Copy # 2

# Final Well Report
# Devlan Exploration Inc.
# Devlan et al Tree River B-10
# Grid # 67°20', 131°45'

# FINAL WELL REPORT

# DEVLAN EXPLORATION INC.

# DEVLAN ET AL TREE RIVER B-10

# GRID #67°20'131°45'

# UID: 300/B10672013145/00

**DATE: MAY 20, 2001**

**COMPANY REPRESENTATIVE: MARK ALGAR, P. ENG.**
**VICE PRESIDENT, ENGINEERING & OPERATIONS**

NATIONAL ENERGY BOARD
ENGINEERING BRANCH
JUL - 3 2001

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## A. INTRODUCTION

Devlan Exploration Inc. (Devlan) drilled a 1294 metre exploratory well named Devlan et al Tree River B-10 67°20' 131°45'. The well was spudded on January 28, 2001at 15:00 hrs and finished drilling at 21:45 hrs on February 19, 2001. The rig was released at 24:00 hrs on February 20, 2001. This well was drilled to evaluate oil potential in the Bear Rock formation at a depth of 1038 mKB.

The drilling contractor was Akita/Sahtu Drilling based out of Calgary, Alberta. The drilling rig used was a Diesel Electric land rig rated for 1400 m. The rig had a 46 $m^3$ single tank mud system supported by a 63 $m^3$ back up mud storage tank. Two 80 hp Volcano Boilers were used for winter operations..

The well was drilled on Exploration License #386 in which Devlan has a 50 % working interest. Operating License No. 934 was issued to Devlan on April 1, 2000.

The well which was located approximately 100 km east of Tsiighetchic, falls in the Grandview Hills area. The exact co-ordinates of the well are as follows:

Latitude: 67°19'14.320"
Longitude: 131°45'35.154"

Conductor casing (406 mm, 96.73 kg/m, H-40) was set to 12 m using a conductor hole auger rig on January 25, 2001. The conductor annulus was filled with cement from the outside. A diverter system was attached to the conductor casing completed with HCR and flare line. The diverter and HCR were function and pressure tested satisfactorily. The rig was moved onto the location January 26, 2001 and the well spudded on January 28, 2001 at 15:00 hours .

The conductor shoe was then drilled out and the 311 mm surface hole was drilled ahead to 38 m when the conductor shoe washed out. The conductor was re-cemented with 12 tonnes of Polar Set cement.

The cement was drilled out to 38 m using a 311 mm bit. Subsequently, a 222 mm pilot hole was drilled from 38 m to 346 m. The pilot hole encountered gravel and boulders. Low weight on bit and high RPM was applied to control deviation. The pilot hole was opened to 311 mm with a bit and deepened to the surface casing setting depth of 388 mKB.

28 joints of 219.1 mm, 35.7 kg/m, J-55, ST&C casing complete with a Topco float shoe and Topco float collar (separated by 1 joint and threadlocked) were run in the hole and landed at 388 mKB. The casing was cemented with 40 tonnes of Polar Set cement + 0.2% R-7C by BJ Services. Full returns were observed throughout circulating and displacing the cement with good cement returning to surface. At 16:05 hrs on February 3, 2001, the cementing operation was terminated prior to the full displacement due to high pumping pressures. The pressure was relieved and the floats held.

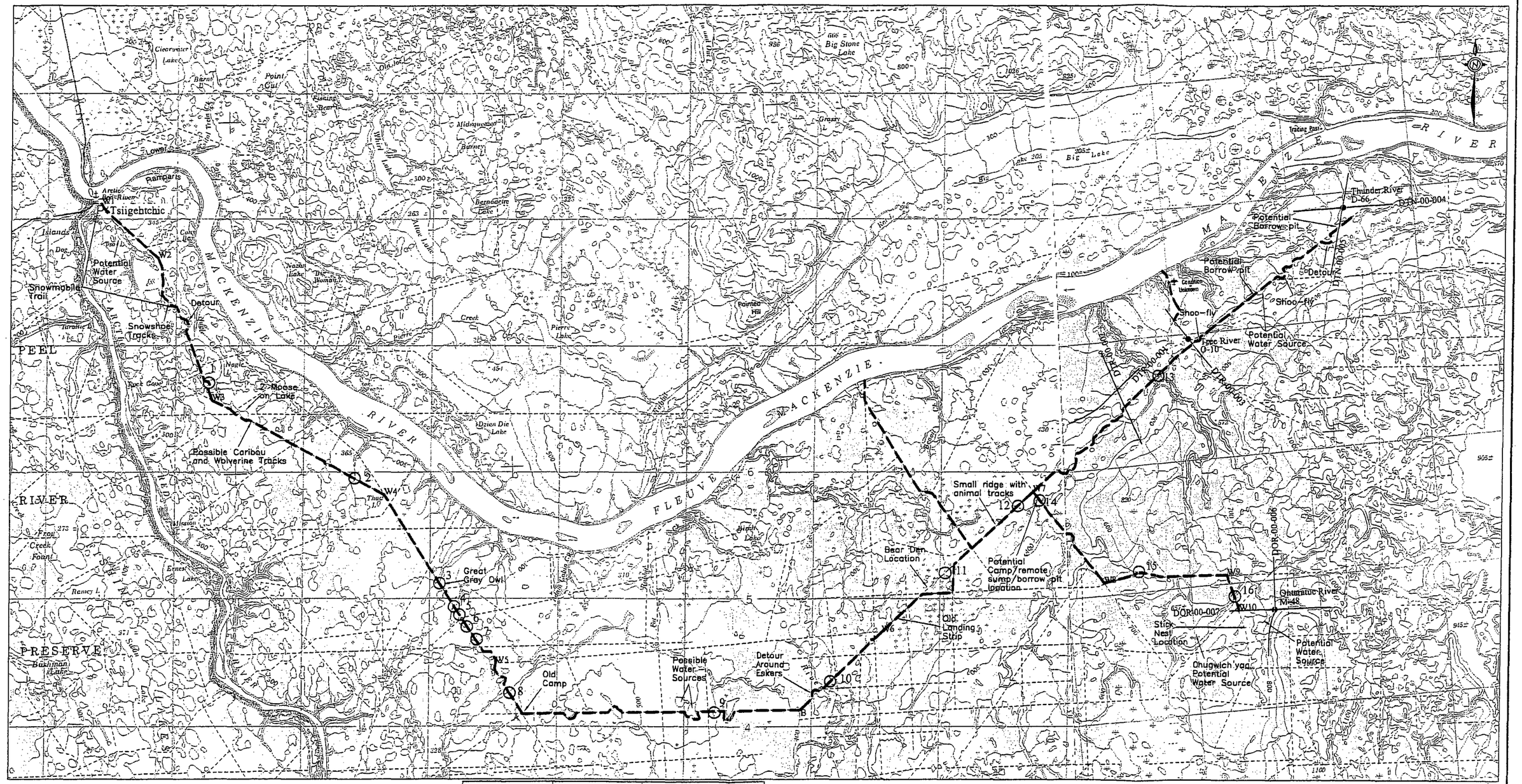
The diverter was removed and the conductor casing flange cut off. The surface casing stub was cut off and a re-conditioned Streamflo Crown H - 229 mm X 219.1 mm X 14,000 kPa casing bowl complete with 2 X 50.8 mm LPSO was welded on. The casing bowl was pressure tested to

7,000 kPa. The BOP's were installed and all components of the BOP system were pressure tested to 1,400 kPa (low) and 7,000 kPa (high).

The float collar and shoe were drilled out on February 5, 2001. A formation leak off test was conducted at 397 mKB and the gradient was taken to 24.2 kPa/m without breaking down the formation. The 200 mm main hole was drilled to a total depth of 1294 m in the Ordovician. Total depth was reached at 21:45 hrs on February 18, 2001.

After total depth had been reached the open hole was logged by Tucker Wireline. Log run # 1 was a DIL-SP-CNL-LDT-PE-GR-CAL-SONIC from total depth to the surface casing. The logging tools were on bottom at 04:15 hrs on February 19, 2001 with no problems reported.

93 joints of 139.7 mm, 20.8 kg/m, J-55, ST&C casing were run in the hole complete with a Topco float shoe, Topco float collar (separated by one joint and threadlocked) and 18 centralizers. The casing was landed at 1294 mKB. The casing was cemented by BJ Services with 9 tonnes Fill-lite 2-100 + 1% CaCl2 lead and 23 tonnes 0:1:0 G + 0.3% FL-63 + 0.5% CD-31 tail with full returns throughout circulating and displacing cement. The top plug was bumped at 13:05 hrs on February 20, 2001 and the floats held. Most of the pre-flush had returned to surface indicating that the cement top was well above the surface casing shoe. The fluid level in the annulus remained stable after the cement job. The BOP's were lifted and the casing was cut off after setting the slips in the casing bowl. The BOP stack and rig were then rigged out and released at 24:00 hours on February 20, 2001. The rig was moved off location to the next well in the program (Thunder River N-73).




## LEGEND

- MgTq–1 ARCHAEOLOGY SITES
- O[1] WATER CROSSING
- PROPOSED WINTER/SEISMIC ACCESS
- PROPOSED SEISMIC LINE
- PROPOSED WELL CENTER

## REFERENCE

BASE MAP PROVIDED BY THE CANADA CENTRE FOR MAPPING (OTTAWA)
DEPARTMENT OF ENERGY, MINES AND RESOURCES.
106 O and 106 N (1971) Edition 3. NAD 27 UTM ZONE 8.

0 2.5 5 7.5 10 12.5
SCALE (km)

| | UTM Zone 8 NAD 27 | | | |
|---|---|---|---|---|
| Well Centers | Easting | Northing | Longitude | Latitude |
| Tree River O-10 | 639537 | 7470588 | w131 45 30.80 | n67 19 14.49 |
| Thunder River D-66 | 651622 | 7480944 | w131 27 52.26 | n67 24 27.03 |
| Ontaratue River M-48 | 646566 | 7449264 | w131 37 20.63 | n67 7 34.94 |
| Waypoints | | | | |
| W1 | 554201 | 7481142 | w133 44 11.56 | n67 26 35.06 |
| W2 | 558574 | 7476876 | w133 38 11.78 | n67 24 14.35 |
| W3 | 562882 | 7465661 | w133 32 32.31 | n67 18 9.14 |
| W4 | 576392 | 7458199 | w133 14 1.07 | n67 13 56.95 |
| W5 | 585184 | 7444936 | w133 2 23.43 | n67 6 40.36 |
| W6 | 615515 | 7447393 | w132 20 21.52 | n67 7 23.27 |
| W7 | 627245 | 7458469 | w132 3 25.89 | n67 13 3.45 |
| W8 | 632854 | 7451270 | w131 56 8.82 | n67 9 2.54 |
| W9 | 642844 | 7451940 | w131 42 17.27 | n67 9 7.66 |
| W10 | 643769 | 7449150 | w131 41 12.89 | n67 7 36.12 |
| A | 587281 | 7440977 | w132 59 40.20 | n67 4 30.43 |
| B | 609142 | 7441302 | w132 29 30.25 | n67 4 15.32 |

Golder Associates

DEVLAN EXPLORATION INC.

