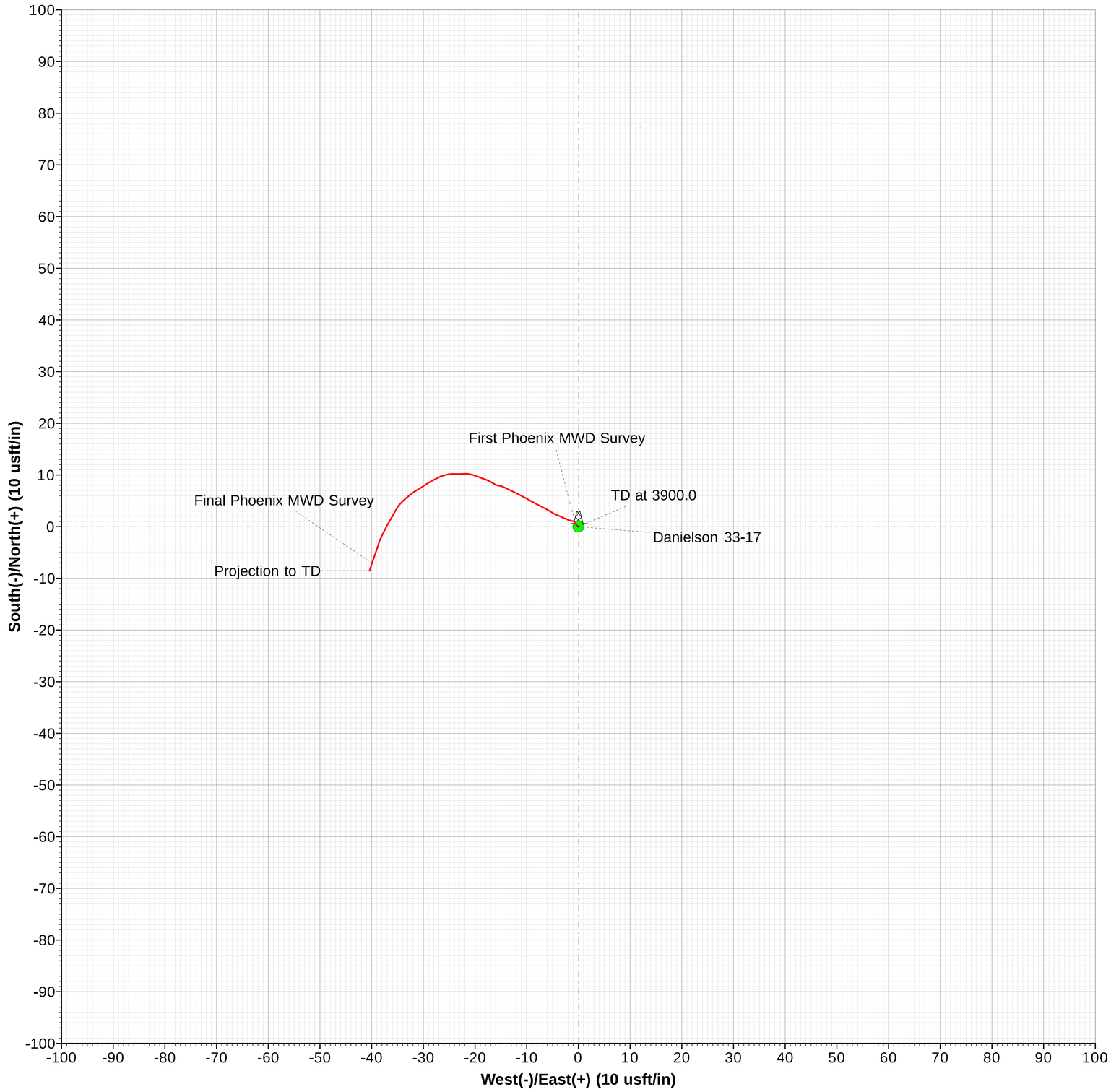
Site Centre Northing: 1663043.942
Easting: 1423712.139

Positional Uncertainity: 0.00
Convergence: -1.65
Local North: Grid

LEGEND

Danielson 33-17, WB#1/Job#:1420740, WB#1/Job#:1420740 V0
Plan#1





Created By: Julio Piña Date: 9:46, July 17 2014

OPERATIONAL SUMMARY

AND

GEOLOGICAL WELL HISTORY

ALTAMONT/VECTA OIL & GAS Ltd./BIG SKY
Danielson 33-17
Section 17 T35N R1W
SW SE (2300'fsl 1650'fel)
Toole County, Montana

API No. 25-101-24243

Permit No. 31368(Montana)

Kevin-Sunburst Field (Wildcat)

Quest Minerals
Don Thompson
[redacted]

North Star Geological, LLC
Steve Sasaki
[redacted]

TABLE OF CONTENTS

RESUME

Operator:	**ALTAMONT/VECTA OIL & GAS Ltd./BIG SKY**
Location:	**NW SE Section 17 Township 35N Range 1W**
Surface Coordinates:	**2300' FSL 1650' FEL**
Field:	**KEVIN-SUNBURST FIELD**
County/State:	**Toole County, Montana**
Elevation:	**3566' GL 3577' KB**
Total Depth:	**3800' Driller 3800' Logger**
Casing size:	**Surface 13 3/8", 54.5#/ft., J-55, ST&C, 8rd, Rge 3. Set at 263' KB. Cemented with 165 sacks Control Set C. Plug down 2:15 AM MDT.**
	Intermediate 8 5/8", 24#/ft., J-55, ST&C, 8rd, Rge 3. Set at 1812'. Cemented with 1st Stage Lead with 95 sx 1-1-0 Posi "G" 1% CaCl2, 0.25%CFL-3, 0.25% CFR-2, 0.4% CDF-4P. Plug down 10:00 PM MDT 5/10/14. 2nd Stage Lead, 205 sacks Control Set "C", 0.15% LTR, ¼#/sx polyflake. Tail: 95 sx Control Set "C", 0.15% LTR, ¼#/sx polyflake. Plug down 8:00 AM MDT 5/11/14.
	Production 7 joints 5 ½", 17#/ft, 13 CR-80 Bare CR T&C R-3 JFE and 89 joints 5 ½". 17#/ft., J-55, LT&C, 8 rd., Range 3 casing. Set at 3799' KB. Cemented with Lead: 214 sacks Control Set "C", 0.15% LTR, ¼#/sx Polyflake. Tail: 208 sacks Custom "G", 0.30% CFR-2, 1.50% LDP-C-137. Plug down at 3:30 PM MDT 5/17/14.
Spud Date:	**May 5, 2014**
Completion Date:	**May 17, 2014**
Well Status:	**Cased For Completion as a Duperow CO2 well**
Drilling Contractor:	**FX Drilling Company**
Rig Number:	**Rig No. 5**
Type Drilling Rig:	**Cardwell KB 150**
Mud Pump:	**No. 1 Bomco 1000 6"X10" No. 2 Bomco 1000 6"X10"**
Air Compressor:	**None**
Mud Company:	**M-I SWACO Drilling Fluids LLC Tommy Soennichsen**
Mud Type:	**Freshwater Chemical/Gel mud system**
Hole Size:	**Surface: 16.875" 0'-270' Main Hole: 10 .625" 270'-1900'**
Size Drill Pipe:	**4 ½" FH (16.60#/ft.)**
Size Drill Collars:	**2 - 10" 120#/ft. (60') Surface only 10 - 6 ¼" 85#/ft. (261')**
Mud Loggers:	**NorAm Dan'l Donges/Dave Myhre**
Sample Intervals:	**Mud 30' 270'-1890' 3460'- 3780'**
	Mud 20' 1890'-3270' 3780'-3800'
	Mud 10' 3350'-3360'
Sample Quality:	**Good**
Drilling Supervision:	**RPM Consultants Edward Heck**
Directional:	**Phoenix Technology Services Mark Hesla/Mark Anderson**
MWD:	**Phoenix Technology Services JT Ebert/Steve Stack**
Core Company:	**Devilbliss Coring Service Virgil Devilbliss**
	Core No. 1 3271'-3331' Cut 60' Recovered 60'
	Core No. 2 3331'-3390' Cut 59' Recovered 59'
	Core No. 3 3390'-3450' Cut 60' Recovered 60'
Core Handling:	**Terra Tek Ronald Rowan**

SAMPLE DISTRIBUTION

Samples are required by State and not by Federal Regulatory Agencies. Dried sample cut were sent to the Montana Board of Oil and Gas. Two sets dry cuts to Vecta Oil & Gas, geologist.

MUD SUMMARY

SURFACE HOLE

Gel (Bentonite)	81 sacks	Soda Ash	2 sacks

MAIN HOLE

Gel (Bentonite)	124 sacks	Sodium Bicarbonate	29 sacks
Soda Ash	4 sacks	Platinum Pac UL	25 sacks
Detergent	1 cans	Unitrol	39 sacks
Platinum Pac	17 sacks	Desco DF	1 sack
Poly Plus	5 cans	RingFree	4 cans
Tackle	1 can	Sawdust	16 sacks
MI-I Bar	24 sacks	Defoam X	2 cans
Myacide GA25	4 cans	Fed Rheosmart	12 sacks
Tannathin	34 sacks	Gypsum	73 sacks
Lime	17 sacks		

DEVIATION SURVEY RECORD

	DEPTH	DEGREES	AZIMUTH	TVD
1.	93’	0.5*		
2.	302’	0.30*	313*#	302’
3.	331’	0.30*	313.80*#	331’
4.	364’	0.20*	357.70*#	364’
5.	395’	0.10*	358.40*#	395’
6.	427’	0.0*	330.10*#	427’
7.	459’	0.10*	355.90*#	459’
8.	491’	0.10*	314.80*#	491’
9.	522’	0.30*	297.0*#	522’
10.	554’	0.30*	278.0*#	554’
11.	586’	0.30*	278.0*#	586’
12.	617’	0.20*	268.1*#	617’
13.	649’	0.20*	299.6*#	649’
14.	680’	0.20*	292.0*#	680’
15.	712’	0.30*	267.80*#	712’
16.	744’	0.20*	298.60*#	744’
17.	776’	0.30*	281.1*#	776’
18.	807’	0.40*	300.9*#	806.99’
19.	839’	0.60*	283.60*#	839.99’

20. 871’	0.40*	283.60*#	870.99’
21. 903’	0.50*	284.0*#	902.99’
22. 933’	0.60*	299.2*#	932.99’
23. 964’	0.60*	300.6*#	963.99’
24. 996’	0.70*	287.1*#	995.99’
25. 1028’	0.60*	290.0*#	1027.98’
26. 1059’	0.80*	298.5*#	1058.98’
27. 1091’	0.80*	297.4*#	1090.98’
28. 1122’	0.70*	302.4*#	1121’
29. 1154’	0.80*	302.4*#	1185.97’
30. 1186’	0.70*	296.0*#	1185.97’
31. 1217’	0.80*	300.6*#	1216.97’
32. 1249’	0.90*	297.8*#	1248.96’
33. 1281’	0.90*	297.8*#	1280.96’
34. 1312’	0.90*	297.0*#	1311.96’
35. 1343’	0.80*	295.9*#	1342.95’
36. 1375’	0.90*	299.6*#	1374.95’
37. 1406’	0.90*	299.4*#	1405.95’
38. 1437’	0.80*	297.0*#	1436.94
39. 1469’	0.90*	299.2*#	1468.94’
40. 1501’	0.80*	299.6*#	1500.94’
41. 1532’	0.90*	298.6*#	1531.93’
42. 1564’	0.90*	298.1*#	1563.93’
43. 1594’	0.90*	298.0*#	1593.92’
44. 1626’	0.90*	296.8*#	1625.92’
45. 1657’	0.90*	296.7*#	1656.92’
46. 1689’	0.90*	295.7*#	1688.91’
47. 1721’	1.0*	293.5*#	1720.91’
48. 1752’	0.9*	295.8*#	1751.9’
49. 1784’	0.9*	298.9*#	1783.9’
50. 1815	1.0*	289.0*#	1814.9’
51. 1843’	1.0*	300.2*#	1842.89’
52. 1940’	0.90*	302.6*#	1939.88’
53. 1971’	1.0*	298.5*#	1970.87’
54. 2003’	0.07*	300.0*#	2002.87’
55. 2034’	0.80*	292.0*#	2033.87’
56. 2066’	0.70*	292.3*#	2065.87’
57. 2098’	0.80*	288.2*#	2096.86’
58. 2129’	0.80*	287.0*#	2128.86’
59. 2161’	0.80*	297.0*#	2160.86’
60. 2192’	0.70*	288.8*#	2191.85’
61. 2224’	0.80*	283.7*#	2223.85’
62. 2256’	0.70*	296.0*#	2255.85’
63. 2287’	0.70*	278.4*#	2286.85’
64. 2319’	0.60*	283.9*#	2318.84’
65. 2350’	0.80*	275.4*#	2349.84’
66. 2382’	0.70*	268.6*#	2381.84’
67. 2413’	0.70*	266.8*#	2412.84’
68. 2445’	1.0*	268.8*#	2444.83’

69.	2476’	1.0*	267.9*#	2475.83’
70.	2507’	1.1*	274.7*#	2506.82’
71.	2539’	1.1*	267.3*#	2538.82’
72.	2571’	1.0*	263.4*#	2570.81’
73.	2602’	1.0*	253.1*#	2601.81’
74.	2634’	1.0*	257.8*#	2633.8’
75.	2665’	1.0*	246.1*#	2664.8’
76.	2697’	1.0*	242.3*#	2696.79’
77.	2729’	1.1*	242.8*#	2728.79’
78.	2761’	0.9*	244.6*#	2760.78’
79.	2792’	0.90*	235.5*#	2791.78’
80.	2824’	1.0*	243.6*#	2823.77’
81.	2856’	1.0*	236.1*#	2855.77’
82.	2887’	1.0*	233.4*#	2886.76’
83.	2919’	0.90*	242.7*#	2918.76’
84.	2950’	0.80*	236.1*#	2949.76’
85.	2981’	1.0*	240.1*#	2980.75’
86.	3013’	1.1*	238.6*#	3012.75’
87.	3045’	1.0*	231.5*#	3044.74’
88.	3076’	1.1*	230.2*#	3075.74’
89.	3108’	1.0*	234.2*#	3107.73’
90.	3138’	1.0*	224.9*#	3137.73’
91.	3170’	1.2*	227.9*#	3169.72’
92.	3201’	1.2*	222.3*#	3200.71’
93.	3232’	1.1*	217.3*#	3231.71’
94.	3264’	1.1*	210.8*#	3263.70’
95.	3296’	1.1*	211.2*#	3295.70’
96.	3326’	1.2	208.9*#	3325.69’
97.	3358’	1.4*	207.7*#	3357.68’
98.	3388’	1.5*	212.0*#	3387.67’
99.	3418’	1.5*	209.5*#	3417.66’
100.	3448’	1.5*	205.1*#	3447.65’
101.	3479’	1.3*	209.9*#	3478.64’
102.	3510’	1.1*	203.6*#	3509.64’
103.	3542’	1.4*	207.3*#	3541.63’
104.	3573’	1.4*	200.5*#	3572.62’
105.	3605’	1.5*	194.5*#	3604.61’
106.	3636’	1.5*	201.4*#	3635.60’
107.	3668’	1.5*	198.7*#	3667.59’
108.	3699’	1.6*	199.8*#	3698.58’
109.	3731’	1.6*	198.5*#	3730.56’
110.	3745’	1.6*	197.9*#	3744.56’

#Electronic

MUD PROPERTIES

DEPTH	VISCOSITY	WEIGHT	WATER LOSS	PH
1. 516’	49	8.6+	7.4	10.5
2. 612’	41	8.8	6.6	10.5
3. 706’	36	8.9	5.8	10
4. 776’	39	8.8	5	10
5. 928’	37	8.9+	5	10
6. 1091’	36	9.0	5.8	9.5
7. 1180’	38	9.0	6.2	10
8. 1238’	42	9.0	5.0	9
9. 1328’	44	9.0	5.0	9.5
10. 1401’	43	9.0	?	9.5
11. 1476’	42	9.1	4.8	9.5
12. 1550’	41	9.0	4.8	9.5
13. 1635’	45	9.2	4.8	9.0
14. 1695’	47	9.2	5.0	9.0
15. 1775	48	9.2+	6.0	9.5
16. 1848’	64	9.2+	5.0	9.0
17. 1945’	34	8.7+	9.6	12.0
18. 2040’	44	8.7+	6.4	10.0
19. 2130’	42	8.7	6.6	10.0
20. 2180’	44	8.6+	6.4	9.0
21. 2230’	46	8.6+	6.2	9.0
22. 2312’	58	8.8	6.0	8.8
23. 2330’	54	8.8	6.0	8.8
24. 2406’	51	8.8	5.2	8.5
25. 2437’	49	8.8	5.2	8.5
26. 2502’	55	8.7	6.0	8.5
27. 2534’	56	8.8	6.2	8.5
28. 2570’	55	8.8	5.2	8.5
29. 2605’	55	8.8	5.2	8.5
30. 2635’	58	8.8	5.4	8.5
31. 2697’	60	8.7	5.6	8.5
32. 2720’	55	8.8	6.0	8.8
33. 2773’	60	8.5	5.0	8.5
34. 2816’	57	8.7+	5.0	8.5
35. 2861’	55	8.7+	5.2	8.5
36. 2906’	60	8.7+	5.2	8.5
37. 2958’	58	8.7+	5.0	8.5
38. 2997’	57	8.7+	5.0	9.0
39. 3036’	50	8.7+	5.0	9.0
40. 3063’	48	8.8+	4.2	8.5
41. 3140’	48	8.8	4.6	8.5
42. 3190’	48	8.8	5.0	9.0
43. 3230’	51	8.8	5.9	8.5
44. 3269’	50	8.8	5.0	9.0
45. 3285’	44	8.8	5.9	8.6

46. 3328’	47	8.7+	5.6	9.0
47. 3336’	49	8.7+	5.0	9.5
48. 3450’	47	8.8	5.4	10.5
49. 3526’	46	8.7+	4.8	10.0

BIT RECORD

BIT#	MAKE	TYPE	SIZE	IN	OUT	FOOTAGE	WOB	JET SIZE	Hrs	RPM
1	HTC-RR	MX-1	16 7/8”	0’	270’	270’	12k	4X20	6.5	52
2	STC	PDC 6 blade	10 5/8”	270’	1900’	1630’	2k	6X18	25 ¾	45
3	STC	MDSi 616	7 7/8”	1900’	3270’	1370’	16k	6X16	43 ½	44
C-1	New	CT 410	7 7/8X4	3270’	3331’	60’	13k	-	3 ¼	52
C-2	RR	CT 410	7 7/8X4	3331’	3390’	59’	14k	-	3 ¼	52
C-3	RR	CT 410	7 7/8X4	3390’	3450’	60’	14k	-	3	52
4	STC	MDSI	7 7/8”	3450’	3800’	350’	13k	6X16	5	45

LOGGING PROGRAM

Run No. 1 Ran Schlumberger Platform Express-Dolomite-Triple Comb AIT-TDL-CNL-GR Log with Caliper from 1891’ to 265’. (Resistivity AIT-GR from 1891’-264’. Compensated Neutron Log Three Detector Density from 1891’-265’.) Drilling Engineers QuickLook Gamma Ray from 1891’ to 265’. Sonic Scanner Cement Bond Log from 265’ to surface.

Run No. 2 Ran Schlumberger Platform Express Triple Combo Log with SP, Gamma Ray and Caliper from 3800’-1810’. (Express Triple Combo Dolomite. Platform Express High Resolution Induction Array, High Resolution Laterlog Array, Array Induction with Linear Correlation, Elemental Capture Sonde, Caliper Cement Volume, Compensated Neutron Litho-Density), Sonic Scanner Monopole Compression Dipole Shear, High Resolution Laterolog Array, Combinable Magnetic Resonance, Spectral Gamma Ray Sonic Scanner Cement Bond Log 1810’ to 250’.

ELECTRICAL LOG FORMATION TOPS (ft.)

FORMATION	E-LOG TOPS	SUBSEA
Cretaceous		
Blackleaf (Second White Specks)	275’	+3302
Bow Island	533’	+3044
Kootenai	1050’	+2527
Sunburst	1416’	+2161
Jurassic		
Swift	1452’	+2125
Rierdon	1517’	+2060

Sawtooth	1628’	+1949
Mississippian		
Madison	1644	+1933
Mission Canyon	1827’	+1750
Lodge Pole	2418’	+1159
Banff	2656’	+ 921
Bakken	2767’	+ 810
Devonian		
Three Forks	2796’	+ 781
Potlatch	2806’	+ 771
Nisku	2960’	+ 617
Duperow	3036’	+ 541
Middle Duperow Porosity	3289’	+ 288
Lower Duperow Porosity	3559’	+ 18
Base Lower Duperow Porosity	3679’	- 102
Souris River ?	3754’	- 177
TOTAL DEPTH LOGGERS	3800’	- 223

DAILY DRILLING CHRONOLOGY

May 5, 2014	FX Drilling rig #5 spudded in @ base of conductor pipe at 10:00 AM MDT. Drilled 16 7/8" hole to 270' with mud. Circulated hole clean, tripped out and then ran 13 3/8", 6 jts., 54.5#/ft., J-55, ST&C, 8rd., Range 3 casing. Rigged up cementers
May 6, 2014	Total Depth 270'. Cemented casing with 165 sacks Control Set "C", ¼#/sx polyflake. Plug down 2:15 AM MDT. 17 barrels cement returns to pit. WOC. Cut casing welded on casing head. Nippled up BOP.
May 7, 2014	Tested blind rams, casing, checked manifold, kelly cock. Picked up 10 5/8" bit, mud motor, directional tools and MWD. Tested blind rams to 1300 psig. Tested pipe rams to 1350 psi, annular to 500 psi. Tripped in hole, tagged cement, drilled out shoe joint, tested MWD. Removed rubber plug stuck in flowline tee, finished drilling shoe joint, changed out wash pipe. Drilled to 1432' with mud.
May 8, 2014	Drilled from 1432' to 1900' with mud. Circulate and condition hole for electrical logs. Trip to surface and lay down directional tools. Pickup bit and trip to bottom. Circulate and condition hole for logs. Trip for logs. Schlumberger loggers on location 8:30 PM MST. Finished tripping out of hole. Rig up Schlumberger. Run in with Schlumberger tools.
May 9, 2014	Total Depth 1900'. Ran Schlumberger logs. Rig down Schlumberger. Rig up and run 45 jts., 8 5/8", 24#/ft., J-55, ST&C, 8rd., range 3 intermediate casing. Set at 1812' KB. Wait on cementers. Cemented 1st Stage Lead with 95 sx 1-1-0 Posi "G" 1% CaCl2, 0.25%CFL-3, 0.25% CFR-2, 0.4% CDF-4P. Plug down 10:00 PM MDT. Drop DV bomb. Open DV ports. Circulate mud.
May 10, 2014	Total Depth 1900'. Circulate 8 5/8" casing. Rig up cementers. Cement 2nd Stage Lead, 205 sacks Control Set "C", 0.15% LTR, ¼#/sx polyflake. Tail: 95 sx Control Set "C", 0.15% LTR, ¼#/sx polyflake. Plug down 8:00 AM MDT. 20 barrels cement returns to pit. WOC. Nipple up BOP. Pickup directional tools and bit. Trip in and drill cement, DV tool, float collar, cement and guide shoe. Washed to total depth.
May 11, 2014	Total Depth 1900'. Finished washing to bottom. Drilled new hole from 1900' to 1934'. MWD tool failure. Trip for MWD tool. Change out MDW tool. Trip in hole. Drilled from 1934' to 2502' with mud.
May 12, 2014	Drilled from 2502' to 3229' with mud.
May 13, 2014	Drilled from 3229' to 3270' (core point). Circulate and condition hole for coring. Short trip to intermediate casing. Circulate bottoms up. Trip for core barrel. Lay down directional equipment, mud motor and bit. Pickup 60' of core barrel and core head. Trip into hole. Cut Core No. 1 from 3271' to 3331'. Cut 60' Recovered 60'. Trip out with core. Lay down inner core barrel and pickup new inner core barrel. Trip into hole. Circulate and wash to bottom. Rubble on bottom. Abort core attempt. Trip out.
May 14, 2014	TD 3330'. Finished tripping out. Lay down core barrel. Pickup bit. Trip in and wash and ream to bottom. Trip out lay down bit. Pickup core barrel and core head. Trip in. Cut Core No. 2 from 3331' to 3390'. Cut 59' Recovered 59'. Trip out. Lay down inner core barrel and pickup new inner core barrel. Trip in hole. Circulate and wash to bottom. Cut Core No. 3 from 3390' to 3446'.

May 15, 2014	Cut Core No. 3 from 3446' to 3450'. Cut 60' Recovered 60' . Trip out. Lay down inner core barrel. Pick up new 7 7/8" PDC bit, motor, MWD and BHA. Trip in hole and ream from 3270' to 3450' begin drilling new hole. Drilled new 7 7/8" hole from 3450' to 3800'. Total Depth 3800'. Circulate and condition hole. Trip out to surface. Lay down directional tools and MWD tools. Pickup bit and trip back in to bottom.
May 16, 2014	Total Depth 3800'. On bottom. Circulate and condition hole for electric logs. Short trip 10 joints. Trip back to bottom. Circulate and condition hole for electric logs. Trip out for electric logs. Run electric logs. Finished running electric logs. Rig loggers down.
May 17, 2014	Total Depth 3800'. Lay down collars and drill pipe. Rig up Wyoming Casing. Ran 5 joints 5 ½" 17#/ft., J-55, 8rd., LT&C, range 3 casing below the chrome casing. Ran 7 joints 5 ½" 17#/ft., HP1-13CR-95, P7100 JFE, Bear, LT&C, Range 3 and J-55, LT&C, 8 rd., Range 3 casing. Finished with 84 joints, 5 ½", 17#/ft., J-55, 8rd., LT&C, Range 3 casing. Set at 3799' KB. Cemented Lead: 214 sacks Control Set "C", 0.15% LTR, ¼#/sx polyflake. Tail: 208 sacks Custom "G", 0.30% CFR-2, 1.50% LDP-C-137. Plug down 3:30 PM MDT. Bumped plug. Plug held. Had 10 barrels of cement returns to surface. End Report.

LITHOLOGY

Sample descriptions begin at 270' in Cretaceous Marias River Shale. Sample descriptions are corrected for drill time lag. Formation tops were determined from samples, penetration rate and downhole gamma tool. Samples were examined and described wet.

FOOTAGE **SAMPLE DESCRIPTION**

SAMPLES CAUGHT IN 30' INTERVALS

E-LOG TOP BLACKLEAF 275' +3302'

270'-300' Shale, very dark gray black, moderately hard brittle, massive, calcareous, minor amounts blocky massive pyrite

300'-330' Shale, very dark gray black, moderately hard, brittle, massive to sublaminar, calcareous, very slightly silty.

330'-360' Shale, very dark gray black, moderately hard, crunchy, calcareous, trace black carbonaceous material, very slightly silty, rare pyrite.

360'-390' Shale, very dark gray black, hard, crunchy, moderately calcareous, very slightly silty, trace of fossil fragments, rare pyrite.

390'-420' Shale, very dark gray black, hard, blocky, moderately calcareous, trace of black carbonaceous material, trace of very finely disseminated to microveined pyrite.

420'-450' Shale, black, platy, medium firm, gritty texture, slightly calcareous. Trace siltstone, gray, hard, sharp, pyritic in part, calcareous. Trace Bentonite, buff, soft.

450'-480' Shale, black, chunky to platy, medium firm to brittle, gritty texture, slightly calcareous. Trace free pyrite. Trace, Bentonite, light gray, soft.

480'-510' Shale, black, chunky to platy, medium firm to brittle, gritty texture, slightly calcareous. Trace Inoceramus Prisms. Trace Bentonite, gray, soft.

510'-540' Shale, black, blocky to chunky, medium firm, gritty texture, slightly calcareous. Trace Bentonite, light gray, soft.

E-LOG TOP BOW ISLAND 533' +3044'

540'-570' Sandstone, light gray, quartzose, very fine to fine grained, medium sorting, hard, sharp, scattered black chert grains, well cemented, appears tite, non-calcareous. Trace Shale interbeds, black, platy, medium firm, gritty texture, non-calcareous.

570'-600' Sandstone, light gray, quartzose, very fine to fine grained, medium sorting, firm, scattered black chert grains, rare pale green glauconite grains, appears tite, non-calcareous.

600'-630' Sandstone, light gray, quartzose, very fine to fine grained, medium sorting, medium firm, scattered black chert grains, rare green glauconite grains, white clay matrix, appears tite, non-

calcareous. Trace Shale interbeds, black, chunky to blocky, medium firm, gritty texture, non-calcareous.

630'-660' Sandstone and shale as above.

660'-690' Sandstone, light gray, quartzose, very fine to fine grained, medium sorting, scattered black and gray chert grains, white clay matrix, appears tite, non-calcareous. Trace Shale interbeds, black, chunky to blocky, medium firm, gritty texture, non-calcareous.

690'-720' Shale, black to dark gray, blocky, medium firm, smooth texture, non-calcareous.

720'-750' Shale, dark gray, blocky, medium to soft, smooth texture, non-calcareous.

750'-780' Shale, black, blocky to platy, medium to soft, gritty texture, non-calcareous.

780'-810' Shale, black to dark gray, blocky to chunky, medium firm, gritty texture, non-calcareous. Trace Bentonite, buff, soft.

810'-840' Shale, dark gray, blocky to chunky, soft, gritty texture, non-calcareous. Trace fossil debris. Trace Sandstone interbed, light gray, quartzose, fine grained, hard, sharp, scattered gray chert grains, rare green glauconite grains, appears tite, non-calcareous.

840'-870' Shale, black, chunky, soft, gritty texture, non-calcareous.

870'-900' Shale, black, chunky to blocky, soft, gritty texture, non-calcareous.

900'-930' Sandstone, light gray, quartzose, fine to medium grained, medium sorting, scattered gray chert grains, appears tite, non-calcareous. Much lose sand grains in sample pan. Trace Shale, dark gray, blocky to chunky, medium to soft, gritty texture, non-calcareous.

930'-960' Sandstone and shale as above.

960'-990' Shale, black, blocky, medium firm, smooth to gritty to silty texture, non-calcareous. Interbedded with Sandstone, light gray, quartzose, very fine to fine grained, medium sorting, hard, scattered black and gray chert grains, appears tite, non-calcareous.

990'-1020' Shale and sandstone as above.

E-LOG TOP KOOTENAI 1050' +2527

1020'-1050' Sandstone, greenish gray, quartzose, very fine to fine grained, medium sorting, hard, appears tite, non-calcareous.

1050'-1080' Sandstone, buff, quartzose, fine to medium grained, medium sorting, rare gray chert grains, appears tite, slightly calcareous, no visible oil stain, pale yellow-white fluorescence, 40% of sample, weak milky cut in solvent, poor gas show.

1080'-1110' Sandstone, buff, quartzose, medium to coarse grained, medium to poorly sorted, scattered black and gray chert grains, appears tite, calcareous, no visible oil stain, pale yellow white fluorescence, 40% of sample, weak milky cut in solvent, poor gas show.

1110'-1140' Sandstone, gray, quartzose in part, very fine to fine grained, medium sorting, argillaceous, rare mica flake, scattered black chert grains, appears tite, non-calcareous.

1140'-1170' Shale, gray, chunky to blocky, medium to soft, gritty texture, non-calcareous.

1170'-1200' Shale, as above.

1200’-1230’ Siltstone, medium gray, very hard, massive, blocky, generally very uniform with traces of very fine grained sand, non calcareous.

1230’-1260’ Sandstone, tan, white, gray, hard, brittle, very fine to predominately medium grained, poorly sorted, generally subangular, quartz – quartzite – black lithic fragments, very calcareous, no visible porosity, irregular dull pink (mineral) fluorescence, no cut.

1260’-1290’ Sandstone, as above, fine to coarse grained, poorly sorted, abundant calcareous cement, no visible porosity, irregular dull pink (mineral) fluorescence, no cut. variable fragments, irregular dull pink (mineral) fluorescence, no cut.

1290’-1320’ Sandstone, white, clear, brown, black, hard, brittle, abundant angular lithic – quartz – quartzitic fragments, fine to medium grained, poorly sorted, very calcareous, no visible porosity, irregular dull pink (mineral) fluorescence, no cut. irregular dull pink (mineral) fluorescence, no cut.

1320’-1350’ Siltstone, medium gray, firm, crumbly to friable, moderate amounts loose sand (as above).

1350’-1380’ Siltstone, medium gray, firm, crumbly to friable, slightly argillaceous.

E-LOG TOP SUNBURST 1416’ +2161

1380’-1410’ Sandstone, white, mottled olive green, very hard, brittle, very fine grained, grading to siltstone, non to locally very slightly calcareous, no visible porosity, no show.

1410’-1440’ Sandstone, as above.

E-LOG TOP SWIFT 1452’ +2125

1440’-1470’ Sandstone, yellow gray brown, mottled tan, clear, black in part, very hard, brittle, very fine to medium grained, occasional coarse grains, poorly sorted, subangular to subrounded, quartz, quartzite, carbonaceous shale fragments, silica and minor amounts pyritic cement, minor amounts brown to black mica flakes, no show.

E-LOG TOP RIERDON 1517’ +2060

1470’-1500’ Limestone, light slightly tan gray, firm, blocky, massive, very silty, argillaceous, moderate amounts very fine grained disseminated pyrite.

1500’-1530’ Limestone, tan gray, very hard, blocky, microcrystalline to cryptocrystalline, dense, moderate amounts very fine grained disseminated and microveined pyrite, slightly silty.

1530’-1560’ Limestone, as above.

1560’-1590’ Limestone, medium gray, mottled tan gray, very hard, brittle, massive, blocky, dolomitic, silty – grading to siltstone, dense, moderate amounts very fine grained disseminated pyrite.

1590’-1620’ Limestone, as above, very silty

E-LOG TOP SAWTOOTH 1628’ +1949

1620’-1650’ Linestone, light gray, medium gray, very hard, microcrystalline to cryptocrystalline, dense, very silty, abundant very fine grained disseminate pyrite.

E-LOG TOP MADISON 1644’ +1933

1650’-1680’ Dolomite, cream, light tan, white in part, very hard, brittle, massive, very silty, irregular amounts very fine grained black carbonation specks, strong petroliferous odor, tan to light brown oil

stain, very bright yellow white fluorescense, slow blue white bleeding to predominately milky cut, bright blue white residual ring fluorescense

1680'-1710' Dolomite, as above

1710'-1740' Dolomite, tan white, hard, brittle, blocky, very silty, limey, no shows

1740'-1770' Dolomite, tan white, hard, brittle, blocky, very silty, limey, no shows

1770'-1800' Dolomite, tan white, hard, brittle, blocky, very silty, limey, no shows

1800'-1830' Dolomite, tan white, hard, brittle, blocky, very silty, limey, no shows

E-LOG TOP MISSION CANYON 1827' +1750

1830'-1860' Dolomite, very light tan white, very hard, cryptocrystalline, microcrystalline, dense, very limy, silty, no shows

1860'-1890' Dolomite, tan white, hard, brittle, blocky, very silty, limey, no shows

BEGIN 20' SAMPLE INTERVALS

1900'-1920' No Sample

1920'-1940' Limestone, tan to buff, cryptocrystalline to microcrystalline, dolomitic in part, no shows

1940'-1960' Limestone, tan to buff, cryptocrystalline, dolomitic in part, dense, no shows.

1960'-1980' limestone, light tan, buff, light gray, microcrystalline to chalky in part, argillaceous, dense no shows.

1980'-2000' Limestone, light tan to light gray, cryptocrystalline, dense, no shows.

2000'-2020' Limestone, buff to light gray, cryptocrystalline to chalky, dolomitic in part, dense no shows.

2020'-2040' Limestone, buff to light gray, cryptocrystalline to chalky, dolomitic in part, argillaceous in part, dense, no shows.

2040'-2060' Limestone, light tan, buff, light gray, cryptocrystalline to chalky, dolomitic in part, argillaceous in part, dense, no shows.

2060'-2080' Limestone as above.

2080'-2100' Limestone as above.

2100'-2120' Dolomite, light tan to light gray, cryptocrystalline to chalky, limey, argillaceous, dense, no shows.

2120'-2140' Limestone, light tan cryptocrystalline, to chalky, slightly argillaceous, dense, no shows.

2140'-2160' Limestone as above.

2160'-2180' Dolomite, gray, cryptocrystalline, argillaceous, limey, dense, no shows.

2180'-2200' Dolomite, gray, cryptocrystalline, slightly argillaceous, dense, no shows.

2200'-2220' Limestone, light tan, cryptocrystalline to microcrystalline, argillaceous, dense, no shows.

2220'-2240' Limestone, light tan, cryptocrystalline to microcrystalline, argillaceous, dense, no shows. Trace chert, amorphous.

2240'-2260' Limestone as above. Trace chert, black, white, amorphous.

2260’-2280’ Limestone, light tan to buff, microcrystalline to cryptocrystalline, argillaceous, dense, no shows. Trace chert, brown, white, amorphous.

2280’-2300’ Limestone, buff to light tan, cryptocrystalline, argillaceous, dense, no shows. Trace chert.

2300’-2320’ Limestone, buff to tan, cryptocrystalline to chalky, micropyritic in part, slightly argillaceous, dense, no shows. Trace chert, brown to opaque, amorphous.

2320’-2340’ Limestone, light brown to buff, cryptocrystalline to chalky, pyritic in part, slightly argillaceous, dense, no shows. Trace chert, brown, amorphous.

2340’-2360’ Limestone, brown, buff, tan, cryptocrystalline to chalky, slightly argillaceous, dense, no shows. Trace chert, gray, brown, amorphous.

2360’-2380’ Limestone, buff to light gray, chalky to cryptocrystalline, slightly argillaceous, dense, no shows. Trace chert, gray to light gray, amorphous.

2380’-2400’ Limestone, gray to light gray, cryptocrystalline, argillaceous, dense, no shows. Trace chert, white to translucent, amorphous.

E-LOG TOP LODGEPOLE 2418’ +1159’

2400’-2420’ Limestone, very light tan gray, mottled tan gray, moderately to very hard, crumbly to brittle, microcrystalline to cryptocrystalline in part, slightly silicic in part, minor amounts pale blue white to tan translucent chert, trace amounts very fine disseminated pyrite, very slightly chalky in part, very dull pale yellow fluorescence, no cut.

2420’-2440’ Limestone, Generally as above, very dull pale yellow fluorescence, very weak slow milky cut.

2440’-2460’ Limestone, light tan, mottled white, moderately hard, crumbly to brittle, very finely microcrystalline, dense, rare chert, very rare disseminated pyrite, very dull pale yellow fluorescence, very weak cut

2460’-2480’ Limestone, light tan, mottled very light tan, dark gray brown, mottled hard, brittle, very finely microcrystalline, cryptocrystalline in part, slightly fragmental in part, dense, slightly silicified in part, rare chert, very rare disseminated pyrite, minor amounts massive carbonaceous material, no fluorescence, pale blue white slow milky cut

2480’-2500’ Limestone, light tan, mottled medium dark gray brown, moderately hard, crumbly to brittle, microcrystalline, mesocrystalline in part, moderate amounts vague fragments, no fluorescence, pale blue white milky cut

2500’-2520’ Limestone, mottled gray, moderately dark brown gray, firm to moderately hard, crumbly, microcrystalline, mesocrystalline, brecciated, fragmented, occasional thin calcite microveining, no fluorescence, slow very pale blue white cut.

2520’-2540’ Limestone, as above

2540’-2560’ Limestone, as above

2560’-2580’ Limestone, medium to dark brown gray, mottled light tan gray, moderately hard, crumbly in part, brecciated and fragmented, no fluorescence, very slow weak dull blue white cut.

2580’-2600’ Limestone, as above

2600’-2620’ Limestone, mottled very light/dark gray, moderately hard, brittle, microcrystalline, fragmental, minor amounts “sooty” black carbonaceous material, very rare pyrite, no fluorescence, very faint residual cut fluorescence

2620’-2640’ Limestone, as above

E-LOG TOP BANFF 2656’ +921’

2640’-2660’ Limestone, white, mottled very light gray, firm, very crumbly, microcrystalline to slightly brecciated, chalky in part, irregular very fine grained disseminated pyrite, dull mineral? fluorescence, faint residual cut fluorescence

2660’-2680’ Limestone, very light gray white, mottled slightly olive gray, firm to moderately hard, microcrystalline, chalky, dull mineral? fluorescence, faint residual cut fluorescence

2680’-2700’ Limestone, very light gray white, mottled slightly olive gray, firm to moderately hard, microcrystalline, chalky, dull mineral? fluorescence, faint residual cut fluorescence

2700’-2720’ Siltstone, light gray, soft to hard, chalky in part, argillaceous, very calcareous, very friable, no fluorescence, no cut

2720’-2740’ Siltstone, very light gray, moderately hard, brittle, friable, crumbly in part, grading to very fine grained sand, predominately angular grains, very limy matrix, no visible porosity, very pale yellow white fluorescence, very faint very slow cut

2740’-2760’ Shale, brown black, firm, crumbly, massive to sublaminar, very slightly calcareous in part, trace of disseminated pyrite, very slow moderately bright blue white cut

E-LOG TOP BAKKEN 2767’ +810’

2760’-2780’ Shale, very dark brown black, black in part, very soft to firm, very crumbly, very slightly to non calcareous, trace very fine disseminated and microveined pyrite, moderate amounts black carbonaceous laminations, very slow moderately bright blue white cut

E-LOG TOP THREE FORKS 2796’ +781’

2780’-2800’ Dolomite, medium gray, very light gray in part, slightly tan gray in part, firm, to very hard, microcrystalline, massive, abundant transparent angular dolomite crystals, very slightly calcareous, rare pyrite, very spotty weak yellow tan oilstain?, very pale yellow white fluorescence, very faint cut

E-LOG TOP POTLATCH 2806’ +771’

2820’-2840’ Dolomite, medium gray, very light gray in part, slightly tan gray in part, firm, to very hard, microcrystalline, massive, abundant transparent angular dolomite crystals, very slightly calcareous, rare pyrite, very pale yellow white fluorescence, very faint cut

2840’-2860’ Anhydrite, white to brown, lumpy, soft, microcrystalline, dolomitic in part, amorphous in part.

2860’-2880’ Anhydrite, cream, brown, gray, lumpy, soft to firm, dolomitic in part.

2880’-2900 Anhydrite, cream to brown, lumpy, soft to medium firm, microcrystalline to amorphous, dolomitic in part.

2900’-2920’ Anhydrite as above.

2920’-2940’ Anhydrite, cream to gray, microcrystalline, soft, lumpy, dolomitic in part. Much Dolomite, gray, hard, cryptocrystalline, dense, no shows.

E-LOG TOP NISKU 2960’ +617’

2940’-2960’ Dolomite, tan, cryptocrystalline, hard, slightly argillaceous, dense, whit mineral fluorescence, no shows. Much Anhydrite as above.

2960’-2980’ Dolomite and Anhydrite as above.

2980’-3000’ Dolomite, brown, cryptocrystalline, hard, argillaceous, dense, pale yellow mineral fluorescence, no shows.

3000’-3020’ Dolomite, brown, cryptocrystalline, very slightly argillaceous, dense, trace spotty faint yellow gold mineral fluorescence, weak milky cut, pale yellow gold residual ring fluorescence.

E-LOG TOP DUPEROW 3036’ +541’

3020’-3040’ Dolomite, brown to tan, cryptocrystalline, slightly argillaceous, dense, even pale yellow gold mineral fluorescence, very weak milky cut, faint blue white residual ring fluorescence.

3040’-3060’ Dolomite, gray, cryptocrystalline, argillaceous, dense, no shows.

3060’-3080’ Dolomite, gray, cryptocrystalline, slightly argillaceous, dense, dull faint yellow gold mineral fluorescence, no shows.

3080’-3100 Dolomite gray to brownish gray, cryptocrystalline, hard, argillaceous, dense, dull faint yellow gold mineral fluorescence, no shows.

3100’-3120’ Dolomite, dark gray, firm, cryptocrystalline, micropyritic in part, argillaceous, anhydritic, dense, no shows. Trace Anhydrite, white, lumpy, soft.

3120’-3140’ Dolomite dark gray, firm, cryptocrystalline, argillaceous, anhydritic, dense, no shows. Increasing amounts of Anhydrite, white, lumpy, soft.

3140’-3160’ Dolomite and Anhydrite as above.

3160’-3180’ Dolomite and Anhydrite as above.

3180’-3200’ Dolomite, brown gray, moderately hard, brittle, microcrystalline, argillaceous in part, abundant light cream anhydrite, scattered bright yellow fluorescence, slow moderately bright blue white cut, dull yellow white residual cut fluorescence.

3200’-3220’ Dolomite, uniform medium gray, moderately to very hard, brittle, microcrystalline, dense, no shows.trace of black carbonaceous material, no shows.

3240’-3270’ Dolomite, yellow brown, moderately hard, brittle, microcrystalline, some rhombohedral grains, trace of intergranular porosity, trace of pyrite, scattered very dull yellow fluorescence, no shows.

CORE NO. 1 3271’-3331’ Cut 60’ Recovered 60’

CORING TIMES

5-8-5-3-4-4-3-4-4-3
4-5-5-5-5-3-4-4-4-4
3-2-2-2-2-2-2-2-2-2

2-2-2-2-2-2-1-2-2-2
2-3-2-3-2-3-3-4-2-2
3-2-3-2-2-2-3-4-3-3

PASON 1' Time During Core No. 1

5.7-7.7-4.2-3.7-3.8-3.4-3.4-3.8-3.6-3.2
4.5-5.0-5.2-4.7-4.3-4.0-3.8-4.1-3.8-4.0
2.8-2.1-2.0-2.0-2.5-1.7-2.1-1.6-6.7-2.3
2.2-2.0-1.9-2.0-1.7-2.0-1.8-1.9-2.0-2.1
2.4-2.0-2.3-2.4-2.5-2.8-3.6-3.6-2.2-2.3
2.4-2.4-2.6-2.3-1.9-2.6-2.9-3.4-3.2-3.7

Note: Samples collected at shakers during coring from 3270' to 3450' are largely very fine sludge – the result of the mechanical action of the core bit on the rock. Refer to core analysis for detailed sample descriptions.

3270'-3280' Dolomite, brown, cryptocrystalline, hard, slightly argillaceous, dense, faint even yellow gold mineral fluorescence, no shows. Trace Anhydrite, white to cream, lumpy, soft.

E-LOG TOP MIDDLE DUPEROW POROSITY 3289' +288'

3280'-3300' Dolomite, brown to black, cryptocrystalline, hard, slightly argillaceous, dense, faint yellow gold mineral fluorescence, no shows. Trace Anhydrite, white to cream, lumpy, soft.

3300'-3320' No Sample.

CORE NO. 2 3331'-3390' Cut 59' Recovered 59'

CORING TIMES

22-2-4-3-4-3-4-4-4
3-3-4-3-4-2-3-3-3-3
3-4-4-4-5-3-1-2-2-3
2-2-3-1-2-2-2-2-1-1
2-2-2-3-3-2-3-2-3-3
3-3-3-2-3-2-4-2-3

PASON 1' Time During Core No. 2

0.7-22.3-2.0-3.8-3.1-3.5-3.7-3.9-3.7
3.3-3.5-3.6-3.3-3.9-3.2-2.7-2.8-2.7-2.8
3.3-3.5-3.3-4.3-3.9-4.6-3.3-1.4-1.7-6.6
3.1-2.6-2.4-2.2-1.8-1.7-2.1-1.9-1.5-1.3
1.3-1.6-1.9-2.2-2.2-2.6-2.7-2.8-2.7-2.9
2.8-2.9-2.7-2.8-2.9-2.8-2.8-2.7-2.6

3320’-3340’ Dolomite, brown, tan, mottled, microcrystalline to cryptocrystalline, limy in part, slightly argillaceous, no shows. Much Limestone, cream, chalky, soft. Much Limestone, cream, chalky, soft.

3340’-3350’ Dolomite, tan to brown, mottled in part, microcrystalline to cryptocrystalline in part, slightly argillaceous, faint yellow gold mineral fluorescence, no shows. Much Limestone, cream, chalky, soft.

CORE NO. 3 3390’-3450’ Cut 60 ’ Recovered 60’

CORING TIMES

2-2-3-3-2-3-2-2-3-2
2-3-2-3-2-2-2-2-2-2
3-2-2-2-2-2-3-2-3-2
3-4-2-3-3-3-4-3-4-3
4-3-4-4-4-3-3-3-3-3
3-3-4-3-3-3-3-3-4-3

PASON 1’ Time During Core No. 3

5.5-2.6-2.8-2.7-2.3-2.5-2.5-2.4-2.3-2.3
2.5-2.3-2.3-2.4-2.5-1.8-1.9-1.4-2.4-2.5
2.5-2.4-2.4-1.9-2.0-2.2-2.6-2.6-2.5-2.5
2.8-3.3-6.3-3.0-3.4-3.3-3.2-3.5-3.4-3.8
3.5-3.4-3.6-3.7-3.8-3.3-2.9-3.0-3.2-2.9
3.1-3.2-3.3-3.1-3.4-2.9-3.3-3.2-3.4-3.0

3350’-3360’ Dolomite, brown, microcrystalline, limy in part, slightly argillaceous, no shows. Much Limestone, cream, chalky, soft.

3360’-3390’ Dolomite, brown, microcrystalline, limy in part, slightly argillaceous, no shows. Much Limestone, cream, chalky, soft.

3390’-3420’ Dolomite, brown, microcrystalline, limy in part, slightly argillaceous, no shows. Much Limestone, cream, chalky, soft.

3420’-3450’ Dolomite, brown, microcrystalline, limy in part, slightly argillaceous, no shows. Much Limestone, cream, chalky, soft.

Note: Resumed collecting of normal drill cuttings from 3450’ to 3800’ (TD).

3450’-3480’ Dolomite, dark brown to black, cryptocrystalline to microcrystalline in part, hard, limy, argillaceous, dense, no shows. Trace Limestone, cream, chalky, soft.

3480’-3510’ Dolomite, dark brown to black, cryptocrystalline, hard, slightly argillaceous, dense, no shows. Trace Limestone, cream, chalky, soft.

3510’-3540’ Dolomite, dark brown to black, cryptocrystalline to microcrystalline, hard, argillaceous, dense, no shows. Trace Anhydrite, cream, soft.

E-LOG TOP LOWER DUPEROW POROSITY 3559’ +18’

3540’-3570’ Dolomite as above, no shows.

3570’-3600’ Anhydrite, cream, lumpy, soft. Trace Dolomite, brown to dark brown, cryptocrystalline, hard, argillaceous, dense, no shows.

3600’-3630’ Anhydrite, cream, chalky to microcrystalline, soft. Trace dolomite, dark brown to black, cryptocrystalline hard, slightly argillaceous, dense, no shows.

3630’-3660’ Dolomite, dark gray to brownish dark gray, cryptocrystalline, hard, limy, argillaceous, dense, no shows.

E-LOG BASE DUPEROW POROSITY 3679’ -102’

3660’-3690’ Limestone, gray to dark gray, cryptocrystalline, hard, slightly argillaceous, dense, no shows.

3690’-3720’ Limestone, dark gray, cryptocrystalline, hard, argillaceous, dense, no shows.

3720’-3750’ Limestone, dark gray, cryptocrystalline, hard, argillaceous, dense, no shows.

E-LOG TOP SOURIS RIVER? 3754’ -288’

3750’-3780’ Limestone, brown, to brownish gray, cryptocrystalline, hard, argillaceous, dolomitic in part, dense, no shows.

3780’-3800’ Limestone, brown to brownish gray, cryptocrystalline, dolomitic in part, argillaceous, dense, no shows. Trace lose, very fine sand grains.

TOTAL DEPTH DRILLER 3800’
LOGGER 3800’

DANIELSON 33-17 AS-BUILT RECORD

	Core Samples			Current Hole Status	Perf Details	Acid Treatment	Onsite H2S Levels	Gas Cylinder Samples
			0 ft	Well was filled with corrosion inhibitor (packer fluid) following Dec 2014/Jan 2015 completion work.				
			3,195ft	packer location				
			3,207 ft					
Middle Duperow	Core Samples 3,271ft-3,331ft	Zone 5	3,208 ft 3,222 ft 3,288 ft 3,336 ft	(OPEN) Chrome starts @ 3,227 ft (OPEN)	See completion report	Acid Job. 3,208 ft - 3,336 ft treated together. 6200 gal 20% HCL acid. Then Nitrification Acid Job. 3,208 ft - 3,336 ft treated together. 4000 gal 15% HCL Acid w/ 3 Nitrogen Diversion stages.	12/17/14, Sampled CO2 and H2S with a rae gas tube puller. H2S=6,000ppm 12/22/14, H2S = 7,000 ppm CO2 = 40%+. The CO2 maxed out our 2.5% to 40% tube. 12/23/14, H2S = 12,000 ppm CO2 = 40%+. The CO2 maxed out our 2.5% to 40% tube. 12/24/14,H2S = 2,000 ppm CO2 = 40%+. The CO2 maxed out our 2.5% to 40% tube. 12/26/14, H2S = 9,000 ppm CO2 = 40%+. H2S = 7,000 ppm CO2 = 40%+. The CO2 maxed out our 2.5% to 40% tube. 12/27/14, H2S = 9,000 ppm CO2 = 40%+. The CO2 maxed out our 2.5% to 40% tube. 12/28/14, H2S = 9,000 ppm CO2 = 40%+. The CO2 maxed out our 2.5% to 40% tube.	Zone 5, Sample 1, 11/17/14, H2S = 0.002%, from lower perf zone only Zone 5, Sample 2, 11/17/14, H2S = 0.002%, from lower perf zone only Zone 5, Sample 3, 11/17/14, H2S = 0.11%, from lower perf zone only Zone 5, Sample 4, 11/18/14, H2S = 0.32%, from lower perf zone only Zone 5, Sample 5, 11/18/14, H2S = 0.004%, from lower perf zone only Zone 5, Sample 6, 11/18/14, H2S = 0.06%, from lower perf zone only Zone 5, Sample 7, 11/21/14, H2S = 0.51%, both perf zones open Zone 5, Sample 8, 11/21/14, H2S = 0.84%, both perf zones open Zone 5, Sample 9, 12/5/14, H2S = 0.721%, both perf zones open Zone 5, Sample 10, 12/5/14, H2S = 0.793%, both perf zones open Zone 5, Sample 11, 12/5/14, H2S = 0.793%, both perf zones open Zone 5, Sample 12, 12/23/14, H2S = 0.431%, both perf zones open Zone 5, Sample 13, 12/26/14, H2S = 0.0083%, both perf zones open Zone 5, Sample 14, 12/27/14, H2S = 0.636%, both perf zones open Zone 5, Sample 15, 12/28/14, H2S = 0.001%, both perf zones open
	Core Samples 3,331ft-3,390ft	Zone 4	3,354 ft 3,374 ft 3,403 ft 3,414 ft	(ISOLATED CIBP@3,350 ft) (ISOLATED CIBP@3,350 ft)	See completion report	Acid Job. 3,354 ft - 3,414 ft treated together. 3000 gal 20% HCL acid.	No comments	Zone 4, Sample 1, 11/10/14, H2S = NA Zone 4, Sample 2, 11/10/14, H2S = NA Zone 4, Sample 3, 11/10/14, H2S = NA Zone 4, Sample 4, 11/10/14, H2S = NA
Lower Duperow	Core Samples 3,390ft-3,450ft							
		Zone 3	3,491 ft 3,498 ft 3,502 ft 3,513 ft 3,536 ft 3,542 ft	(ISOLATED CIBP@3,480 ft & 5 sacks of cement) (ISOLATED CIBP@3,480 ft & 5 sacks of cement) (ISOLATED CIBP@3,480 ft & 5 sacks of cement)	See completion report	Acid Job. 3,491 ft - 3,542 ft treated together. 1000 gal 20% HCL acid.	No comments	Zone 3 Sample 1, 11/3/2014, H2S = 0.0003
				Chrome ends @ 3,544 ft according to completion report.				

	Core Samples			Current Hole Status	Perf Details	Acid Treatment	Onsite H2S Levels	Gas Cylinder Samples
Lower Duperow		Zone 2	3,588 ft 3,593 ft 3,597 ft 3,602ft	(ISOLATED CIBP@3,580 ft & 5 sacks of cement) (ISOLATED CIBP@3,580 ft & 5 sacks of cement)	See completion report	Acid Job. 3,588 ft - 3,602 ft treated together. 1000 gal 20% HCL acid.	No comments	Zone 2, No Gas for Sample Collection
		Zone 1	3,658 ft 3,665ft 3,669 ft 3,678ft	(ISOLATED CIBP@3,650 ft & 5 sacks of cement) (ISOLATED CIBP@3,650 ft & 5 sacks of cement)	See completion report	Acid Job. 3,658 ft - 3,678 ft treated together. 500 gal 20% HCL acid.	No comments	Zone 1 Sample 1, 9/15/2014, H2S = NA
			3,800 ft	BOTTOM OF HOLE				

DANIELSON 33-17 EBOOK

Testing & Completion Documents

ALTAMONT/VECTA OIL & GAS, LTD/BIG SKY
Danielson 33-17

LOCATION: NWSE - SECTION 17 – T35N – R1W
(2300' FSL – 1650' FEL)
TOOLE COUNTY, MONTANA

COMPLETION PROGNOSIS

Altamont Oil & Gas Operations, Inc (Altamont), dig and line pits, set mud tanks. Liquid Gold Service Rig Company will move in, rig up on September 8, 2014, weather permitting.

Well Data

Surface elevation: 3566' GL

KB elevation: 11 feet above GL

Surface casing: 13 3/8'' 54.5 #/ft. J-55 set to 263 ft.; cemented to surface

Intermediate casing: 8 5/8'' 24#/ft. J-55 set to 1900 ft.; cemented to surface in two stages

Long String Casing: 5 ½'' 17#/ft. J-55 set to 3800 ft. Interval from 3166- 3536 5 ½'' 17#/ft.

CR13-80 JFE Bear cemented to surface

Tubing: 2 7/8'' 6.5#/ft. EUE 8rd L-80 work string

Objective

Test the Lower and Middle Duperow interval for CO2 production. Obtain gas and liquid samples. Perform flow test to estimate reservoir properties and deliverability.

Procedure

1. Move in completion rig and support equipment and rig up. Rig up pump and tank. Spot frac tank on location. Install rig anchors if required.
2. Offload 2 7/8'' EUE 8rd 6.5#/ft. work string. Have enough tubing pup joints to space out packer and plug settings if needed.
3. Install 11'' 3000 psi by 7 1/16'' 3000 psi tubing head adapter.
4. Nipple up 7 1/16'' 3000 psi double ram BOP. Pressure test BOP and casing to 1000 psi high and 750 psi low.
5. Pick up 4 ¾'' rock bit and 2 7/8'' X 5 ½'' casing scraper on 2 7/8'' tubing and trip in hole strapping tubing in hole.
6. Tag up on PBTD at approximately 3800 ft.
7. Reverse circulate well with clean fresh water.
8. Trip out of hole laying down bit and scraper.
9. Rig up H2S monitoring company.

10. Rig up test separator with liquid line to frac tank and gas line to a blouey pit or vent stack. If digital orifice meter is used make sure it is calibrated for CO2 and not methane.
11. Run CBL Log from TD to surface with same pressure done as the casing pressure test. 1000 psi applied to casing. Trip in hole with BHA and swab through tubing till fluid level is approximately 1000' above proposed perforations.
12. Rig perforators to well. Run full lubricator.
13. Perforate 1st and 2nd intervals (Zone 1) of Lower Duperow perfs: 3669'-3678', 3658'-3665' with 6 shots per foot using 3 1/8' gun. All depths based on open hole logs. (Perf well unbalanced)
14. If well kicks off flowing allow well to flow up casing to frac tank. Flow well until dead or if no flow proceed to next step. If well flows for extended time then kill with fresh water.
15. Pick up test packer and retrievable bridge plug. Run a four foot 2 7/8 '' pup joint, 1.75'' X-nipple, a four foot 2 7/8'' pup joint and 1.75'' X-N profile above bridge plug retrieving tool. Test packer should have minimum 2'' bore. Above packer run standard 2 7/8'' seating nipple (2.21''-2.28''). Trip testing assembly into well on 2 7/8'' tubing.
16. Isolate Zone 1 of Lower Duperow perforations by setting packer at 3625' isolating perforations at 3669'-3678' and 3658'-3665'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
17. Rig to swab directly to frac tank. Put check valve in line at frac tank to prevent fluid siphoning back into well. (Best to swab into mix line) Rig lines in such a way that if well kicks off it can be switched to test separator. Keep accurate swab records
18. Swab test well to frac tank. If well kicks off turn through test separator and obtain gas analysis. Flow test well overnight to get gas rate, gas samples, and liquid samples.
19. If no fluid entry is obtained then evaluate for potential acid job. Step 42 has acid job details.
20. After determining fluid entry and getting gas/liquid rate kill well with fresh water
21. Release packer and retrieve bridge plug. Trip out 2 7/8" tubing working string and BHA.
22. Rig perforators to well. Run full lubricator.
23. Perforate intervals 3 & 4 (Zone 2) of Lower Duperow perfs: 3597'-3602', 3588'-3593' with 6 shots per foot using 3 1/8' gun. All depths based on open hole logs.
24. If well kicks, repeat steps 14 & 15.
25. Isolate Zone 2 of perforations by setting bridge plug at +/- 3610' and packer at 3565' isolating perforations at 3597'-3602', 3588'-3593'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
26. Repeat steps 17-21. Evaluate for potential acid job. Step 42 has acid job details.
27. Rig perforators to well. Run full lubricator.
28. Perforate intervals 5, 6, & 7 (Zone 3) of Lower Duperow perfs: 3536'-3542', 3502'-3513', 3491'-3498' with 6 shots per foot using 3 1/8' gun. All depths based on open hole logs.
29. If well kicks, repeat steps 14 & 15.

30. Isolate Zone 3 of perforations by setting bridge plug at +/- 3550' and packer at 3480' isolating perforations at 3536'-3542', 3502'-3513', 3491'-3498'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
31. Repeat steps 17-21. Evaluate for potential acid job. Step 42 has acid job details.
32. Rig perforators to well. Run full lubricator.
33. Perforate intervals 8 & 9 (Zone 4) of Middle Duperow perfs: 3403'- 3414', 3354'-3374' with 6 shots per foot using 3 1/8' gun. All depths based on open hole logs.
34. If well kicks, repeat steps 14 & 15.
35. Isolate Zone 4 of perforations by setting bridge plug at +/- 3420' and packer at 3345' isolating perforations at 3403'-3414', 3354'-3374'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
36. Repeat steps 17-21 Evaluate for potential acid job. Step 42 has acid job details.
37. Rig perforators to well. Run full lubricator.
38. Perforate intervals 10 & 11 (Zone 5) of Middle Duperow perfs: 3288'-3336', 3208'-3,222' with 6 shots per foot using 3 1/8' gun. All depths based on open hole logs.
39. If well kicks, repeat steps 14 & 15.
40. Isolate Zone 5 of perforations by setting bridge plug at +/- 3345' and packer at 3200' isolating perforations at 3288'- 3336', 3208'-3,222'. All depths KB depths. Put TIW valve in top of tubing, have second TIW valve on location.
41. Repeat steps 17-21. Evaluate for potential acid job. Step 42 has acid job details.
42. After initially testing each zone and based on the outcome of the tests a decision might be made to acidize the perforations. If required then isolate and acidize each set of perforations with 500- 1000 gallons 20% breakdown acid. After acidizing each zone separately then move bridge plug below all perforations and packer above all perforations and swab and flow test as in Steps 17 and 18. Based on the outcome there may be a need for individual re- testing of all the zones. If required repeat settings above to test. *Please see full Acid Program attached.
43. **After testing all four of the Lower Duperow intervals depending upon outcome a flow test may be performed. If so a procedure will be provided as to the length of flow period and shut in time. The flow test will require gauges and will be similar to the procedure starting in Step 48 below. If zones are unproductive or wet then Lower Duperow perforations should be abandoned by setting a cast iron bridge plug with an appropriate amount of cement dump bailed on top of the plug or by setting a cement retainer and squeezing perfs with cement. Consult State regulators as to plugging method.**
44. **Note: After acidizing if lower zones are thought to be wet then additional testing might be required to confirm production. If lower zones are wet then depending upon how the Lower Duperow perforation produced a mitigation strategy will need to be developed. If all zones are gas producing the procedure follows:**
45. Shut well in and rig slickline to well. Trip in well with slickline and hang tandem memory gauges in X-nipple profile below packer. Rig down slickline.

46. Open well up flowing through test separator. Attempt to stabilize gas rate at approximately 300-500 MCF/D. Control flow with choke on separator and use line heater to prevent freeze off. Flow test well approximately 72 hours **Note:** A detailed test procedure will be provided.
47. Shut well in for buildup. Make sure there are no surface leaks. Bull plug connections as necessary.
48. After 96-120 hours retrieve memory gauges with slickline. Download data and send out for interpretation. 5d (Standby time)
49. Load tubing with fresh water.
50. Release packer and trip in hole to latch onto bridge plug and trip out of hole with bridge plug and packer.
51. If required set CIBP above perforations 3354-3374. **Note: This step may not be required.**
52. Trip in hole with production packer. Production packer detail previously identified. Have plug in profile on top of packer.
53. Set packer and lower completion assembly at +/- 3270'. Reverse circulate well with 2% KCL water with oxygen scavenger and corrosion inhibitor.
54. Trip out of hole laying down work string.
55. Nipple down BOP and upper tree assembly.
56. Rig down all test equipment. Haul off fluids to disposal well.
57. Release rig and move off location.

SAMPLES

All fluid and gas samples need to be taken by using necessary equipment and closely following attached document detailing proper Sampling procedure. Someone from 1st Rate Energy Services will handle taking the samples. Please see proper sampling procedure attached for at the end of this document.

H2S SAFETY

H2S and CO2 monitoring equipment will be present on-site along with a safety supervisor. All hands will be required to attend daily H2S training. The service will be provided by Triple AAA Safety/Training and Darwin Krabbenhoft

ACID PROCEDURE

Set packer and spot 500-1000 gallons of 20% acid on perforations. Displace acid at 2-3 barrels a minute and do not exceed 1000-1500 psi. (Adjust accordingly to what formation allows). Over displace acid by volume of tubing. Take an instant shut in pressure (ISIP) of 5 minutes, 10 minutes, and 15 minutes after displacing acid. Rig down acid truck. Unseat packer and swab well down.

Steps	Time estimate	Cumulative time	
1 thru 4	1d	1d	
5 thru 10	1d	2d	
11 thru 16	1d	3d	
17 thru 18	1d	4d	
19 thru 21	2d	6d	
22 thru 25	1d	7d	
26	3d	10d	
27 thru 30	1d	11d	*Could be more if flow test required
31	3d	14d	
32 thru 35	1d	15d	
36	3d	18d	
37 thru 40	1d	19d	
41	3d	22d	
42 thru 44	1d	23d	
45 thru 48	8d	31d	
49 thru 51	1d	32d	
52 thru 54	1d	33d	
55 thru 57	1d	34d	

DANIELSON 33-17 COMPLETION REPORT
Daily Operations Summary

Day 1: September 8, 2014
- Liquid Gold service rig transported to Danielson 22-17 well site
- Rig assembled, secured, and prepped for operations
- Final excavation work completed

Day 2: September 9, 2014
- Pipe tubing and new wellhead delivered to site by American Pipe/Trucking
- New wellhead and blowout preventer system installed and tested
- Completion work commenced; ran drill-string and casing scraper down hole to a depth of 1,946'.

Day 3: September 10, 2014
- Tubing ran to depth of 3,743' and rig made ready to 'reverse circulate' wellbore fluids
- Wireline cement bond logging (CBL) tool ran to a depth of 3,742'
- Variable density logging (VDL) tool malfunctioned, but, work continued with spare VDL tool

Day 4: September 11, 2014
- Rigged up to swab well down (i.e. pull fluid from well bore)
- Perforated from depths 3,658' – 3665' (Zone 1, Interval 2) and 3669' – 3678' (Zone 1, Interval 1)
- Rigged down wireline, bled fluid to flat tank, and vented gas (no H2S detected; C02 present)

Day 5: September 12, 2014
- Vented well and tested for H2S present and trace CO2
- Completed swab runs and recovered 28 barrels of water
- Installed pit liner and rigged up 'swab' tanks

Day 6: September 13, 2014
- Vented well; gas present, including H2S (20 ppm) and CO2 (500 ppm)
- Completed hourly swab runs from 8:30 AM to 2:30 PM; no fluid recovered

Day 7: September 14, 2014, Standby
- No Rig Activity; First Rate Energy Services measured 'shut-in' well pressure

Day 8: September 15, 2014
- Set packer to a depth of 3,648' and completed swab run (no fluid recovered)
- Pumped water and acid concentrate to high pressure and displaced acid at perforation intervals
- Rigged up to swab and recovered 31 barrels of fluid (bled well to flat tank)

Day 9: September 16, 2014
- Completed hourly swab runs from 7:00 AM to 2:00 PM; no fluid recovered

Day 10: **September 17, 2014**
- Rigged up wireline and set permanent cast iron bridge plug at a depth of 3,650'

Days 11 – 15: **September 18 – 22, 2014, Standby**
- Location idle; crew on standby

Day 16: **September 23, 2014,**
- Rig disassembled and transported back to Cut Bank, MT

Days 17 – 46: September 24 – October 23, 2014, Days Off

Day 47: **October 24, 2014**

- General Well Service field hands and engineer attended H2S Safety Certification Training and MSU orientation in Shelby, MT
- On-site emergency breathing apparatus equipment made ready by Triple AAA Safety
- General Well Service rig and equipment transported to Danielson 22-17 well site and assembled, secured, and prepped for operations

Days 48 – 49: October 25 – 26, 2014, Days Off

Day 50: **October 27, 2014**

- Wellhead and blowout preventer system tested under pressure
- 'Tripped' (i.e. ran) tubing in hole to a depth of 2,730' and tested under pressure
- Completed well swab to a depth of 3,600' and prepared rig for 'tripping out' of hole
- Maneuvered new 400 barrel [capacity] test tank upright and secured tank line connections

Day 51: **October 28, 2014**

- Perforated from depths 3,597' – 3,602' (Zone 2, Interval 3) and 3,588' – 3,593' (Zone 2, Interval 4)
- Experienced very slight blow on casing (no H2S detected)
- Packer malfunction detected; tubing and bottom hole assembly (including packer) pulled out of well for inspection; crew discovered malfunction with packer's emergency release

Day 52: October 29, 2014

- Packer set at a depth of 3,558' and crew completed a total of 8 swab runs (with no fluid recovered)
- Personal gas monitor metered Carbon Monoxide up to 100 ppm, however, no gas sample collected [possibly] due to no pressure

Day 53: October 30, 2014

- 3 swab runs were completed with no fluid recovered
- Tubing hooked up to vacuum truck and hole loaded with 60 barrels of freshwater to remove all air

Day 54: October 31, 2014

- Tubing and casing filled to surface with freshwater; 1,000 gallons of 20% HCL acid concentrate injected under high pressure at perforation intervals
- Bled tubing pressure to 0 psi and completed swab runs (on the hour); 32 barrels of water recovered

Day 55: November 1, 2014

- Crew attempted to retrieve gas sample
- Rig shut down for impending weather event

Day 56: November 2, 2014, Day off (weather)

Day 57: November 3, 2014

- Thawed out flow lines (due to cold weather) and made 5 swab runs; 5 barrels of water recovered
- Packer released and final swab run completed to a depth of 2,500'

Day 58: November 4, 2014

- Ran cement bailer on wireline and set cement plug from top of existing 'bridge plug' at a depth from 3,650' – 3,608' (satisfying the requirements of MT Board of Oil Gas)
- Perforated from depths 3,536' – 3,542' (Zone 3, Interval 5) and 3,491' – 3,498' (Zone 3, Interval 7)
- Set packer at a depth of 3,464' and completed 4 swab runs; no liquid recovered

Day 59: November 5, 2014

- Pumped, pressurized, and injected 1,000 gallons of acid concentrate to perforation intervals
- Completed 6 swab runs; no fluid recovered

Day 60: November 6, 2014

- Swab run completed to a depth of 2,350'
- Discovered 40' of fill on top of cast iron bridge plug (CIBP) at a depth of 3,580'; MT Oil and Gas approved covering fill with cement from a depth of 3,540' – 3,500'
- Set CIBP at 3,480' and poured [additional] cement from a depth of 3,480' to 3,440'
- Perforated from depths 3,403' – 3,414' (Zone 4, Interval 8) and 3,354' – 3,374' (Interval 9, Zone 4)
- Well had minor flow with no H2S or CO2 metered in gas stream
- Crew and well testers performed H2S safety drill (including 'mask-up' procedures)

Day 61: November 7, 2014

- Packer set to 3,317' and 8 swab runs were completed (recovering ~10 barrels of water)
- Swab runs #3 – 6 had good flow (changing to gas); final 2 swab runs pulled dry (with slight vacuum noted)

Days 62 – 63: November 8 – 9, 2014, Days off

Day 64: November 10, 2014

- Pumped 3,000 gallons of 20% HCL acid concentrate to perforation zones
- First swab run completed; 45 barrels of water recovered
- Second swap run attempted, however, freezing pipes halted work

Day 65: November 11, 2014

- Simultaneous well operations included 'winterizing' flowlines to prevent freezing
- Completed 2 swab runs; well produced strong water flow and increasing concentrations of gas
- Crew was unable to swab further due to strong flow (18 barrels of water recovered)

Day 66: November 12, 2014

- 21 swab runs completed; each run recovered 1.5 – 2 barrels of water; gas pressure following each run measured at 2 – 10 psi, until falling to a non-measurable flow rate

Day 67: November 13, 2014

- 11 swab runs completed; 4 barrels of water recovered; gas volume was too small to measure
- General Well Service crew changeover took place; new crew underwent BSCSP Project Orientation and were oriented to specific procedures and job duties by previous crew

Day 68: November 14, 2014

- New rig crew performed H2S safety drill
- Perforated from depths 3,308' – 3,336' (Zone 5) and completed swab runs
- Casing pressure increased from 20 to 254 psi; bled off pressure to tank
- Set packer with end of tail pipe to a depth of 3,285'

Day 69: November 15, 2014

- Crew completed a total of five swab runs; gassy returns and little fluid was produced
- H2S monitor alarmed on crew member while he was checking for flow (and feeling nauseous); a 'pull tube test' showed H2S levels at 8,000 ppm; H2S emergency was enacted and crew members donned SCBA's; work safely continued without incident until evening shutdown

Day 70: November 16, 2014, Day off

Day 71: November 17, 2014

- Morning safety meeting took place to address H2S operational precautions
- Open well test yielded H2S levels at 4,000 ppm and C02 over 100,000 ppm; three gas samples were collected for analysis
- Three swab runs completed; one fluid sample collected for analysis
- 20 barrels of heated water were circulated down tubing; casing began unloading C02 at a fairly high rate (likely attributed to liquid CO2 changing to vapor phase)
- SCBA equipment and 'spotters' were used by crew at all times to ensure safety

Day 72: November 18, 2014

- Wellhead 'wing valve' replaced by crew
- 16 swab runs completed; gaseous fluid recovered
- Five additional swab runs completed with minimal fluid recovery and minor gas volumes
- Nine final swab runs completed; 20 barrels of fluid were recovered

Day 73: November 19, 2014

- 35 barrels of 3% NaCl2 circulated down-hole
- Crew completed two perforation runs at depths from 3,288' – 3,308' (Zone 5, Interval 10) and 3,208' – 3,222' (Zone 5, Interval 11)

Day 74: November 20, 2014

- 12 swab runs completed; recovered 20 barrels of water with limited gas entry
- Packer set at 3,206' (above top perforation) and pressure built to 300 psi; reservoir exhibited limited feed-in with rapid pressure buildup
- Four additional swab runs completed with no yield

Day 75: November 21, 2014

- Seven 'dry' swab runs completed; recovered minimal fluid and little gas
- Gas sample pulled for analysis; measured 400,000 ppm C02

Days 76 – 77: November 22 – 23, 2014, Days off

Day 78: November 24, 2014

- Completed two swab runs (both dry)
- Acidized well with 6,200 gallons of 20% HCL acid; pressure broke from 4,000 psi to 2,00 psi after 15 minutes
- Completed six additional swab runs and recovered 83 total barrels of fluid

Day 79: November 25, 2014

- Vented gas from well
- Swabbed well dry throughout the day

Day 80: November 26, 2014

- Vented gas from well
- Crew unable to pump acid into perforation zone; discovered malfunction with swab equipment
- New swab installed; three swab runs completed; 19 barrels of fluid recovered

Days 81 – 84: November 27 – 30, 2014, Days off

Day 85: December 1, 2014

- Vented gas from well; C02 at max meter reading of 10,000 ppm; H2S at 9,000 ppm
- Crew donned SCBA equipment to ensure H2S safety and completed one dry swab run

Day 86: December 2, 2014

- Completed open well flow test; well flowed for three hours with pressure declining steadily down to 24 psi
    - highest CO2 rate recorded: 323 MCFD (thousand cubic feet per day)
    - average CO2 rate: 200 MCFD
- Completed dry swab run; no fluid recovery
- Took one gas sample; H2S measured at 8,000 ppm, C02 maxed out at 400,000 ppm

Day 87: December 3, 2014

- Completed open well flow test; well blew down to 20 psi in 1.5 hours on adjustable choke (rates of 375 – 100 MCFD)
    - highest CO2 rate recorded: 771 MCFD (thousand cubic feet per day)
- Pumped four acid stages, including three Nitrogen fiver stages; very good diversion/breaks observed throughout job
- Completed second open well flow test of the day; well flowed back 60 barrels of fluid and died
- Crew began well 'shut-in' process overnight (note: an additional 80 barrels of fluid recovered by 7:00 AM on December 4)

Day 88: Dec 4, 2014

- Continued alternating shut-in and flow-back periods; recovered 28 barrels of fluid
- Began swab run at dawn hours; recovered an additional 4 barrels of fluid
- Later in day, well pressure recharged to 260 psi in 30 minutes, up from 160 psi in 30 min as recorded in earlier hours
- 102 cumulative barrels of fluid recovered from prior day's acid job

Day 89: Dec 5, 2014

- Flowed well for ~2 hours; pressure dropped to 46 psi with CO2 gas rates at 396 MCFD (thousand cubic feet per day) to 50 MCFD
- 'Shut-in well;' brought pressure to a daily-max level of 247 psi; completed swab runs
- Recovered a total of four barrels of fluid (106 cumulative barrels from this acid job)

Day 90: December 6, 2014

- Flowed well for ~1 hour; pressure dropped to 46 psi (from original 'shut-in' pressure of 706 psi)
- 'Blew down' well in 1 hour with C02 rates declining from 417 MCFD (thousand cubic feet per day) to 187 MCFD
- Completed a total of three swab runs and maintained 100 psi backpressure on formation for 1.5 hours

Day 91: December 7, 2014, Day off

Day 92: December 8, 2014

- 'Blew down' well to 38 psi in ~1 hour with flow rates from 693 MCFD (thousand cubic feet per day) to 313 MCFD
- Completed 12 swab runs; recovered 47.5 barrels of fluid (10.5 barrels from latest acid job)
- Left well open for 2 hours and flow increased from 58 MCFD to a max 167 MCFD with pressure increasing from 8 psi to 33 psig.
- Completed 4 additional swab runs (dry)

Day 93: December 9, 2014

- 'Shut-in' well pressure measured at 665 psi
- Flowed well for 6 hours on various chokes with the following [average] rate and pressures:
    - Hour 1: 650 MCFD, 530 psi
    - Hour 2: 270 MCFD, 340 psi
    - Hour 3: 190 MCFD, 280 psi
    - Hour 4: 250 MCFD, 180 psi
    - Hour 5: 160 MCFD; 80 psi
    - Hour 6: 95 MCFD, 50 psi
- 'Shut-in' well (pressure at 203 psi), blew down to tank
- Completed 4 total swab runs (2 dry)

Day 94: December 10, 2014

- 'Shut-in' well pressure measured at 635 psi; 'blew down' well in hour (to tank); recovered 3.34 barrels of fluid
- Unseated packer to remove blow-out preventer system
- Removed top collar on tubing

Day 95: December 11, 2014

- 'Shut-in' well pressure measured at 262 psi; 'blew down' well in 10 minutes
- Completed 2 swab runs; recovered 15 barrels of fluid
- Flowed well for 3 hours and averaged 150 MCFD (thousand cubic feet per day) rate
- 'Blew down' well to tank; swabbed dry
- 'Rigged down' rig and prepared for move to Wallewein well pad

Day 96: December 12, 2014

- 'Shut-in' well pressure measured at 710 psi; left well shut through weekend (Dec 13 – 14)
- Began moving rig to Wallewein well pad

Days 97 – 98: December 13 – 14, 2014, Days off

Day 99: December 15, 2014

- Moved-in and rigged-up Liquid Gold Service Rig
- Held orientation meeting for crew
- Opened well to flow at 1:30 PM; pressure measured at 670 psi
    - After 1 hour, well flowed at 394 MCFD (thousand cubic feet per day) at 579 psi.
    - After 1 hour and 45 minutes, well flowed at 597 MCFD at 154 psi
    - 'Bled down' pressure to tank
- Prepared for swab run; located seat nipple and possible float collar (component installed near the bottom of the casing string) in well
- Unable to complete swab run due to failing light conditions
- Opened well to flare; pressure built to 115 psi in 10 minutes
- Well flowed at 120 MCFD at 115 psi; declined to 50 MCFD at 64 psi after 16 hours; 1 barrel of fluid recovered

Day 100: December 16, 2014

- Held H2S training for Liquid Gold crew
- Completed 4 swab runs; 0 barrels of fluid recovered
- Flowed well through 4 PM and completed final swab run (dry)
- 'Shut-in' well for pressure buildup (for 5 hours); pressure built to 600 psi
- Opened and flowed well (again) at 9:30 PM

Day 101: December 17, 2014

- No fluid recovered from previous nights' flow
- At 12:30 PM, well flowed at a rate of 50 MCFD at 45 psi
- Blew pressure down to tank and completed 4 swab runs (dry)
- Checked rig capability to unseat tension on packer
- Opened casing to atmosphere; crew masked-up in SCBA equipment for possible H2S breach
- Unbolted 'Christmas tree' (the set of valves, spools, and fittings which are used to control well flow) and pressured-up tree while checking slip-set clearance (the device used to grip the drill-string); equipment okay
- Reassembled 'Christmas Tree' before shutting down operations for the evening

Day 102: December 18, 2014

- Waited on water truck and blow-out preventer delivery
- 'Killed' well (i.e., stopped flow) with 25 barrels of 3% NaCl water
- Disassembled 'Christmas Tree' and installed blowout preventer system
- Unseated packer and left it (and 10 joints of tubing) inside hole as a 'kill string'

Day 103: December 19, 2014

- 'Killed' annulus between casing and tubing with 4 barrels of 3% NaCl; 'killed' tubing with 2 barrels
- Connected pipe and hardware (from bottom to top) and set in hole; packer set at a depth of 3,195 feet and seat nipple at 3,188 feet
- Unhooked from packer and pumped 48 barrels of packer fluid with corrosion inhibitor and biocide into hole; circulated with near full returns (recovered 42 barrels) and displaced 8.4 total barrels of fluid
- Hooked back onto packer and loaded annuals with 2 barrels of packer fluid
- Completed a total of 3 swab runs (last 2 dry); recovered 16 barrels of fluid
- Shut-in well for pressure buildup; pressure measured at 600 psi at 2:30 AM, then blew down to tank in 6 minutes; recovered 2 barrels of fluid

Day 104: December 20, 2014

- Completed three swab runs (dry)

Day 105: December 21, 2014, day off

Day 106: December 22, 2014

- After 34 hours, shut-in pressure measured at 688 psi
- Bled well to tank in 6 minute intervals and recovered 1.5 barrels of fluid
- Completed 5 swab runs and recovered .5 barrels of fluid
- Released Liquid Gold Service Rig
- Shut-in well for pressure buildup (for 2 hours); pressure measured at 454 psi
- Began trial flow for 48 hours (prior to running gages)
    - Opened well and flow-rate leveled out at 60 MCFD at 3:30 AM
    - Well flowed at a rate of 58 MCFD the following morning

Day 107: December 23, 2014

- Opened well and flow rate leveled out at 60 MCFD (thousand cubic feet per day)
- Adjusted choke to sustain flow rate; rate fluctuated between 85 and 46 MCFD throughout the day

Day 108: December 24, 2014

- Completed 36 hour trial flow period with initial flow rates at 60 MCFD declining to 45 MCFD (thousand cubic feet per day)
- Opened well tank and unloaded 1.5 barrels of fluid
- Well shut-in for flow test scheduled for Friday, December 26

Day 109: December 25, 2014

- Well shut-in for flow test scheduled for Friday, December 26

Day 110: December 26, 2014

- Rigged up slickline; ran in-hole with gauge ring to tag (i.e., confirm depth) at 3,180 feet
- Attached gauges to slickline and ran in-hole with quartz gauges; completed gradient check every 750 feet for 5 minutes; landed gauges at 3,180 feet
- Rigged down slickline; well opened to test vessel and adjust choke to achieve sustained flow
- Sustained flow rate achieved at 8 PM; rate measures from 43 – 47 MCFD (thousand cubic feet per day)

Day 111: December 27, 2014

- Continued to flow well with downhole gauges

Day 112: December 28, 2014

- Continued to flow well with downhole gauges
- Completed 48 hour flow test and shut-in well; 4 gas samples collected during test
- Well will remain shut for an additional 200 – 250 hours

Day 113: December 29, 2014

- Continued to keep well shut-in for the 200+ hour shut-in phase of test

Day 114: December 30, 2014

- Continued to keep well shut-in for the 200+ hour shut-in phase of test

Day 115: December 31, 2014

- Continued to keep well shut-in for the 200+ hour shut-in phase of test

Day 116: January 1, 2015

- Continued to keep well shut-in for the 200+ hour shut-in phase of test

Day 117: January 2, 2015

- Continued to keep well shut-in for the 200+ hour shut-in phase of test

Day 118 – 120: January 3 – 5, 2015, Days off

Day 121: January 6, 2015

- Well completed its minimum 200 hour shut-in period

Day 122: January 7, 2015

- Gauges unseated and pulled out of hole; 5 minute stops taken every 750 feet

Day 123: January 8, 2015, Day off

Day 124: January 9, 2015

- Shut-in pressure measured at 683 psi; blew down well to tank
- Shut-in well at noon; shut-in pressure measured at 321 psi after 45 minutes
- Flowed well to 5 PM and shut-in overnight
- Zero barrels of fluid produced

Day 125: January 10, 2015

- Blew tubing down to tank
- "Near Miss" incident reported: sheave on dead man line broke, causing dropped blocks and strewn cable; no one hurt; rig repaired
- Unbolted/unhooked 'Christmas tree' (the set of valves, spools, and fittings which are used to control well flow from packer; allowed well to equalize
- Pulled out of hole with tubing; ~20 joints left to reach packer; will resume work on 1/12/2015

Day 127: January 11, 2015, Day off

Day 126: January 12, 2015

- In-hole with tubing; well started kicking; loaded tubing with ten barrels of water to kill flow
- Rigged-up Northline Services rig and set 2-piece retrievable (i.e., slick) bridge plug
- Unhooked from packer and circulated 60 barrels of packer fluid with corrosion inhibitor and biocide down-hole.

Day 127: January 13, 2015

- Overnight cold weather conditions caused equipment freezing and morning work delays
- Liquid Gold to top off casing with packer fluid circulating packer fluid at Wallewein well)
- Rigged-down workover rig; rig made ready to travel in morning

Form No. 4 R10/09

LOCATE WELL CORRECTLY

(SUBMIT IN TRIPLICATE)
TO
MONTANA BOARD OF OIL AND GAS CONSERVATION
2535 ST. JOHNS AVENUE
BILLINGS, MONTANA 59102

ARM 36.22.302
ARM 36.22.307
ARM 36.22.1011
ARM 36.22.1013
ARM 36.22.1414

RECEIVED
JUN 15 2015
MONTANA BOARD OF OIL & GAS CONSERVATION • BILLINGS

COMPLETION REPORT

API # 25 - 101 - 24243

Company Vecta Oil & Gas, Ltd Lease Danielson Well No. 33-17

Address 575 Union Blvd. Suite 208 Field or Area Kevin Dome

Lakewood, CO 80228

Surface Location: 2300 ft. from S (N/S) Line, 1650 ft. from E (E/W) Line, Sec. 17 T 35 R 1

County Toole Elevation 3566 (Surface) 3577 (KB)

Date Spud 5/5/2014 Date Completed 1/13/2015 Completed as CO2 Gas (Oil, gas, cbm, injection, dry hole, etc.)