# DEVLAN'S PROJECT IN THE GWICH'IN SETTLEMENT REGION

| | | |
|---|---|---|
| DRAWN: TVS | APPROVED: | DATE: 23 OCT. 2000 |
| PROJECT: 002–2214 | | FIGURE: 1 |

Revision No.: 01

J:\2000\2200\002-2214\250-topo-base.dwg

## B. GENERAL DATA

1. Well Name: Devlan et al Tree River B-10 67°20' 131°45'

   Authority to Drill a Well No.: 9211-D28-1-2

   Exploration Agreement Number: EL 386

   Location Unit: B

   Section: 10

   Grid Area: 67°20' 131°45'

   Classification: New Field Wildcat

2. Well Location:
   Coordinates: Latitude: 67° 19' 14.320"
   Longitude: 131° 45' 35.154"

3. Unique Well Identifier: 300/B10652013145/00

4. Operator: Devlan Exploration Inc.

5. Contractor: Akita/Sahtu Drilling

6. Drilling Unit: Akita Rig #14
   Diesel Electric, Land Rig

7. Position Keeping: Not Applicable, Land Rig

8. Support Craft : Fixed Wing

9. Drilling Unit Performance: Good

10. Difficulties and Delays: Conductor casing cement failure, Deviation on surface hole.

11. Total Well Cost: $1.9 Million including lease & access construction

12. Horizontal Deviated Wells Require Bottom Hole Co-ordinates: N/A

## C. SUMMARY OF DRILLING OPERATIONS

1. Elevations:
   - Ground: 104.0 (m above sea level)
   - KB: 108.1 (m above sea level)
   - KB To Casing Flange: 4.1 m (KB to CF)

2. Total Depth:
   - FTD: 1294 mKB
   - PBTD: 1279 mKB
   - TVD: 1294 mKB

3. Date and Hour Spudded: January 28, 2001 at 15:00 hrs

4. Date Drilling Completed: February 18, 2001 at 21:45 hrs

5. Date of Rig Release: Februay 20, 2001 at 24:00 hrs

6. Well status: Drilled and Cased

7. Hole Sizes and Depths:

| | |
|---|---|
| Conductor Hole: | 508 mm to 12 mKB |
| Surface Hole: | 311 mm to 388 mKB |
| Main Hole: | 200 mm to 1294 mKB |

8. Casing and Cementing Record:

   Conductor Hole:

| | |
|---|---|
| Casing Size: | 406.4 mm |
| Casing Weight: | 96.7 kg/m |
| Casing Grade: | H-40 |
| Casing Make: | Ipsco |
| Number of Joints: | 1 |
| Thread: | ST&C |
| Depth Set: | 12 m (KB) |
| Cut Height: | At Surface KB |
| Cut off Depth: | Surface |
| Date Set: | January 25, 2001 |
| Cement Volume: | Re-Cemented with 12Tonnes |
| Cement Type: | Polar Set Cement |
| Additives: | N/A |

## C. SUMMARY OF DRILLING OPERATIONS ...continued

Surface Hole:

| | |
|---|---|
| Casing Size: | 219.1 mm |
| Casing Weight: | 35.7 kg/m |
| Casing Grade: | J-55 |
| Casing Make: | Stelco |
| Number of Joints: | 28 |
| Thread: | ST&C |
| Depth Set: | 388 m (KB) |
| Cut Height: | At Surface |
| Date Set: | February 3, 2001 |
| Cement Volume: | 40 Tonnes |
| Float Shoe Depth: | 388 mKB |
| Float Collar Depth: | 374 mKB |
| Cut Off Depth: | After abandonment |
| Cement Type: | Polar Set Cement |
| Additives: | 0.2% R-7C |
| Cement Top: | Surface (mKB ) |
| Casing Bowl Size: | 229 mm X 219.1 mm X 14 MPa |
| Casing Bowl Make: | StreamFlo Crown H (Reconditioned) |

9. Sidetracked Hole: Not applicable

10. Drilling Fluid:

Conductor Hole: Native

Properties: N/A

Surface Hole: Gel - Chemical

Properties:

| | |
|---|---|
| Viscosity: | 69 sec/L |
| Weight: | 1325 kg/m$^3$ |
| PH: | 9.0 |
| Water loss: | 6.6cc/30 min |
| Solids: | 0.19 |
| Gels: | 10.5 / 15 |
| Filter Cake: | 3 |
| PV / YP: | 7 / 40 |

## C. SUMMARY OF DRILLING OPERATIONS ...continued

| | | | |
|---|---|---|---|
| Main: | | Gel - Chemical | |
| | Properties: | Viscosity: | 43 sec/L |
| | | Weight: | 1055 kg/m$^3$ |
| | | PH: | 9.0 |
| | | Water loss: | 7.6 cc/30 min |
| | | Solids: | 0.03 |
| | | Gels: | 1.5 / 3 |
| | | Filter Cake: | 1 |
| | | PV / YP: | 13 / 4.5 |

11. Fishing Operations: Not Applicable

12. Well Kicks and Well Control Operations: Not Applicable

13. Formation Leak Off Tests:

| | |
|---|---|
| Depth: | 397 m |
| Fluid Density: | 1000 kg/m$^3$ |
| Applied Pressure: | 5580 kPa |
| Hydrostatic Press. | 3806 kPa |
| Mud Weight Equi. | 2464 kg/m$^3$ |
| Casing Setting Depth: | 388 mKB |

The leak-off test was taken to a gradient of 24.2 kPa /m without breaking down the formation.

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING PRECIS

410, 311 - 6th Avenue S. W.
Calgary, Alberta
T2P 3H2
Phone: 237-7808
FAX: 265-1760

**Well Name:** DEVLAN ET AL TREE RIVER **Spud Date:** 01-01-28

**Location:** B-10 67°20'131°45' **Rig Release Date:** 01-02-20

| DATE | DEPTH (mKB) | PROGRESS (m) | BREAKDOWN OF RIG TIME | |
|---|---|---|---|---|
| 01-01-27 | 0 | 0 | Other | 12.00 |
| | | | Rig Move | 7.00 |
| | | | Rig Up | 5.00 |
| 01-01-28 | 0 | 0 | Nipple Up | 6.00 |
| | | | Other | 18.00 |
| 01-01-29 | 38 | 26 | Drilling | 6.25 |
| | | | Trip | 0.50 |
| | | | Survey | 0.25 |
| | | | Cement | 2.00 |
| | | | Wait on Cement | 1.00 |
| | | | Nipple Up | 6.50 |
| | | | Wait on Cementer | 7.00 |
| | | | Function Test | 0.25 |
| | | | Held Safety Meeting | 0.25 |
| 01-01-30 | 201 | 163 | Drilling | 8.00 |
| | | | Rig Service | 0.25 |
| | | | Trip | 0.50 |
| | | | Survey | 1.50 |
| | | | Circulate and Condition | 2.50 |
| | | | Ream | 3.25 |
| | | | Wait on Cement | 8.00 |
| 01-01-31 | 378 | 177 | Drilling | 21.75 |
| | | | Rig Service | 0.75 |
| | | | Survey | 1.50 |
| 01-02-01 | 384 | 6 | Drilling | 1.25 |
| | | | Rig Service | 0.75 |
| | | | Trip | 6.50 |
| | | | Survey | 0.50 |
| | | | Circulate and Condition | 0.75 |
| | | | Ream | 13.50 |
| | | | Mix Mud | 0.75 |

...../2

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING PRECIS

410, 311 - 6th Avenue S. W.
Calgary, Alberta
T2P 3H2
Phone: 237-7808
FAX: 265-1760

**Well Name:** DEVLAN ET AL TREE RIVER **Spud Date:** 01-01-28

**Location:** B-10 67°20'131°45' **Rig Release Date:** 01-02-20

| DATE | DEPTH (mKB) | PROGRESS (m) | BREAKDOWN OF RIG TIME | |
|---|---|---|---|---|
| 01-02-02 | 384 | 0 | Rig Service | 0.75 |
| | | | Trip | 0.75 |
| | | | Survey | 0.50 |
| | | | Circulate and Condition | 1.00 |
| | | | Ream | 20.75 |
| | | | Blow Kelly | 0.25 |
| 01-02-03 | 388 | 4 | Drilling | 1.75 |
| | | | Rig Service | 0.50 |
| | | | Trip | 14.25 |
| | | | Survey | 0.25 |
| | | | Circulate and Condition | 1.75 |
| | | | Run Casing | 3.00 |
| | | | Circulate Casing | 1.50 |
| | | | Rig in Tongs | 1.00 |
| 01-02-04 | 388 | 0 | Cement | 2.00 |
| | | | Wait on Cement | 11.00 |
| | | | Circulate Casing | 6.00 |
| | | | Weld on Bowl | 5.00 |
| 01-02-05 | 388 | 0 | Rig Service | 0.25 |
| | | | Trip | 3.00 |
| | | | Nipple Up | 6.75 |
| | | | Pressure Test | 5.75 |
| | | | Weld on Bowl | 1.25 |
| | | | Wait on Vacuum Truck | 7.00 |
| 01-02-06 | 454 | 66 | Drilling | 11.50 |
| | | | Rig Service | 0.75 |
| | | | Trip | 0.50 |
| | | | Survey | 0.25 |
| | | | Circulate and Condition | 0.25 |
| | | | Pressure Test | 0.50 |
| | | | Held BOP Drill | 0.50 |
| | | | Drill Out Cement | 6.00 |
| | | | Thaw Lines | 1.50 |
| | | | Blow Manifold Line | 2.25 |

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# CODECO CONSULTING (2000) INC.
# DAILY DRILLING PRECIS

410, 311 - 6th Avenue S. W.
Calgary, Alberta
T2P 3H2
Phone: 237-7808
FAX: 265-1760

**Well Name:** DEVLAN ET AL TREE RIVER **Spud Date:** 01-01-28

**Location:** B-10 67°20'131°45' **Rig Release Date:** 01-02-20

| DATE | DEPTH (mKB) | PROGRESS (m) | BREAKDOWN OF RIG TIME | |
|---|---|---|---|---|
| 01-02-07 | 546 | 92 | Drilling | 18.75 |
| | | | Rig Service | 0.50 |
| | | | Trip | 4.00 |
| | | | Circulate and Condition | 0.75 |
| 01-02-08 | 620 | 74 | Drilling | 21.00 |
| | | | Rig Service | 0.50 |
| | | | Trip | 1.50 |
| | | | Survey | 0.25 |
| | | | Circulate and Condition | 0.50 |
| | | | Held BOP Drill | 0.25 |
| 01-02-09 | 696 | 76 | Drilling | 19.75 |
| | | | Rig Service | 0.50 |
| | | | Trip | 3.25 |
| | | | Survey | 0.25 |
| | | | Held BOP Drill | 0.25 |
| 01-02-10 | 784 | 88 | Drilling | 23.00 |
| | | | Rig Service | 0.75 |
| | | | Survey | 0.25 |
| 01-02-11 | 871 | 87 | Drilling | 20.50 |
| | | | Rig Service | 0.75 |
| | | | Trip | 2.25 |
| | | | Survey | 0.25 |
| | | | Circulate and Condition | 0.25 |
| 01-02-12 | 932 | 61 | Drilling | 20.00 |
| | | | Rig Service | 0.75 |
| | | | Trip | 3.25 |
| 01-02-13 | 1002 | 70 | Drilling | 23.00 |
| | | | Rig Service | 0.75 |
| | | | Survey | 0.25 |

...../4

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING PRECIS

410, 311 - 6th Avenue S. W.
Calgary, Alberta
T2P 3H2
Phone: 237-7808
FAX: 265-1760

**Well Name:** DEVLAN ET AL TREE RIVER **Spud Date:** 01-01-28

**Location:** B-10 67°20'131°45' **Rig Release Date:** 01-02-20

| DATE | DEPTH (mKB) | PROGRESS (m) | BREAKDOWN OF RIG TIME | |
|---|---|---|---|---|
| 01-02-14 | 1087 | 85 | Drilling | 23.00 |
| | | | Rig Service | 0.75 |
| | | | Survey | 0.25 |
| 01-02-15 | 1141 | 54 | Drilling | 15.75 |
| | | | Rig Service | 0.50 |
| | | | Trip | 7.50 |
| | | | Circulate and Condition | 0.25 |
| 01-02-16 | 1187 | 46 | Drilling | 17.00 |
| | | | Rig Service | 0.75 |
| | | | Trip | 5.25 |
| | | | Survey | 0.50 |
| | | | Circulate and Condition | 0.50 |
| 01-02-17 | 1235 | 48 | Drilling | 23.25 |
| | | | Rig Service | 0.75 |
| 01-02-18 | 1267 | 32 | Drilling | 15.50 |
| | | | Rig Service | 0.50 |
| | | | Trip | 6.50 |
| | | | Survey | 0.50 |
| | | | Circulate and Condition | 0.50 |
| | | | Repair | 0.50 |
| 01-02-19 | 1294 | 27 | Drilling | 13.00 |
| | | | Rig Service | 0.50 |
| | | | Trip | 4.00 |
| | | | Circulate and Condition | 1.00 |
| | | | Log | 5.25 |
| | | | Held BOP Drill | 0.25 |

...../5

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING PRECIS

410, 311 - 6th Avenue S. W.
Calgary, Alberta
T2P 3H2
Phone: 237-7808
FAX: 265-1760