The information given herewith is a complete and correct record of the well as of the date of preparation.

Signed

Title Consultant Date 6/10/2015

Telephone 406-873-9000

For Vertical Well: Total depth 3800 ft. Plugged back to 3350 ft.

For Horizontal or Directionally Drilled Well: Enter well bore and bottom hole location data on page 2 of this form.

For coal bed natural gas well: Static water level NA ft. below reference elevation of NA ft.

Casing and Tubing Record

Well Bore	String Type	Size	Weight	Grade	Length (Feet)	From (MD, Feet)	To (MD, Feet)	Cement (Sacks)	Cement Top (MD, Feet)	Packer Set (MD, Feet)
16 7/8"	Surface	13 3/8"	54.5	J55	266	0	266	165	Surface	None
10 5/8"	Intermediate	8 5/8"	24	J55	1812	0	1812	295	Surface	None
7 7/8"	Production	5 1/2"	17	J55	3800	0	3800	422	Surface	None
7 7/8"	Production	5 1/2"	17	Chorme	317	3227	3544	-	Surface	None

Perforated or Open-hole Intervals

Well Bore	Open Hole/Perf'd Zone Top	Bottom	Holes per foot	Size and Type	Open or Isolated (method of isolation)
See attached					

Acidized, Shot, Fraced, Squeezed, or Cemented

Well Bore	Interval Top	Bottom	Treatment Type	Amount and Type of Material	Max. Rate (BBLS/Min)	Max. Pressure (PSI)
See attached						

Well is producing from Duperow formation(s) or pool(s).

I.P. 0 barrels of oil, 40 MCF of gas, and 0 barrels of water per 24 hours.

Initial 10-day average production NA /day (if taken)

Pressures (if measured): Tubing 43 psi flowing: 700 psi shut-in

Casing NA psi flowing: NA psi shut-in

Formation Volume Factor .00246 Porosity 6 % Water Saturation 0 %

Type Of Trap Stratigraphic Producing Mechanism Gas Solution

Bottom Hole Locations

Well Bore	Kick-off MD	Kick-off From (Well bore)	Total Depth MD	Total Depth TVD	Location, T-R-S Twp	N/S	Rng	E/W	Sec.	From N/S Line Feet	N / S	From E/W Line Feet	E / W
None													

Drill Stem Tests

DST #	Interval From	Interval To	Tool Open (Min.)	Shut-in (Min.)	F.P.	S.I.P.	Recovery	Cushion
None								

Cores

Core #	Interval From	Interval To	Recovery
1	3271	3331	60'
2	3331	3390	59'
3	3390	3450	60'

Logs

Log Type	Interval From	Interval To
See attached		

Geological Markers

Formation	Top MD	Top TVD	Formation	Top MD	Top TVD
Blackleaf (Second White Specks)	275'		Middle Duperow	3289'	
Bow Island	533'		Lower Duperow	3559'	
Kootenai	1050'		Base Lower Duperow	3679'	
Sunburst	1416'		Souris River	3754'	
Swift	1452'				
Reirdon	1517'				
Sawtooth	1628'				
Madison	1644'				
Mission Canyon	1827'				
Lodge Pole	2418'				
Banff	2656'				
Bakken	2767'				
Three Forks	2796'				
Potlatch	2806'				
Nisku	2960'				
Duperow	3036'				

Perforated or Open Hole Intervals

Well Bore	Open hole/perf'd zone Top	Bottom	Hole per foot	Size and Type	Open or Isolated (Method of Isolation)
7 7/8"	3669	3678	6	3 1/8" Hollow Steel Carrier	Isolated (CIBP @ 3650' & 5 sacks of cement)
7 7/8"	3658	3665	6	3 1/8" Hollow Steel Carrier	Isolated (CIBP @ 3650' & 5 sacks of cement)
7 7/8"	3597	3602	6	3 1/8" Hollow Steel Carrier	Isolated (CIBP @ 3580' & 5 sacks of cement)
7 7/8"	3588	3593	6	3 1/8" Hollow Steel Carrier	Isolated (CIBP @ 3580' & 5 sacks of cement)
7 7/8"	3536	3542	6	3 1/8" Hollow Steel Carrier	Isolated (CIBP @ 3480' & 5 sacks of cement)
7 7/8"	3502	3513	6	3 1/8" Hollow Steel Carrier	Isolated (CIBP @ 3480' & 5 sacks of cement)
7 7/8"	3491	3498	6	3 1/8" Hollow Steel Carrier	Isolated (CIBP @ 3480' & 5 sacks of cement)
7 7/8"	3403	3414	6	3 1/8" 19 gram titan perfecta	Isolated (CIBP @ 3350')
7 7/8"	3354	3374	6	3 1/8" 19 gram titan perfecta	Isolated (CIBP @ 3350')
7 7/8"	3288	3336	6	3 1/8" 19 gram titan perfecta	Open
7 7/8"	3208	3222	6	3 1/8" 19 gram titan perfecta	Open

Acidized, Shot, Fraced, Squeezed, or Cemented

Well Bore	Interval Top	Interval Bottom	Treatment type	Amount and Type of Material	Max Rate (BBLS/Min)	Max Pressure (PSI)
7 7/8"	3669	3678	Acid Job	500 Gallons 20% HCL Acid	1.5	3000
7 7/8"	3658	3665	Acid Job	Treated with zone above		
7 7/8"	3597	3602	Acid Job	1000 Gallons 20% HCL Acid	1	3000
7 7/8"	3588	3593	Acid Job	Treated with zone above		
7 7/8"	3536	3542	Acid Job	1000 Gallons 20% HCL Acid	3	2950
7 7/8"	3502	3513	Acid Job	Treated with zone above		
7 7/8"	3491	3498	Acid Job	Treated with zone above		
7 7/8"	3403	3414	Acid Job	3000 Gallons HCL Acid	4.7	3000
7 7/8"	3354	3374	Acid Job	Treated with zone above		
7 7/8"	3288	3336	Acid Job	6200 Gallons 20% HCL Acid	4.2	4000
7 7/8"	3208	3222	Acid Job	Treated with zone above		
7 7/8"	3288	3336	Nitrified Acid Job	4000 Gallons 15% HCL Acid with 3 Nitrogen Diversion stages		
7 7/8"	3208	3222	Nitrified Acid Job	Treated with zone above	6.5	3700

Log Type	From	To
Sonic Scanner CBL	0	265
Multifinger Imaging Tool - Caliper - GR	0	3800
Sonic Scanner CBL	265	1800
Drilling Engineers QuickLook Gamma Ray	265	1900
PEX - HNGS Schlumberger Platform Express-array induction, density porosity, neutron porosity, resistivity, gamma ray, and caliper	265	1900
MSIP - Sonic Scanner	265	3800
Isolation Scanner - Cement Evaluation, GR, CCL	1810	3800
Isolation Scanner - Casing Integrity, GR, CCL	1810	3800
CBL - DSLT - GR	1810	3800
PEX - HNGS Schlumberger Platform Express-array induction, density porosity, neutron porosity, resistivity, gamma ray, and caliper	1810	3800
FMI - CMR-ECS - Full-bore Micro Imager and Combinable Magnetic Resonance Spectroscopy Capture Sonde	1900	3800
RST - Reservoir Saturation Tool	200	3800

TerraTek
A Schlumberger company
Pioneer Business Park
1935 South Fremont Drive
Salt Lake City, Utah 84104

Routine Core Analysis Report

Prepared for: Altamont Vecta Oil Gas Ltd Big Sky

Well: Danielson 33-17

Location: Toole, MT

Prepared by:
TerraTek, A Schlumberger company
1935 South Fremont Drive
Salt Lake City, Utah 84104
(801) 584-2400

Date: Sep 11 2014

Project No: 811151

Client: Attamont Vecta Oil Gas Ltd Big Sky

Well: Danielson 33-17 Location: Toole, MT

Project No: 811151

TerraTek
A Schlumberger company
Pioneer Business Park
1935 South Fremont Drive
Salt Lake City, Utah 84104

Quality Assurance Process

Schlumberger is committed to providing unsurpassed services in reservoir sampling and analyses while maintaining high standards of safety and quality. Our objective is to deliver the most accurate and reliable sampling processes and fluid and rock property measurements available in the industry. This objective requires persistent innovation and ongoing development of state-of-the-art technologies and equipment.

A rigorous quality assurance program, continuous employee training and enforcement of strict safety standards maintain our compliance with quality, health, safety, and environment (QHSE) requirements. Proactive integration of QHSE objectives and management goals at every level supports the communication and implementation of QHSE policies and standards. Schlumberger requires that qualified engineering technologists perform all laboratory measurements according to specified analytical procedures designed for obtaining accurate and reliable data.

The lab-generated data undergoes the following five levels of quality checks to establish the integrity of the reported results.

a) Establish quality of measurement during data generation.
b) Lab supervisor and manager confirm the overall quality of the generated data.
c) Project manager reviews and processes generated data and generates reports.
d) Technical advisors confirm consistency of reported data.
e) Project manager finalizes reports.

Hence, the completion of each project requires that a qualified and experienced team of engineers perform a variety of independent reviews of all technical data to confirm the consistency and accuracy of the report as per pre-established quality checklists designed for each operation and based on the level of complexity. All property measurements and calculation procedures are maintained in company archives for a period of one year. This information is available for review by clients upon request.

The file and laboratory records information is listed below to provide access reference to all records related to this project. For any questions, please do not hesitate to contact the undersigned project manager.

File No.: 811151

Laboratory Procedures
Alexander Leibold
Routine Core Analysis

Reviewed by

X	Clay Williams	TRA Lab Data Processor
X	Chad Fuller	TRA Lab Manager

Project Management
Kelly Vaughn
Core Analysis Manager

Client: Altamont Vecta Oil Gas Ltd Big Sky
Well: Danielson 33-17 Location: Toole, MT
Project No: 811151

TerraTek
A Schlumberger company
Pioneer Business Park
1935 South Fremont Drive
Salt Lake City, Utah 84104

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Well: Danielson 33-17 Location: Toole, MT

Project No: 811151

TerraTek
A Schlumberger company
Pioneer Business Park
1935 South Fremont Drive
Salt Lake City, Utah 84104

Routine Core Analysis Summary

67 samples from the Danielson 33-17 well were tested. The samples were destroyed by an acidic chloroform-methanol mixture. All samples were re-tested with the other half of the originally cored 1x2" plug pulled from a single depth. The results shown are of the re-tested samples, except for a few of the permeability values.

The properties of residual fluid saturations, porosity and permeability of the core sample were obtained through basic core analysis specified in the API RP40 method, Recommended Practices for Core Analysis (1998).

All plugs were Dean-Stark extracted to measure fluid saturation. Plugs were then dried in convection oven at 104 degC until the weights stabilized. Afterward, they were kept in a desiccant chamber when not being tested.

For each sample, steady-state air permeability was measured with nitrogen gas for a single flow rate up to 1 cc/sec at a net confining pressure of 400 psi. Grain volume was measured using helium expansion at ambient conditions based on Boyle's Law. Bulk volume was calculated by measuring the length and width of each plug, a right cylinder. Pore volume was calculated to be the difference between the bulk volume and grain volume. Porosity was calculated to be the pore volume divided by the bulk volume, and the oil and water saturations are the volume of each divided by pore volume. The following samples have pieces missing and/or are not perfect cylinders; bulk density determined by Archimedes submersion method, post-test: 9B,11B,12B,15B,17B,23B,24B,29B,32B,33B, 34B,52B,57B,62B,64B.

When the first run of samples were tested, the best of the two plugs was used. For this reason, many of the permeability measurements from the original samples gave more realistic values than the reruns. Permeability measurements that were selected from the originally ran samples rather than the reran samples are: 3,11,12,14,17, 18,20,22,30,46,50,62,64. Some samples have bedding fractures or partial bedding fractures. Reported permeability of samples with fractures that were successfully sealed with teflon are: 3,23B,24B,34B,36B,37B,52B, 57B. Reported permeability of samples that were unsuccessfully healed with teflon, but are more accurate than with no teflon at all are: 7B,8B,9B,19B,27B,29B,47B,48B,49B,61B. Reported permeability of samples that have multiple fractures and an attempt to heal with teflon could not be made are: 14,15B,41B,53B. A few of the samples have a permeability that is less than the minimum resolution of testability and are reported as <0.01 mD. Many of these samples contain small amounts of gypsum, which resulted in a negative calculated oil saturation value. Samples with negative values are reported as being <0.01%. This gypsum most likely came from the hydration of anhydrite which was originally present in the rock before being cored.

The routine core properties are summarized in Table 1. The permeability-porosity relationship is shown in Fig. 1. The permeability, porosity, and saturation profiles with depth can be found in Fig. 2 through 4.

Altamont Vecta Oil Gas Ltd Big Sky
Danielson 33-17
Routine Core Analysis Results Summary
811151
September 11, 2014

TerraTek
A Schlumberger company
Pioneer Business Park
1935 South Fremont Drive
Salt Lake City, Utah 84104

Sample ID	Sample Depth (ft)	Sample Length (cm)	Sample Diameter (cm)	Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Grain Density (g/cc)	Ambient Porosity (%)	Saturation		Permeability (mD)	Lithology
								Water (% PV)	Oil (% PV)		
1B	3273.92	2.690	2.516	2.770	2.769	2.874	3.67	0.08	2.78	<0.01	dol, gy-dk gy, xl, anhy, sl/ calc
2B	3278.82	2.832	2.517	2.739	2.736	2.867	4.59	6.95	1.82	0.01	dol, gy, xl, sl/ gyp
3B	3283.32	2.783	2.516	2.906	2.906	2.962	1.89	0.00	1.79	0.07	anhy, gy, xl, lam, frac
4B	3290.63	2.593	2.515	2.798	2.797	2.915	4.05	0.19	2.26	0.12	dol anhy, lt gy-gy, f gr, lam
5B	3291.45	2.783	2.513	2.431	2.384	2.860	16.63	34.42	<0.01	2.43	calc dol, lt brn, f-m gr, gyp, sl/ vgy, v/ lam
6B	3295.47	2.492	2.515	2.659	2.656	2.860	7.14	2.26	2.80	0.10	dol, gy, m gr, sl/ gyp, vgy
7B	3296.23	2.748	2.515	2.613	2.604	2.872	9.33	8.25	1.76	1.14	dol, gy-brn, m gr, anhy, sl/ gyp, vgy, frac
8B	3297.42	2.748	2.523	2.620	2.618	2.856	8.33	0.13	1.28	4.81	dol, gy-brn, f gr, sl/ vgy, frac
9B	3298.34	2.827	2.522	2.727	2.723	2.853	4.55	10.48	<0.01	6.68	dol, dk gy, m gr, sl/ anhy, lam, gypff, frac
10B	3299.43	2.692	2.516	2.765	2.762	2.866	3.60	2.90	4.39	0.03	anhy dol, gy & wh, xl & f gr, sl/ vgy
11B	3301.44	2.832	2.517	2.742	2.733	2.873	4.86	14.71	4.33	1.27	anhy dol, dk gy & wh, xl & f-m gr, sl/ vgy, frac
12B	3302.47	2.784	2.517	2.608	2.598	2.864	9.28	12.98	<0.01	0.19	dol, lt brn, xl, sl/ vgy, gyp, lam, cff, frac
13B	3302.79	2.667	2.522	2.610	2.610	2.849	8.39	0.00	0.21	6.61	dol, dk gy & brn, xl, vgy, v/ lam
14B	3303.37	2.644	2.512	2.537	2.529	2.860	11.58	6.26	0.93	30.8	dol, dk gy & brn, m gr, sl/ vgy, v/ lam, gypff, frac
15B	3304.41	2.586	2.525	2.781	2.780	2.840	2.12	1.64	2.79	0.07	dol, lt brn, xl, sl/ lam, cff, frac
16B	3305.67	2.637	2.525	2.689	2.687	2.813	4.46	6.79	<0.01	0.01	dol, lt gy & gy, f-m gr, sl/ vgy, v/ lam
17B	3307.30	2.661	2.527	2.554	2.554	2.865	10.86	0.29	<0.01	0.76	dol, gy & lt brn, f-m gr, vgy, v/ lam, fos
18B	3308.56	2.625	2.523	2.595	2.593	2.859	9.31	1.64	0.10	2.29	dol, gy, m gr, vgy, gff
19B	3309.93	2.743	2.525	2.615	2.608	2.851	8.50	8.13	<0.01	8.57	dol, lt gy & gy, f-m gr, anhy, sl/ gyp, v/ lam, frac
20B	3310.75	2.630	2.523	2.567	2.558	2.850	10.22	14.87	<0.01	1.60	dol, gy, f-m gr, anhy, gyp, vgy, foss, frac
21B	3312.82	2.700	2.522	2.550	2.550	2.860	10.85	0.34	<0.01	0.37	dol, lt gy-lt brn, f-gr, sl/ anhy, sl/ vgy
22B	3314.23	2.642	2.526	2.593	2.582	2.863	9.83	17.67	<0.01	0.40	dol, gy-brn, f gr, anhy, gyp, sl/ vgy, frac
23B	3317.53	2.677	2.525	2.731	2.731	2.786	1.99	0.01	0.87	0.01	dol ls, gy, f gr, sl/ lam, frac
24B	3318.24	2.744	2.527	2.709	2.709	2.785	2.73	0.05	<0.01	0.01	calc dol, gy & lt gy, xl, sl/ lam, cff, frac
25B	3320.74	2.746	2.526	2.651	2.650	2.797	5.25	0.00	1.95	0.05	dol ls, lt gy, f-m gr, lam
26B	3322.74	2.718	2.525	2.783	2.783	2.872	3.10	0.00	<0.01	0.06	dol, lt gy-gy, f-m gr, anhy, sl/ calc, sl/ vgy

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Sample ID	Sample Depth (ft)	Sample Length (cm)	Sample Diameter (cm)	Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Grain Density (g/cc)	Ambient Porosity (%)	Saturation		Permeability (mD)	Lithology
								Water (% PV)	Oil (% PV)		
27B	3326.50	2.687	2.527	2.731	2.731	2.856	4.37	3.40	<0.01	0.37	dol, gy, f gr, calc, frac
28B	3328.40	2.624	2.527	2.939	2.940	2.975	1.19	0.10	<0.01	0.01	anhy, gy, xl, sl/ lam
29B	3330.80	2.738	2.527	2.842	2.842	2.944	3.44	5.32	<0.01	0.07	anhy, lt brn, xl, sl/ dol, v/ lam, frac
30B	3331.70	2.657	2.525	2.405	2.394	2.868	16.52	5.91	1.02	2.68	dol, lt gy, f gr, gypff
31B	3332.84	2.686	2.526	2.426	2.393	2.858	16.25	28.34	<0.01	0.88	dol, lt gy, f gr
32B	3334.15	2.731	2.527	2.576	2.568	2.843	9.66	6.85	1.52	0.85	dol, lt gy-brn, f gr, sl/ calc
33B	3336.30	2.720	2.529	2.746	2.746	2.832	3.04	0.36	<0.01	0.01	dol, gy, f gr, calc, sl/ lam, cff
34B	3337.72	2.649	2.535	2.716	2.716	2.786	2.51	0.09	<0.01	0.01	dol ls, gy, xl
35B	3344.54	2.713	2.535	2.739	2.739	2.807	2.42	0.01	<0.01	0.05	dol ls, gy, f gr, anhy
36B	3346.35	2.765	2.532	2.662	2.662	2.736	2.73	0.16	<0.01	0.06	ls, lt gy, f gr, lam, styl, frac
37B	3350.14	2.779	2.532	2.698	2.698	2.771	2.61	0.00	<0.01	0.07	ls, lt gy-gy, f gr, lam, frac
38B	3357.80	2.757	2.527	2.439	2.435	2.846	14.44	3.00	<0.01	13.1	dol, lt brn, m gr, calc
39B	3358.43	2.640	2.527	2.419	2.419	2.853	15.22	0.60	<0.01	53.1	dol, brn-lt gy, m gr, calc, frac
40B	3363.10	2.728	2.530	2.663	2.648	2.760	4.05	35.13	3.81	0.01	ls, lt gy, f-m gr, gyp, dol
41B	3363.83	2.703	2.529	2.636	2.624	2.759	4.92	36.67	<0.01	0.06	ls, lt gy, f-m gr, gyp, dol, sl/ vgy, sl/ lam, frac
42B	3364.45	2.689	2.527	2.598	2.599	2.777	6.42	0.00	<0.01	0.03	ls, lt gy, m gr, dol, sl/ gyp, vgy, sl/ lam
43B	3365.75	2.732	2.526	2.585	2.585	2.792	7.39	0.02	<0.01	0.04	ls, lt gy, m gr, dol, vgy, sl/ lam
44B	3367.20	2.720	2.525	2.584	2.583	2.767	6.63	1.66	<0.01	0.16	ls, lt gy, m gr, dol, vgy, lam
45B	3368.52	2.697	2.527	2.585	2.557	2.806	8.87	41.64	<0.01	0.17	dol ls, lt gy, m gr, gyp, vgy, sl/ lam
46B	3369.24	2.753	2.527	2.554	2.550	2.805	9.08	5.18	<0.01	0.55	dol ls, lt gy, m gr, sl/ lam, gypff
47B	3370.20	2.743	2.527	2.564	2.562	2.839	9.78	2.97	<0.01	1.94	dol ls, gy-lt gy, f-m gr, sl/ gyp, lam, frac
48B	3370.81	2.586	2.536	2.503	2.494	2.829	11.87	12.90	<0.01	8.35	calc dol, gy-lt gy, f-m gr, gyp, sl/ vgy, sl/ lam, gypff, frac
49B	3371.37	2.678	2.525	2.525	2.518	2.814	10.51	7.10	<0.01	2.40	dol ls, lt gy-brn, f-m gr, sl/ lam, gypff, frac
50B	3372.46	2.687	2.530	2.607	2.599	2.797	7.09	9.92	1.35	0.23	dol ls, lt gy, f-m gr, sl/ gyp, lam, gypff
51B	3373.24	2.696	2.530	2.597	2.571	2.793	7.93	39.09	<0.01	0.06	dol ls, lt gy, m gr, gyp
52B	3376.06	2.695	2.535	2.731	2.730	2.819	3.16	1.91	1.96	0.02	calc dol, gy-brn, f gr, gypff, frac

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								Water (% PV)	Oil (% PV)		
53B	3377.61	2.671	2.532	2.716	2.713	2.809	3.41	5.01	3.33	0.01	dol ls, gy, f gr, frac
54B	3380.09	2.687	2.536	2.719	2.718	2.779	2.17	1.02	<0.01	<0.01	dol ls, gy, xl, sl/ lam
55B	3382.12	2.724	2.536	2.714	2.714	2.797	2.96	0.00	1.45	0.01	dol ls, gy, xl, sl/ lam
56B	3386.05	2.731	2.539	2.717	2.717	2.759	1.49	0.01	0.55	<0.01	dol ls, gy, xl, sl/ lam
57B	3388.33	2.667	2.535	2.709	2.709	2.744	1.29	0.00	0.68	0.01	dol ls, gy, xl, sl/ lam, frac
58B	3400.35	2.785	2.536	2.698	2.697	2.739	1.52	0.05	2.69	<0.01	dol ls, gy, xl, sl/ lam
59B	3405.39	2.703	2.529	2.698	2.637	2.853	7.58	69.02	14.18	0.05	dol, gy, f-m gr, anhy, gyp, aff
60B	3405.87	2.720	2.535	2.781	2.774	2.857	2.91	20.01	5.30	0.07	dol, gy, f gr, anhy, sl/ gyp, lam, styl, aff
61B	3406.77	2.733	2.526	2.594	2.563	2.850	10.09	41.97	<0.01	15.1	dol, gy, f gr, anhy, gyp, sl/ lam, gypff, aff, frac
62B	3407.33	2.645	2.527	2.643	2.636	2.777	5.07	12.73	0.53	1.44	ls, gy, f gr, dol, anhy, gyp, lam, gypff, aff, frac
63B	3408.17	2.719	2.529	2.715	2.708	2.787	2.84	9.04	20.05	0.01	ls, lt gy-gy, f-m gr, anhy, gyp, sl/ lam, gypff, aff
64B	3410.56	2.731	2.537	2.680	2.668	2.807	4.94	29.39	<0.01	0.81	dol ls, gy, m gr, anhy, gyp, lam, gypff, aff, frac
65B	3414.33	2.670	2.531	2.833	2.832	2.923	3.10	1.92	1.98	0.06	dol anhy, lt gy-wh, xl, sl/ lam
66B	3431.67	2.725	2.521	2.784	2.784	2.840	1.97	0.11	1.63	0.01	calc dol, lt gy, f-m gr, anhy
67B	3446.65	2.692	2.527	2.847	2.846	2.914	2.32	0.00	2.25	0.03	dol anhy, lt gy-gy, xl
Sample ID	Sample Depth (ft)	Sample Length (cm)	Sample Diameter (cm)	Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Grain Density (g/cc)	Ambient Porosity (%)	Saturation		Permeability (mD)	Lithology
								Water (% PV)	Oil (% PV)		

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Client: Altamont Vecta Oil Gas Ltd Big Sky

Well: Danielson 33-17 Location: Toole, MT

Project No: 811151

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Figure 1. Permeability v. Porosity Cross Plot

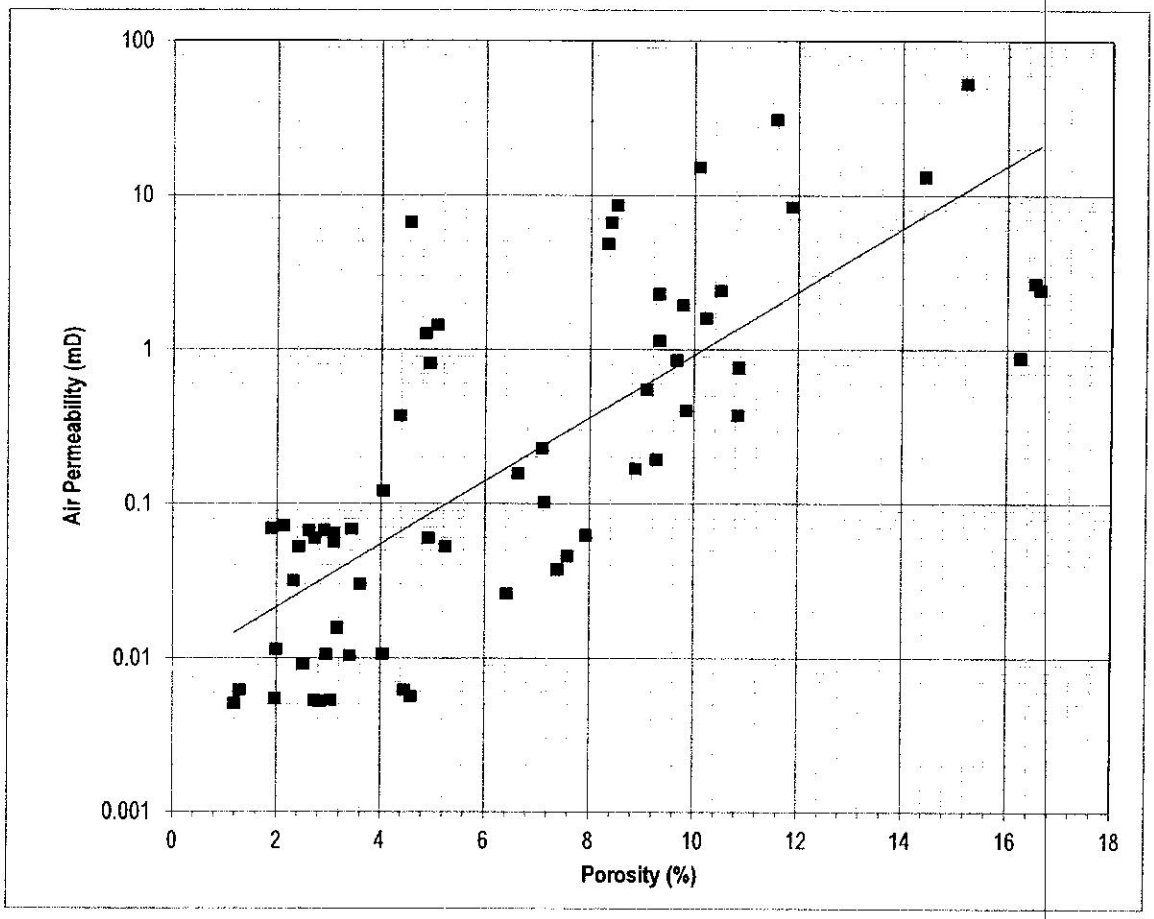

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Figure 2. Permeability Profile v. Depth

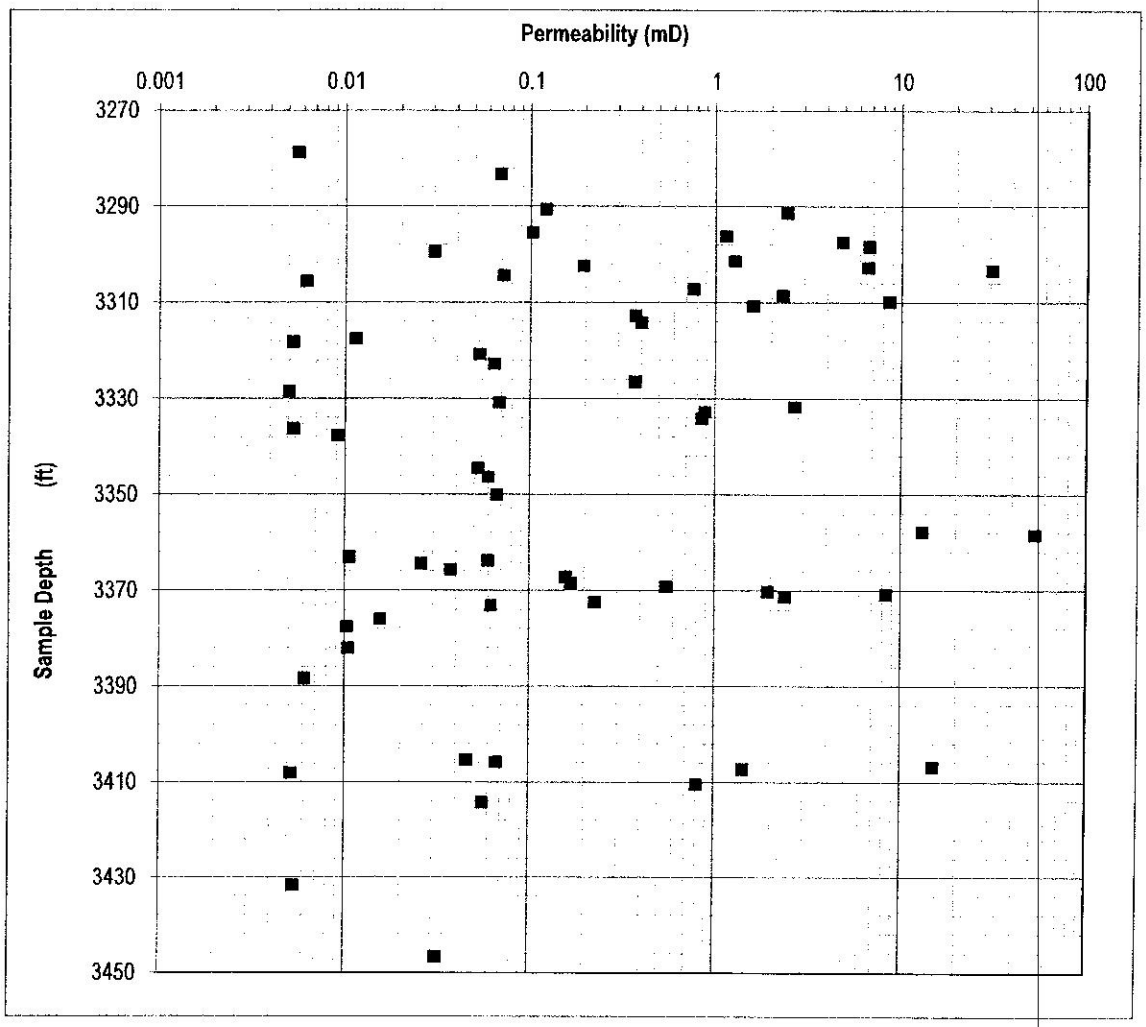

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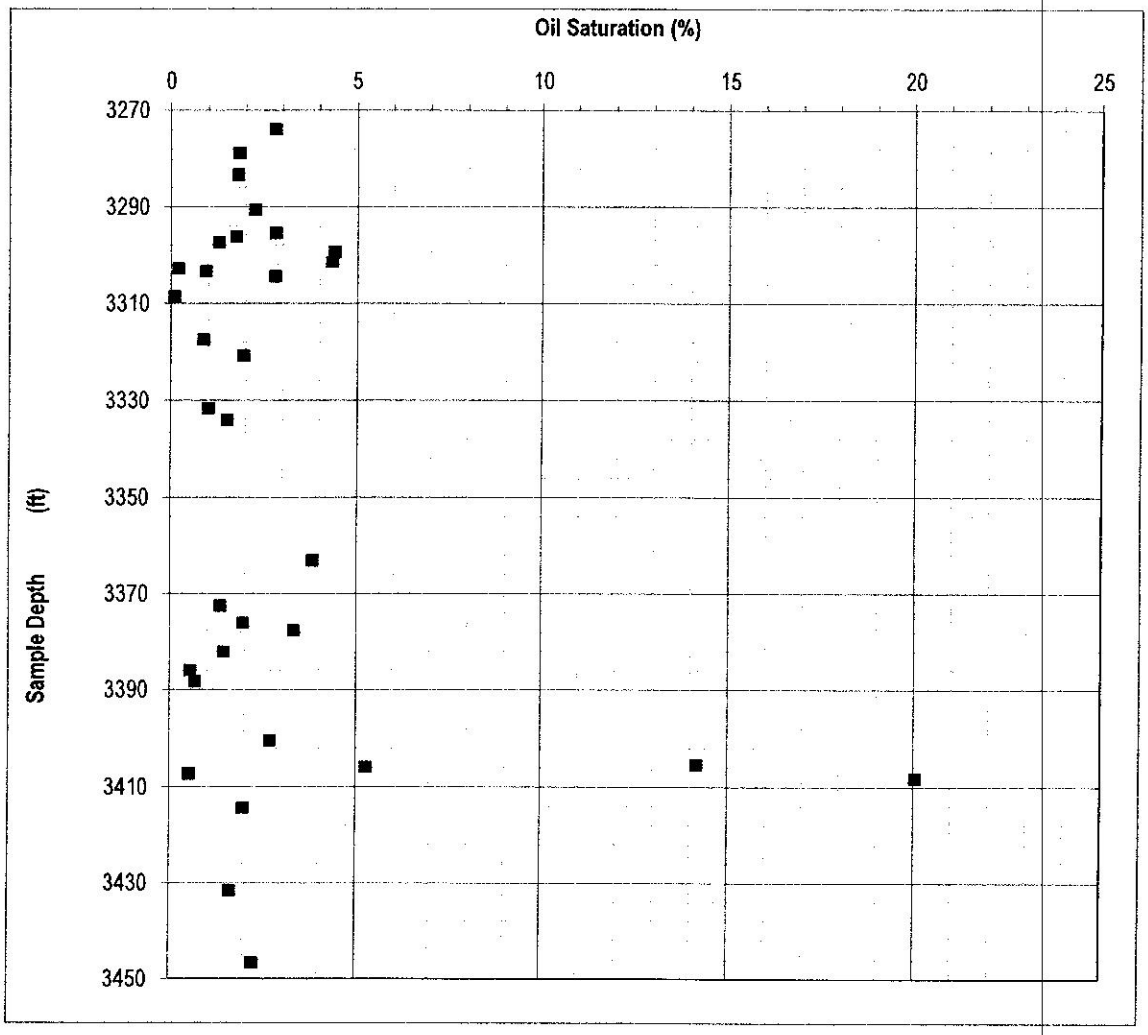
Figure 4. Saturation Profile v. Depth



Description Scheme for Carbonate Sedimentary Rocks:
Rock Type, Color, Grain Size or Crystal Size, Porosity Type, Accessories

Description Scheme for Clastic Sedimentary Rocks:
Rock Type, Color, Grain Size, Cement, Structures and Accessories

Key to Abbreviations:

aff	- anhydrite filled fracture	grnl	- granule	sdy	- sandy
alt	- altered	gy	- gray	sh	- shale
anhy	- anhydrite(ic)	gyp	- gypsum(iferous)	shy	- shaley
arg	- argillaceous	gypff	- gypsum filled fracture	sid	- siderite
bdd	- bedded	hem	- hematite(ic)	sil	- silica(eous)
bent	- bentonite	if	- incipient fracture	sl/	- slightly
bf	- buff	incl	- inclusion	sltst	- siltstone
biot	- bioturbated	intprt	- interparticle	slt	- silt
bit	- bitumen	intrprt	- intraparticle	slty	- silty
bl	- blue(ish)	intxl	- intercrystalline	ss	- sandstone
blk	- black	lam	- laminated	stn	- stain(ed)(ing)
bnd	- banded	lav	- lavender	str	- streak
brec	- breccia(ted)	lig	- lignite(ic)	styl	- stylolite
brn	- brown(ish)	ls	- limestone	suc	- sucrosic
bur	- burrowed	lt	- light	tan	- tan
c	- coarse	m	- medium	v/	- very
calc	- calcite(areous)	mar	- maroon	vc	- very coarse
carb	- carbonaceous	mas	- massive	vf	- very fine
cff	- calcite filled fracture	mdy	- muddy	vgy	- vuggy
cgl	- conglomerate	mic	- micro	wh	- white
chky	- chalky	mc	- micro-crack	wthrd	- weathered
chlor	- chlorite	mnr	- minor	wvy	- wavy
cht	- chert	mica	- micaceous	yel	- yellow
chty	- cherty	mol	- moldic	xl	- crystalline
clst	- clast	ms	- mudstone		
cly	- clay(ey)	mtx	- matrix		
clyst	- claystone	nod	- nodule(s)		
cob	- cobble	o	- oil		
dism	- disseminated	of	- open fracture		
dk	- dark	ool	- oolitic		
dff	- dolomite filled	org	- organic		
frac	- fracture	orng	- orange		
dol	- dolomite(ic)	pbl	- pebble		
f	- fine	pel	- peloids		
fen	- fenestral	pff	- pyrite filled fracture		
fis	- fissile	pis	- pisolitic		
flu	- fluorescence	pk	- pink		
fos	- fossil(iferous)	pof	- partially open fracture		
frac	- fracture	ppvgs	- pinpoint vugs		
fri	- friable	ptg	- parting(s)		
gff	- gouge filled fracture	purp	- purple		
glauc	- glauconitic	pyr	- pyrite(ic)		
gn	- green	qff	- quartz filled fracture		
grdd	- graded	qtz	- quartz		
gr	- grain(ed)	red	- red(dish)		
		sa	- salty		

DANIELSON 33-17 EBOOK

Fluid Analysis

Big Sky Carbon Sequestration Partnership (BSCSP)
Kevin Dome Carbon Sequestration Project
Toole County, Montana

Danielson 33-17 Fluid Data

Formation groundwater and gas samples were taken from the Duperow formation in 2015 as part of the Site Characterization data collection process. This data has been archived on the BSCSP Archive repository and is also available for download through the U.S. Department of Energy (DOE) EDX website: https://edx.netl.doe.gov/dataset

DANIELSON 33-17 EBOOK

Well Logs

BIG SKY CARBON SEQUESTRATION PARTNERSHIP

Schlumberger Carbon Services

Wireline Logging Program

Danielson 33-17

30 April, 2014

Open Hole Logs – Intermediate 10 5/8”

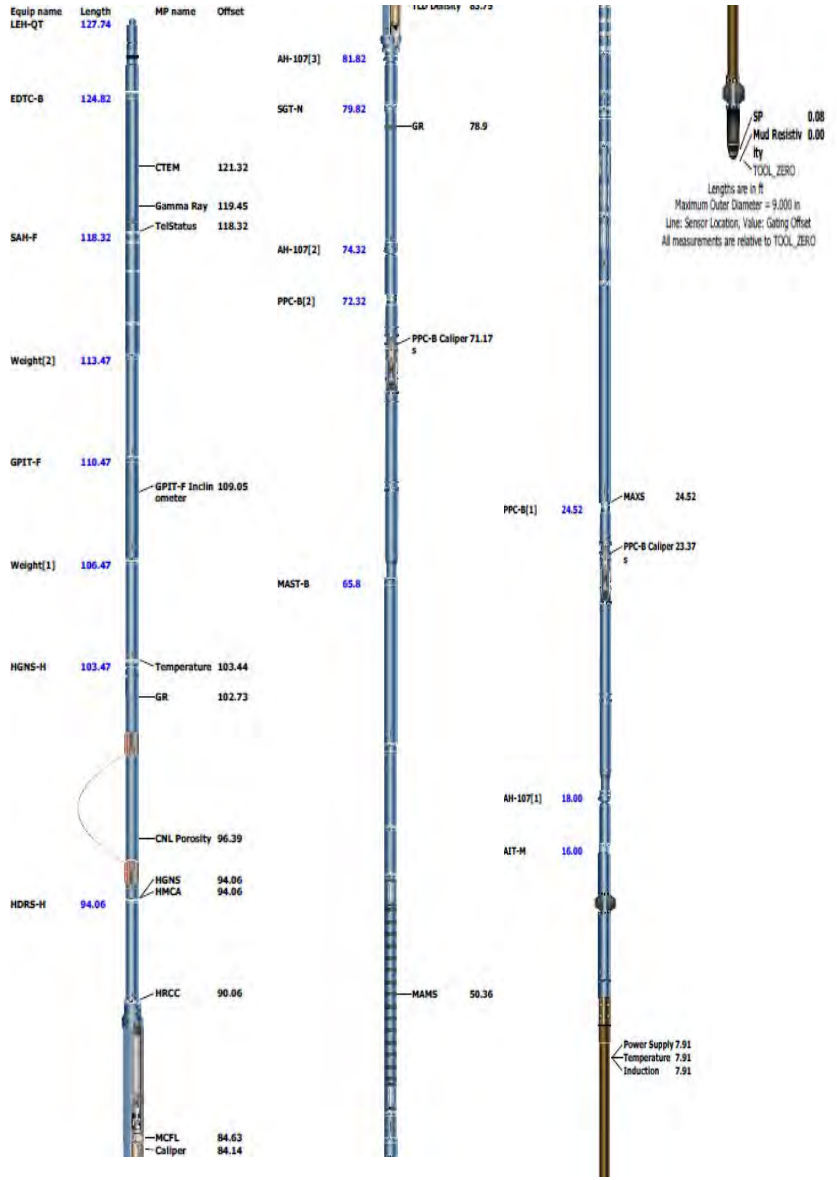
Schlumberger
Carbon Services

Run # 1: AIT-PEX-MSIP (Array Induction, Platform Express, Sonic Scanner)
Note: *PEX includes formation Density, compensated neutron, gamma ray and caliper*

Details:
Length = 127.74’
Maximum Diameter = 7-3/8” (standoffs on AIT)

Time = 6.5 hrs. (includes Rig Up/Down)

Output:
Induction resistivity, SP, mud resistivity, neutron porosity, bulk density, borehole caliper, microrestivity, Compressional and shear delta t, CBL, anisotropy,



Open Hole Logs – TD 7 7/8”

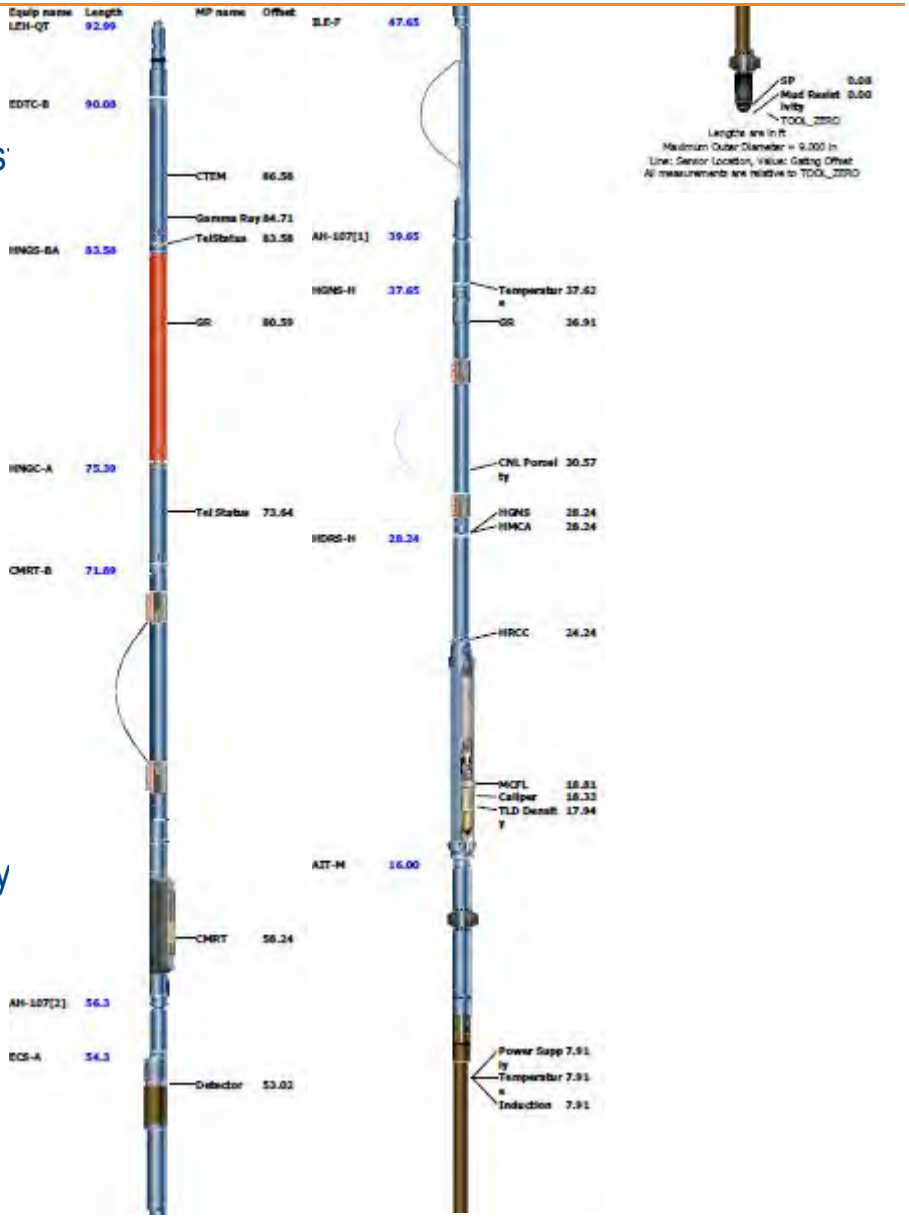
Schlumberger
Carbon Services

Run # 1: AIT-PEX-ECS-HNGS-CMR (Array Induction, Platform Express; Elemental Capture Spectroscopy, Hos Environment Natural Gamma Ray Spectroscopy Combinable Magnetic Resonance)
Note: *PEX includes formation Density, compensated neutron, gamma ray and caliper*

Details:
Length = 92.99 ft.
Maximum Diameter = 5-3/8” (standoffs on AIT)

Time = 7.5 hrs. (includes Rig Up/Down)

Output:
Induction resistivity, SP, mud resistivity, neutron porosity, bulk density, borehole caliper, microrestivity, Permeability Capillary bound porosity, Spectrum lithology, corrected gamma ray for uranium, potassium and thorium.



Open Hole Logs – TD 7 7/8”

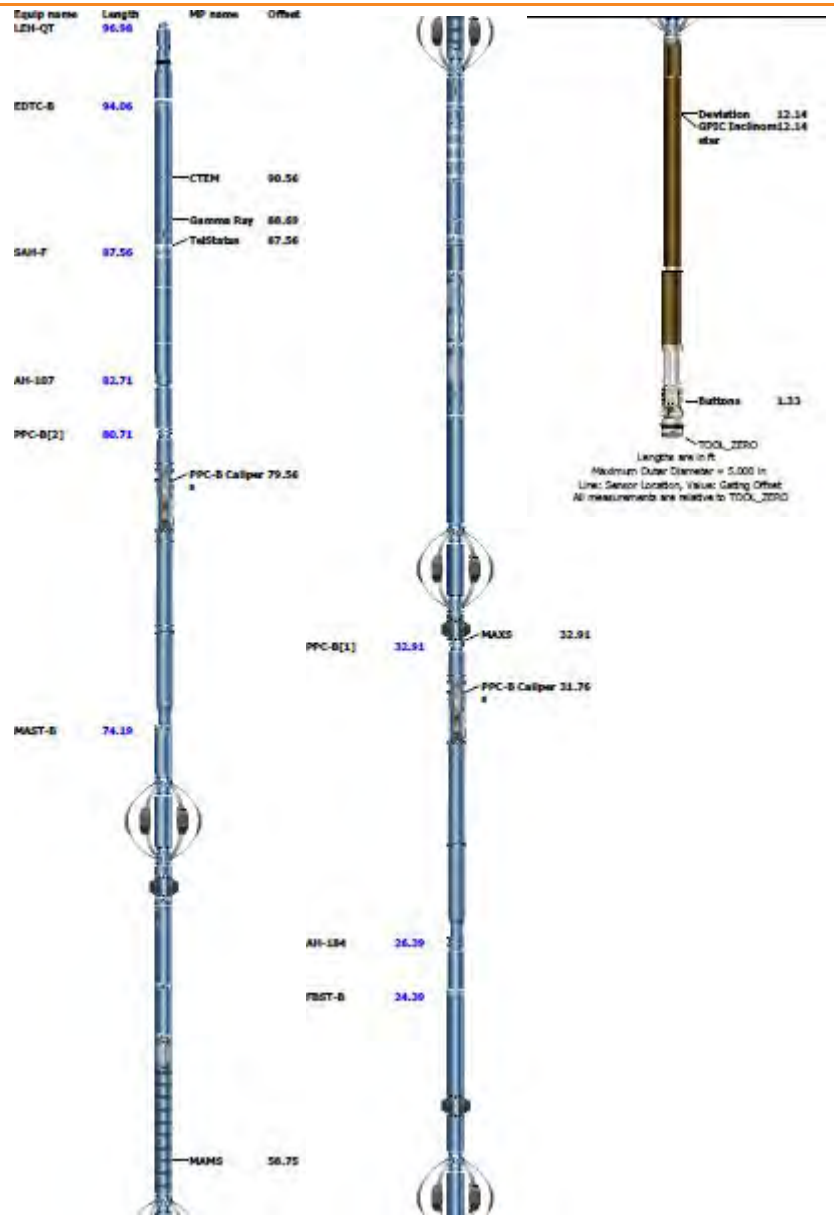
Schlumberger
Carbon Services

Run # 2: MSIP-FMI (Sonic Scanner, Full-bore Micro Imager)

Details:
Length = 96.98 ft.
Maximum Diameter = 5”

Time = 7.5 hrs. (includes Rig Up/Down)

Output:
Compressional and shear delta t, CBL, anisotropy, formation dip, borehole images.



BIG SKY CARBON SEQUESTRATION PARTNERSHIP

Schlumberger Carbon Services

Wireline Logging Program – Cased Hole

Danielson 33-17 / Wallewein 22-1

20 May, 2014

Cased Hole Logs

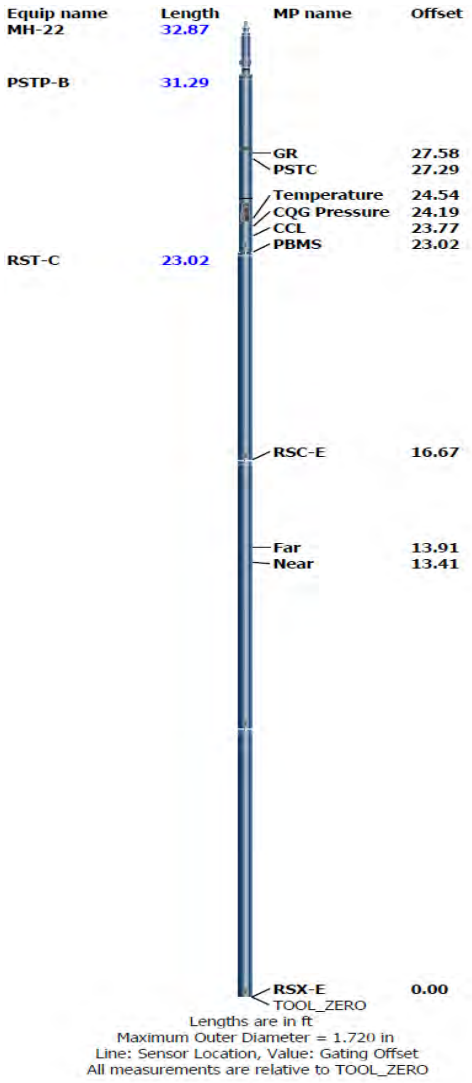
Schlumberger
Carbon Services

Run # 1: RST (Reservoir Saturation Tool)

Details:
Length = 32.87 ft.
Maximum Diameter =1.72”

Time = 6 hrs. (includes Rig Up/Down)

Output:
Sigma, porosity, pressure and temperature



Cased Hole Logs

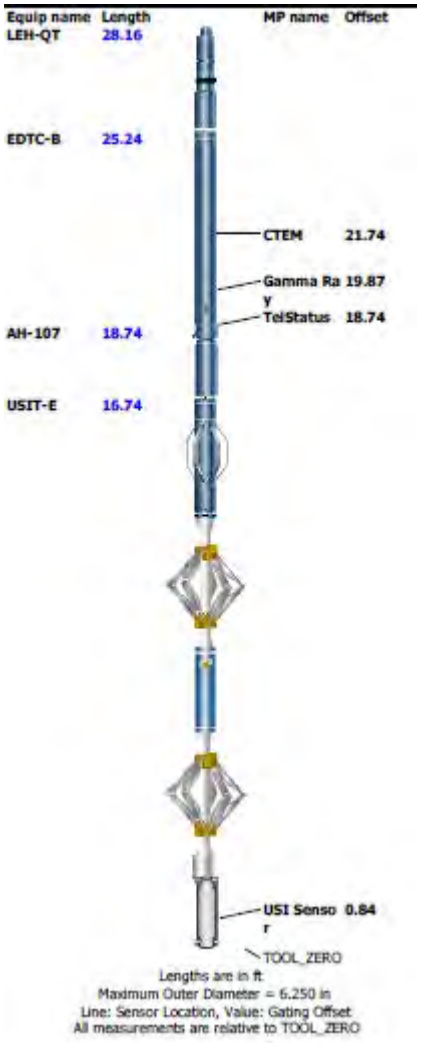
Schlumberger
Carbon Services

Run # 2: IBC (Isolation Scanner)

Details:
Length = 32.87 ft.
Maximum Diameter =3.375”

Time = 6 hrs. (includes Rig Up/Down)

Output:
Casing thickness, internal radius, acoustic impedance, flexural attenuation, hydraulic communication map, solid-liquid-gas map of annulus material



Cased Hole Logs

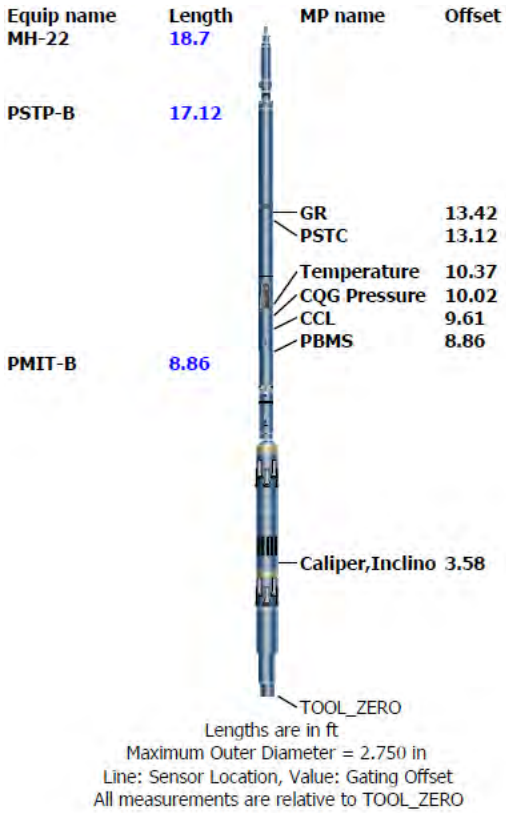
Schlumberger
Carbon Services

Run # 3: PMIT (Multifinger Imaging Tool)

Details:
Length = 18.7 ft.
Maximum Diameter =2.75” – 6.99” extended

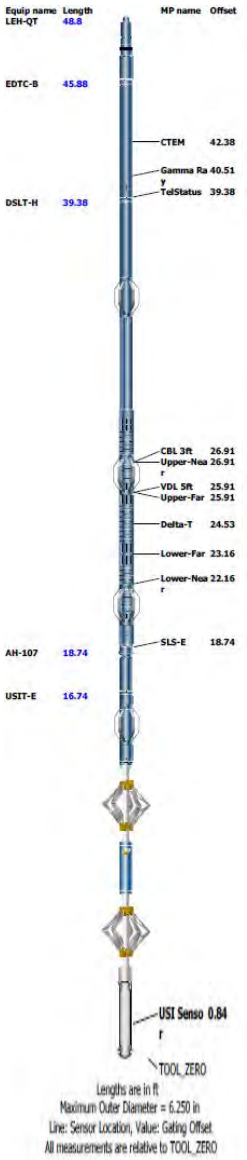
Time = 6 hrs. (includes Rig Up/Down)

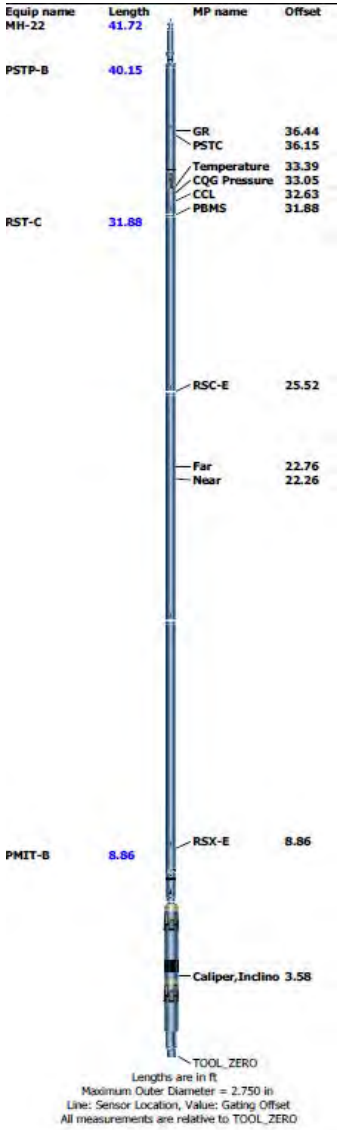
Output:
Internal casing image from multiple internal radius measurements



Optional

Schlumberger
Carbon Services





Big Sky Carbon Sequestration Partnership (BSCSP)
Kevin Dome Carbon Sequestration Project
Toole County, Montana

Danielson 33-17 Well Logs

Danielson 33-17 Log List	From	To
Sonic Scanner CBL	0 ft	265 ft
Multifinger Imaging Tool - Caliper - GR	0 ft	3,800 ft
Sonic Scanner CBL	265 ft	1,800 ft
Drilling Engineers QuickLook Gamma Ray	265 ft	1,900 ft
PEX - HNGS Schlumberger Platform Express-array induction, density porosity, neutron porosity, resistivity, gamma ray, and caliper	265 ft	1,900 ft
MSIP - Sonic Scanner	265 ft	3,800 ft
Isolation Scanner - Cement Evaluation, GR, CCL	1,810 ft	3,800 ft
Isolation Scanner - Casing Integrity, GR, CCL	1,810 ft	3,800 ft
CBL - DSLT - GR	1,810 ft	3,800 ft
PEX - HNGS Schlumberger Platform Express-array induction, density porosity, neutron porosity, resistivity, gamma ray, and caliper	1,810 ft	3,800 ft
FMI - CMR-ECS - Full-bore Micro Imager and Combinable Magnetic Resonance Spectroscopy Capture Sonde	1,900 ft	3,800 ft
RST - Reservoir Saturation Tool	200 ft	3,800 ft

Well logs are available for download through the U.S. Department of Energy (DOE) EDX website: https://edx.netl.doe.gov/dataset

DANIELSON 33-17 EBOOK

Core Analysis

BIG SKY CARBON
SEQUESTRATION PARTNERSHIP

Core Analysis Plan

April 28, 2014
Big Sky Carbon Sequestration Partnership
Production Well #1, Monitoring Well #1, Injection Well

The purpose of the Core Plan is to assure that the project objectives for site characterization and subsurface modeling are achieved. Considerations for the research goals of project partners, permitting requirements, required data for project planning and decision making, as well as budget and scope all went into creation of this document. The following sections are included to provide a framework for core acquisition and analysis in addition to rationale for proposed core intervals:

Table of Contents

Order of Core & Sample Handling/Preparation/Analyses

1. Core from intervals of interest (see Appendix I) are pulled out of the 30 and 60 foot core barrels, already contained in aluminum sleeves. The aluminum sleeves are handled by TerraTek crew. Core will be packaged in core boxes and shipped to TerraTek facilities by SLB/TerraTek trucks and personnel.

TerraTek Contact Info:

Coring Services:	Core Analysis:	
Virgil Devilbis	Daniel Fargo	Christopher Gillespie
[redacted]	[redacted]	[redacted]

2. On arrival at TerraTek, the core will be gamma logged in the aluminum tubes. The core is then removed from the aluminum tubes and additionally marked for core section, depth, orientation, etc. (according to the standard methods outlined by the American Petroleum Institute) and reassembled. A single 4" diameter core sample will be prepared in the injection zone of each well.

3. Whole core samples will be prepared for shipment to Shell's sterile slabbing facility in Houston – 3-5 samples, each 15-20 cm long, of intact core will be prepared from gas cap zone in the production well and injections zones of the monitoring and injection wells. **Special handling is required – See Appendix II**

4. TerraTek will then slab the core to 1/3 thickness. D. Bowen, Vecta Oil and Gas, will do initial physical examination of the slabbed core at TerraTek and make preliminary descriptions. The core will undergo basic preservation and photography, and fragment samples will be prepared per state requirements.

5. Core fragments from selected intervals will be collected by D. Bowen and distributed to project partners for:
    a. Isotopic analysis (Columbia),
    b. Rare earth element, trace, and major element analysis (INL),
    c. Bulk XRD (MSU), and
    d. Bulk composition XRF (LANL).

    Fragment sample distribution will be documented with details including depth, formation, core section, and quantity.

6. TerraTek will prepare petrographic thin sections. Thin sections will be sent to Eby Petrography for detailed mineralogical analysis. After analysis, thin sections will be archived at MSU.

7. D. Bowen (and Core Team members) will visually inspect the slabbed core and logs and determine the most appropriate intervals to be sampled for tests described in the "Core & Sample Analyses" section below. The butt end of the core will be plugged to 1.0 or 1.5 inch diameter subcore, either as single oriented core (vertical or horizontal) or as sets (vertical and horizontal) depending on the type of analyses to be performed.

8. Standard analyses of core plugs will be conducted at TerraTek, including baseline testing for mineralogy, grain density, porosity, and vertical and horizontal permeability.

9. Duplicate core plugs will be further tested at TerraTek using CO_2/CO_2+brine to assess relative permeability, strength, and anisotropic properties from multi-stage compression testing, with pre- and post-test CT scanning and photography.

10. TerraTek will also prepare samples and perform selected tight rock analyses on core obtained from sealing layers.

11. Both the 1/3 and 2/3 slabs will be shipped to archival facilities at MSU (C. Shaw, Gaines Hall Rm 024).

12. Selected 3-foot sections (n = 2) of the 2/3 slab will be sent to LBNL for analysis of seismic properties.

13. C. Shaw (MSU) will perform bulk XRD mineral analysis on selected samples.

14. C. Shaw (MSU) will conduct flow through tests on selected subsamples.

15. The archived core, selected subsamples (for SEM), and thin sections will used for fracture characterization by D. Lageson (MSU).

16. The Core Team will inspect results obtained above and determine additional plugging (of core butt) and/or testing to close data gaps.

17. Core sample distribution will be logged by MSU (S. Fairweather/C. Shaw). Further requests for core samples will be directed through S. Fairweather. The core facilities at MSU will be utilized to prepare additional samples from the 2/3 section as requested. The 1/3 slab will be permanently archived at MSU.

18. Core images, analysis results, and supporting documentation will be made available to partners through an online database hosted by MSU.

Core & Sample Analyses

1. Sample Preparation

Following the core arrival and initial core handling (removal from aluminum sleeves), the full diameter core (4 inch) will be slabbed according to standard practice (1/3). A single, full diameter (4 inch) sample from the porosity (injection) zone from each well be prepared and samples will be prepared and shipped to Shell's WTC lab for sterile slabbing and microbial analysis. After the remaining core is slabbed at TerraTek, the clean faces will be digitally photographed in white light for an easy to access digital record of the core appearance by TerraTek.

The butt end of the core will be further plugged (1.0, 1.5 or 2.5 inch diameter) at horizontal and vertical orientations. The plugs will be analyzed at TerraTek for hydraulic and geomechanic characteristics (see Tables 1 – 6 below).

Table 1. Core handling and preparation.

Test	Description	Total No. of Samples	Analysis Lab
1.1	Digital White Light Photography of the entire length of core.	730 ft	TerraTek
1.2	Core Preservation	730 ft	TerraTek
1.3	State fragment sample requirement preparation (one sample per foot for MT)	750	TerraTek
1.4	Drilling of horizontal and vertical plugs for conventional core analysis	~90	TerraTek
1.5	Detailed core description, per foot	730	Vecta (Bowen)

2. Standard Mineralogic and Petrographic Analyses

Subsamples of selected plugged intervals will be analyzed using XRD for baseline bulk mineralogy by MSU. XRD subsamples from selected plugged intervals will be collected immediately adjacent to the vertical plug only (half height of the vertical plug) for a representative sample area. Thin-section subsamples will be gathered for petrographic analysis (Eby Consulting) of *each plug orientation* from select intervals to assess anisotropy and at regular intervals along the core.

Eby Consulting will carry out petrographic analysis of thin sections sampled from the same regular and select locations in the core where geomechanical and hydraulic plug samples are gathered. The analysis will include estimates of grain size, sorting, porosity, grain and cement mineralogy, fabric and rock classification.

All core will be archived at MSU. Supplementary core samples and thin sections requested post-archival will be prepared using MSU's core facilities.

Table 1. Mineralogy and petrography core tests.

Test	Description	No. of samples	Analysis Lab
2.1	Petrographic thin section preparation (one per 3 feet)	~240	TerraTek
2.2	General petrographic thin section description, mineralogy		Eby Consulting
2.3	Bulk XRD mineral analysis	~100	MSU (Shaw)
2.4	Whole core petrology	730 ft	MSU (Shaw, Lageson)

3. Hydraulic Analysis

TerraTek will undertake measurements of porosity and permeability on reservoir (dolomite) core plugs at regular and select intervals. Porosity will be determined on 1 or 1.5 inch plugs. Plugs for the porosity analyses will be sampled from each of the regular interval sites along the core as well as the select intervals that are of marked interest to the BSCSP researchers. It is anticipated that porosity will be determined for approximately 90 plugs total for all three wells. The porosity analyses are considered non-destructive; these samples will be used for later geomechanical and/or hydraulic tests to minimize plugging time and costs.

Permeability to gas at a single confining pressure will be measured on 1 or 1.5 inch plugs. Plugs for permeability analyses will be sampled from each orientation (vertical/horizontal to assess permeability anisotropy) from select intervals that are of marked interest to BSCSP researchers. Vertical air permeability measurements require 2.5 inch plugs. The liquid permeability analyses are considered non-destructive; these samples will be used for subsequent relative (CO_2 and brine) permeability tests, so as to minimize plugging time and cost.

A single, full diameter (4 inch) sample from the porosity (injection) zone from each well will be analyzed for porosity, grain density, air permeability.

Table 2. Standard hydraulic core tests.

Test	Description	No. of samples	Analysis Lab
3.1	Porosity of core plugs sampled from regular and select intervals	~90	TerraTek
3.2	Grain density of core plugs sampled from regular and select intervals	~90	TerraTek
3.3	Permeability to gas at one confining pressure of core plugs sampled from regular and select intervals	~90	TerraTek
3.4	Air permeability and porosity at additional confining pressures - per sample / pressure- in conjunction with above test	~45	TerraTek
3.5	Vertical air permeability (min. sample length 2.5 inches)	~45	TerraTek
3.6	Full diameter routine porosity (@ 1 stress) grain density, air permeability (@ 1 stress) K-h (horizontal), K-h-90°, and K-vertical	~3	TerraTek

4. Tight Rock Analysis

In order to assess the porosity and permeability of reservoir seals (tight dolomite and anhydrite), special techniques are used that yield more accurate results than standard pycnometry and liquid permeability analyses. As such, TerraTek will undertake measurements of porosity (bulk and effective), density (bulk and grain), fluid saturation and single-phase gas permeability (pulse decay) on seal core plugs at intervals selected by the BSCSP researchers. It is anticipated that approximately 2 plugs from tight dolomite (Upper Duperow) intervals in each of the three wells will be sampled for TRA porosity and permeability analyses. Two plugs will also be sampled from the anhydrite (Potlatch) core in the monitoring well. The technique for TRA porosity and permeability is considered destructive.

Table 3. Tight Rock Analysis core tests.

Test	Description	No. of samples	Analysis Lab
4.1	Pulse Decay permeability (plug sample) from Upper Duperow and Potlatch	~8	TerraTek
4.2	TRA Sample prep, bulk density, grain density, GasPHI, Saturations, PHIeff	~8	TerraTek

5. Mechanical Properties

The geomechanical core testing will assess rock strength at select intervals along the length of the core. TerraTek will conduct compression strength tests (unconfined compression strength with evaluation of elastic parameters of Young's modulus and Poisson's ratio) on select plugs. Analysis of anisotropic properties from multi-stage compression testing will also be performed on a limited subset of plugs. Plugs will undergo pre- and post-test CT scanning and post-test photography.

Table 4. Geomechanical core tests.

Test	Description	No. of samples	Analysis Lab
5.1	Unconfined compression strength test with evaluation of elastic parameters of Young's modulus and Poisson's ratio (per sample, destructive).	~12	TerraTek
5.2	3 Sample Multi-stress path testing suite for analysis of anisotropic properties and in-situ stress, destructive.	~8	TerraTek
5.3	Pre and post-test CT scanning of plugs (1 longitudinal and 2 x-section)	~20	TerraTek
5.4	Post-test photography of plugs	~20	TerraTek
5.5	Triaxial shear testing		MSU/MT Tech

6. Special Core Analysis

Additional core analyses will be undertaken that are not considered part of the standard petrophysical suite of analyses. The following tests will be performed by project partners:

TerraTek will conduct gamma logging of the entire 730 feet of core obtained, to be used to correlate to down-hole logs. They will also take CAT Scan longitudinal images of whole core sections to be used for quality assurance. NMR T2 relaxation cutoff and permeability relationship measurements will be taken for down-hole logging calibration.

TerraTek will also perform several tests to determine the rocks' response when subjected to flow and chemical characteristics of CO_2+brine including: CO_2/brine relative permeability at reservoir conditions, rate sensitivity to CO_2, and return permeability after CO_2/brine relative permeability tests. LBNL will conduct high pressure (0 - 60,000 psia) mercury injection capillary pressure tests and helium porosimetry on ~10 samples to obtain capillary pressure curves and throat size histograms.

LBNL will also measure BET surface area on selected subsets to determine reaction rates for RTM modeling. Seismic properties will be measured using (1) SHRB resonance system at 1000 hz (Vp, Vs, Qp, Qs) and (2) torsional shear at 0.1-100 hz (Vs, Qs). They will perform SEM/EDS using a Zeiss LS-10 w. SDD EDS detector and powder XRD on a small set of samples from the 2/3 slab (n = 5) using a Rigaku. Anisotropy analysis and micro-CT imaging on selected samples (Advanced Light Source, Beamline 8.3.2 at a range of resolutions 4 microns to 750 nm) will also help with seismic calibration for the geophysical monitoring program.

LANL will conduct bulk composition XRF measurements on a select number of samples.

INL will test core fragment samples for rare earth elements, trace, and major element composition, and Columbia will perform analysis of carbon isotopes in preparation for the MVA Geochemistry and Tracer programs.

Table 5. Special core tests.

Test	Description	No. of samples	Analysis Lab
6.1	Gamma Logging of entire length of core, to be used to match core to down-hole logs.	730 ft	TerraTek
6.2	CAT Scan Longitudinal Images of whole core	~65	TerraTek
6.3	NMR- T2 measurements at 100% Sw and at Swi (ambient conditions)	~25	TerraTek
6.4	USS CO2 / brine relative permeability test at reservoir conditions	~10	TerraTek
6.5	Rate sensitivity to CO2 @ Srw: 4 flow rates at reservoir conditions	~10	TerraTek
6.6	Return permeability test following CO2- Brine USS relative permeability tests	~10	TerraTek
6.7	High pressure mercury injection capillary pressure test (0-60,000 psia)	~10	LBNL
6.8	BET Surface Area	~15	LBNL
6.9	seismic properties using (1) SHRB resonance system at 1000 hz (Vp, Vs, Qp, Qs) and (2) torsional shear at 0.1-100 hz (Vs, Qs) from LBNL's 2/3 slab sample		LBNL
6.10	SEM/EDS from 2/3 slab sample		LBNL
6.11	Powder XRD on a small set of samples from LBNL's 2/3 slab	~5	LBNL
6.12	Micro-CT imaging on selected min-cores from LBNL's 2/3 slab		LBNL
6.12	anisotropy analysis - seismic calibration (requires whole core section from porosity zone, monitoring well only)	1	LBNL
6.13	Carbon isotopes (fragment samples, one per foot in monitoring and injection wells)	540	Columbia
6.14	REE, Trace, major element composition (100g samples, primary seal and reservoir zones)		INL
6.15	Bulk composition XRF		LANL
6.16	Porous Plate capillary pressure test	1-3	TerraTek
6.17	Flow Through tests	~20	MSU

Appendix I.

Potential Reservoir and Seal Identification & Coring Strategy
October 29, 2013

Kevin Dome is a large anticlinal structural culmination located along the Sweetgrass Arch in north central Montana. The Duperow Formation is a natural CO_2 reservoir, primarily dolomite with interbedded anhydrites, which occurs deeper and stratigraphically lower than oil and gas production. CO_2 is contained at Kevin Dome in a static buoyancy trap where supercritical CO_2 rests as a buoyant fluid above brine water. The CO_2 rises in the reservoir to the limits of reservoir development in up-dip directions until trapped beneath impermeable seals. Porous and permeable reservoir rocks, although very wide spread, are not continuous across the entire dome. The traps are thus combination stratigraphic/structural traps and involve limits based on both the areal extent of permeable reservoir rock and structural confinement.

The primary seal consists of interbedded anhydrites and tight carbonates of the upper Duperow Formation that are secondarily capped by approximately 150 feet of the Potlatch Anhydrite. The seals in the region are proven effective as evidenced by the large volumes of naturally trapped CO_2 in the formation and by oil and gas in the region trapped in the Nisku Formation (a thin carbonate between the Duperow and Potlatch). Injected CO_2, especially at low to moderate volumes, will show little vertical migration beyond the boundary between the injected formation and the immediately overlying caprock layer assuming no major faulting or fracture networks exist near the point of injection and that nearby existing wells have been plugged and abandoned effectively.

As a naturally-occurring repository of CO_2, the dome is also an attractive target for studying the long-term impact of CO_2 on the surrounding rock. For this reason, core intervals were chosen to capture the interface between upper Duperow sealing rock and the CO_2 reservoir in the production well.

Brief Lithology Descriptions of Potential Reservoirs and Seals

The primary CO_2 reservoir at Kevin Dome is the middle Duperow formation. The lower Mississippian/Upper Devonian (lower Lodgepole/Bakken/Banff/Exshaw formations) through Devonian Souris River Formation strata are most important from the standpoint of trapping CO_2 as a potential sequestration target (Figure 1). The Souris River to Potlatch Anhydrite system includes:

- limited reservoirs/brine aquifers in the **Souris River** formation,
- aquitards in the upper **Souris River** and **lower Duperow** formations,
- a regional lower porosity zone that is a brine aquifer/CO_2 reservoir in the **lower Duperow**,
- aquitards in the **middle Duperow**,
- a second regional upper porosity zone, injection target, that is a brine aquifer/CO_2 reservoir in the **middle Duperow**,
- aquicludes in the **upper Duperow**,
- localized aquifer/oil and gas reservoirs in the **Nisku** formation,
- a regional aquiclude overlying that is the **Potlatch Anhydrite**.

Overlying this Devonian CO_2/brine aquifer system is the Exshaw/Bakken petroleum system. The top seal for the system is a sequence of tight limestones in the lower Lodgepole. This system provides a secondary sealed system above the CO_2 systems providing enhanced sequestration security. Above these units, additional reservoirs and regional seals are present in the Mississippian Madison formation and throughout the Mesozoic system above.

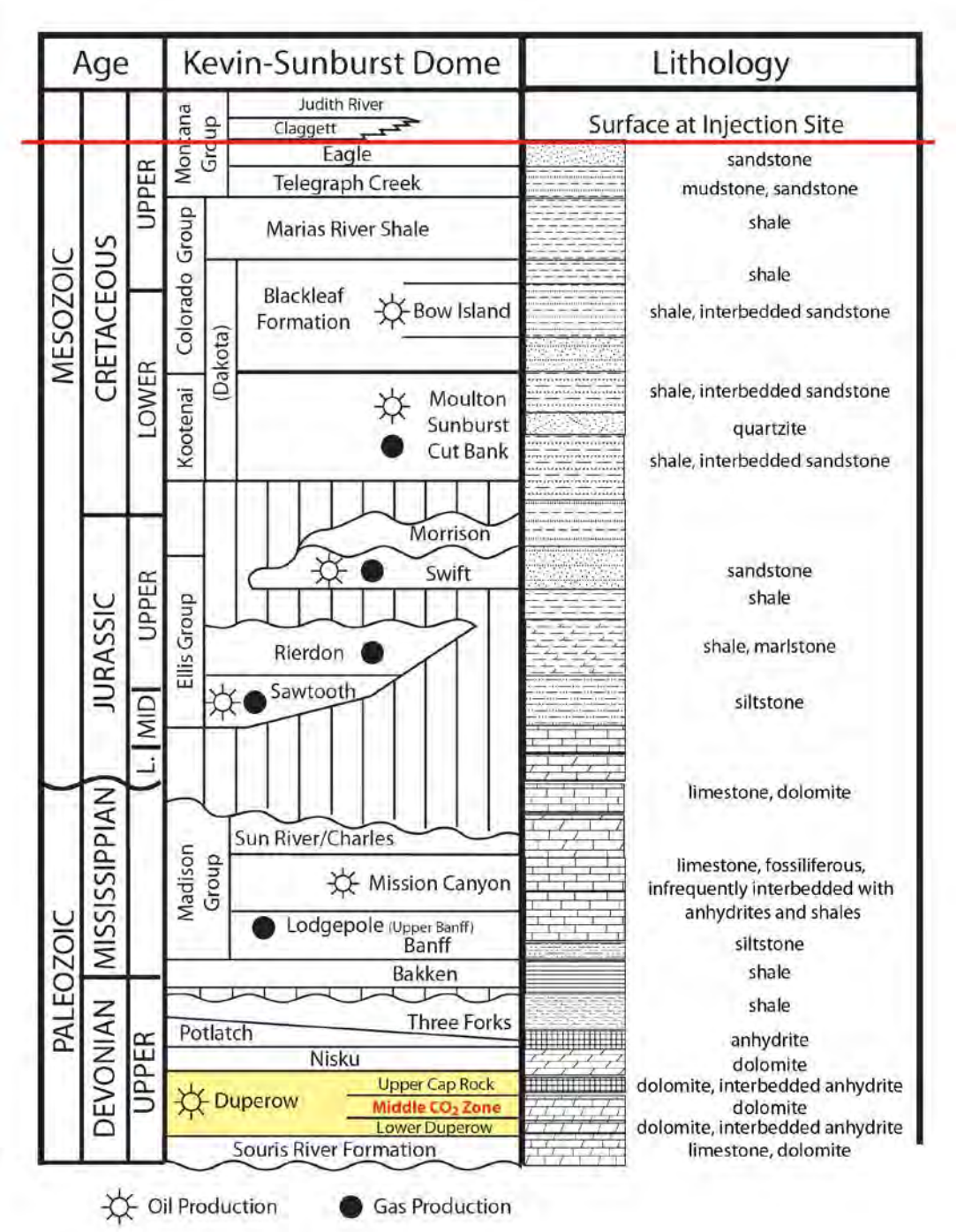


Figure 1. Stratigraphy of Kevin Dome.

Coring Strategy

The current plan for coring targets 730 total feet of core obtained from three wells: (1) BSCSP's first production well, (2) first monitoring well, and (3) the injection well. Figure 2 shows selected core intervals. The approach for each well and targeted core interval is as follows:

(1) Production Well #1	**~ 180' Core** Continuous from upper Duperow seal through the middle Duperow porosity zone. MSU and LBNL have requested a total (minimum) of 20' in the tight zone (caprock) and 25' in the porosity zone.
(2) Monitoring Well #1 (far geochemical)	**~ 30' Core (10' minimum)** Potlatch anhydrite. As the secondary seal for the injection zone and primary seal of the Devonian system, core from this interval will be useful for the EPA UIC Class VI permit. LANL will conduct geomechanical testing. **~240 Core** Continuous from upper Duperow seal through the middle Duperow porosity zone, picked based on logs. Captures the primary seal and porosity zones near the injection well. MSU, LBNL, and LANL request a total (minimum) of 30' in the caprock and 35' in the porosity zone.
(3) Injection Well	**~ 240 Core** Continuous from upper Duperow seal through the middle Duperow porosity zone, picked based on logs. Captures the primary seal and porosity zones in the injection well. **~ 60' Core** Lower Duperow – proposed interval based on results from well (2). The lower Duperow porosity zone may provide a secondary zone for injection.

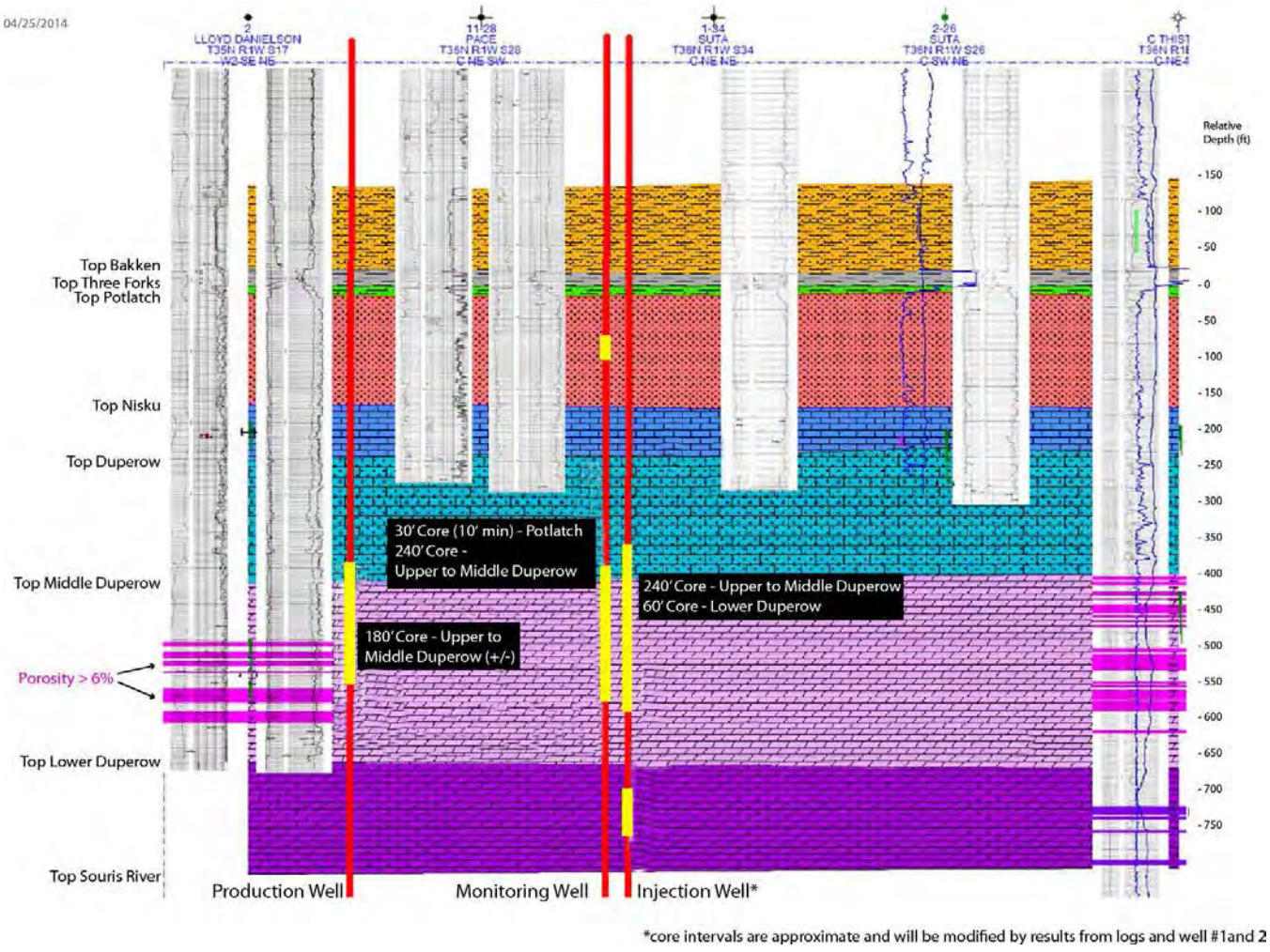


Figure 2. Selected core intervals for the production well, monitoring well, and injection well.

PROGNOSIS: WALLEWEIN 22-1		
LOCATION: 2407 FWL, 1217 FSL, SECTION 22, T36N-R1W		
K.B. =	3974	
FORMATION	Subsea	Depth
BLACKLEAF	2933	1041
BOW ISLAND	2660	1314
KOOTENAI	2116	1858
SUNBURST	1747	2227
SWIFT	1692	2282
REARDON	1638	2336
SAWTOOTH	1522	2452
MADISON (SUN RIVER DOLOMITE)	1485	2489
MISSION CANYON	1350	2624
LODGEPOLE	779	3195
BANFF	546	3428
BAKKEN	427	3547
THREE FORKS	405	3569
POTLATCH	397	3577
NISKU	236	3738
DUPEROW	181	3793
MIDDLE DUPEROW	9	3965
LOWER DUPEROW	-238	4212
SOURIS RIVER	-497	4471
T.D.	-587	4561
CORE 1	3600-3630	
CORE 2	3843-3903	
CORE 3	3903-3963	
CORE 4	3963-4023	

Figure 3. Drilling prognosis for the Wallewein 22-1 Monitoring Well based on tops picked by Dave Bowen, FX rig specs, logging requirements, and the surveyed well locations. Formation depths at subsequent wells will be provided prior to drilling.