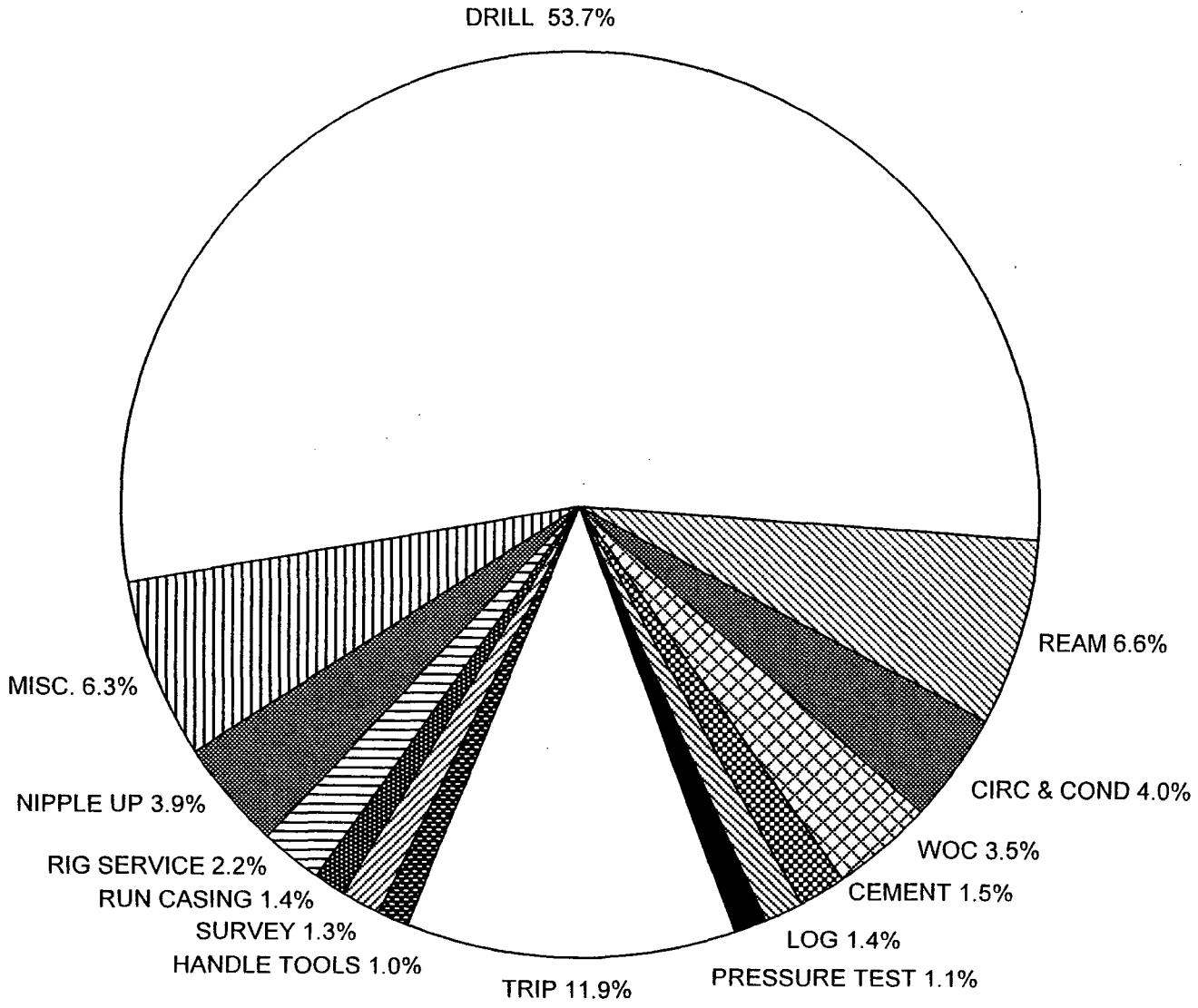
**Well Name:** DEVLAN ET AL TREE RIVER **Spud Date:** 01-01-28

**Location:** B-10 67°20'131°45' **Rig Release Date:** 01-02-20

| DATE | DEPTH (mKB) | PROGRESS (m) | BREAKDOWN OF RIG TIME | |
|---|---|---|---|---|
| 01-02-20 | 1294 | 0 | Trip | 3.50 |
| | | | Circulate and Condition | 1.00 |
| | | | Log | 2.50 |
| | | | Handle Tools | 2.00 |
| | | | Run Casing | 4.75 |
| | | | Cement | 1.50 |
| | | | Slip and Cut | 1.00 |
| | | | Lay Down Drill Pipe and Collars | 4.00 |
| | | | Wait on Orders | 1.00 |
| | | | Blow Kelly | 1.00 |
| | | | Circulate Casing | 1.75 |
| 01-02-21 | 1294 | 0 | Cement | 3.00 |
| | | | Circulate Casing | 2.50 |
| | | | Nipple Down BOP's | 2.50 |
| | | | Rig Out | 8.00 |

Rig released at 2400 hours, 01-02-20.

# DEVLAN ET AL TREE RIVER B-10 67°20'131°45'
# RIG TIME BREAKDOWN



C. SUMMARY OF DRILLING OPERATIONS ...continued


# CODECO CONSULTING (2000) INC.
## SURVEYS

410, 311 - 6th Avenue S. W.
Calgary, Alberta
T2P 3H2
Phone: 237-7808
FAX: 265-1760


**Well Name:** DEVLAN ET AL TREE RIVER

**Location:** B-10 67°20'131°45' **Supervisor:** Erwin Alyea

| DEPTH | DEGREES | DEPTH | DEGREES | DEPTH | DEGREES |
|---|---|---|---|---|---|
| 29 | 1.00 | | | | |
| 56 | 0.50 | | | | |
| 84 | 0.25 | | | | |
| 112 | Misrun | | | | |
| 122 | 0.50 | | | | |
| 151 | 0.75 | | | | |
| 180 | 1.00 | | | | |
| 209 | 1.00 | | | | |
| 237 | 1.25 | | | | |
| 266 | 1.13 | | | | |
| 296 | 1.00 | | | | |
| 325 | 0.50 | | | | |
| 354 | 0.75 | | | | |
| 95 | 0.50 | | | | |
| 200 | 1.00 | | | | |
| 295 | 1.00 | | | | |
| 380 | 1.00 | | | | |
| 442 | 0.75 | | | | |
| 540 | 1.00 | | | | |
| 665 | 1.00 | | | | |
| 762 | 1.50 | | | | |
| 849 | 1.75 | | | | |
| 955 | 2.00 | | | | |
| 1051 | 2.25 | | | | |
| 1168 | 2.00 | | | | |
| 1265 | 2.00 | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

## C. SUMMARY OF DRILLING OPERATIONS ...continued

16. Abandonment Plugs: Not Applicable

17. Composite Well Record:

- The Composite well record (strip chart) can be found in a plastic envelope at the end of this report.

18. Completion Record: Not Applicable

# FORMATION SUMMARY

## DEVLAN ET AL TREE RIVER
## 300\B10672013145\00

The Devlan et al Tree River well was spudded the 28 of January at 1500 hours. Drilling commenced below the conductor barrel. At 38 metres drilling mud begin to bubble up around the barrel indicating a wash out. The barrel was re-cemented and a pilot hole was started with a 222 mm bit. This subterfuge was used to prevent deviation problems in the surface hole as well as to alleviate the possibility of becoming stuck. At 385 metres a trip was done to replace the 222 mm. bit with a 311 mm. bit. The hole was then re-drilled from 15 metres to a TD of 388 m. where surface casing was set.

Samples were caught in 5 metre intervals from surface to TD as per instructions from the NEB. One set of bagged samples and 3 sets of vialed samples were required. The bagged samples and 2 sets of vials were shipped to the NEB, while the operator of the well retained the final set.

This well was drilled to evaluate the potential of the Gossage, Bear Rock, and Ordovician formations. The play was constructed around old wells drilled in the 60's and 70's along with new seismic data run over the area. The Devlan et al Tree River well was drilled on top of the seismic high that appeared to be developed over a fairly large land area. The Gossage formation contained thin dolomite stringers in a predominantly limestone basal section. Stringers at 817 and 847 provided the best possibility of a hydrocarbon reservoir. At 817 metres a gas peak of 850\50 units background over a 1 metre interval was recorded. **At 847 metres a gas peak of 75\45 units background over a 4 metre interval was recorded, however questionable light blue blooming cut fluorescence was also noted.** No test was preformed over these zones due to restrictions from the NEB. The Bear Rock formation is commonly brecciated. **However in this well, it was not, and consisted of clean calcilutites and packstones, well cemented with little porosity and no permeability. The Ordovician exhibited high porosity streaks in thin dolomite beds in other wells.** However in this well the Ordovician comprised tight dolomite with an occasional limestone stringers. Consequently the well was cased as a **Potential Gossage Gas Well**, with possible DST's to be executed in the future.

# FORMATION TOPS

## DEVLAN ET AL TREE RIVER
## SECTION 10 N67 19'14" W131 45' 30"

**K.B.(m):** 108.10 **G.L.(m):** 104.00

| | PROGNOSIS | | SAMPLE | | LOG | |
|---|---|---|---|---|---|---|
| FORMATION | MD (m) | SS (m) | MD (m) | SS (m) | MD (m) | SS (m) |
| GLACIAL GRAVEL | N\A | 185.0 | 5.0 | 103.1 | 5.0 | 103.1 |
| IMPERIAL | N\A | 185.0 | 40.0 | 68.1 | 45.0 | 63.1 |
| FORT CREEK | 23.1 | 85.0 | 138.0 | -29.9 | 101.0 | 7.1 |
| RAMPARTS (HUME) | 608.2 | -420.2 | 572.0 | -463.9 | 577.0 | -468.9 |
| GOSSAGE | 688.2 | -500.0 | 661.0 | -552.9 | 660.5 | -552.4 |
| LONE MOUNTAIN | 783.1 | -675.0 | 913.0 | -804.9 | 912.0 | -803.9 |
| BEAR ROCK | 1013.0 | -825.0 | 1038.0 | -929.9 | 1042.0 | -933.9 |
| LOWER LONE MTN | N\A | N\A | 1118.0 | -1009.9 | 1114.0 | -1005.9 |
| ORDOVICIAN | 1208.1 | -1100.0 | 1165.0 | -1056.9 | 1163.0 | -1054.9 |
| TOTAL DEPTH | 1423.1 | -1315.0 | 1294.0 | -1185.9 | 1293.2 | -1185.1 |

# FORMATION EVALUATIONS

**DEVLAN ET AL FERRIER**
**300\B10672013145\00**

## GLACIAL GRAVEL surface to 40m.

These gravels consisted of clear, vitreous, pink, light brown to ochre; vari-coloured sands ranging in size from very fine grained to coarse grained, with occasional small pebbles. They were unconsolidated in samples but were cemented with uncompacted calcareous cement Although generally angular and sub angular they also contained well rounded quartz grains. It was obvious that the source rock was the igneous granite shield of the north since samples contained common feldspars often with imbedded micas and quartz crystals.

**CONCLUSION:** No hydrocarbon shows or gas increase indicates a zone of no interest.

## IMPERIAL 40 to 138 m.

Medium to dark grey, blocky to platy, silty and sandy, firm to hard, non-calcareous shales with stringers of very argillaceous siltstone and very dirty, silty to very fine grained, argillaceous sandstone.

**CONCLUSION:** A zone of no interest.

## FORT CREEK 138 m. to 572 m.

The Fort Creek formation can be divided into an upper, middle and lower section. The upper section comprised predominantly light to medium grey, blocky to sub platy, silty and sandy, non calcareous shale. Micro fragments of coal and pyrite blebs were rare throughout. Only minor stringers of very argillaceous, very fine to fine grained sandstones were logged.

The middle section of the formation was generally contained more sand. Medium grey to grey brown, argillaceous, carbonaceous, dense siltstones were common and often graded to light grey, salt and pepper, very fine to fine grained, siliceous, clean to argillaceous, sandstones. From 360 to 380 metres very fine to fine grained, earthy, quartose, **sand lenses contained light brown residual oil stain with slow to good blooming cut fluorescence.** Gas readings increased from a background of 150 to 200 units to a peak of only 250 to 300 units.

The lower Fort Creek comprised increased amounts of black to dark grey brown, blocky, carbonaceous, very hard, pyritic, non-calcareous shales.

No gas increases of astronomical proportions were encountered.

**CONCLUSION:** This formation is non-reservoir. However it is interesting to note that it was subjected to at least 2 different geological movements, due to the amounts of calcite crystals and pyrite deposited in fractures and secondary fractures.

## HUME 572 to 661 m.

The Hume comprised a mixed section of interbedded shales and limestone with minor marlstone laminae at the top of the formation. Shale beds were grey green in colour, silty with common disseminated pyrite, and calcareous. The marlstones were light grey in colour, mottled, argillaceous and limy. Marlstones were prominent in the top 20 metres of the formation. The limestones were off white to light grey to tan and medium brown. They were predominantly cryptocrystalline, a calcilutite, with common disseminated pyrite, and occasional brachiopod and crinoid fragments. Towards the base of the formation traces of dead bitumen were noted although the rock contained little to no porosity.

No gas increases were observed while logging this section except for the top 8 metres of the formation. Background readings over the majority of the Hume were 50 to 100 units. The upper 8 metres contained peaks of 400 to 500 units over a background of 300 units.