Appendix II

Special Handling Requirements for Microbial Analysis

Per email from Bart Lomans November 25, 2013

Requirements for core sample collection, preparation and shipping/storage:

Sample Type & Sample Requirements:

- Preference for 3-5 smaller pieces (15-20 cm) of intact core rather than one big piece
- Use clean (sterile) latex gloves handling the core sections to possibly avoid any contamination.
- Ideally having these pieces stretching over the complete reservoir depth and homogeneous core sections
- Key-interest in core pieces from the CO2/water transition zone
- Core should (ideally) be NON-slabbed
- Sub-sampling should be by dry-cutting (or alternatively clean mineral oil, but at least NOT water based!!)
- Core should be preserved (in barrel and/or waxed – if not waxed or in barrel store/ship in air-tight bags)
- Stored at 4°C or room temperature (avoid large cold-warm temperature transitions) (DO NOT FREEZE!!)
- We will be needing metadata (depth, temperature, formation water characteristics, etc.)

Purpose and Scope of Work with Core material (at Shell HOU WTC lab):

- Core will be sub-sampled under sterile conditions
- DNA will be isolated from the sub-samples taken from the non-contaminated inner parts of the core
- DNA (originating from the full mixture of microbes present in the sample) will be sequenced
- Based on sequence analysis we will be able to answer; 1) which microbes are there? 2) How many are there? and 3) what type of reactions they can perform?
- This data provides the opportunity to: 1) further characterize the reservoir (presence of certain group of microbes reflect certain environmental conditions, even from historical perspective), 2) to predict how a reservoir will respond to e.g. water flooding, nitrate injection, etc.

Ship Core Material To:

Nicolas Tsesmetzis or Crystal Warner,
Biodomain labs, BD-1022A,

Big Sky Carbon Sequestration Partnership (BSCSP)
Kevin Dome Carbon Sequestration Project
Toole County, Montana

Danielson 33-17 Core Data

Additional core data has been archived on the BSCSP Archive repository and is also available upon request from the Montana Board of Oil & Gas Commission, or via the BSCSP Core Viewer application (https://core.bigskyco2.org/). It is also available for download through the U.S. Department of Energy (DOE) EDX website: https://edx.netl.doe.gov/dataset

TerraTek
A Schlumberger company
Pioneer Business Park
1935 South Fremont Drive
Salt Lake City, Utah 84104

Routine Core Analysis Report

Prepared for: Altamont Vecta Oil Gas Ltd Big Sky

Well: Danielson 33-17

Location: Toole, MT

Prepared by:

TerraTek, A Schlumberger company

1935 South Fremont Drive

Salt Lake City, Utah 84104

[redacted]

Date: Sep 11 2014

Project No: 811151

Client:	**Altamont Vecta Oil Gas Ltd Big Sky**		
Well:	**Danielson 33-17**	**Location:**	**Toole, MT**
Project No:	**811151**		

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Quality Assurance Process

Schlumberger is committed to providing unsurpassed services in reservoir sampling and analyses while maintaining high standards of safety and quality. Our objective is to deliver the most accurate and reliable sampling processes and fluid and rock property measurements available in the industry. This objective requires persistent innovation and ongoing development of state-of-the-art technologies and equipment.

A rigorous quality assurance program, continuous employee training and enforcement of strict safety standards maintain our compliance with quality, health, safety, and environment (QHSE) requirements. Proactive integration of QHSE objectives and management goals at every level supports the communication and implementation of QHSE policies and standards. Schlumberger requires that qualified engineering technologists perform all laboratory measurements according to specified analytical procedures designed for obtaining accurate and reliable data.

The lab-generated data undergoes the following five levels of quality checks to establish the integrity of the reported results.

a) Establish quality of measurement during data generation.
b) Lab supervisor and manager confirm the overall quality of the generated data.
c) Project manager reviews and processes generated data and generates reports.
d) Technical advisors confirm consistency of reported data.
e) Project manager finalizes reports.

Hence, the completion of each project requires that a qualified and experienced team of engineers perform a variety of independent reviews of all technical data to confirm the consistency and accuracy of the report as per pre-established quality checklists designed for each operation and based on the level of complexity. All property measurements and calculation procedures are maintained in company archives for a period of one year. This information is available for review by clients upon request.

The file and laboratory records information is listed below to provide access reference to all records related to this project. For any questions, please do not hesitate to contact the undersigned project manager.

File No.: 811151

Laboratory Procedures
Alexander Leibold
Routine Core Analysis

Reviewed by

X	Clay Williams	TRA Lab Data Processor
X	Chad Fuller	TRA Lab Manager

Project Management
Kelly Vaughn
Core Analysis Manager

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Routine Core Analysis Summary

67 samples from the Danielson 33-17 well were tested. The samples were destroyed by an acidic chloroform-methanol mixture. All samples were re-tested with the other half of the originally cored 1x2" plug pulled from a single depth. The results shown are of the re-tested samples, except for a few of the permeability values.

The properties of residual fluid saturations, porosity and permeability of the core sample were obtained through basic core analysis specified in the API RP40 method, Recommended Practices for Core Analysis (1998).

All plugs were Dean-Stark extracted to measure fluid saturation. Plugs were then dried in convection oven at 104 degC until the weights stabilized. Afterward, they were kept in a desiccant chamber when not being tested.

For each sample, steady-state air permeability was measured with nitrogen gas for a single flow rate up to 1 cc/sec at a net confining pressure of 400 psi. Grain volume was measured using helium expansion at ambient conditions based on Boyle's Law. Bulk volume was calculated by measuring the length and width of each plug, a right cylinder. Pore volume was calculated to be the difference between the bulk volume and grain volume. Porosity was calculated to be the pore volume divided by the bulk volume, and the oil and water saturations are the volume of each divided by pore volume. The following samples have pieces missing and/or are not perfect cylinders; bulk density determined by Archimedes submersion method, post-test: 9B,11B,12B,15B,17B,23B,24B,29B,32B,33B, 34B,52B,57B,62B,64B.

When the first run of samples were tested, the best of the two plugs was used. For this reason, many of the permeability measurements from the original samples gave more realistic values than the reruns. Permeability measurements that were selected from the originally ran samples rather than the reran samples are: 3,11,12,14,17, 18,20,22,30,46,50,62,64. Some samples have bedding fractures or partial bedding fractures. Reported permeability of samples with fractures that were successfully sealed with teflon are: 3,23B,24B,34B,36B,37B,52B, 57B. Reported permeability of samples that were unsuccessfully healed with teflon, but are more accurate than with no teflon at all are: 7B,8B,9B,19B,27B,29B,47B,48B,49B,61B. Reported permeability of samples that have multiple fractures and an attempt to heal with teflon could not be made are: 14,15B,41B,53B. A few of the samples have a permeability that is less than the minimum resolution of testability and are reported as <0.01 mD. Many of these samples contain small amounts of gypsum, which resulted in a negative calculated oil saturation value. Samples with negative values are reported as being <0.01%. This gypsum most likely came from the hydration of anhydrite which was originally present in the rock before being cored.

The routine core properties are summarized in Table 1. The permeability-porosity relationship is shown in Fig. 1. The permeability, porosity, and saturation profiles with depth can be found in Fig. 2 through 4.

Altamont Vecta Oil Gas Ltd Big Sky
Danielson 33-17
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Sample ID	Sample Depth (ft)	Sample Length (cm)	Sample Diameter (cm)	Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Grain Density (g/cc)	Ambient Porosity (%)	Saturation		Permeability (mD)	Lithology
								Water (% PV)	Oil (% PV)		
1B	3273.92	2.690	2.516	2.770	2.769	2.874	3.67	0.08	2.78	<0.01	dol, gy-dk gy, xl, anhy, sl/ calc
2B	3278.82	2.832	2.517	2.739	2.736	2.867	4.59	6.95	1.82	0.01	dol, gy, xl, sl/ gyp
3B	3283.32	2.783	2.516	2.906	2.906	2.962	1.89	0.00	1.79	0.07	anhy, gy, xl, lam, frac
4B	3290.63	2.593	2.515	2.798	2.797	2.915	4.05	0.19	2.26	0.12	dol anhy, lt gy-gy, f gr, lam
5B	3291.45	2.783	2.513	2.431	2.384	2.860	16.63	34.42	<0.01	2.43	calc dol, lt brn, f-m gr, gyp, sl/ vgy, v/ lam
6B	3295.47	2.492	2.515	2.659	2.656	2.860	7.14	2.26	2.80	0.10	dol, gy, m gr, sl/ gyp, vgy
7B	3296.23	2.748	2.515	2.613	2.604	2.872	9.33	8.25	1.76	1.14	dol, gy-brn, m gr, anhy, sl/ gyp, vgy, frac
8B	3297.42	2.748	2.523	2.620	2.618	2.856	8.33	0.13	1.28	4.81	dol, gy-brn, f gr, sl/ vgy, frac
9B	3298.34	2.827	2.522	2.727	2.723	2.853	4.55	10.48	<0.01	6.68	dol, dk gy, m gr, sl/ anhy, lam, gypff, frac
10B	3299.43	2.692	2.516	2.765	2.762	2.866	3.60	2.90	4.39	0.03	anhy dol, gy & wh, xl & f gr, sl/ vgy
11B	3301.44	2.832	2.517	2.742	2.733	2.873	4.86	14.71	4.33	1.27	anhy dol, dk gy & wh, xl & f-m gr, sl/ vgy, frac
12B	3302.47	2.784	2.517	2.608	2.598	2.864	9.28	12.98	<0.01	0.19	dol, lt brn, xl, sl/ vgy, gyp, lam, cff, frac
13B	3302.79	2.667	2.522	2.610	2.610	2.849	8.39	0.00	0.21	6.61	dol, dk gy & brn, xl, vgy, v/ lam
14B	3303.37	2.644	2.512	2.537	2.529	2.860	11.58	6.26	0.93	30.8	dol, dk gy & brn, m gr, sl/ vgy, v/ lam, gypff, frac
15B	3304.41	2.586	2.525	2.781	2.780	2.840	2.12	1.64	2.79	0.07	dol, lt brn, xl, sl/ lam, cff, frac
16B	3305.67	2.637	2.525	2.689	2.687	2.813	4.46	6.79	<0.01	0.01	dol, lt gy & gy, f-m gr, sl/ vgy, v/ lam
17B	3307.30	2.661	2.527	2.554	2.554	2.865	10.86	0.29	<0.01	0.76	dol, gy & lt brn, f-m gr, vgy, v/ lam, fos
18B	3308.56	2.625	2.523	2.595	2.593	2.859	9.31	1.64	0.10	2.29	dol, gy, m gr, vgy, gff
19B	3309.93	2.743	2.525	2.615	2.608	2.851	8.50	8.13	<0.01	8.57	dol, lt gy & gy, f-m gr, anhy, sl/ gyp, v/ lam, frac
20B	3310.75	2.630	2.523	2.567	2.558	2.850	10.22	14.87	<0.01	1.60	dol, gy, f-m gr, anhy, gyp, vgy, foss, frac
21B	3312.82	2.700	2.522	2.550	2.550	2.860	10.85	0.34	<0.01	0.37	dol, lt gy-lt brn, f-gr, sl/ anhy, sl/ vgy
22B	3314.23	2.642	2.526	2.593	2.582	2.863	9.83	17.67	<0.01	0.40	dol, gy-brn, f gr, anhy, gyp, sl/ vgy, frac
23B	3317.53	2.677	2.525	2.731	2.731	2.786	1.99	0.01	0.87	0.01	dol ls, gy, f gr, sl/ lam, frac
24B	3318.24	2.744	2.527	2.709	2.709	2.785	2.73	0.05	<0.01	0.01	calc dol, gy & lt gy, xl, sl/ lam, cff, frac
25B	3320.74	2.746	2.526	2.651	2.650	2.797	5.25	0.00	1.95	0.05	dol ls, lt gy, f-m gr, lam
26B	3322.74	2.718	2.525	2.783	2.783	2.872	3.10	0.00	<0.01	0.06	dol, lt gy-gy, f-m gr, anhy, sl/ calc, sl/ vgy

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Sample ID	Sample Depth (ft)	Sample Length (cm)	Sample Diameter (cm)	Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Grain Density (g/cc)	Ambient Porosity (%)	Saturation		Permeability (mD)	Lithology
								Water (% PV)	Oil (% PV)		
27B	3326.50	2.687	2.527	2.731	2.731	2.856	4.37	3.40	<0.01	0.37	dol, gy, f gr, calc, frac
28B	3328.40	2.624	2.527	2.939	2.940	2.975	1.19	0.10	<0.01	0.01	anhy, gy, xl, sl/ lam
29B	3330.80	2.738	2.527	2.842	2.842	2.944	3.44	5.32	<0.01	0.07	anhy, lt brn, xl, sl/ dol, v/ lam, frac
30B	3331.70	2.657	2.525	2.405	2.394	2.868	16.52	5.91	1.02	2.68	dol, lt gy, f gr, gypff
31B	3332.84	2.686	2.526	2.426	2.393	2.858	16.25	28.34	<0.01	0.88	dol, lt gy, f gr
32B	3334.15	2.731	2.527	2.576	2.568	2.843	9.66	6.85	1.52	0.85	dol, lt gy-brn, f gr, sl/ calc
33B	3336.30	2.720	2.529	2.746	2.746	2.832	3.04	0.36	<0.01	0.01	dol, gy, f gr, calc, sl/ lam, cff
34B	3337.72	2.649	2.535	2.716	2.716	2.786	2.51	0.09	<0.01	0.01	dol ls, gy, xl
35B	3344.54	2.713	2.535	2.739	2.739	2.807	2.42	0.01	<0.01	0.05	dol ls, gy, f gr, anhy
36B	3346.35	2.765	2.532	2.662	2.662	2.736	2.73	0.16	<0.01	0.06	ls, lt gy, f gr, lam, styl, frac
37B	3350.14	2.779	2.532	2.698	2.698	2.771	2.61	0.00	<0.01	0.07	ls, lt gy-gy, f gr, lam, frac
38B	3357.80	2.757	2.527	2.439	2.435	2.846	14.44	3.00	<0.01	13.1	dol, lt brn, m gr, calc
39B	3358.43	2.640	2.527	2.419	2.419	2.853	15.22	0.60	<0.01	53.1	dol, brn-lt gy, m gr, calc, frac
40B	3363.10	2.728	2.530	2.663	2.648	2.760	4.05	35.13	3.81	0.01	ls, lt gy, f-m gr, gyp, dol
41B	3363.83	2.703	2.529	2.636	2.624	2.759	4.92	36.67	<0.01	0.06	ls, lt gy, f-m gr, gyp, dol, sl/ vgy, sl/ lam, frac
42B	3364.45	2.689	2.527	2.598	2.599	2.777	6.42	0.00	<0.01	0.03	ls, lt gy, m gr, dol, sl/ gyp, vgy, sl/ lam
43B	3365.75	2.732	2.526	2.585	2.585	2.792	7.39	0.02	<0.01	0.04	ls, lt gy, m gr, dol, vgy, sl/ lam
44B	3367.20	2.720	2.525	2.584	2.583	2.767	6.63	1.66	<0.01	0.16	ls, lt gy, m gr, dol, vgy, lam
45B	3368.52	2.697	2.527	2.585	2.557	2.806	8.87	41.64	<0.01	0.17	dol ls, lt gy, m gr, gyp, vgy, sl/ lam
46B	3369.24	2.753	2.527	2.554	2.550	2.805	9.08	5.18	<0.01	0.55	dol ls, lt gy, m gr, sl/ lam, gypff
47B	3370.20	2.743	2.527	2.564	2.562	2.839	9.78	2.97	<0.01	1.94	dol ls, gy-lt gy, f-m gr, sl/ gyp, lam, frac
48B	3370.81	2.586	2.536	2.503	2.494	2.829	11.87	12.90	<0.01	8.35	calc dol, gy-lt gy, f-m gr, gyp, sl/ vgy, sl/ lam, gypff, frac
49B	3371.37	2.678	2.525	2.525	2.518	2.814	10.51	7.10	<0.01	2.40	dol ls, lt gy-brn, f-m gr, sl/ lam, gypff, frac
50B	3372.46	2.687	2.530	2.607	2.599	2.797	7.09	9.92	1.35	0.23	dol ls, lt gy, f-m gr, sl/ gyp, lam, gypff
51B	3373.24	2.696	2.530	2.597	2.571	2.793	7.93	39.09	<0.01	0.06	dol ls, lt gy, m gr, gyp
52B	3376.06	2.695	2.535	2.731	2.730	2.819	3.16	1.91	1.96	0.02	calc dol, gy-brn, f gr, gypff, frac

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								Water (% PV)	Oil (% PV)		
53B	3377.61	2.671	2.532	2.716	2.713	2.809	3.41	5.01	3.33	0.01	dol ls, gy, f gr, frac
54B	3380.09	2.687	2.536	2.719	2.718	2.779	2.17	1.02	<0.01	<0.01	dol ls, gy, xl, sl/ lam
55B	3382.12	2.724	2.536	2.714	2.714	2.797	2.96	0.00	1.45	0.01	dol ls, gy, xl, sl/ lam
56B	3386.05	2.731	2.539	2.717	2.717	2.759	1.49	0.01	0.55	<0.01	dol ls, gy, xl, sl/ lam
57B	3388.33	2.667	2.535	2.709	2.709	2.744	1.29	0.00	0.68	0.01	dol ls, gy, xl, sl/ lam, frac
58B	3400.35	2.785	2.536	2.698	2.697	2.739	1.52	0.05	2.69	<0.01	dol ls, gy, xl, sl/ lam
59B	3405.39	2.703	2.529	2.698	2.637	2.853	7.58	69.02	14.18	0.05	dol, gy, f-m gr, anhy, gyp, aff
60B	3405.87	2.720	2.535	2.781	2.774	2.857	2.91	20.01	5.30	0.07	dol, gy, f gr, anhy, sl/ gyp, lam, styl, aff
61B	3406.77	2.733	2.526	2.594	2.563	2.850	10.09	41.97	<0.01	15.1	dol, gy, f gr, anhy, gyp, sl/ lam, gypff, aff, frac
62B	3407.33	2.645	2.527	2.643	2.636	2.777	5.07	12.73	0.53	1.44	ls, gy, f gr, dol, anhy, gyp, lam, gypff, aff, frac
63B	3408.17	2.719	2.529	2.715	2.708	2.787	2.84	9.04	20.05	0.01	ls, lt gy-gy, f-m gr, anhy, gyp, sl/ lam, gypff, aff
64B	3410.56	2.731	2.537	2.680	2.668	2.807	4.94	29.39	<0.01	0.81	dol ls, gy, m gr, anhy, gyp, lam, gypff, aff, frac
65B	3414.33	2.670	2.531	2.833	2.832	2.923	3.10	1.92	1.98	0.06	dol anhy, lt gy-wh, xl, sl/ lam
66B	3431.67	2.725	2.521	2.784	2.784	2.840	1.97	0.11	1.63	0.01	calc dol, lt gy, f-m gr, anhy
67B	3446.65	2.692	2.527	2.847	2.846	2.914	2.32	0.00	2.25	0.03	dol anhy, lt gy-gy, xl
Sample ID	Sample Depth (ft)	Sample Length (cm)	Sample Diameter (cm)	Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Grain Density (g/cc)	Ambient Porosity (%)	Saturation		Permeability (mD)	Lithology
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Figure 1. Permeability v. Porosity Cross Plot

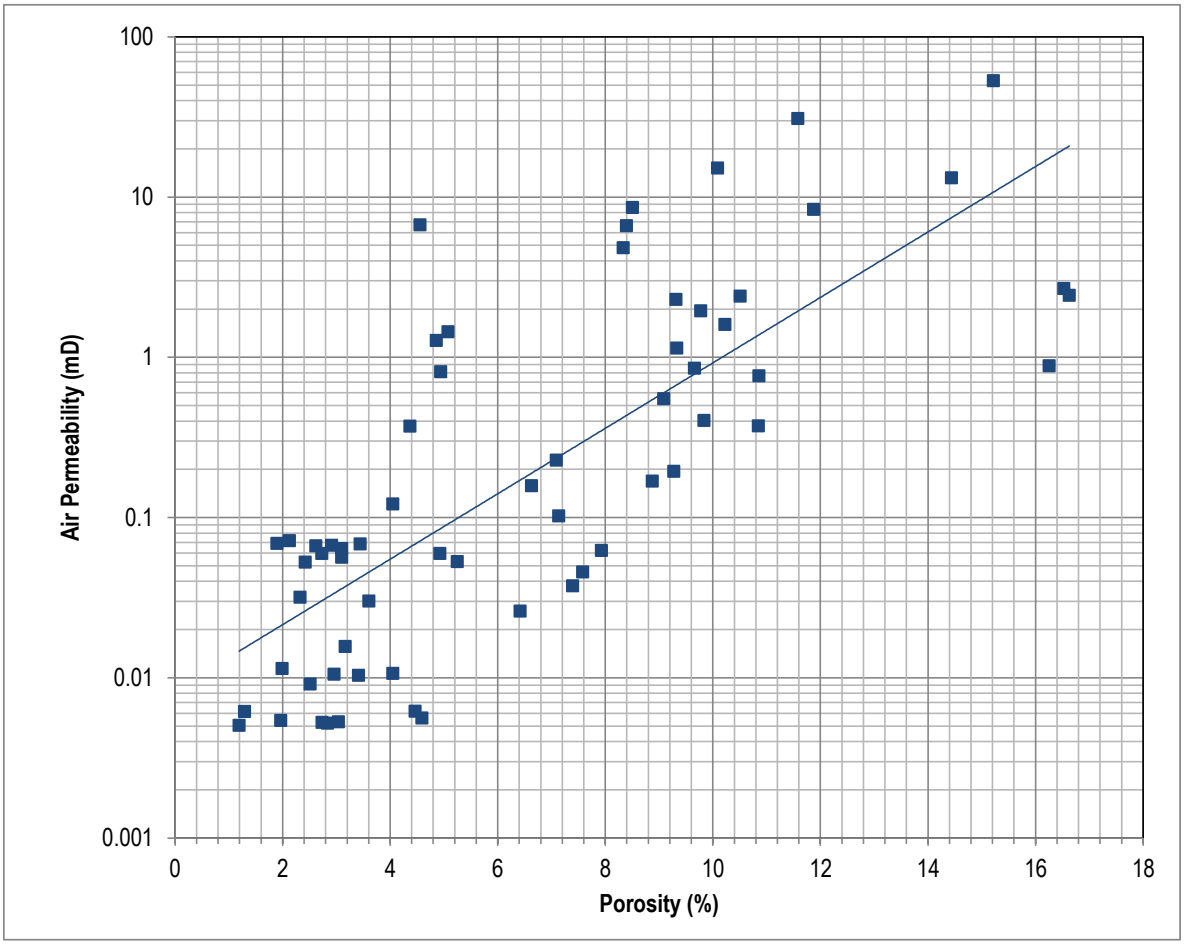

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Figure 2. Permeability Profile v. Depth

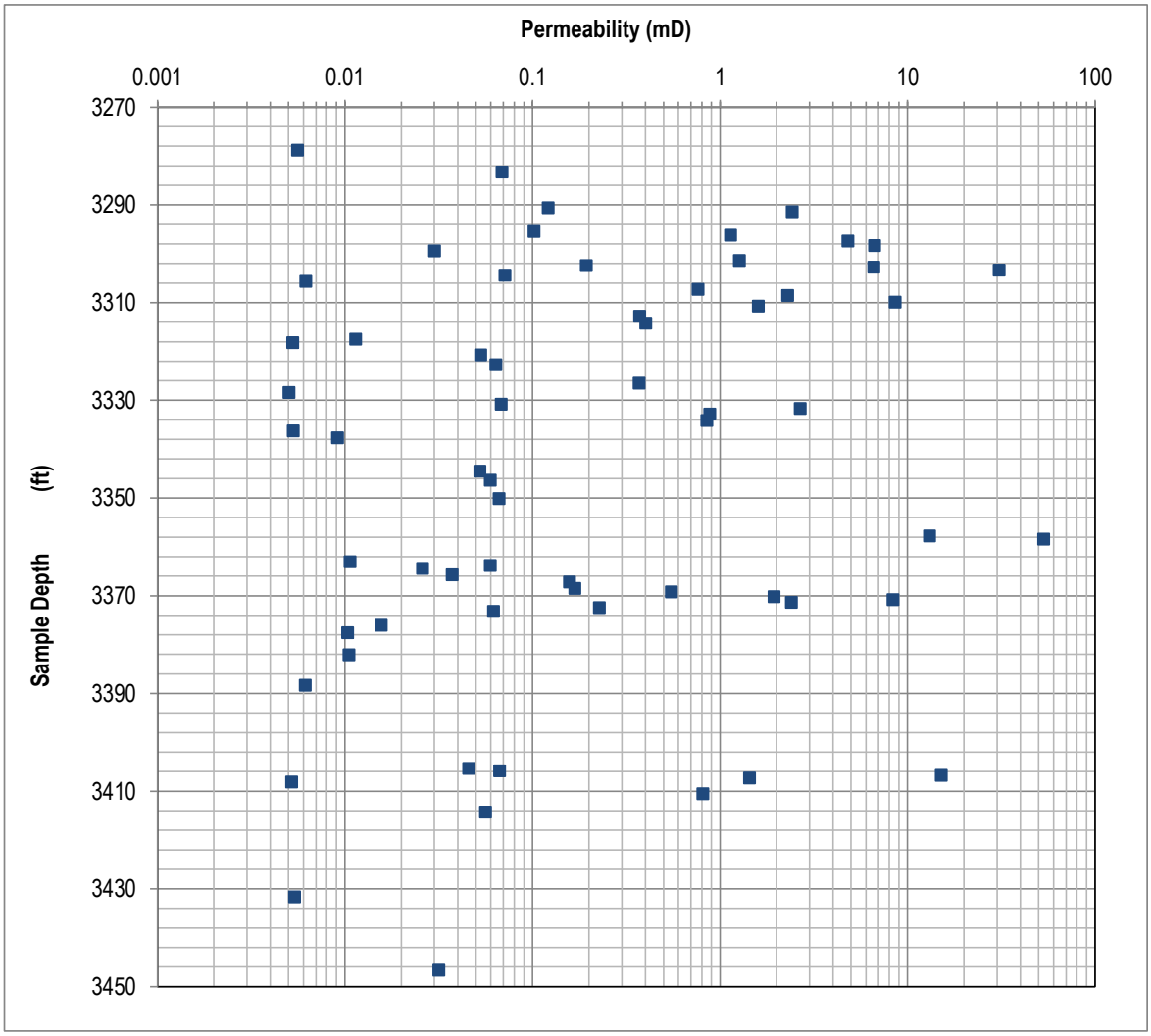

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Figure 3. Porosity Profile v. Depth

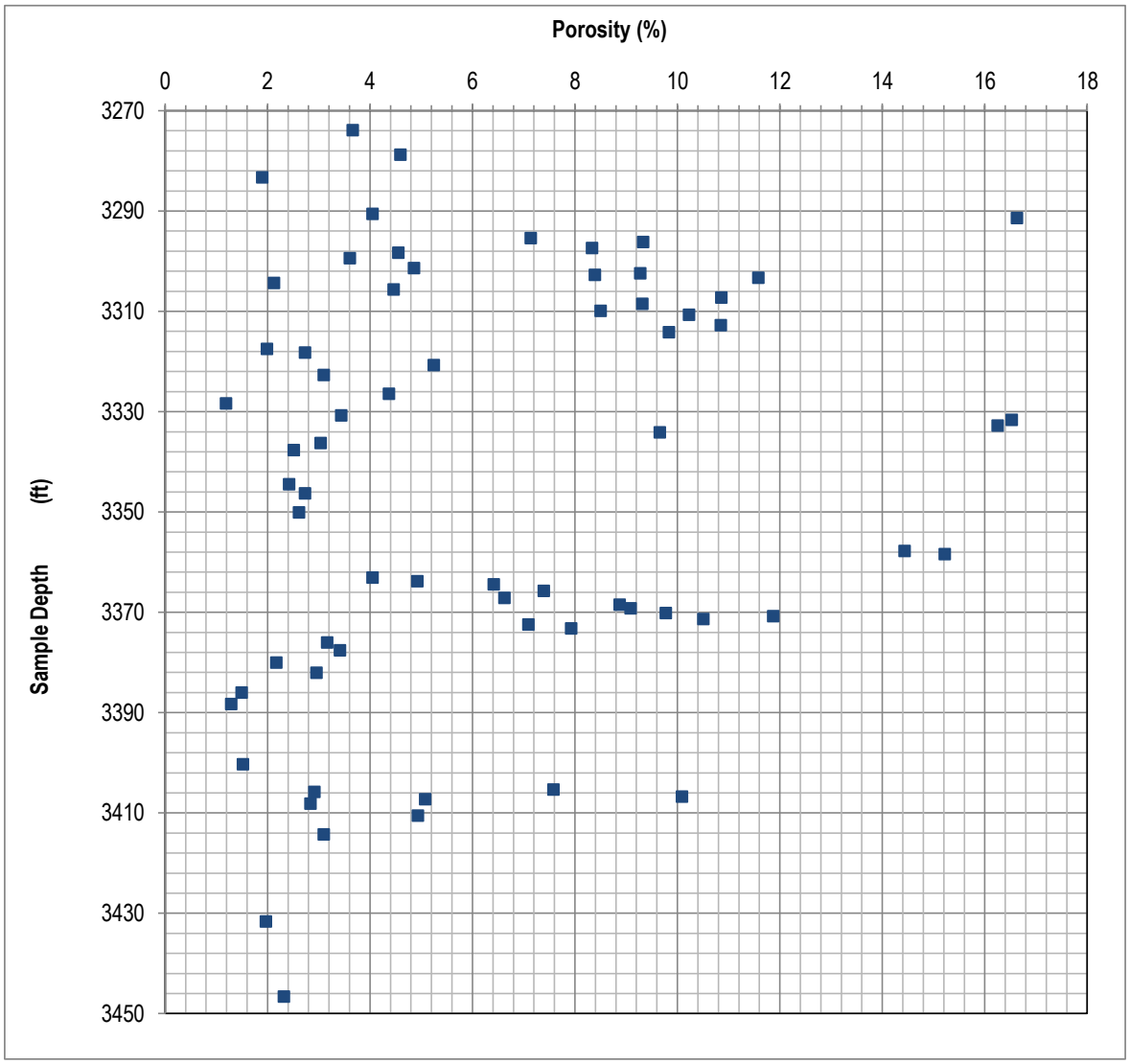

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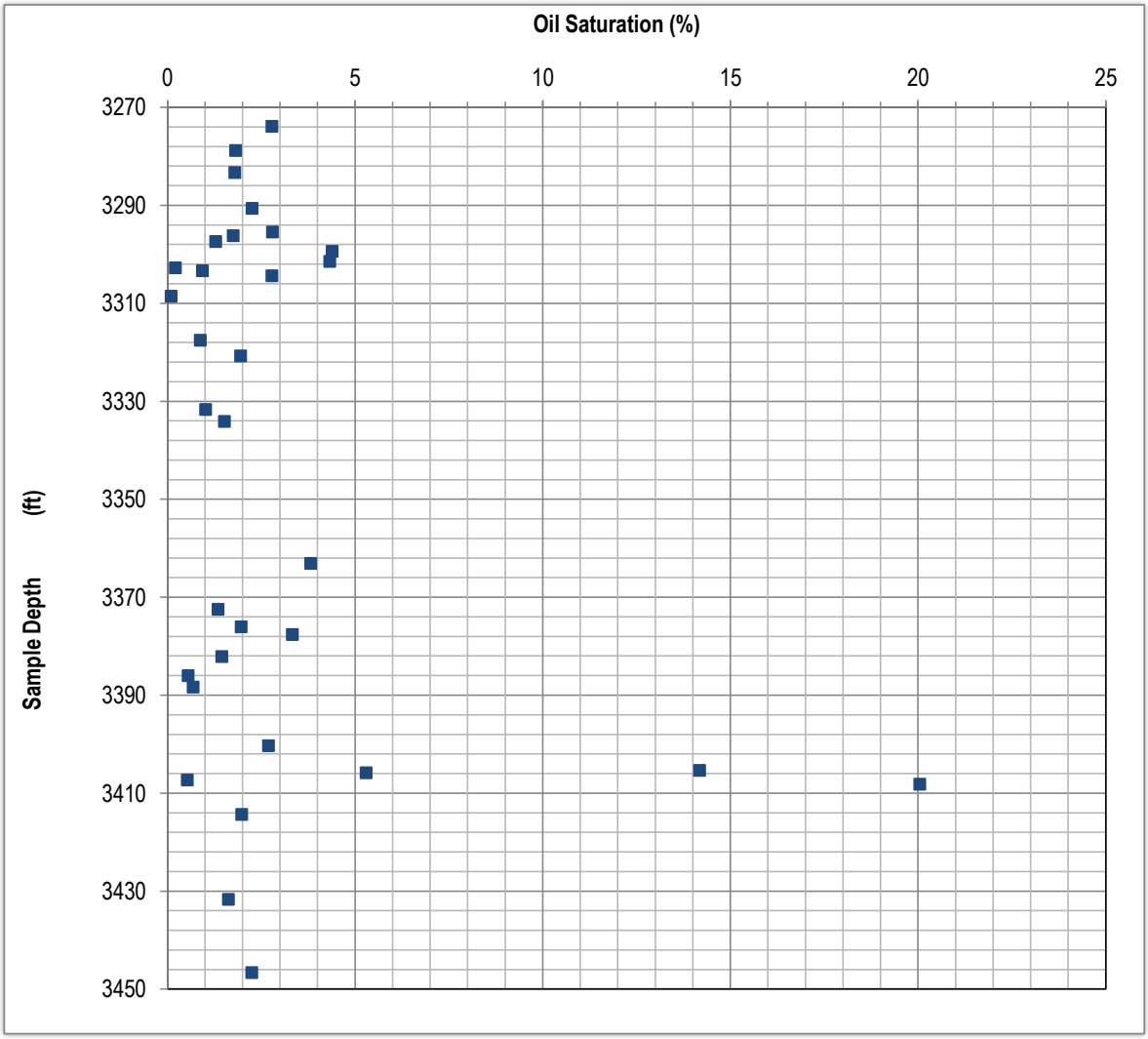
Figure 4. Saturation Profile v. Depth



Description Scheme for Carbonate Sedimentary Rocks:

Rock Type, Color, Grain Size or Crystal Size, Porosity Type, Accessories

Description Scheme for Clastic Sedimentary Rocks:

Rock Type, Color, Grain Size, Cement, Structures and Accessories

Key to Abbreviations:

aff	- anhydrite filled fracture	grnl	- granule	sdy	- sandy
alt	- altered	gy	- gray	sh	- shale
anhy	- anhydrite(ic)	gyp	- gypsum(iferous)	shy	- shaley
arg	- argillaceous	gypff	- gypsum filled fracture	sid	- siderite
bdd	- bedded	hem	- hematite(ic)	sil	- silica(eous)
bent	- bentonite	if	- incipient fracture	sl/	- slightly
bf	- buff	incl	- inclusion	sltst	- siltstone
biot	- bioturbated	intprt	- interparticle	slt	- silt
bit	- bitumen	intrprt	- intraparticle	slty	- silty
bl	- blue(ish)	intxl	- intercrystalline	ss	- sandstone
blk	- black	lam	- laminated	stn	- stain(ed)(ing)
bnd	- banded	lav	- lavender	str	- streak
brec	- breccia(ted)	lig	- lignite(ic)	styl	- stylolite
brn	- brown(ish)	ls	- limestone	suc	- sucrosic
bur	- burrowed	lt	- light	tan	- tan
c	- coarse	m	- medium	v/	- very
calc	- calcite(areous)	mar	- maroon	vc	- very coarse
carb	- carbonaceous	mas	- massive	vf	- very fine
cff	- calcite filled fracture	mdy	- muddy	vgy	- vuggy
cgl	- conglomerate	mic	- micro	wh	- white
chky	- chalky	mc	- micro-crack	wthrd	- weathered
chlor	- chlorite	mnr	- minor	wvy	- wavy
cht	- chert	mica	- micaceous	yel	- yellow
chty	- cherty	mol	- moldic	xl	- crystalline
clst	- clast	ms	- mudstone		
cly	- clay(ey)	mtx	- matrix		
clyst	- claystone	nod	- nodule(s)		
cob	- cobble	o	- oil		
dism	- disseminated	of	- open fracture		
dk	- dark	ool	- oolitic		
dff	- dolomite filled	org	- organic		
frac	- fracture	orng	- orange		
dol	- dolomite(ic)	pbl	- pebble		
f	- fine	pel	- peloids		
fen	- fenestral	pff	- pyrite filled fracture		
fis	- fissile	pis	- pisolitic		
flu	- fluorescence	pk	- pink		
fos	- fossil(iferous)	pof	- partially open fracture		
frac	- fracture	ppvgs	- pinpoint vugs		
fri	- friable	ptg	- parting(s)		
gff	- gouge filled fracture	purp	- purple		
glauc	- glauconitic	pyr	- pyrite(ic)		
gn	- green	qff	- quartz filled fracture		
grdd	- graded	qtz	- quartz		
gr	- grain(ed)	red	- red(dish)		
		sa	- salty		

DANIELSON 33-17 EBOOK

Production Tests

CO_2 Production and Shut-In Tests at Danielson 33-17 Well

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Earth Sciences Division
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February 2, 2015

Rev. 1.0

Findings of CO_2 Production/Shut-In Tests

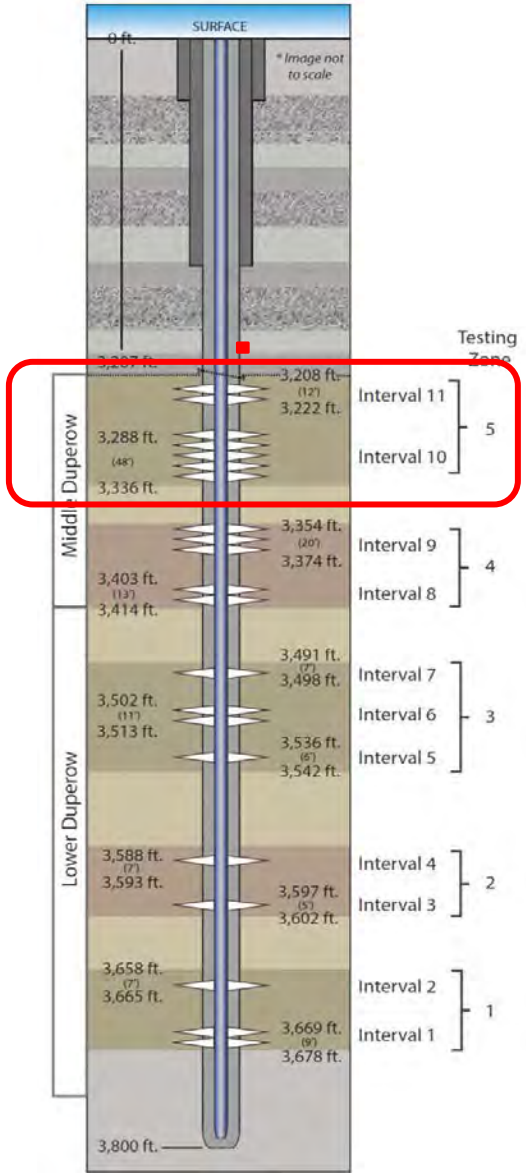
- Under the shut-in conditions of Danielson 33-17, phase transition from deep liquid CO_2 to shallower gaseous CO_2 occurs at a depth of 2249 feet (685.5 m);
- Under production testing conditions, this phase interface was lowered within one hour to the reservoir level by lowering wellbore pressure to 7 bar;
- The pressure lowering (ΔP) caused significant temperature drop (ΔT) to 2℃ in the wellbore, monitored by bottomhole P/T gauges;
- Significant ΔP in the perforated Zone 5 is expected to produce significant ΔT, which may lead to CO_2 hydrate (or water ice) in the formation near the perforations;
- The radius of the affected reservoir volume is estimated to be less than 1 meter for the CO_2 production over 4.5 days;
- The reservoir volume with hydrate near the perforations might significantly reduce absolute and rel. perm., which was estimated using the following shut-in pressure recovery data.

Contents

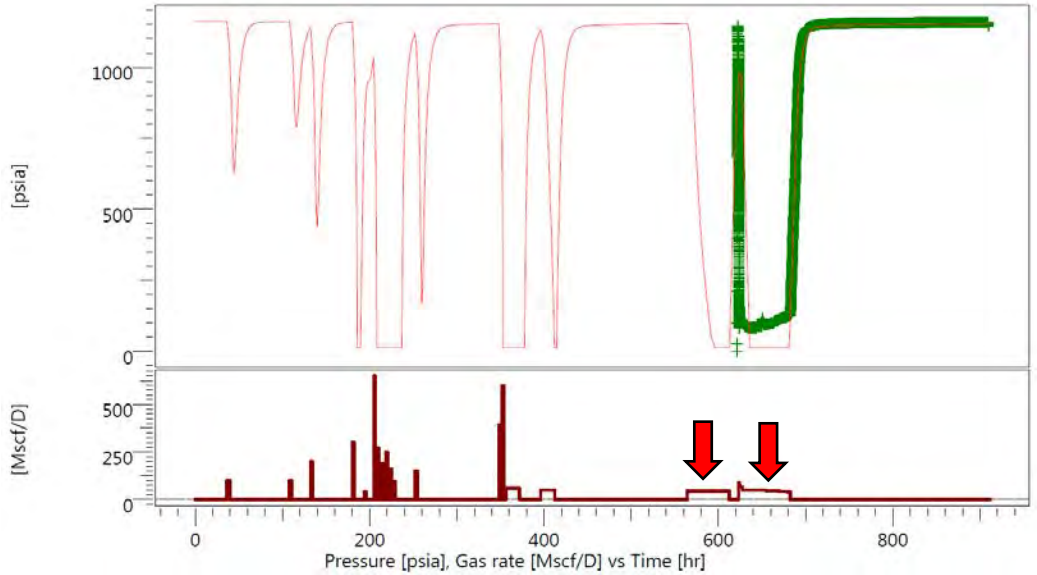
- Danielson Well and CO_2 Production Tests
- Shut-in P/T Profiles and Phase Changes
- Last Production and Shut-In Test
  - Bottomhole P/T
  - Wellhead P/T
  - CO_2 Flow Rate
- Potential Hydrate Formation
  - Significant Reduction in Temperature due to JT Cooling
  - Potential Hydrate Formation
  - Reduction in CO_2 Rel. and Absolute Perm., and Production Rate
- Mitigation for CO_2 Production during the Injection Period
  - Reduce Pressure Drop by Controlling Q and P at Wellhead
  - Inhibitors? Heating?

1. Danielson 33-17 Well

- **Zone 5 of Middle Duperow:**
  - Interval 11: 3208 – 3222 ft
  - Interval 10: 3288 – 3336 ft
- **Bottomhole P/T Gauges:**
  - Top Gauge @ 3179 ft
  - Lower Gauge @ 3180 ft
- **Wellhead P/T/Q Monitoring:**
  - Tubing P/T
  - Casing P/T
  - Gas T
  - CO_2 Flow Rate
  - Water Flow Rate



CO_2 Production Tests



(SLB, 2015)

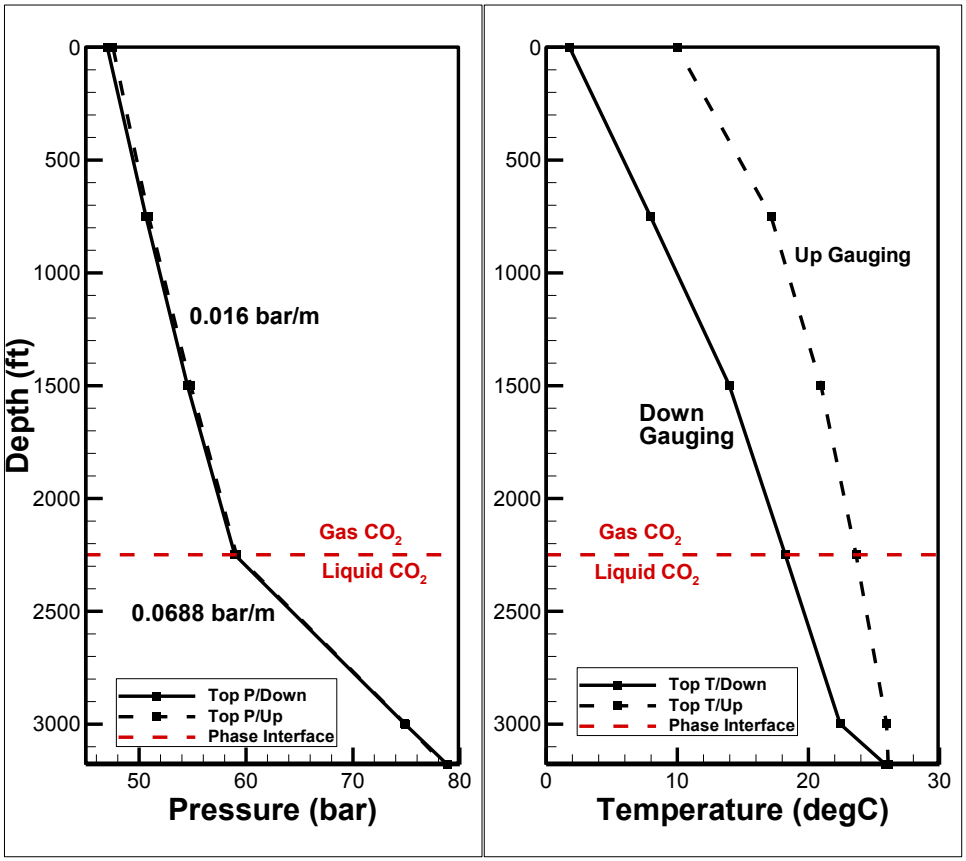
5-Dec	100 MSCF	2 Hours
6-Dec	200	1
	40	1.5
8-Dec	300	1
	40	1
9-Dec	650	1
	270	1
	190	1
	250	1
	160	1
	95	1
11-Dec	150	3
15-Dec	394	1
	597	1.75
	60	16
17-Dec	50	16
24-Dec	**45**	**48**

(Kirksey, 2015)

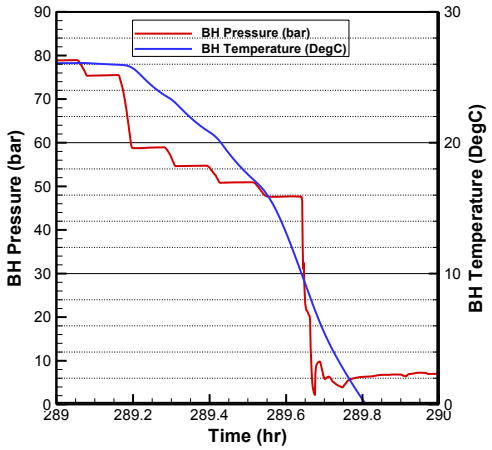
- **14 production tests of 1-3 hours from Dec 5 to 15, 2014;**
- **2 production tests of 16 hours on Dec 15 and 17;**
- **1 production test of 2 days on Dec 24, 2014;**
- **1 production (2.5 days) test on Dec 26 – 28, 2014, followed by a shut-in test of 10 days.**
- **How were these tests conducted? Vent, i.e., open the well and let CO_2 freely flow out of the well? What is wellhead pressure control for flow rate?**
- **Interplay between different tests for the wellbore and reservoir? Cumulative effects?**

A total of 426 MSCF CO_2

2. Shut-In P/T Profiles

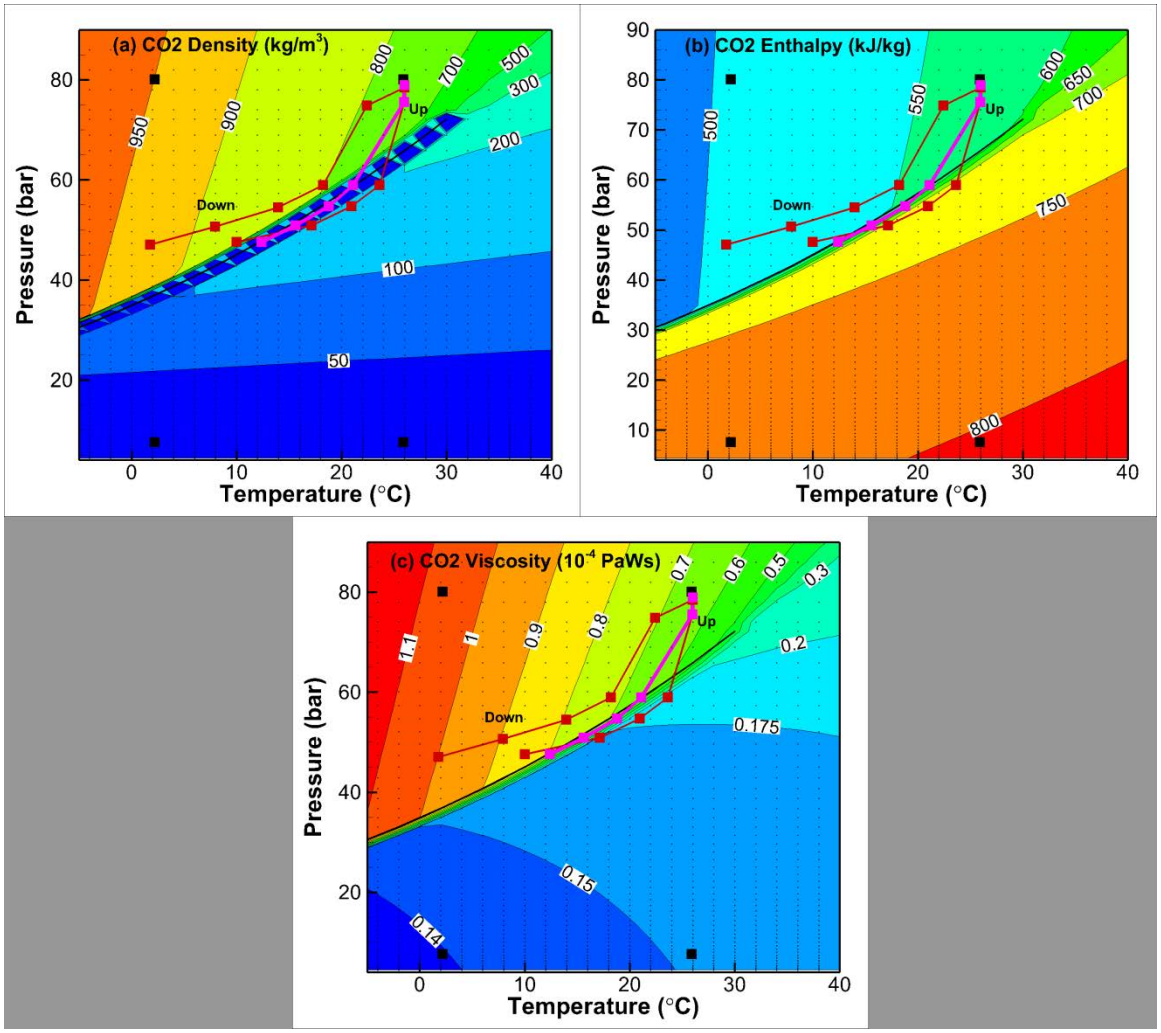


- Data 1 (Down) was acquired 9 – 11 am, Dec 26, 2014 before the production test on Dec 26 – 28;
- Data 2 (Up) was acquired 10:04 – 10:39 am, Jan 7, 2015;
- Pressure profiles in both datasets show phase transition from liquid in the deep to gaseous CO_2 in the shallower segment of the well;
- Pressure data are at equilibrium at each depth; while temperature are



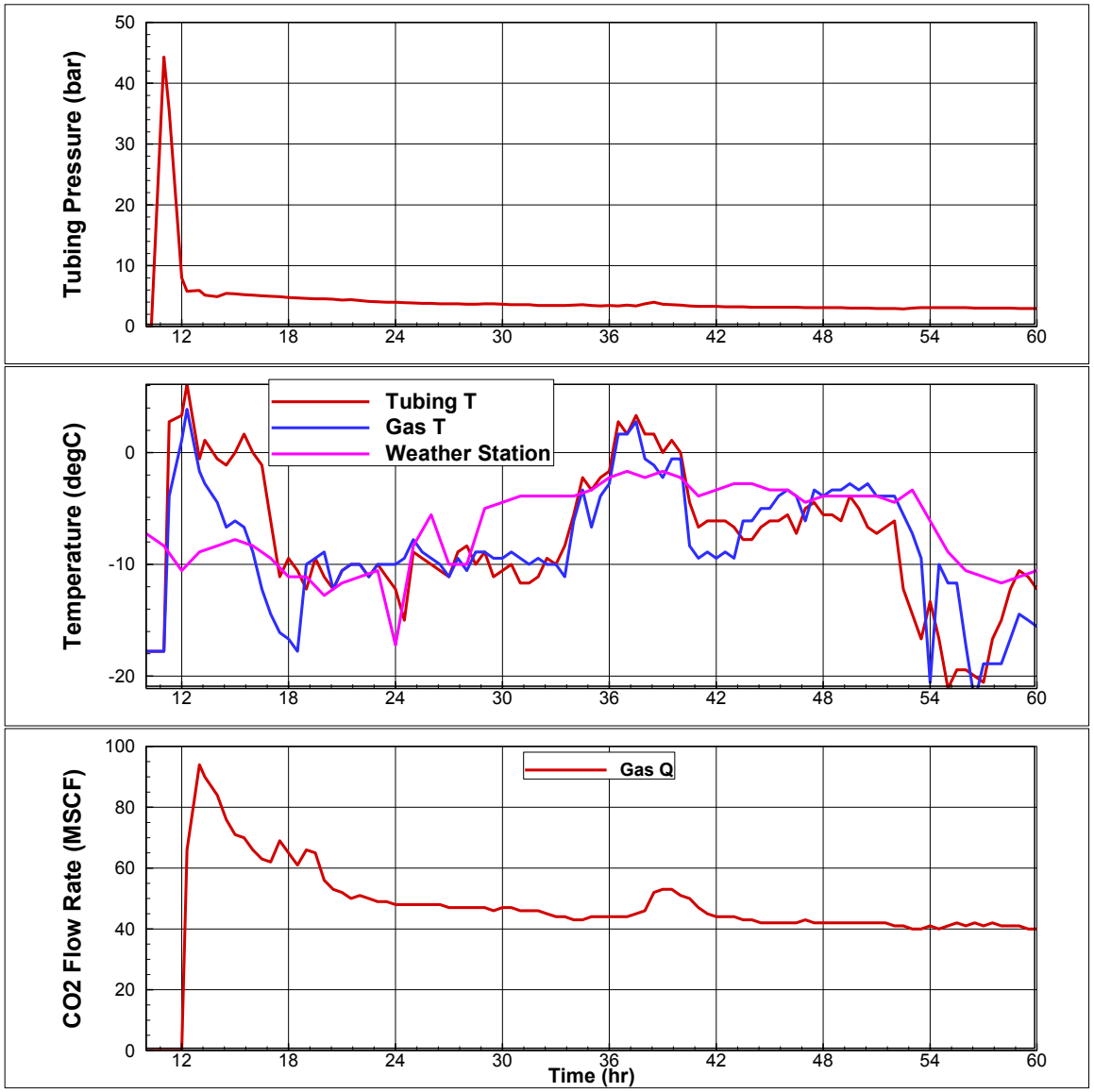
Top Gauge	@11am, 12/26/14	@10 am, 01/07/15
BH P	1144 psi (78.8 bar)	1147 psi (79.0 bar)
BH T	78.6℉ (25.9℃)	78.89 (26.1℃)
WH P	682.4 psi (47.0 bar)	690.9 psi (47.6 bar)
WH T	35.2 (1.8℃) ?	50.0 (10℃)

Wellbore Phase Diagram



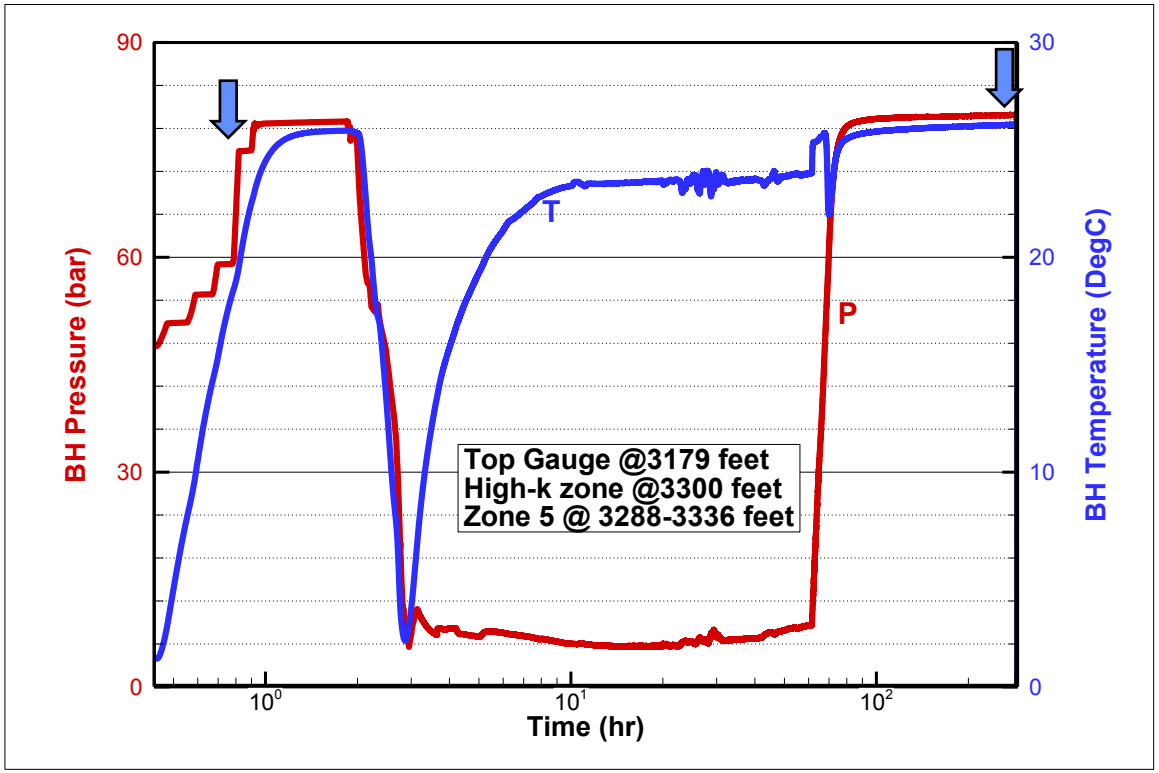
- Shut-in on Jan 7, 2015
- Shut-in on Dec 26, 2014
- T profiles are corrected using pressure profile data to assure the transition between liquid and gas CO_2;
- First 3 depths in liquid CO_2
  - 2249 ft (transition)
  - 2999 ft
  - 3179 ft
- Last 3 depths in gas CO_2
  - Ground Surface
  - 749 ft
  - 1499 ft

3. Production Test: Wellhead P/T/Q



- Wellhead pressure dropped from 643 to 43 psi, or 44.3 to 3.0 bar;
- CO_2 flow rate reduced from 94 to 40 MSCFD;
- Wellhead and gas T may be affected mainly by the weather T, rather than the subsurface T?

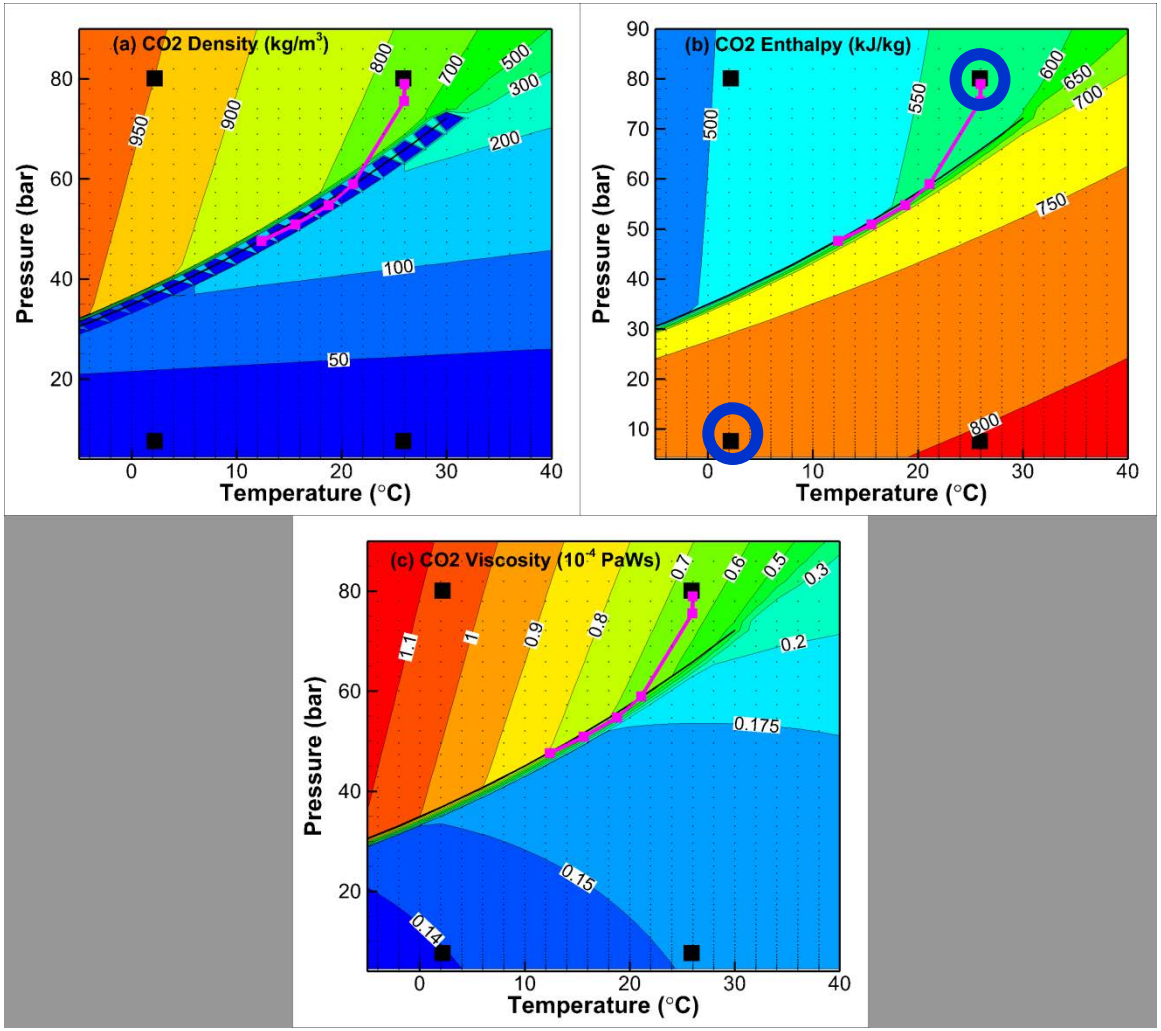
Production Test: BH P/T



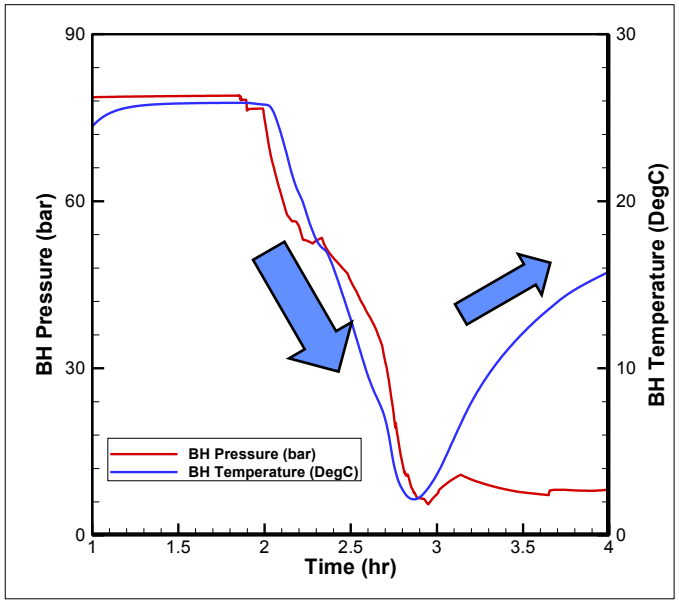
- Downhole gauge is located at depth of 3180 feet, ~100 feet above Zone 5 of the Middle Duperow;
- Pressure dropped from 1145 to 85 psi, or from 78.8 to 5.9 bar;
- The large ΔP resulted in ΔT = 78.6 – 35.8 °F, showing a significant JT cooling effect
- **Minimum T = 35.8 °F (2.2 °C),** showing potential hydrate formation in the reservoir.

- Temperature was not equilibrated at each depth, thus the T profiles cannot be used directly;
- Pressure was at equilibrium for each depth.

Joule-Thomson Cooling in Wellbore

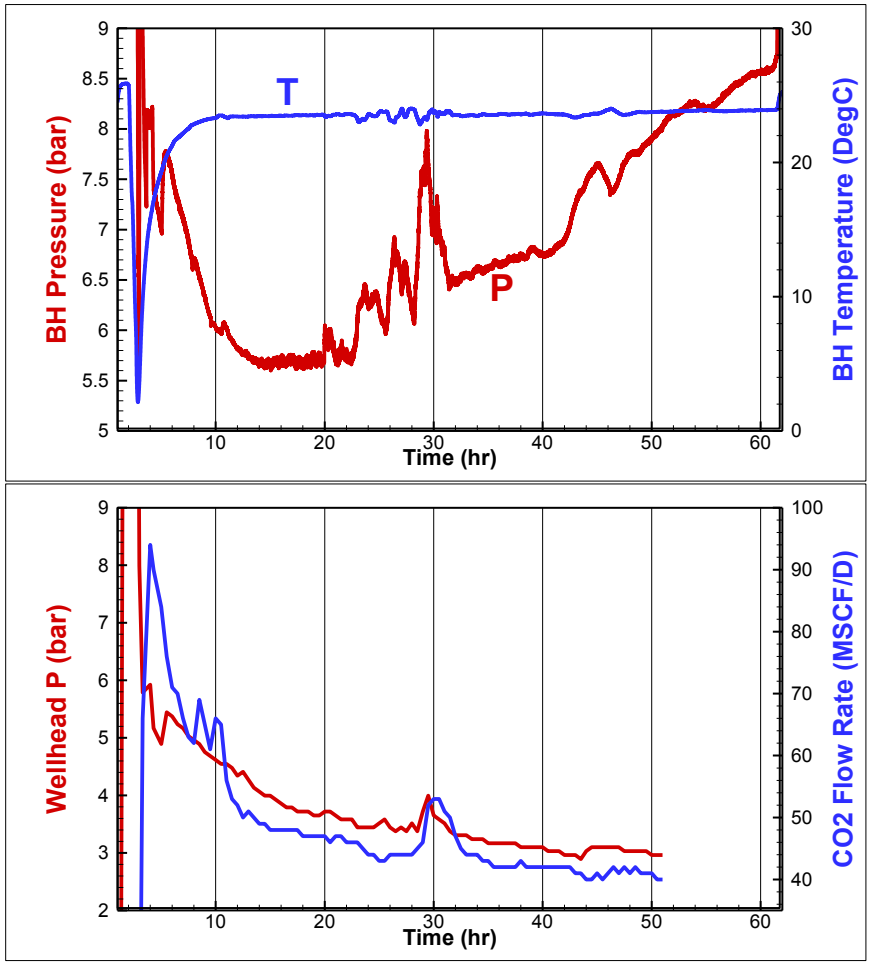


- **Production Conditions @BH Gauges**
  - **P: 1145 to 110.6 psi (78.9 to 7.6 bar);**
  - **T: 78.61 to 35.88℉ (25.9 to 2.2℃);**
  - **Enthalpy: 569.3 to 781.6 kJ/kg**



4. JT Cooling in Reservoir and Hydrate Formation ?

- **Reservoir Conditions**
  - Pressure @ 1145 (78.9 bar);
  - Temperature @ 78.61℉ (25.9℃);
  - Enthalpy: 569.3 kJ/kg
- **Wellbore Conditions @ Zone 5**
  - Pressure @ 110.6 psi (7.6 bar);
  - Temperature @ 35.88℉ (2.2℃);
  - Enthalpy: 781.6 kJ/kg
- **CO_2 Flow Mass for Two Vents**
  - 45.84 + 44 + 10.3 = 100.14 MSCF
  - 1 MSCF = 28.3 m^3 * 1.98 kg/m^3 = 56.1 kg
  - CO_2 total mass = 5617.8 kg
  - CO_2 mass in previous production = 5049 kg;
- **Heat Released to have 0℃**
  - = -(780-570) kJ/kg*(5618+5049) kg
  - = -2,240,000 kJ



Cooling-Affected Reservoir Volume/Radius

- **Specific Heat**
  - Dolostone rock: 0.92 kJ/kg/K
  - Water: 4.186 kJ/kg/K
  - Porosity = 6%
- **Dolomite density = 2.84 x 10^3 kg/m^3**
- **ΔT = 26 ℃ for 0 ℃ for hydrate formation;**
- **Affected Volume/Radius:**
  - Heat/(density*Sh*ΔT) = 2,240,000 kJ/(2.84*1000*0.92*26) = 33.0 m^3
  - Zone 5 Thickness = 48 feet = 14.6 m
  - Radius = 0.85 m

5MPa.

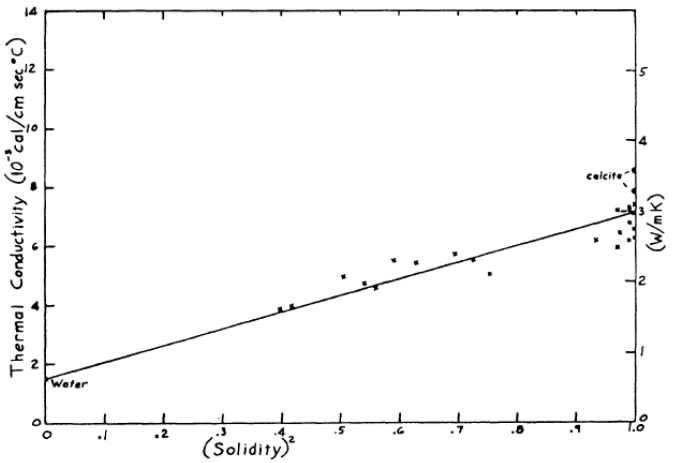


FIGURE 6. Thermal conductivity of limestone with water in the pores, showing variation with solidity, at 300 K, 5MPa.

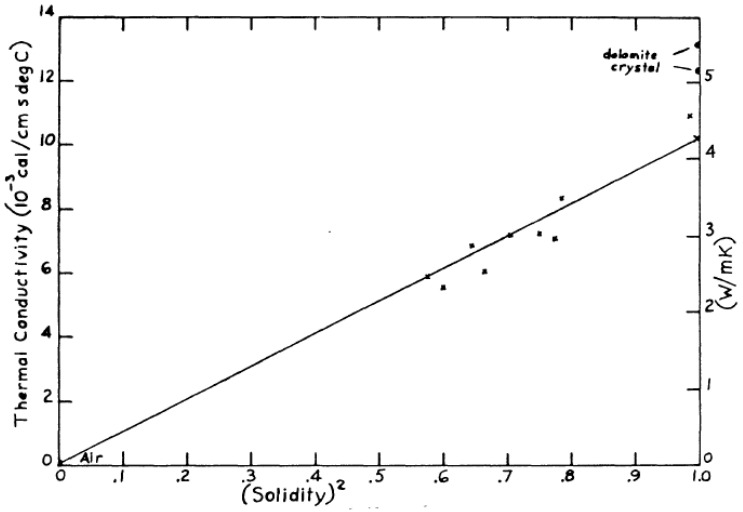
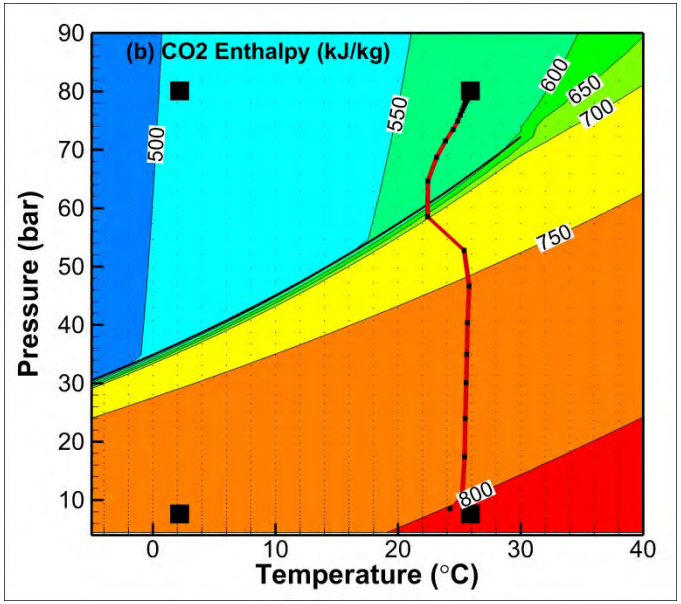
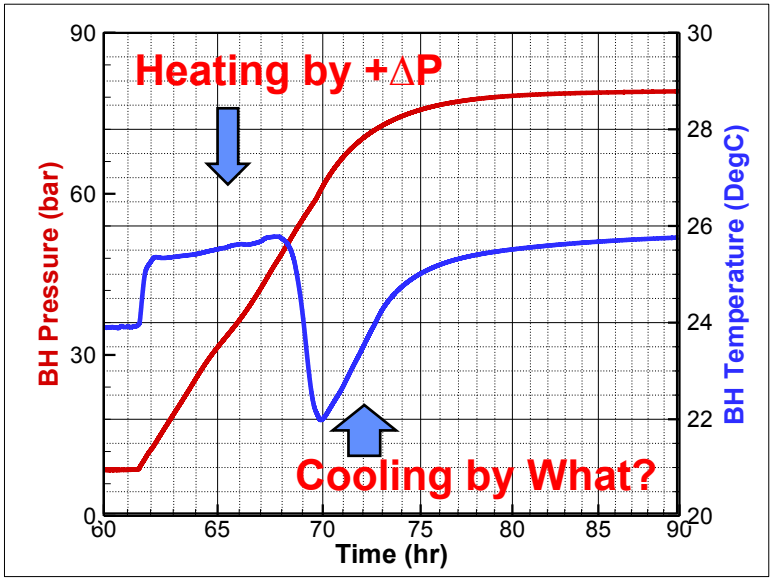


FIGURE 7. Thermal conductivity of dolostone with air in the pores, showing variation with solidity, at 300 K, 5MPa.

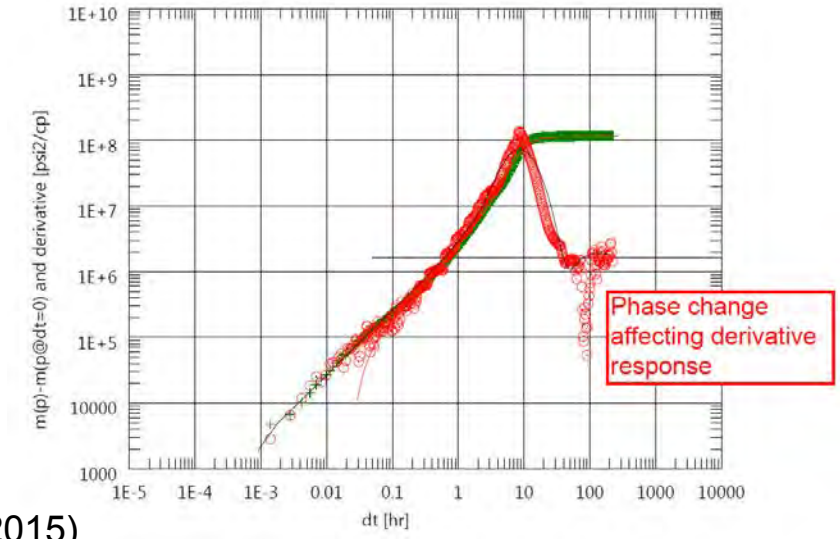
Evidence of Hydrate Formation?

- Temperature at gauges @ 3180 ft increased by positive ΔP, and then decreased by up-moving of cooler CO_2 in the reservoir;



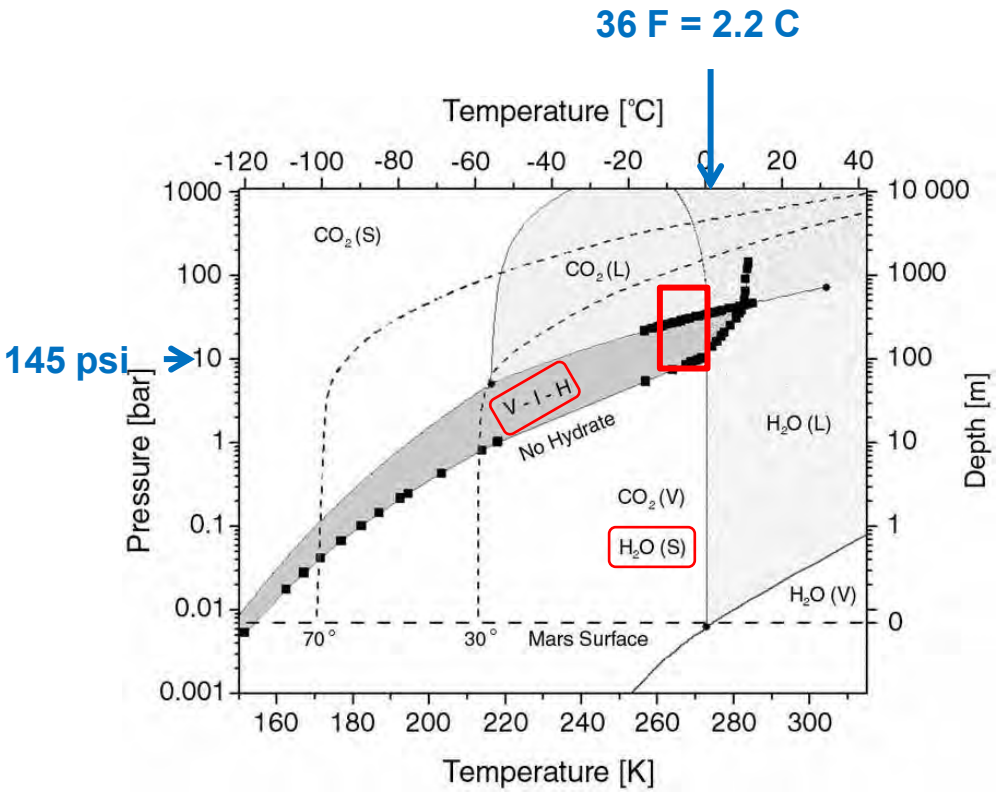


- Changes of pressure derivative around 80 hours were attributed to phase change in wellbore and reservoir by SLB



(SLB, 2015)

Hydrate Formation: Stability Diagram



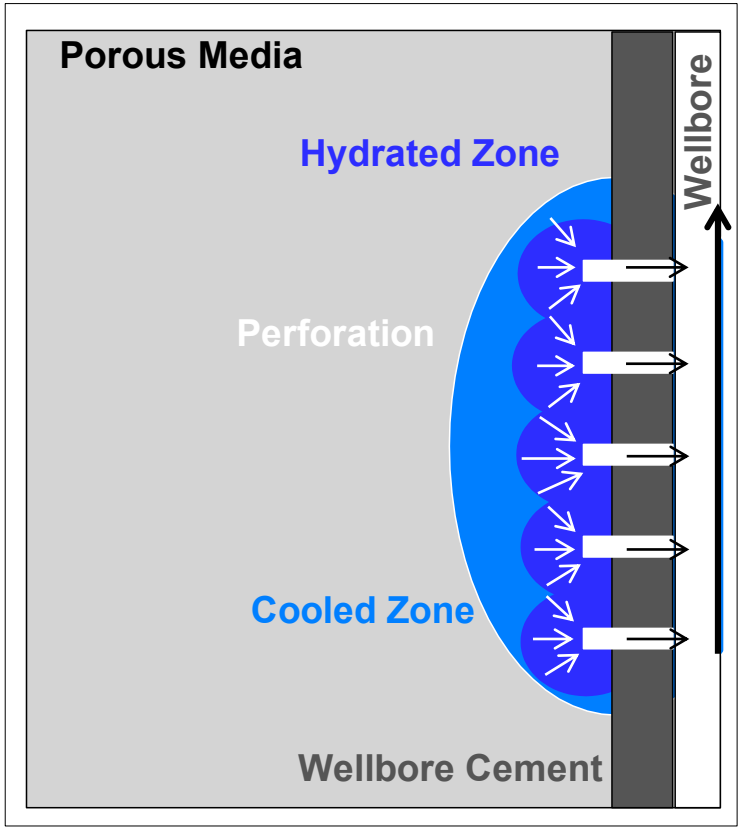
CO_2-hydrate has 5.75-7.67 moles H_2O per mole CO_2

Anderson, Graydon K. "Enthalpy of dissociation and hydration number of carbon dioxide hydrate from the Clapeyron equation." *The Journal of Chemical Thermodynamics* 35.7 (2003): 1171-1183.

CO_2 hydrate phase diagram. The black squares show experimental data (after Sloan, 1998 and references therein). The lines of the CO_2 phase boundaries are calculated according to the Intern. thermodyn. tables (1976). The H_2O phase boundaries are only guides to the eye. The abbreviations are as follows: L - liquid, V - vapor, S - solid, I - water ice, H - hydrate.

Hydrate Form

- Liquid CO_2, water, ar in the perforated Zor Duperow, with water 34% and oil saturatic
- No water production
- CO_2 liquid flashing t cooling during flow t cooled the formation of perforations in the where the ΔP is large
- Hydrate could have f plugging pores and r permeability;
- Six moles of water fo CO_2 would consume
- Outside of CO_2-hydra zone, H_2O ice also co formed.



5. Conclusions

- Under the shut-in conditions of Danielson 33-17, phase transition from deep liquid CO_2 to shallower gaseous CO_2 occurs at a depth of 2249 feet (685.5 m);
- Under production testing conditions, this phase interface was lowered within one hour to the reservoir level by lowering wellbore pressure to 7 bar;
- The pressure lowering (ΔP) caused significant temperature drop (ΔT) to 2℃ in the wellbore, monitored by bottomhole P/T gauges;
- Significant ΔP in the perforated Zone 5 is expected to produce significant ΔT, which may lead to CO_2 hydrate (or water ice) in the formation near the perforations;
- The radius of the affected reservoir volume is estimated to be less than 1 meter for the CO_2 production over 4.5 days;
- The reservoir volume with hydrate/ice near the perforations might significantly reduce absolute and rel. perm., which was estimated using the following shut-in pressure recovery data;
- More significant effect with enlarged affected reservoir volume and radius is expected for high-rate production over four years of the CO_2 injection phase;
- Mitigation measures may include reducing pressure drop by controlling Q and P at wellhead and use of some inhibitors and heating (?)

Pressure Test Report

COMPANY INFORMATION

Company Name	Altamont Oil and Gas
Representative	Tom White
Phone	[redacted]
Fax	
Address	
E-Mail Address	tompetro@outlook.com
Service Company	Northern Lights Energy Co, Inc.

WELL INFORMATION

Well Name	Danielson
Well Location	Toole County, MT
Field and Pool	Oilmont
Status (Oil, Gas, Water, Injection)	Gas
Perforated Intervals	
Mid-point of Perforated Intervals (MPP)	
Drilling Rig Number	
Elevations	
Kelly Bushing (KB)	
Casing Flange (CF)	
KB-CF	
Ground Level	
Plug Back Total Depth	
Total Depth	
Production Casing	
Production Tubing	2 7/8"

TEST INFORMATION

Type of Test	BHP Reservoir Flow/Shut-In	
Date(s) of Test	Dec 26, 2014 - Jan 7, 2015	
Dead-weight Gauge Tubing Pressure		
Dead-weight Gauge Casing Pressure		
Shut-in Date (Duration)		
Date / Time on Bottom	12/26/2014 - 09:57:42	
Date / Time off Bottom	01/07/2015 - 10:04:27	
Probe Serial Number	9642 - Top Gauge	90026 - Low Gauge
Probe Offset from End of Tool String		
Run Depth at Probe Pressure Port	3,179' glm	3,180' glm

PRESSURE TEST RESULTS

Maximum Recorded Probe Pressure	
Maximum Recorded Probe Temperature	
Final Buildup Pressure	
Gradient Survey Information	
Extrapolated Pressure to MPP	
Final Gradient at Depth	
Job Number	

PROBE INFORMATION

Probe Serial Number	9642 - Top Gauge
Model	PPS28 Quartz
Pressure	
Calibrated Pressure Range	16,000 PSI
Accuracy	.02% F.S.
Resolution	
Temperature	
Calibrated Temperature Range	350 Deg F
Accuracy	.2 deg C
Resolution	
Calibration File Used for Reports	

PROGRAMMING DETAILS

Step	Sample Mode	Period	Duration	Comment

Program Start Time
Program End Time
Total Samples Taken
Usage for this Test
Generic Data File Name

PROBE INFORMATION

Probe Serial Number	90026 - Low Gauge
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Accuracy	.02% F.S.
Resolution	
Temperature	
Calibrated Temperature Range	350 Deg F
Accuracy	.2 Deg C
Resolution	
Calibration File Used for Reports	

PROGRAMMING DETAILS

Step	Sample Mode	Period	Duration	Comment

Program Start Time
Program End Time
Total Samples Taken
Usage for this Test
Generic Data File Name

COMMENTS

Reported By Jesse Butcher

Dec. 26, 2014
MIRU. RIH with 2.26" gauge ring and locate nipple at 3,180' glm. Run tandem Electronic Memory Quartz Gauges in the hole and conduct BHP Reservoir Test. Made gradient stops going in the hole. Soft-set Gauges on nipple at 3,180' glm. POH the RDMO. (Gauges were encapsulated in a shock absorbed carrier with an anti-blowout tool).

Jan. 7, 2015
MIRU. RIH with overshot, latch and retrieve BHP Gauges off bottom at 3,180' glm. Made gradient stops coming out of the hole. Brought back a bunch of iron sulfide scale that was packed in the shock absorbed carrier from down hole. Download good data, RDMO.