**CONCLUSION:** A zone of no economic interest.

## GOSSAGE 661 to 913 m.

The Gossage formation consisted of a massive, clean limestone with interbedded dolomite stringers at the base containing variable porosity. The upper 15 metres comprised white to buff, microcrystalline and pelloidal limestone with poor porosity and permeability but common, light blue, blooming, cut fluorescence and black dead bitumen. The majority of the Gossage was buff to medium brown limestone, a clean microcrystalline massive calcilutite. The basal Gossage contained thin dolomite stringers. Most were buff to white, cryptocrystalline to very fine crystalline with variable porosity but no permeability or shows. The exceptions were found at depths of 817, 820 and 847 metres, where earthy brown dolomite stringers exhibited light blue, blooming cut fluorescence from micro vuggy porosity of 8 to 12%.

Background gas readings ranged from 50 to 100 units over the whole section. The exceptions were recorded at depths of 669 metres to 677 metres; containing a group of peaks of 250 units over a background of 100 units, and at 817 and 820 metres; where peaks of 850 units and 280 units over a background of 50 units were recorded, respectively.

CONCLUSION: The Gossage has some potential in this well. The dead bitumen found in the upper 15 metres are an indication that oil existed in this reservoir at some time in the past. **It also may indicate the possibility of an oil reservoir in this formation in other locations.** The dolomite stringers at 817 metres contains a gas reservoir, as noted by the gas peak, but since the gas readings returned to normal shortly afterwards, possibly a high-pressure low volume section. A DST would be advisable over this metre. Although the dolomite stringers at 847 metres produced no gas response, this zone should be evaluated further due to its high porosity and slight hydrocarbon show.

## LONE MOUNTAIN 913 to 1038 m.

The Lone Mountain comprised an upper calcareous dolomite grading to a lower dolomitic limestone. The upper dolomite section ranged from medium to dark brown in colour. Vitreous, microcrystalline to very fine crystalline dolomitic rhombs were predominant. Often "ghost" fossil fabric could be discerned, but most of the rock contained little to no porosity, permeability, or shows. Variable amounts of calcareous cement could also be seen in the dolomite, ranging from 40% to 10% over all. With depth, crystal size decreased to predominantly cryptocrystalline, as the formation changed to limestone. The lower limestone was predominantly medium grey brown, cryptocrystalline, clean, dolomitic and lithographic. The basal 20 metres contained abundant calcite crystals, indicating the presence of intense fracturing.
Gas readings were low over the whole section ranging from 50 to 100 units background. No peaks were recorded.

CONCLUSION: The Lone Mountain contains no viable reservoir.

## BEAR ROCK 1038 to 1118 m.

The Bear Rock was one our main zones of interest in this well. It consisted of a clean microcrystalline to very fine crystalline dolomite, with little porosity or permeability. The dolostones ranged from a clean calcilutite to a clean packstone, predominantly dolomitic cemented but with varying amounts of calcareous cement up to 30%. Rare to common white calcite crystals were recorded through out the formation indicating some minor fracturing. Stringers of 6 to 12% micro vuggy porosity were logged but the majority of the formation contained 3% intercrystalline porosity to tight. With depth the crystal size decreased.
Background gas averaged 100 units and no peaks were recorded.

CONCLUSION: Although the Bear Rock is often a fractured dolomite, in this well it was predominantly a well cemented dolomite, with little to no porosity or permeability, and consequently was not a hydrocarbon reservoir.

## LOWER LONE MOUNTAIN 1118 to 1165 m.

The lower Lone Mountain comprised a continuation of the dolomite seen above the Bear Rock. The colours darken to a medium brown and grey brown but crystal size was predominantly cryptocrystalline to microcrystalline. Dolomites graded to grey green indicating an influx of argillaceous grey green shale material. Beneath the dolostones, a 20 metre section of red beds was discovered, comprising red dolomitic siltstone, silty and slightly anhydritic dolomite laminae, dark red dolomitic shale, and dolomitic and pyritic mudstone.

Gas readings over this whole section were very low ranging from 10 to 20 units with no peaks.

CONCLUSION: A zone of no economic interest. However the red beds indicate a period of upheaval in this area which could be used to extrapolate to other seismic information thereby uncovering further possible reservoirs.

## ORDOVICIAN 1165 to 1294 m. TD

Upon entering the Ordovician, white to off white and cream, cryptocrystalline to microcrystalline, dense well indurated dolomite was the predominate rock. These clean calcilutites and calcisiltites exhibit very little porosity and no permeability or shows through out the drilled section. Towards the base there were increases of pyritic green and grey green shales. Minor limestone stringers and beds were also logged, often with "ghost" fabric of a fossiliferous, pelletoidal, or possibly slightly brecciated lime with secondary calcareous cement.
Gas readings ranged between 10 and 50 units with no peaks encountered.

CONCLUSION: A zone of no interest.

# LITHOLOGICAL DESCRIPTIONS

**DEVLAN ET AL TREE RIVER**
**300\B10672013145\00**
**SECTION 10 N67 19'14" W131 45' 30"**
**TSIIGEHTCHIC, N.W.T.**

0 to 10 NO SAMPLES

10 to 15 SANDSTONE; clear, vitreous, frosted in part, variable colour, orange, light tan, light brown, medium to coarse and very coarse grained, angular to sub rounded, occasional rounded quartz grains, poorly sorted, unconsolidated and loose, quartzose, clay matrix Inferred, calcareous cement in part, occasional black and dark gray chert grains, 20% dark lithics, **30% porosity, no shows,** trace feldspar.

15 to 20 SANDSTONE; clear, vitreous, frosted in part, variable colour, pink, green, orange, fine to medium grained with occasional coarse grained quartz, angular to rounded, poorly sorted, unconsolidated and loose, quartzose, calcareous cement in part with clay matrix inferred, trace dark chert grains, 20% lithics (shale and coaly shale partings), rare feldspar and basalt, **30% porosity, no shows,** igneous source rock.

20 to 25 SANDSTONE; clear, vitreous, pink, light brown, fine to medium grained with occasional coarse grained, angular to sub angular, rare rounded quartz grains, poorly sorted, unconsolidated and loose, quartzose, very calcareous cement, occasional dark chert grains, increase in argillaceous, 10% lithics, trace pyrite blebs, **30% porosity, no shows,** igneous source rock, SANDSTONE stringers, light brown, very fine grained, 50% calcareous cement.

25 to 30 SANDSTONE; light brown, clear, variable colour, green, pink, ochre, very fine to very coarse grained, angular to rounded, poorly sorted, unconsolidated and loose, quartzose, calcareous cement, coarse and very coarse grained sandstone with very fine grained matrix and cement, common feldspar with imbedded quartz and mica, quartz with imbedded mica, (igneous source rock), pyrite blebs cubes and balls, 10% lithics, **30% porosity, no shows,** stringers of SANDSTONE; as above.

30 to 35 SANDSTONE; as above, light brown, clear, variable colour, green, pink, ochre, very fine to very coarse grained, angular to rounded, poorly sorted, unconsolidated and loose, quartzose, calcareous cement, coarse and very coarse grained sandstone with very fine grained matrix and cement, common feldspar with imbedded quartz and mica, quartz with imbedded mica, (igneous source rock), pyrite blebs cubes and balls, 10% lithics, **30% porosity, no shows.**

35 to 40 SANDSTONE; gravel, clear, variable colour, vitreous, pink, light tan, black, dark gray, frosted in part, medium to coarse grained with very coarse grained and small pebbles, angular to rounded, poorly sorted, unconsolidated and loose, quartzose, occasional feldspar with imbedded mica, ( igneous source rock), dark chert grains, calcareous cement, rare pyrite, **30% intergranular porosity, no shows.**

## TOP OF IMPERIAL 40 m

40 to 50 SHALE; medium to dark gray. blocky to sub platy. silty throughout. micromicaceous. firm to hard, non calcareous, slightly carbonaceous, large pyrite blebs, carbonaceous partings and smear, rare glauconite grains, silty grading to SILTSTONE stringers in part, argillaceous, very dirty.

50 to 65 SHALE; medium to dark gray, blocky to sub platy, silty and sandy throughout, micromicaceous, firm to hard, non calcareous, occasional pyrite blebs, slightly carbonaceous, grading to argillaceous and dirty SILTSTONE stringers throughout.

65 to 80 SHALE; medium to dark gray, blocky to sub blocky and sub platy, silty, rare floating sand grains, very carbonaceous with coal partings and carbonaceous smear, firm to hard, non calcareous, trace pyrite.

80 to 100 SHALE; medium to dark gray, blocky to sub blocky to platy in part, silty throughout with minor floating sand grains, rare glauconite grains, carbonaceous with coal partings throughout, firm to hard, non calcareous, grading to argillaceous and dirty SILTSTONE stringers in part.

100 to 105 SHALE; medium to dark gray, blocky to sub platy, silty with occasional floating sand grains, common carbonaceous partings throughout, firm to hard, non calcareous, grading to argillaceous and dirty SILTSTONE stringers.

105 to 115 SHALE; as above, medium to dark gray, blocky to sub platy, silty with occasional floating sand grains, common carbonaceous partings throughout, firm to hard, non calcareous, grading to SANDSTONE stringers, dark gray, very fine grained to silty with occasional fine grains, poorly sorted, well consolidated, very argillaceous and dirty, **tight.**

115 to 125 SHALE; medium to dark gray, blocky to occasionally sub platy, silty and sandy, common carbonaceous partings, trace pyrite, firm to moderately firm, slightly softer than above, non calcareous, SANDSTONE stringers, silty to very fine grained with rare fine grained, very argillaceous and dirty, well consolidated, tight, rare siderite cement.

125 to 138 SHALE; medium to dark gray, blocky to sub platy, silty, decrease in sand content and sandstone stringers, trace pyrite, occasional coal partings decreasing from above, non calcareous.

## TOP OF FORT CREEK 138 m

138 to 143 SHALE; light to medium gray mottled with brown, blocky, sandy throughout grading to argillaceous very fine grained SANDSTONE stringers, occasional pyrite blebs, occasional coal partings, firm to moderately firm, non calcareous, rare glauconite grains, increase in sand components.

143 to 155 SANDSTONE; medium brown and gray brown, very fine to fine grained and silty, poorly sorted, well consolidated, quartzose with 50% argillaceous and shale matrix and cement, coal micro laminae, trace pyrite. SHALE; medium gray mottled with light brown, blocky, sandy, occasional pyrite blebs, coal partings, firm to moderately firm, non calcareous, rare glauconite grains.

155 to 165 SHALE; medium gray mottled with light brown, blocky to sub platy, silty throughout, micromicaceous, minor carbonaceous micro laminae, pyrite blebs and stringers, firm to moderately firm, non calcareous, rare SANDSTONE stringers as above.

165 to 170 SHALE; medium to dark gray, mottled with brown, blocky to sub platy, silty and sandy throughout, micromicaceous, occasional carbonaceous micro laminae, no pyrite, firm to moderately firm, non calcareous, increase in sand content.

170 to 175 SHALE; medium to dark gray, blocky, sub platy, sub fissile in part, silty, rare sand grains, rare coal partings, micromicaceous, occasional pyrite blebs throughout, firm to moderately firm, non calcareous, decrease in sand content.

175 to 190 SHALE; medium gray, blocky, sub platy in part, silty throughout, sandy in part, occasional coal partings, micromicaceous, trace pyrite blebs, firm to moderately firm, non calcareous.

190 to 196 SHALE; medium gray, blocky, sub platy, silty to sandy throughout, micromicaceous, micro laminae of coal, rare siderite grains and pyrite blebs, firm, non calcareous.

196 to 202 SANDSTONE; medium gray, mottled in part, silty, very fine to fine grained, sub angular, poorly sorted, well consolidated, argillaceous matrix and cement, coal partings, very shaly, **tight.**

202 to 208 SHALE; medium gray, silty, blocky to sub platy, sandy in part, micromicaceous, rare carbonaceous partings with sandstone lenses, firm, non calcareous.

208 to 212 SANDSTONE; light gray, mottled, silty to fine grained, sub angular, poorly sorted, well consolidated, very argillaceous and dirty, argillaceous matrix and cement, occasional glauconite grains, common coal partings, **tight.**

212 to 225 SHALE; medium gray, blocky, sub platy, silty throughout, sandy in part, micromicaceous, micro flakes of coal, disseminated pyrite, firm to hard, non calcareous. SANDSTONE; stringers, light gray brown, mottled, very fine to fine grained to silty, sub angular, poorly sorted, well consolidated, 40% argillaceous matrix and cement, sideritic cement in part, trace pyrite and glauconite and coal, **tight.**

225 to 231 SHALE; medium gray, blocky to sub platy, micromicaceous, silty and sandy throughout with common argillaceous sand lenses, micro flakes of coal, disseminated pyrite, firm, non calcareous.