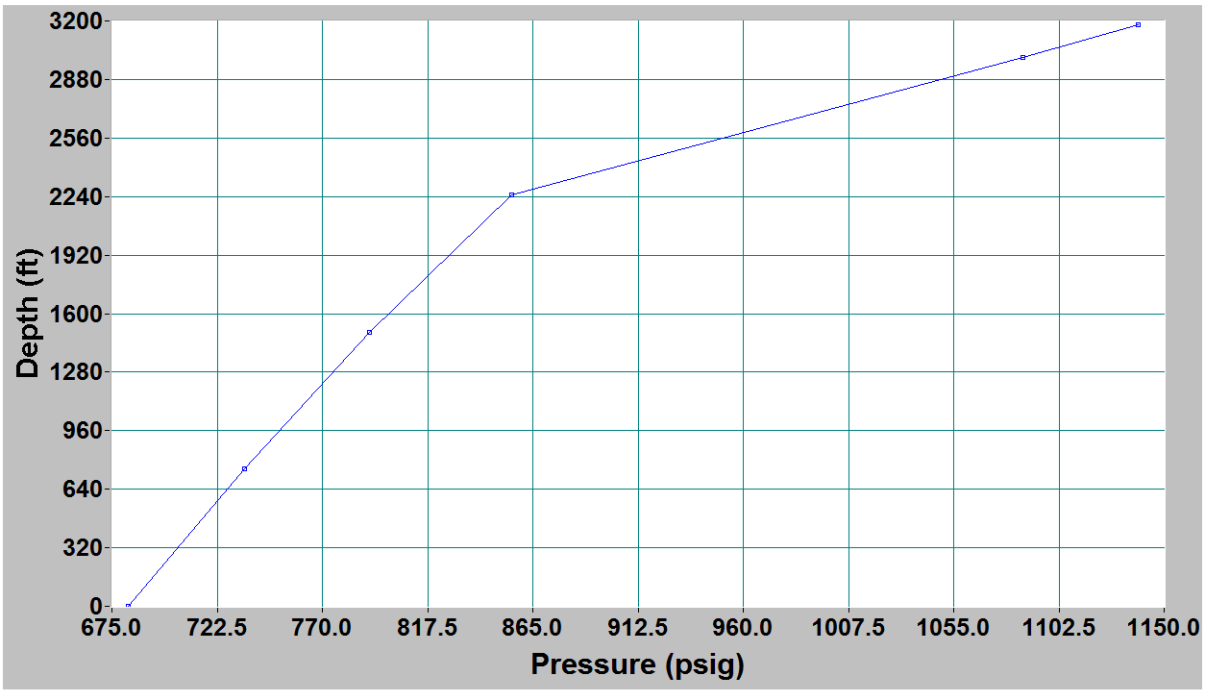
Pressure vs. Depth

Probe Serial Number 9642 - Top Gauge

Stop Time From	Stop Time To	Depth (ft)	Pressure (psig)	Gradient (psi/ft)	(deg F)	(deg F/ft)
		0.000	682.405	-	35.187	-
		749.000	734.900	0.0701	46.304	0.0148
		1499.000	791.327	0.0752	57.147	0.0145
		2249.000	855.522	0.0856	64.818	0.0102
		2999.000	1086.328	0.3077	72.357	0.0101
		3179.000	1138.489	0.2898	74.530	0.0121

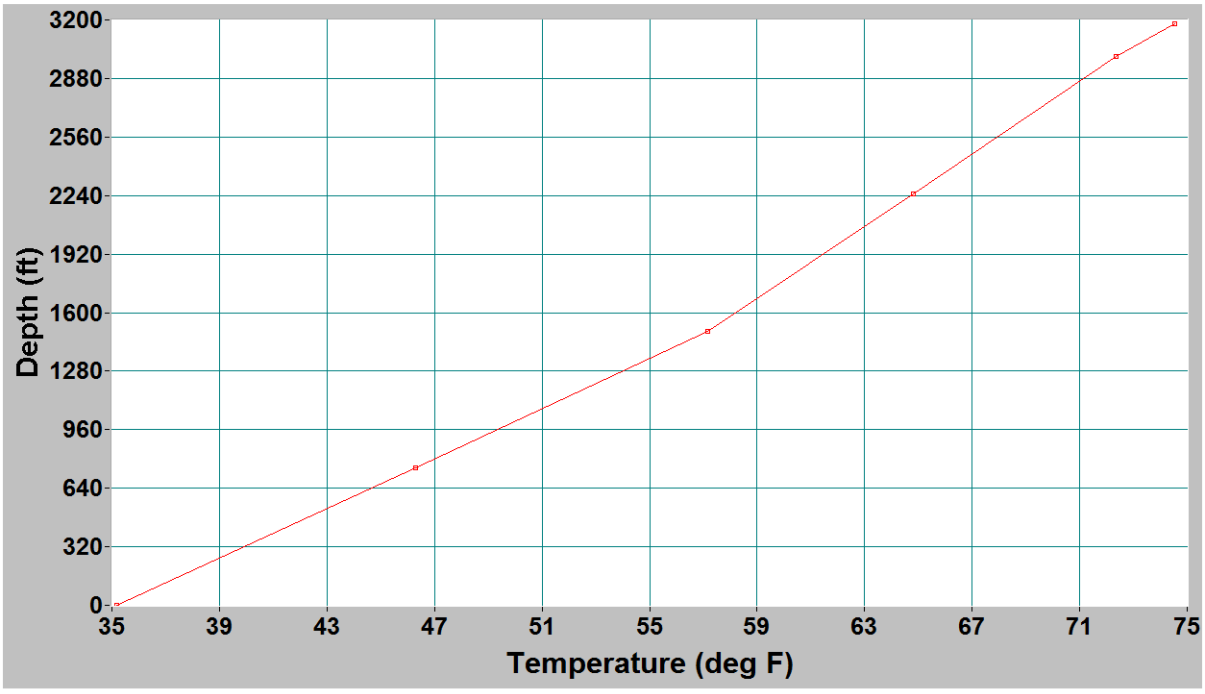
Extrapolated to MPP:	Depth (ft)	Pressure (psig)	(deg F)
	0.000		

9642 - Top Gauge Depth vs. Pressure



RIH Depth 1

9642 - Top Gauge Depth vs. Temperature



RIH Depth 1

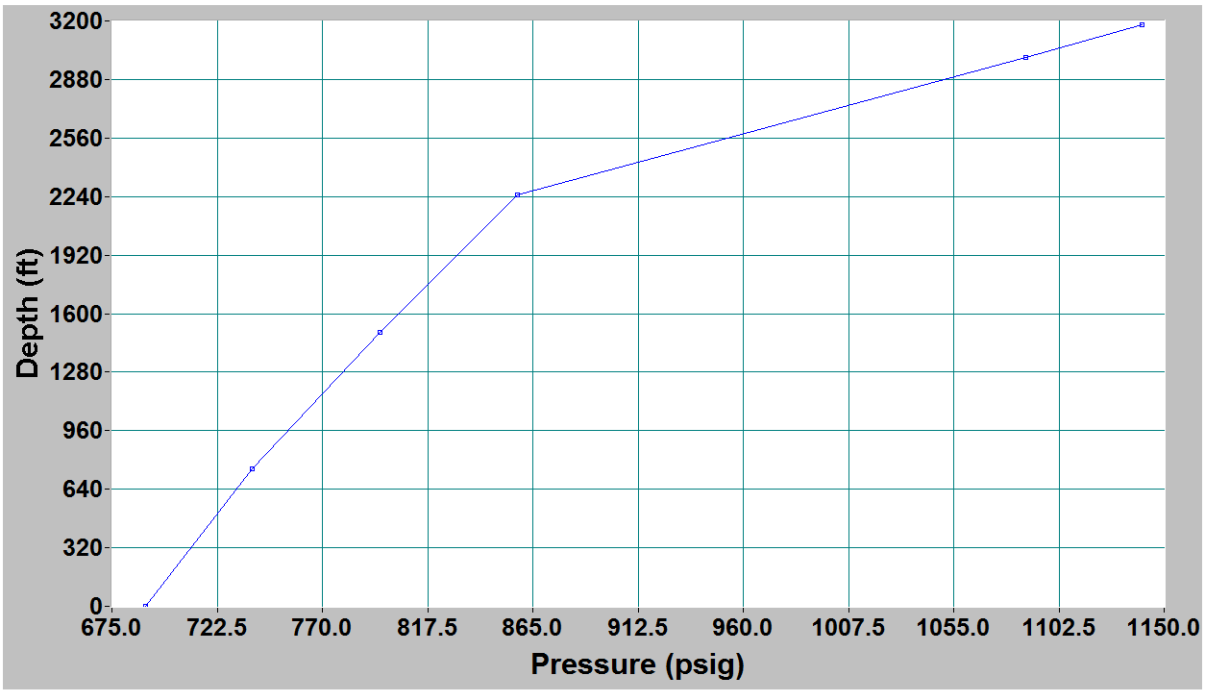
Pressure vs. Depth

Probe Serial Number 90026 - Low Gauge

Stop Time From	Stop Time To	Depth (ft)	Pressure (psig)	Gradient (psi/ft)	(deg F)	(deg F/ft)
		1.000	690.163	-	34.413	-
		750.000	738.550	0.0646	46.292	0.0159
		1500.000	795.815	0.0764	57.517	0.0150
		2250.000	857.938	0.0828	65.051	0.0100
		3000.000	1087.524	0.3061	72.560	0.0100
		3180.000	1140.164	0.2924	74.746	0.0121

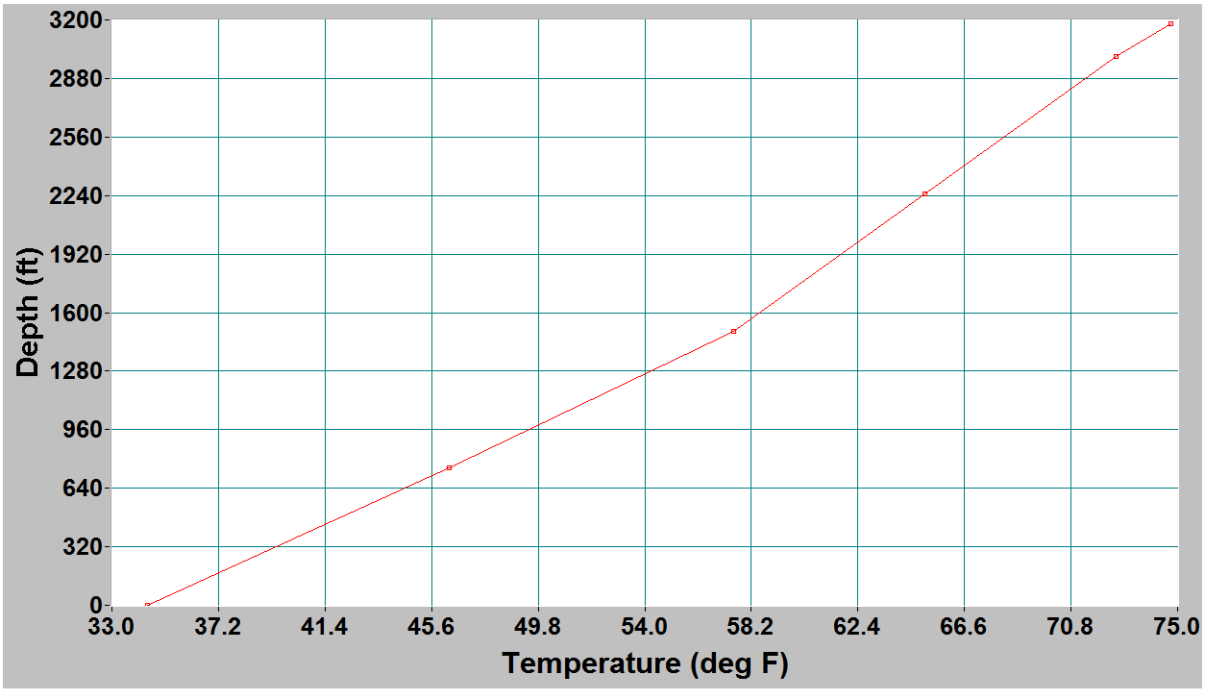
Extrapolated to MPP:	Depth (ft)	Pressure (psig)	(deg F)
	0.000		

90026 - Low Gauge Depth vs. Pressure



RIH Depth 2

90026 - Low Gauge Depth vs. Temperature



RIH Depth 2

Pressure vs. Depth

Probe Serial Number 9642 - Top Gauge

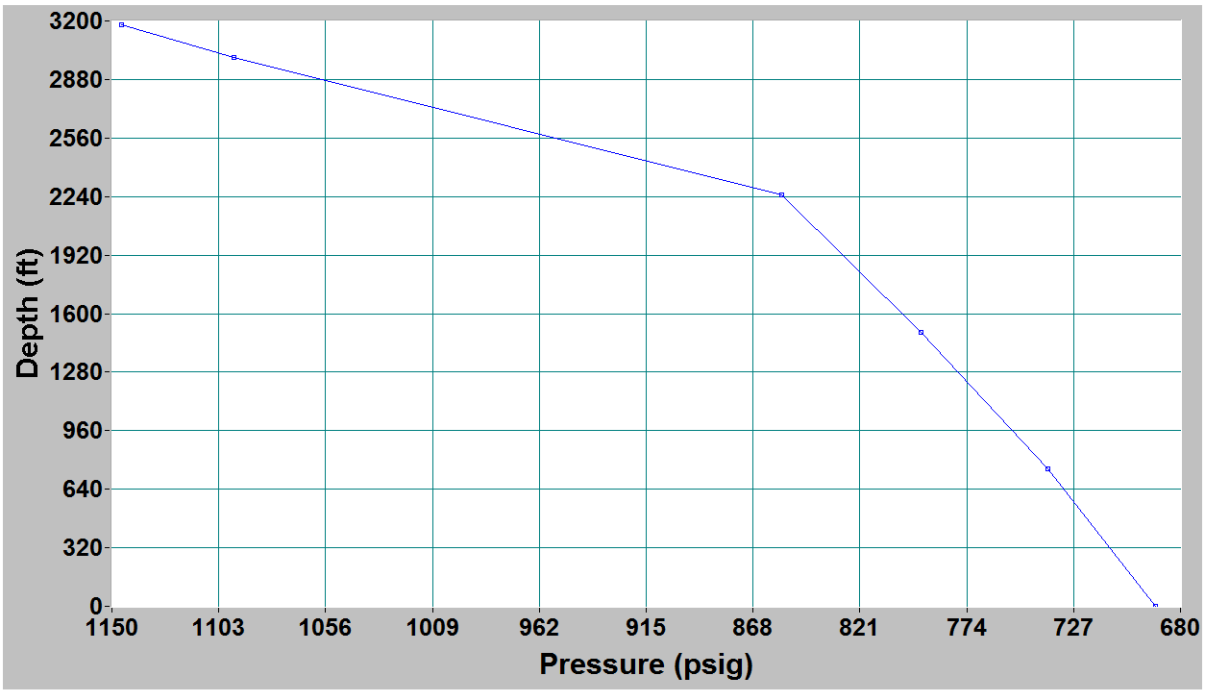
(ft)	(psig)	(psi/ft)	(deg F)	(deg F/ft)
3179.000	1145.642	-	78.954	-
2999.000	1096.122	0.2751	78.728	0.0013
2249.000	855.370	0.3210	74.540	0.0056
1499.000	794.297	0.0814	69.721	0.0064
749.000	738.173	0.0748	62.865	0.0091
0.000	690.778	0.0633	59.790	0.0041

Extrapolated to MPP:

(ft)	(psig)	(deg F)
0.000		

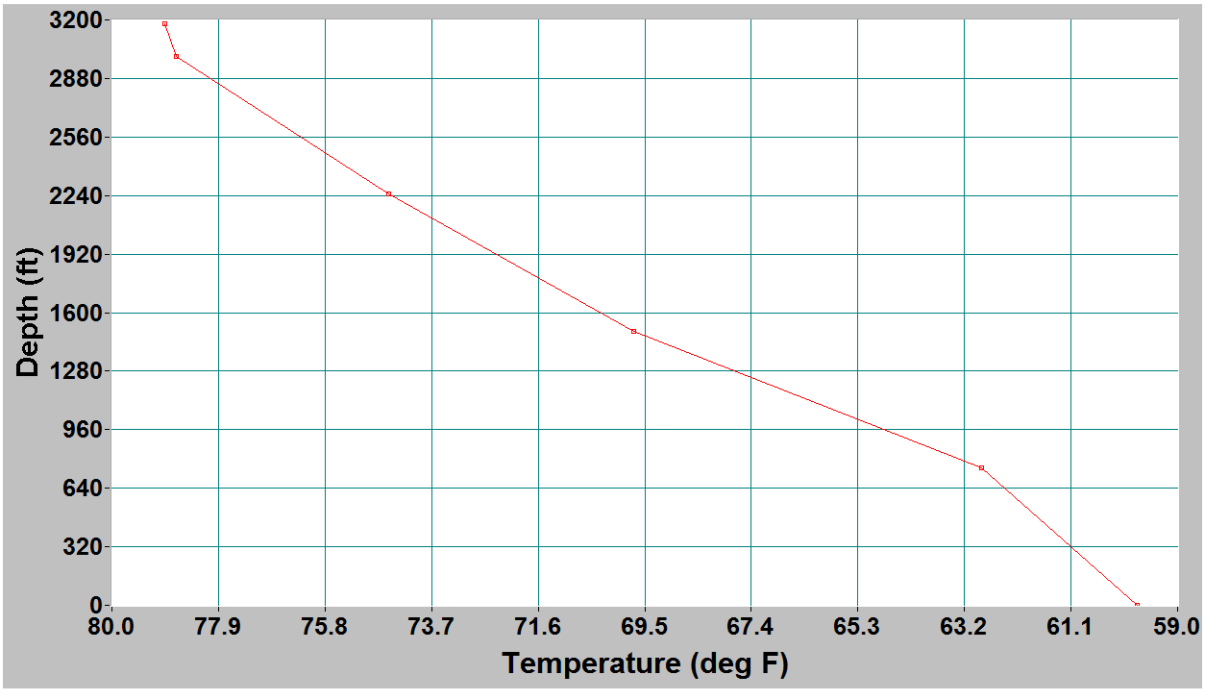
Probe Serial Number 9642 - Top Gauge

9642 - Top Gauge Depth vs. Pressure



POOH Depth 1

9642 - Top Gauge Depth vs. Temperature



POOH Depth 1

Pressure vs. Depth

Probe Serial Number 90026 - Low Gauge

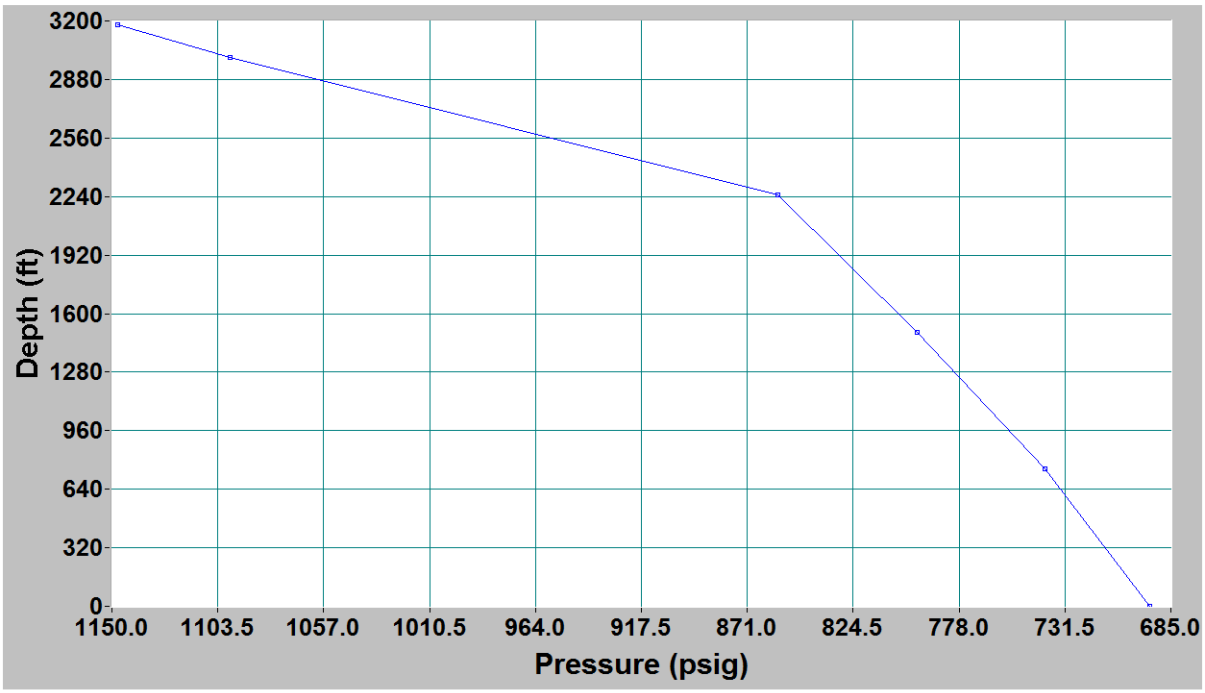
(ft)	(psig)	(psi/ft)	(deg F)	(deg F/ft)
3180.000	1147.361	-	78.885	-
3000.000	1097.992	0.2743	78.694	0.0011
2250.000	857.620	0.3205	74.613	0.0054
1500.000	796.341	0.0817	69.643	0.0066
750.000	740.117	0.0750	62.449	0.0096
1.000	694.391	0.0610	59.202	0.0043

Extrapolated to MPP:

(ft)	(psig)	(deg F)
0.000		

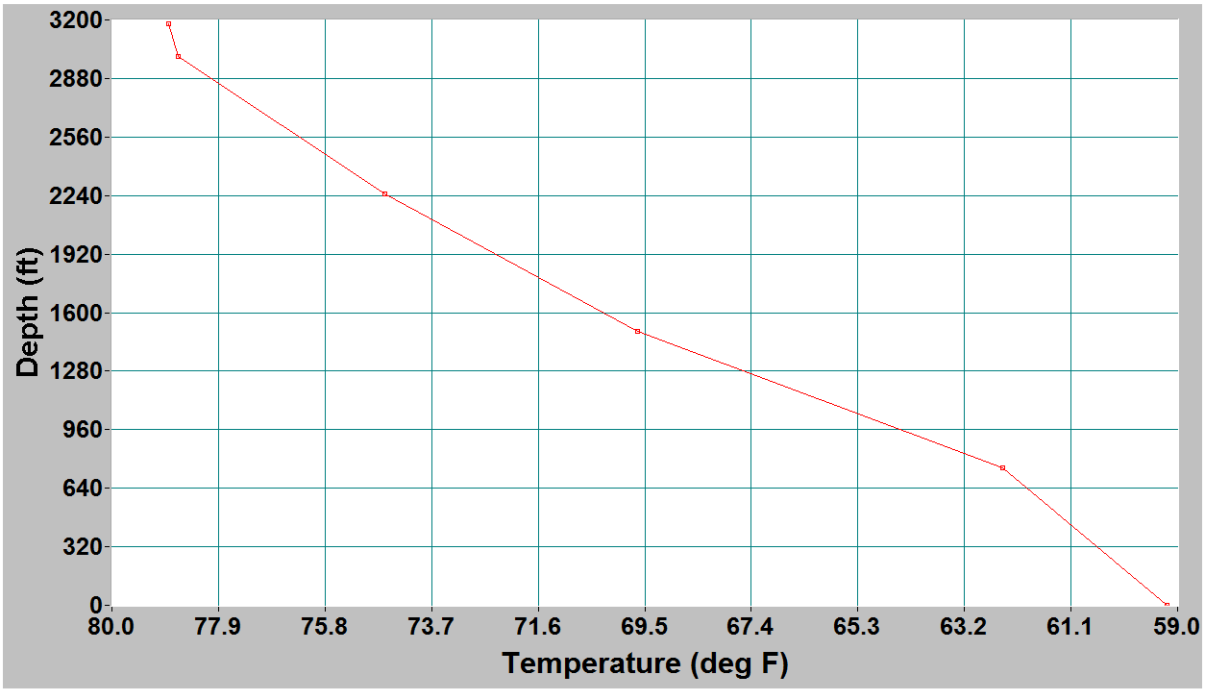
Probe Serial Number 90026 - Low Gauge

90026 - Low Gauge Depth vs. Pressure



POOH Depth 2

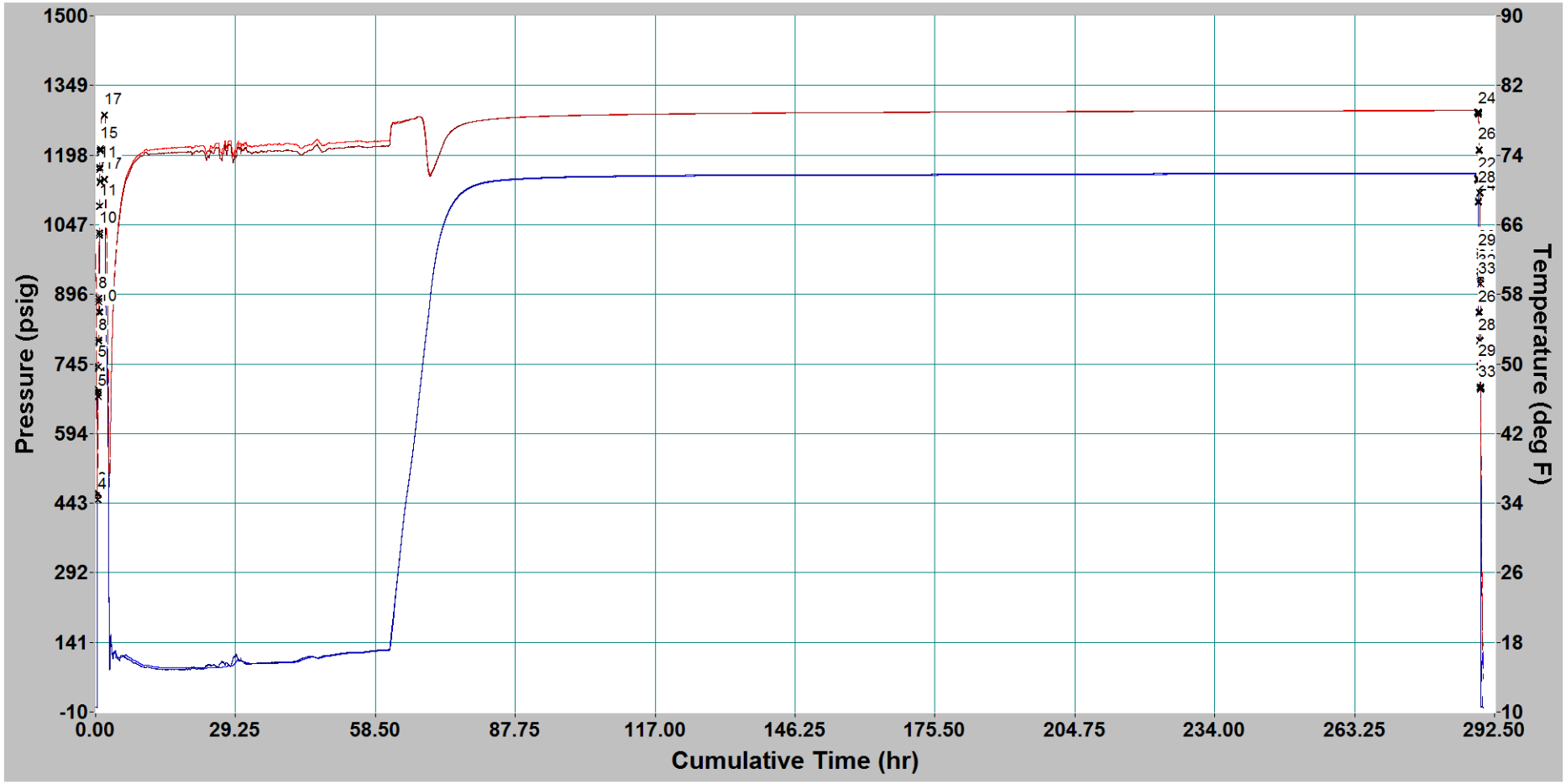
90026 - Low Gauge Depth vs. Temperature



POOH Depth 2

Company Name	Altamont Oil and Gas
Well Name	Danielson
Type of Test	BHP Reservoir Flow/Shut-In
Date(s) of Test	Dec 26, 2014 - Jan 7, 2015

Danielson #33-17



Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2014/12/26	09:01:01	0.0000	0.189	62.644
RIH Gradient: 0.000 ft				
2014/12/26	09:26:57	0.4322	682.405	35.187
Top Gauge start in hole				
2014/12/26	09:27:27	0.4406	683.814	35.056
RIH Gradient: 749.000 ft				
2014/12/26	09:34:17	0.5544	734.900	46.304
RIH Gradient: 1499.000 ft				
2014/12/26	09:41:12	0.6697	791.327	57.147
RIH Gradient: 2249.000 ft				
2014/12/26	09:47:52	0.7808	855.522	64.818
RIH Gradient: 2999.000 ft				
2014/12/26	09:55:02	0.9003	1086.328	72.357
Top Gauge on bottom, 3179' glm				
2014/12/26	09:57:42	0.9447	1137.030	74.287
RIH Gradient: 3179.000 ft				
2014/12/26	09:58:07	0.9517	1138.489	74.530
2014/12/26	09:59:02	0.9669	1139.322	75.013
Top Gauge initial flow				
2014/12/26	10:51:47	1.8461	1144.146	78.587
2014/12/26	10:56:57	1.9322	1109.772	78.528
2014/12/26	11:54:57	2.8989	101.681	36.975
2014/12/26	12:53:02	3.8669	119.949	59.396
2014/12/26	13:50:57	4.8322	107.546	66.429
2014/12/26	14:49:02	5.8003	111.678	70.068
2014/12/26	15:47:02	6.7669	109.799	71.992
2014/12/26	16:45:02	7.7336	103.646	73.178
2014/12/26	17:43:02	8.7003	98.560	73.856
2014/12/26	18:40:57	9.6656	92.586	74.269
2014/12/26	19:38:57	10.6322	90.793	74.643
2014/12/26	20:37:02	11.6003	89.531	74.629
2014/12/26	21:35:02	12.5669	87.641	74.672
2014/12/26	22:32:57	13.5322	86.676	74.714
2014/12/26	23:31:02	14.5003	85.957	74.768
2014/12/27	00:29:02	15.4669	85.789	74.772
2014/12/27	01:26:57	16.4322	85.899	74.873
2014/12/27	02:25:02	17.4003	85.930	74.914
2014/12/27	03:23:02	18.3669	85.860	74.885
2014/12/27	04:20:57	19.3322	85.826	74.987
2014/12/27	05:18:57	20.2989	85.702	74.867
2014/12/27	06:16:57	21.2656	85.636	75.047
2014/12/27	07:14:57	22.2322	85.552	75.098
2014/12/27	08:12:57	23.1989	85.209	74.198
2014/12/27	09:11:02	24.1669	86.092	75.017
2014/12/27	10:08:57	25.1322	86.624	75.342
2014/12/27	11:07:02	26.1003	86.431	74.362
2014/12/27	12:05:02	27.0669	88.598	75.615
2014/12/27	13:03:02	28.0336	89.458	75.654
2014/12/27	14:00:57	28.9989	94.364	74.416
2014/12/27	14:59:02	29.9669	100.743	75.179
2014/12/27	15:57:02	30.9336	99.159	75.106
2014/12/27	16:54:57	31.8989	96.182	75.068
2014/12/27	17:52:57	32.8656	95.206	74.972
2014/12/27	18:51:02	33.8336	94.891	75.026

Date	Time	Cum.Time BH2	BH Pres 2	BH Temp 2
		hr	psig	deg F
2014/12/26	09:03:01	0.0333	0.915	62.428
RIH Gradient: 1.000 ft				
2014/12/26	09:26:57	0.4322	690.163	34.413
Lower Gauge start in hole				
2014/12/26	09:27:27	0.4406	691.156	34.371
RIH Gradient: 750.000 ft				
2014/12/26	09:34:17	0.5544	738.550	46.292
RIH Gradient: 1500.000 ft				
2014/12/26	09:41:12	0.6697	795.815	57.517
RIH Gradient: 2250.000 ft				
2014/12/26	09:47:52	0.7808	857.938	65.051
RIH Gradient: 3000.000 ft				
2014/12/26	09:55:02	0.9003	1087.524	72.560
Lower Gauge on bottom, 3180' glm				
2014/12/26	09:57:42	0.9447	1140.740	74.501
RIH Gradient: 3180.000 ft				
2014/12/26	09:58:07	0.9517	1140.164	74.746
2014/12/26	10:01:02	1.0003	1142.090	76.057
Lower Gauge initial flow				
2014/12/26	10:51:47	1.8461	1145.523	78.609
2014/12/26	10:58:57	1.9656	1112.194	78.469
2014/12/26	11:56:57	2.9322	91.042	36.690
2014/12/26	12:55:02	3.9003	116.246	59.495
2014/12/26	13:52:57	4.8656	102.861	66.082
2014/12/26	14:51:02	5.8336	110.663	69.830
2014/12/26	15:49:02	6.8003	104.491	71.650
2014/12/26	16:47:02	7.7669	97.797	72.981
2014/12/26	17:45:02	8.7336	93.553	73.566
2014/12/26	18:42:57	9.6989	88.186	73.910
2014/12/26	19:40:57	10.6656	87.816	74.262
2014/12/26	20:39:02	11.6336	85.223	74.175
2014/12/26	21:37:02	12.6003	83.877	74.156
2014/12/26	22:34:57	13.5656	82.617	74.182
2014/12/26	23:33:02	14.5336	82.339	74.227
2014/12/27	00:31:02	15.5003	83.074	74.220
2014/12/27	01:28:57	16.4656	82.802	74.312
2014/12/27	02:27:02	17.4336	81.559	74.359
2014/12/27	03:25:02	18.4003	82.065	74.303
2014/12/27	04:22:57	19.3656	82.634	74.398
2014/12/27	05:20:57	20.3322	84.374	74.258
2014/12/27	06:18:57	21.2989	83.024	74.438
2014/12/27	07:16:57	22.2656	82.775	74.503
2014/12/27	08:14:57	23.2322	90.679	73.520
2014/12/27	09:13:02	24.2003	91.232	74.377
2014/12/27	10:10:57	25.1656	89.509	74.907
2014/12/27	11:09:02	26.1336	95.337	73.607
2014/12/27	12:07:02	27.1003	93.045	75.229
2014/12/27	13:05:02	28.0669	89.754	75.190
2014/12/27	14:02:57	29.0322	108.857	73.756
2014/12/27	15:01:02	30.0003	102.059	74.637
2014/12/27	15:59:02	30.9669	98.980	74.513
2014/12/27	16:56:57	31.9322	93.982	74.382
2014/12/27	17:54:57	32.8989	95.159	74.255
2014/12/27	18:53:02	33.8669	95.896	74.281

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2014/12/27	19:48:57	34.7989	94.855	75.108
2014/12/27	20:47:02	35.7669	95.078	75.146
2014/12/27	21:45:02	36.7336	95.254	75.192
2014/12/27	22:42:57	37.6989	95.702	75.280
2014/12/27	23:41:02	38.6669	96.006	75.238
2014/12/28	00:38:57	39.6322	96.784	75.308
2014/12/28	01:36:57	40.5989	96.646	75.293
2014/12/28	02:35:02	41.5669	97.387	75.216
2014/12/28	03:33:02	42.5336	99.331	74.973
2014/12/28	04:30:57	43.4989	104.132	74.911
2014/12/28	05:29:02	44.4669	107.325	75.169
2014/12/28	06:27:02	45.4336	108.955	75.333
2014/12/28	07:25:02	46.4003	106.462	75.733
2014/12/28	08:22:57	47.3656	108.185	75.083
2014/12/28	09:21:02	48.3336	110.891	75.264
2014/12/28	10:18:57	49.2989	111.806	75.361
2014/12/28	11:16:57	50.2656	113.349	75.397
2014/12/28	12:14:57	51.2322	115.060	75.417
2014/12/28	13:12:57	52.1989	116.627	75.506
2014/12/28	14:10:57	53.1656	117.498	75.520
2014/12/28	15:09:02	54.1336	118.332	75.557
2014/12/28	16:07:02	55.1003	117.720	75.643
2014/12/28	17:04:57	56.0656	118.345	75.527
2014/12/28	18:03:02	57.0336	119.815	75.511
2014/12/28	19:01:02	58.0003	121.061	75.560
2014/12/28	19:58:57	58.9656	122.117	75.597
2014/12/28	20:57:02	59.9336	122.817	75.622
2014/12/28	21:55:02	60.9003	123.204	75.623
2014/12/28	22:52:57	61.8656	152.500	77.428
2014/12/28	23:50:57	62.8322	252.958	77.777
2014/12/29	00:49:02	63.8003	347.645	77.864
2014/12/29	01:47:02	64.7669	436.277	77.998
2014/12/29	02:45:02	65.7336	507.339	78.117
2014/12/29	03:43:02	66.7003	585.658	78.203
2014/12/29	04:40:57	67.6656	676.780	78.428
2014/12/29	05:38:57	68.6322	765.921	77.704
2014/12/29	06:37:02	69.6003	849.251	72.354
2014/12/29	07:35:02	70.5669	937.931	72.374
2014/12/29	08:32:57	71.5322	997.325	73.661
2014/12/29	09:30:57	72.4989	1037.845	74.994
2014/12/29	10:29:02	73.4669	1066.361	76.113
2014/12/29	11:27:02	74.4336	1087.051	76.750
2014/12/29	12:24:57	75.3989	1102.034	77.155
2014/12/29	13:22:57	76.3656	1112.969	77.428
2014/12/29	14:21:02	77.3336	1120.996	77.620
2014/12/29	15:18:57	78.2989	1126.884	77.758
2014/12/29	16:17:02	79.2669	1131.253	77.865
2014/12/29	17:15:02	80.2336	1134.460	77.951
2014/12/29	18:13:02	81.2003	1136.924	78.025
2014/12/29	19:11:02	82.1669	1138.843	78.090
2014/12/29	20:08:57	83.1322	1140.351	78.146
2014/12/29	21:06:57	84.0989	1141.545	78.196
2014/12/29	22:05:02	85.0669	1142.512	78.240
2014/12/29	23:03:02	86.0336	1143.330	78.279

Date	Time	Cum.Time BH2	BH Pres 2	BH Temp 2
		hr	psig	deg F
2014/12/27	19:50:57	34.8322	95.870	74.390
2014/12/27	20:49:02	35.8003	96.450	74.400
2014/12/27	21:47:02	36.7669	96.971	74.465
2014/12/27	22:44:57	37.7322	97.457	74.511
2014/12/27	23:43:02	38.7003	98.084	74.452
2014/12/28	00:40:57	39.6656	98.066	74.550
2014/12/28	01:38:57	40.6322	98.120	74.518
2014/12/28	02:37:02	41.6003	99.656	74.447
2014/12/28	03:35:02	42.5669	102.395	74.203
2014/12/28	04:32:57	43.5322	106.794	74.215
2014/12/28	05:31:02	44.5003	109.895	74.517
2014/12/28	06:29:02	45.4669	110.186	74.750
2014/12/28	07:27:02	46.4336	107.105	75.115
2014/12/28	08:24:57	47.3989	110.895	74.344
2014/12/28	09:23:02	48.3669	112.601	74.650
2014/12/28	10:20:57	49.3322	113.796	74.712
2014/12/28	11:18:57	50.2989	115.171	74.772
2014/12/28	12:16:57	51.2656	117.083	74.797
2014/12/28	13:14:57	52.2322	118.227	74.904
2014/12/28	14:12:57	53.1989	119.363	74.918
2014/12/28	15:11:02	54.1669	119.654	74.941
2014/12/28	16:09:02	55.1336	119.116	75.021
2014/12/28	17:06:57	56.0989	120.069	74.894
2014/12/28	18:05:02	57.0669	121.538	74.889
2014/12/28	19:03:02	58.0336	122.623	74.961
2014/12/28	20:00:57	58.9989	124.127	74.990
2014/12/28	20:59:02	59.9669	124.334	75.029
2014/12/28	21:57:02	60.9336	124.519	75.036
2014/12/28	22:54:57	61.8989	168.756	77.327
2014/12/28	23:52:57	62.8656	260.229	77.629
2014/12/29	00:51:02	63.8336	353.290	77.727
2014/12/29	01:49:02	64.8003	440.758	77.898
2014/12/29	02:47:02	65.7669	511.290	78.089
2014/12/29	03:45:02	66.7336	590.019	78.158
2014/12/29	04:42:57	67.6989	681.118	78.405
2014/12/29	05:40:57	68.6656	770.940	77.283
2014/12/29	06:39:02	69.6336	853.633	71.940
2014/12/29	07:37:02	70.6003	941.923	72.307
2014/12/29	08:34:57	71.5656	1000.524	73.650
2014/12/29	09:32:57	72.5322	1040.582	75.037
2014/12/29	10:31:02	73.5003	1068.835	76.171
2014/12/29	11:29:02	74.4669	1089.335	76.791
2014/12/29	12:26:57	75.4322	1104.186	77.184
2014/12/29	13:24:57	76.3989	1115.018	77.449
2014/12/29	14:23:02	77.3669	1122.977	77.634
2014/12/29	15:20:57	78.3322	1128.810	77.766
2014/12/29	16:19:02	79.3003	1133.145	77.867
2014/12/29	17:17:02	80.2669	1136.332	77.948
2014/12/29	18:15:02	81.2336	1138.778	78.017
2014/12/29	19:13:02	82.2003	1140.692	78.079
2014/12/29	20:10:57	83.1656	1142.198	78.132
2014/12/29	21:08:57	84.1322	1143.413	78.180
2014/12/29	22:07:02	85.1003	1144.412	78.221
2014/12/29	23:05:02	86.0669	1145.263	78.258

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2014/12/30	00:00:57	86.9989	1144.096	78.314
2014/12/30	00:59:02	87.9669	1144.782	78.345
2014/12/30	01:57:02	88.9336	1145.380	78.372
2014/12/30	02:54:57	89.8989	1145.914	78.397
2014/12/30	03:52:57	90.8656	1146.402	78.419
2014/12/30	04:51:02	91.8336	1146.854	78.439
2014/12/30	05:48:57	92.7989	1147.276	78.458
2014/12/30	06:46:57	93.7656	1147.661	78.475
2014/12/30	07:44:57	94.7322	1148.022	78.491
2014/12/30	08:42:57	95.6989	1148.356	78.507
2014/12/30	09:40:57	96.6656	1148.675	78.521
2014/12/30	10:39:02	97.6336	1148.995	78.535
2014/12/30	11:36:57	98.5989	1149.276	78.548
2014/12/30	12:35:02	99.5669	1149.504	78.560
2014/12/30	13:33:02	100.5336	1149.705	78.572
2014/12/30	14:31:02	101.5003	1149.892	78.583
2014/12/30	15:28:57	102.4656	1150.046	78.594
2014/12/30	16:27:02	103.4336	1150.200	78.604
2014/12/30	17:25:02	104.4003	1150.340	78.614
2014/12/30	18:22:57	105.3656	1150.478	78.624
2014/12/30	19:20:57	106.3322	1150.604	78.633
2014/12/30	20:19:02	107.3003	1150.739	78.642
2014/12/30	21:16:57	108.2656	1150.865	78.651
2014/12/30	22:15:02	109.2336	1151.000	78.659
2014/12/30	23:13:02	110.2003	1151.138	78.668
2014/12/31	00:10:57	111.1656	1151.259	78.676
2014/12/31	01:09:02	112.1336	1151.380	78.683
2014/12/31	02:06:57	113.0989	1151.490	78.691
2014/12/31	03:04:57	114.0656	1151.611	78.698
2014/12/31	04:03:02	115.0336	1151.737	78.705
2014/12/31	05:01:02	116.0003	1151.856	78.711
2014/12/31	05:58:57	116.9656	1151.977	78.718
2014/12/31	06:56:57	117.9322	1152.090	78.724
2014/12/31	07:55:02	118.9003	1152.191	78.730
2014/12/31	08:53:02	119.8669	1152.288	78.736
2014/12/31	09:50:57	120.8322	1152.390	78.742
2014/12/31	10:49:02	121.8003	1152.497	78.748
2014/12/31	11:46:57	122.7656	1152.577	78.754
2014/12/31	12:44:57	123.7322	1152.665	78.760
2014/12/31	13:42:57	124.6989	1152.650	78.764
2014/12/31	14:40:57	125.6656	1152.725	78.769
2014/12/31	15:38:57	126.6322	1152.801	78.775
2014/12/31	16:37:02	127.6003	1152.895	78.781
2014/12/31	17:35:02	128.5669	1152.958	78.786
2014/12/31	18:32:57	129.5322	1153.027	78.791
2014/12/31	19:31:02	130.5003	1153.087	78.796
2014/12/31	20:29:02	131.4669	1153.156	78.801
2014/12/31	21:26:57	132.4322	1153.244	78.806
2014/12/31	22:25:02	133.4003	1153.327	78.810
2014/12/31	23:23:02	134.3669	1153.401	78.815
2015/01/01	00:20:57	135.3322	1153.469	78.820
2015/01/01	01:19:02	136.3003	1153.522	78.824
2015/01/01	02:17:02	137.2669	1153.535	78.829
2015/01/01	03:15:02	138.2336	1153.554	78.834