231 to 240 SILTSTONE; medium gray, argillaceous and dirty, common very fine and fine grained sand grains, micromicaceous, common coal ( occasionally as matrix for sandstone lenses), trace pyrite, siderite cement and grains, hard, **tight,** shaly.

240 to 252 SHALE; medium gray, blocky, micromicaceous, silty, slightly sandy, minor coal and disseminated pyrite, hard, non calcareous.

252 to 255 SHALE; medium gray, blocky, sub poorly, micromicaceous, coal laminae, disseminated pyrite, silty and sandy, minor light tan siderite stringers, firm, non calcareous.

255 to 260 SANDSTONE; medium gray, occasionally mottled brown, silty to fine grained, sub angular, poorly sorted, well consolidated, argillaceous and dirty, argillaceous matrix, sideritic cement, coal partings and carbonaceous smear, **tight.**

260 to 269 SHALE; medium gray, blocky, sub platy, silty, micromicaceous, sandy in part, carbonaceous, firm, non calcareous, SILTSTONE stringers, medium gray to medium gray brown, very argillaceous and dirty, sandy throughout with floating fine sand grains, shaly, trace siderite grains, **tight.**

269 to 281 SHALE; medium gray, blocky, sub platy in part, silty and sandy, micromicaceous, slightly carbonaceous, firm, non calcareous. SANDSTONE; lenses, light gray, salt and pepper, clear in part, lower very fine to upper fine grained, sub angular, poorly sorted, well consolidated, quartzose, siliceous cement, slightly sideritic in part, trace glauconite grains, micro varved coal laminae , argillaceous streaky throughout, hard, dense, **tight.**

281 to 288 SHALE; medium gray, blocky, sub platy, silty and sandy throughout, micromicaceous, slightly carbonaceous, firm, non calcareous . SILTSTONE stringers, medium gray to mottled light gray, sand grains throughout, coal laminae and grains, very argillaceous, dense, **tight,** rare pyrite laminae.

288 to 301 SANDSTONE; medium gray and gray brown, silty to fine grained, sub angular, poorly sorted, well consolidated, very argillaceous and dirty, argillaceous cement and matrix, abundant micro fragments of coal, firm, **tight.** SHALE; stringers, medium gray, blocky, sub platy, silty and sandy, micromicaceous, firm, non calcareous.

301 to 305 SHALE; medium gray and gray brown, blocky, silty and sandy throughout, common micro fragments of coal, rare pyrite laminae, firm to hard, non calcareous.

305 to 311 SILTSTONE; medium gray to gray brown, very fine and fine grained sand inclusions, very argillaceous and dirty, common micro fragments of coal, dense , **tight.** SHALE stringers, medium gray, blocky, sub platy in part, silty, occasional sand grains, common micro fragments of coal, firm, non calcareous.

311 to 317 SHALE; as above, medium gray, blocky, sub platy in part, silty, occasional sand grains, common micro fragments of coal, firm, non calcareous.

317 to 323 SHALE; medium gray, blocky, sub platy in part, silty with occasional floating sand grains, common micro fragments of coal, firm to non calcareous, occasional SILTSTONE stringers, medium gray, slightly sandy, very argillaceous and dirty.

323 to 330 SANDSTONE; light gray, salt & pepper, silty to very fine grained, sub angular, poorly sorted, well consolidated, slightly calcareous cement, disseminated pyrite, rare glauconite grains, occasional micro fragments of coal, siliceous cement in part and clean grading to predominantly argillaceous and dirty, hard, tight. interbedded with SHALE; lenses, as above, medium gray, blocky, sub platy in part, silty with occasional floating sand grains, common micro fragments of coal, firm to non calcareous, occasional SILTSTONE stringers, medium gray, slightly sandy, very argillaceous and dirty.

330 to 340 SHALE; medium gray, blocky to sub platy, silty, rare sand grains, micromicaceous, firm, non calcareous. SILTSTONE stringers, medium to light gray, occasionally sandy with very fine grained sand grains throughout, very argillaceous and dirty, occasional siderite grains, slightly siliceous cement, hard, minor coal micro fragments, **tight.**

340 to 349 SANDSTONE; light gray, salt & pepper, very fine to fine grained, sub angular, poorly sorted, well consolidated, quartzose, slightly calcareous cement, predominantly siliceous, rare glauconite grains, common micro fragments of coal, argillaceous and dirty grading to clean in part, hard tight, decreasing in grain size and becoming silty with depth. SHALE; lenses as above, medium gray, blocky to sub platy, silty, rare sand grains, micromicaceous, firm, non calcareous.

349 to 356 SHALE; as above, medium gray, blocky to sub platy, silty, rare sand grains, micromicaceous, firm, non calcareous. SANDSTONE; light gray to medium gray with stringers of black, very fine to fine grained, silty in part, sub angular, poorly sorted, well consolidated, quartzose, very slightly calcareous but predominantly siliceous cement, abundant micro fragments of coal with carbonaceous matrix and cement in part, predominantly clean grading to argillaceous and dirty locally, hard, rare glauconite grains, **tight.**

356 to 360 SHALE; medium gray and gray brown, blocky to sub platy, silty and sandy throughout, micromicaceous, firm, non calcareous. SILTSTONE; laminae, degrading from above, light to medium gray and occasionally gray brown, sandy with very fine grained sand grains throughout, very argillaceous and dirty, slightly siliceous, common carbonaceous micro fragments, hard, dense, **tight.**

360 to 365 SANDSTONE; light gray to gray brown, mottled in part, lower very fine grained to upper fine grained, sub angular, poorly sorted, well consolidated, quartzose, siliceous cement, occasional glauconite grains, common coal micro fragments, clean to argillaceous in part, hard, tight. SANDSTONE; #2 light brown to earthy brown, upper very fine grained to lower fine grained, sub angular, moderately sorted and consolidated, quartzose, predominantly clean, siliceous cement, **14% intergranular porosity, light brown residual(?) oil stain, no visible dry fluorescence, slow streaming to good blooming yellow cut fluorescence.**

365 to 370 SHALE; medium gray, blocky, sub platy, silty, micromicaceous, occasional carbonaceous micro fragments, firm, non calcareous, SANDSTONE; light gray to gray brown, mottled in part, lower very fine grained to upper fine grained, sub angular, poorly sorted, well consolidated, quartzose, siliceous cement, occasional glauconite grains, common coal micro fragments, clean to argillaceous in part, hard, **tight.**

370 to 378 SANDSTONE; light brown to earthy brown, upper very fine grained to lower fine grained, sub angular, moderately sorted and consolidated, quartzose, predominantly clean to slightly argillaceous and dirty, rare glauconite grains, siliceous cement, 14% intergranular porosity, light brown residual(?) oil stain, no visible dry fluorescence, slow blooming to moderately bleeding yellow cut fluorescence. SHALE; medium gray, blocky, sub platy, silty, micromicaceous, occasional carbonaceous micro fragments, firm, non calcareous

378 to 388 SHALE; medium gray to gray brown, blocky, sub platy, silty, occasional coal micro fragments, firm, non calcareous, trace of light orange tan, dense, hard, SIDERITE laminae.

## SET SURFACE CASING 388m.

388 to 395 SHALE; medium gray, blocky to sub platy, micromicaceous, silty, carbonaceous micro fragments throughout, non calcareous, firm to hard, interbedded SILTSTONE stringers, siliceous, argillaceous, dirty, sandy.

395 to 404 SHALE; as above, medium gray, blocky to sub platy, micromicaceous , silty, carbonaceous micro fragments throughout, non calcareous, firm to hard, interbedded SILTSTONE stringers, siliceous, argillaceous, dirty, sandy. INTERPOLATED DUE TO ABUNDANT CEMENT IN SAMPLES.

404 to 409 SANDSTONE; light brown, mottled brown in part, very fine to fine grained, sub angular to angular, moderately sorted and consolidated, quartzose, moderately clean, slightly argillaceous in part, siliceous cement, occasional dull brown bitumen, **no visible dry fluorescence, trace pale blue blooming cut fluorescence, 12% intergranular porosity, (residual?, gas?)**

409 to 416 SANDSTONE; light to medium gray, very fine grained to silty to fine grained inclusions, poorly sorted, well consolidated, siliceous cement, argillaceous and dirty, hard, dense, tight. SHALE: medium gray, blocky, sub platy, micromicaceous, silty carbonaceous micro fragments, firm to hard, non calcareous.

416 to 425 SHALE; medium gray, as above, blocky, sub platy, silty to sandy, micro carbonaceous fragments, hard, non calcareous, minor SIDERITE laminae: light brown, hard, dense, well consolidated.

425 to 435 SHALE; dark gray to black, blocky, micromicaceous, carbonaceous throughout, moderately firm, non calcareous, rare silt, common clear to opaque gypsum/calcite crystals, rare SIDERITE laminae, medium brown, hard, dense.

435 to 448 SHALE; medium to dark gray brown, blocky to sub platy, rare carbonaceous micro fragments, micromicaceous, slightly silty, firm, non calcareous.

448 to 455 SHALE; medium to dark gray brown, blocky, sub platy, slightly silty, rare micro carbonaceous fragments, firm to hard, non calcareous.

455 to 462 SHALE; medium gray brown, (brown tint throughout), blocky, sub platy, sub splintery, sub fissile, very rare silt and micro carbonaceous fragments, very hard, non calcareous, rare SANDSTONE stringers, light to medium gray, mottled, very fine grained, siliceous cement, hard, **tight.**

462 to 470 SHALE; black, dark grey brown, mottled in part, blocky, sub platy, sub splintery, common floating very fine grained sub angular to sub rounded sand grains, disseminated pyrite throughout, rare carbonaceous micro fragments, very hard, non calcareous, (gas bubbles?)

470 to 474 SHALE; black, dark gray brown, blocky to sub platy to sub fissile, common floating sand grains, rare micro carbonaceous fragments, common disseminated pyrite, very hard, non calcareous, (gas bubbles?)

474 to 480 SHALE; black to dark gray brown, mottled, blocky to sub platy to sub fissile, occasional floating very fine grained sand grains, common disseminated pyrite and occasional pyrite nodules, rare carbonaceous micro fragments, very hard, non calcareous, decrease in bubbles.

480 to 492 SHALE; black, dark gray brown, blocky, sub platy, micromicaceous in part, rare silt grains, common clear to vitreous to white crystalline infill in fractures (calcite? or other orthorhombic crystals), scattered white specks of same, occasional nodular pyrite, common disseminated pyrite, very hard, non calcareous, trace of SANDSTONE stringers, light brown, siliceous, hard.

492 to 496 SHALE; dark gray brown, black in part, blocky, sub platy, common disseminated pyrite, hairline fractures with white to clear minimum infill, very hard, non calcareous.

496 to 504 SHALE; predominantly as above, dark gray brown, black in part, blocky, common disseminated pyrite with rare nodular pyrite, common white specks throughout ( white to clear calcite? minimum replacement of spores?) very hard, non calcareous, increase in fractures at base.

504 to 510 SHALE; dark gray brown, blocky, sub platy in part, common disseminated pyrite, rare nodular pyrite, hard, non calcareous, no fractures, stringers of earthy brown blocky slightly calcareous moderately firm SHALE.

510 to 521 SHALE; dark gray brown, black in part, blocky, sub platy, common disseminated pyrite, rare pyrite nodules, hard, non calcareous, increase in white to clear minimum replacement (calcite?) of spores?, common white calcite/ infill in fractures.

521 to 530 SHALE; dark gray brown, blocky, sub platy, common disseminated pyrite with rare pyrite nodules, common white specks throughout and white to clear calcite? minimum replacement and infill in fractures, occasional earthy brown shale stringers, very hard, all non calcareous.

530 to 535 SHALE; dark gray brown, blocky, sub platy in part, common disseminated pyrite, increase in pyritic micro laminae and nodular pyrite, very hard, non calcareous, rare LIMESTONE stringers, medium to dark mottled brown, cryptocrystalline, crystalline texture, hard, argillaceous and dirty, **tight.**

535 to 540 SHALE; dark gray brown, blocky, sub platy in part, occasional disseminated pyrite decreasing from above, rare nodular pyrite, very hard, non calcareous, common white to clear calcite crystals in fractures, stress fractures, (increase in fractures).

540 to 545 SHALE; dark gray brown, blocky, common disseminated pyrite, common white to clear rounded specks (calcite infill?), common white to clear calcite infill in fractures, very hard, non calcareous, stringers of silica; dark brown, crystalline, argillaceous, pseudo chert?

545 to 550 SHALE; dark gray brown, blocky, sub platy in part, common disseminated pyrite, occasional white to clear rounded specks ( calcite infill?) spores?, occasional calcite infill in fractures (decreasing from above), very hard, non calcareous, stringers of SHALE; earthy brown to medium gray brown, mottled, moderately firm, calcareous.

550 to 555 SHALE; dark gray brown, blocky, common disseminated pyrite, very hard, non calcareous, stringers of dark brown mottled silica (pseudo chert?).

555 to 560 SHALE; predominantly as above, dark gray brown, blocky, common disseminated pyrite, very hard, non calcareous, stringers of dark brown mottled silica (pseudo chert?), increase in nodular pyrite, increase in earthy brown mottled moderately firm calcareous SHALE.

560 to 565 SHALE; dark gray brown to black, micromicaceous, carbonaceous, common disseminated pyrite, occasional massive pyrite blebs, very hard, non calcareous, stringers of pseudo chert as above, MARLSTONE; (30%) light mottled gray brown to medium gray brown, very argillaceous and dirty, soft, earthy.

565 to 572 SHALE; light mottled gray, (interbedded light and off white and dark clay), platy, banded texture, plastic, non calcareous, occasional disseminated pyrite, rare carbonaceous flakes and micro carbonaceous laminae, moderately firm.

## TOP OF HUME 572 m

572 to 575 SHALE; dark gray brown, black, blocky, micromicaceous, carbonaceous, occasional disseminated pyrite, common nodular pyrite, very hard, non calcareous, plant remnants, minor fossil remnants, (brachiopod? crinoid?) minor infilled fractures, LIMESTONE; stringers (20%), white mottled with gray and black argillaceous material, poorly indurated, chalky texture, soft.

575 to 585 LIMESTONE; (40%) white, slightly mottled, light to medium tan, chalky to massive texture, argillaceous in part, occasional crystalline texture with very fine crystalline limestone, moderately indurated, calcilutite, **tight, no shows.** MARLSTONE (60%) light gray, mottled, very argillaceous and dirty, limy, occasional crinoid fragments, moderately firm.

585 to 590 LIMESTONE; (20%) white, slightly mottled, light to medium tan, chalky to massive texture, argillaceous in part, occasional crystalline texture with very fine crystalline limestone, moderately indurated, calcilutite, **tight, no shows.** MARLSTONE (40%) light gray, mottled, very argillaceous and dirty, limy, greasy texture, occasional crinoid fragments, moderately firm. SHALE; medium gray slightly silty, blocky, disseminated pyrite, calcareous.

590 to 594 LIMESTONE (50%), off white, light to medium gray tan, predominantly cryptocrystalline, crystalline texture, rare chalky texture, clean to argillaceous and dirty, dense, tight, no shows, occasional brachiopod fragments. SHALE; (50%) medium gray to gray green, blocky to platy, disseminated pyrite, rare silt, occasional fossil fragments, moderately firm, calcareous.

594 to 603 SHALE; medium gray to gray green, blocky to platy, disseminated pyrite, rare silt, occasional fossil fragments, moderately firm, calcareous.

603 to 608 SHALE; (20%) medium gray to gray green, blocky to platy, disseminated pyrite, rare silt, occasional fossil fragments, moderately firm, calcareous. LIMESTONE (80%) off white, light gray brown to medium tan gray, cryptocrystalline to microcrystalline in part, predominantly crystalline texture, rare chalky texture, calcilutite, micro pyrite in stress fractures, rare lithics, well indurated, **tight.**

608 to 616 LIMESTONE; off white, light to medium gray brown and tan, cryptocrystalline with increasing microcrystalline and rare very fine crystalline, crystalline texture, massive texture in part, calcilutite grading to packstone in part, argillaceous and dirty with common clean laminae, rare micro pyrite laminae, well indurated, trace dolomite crystals, **tight to 3% intercrystaline porosity in streaky.**

616 to 620 LIMESTONE; (60%) off white, light to medium gray brown and tan, mottled in part, cryptocrystalline, occasionally microcrystalline, crystalline texture, calcilutite, occasional fossil fragments and white crystalline replacement of fossil (crinoid?), minor disseminated pyrite, predominantly argillaceous and dirty, well indurated, **tight.** SHALE (40%) medium to dark gray and gray brown, silty in part, blocky, disseminated pyrite, moderately firm, calcareous.

620 to 626 LIMESTONE; off white, light tan, buff, dark tan, mottled, predominantly crystalline texture, rarely chalky, well indurated, calcilutite with fossiliferous stringers, common unidentifiable for fragments, crinoid, brachiopod?, argillaceous in part, hard, tight, disseminated pyrite.

626 to 632 SHALE; medium gray to gray green, blocky, sub platy, silty, moderately firm, calcareous, minor fossil fragments in part, rare disseminated pyrite, occasional black lithics.

632 to 635 LIMESTONE; off white, light tan, buff, dark tan, mottled, increase in fossiliferous stringers, cryptocrystalline matrix, calcilutite, occasionally sucrosic texture, white calcite crystalline replacement with dead bitumen, rare pyrite, argillaceous in part, well indurated, **tight.**

635 to 640 LIMESTONE; off white, buff, medium brown, predominantly cryptocrystalline, occasional microcrystalline, calcilutite, crystalline texture, calcite replacement of fossil fragments, hard, dense, well indurated, trace disseminated pyrite, trace dead bitumen, **tight.**

640 to 645 LIMESTONE; off white, buff, medium brown, as above, cryptocrystalline texture, calcilutite with fossil fragments throughout, rare dead bitumen, predominantly clean, **tight.**

645 to 652 SHALE; medium gray to medium gray green, blocky to platy, silty, disseminated pyrite, moderately firm, calcareous.

652 to 661 SHALE; 50%, medium gray to medium gray green, blocky, platy, disseminated pyrite, moderately firm, calcareous. LIMESTONE; 50%, light buff, white, light tan, cryptocrystalline, calcilutite, crystalline texture to massive texture, clean, rare chalky texture, slightly argillaceous, disseminated pyrite, trace of pelloidal limestone stringer, moderately firm, **tight.**

## TOP OF GOSSAGE 661 m

661 to 665 LIMESTONE; off white, buff, tan, cryptocrystalline in part, calcilutite, crystalline texture, rare chalky texture, predominantly well indurated, hard and dense, rare stringers of pelloidal limestone, abundant black dead bitumen outlining fossil fragments, **3 to 4% porosity, no permeability, slight light blue blooming halo on cut fluorescence**

665 to 670 LIMESTONE; off white, buff, increase in medium tan, cryptocrystalline, calcilutite, crystalline and massive texture, rare pelloidal texture, well indurated, hard, trace chalky texture, common black dead bitumen in associated with fossil fragments or minor stress fractures, **3 to 4% porosity, no permeability, slight light blue blooming halo on cut fluorescence after 1 minute.**

670 to 678 LIMESTONE; white, buff, light brown, mottled, speckled,, medium brown cryptocrystalline well indurated calcilutite with crystalline texture, white pelloidal packstone soft to moderately firm chalky texture with abundant black dead bitumen outlining pellets, **3 to 5% porosity, no permeability, good blooming blue cut fluorescence.**

678 to 685 LIMESTONE; off white, buff, cryptocrystalline, crystalline texture, calcilutite, very hard, very well indurated, dense, minor argillaceous infill in occasional micro fractures, trace black shale laminae, **tight, no shows.**

685 to 695 LIMESTONE; off white, buff, mottled, cryptocrystalline, crystalline texture, occasional microcrystalline and pelloidal texture, common streaks of pelloidal limestone, clean, increase in black dead bitumen outlining pellets and in associated with rare calcite crystals, **3% porosity, no permeability, trace light blue blooming cut fluorescence after 1 minimum.**

695 to 700 LIMESTONE; off white, light tan, increase in dark tan and dark brown, cryptocrystalline, crystalline texture to massive texture, rare pelloidal texture, occasional clear calcite crystals, clean in part, grading to argillaceous with argillaceous and shale infill in minor fractures, trace black shale laminae, trace micro styolite, **tight, no shows.**

700 to 705 LIMESTONE; light gray grading to buff and medium brown with occasional dark brown, cryptocrystalline with rare laminae of microcrystalline and very fine crystalline, calcilutite, well indurated, clean, occasional dead bitumen in microcrystalline and very fine crystalline laminae, rare carbonaceous shale laminae, very well indurated, hard and dense, **tight, no shows.**

705 to 710 LIMESTONE; medium buff to medium and dark brown, cryptocrystalline, calcite replacement of previous porosity, **occasional black dead bitumen associated with older porosity,** calcilutite, massive texture, clean, very well indurated, hard, **tight.**

710 to 720 LIMESTONE; off white,, light tan, medium brown, cryptocrystalline, calcilutite, massive texture, clean, well indurated, very hard and dense, occasional minor black carbonaceous shale micro laminae increasing slightly with depth, rare disseminated pyrite with shale micro laminae, **tight, no shows**

720 to 725 LIMESTONE; off white, light to medium tan, rare dark brown, cryptocrystalline with occasional microcrystalline in part, crystalline texture and massive texture, calcilutite, well indurated, clean, rare black carbonaceous shale laminae, hard, dense, **tight, no shows,** common white calcite crystals.

725 to 730 LIMESTONE; off white, light tan, cryptocrystalline, massive texture, calcilutite, well indurated, clean, hard, dense, **tight, stringers of light brown very fine crystalline limestone with 6% porosity.**

730 to 735 LIMESTONE; off white, light tan, medium brown, cryptocrystalline, rare microcrystalline, massive and crystalline texture, calcilutite, well indurated, predominantly clean with increase in black carbonaceous calcareous shale laminae, occasional gray green shale laminae, hard, dense, **tight.**

735 to 740 LIMESTONE; off white, light tan, medium to dark brown, mottled in part, cryptocrystalline with rare microcrystalline, crystalline texture, massive texture, calcilutite, slightly argillaceous, rare pelloidal laminae, trace Ostracods?, rare sparry calcite replacement of fossil fragments, hard, dense, **tight,** occasional black carbonaceous SHALE laminae.

740 to 755 LIMESTONE; predominantly light buff to light tan, rare dark brown, cryptocrystalline, crystalline and massive texture, lithographic in part, common sparry calcite with argillaceous coating, predominantly clean, hard, dense, **tight, no shows,** very minor black carbonaceous SHALE micro laminae.

755 to 760 LIMESTONE; predominantly buff to medium tan, cryptocrystalline, clean, massive and crystalline texture, lithographic in part, calcilutite, occasional argillaceous coating of sparry calcite, hard, dense, **tight,** rare dark green calcareous SHALE laminae, trace disseminated pyrite.

760 to 770 LIMESTONE; predominantly buff to medium tan, cryptocrystalline to microcrystalline, massive and crystalline texture, rare stringers of pelloidal texture, increase in sparry calcite, clean with common argillaceous micro laminae and coating of calcite, hard, dense, **tight, no shows,** rare laminae of black carbonaceous calcareous SHALE.