Date	Time	Cum.Time BH2	BH Pres 2	BH Temp 2
		hr	psig	deg F
2014/12/30	00:02:57	87.0322	1146.005	78.291
2014/12/30	01:01:02	88.0003	1146.651	78.320
2014/12/30	01:59:02	88.9669	1147.229	78.346
2014/12/30	02:56:57	89.9322	1147.755	78.369
2014/12/30	03:54:57	90.8989	1148.236	78.390
2014/12/30	04:53:02	91.8669	1148.676	78.409
2014/12/30	05:50:57	92.8322	1149.096	78.427
2014/12/30	06:48:57	93.7989	1149.482	78.443
2014/12/30	07:46:57	94.7656	1149.841	78.459
2014/12/30	08:44:57	95.7322	1150.166	78.475
2014/12/30	09:42:57	96.6989	1150.489	78.489
2014/12/30	10:41:02	97.6669	1150.809	78.503
2014/12/30	11:38:57	98.6322	1151.087	78.517
2014/12/30	12:37:02	99.6003	1151.316	78.529
2014/12/30	13:35:02	100.5669	1151.519	78.541
2014/12/30	14:33:02	101.5336	1151.703	78.553
2014/12/30	15:30:57	102.4989	1151.856	78.564
2014/12/30	16:29:02	103.4669	1152.012	78.575
2014/12/30	17:27:02	104.4336	1152.146	78.584
2014/12/30	18:24:57	105.3989	1152.288	78.594
2014/12/30	19:22:57	106.3656	1152.417	78.603
2014/12/30	20:21:02	107.3336	1152.553	78.612
2014/12/30	21:18:57	108.2989	1152.682	78.620
2014/12/30	22:17:02	109.2669	1152.812	78.628
2014/12/30	23:15:02	110.2336	1152.952	78.636
2014/12/31	00:12:57	111.1989	1153.077	78.644
2014/12/31	01:11:02	112.1669	1153.194	78.652
2014/12/31	02:08:57	113.1322	1153.306	78.659
2014/12/31	03:06:57	114.0989	1153.428	78.666
2014/12/31	04:05:02	115.0669	1153.548	78.672
2014/12/31	05:03:02	116.0336	1153.673	78.679
2014/12/31	06:00:57	116.9989	1153.785	78.685
2014/12/31	06:58:57	117.9656	1153.896	78.692
2014/12/31	07:57:02	118.9336	1154.005	78.698
2014/12/31	08:55:02	119.9003	1154.102	78.704
2014/12/31	09:52:57	120.8656	1154.200	78.710
2014/12/31	10:51:02	121.8336	1154.303	78.716
2014/12/31	11:48:57	122.7989	1154.392	78.722
2014/12/31	12:46:57	123.7656	1154.476	78.728
2014/12/31	13:44:57	124.7322	1154.465	78.733
2014/12/31	14:42:57	125.6989	1154.538	78.739
2014/12/31	15:40:57	126.6656	1154.610	78.744
2014/12/31	16:39:02	127.6336	1154.702	78.749
2014/12/31	17:37:02	128.6003	1154.772	78.755
2014/12/31	18:34:57	129.5656	1154.839	78.760
2014/12/31	19:33:02	130.5336	1154.895	78.765
2014/12/31	20:31:02	131.5003	1154.973	78.770
2014/12/31	21:28:57	132.4656	1155.053	78.774
2014/12/31	22:27:02	133.4336	1155.140	78.779
2014/12/31	23:25:02	134.4003	1155.212	78.784
2015/01/01	00:22:57	135.3656	1155.279	78.789
2015/01/01	01:21:02	136.3336	1155.332	78.794
2015/01/01	02:19:02	137.3003	1155.349	78.799
2015/01/01	03:17:02	138.2669	1155.369	78.804

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2015/01/01	04:13:02	139.2003	1153.567	78.838
2015/01/01	05:11:02	140.1669	1153.575	78.842
2015/01/01	06:09:02	141.1336	1153.580	78.846
2015/01/01	07:06:57	142.0989	1153.580	78.851
2015/01/01	08:05:02	143.0669	1153.585	78.854
2015/01/01	09:03:02	144.0336	1153.587	78.858
2015/01/01	10:01:02	145.0003	1153.598	78.862
2015/01/01	10:58:57	145.9656	1153.612	78.866
2015/01/01	11:57:02	146.9336	1153.614	78.870
2015/01/01	12:55:02	147.9003	1153.639	78.873
2015/01/01	13:52:57	148.8656	1153.638	78.877
2015/01/01	14:50:57	149.8322	1153.649	78.880
2015/01/01	15:49:02	150.8003	1153.654	78.884
2015/01/01	16:46:57	151.7656	1153.659	78.887
2015/01/01	17:45:02	152.7336	1153.654	78.890
2015/01/01	18:43:02	153.7003	1153.653	78.893
2015/01/01	19:40:57	154.6656	1153.667	78.895
2015/01/01	20:39:02	155.6336	1153.672	78.897
2015/01/01	21:36:57	156.5989	1153.686	78.899
2015/01/01	22:34:57	157.5656	1153.697	78.901
2015/01/01	23:33:02	158.5336	1153.710	78.904
2015/01/02	00:31:02	159.5003	1153.729	78.906
2015/01/02	01:28:57	160.4656	1153.749	78.909
2015/01/02	02:27:02	161.4336	1153.765	78.912
2015/01/02	03:25:02	162.4003	1153.792	78.915
2015/01/02	04:23:02	163.3669	1153.800	78.918
2015/01/02	05:20:57	164.3322	1153.836	78.921
2015/01/02	06:19:02	165.3003	1153.852	78.924
2015/01/02	07:16:57	166.2656	1153.888	78.927
2015/01/02	08:14:57	167.2322	1153.915	78.930
2015/01/02	09:12:57	168.1989	1153.976	78.933
2015/01/02	10:10:57	169.1656	1154.047	78.936
2015/01/02	11:08:57	170.1322	1154.097	78.938
2015/01/02	12:07:02	171.1003	1154.149	78.941
2015/01/02	13:04:57	172.0656	1154.210	78.944
2015/01/02	14:02:57	173.0322	1154.262	78.947
2015/01/02	15:01:02	174.0003	1154.323	78.949
2015/01/02	15:59:02	174.9669	1154.370	78.952
2015/01/02	16:56:57	175.9322	1154.422	78.953
2015/01/02	17:55:02	176.9003	1154.483	78.955
2015/01/02	18:53:02	177.8669	1154.546	78.958
2015/01/02	19:50:57	178.8322	1154.621	78.959
2015/01/02	20:48:57	179.7989	1154.676	78.963
2015/01/02	21:47:02	180.7669	1154.720	78.965
2015/01/02	22:45:02	181.7336	1154.761	78.968
2015/01/02	23:43:02	182.7003	1154.802	78.970
2015/01/03	00:41:02	183.6669	1154.833	78.972
2015/01/03	01:38:57	184.6322	1154.863	78.975
2015/01/03	02:37:02	185.6003	1154.882	78.977
2015/01/03	03:34:57	186.5656	1154.898	78.980
2015/01/03	04:32:57	187.5322	1154.926	78.982
2015/01/03	05:31:02	188.5003	1154.942	78.984
2015/01/03	06:29:02	189.4669	1154.953	78.987
2015/01/03	07:27:02	190.4336	1154.969	78.988

Date	Time	Cum.Time BH2	BH Pres 2	BH Temp 2
		hr	psig	deg F
2015/01/01	04:15:02	139.2336	1155.378	78.808
2015/01/01	05:13:02	140.2003	1155.384	78.813
2015/01/01	06:11:02	141.1669	1155.390	78.817
2015/01/01	07:08:57	142.1322	1155.390	78.821
2015/01/01	08:07:02	143.1003	1155.396	78.825
2015/01/01	09:05:02	144.0669	1155.399	78.829
2015/01/01	10:03:02	145.0336	1155.411	78.833
2015/01/01	11:00:57	145.9989	1155.422	78.837
2015/01/01	11:59:02	146.9669	1155.431	78.841
2015/01/01	12:57:02	147.9336	1155.445	78.844
2015/01/01	13:54:57	148.8989	1155.448	78.848
2015/01/01	14:52:57	149.8656	1155.462	78.851
2015/01/01	15:51:02	150.8336	1155.466	78.854
2015/01/01	16:48:57	151.7989	1155.474	78.858
2015/01/01	17:47:02	152.7669	1155.469	78.861
2015/01/01	18:45:02	153.7336	1155.466	78.864
2015/01/01	19:42:57	154.6989	1155.475	78.867
2015/01/01	20:41:02	155.6669	1155.484	78.869
2015/01/01	21:38:57	156.6322	1155.503	78.872
2015/01/01	22:36:57	157.5989	1155.512	78.875
2015/01/01	23:35:02	158.5669	1155.529	78.877
2015/01/02	00:33:02	159.5336	1155.548	78.880
2015/01/02	01:30:57	160.4989	1155.565	78.883
2015/01/02	02:29:02	161.4669	1155.579	78.886
2015/01/02	03:27:02	162.4336	1155.602	78.888
2015/01/02	04:25:02	163.4003	1155.619	78.891
2015/01/02	05:22:57	164.3656	1155.647	78.894
2015/01/02	06:21:02	165.3336	1155.675	78.897
2015/01/02	07:18:57	166.2989	1155.708	78.900
2015/01/02	08:16:57	167.2656	1155.733	78.903
2015/01/02	09:14:57	168.2322	1155.795	78.907
2015/01/02	10:12:57	169.1989	1155.867	78.909
2015/01/02	11:10:57	170.1656	1155.911	78.912
2015/01/02	12:09:02	171.1336	1155.967	78.915
2015/01/02	13:06:57	172.0989	1156.025	78.917
2015/01/02	14:04:57	173.0656	1156.089	78.919
2015/01/02	15:03:02	174.0336	1156.137	78.922
2015/01/02	16:01:02	175.0003	1156.189	78.923
2015/01/02	16:58:57	175.9656	1156.242	78.926
2015/01/02	17:57:02	176.9336	1156.298	78.928
2015/01/02	18:55:02	177.9003	1156.370	78.930
2015/01/02	19:52:57	178.8656	1156.440	78.933
2015/01/02	20:50:57	179.8322	1156.490	78.935
2015/01/02	21:49:02	180.8003	1156.531	78.938
2015/01/02	22:47:02	181.7669	1156.573	78.940
2015/01/02	23:45:02	182.7336	1156.615	78.942
2015/01/03	00:43:02	183.7003	1156.646	78.945
2015/01/03	01:40:57	184.6656	1156.676	78.948
2015/01/03	02:39:02	185.6336	1156.696	78.950
2015/01/03	03:36:57	186.5989	1156.713	78.952
2015/01/03	04:34:57	187.5656	1156.735	78.955
2015/01/03	05:33:02	188.5336	1156.755	78.957
2015/01/03	06:31:02	189.5003	1156.769	78.959
2015/01/03	07:29:02	190.4669	1156.791	78.962

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2015/01/03	08:24:57	191.3989	1154.999	78.991
2015/01/03	09:23:02	192.3669	1155.024	78.993
2015/01/03	10:21:02	193.3336	1155.065	78.995
2015/01/03	11:18:57	194.2989	1155.112	78.997
2015/01/03	12:17:02	195.2669	1155.156	79.000
2015/01/03	13:14:57	196.2322	1155.198	79.002
2015/01/03	14:12:57	197.1989	1155.242	79.004
2015/01/03	15:10:57	198.1656	1155.269	79.005
2015/01/03	16:08:57	199.1322	1155.291	79.007
2015/01/03	17:07:02	200.1003	1155.330	79.009
2015/01/03	18:05:02	201.0669	1155.368	79.012
2015/01/03	19:03:02	202.0336	1155.404	79.014
2015/01/03	20:00:57	202.9989	1155.437	79.015
2015/01/03	20:59:02	203.9669	1155.456	79.017
2015/01/03	21:57:02	204.9336	1155.486	79.019
2015/01/03	22:54:57	205.8989	1155.517	79.021
2015/01/03	23:53:02	206.8669	1155.547	79.023
2015/01/04	00:51:02	207.8336	1155.585	79.024
2015/01/04	01:49:02	208.8003	1155.632	79.026
2015/01/04	02:47:02	209.7669	1155.685	79.028
2015/01/04	03:45:02	210.7336	1155.748	79.030
2015/01/04	04:43:02	211.7003	1155.798	79.031
2015/01/04	05:41:02	212.6669	1155.836	79.034
2015/01/04	06:38:57	213.6322	1155.880	79.036
2015/01/04	07:37:02	214.6003	1155.913	79.038
2015/01/04	08:34:57	215.5656	1155.947	79.039
2015/01/04	09:33:02	216.5336	1155.977	79.040
2015/01/04	10:31:02	217.5003	1156.024	79.042
2015/01/04	11:29:02	218.4669	1156.051	79.044
2015/01/04	12:26:57	219.4322	1156.090	79.046
2015/01/04	13:25:02	220.4003	1156.123	79.047
2015/01/04	14:23:02	221.3669	1156.153	79.048
2015/01/04	15:20:57	222.3322	1156.170	79.050
2015/01/04	16:18:57	223.2989	1156.178	79.051
2015/01/04	17:17:02	224.2669	1156.189	79.052
2015/01/04	18:14:57	225.2322	1156.205	79.054
2015/01/04	19:13:02	226.2003	1156.246	79.056
2015/01/04	20:11:02	227.1669	1156.274	79.057
2015/01/04	21:08:57	228.1322	1156.310	79.059
2015/01/04	22:07:02	229.1003	1156.332	79.061
2015/01/04	23:04:57	230.0656	1156.345	79.062
2015/01/05	00:02:57	231.0322	1156.367	79.064
2015/01/05	01:01:02	232.0003	1156.395	79.067
2015/01/05	01:59:02	232.9669	1156.414	79.068
2015/01/05	02:56:57	233.9322	1156.439	79.069
2015/01/05	03:55:02	234.9003	1156.458	79.070
2015/01/05	04:53:02	235.8669	1156.480	79.073
2015/01/05	05:51:02	236.8336	1156.510	79.074
2015/01/05	06:48:57	237.7989	1156.532	79.075
2015/01/05	07:47:02	238.7669	1156.551	79.077
2015/01/05	08:44:57	239.7322	1156.568	79.079
2015/01/05	09:42:57	240.6989	1156.587	79.080
2015/01/05	10:40:57	241.6656	1156.606	79.081
2015/01/05	11:38:57	242.6322	1156.634	79.082

Date	Time	Cum.Time BH2	BH Pres 2	BH Temp 2
		hr	psig	deg F
2015/01/03	08:26:57	191.4322	1156.811	78.964
2015/01/03	09:25:02	192.4003	1156.836	78.966
2015/01/03	10:23:02	193.3669	1156.875	78.968
2015/01/03	11:20:57	194.3322	1156.922	78.971
2015/01/03	12:19:02	195.3003	1156.972	78.973
2015/01/03	13:16:57	196.2656	1157.014	78.975
2015/01/03	14:14:57	197.2322	1157.050	78.978
2015/01/03	15:12:57	198.1989	1157.078	78.979
2015/01/03	16:10:57	199.1656	1157.098	78.981
2015/01/03	17:09:02	200.1336	1157.142	78.984
2015/01/03	18:07:02	201.1003	1157.176	78.986
2015/01/03	19:05:02	202.0669	1157.215	78.987
2015/01/03	20:02:57	203.0322	1157.242	78.989
2015/01/03	21:01:02	204.0003	1157.268	78.992
2015/01/03	21:59:02	204.9669	1157.287	78.993
2015/01/03	22:56:57	205.9322	1157.309	78.995
2015/01/03	23:55:02	206.9003	1157.340	78.997
2015/01/04	00:53:02	207.8669	1157.385	78.999
2015/01/04	01:51:02	208.8336	1157.426	79.001
2015/01/04	02:49:02	209.8003	1157.479	79.002
2015/01/04	03:47:02	210.7669	1157.540	79.004
2015/01/04	04:45:02	211.7336	1157.593	79.006
2015/01/04	05:43:02	212.7003	1157.632	79.008
2015/01/04	06:40:57	213.6656	1157.676	79.010
2015/01/04	07:39:02	214.6336	1157.712	79.011
2015/01/04	08:36:57	215.5989	1157.740	79.013
2015/01/04	09:35:02	216.5669	1157.763	79.015
2015/01/04	10:33:02	217.5336	1157.810	79.017
2015/01/04	11:31:02	218.5003	1157.843	79.018
2015/01/04	12:28:57	219.4656	1157.879	79.020
2015/01/04	13:27:02	220.4336	1157.907	79.022
2015/01/04	14:25:02	221.4003	1157.935	79.023
2015/01/04	15:22:57	222.3656	1157.957	79.025
2015/01/04	16:20:57	223.3322	1157.963	79.026
2015/01/04	17:19:02	224.3003	1157.977	79.027
2015/01/04	18:16:57	225.2656	1157.994	79.029
2015/01/04	19:15:02	226.2336	1158.033	79.031
2015/01/04	20:13:02	227.2003	1158.063	79.033
2015/01/04	21:10:57	228.1656	1158.097	79.034
2015/01/04	22:09:02	229.1336	1158.119	79.036
2015/01/04	23:06:57	230.0989	1158.133	79.038
2015/01/05	00:04:57	231.0656	1158.150	79.039
2015/01/05	01:03:02	232.0336	1158.178	79.041
2015/01/05	02:01:02	233.0003	1158.192	79.043
2015/01/05	02:58:57	233.9656	1158.214	79.044
2015/01/05	03:57:02	234.9336	1158.239	79.046
2015/01/05	04:55:02	235.9003	1158.259	79.047
2015/01/05	05:53:02	236.8669	1158.287	79.049
2015/01/05	06:50:57	237.8322	1158.312	79.051
2015/01/05	07:49:02	238.8003	1158.331	79.052
2015/01/05	08:46:57	239.7656	1158.348	79.053
2015/01/05	09:44:57	240.7322	1158.370	79.055
2015/01/05	10:42:57	241.6989	1158.390	79.057
2015/01/05	11:40:57	242.6656	1158.409	79.058

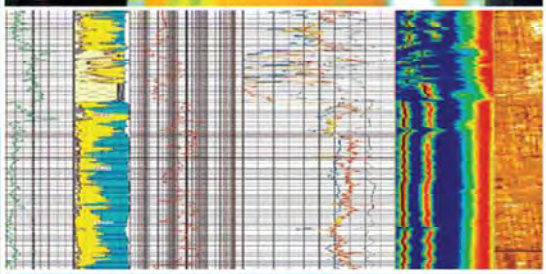
Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
2015/01/05	12:36:57	243.5989	1156.659	79.084
2015/01/05	13:35:02	244.5669	1156.686	79.085
2015/01/05	14:33:02	245.5336	1156.716	79.087
2015/01/05	15:30:57	246.4989	1156.741	79.088
2015/01/05	16:29:02	247.4669	1156.766	79.089
2015/01/05	17:27:02	248.4336	1156.782	79.091
2015/01/05	18:24:57	249.3989	1156.807	79.092
2015/01/05	19:23:02	250.3669	1156.829	79.094
2015/01/05	20:21:02	251.3336	1156.857	79.095
2015/01/05	21:18:57	252.2989	1156.879	79.097
2015/01/05	22:16:57	253.2656	1156.901	79.097
2015/01/05	23:15:02	254.2336	1156.928	79.099
2015/01/06	00:13:02	255.2003	1156.959	79.099
2015/01/06	01:11:02	256.1669	1156.983	79.101
2015/01/06	02:09:02	257.1336	1157.008	79.102
2015/01/06	03:06:57	258.0989	1157.033	79.104
2015/01/06	04:05:02	259.0669	1157.055	79.106
2015/01/06	05:02:57	260.0322	1157.080	79.106
2015/01/06	06:00:57	260.9989	1157.096	79.107
2015/01/06	06:59:02	261.9669	1157.121	79.108
2015/01/06	07:57:02	262.9336	1157.140	79.110
2015/01/06	08:55:02	263.9003	1157.157	79.111
2015/01/06	09:52:57	264.8656	1157.182	79.112
2015/01/06	10:51:02	265.8336	1157.206	79.113
2015/01/06	11:49:02	266.8003	1157.248	79.115
2015/01/06	12:46:57	267.7656	1157.284	79.116
2015/01/06	13:45:02	268.7336	1157.333	79.117
2015/01/06	14:42:57	269.6989	1157.389	79.118
2015/01/06	15:40:57	270.6656	1157.424	79.119
2015/01/06	16:38:57	271.6322	1157.452	79.120
2015/01/06	17:37:02	272.6003	1157.482	79.122
2015/01/06	18:35:02	273.5669	1157.510	79.123
2015/01/06	19:33:02	274.5336	1157.546	79.125
2015/01/06	20:31:02	275.5003	1157.579	79.126
2015/01/06	21:28:57	276.4656	1157.592	79.127
2015/01/06	22:27:02	277.4336	1157.617	79.128
2015/01/06	23:25:02	278.4003	1157.639	79.129
2015/01/07	00:22:57	279.3656	1157.658	79.130
2015/01/07	01:21:02	280.3336	1157.678	79.131
2015/01/07	02:19:02	281.3003	1157.691	79.133
2015/01/07	03:17:02	282.2669	1157.711	79.134
2015/01/07	04:15:02	283.2336	1157.724	79.135
2015/01/07	05:13:02	284.2003	1157.741	79.136
2015/01/07	06:11:02	285.1669	1157.752	79.138
2015/01/07	07:08:57	286.1322	1157.777	79.139
2015/01/07	08:06:57	287.0989	1157.796	79.139
2015/01/07	09:05:02	288.0669	1157.812	79.140
2015/01/07	10:02:57	289.0322	1145.706	78.951
POOH Gradient: 3179.000 ft				
2015/01/07	10:03:57	289.0489	1145.642	78.954
Top Gauge off bottom, 3179' glm				
2015/01/07	10:04:27	289.0572	1143.204	78.955
POOH Gradient: 2999.000 ft				
2015/01/07	10:10:37	289.1600	1096.122	78.728

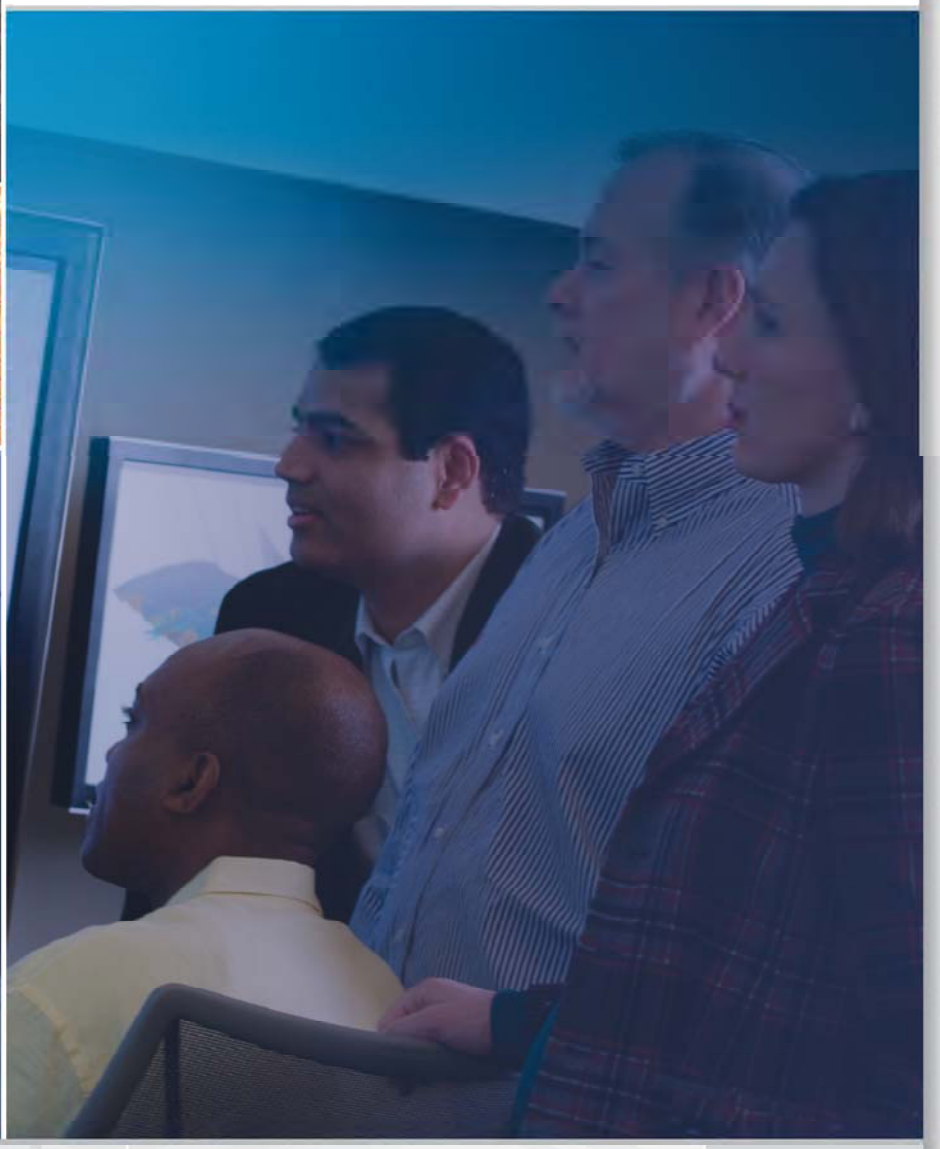
Date	Time	Cum.Time BH2	BH Pres 2	BH Temp 2
		hr	psig	deg F
2015/01/05	12:38:57	243.6322	1158.437	79.059
2015/01/05	13:37:02	244.6003	1158.468	79.061
2015/01/05	14:35:02	245.5669	1158.495	79.062
2015/01/05	15:32:57	246.5322	1158.523	79.063
2015/01/05	16:31:02	247.5003	1158.543	79.065
2015/01/05	17:29:02	248.4669	1158.562	79.066
2015/01/05	18:26:57	249.4322	1158.582	79.068
2015/01/05	19:25:02	250.4003	1158.610	79.069
2015/01/05	20:23:02	251.3669	1158.632	79.070
2015/01/05	21:20:57	252.3322	1158.654	79.072
2015/01/05	22:18:57	253.2989	1158.677	79.073
2015/01/05	23:17:02	254.2669	1158.704	79.074
2015/01/06	00:15:02	255.2336	1158.732	79.076
2015/01/06	01:13:02	256.2003	1158.754	79.077
2015/01/06	02:11:02	257.1669	1158.782	79.078
2015/01/06	03:08:57	258.1322	1158.804	79.079
2015/01/06	04:07:02	259.1003	1158.835	79.080
2015/01/06	05:04:57	260.0656	1158.854	79.081
2015/01/06	06:02:57	261.0322	1158.871	79.083
2015/01/06	07:01:02	262.0003	1158.894	79.084
2015/01/06	07:59:02	262.9669	1158.913	79.085
2015/01/06	08:57:02	263.9336	1158.927	79.086
2015/01/06	09:54:57	264.8989	1158.952	79.088
2015/01/06	10:53:02	265.8669	1158.980	79.089
2015/01/06	11:51:02	266.8336	1159.019	79.090
2015/01/06	12:48:57	267.7989	1159.052	79.092
2015/01/06	13:47:02	268.7669	1159.105	79.093
2015/01/06	14:44:57	269.7322	1159.152	79.093
2015/01/06	15:42:57	270.6989	1159.194	79.095
2015/01/06	16:40:57	271.6656	1159.216	79.096
2015/01/06	17:39:02	272.6336	1159.246	79.097
2015/01/06	18:37:02	273.6003	1159.274	79.099
2015/01/06	19:35:02	274.5669	1159.308	79.100
2015/01/06	20:33:02	275.5336	1159.335	79.101
2015/01/06	21:30:57	276.4989	1159.358	79.102
2015/01/06	22:29:02	277.4669	1159.383	79.105
2015/01/06	23:27:02	278.4336	1159.405	79.106
2015/01/07	00:24:57	279.3989	1159.419	79.107
2015/01/07	01:23:02	280.3669	1159.439	79.108
2015/01/07	02:21:02	281.3336	1159.458	79.109
2015/01/07	03:19:02	282.3003	1159.472	79.111
2015/01/07	04:17:02	283.2669	1159.483	79.112
2015/01/07	05:15:02	284.2336	1159.497	79.113
2015/01/07	06:13:02	285.2003	1159.508	79.114
2015/01/07	07:10:57	286.1656	1159.531	79.115
2015/01/07	08:08:57	287.1322	1159.547	79.116
2015/01/07	09:07:02	288.1003	1159.567	79.117
POOH Gradient: 3180.000 ft				
2015/01/07	10:03:57	289.0489	1147.361	78.885
Lower Gauge off bottom, 3180' glm				
2015/01/07	10:04:27	289.0572	1145.503	78.887
2015/01/07	10:04:57	289.0656	1131.029	78.888
POOH Gradient: 3000.000 ft				
2015/01/07	10:10:37	289.1600	1097.992	78.694

Date	Time	Cum.Time BH1	BH Pres 1	BH Temp 1
		hr	psig	deg F
POOH Gradient: 2249.000 ft				
2015/01/07	10:17:57	289.2822	855.370	74.540
POOH Gradient: 1499.000 ft				
2015/01/07	10:24:32	289.3919	794.297	69.721
POOH Gradient: 749.000 ft				
2015/01/07	10:31:57	289.5156	738.173	62.865
Top Gauge at surface				
2015/01/07	10:34:12	289.5531	691.397	60.608
POOH Gradient: 0.000 ft				
2015/01/07	10:34:47	289.5628	690.778	59.790
2015/01/07	11:01:02	290.0003	102.568	20.107

Date	Time	Cum.Time BH2	BH Pres 2	BH Temp 2
		hr	psig	deg F
POOH Gradient: 2250.000 ft				
2015/01/07	10:17:57	289.2822	857.620	74.613
POOH Gradient: 1500.000 ft				
2015/01/07	10:24:32	289.3919	796.341	69.643
POOH Gradient: 750.000 ft				
2015/01/07	10:31:57	289.5156	740.117	62.449
Lower Gauge at surface				
2015/01/07	10:34:12	289.5531	694.925	60.129
POOH Gradient: 1.000 ft				
2015/01/07	10:34:47	289.5628	694.391	59.202
2015/01/07	11:03:02	290.0336	0.043	16.990

PetroTechnical Services





Company :	**Altamont Oil and Gas**
Well:	**Danielson 33-17**
Field:	**Oilmont**
State:	**Montana**
County:	**Toole**
Job #:	**DSP-2015-01524**
Report Date:	**20-Jan-2015**
Analyst:	**Hebert**

Pressure Buildup Analysis

Schlumberger

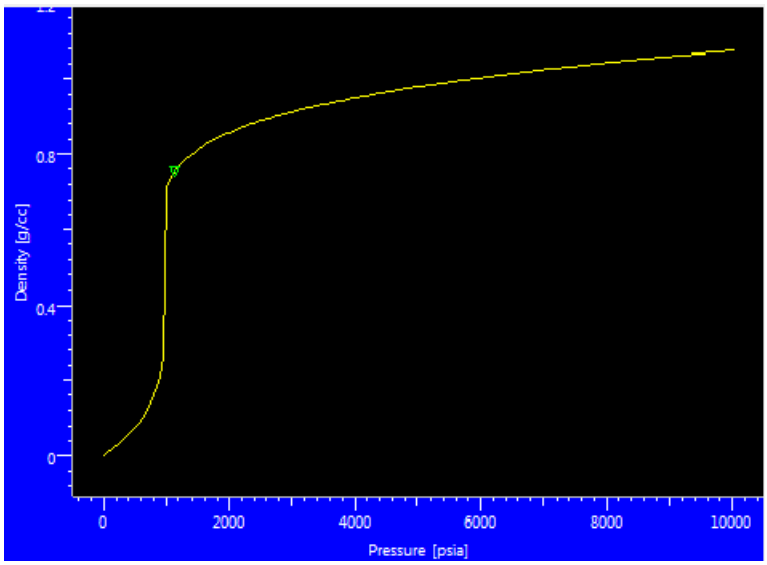
Report Summary

The following report summarizes the well test data acquired on the Danielson 33-17 well on starting on 26-Dec-2014 and ending 07-Jan-2015. The production history for the well started with intermittent flow periods and finished with a final flow period of 40 Mscfd prior to shut-in. After shutin, the well was allowed to buildup for approximately 227 hours in an attempt to obtain reservoir properties. Flow from the well was from the Middle Duperow, Testing Zone 5.

As noted in the log-log plot on the following page, the buildup response appears to be affected by changing storage and there appears to be an area at around 80 hours of shut-in time where the derivative response appears to be highly affected by a non-reservoir response. Based on the PVT properties, there appears to be a dramatic change in fluid properties as the pressure build above 1000 psi so the effects noted are likely due to phase changes in the wellbore and reservoir. Once these effects subside the derivative response appears to be attempting to re-establish the infinite acting radial flow plateau so it is believed the later time data acquired is reflecting the radial flow portion and the results obtained reflect that.

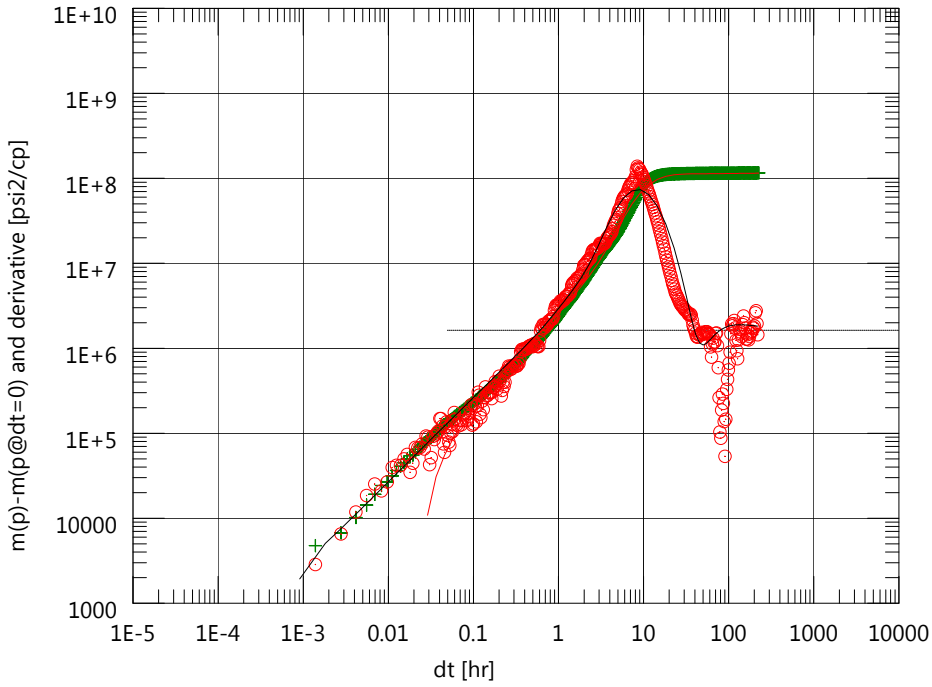
The table below sumarizes the main inputs and results with additional results presented on the plots that are presented to show the models match to the acquired data on the following pages. PVT results are at reservoir pressure and temperature.

Input Parameters	
Porosity (PU)	6
Temperature (degF)	74
Wellbore radius (ft)	0.3
Viscosity (cP)	0.064
Total FormVolFractor (cf/scf)	0.00246
Thickness (ft)	58
Final Rate (Mscfd)	40
Results	
Reservoir Model	Homogeneous
Permeability-Thickness (md-ft)	9.41
Permeability (mD)	0.162
Skin	26.40
Dpskin	524.80
Radius of Investigation (ft)	224.00
Reservoir Pressure (psia)	1161.80



Density vs. Pressure indicates change in fluid properties as pressure nears 1000 psi.

Log-Log plot	Analysis 1
Company Altamont Oil and Gas	Field Oilmont
Well Danielson 33-13	Test Name / # BHP Flow/Shut-In



BHP build-up #2

Rate	0 Mscf/D
Rate change	40 Mscf/D
P@dt=0	126.686 psia
Pi	1161.8 psia
Smoothing	0

Default values are used!

Selected Model

Model Option	Standard Model
Well	Vertical, Changing Storage (Hegeman)
Reservoir	Homogeneous
Boundary	Infinite

Main Model Parameters

TMatch	10.1 [hr]-1
PMatch	3.06E-7 [psi2/cp]-1
C	0.00433 bbl/psi
Total Skin	26.4
k.h, total	9.41 md.ft
k, average	0.162 md
Pi	1161.8 psia

Model Parameters

Well & Wellbore parameters (Danielson 33-13)

C	0.00433 bbl/psi
Ci/Cf	19.3
delta_t	22.2 hr
Skin	26.4

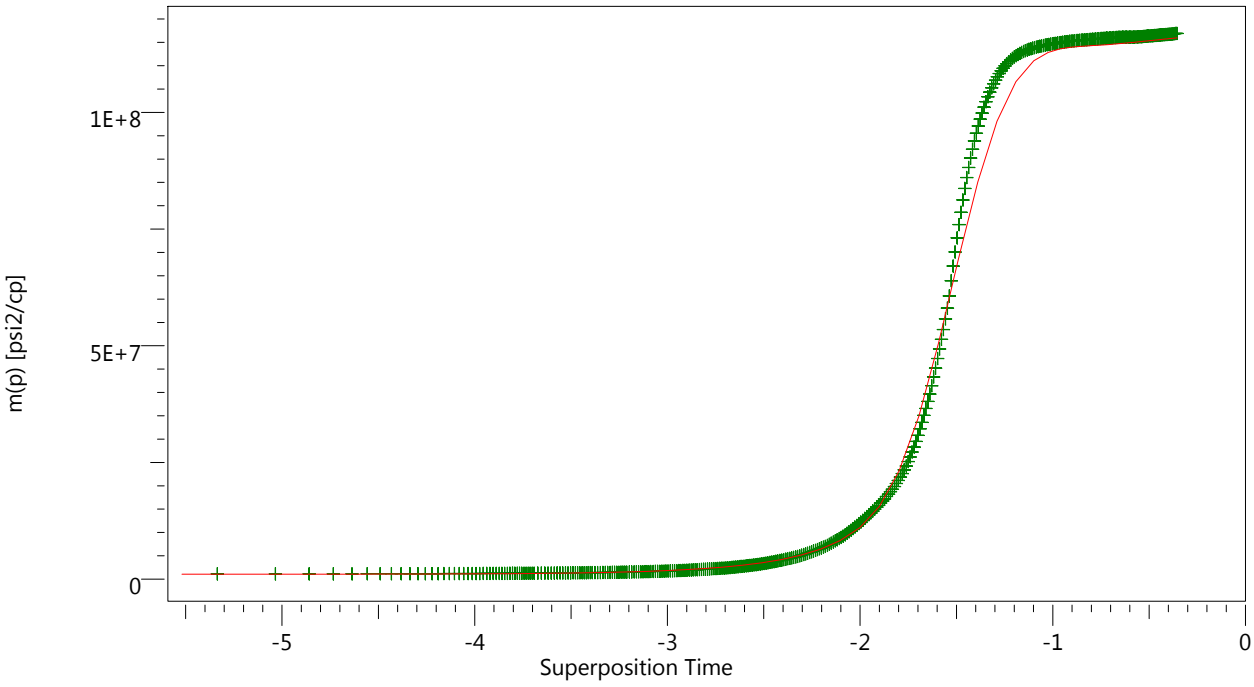
Reservoir & Boundary parameters

Pi	1161.8 psia
k.h	9.41 md.ft
k	0.162 md

Derived & Secondary Parameters

Rinv	224 ft
Test. Vol.	0.0976241 MMB
Delta P (Total Skin)	524.82 psi
Delta P (Geometrical Skin)	8.10462E-13 psi
Delta P Ratio (Total Skin)	0.508855 Fraction

Semi-Log plot	Analysis 1
Company Altamont Oil and Gas	Field Oilmont
Well Danielson 33-13	Test Name / # BHP Flow/Shut-In



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Model Parameters

Well & Wellbore parameters (Danielson 33-13)

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Ci/Cf	19.3
delta_t	22.2 hr
Skin	26.4

Reservoir & Boundary parameters

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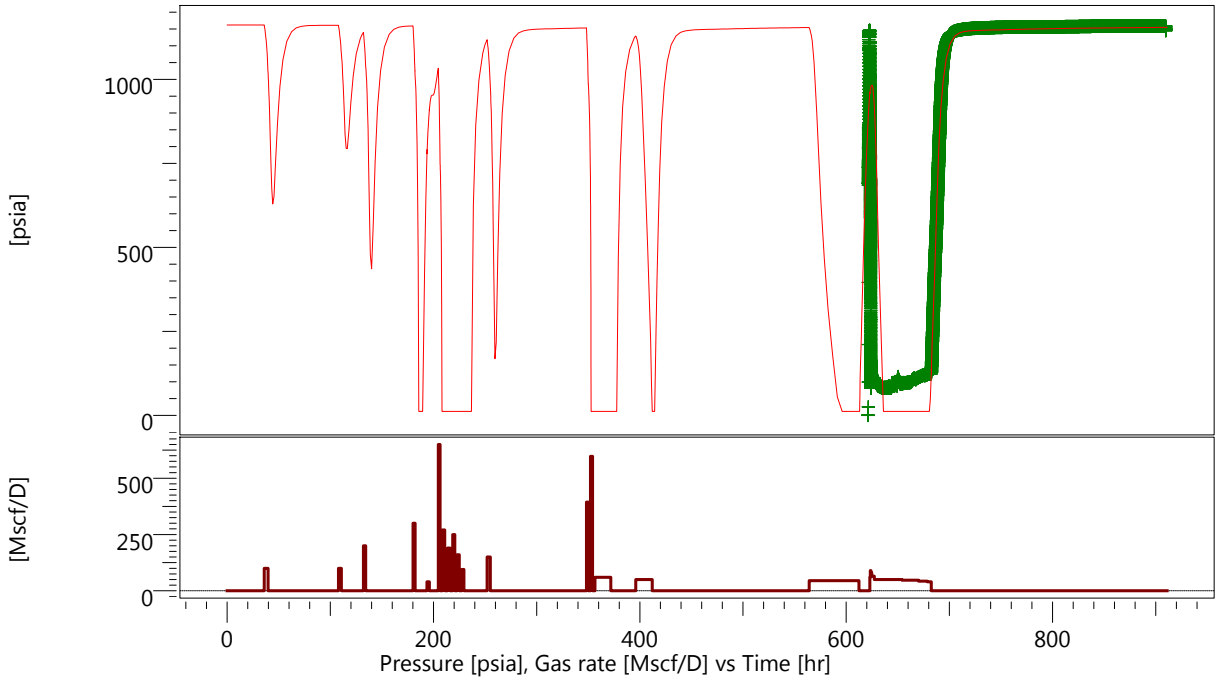
Delta P Ratio (Total Skin)	0.508855 Fraction

History plot	Analysis 1
Company Altamont Oil and Gas	Field Oilmont
Well Danielson 33-13	Test Name / # BHP Flow/Shut-In



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Ci/Cf	19.3
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Skin	26.4

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Delta P Ratio (Total Skin)	0.508855 Fraction

Company Altamont Oil and Gas | Field Oilmont
Well Danielson 33-13 | Test Name / # BHP Flow/Shut-In

Test date / time	Dec 26, 2014 - Jan 7, 2015
Formation interval	Middle Duperow - Testing Zone 5
Perforated interval	3208-3222 & 3288-3336
Gauge type / #	SN 90026
Gauge depth	3180
Analyzed by	Hebert
Analysis date / time	20-Jan-2015
TEST TYPE	Standard
Porosity Phi (%)	6
Well Radius rw	0.3 ft
Pay Zone h	58 ft
Form. compr.	3E-6 psi-1
Water Salt (ppm)	10000
Reservoir T	80 °F
Reservoir P	1147 psia
Fluid type	Gas

Gas

Gas Gravity	0.7
Pseudo-Critical P	663.573 psia
Pseudo-Critical T	377.26 °R

Sour gas composition

Hydrogen sulphide	0
Carbon dioxide	0
Nitrogen	0

Water

Salinity, ppm	10000
Temperature	80 °F
Pressure	1147 psia
Properties	@ Reservoir T&P

Gas

Z	0.186434
Mug	0.0636066 cp
Bg	0.00247904 cf/scf
cg	3.07702E-4 psi-1
Rhog	0.75513 g/cc

Water

Rsw	167.649 scf/stb
Bw	1.04506 B/STB
cw	7.52225E-6 psi-1
Muw	0.967738 cp
Rhow	0.964246 g/cc

Total Compr. ct	1.60612E-4 psi-1
Connate Water (%)	50

Default values are used!

Selected Model

Model Option	Standard Model
Well	Vertical, Changing Storage (Hege
Reservoir	Homogeneous
Boundary	Infinite

Main Model Parameters

TMatch	10.1 [hr]-1
PMatch	3.06E-7 [psi2/cp]-1
C	0.00433 bbl/psi
Total Skin	26.4
k.h, total	9.41 md.ft
k, average	0.162 md
Pi	1161.8 psia

Model Parameters

Well & Wellbore parameters (Danielson 33-13)

C	0.00433 bbl/psi
Ci/Cf	19.3
delta_t	22.2 hr
Skin	26.4

Reservoir & Boundary parameters

Pi	1161.8 psia
k.h	9.41 md.ft
k	0.162 md

Derived & Secondary Parameters

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