770 to 775 LIMESTONE; off white, light buff, cryptocrystalline to microcrystalline increasing from above, massive to crystalline texture, calcilutite, predominantly clean, common sparry calcite, rare argillaceous infill of micro fractures, also coating calcite, hard, dense, **tight.**

775 to 779 LIMESTONE; buff, medium tan, cryptocrystalline to microcrystalline, rare pelloidal texture, predominantly clean. common sparry calcite, increase in argillaceous carbonaceous SHALE laminae, also argillaceous infill and coating of calcite crystals, trace disseminated pyrite, firm, well indurated, **tight, no shows.**

779 to 790 LIMESTONE; (70%) buff, mottled, medium tan, occasionally dark brown, cryptocrystalline, microcrystalline, clean, massive to chalky texture, calcilutite, rare pelloidal texture, well indurated, trace disseminated pyrite, hard, dense, tight. DOLOMITE; stringers, light brown sucrosic with calcareous matrix, also dark brown, vitreous, cryptocrystalline, crystalline texture, well indurated, argillaceous, very hard, dense, **tight.**

790 to 795 LIMESTONE; off white, buff, light tan, cryptocrystalline, clean, calcilutite, massive texture, lithographic, well indurated, hard, dense, **tight.**

795 to 805 LIMESTONE; off white, buff, medium tan and gray brown, cryptocrystalline with occasional microcrystalline, massive and lithographic texture, occasional pelloidal texture, predominantly clean, trace disseminated pyrite, rare micro SHALE laminae, slightly dolomitic in part, hard, dense, **tight.**

805 to 817 LIMESTONE; off white, light tan, medium buff and brown, cryptocrystalline to microcrystalline, massive and lithographic texture, calcilutite, predominantly clean, rare black dead bitumen in rare micro fractures, hard, dense, **tight.**

817 to 821 DOLOMITE; earthy brown, sucrosic texture grading to crystalline texture and massive in lower stringer, packstone, macro crystalline to very fine crystalline, clean in part to argillaceous in part, poorly indurated, friable, 50% limestone cement and matrix, **12% porosity, no visible fluorescence,** rare disseminated pyrite. LIMESTONE; stringer, as above, LIMESTONE; off white, light tan, medium buff and brown, cryptocrystalline to microcrystalline, massive and lithographic texture, calcilutite, predominantly clean, rare black dead bitumen in rare micro fractures, hard, dense, **tight.**

821 to 826 LIMESTONE; off white, buff, cryptocrystalline, clean, massive texture, lithographic, calcilutite, hard, dense, **tight.**

826 to 828 DOLOMITE; white, light brown, vitreous, very fine crystalline to macro crystalline, sucrosic texture, 7% porosity in sucrosic dolomite stringers, packstone to grainstone, common secondary dolomitic and limy cement, hard, dense, **tight.**

828 to 840 LIMESTONE; off white, buff, light tan, cryptocrystalline to microcrystalline, lithographic in part, common pelloidal and brecciated limestone with secondary limestone cement that is dolomitize (30%), scattered dolomite crystals throughout, clean, sucrosic texture in part, moderately indurated to well indurated in part, dense, **tight.**

840 to 845 DOLOMITE; white, vitreous, microcrystalline, sucrosic texture, packstone with calcite cement grading to massive texture, vitreous, hard, clean throughout, **4 to 5% intercrystalline porosity in part, tight in part, no shows.** LIMESTONE; stringers as above.

845 to 847 LIMESTONE; off white, buff, light tan, cryptocrystalline to microcrystalline, lithographic in part, scattered dolomite crystals throughout, clean, sucrosic texture in part, moderately indurated to well indurated in part, dense, **tight.**

847 to 852 DOLOMITE; earthy, light to medium brown, vitreous, very fine crystalline grading to microcrystalline and cryptocrystalline stringers, grainstone with calcareous cement, predominantly dolomitic cement, friable grading to well indurated, very clean, **12% micro vuggy porosity, good permeability, no visible dry fluorescence, very faint, light blue blooming haloes on cut fluorescence.**

852 to 855 LIMESTONE; off white, buff, light gray brown, cryptocrystalline to microcrystalline, lithographic in part, calcilutite to calcisiltite, massive to crystalline texture, predominantly clean, trace sparry calcite, occasional dolomite crystals, hard, dense, **tight.**

855 to 864 LIMESTONE; off white, buff, light gray brown, cryptocrystalline to microcrystalline, calcilutite, well indurated, occasionally mottled with sparry calcite, massive to crystalline texture, clean, hard, dense, **tight.** DOLOMITE; stringers, medium slate gray, microcrystalline to macro crystalline, grainstone, well indurated, dolomitic cement, clean, hard, dense, **tight.** trace SHALE laminae, gray green, platy, calcareous to dolomitic.

864 to 866 DOLOMITE; medium to dark gray brown, light brown in part, microcrystalline, sucrosic texture, clean, vitreous, mottled in part, calcareous cement in part, moderately indurated, dense, **tight.**

866 to 870 LIMESTONE; off white, buff, light brown, mottled, cryptocrystalline to microcrystalline, massive to crystalline texture, calcilutite to calcisiltite, predominantly clean, common dolomite grains throughout, stringers of dark brown cryptocrystalline lithographic limestone, well indurated, dense, **tight, no shows.**

870 to 875 LIMESTONE; off white, light tan to buff with rare dark brown, cryptocrystalline to microcrystalline, clean packstone to calcilutite, massive texture, common dolomite crystals throughout, well indurated, hard, dense, **tight,** occasional stringers of sucrosic light brown DOLOMITE.

875 to 881 LIMESTONE; off white to light tan, cryptocrystalline to microcrystalline, clean calcilutite to packstone in part, massive texture, rare to common pelloidal texture with secondary calcareous cement, rare to common dolomite crystals scattered throughout, hard, dense, **tight, no shows.**

881 to 884 LIMESTONE; (50%) as above, off white to light tan, cryptocrystalline to microcrystalline, clean calcilutite to packstone in part, massive texture, rare to common pelloidal texture with secondary calcareous cement, rare to common dolomite crystals scattered throughout, hard, dense, **tight, no shows.** DOLOMITE; (50%), light tan to light brown, microcrystalline to macro crystalline in part, clean packstone, sucrosic texture, predominantly dolomitic cement, rare calcareous cement, moderately indurated, **3% intercrystalline porosity, no permeability, no shows.**

884 to 890 DOLOMITE; white, light tan, dark brown, microcrystalline to macro crystalline with rare very fine crystalline, clean packstone with calcareous cement, moderately indurated, sucrosic texture, **3% intercrystalline porosity, no permeability, no shows.** LIMESTONE; stringers, buff, light tan, mottled, cryptocrystalline to microcrystalline, clean calcilutite with common dolomite crystals scattered throughout, massive to crystalline texture, minor sparry calcite with argillaceous coating at contact, hard, dense, **tight.**

890 to 895 LIMESTONE; off white, very light tan and very light gray, cryptocrystalline, rare microcrystalline, very clean calcilutite, lithographic in part, massive texture, rare dolomite crystals, trace sparry calcite, trace pyrite micro laminae, hard, dense, **tight.**

895 to 900 LIMESTONE; light buff, light tan, cryptocrystalline, rare microcrystalline, massive texture, clean, calcilutite, lithographic in part, hard, dense, occasional stringers of dark brown LIMESTONE with common sparry calcite and carbonaceous laminae, occasional pyrite micro laminae, tight, trace gray green, pyritic, dolomitic SHALE.

900 to 910 LIMESTONE; off white, buff, very light tan, cryptocrystalline, massive texture, very clean calcilutite, lithographic in part, rare pelloidal texture with calcareous cement, trace sparry calcite, hard, dense, **tight,** occasional SHALE laminae, gray green to dark gray green brown, platy, dolomitic, abundant pyrite cubes and rare nodular pyrite.

910 to 913 LIMESTONE; light gray brown, cryptocrystalline, massive texture, very clean calcilutite, lithographic in part, trace sparry calcite, rare pyritic argillaceous laminae, hard, dense, **tight.**

## TOP OF LONE MOUNTAIN 913 m

913 to 920 LIMESTONE; stringers, as above, light gray brown, cryptocrystalline, massive texture, very clean calcilutite, lithographic in part, trace sparry calcite, rare pyritic argillaceous laminae, hard, dense, tight, with dolomitic laminae. DOLOMITE; dark brown to medium brown, macro to very fine crystalline, sucrosic texture, occasionally massive, predominantly clean packstone with 30% calcareous cement, slightly argillaceous with minor argillaceous laminae, mottled in part, hard, dense, **tight.**

920 to 925 DOLOMITE; white, sucrosic, macro to very fine crystalline, very clean packstone, dolomitic cement, moderately indurated, tight, also medium to dark brown and brown black, macro to predominantly very fine crystalline, vitreous, argillaceous, predominantly dolomitic cement, rare calcareous cement, dense, **3% porosity to tight, no shows or permeability.**

925to 928 DOLOMITE; white, sucrosic, macro crystalline to very fine crystalline, very clean packstone, dolomitic cement, moderately indurated, **tight.**

928 to 932 DOLOMITE; dark brown to brown black, macro crystalline to very fine crystalline, sucrosic texture, mottled in part, argillaceous packstone, common dolomitic cement with rare calcareous cement, common argillaceous grain coating dolomite rhombs, well indurated, **3% to tight. no permeability or shows.**

932 to 935 LIMESTONE; off white, light buff to tan, mottled in part, cryptocrystalline, crystalline calcilutite, dolomitic in part, no visible dolomite rhombs, lithographic in part hard, dense, **tight.**

935 to 940 DOLOMITE; dark brown and brown black, cryptocrystalline to microcrystalline, vitreous, sucrosic texture in part to massive texture in part, clean packstone to calcilutite, (deep water environment?) predominantly dolomitic cement with rare sparry calcite, well indurated, dense, **tight.** LIMESTONE; stringers, medium gray, pelloidal texture with calcite mud matrix, argillaceous calcilutite, rare fossil fragments, hard, **tight.**

940 to 951 DOLOMITE; light gray brown, mottled, cryptocrystalline to microcrystalline, slightly sucrosic texture to massive texture, clean calcisiltite to packstone, trace ghost fossil fragments remnants, predominantly dolomitic cement with occasional calcareous cement, hard, dense, **tight.**

951 to 958 DOLOMITE; light gray to light gray brown with stringers of dark brown, cryptocrystalline to microcrystalline, vitreous, sucrosic texture, occasionally massive texture, calcisiltite to grainstone, predominantly clean with rare argillaceous grain coating on dolomite rhombs in dark dolomite, trace ghost fabric ( fossil? fractures?) predominantly dolomitic cement, dense, **tight.**

958 to 961 DOLOMITE; medium gray brown, increase in dark brown, vitreous, cryptocrystalline, rare microcrystalline, predominantly massive texture with rare sucrosic texture, clean calcilutite, rare argillaceous laminae, trace ghost fossil, predominantly dolomitic cement, rare calcareous cement, hard, dense, **tight.**

961 to 965 **DOLOMITE**; medium to dark brown, microcrystalline to cryptocrystalline, massive texture, rarely sucrosic texture, clean calcilutite, rare argillaceous micro la, rare carbonaceous micro flakes, dolomitic cement, hard, dense, **tight.**

965 to 975 **DOLOMITE**; as above, medium to dark brown, microcrystalline to cryptocrystalline, massive texture, rarely sucrosic texture, clean calcilutite, rare argillaceous micro laminations, rare carbonaceous micro flakes, dolomitic cement, hard, dense, **tight.** **LIMESTONE**; light tan, medium brown, cryptocrystalline, massive texture, dolomitic, clean calcilutite, hard, dense, **tight.**

975 to 980 **DOLOMITE** (40%), dark brown to brown black, cryptocrystalline with rare microcrystalline, massive texture, clean calcilutite (deep water environment?) slightly calcareous, hard, dense, **tight.** **LIMESTONE**; light fine and gray brown to medium brown, mottled, cryptocrystalline, massive texture, slightly chalky in part, common argillaceous micro laminae, trace fossil fragments (ostracod?), dense, **tight.**

980 to 986 **DOLOMITE**; medium gray brown to dark brown, cryptocrystalline, rare microcrystalline, massive texture, predominantly clean calcilutite, (deep water environment?), high % of calcareous composition (40%), grading to dolomitic **LIMESTONE** in part, dense, **tight.**

986 to 990 **LIMESTONE**; cream, buff, light tan, stringers of dark brown, mottled, cryptocrystalline, massive texture, lithographic in part, clean calcilutite, occasional stringers of bioclastic limestone with lime mud matrix (crinoid? unidentifiable fossil fragments), common dolomitic throughout (30%), trace of argillaceous micro laminae, dense, **tight.**

990 to 995 **LIMESTONE**; cream, light gray brown, mottled, cryptocrystalline, massive texture, chalky in part, lithographic in part, clean calcilutite, rare bioclastic stringers with lime mud matrix (unidentifiable fossil fragments), very dolomitic, slightly argillaceous in part, hard, dense, **tight.** **DOLOMITE**; stringers, dark brown, cryptocrystalline, massive texture, calcilutite, clean, calcareous, dense, **tight.**

995 to 1005 **LIMESTONE**; cream, medium gray brown, stringers of dark gray brown, occasionally mottled, cryptocrystalline, clean to argillaceous calcilutite, massive texture, crystalline texture in part, trace of fossil (ostracod) in light colour limestone, 20 to 40% dark limestone, cryptocrystalline, very dolomitic and argillaceous, (grading to limy **DOLOMITE** in part), **tight,** occasional white calcite crystals.

1005 to 1010 **LIMESTONE**: medium brown to dark brown and black, cryptocrystalline, argillaceous calcilutite, lithographic, disseminated pyrite, dolomitic in part, hard, dense, **tight,** (deep water environ?)

1010 to 1015 **LIMESTONE**: light gray brown to medium brown, stringers of dark brown and black, cryptocrystalline with rare microcrystalline, clean calcilutite in part, stringers of calcareous sucrosic calcisiltite **DOLOMITE**, dark brown **LIMESTONE** is dolomitic and argillaceous, lithographic, calcilutite, hard, dense, **tight.**

1015 to 1020 LIMESTONE: light medium gray brown, mottled, stringers of dark brown, cryptocrystalline, predominantly clean calcilutite grading to argillaceous calcilutite where dark coloured, dolomitic with rare visible dolomite rhombs, well indurated, hard, dense, **tight,** trace disseminated pyrite, trace argillaceous micro laminae, trace unidentifiable fossil or fossil fragments replaced with sparry calcite.

1020 to 1025 LIMESTONE; medium gray brown, light gray, mottled, dark brown and brown black, cryptocrystalline, rare microcrystalline, massive texture to chalky in part, lithographic, argillaceous calcilutite, occasional dolomite rhombs, dolomitic , well indurated, dense, **tight,** occasional large calcite crystals (fractures?)

1025 to 1030 LIMESTONE; medium brown and gray brown, mottled in part, cryptocrystalline to microcrystalline, massive texture, lithographic in part, clean calcilutite, rare sucrosic texture where dolomitic with rare stringers of limy DOLOMITE, well indurated, dense, tight. occasional large clear calcite crystals, ( fractures?), trace unidentifiable fossil.

1030 to 1035 LIMESTONE; medium brown and gray brown, mottled, cryptocrystalline to microcrystalline, massive texture, clean calcilutite, argillaceous in part, dolomitic with visible dolomite rhombs to 20%, dense, tight, common white free calcite crystals, DOLOMITE; stringers 10%, medium to dark gray brown, sucrosic texture, clean calcisiltite, calcareous cement to dolomitic cement, well indurated, dense, tight.

1035 to 1038 LIMESTONE; medium brown, mottled, cryptocrystalline to microcrystalline, massive texture, lithographic, clean calcilutite, well indurated, occasional fossil (crinoid?), occasional dolomite rhombs, rare to common white calcite crystals, dense, tight, dark brown black LIMESTONE, cryptocrystalline, argillaceous calcilutite, dolomitic in part, well indurated, hard, dense, **tight,** stringers of black dolomitic SHALE.

## TOP OF BEAR ROCK 1038 m

1038 to 1046 LIMESTONE; medium gray, mottled to dark brown, cryptocrystalline to microcrystalline, clean calcilutite, well indurated, argillaceous micro laminae, dolomitic with common dolomite rhombs, dense, **tight,** DOLOMITE; stringers, medium gray brown to dark brown, microcrystalline to macro crystalline, calcareous cement, sucrosic texture, calcisiltite to packstone, well indurated, dense, **tight.**

1046 to 1050 DOLOMITE; light gray, vitreous, microcrystalline to macro crystalline with rare very fine crystalline, sucrosic texture, clean packstone, dolomitic cement, very well indurated, rare calcareous cement, hard, dense, **3% porosity to tight, no shows.**

1050 to 1055 DOLOMITE; light gray, occasionally medium gray, vitreous, microcrystalline to macro crystalline with occasional very fine crystalline, sucrosic texture, clean packstone, dolomitic cement, moderately indurated, common calcareous cement grading to stringers of dolomitic LIMESTONE, stringers of 12% micro vuggy porosity, predominantly 3% porosity to tight, no shows, occasional large fractures with white calcite crystals infill.

1055 to 1060 DOLOMITE; light to medium gray brown, vitreous, cryptocrystalline to microcrystalline, predominantly massive texture grading to slightly sucrosic texture and crystalline texture in part, clean packstone to calcisiltite, predominantly dolomitic cement but stringers with calcareous cement grading to dolomitic LIMESTONE in part (30%), well indurated, dense, **5% porosity to tight, no shows.**

1060 to 1065 DOLOMITE; medium gray brown, predominantly dark brown, vitreous, cryptocrystalline where dark microcrystalline where medium, massive texture to sucrosic texture in part, clean calcilutite, very well indurated, dolomitic cement with stringers of calcareous cement grading to dolomitic LIMESTONE in part (10%), trace white calcite crystals infill in fractures, becoming slightly argillaceous with trace SHALE laminae, hard, dense, **tight.**

1065 to 1068 DOLOMITE; dark brown, vitreous, cryptocrystalline to microcrystalline, massive texture to crystalline texture, clean calcilutite, very well indurated, predominantly dolomitic cement with very rare calcareous cement, rare white calcite crystals, hard, dense, **tight.**

1068 to 1075 DOLOMITE; medium gray brown to dark brown, vitreous, cryptocrystalline to microcrystalline, scattered very fine crystalline dolomite rhombs, predominantly clean calcilutite to clean packstone in part, predominantly dolomitic cement, common white calcite crystals infill fractures and pore spaces, rare dead black bitumen in pore spaces and coating calcite infill, scattered 6 to 8% micro vuggy and pinpoint porosity but no permeability, **tight in part, no shows,** increase in stringers of light gray brown dolomitic LIMESTONE.

1075 to 1080 DOLOMITE; medium brown and gray brown, vitreous, cryptocrystalline to microcrystalline, clean calcisiltite to packstone, predominantly dolomitic cement, rare argillaceous micro laminae, occasional white calcite infill crystals, moderately indurated, **3% porosity to tight, no shows.**

1080 to 1090 DOLOMITE; medium gray brown and brown mottled with white, vitreous, macro crystalline to very fine crystalline, sucrosic texture with visible dolomite rhombs, clean packstone, predominantly dolomitic cement with rare to common calcareous cement (10 to 20% at base), moderately indurated, **6 to 8% intercrystalline porosity and scattered micro vuggy and pinpoint porosity, no permeability, no shows.**

1090 to 1095 DOLOMITE; medium brown and gray brown, vitreous, mottled with white dolomite rhombs, macro crystalline to very fine crystalline, sucrosic texture, clean packstone, predominantly dolomitic cement with common calcareous cement (30%), moderately indurated, **5% intercrystalline and pinpoint porosity, no permeability, no shows,** occasional argillaceous micro laminae.

1095 to 1100 DOLOMITE; medium brown and gray brown, vitreous, microcrystalline to macro crystalline, sucrosic texture, clean packstone, predominantly dolomitic cement, rare calcareous cement (5%), moderately indurated, **5% intercrystalline and pinpoint porosity, no permeability, no shows,** common large free calcite crystals.

1100 to 1112 DOLOMITE; light brown to medium brown and gray brown mottled with white, vitreous, microcrystalline to very fine crystalline, sucrosic texture, clean packstone, predominantly dolomitic cement, rare calcareous cement, common white calcite crystals, trace pyrite cubes, **5% intercrystalline and pinpoint porosity, no permeability, no shows.**

1112 to 1118 DOLOMITE; medium brown and gray brown, vitreous, cryptocrystalline to microcrystalline, sucrosic texture to massive texture, clean packstone grading to clean calcilutite, dolomitic cement grading to common calcareous cement at base, rare calcite crystals, argillaceous micro laminae at base, **3% porosity to tight,** stringers of slate gray argillaceous calcilutite DOLOMITE.

## LOWER LONE MOUNTAIN 1118 m

1118 to 1125 LIMESTONE; light to medium gray, mottled with white, cryptocrystalline, massive texture, argillaceous calcilutite, moderately indurated, chalky texture in part, dolomitic, dense, **tight.** DOLOMITE; medium brown and gray brown, vitreous, cryptocrystalline to microcrystalline, sucrosic texture to massive texture, clean packstone grading to clean calcilutite, dolomitic cement grading to common calcareous cement at base, rare calcite crystals, argillaceous micro laminae at base, **3% porosity to tight.**

1125 to 1130 DOLOMITE; medium brown and gray brown mottled with white, vitreous, cryptocrystalline rare microcrystalline, massive texture to sucrosic texture, predominantly red dolomitic cement with occasional calcareous cement (10%), clean calcilutite to clean packstone, **common white calcite crystals (fractures? infill in porosity space?), moderately to well indurated, dense, predominantly tight.**

1130 to 1135 DOLOMITE; medium brown, vitreous, cryptocrystalline, massive to crystalline texture, clean calcilutite, common calcareous cement to predominantly dolomitic cement, well indurated, scattered white calcite crystals, hard dense, **tight.** DOLOMITE #2 slate gray, vitreous, (greasy in part), massive texture, argillaceous calcilutite, very well indurated, hard, dense, **tight,** grading to gray green dolomitic SHALE stringers.

1135 to 1143 DOLOMITE; dark gray to slate gray with gray green cast, greasy, cryptocrystalline in part. massive texture, rare visible dolomite rhombs with argillaceous mud matrix, dolomitic argillaceous calcilutite, common disseminated pyrite, moderately indurated, dense, **tight.**

1143 to 1146 DOLOMITE; slate gray with gray green cast, cryptocrystalline, massive texture, argillaceous calcilutite, common disseminated pyrite and pyrite blebs, very well indurated, hard, dense, **tight.**

1146 to 1152 SILTSTONE; red dolomitic cement with scattered calcareous cement as matrix, disseminated pyrite, grading to silty DOLOMITE; calcisiltite, moderately indurated, silty, scattered calcareous cement, **tight.**

1152 to 1158 SHALE; dark red, blocky, occasional silt grains scattered throughout, earthy, occasional dolomite crystals, rare off white to pink calcareous crystals, dolomitic, firm.

1158 to 1161 DOLOMITE; off white, white, very light buff, vitreous to greasy texture, cryptocrystalline to microcrystalline, clean calcilutite and calcisiltite, common disseminated pyrite, dolomitic cement throughout, no calcareous cement, moderately indurated, **tight.**

1161 to 1165 DOLOMITE\MUDSTONE; slate gray with gray green cast, cryptocrystalline, massive texture, grading from argillaceous dolomite to dolomitic mudstone, common disseminated pyrite, well indurated, dense, **tight.** PYRITE; stringers (10%) common pyrite blebs and nodules associated with calcite in fractures.

## TOP OF ORDOVICIAN 1165 m

1165 to 1170 DOLOMITE; off white, light gray, light buff, vitreous, stringers of microcrystalline, predominantly cryptocrystalline, massive and crystalline texture, clean calcilutite, occasional disseminated pyrite, well indurated, dense, **tight.**

1170 to 1175 DOLOMITE; white, off white, light slate gray, vitreous, cryptocrystalline, very rare microcrystalline, massive texture, very clean calcilutite, dolomitic cement, occasional disseminated pyrite in slate gray, well indurated, dense, **tight.**

1175 to 1185 DOLOMITE; white, off white, cream, vitreous to greasy in part, cryptocrystalline, massive texture, very clean calcilutite, dolomitic cement, rare small pyrite cubes, rare argillaceous blebs, well indurated, dense, **tight.**

1185 to 1190 DOLOMITE; light gray to slate gray and off white, vitreous, greasy, cryptocrystalline, massive texture, clean calcilutite, occasional pyrite cubes with calcareous coating, well indurated, rare black carbonaceous shale laminae, dense, hard, **tight.**

1190 to 1200 DOLOMITE; off white, cream, vitreous, greasy, cryptocrystalline, massive texture, very clean calcilutite, rare disseminated pyrite , dolomitic cement, rare calcite crystalline in minor fractures, dense, well indurated, hard, **tight.**

1200 to 1210 DOLOMITE; off white, white, cream, very light gray, vitreous to greasy, cryptocrystalline, massive texture, clean calcilutite , dolomitic cement, rare calcite crystals and disseminated pyrite, well indurated, dense, **tight.**

1210 to 1215 DOLOMITE; off white, very light buff, vitreous to greasy, cryptocrystalline, massive texture, clean calcilutite, well indurated, dense, tight, stringers of macro crystalline, very fine to fine crystalline dolomite rhombs with dolomitic cement, clean grainstone, **3 to 5% intercrystalline porosity, no shows.**

1215 to 1225 DOLOMITE; off white, cream, very light buff, cryptocrystalline, massive texture, very clean calcilutite, dolomitic cement, occasional disseminated pyrite, hard, dense, well indurated, **tight.**

1225 to 1230 DOLOMITE; white, clear, cream, very light gray, cryptocrystalline, massive texture, very clean calcilutite , dolomitic cement, well indurated, hard, dense, tight, stringers of common very light gray very fine to fine crystalline DOLOMITE, dolomitic cement, **poorly developed rhombs ( pressure deformed?) 3 to 5% intercrystalline porosity,** moderately indurated, occasional disseminated pyrite and rare argillaceous crystal coating.

1230 to 1240 DOLOMITE; off white, cream, very light buff, cryptocrystalline, massive texture, very clean calcilutite, dolomitic cement, well indurated, dense, **tight.**

1240 to 1245 DOLOMITE; white, off white, cream, cryptocrystalline to microcrystalline, massive texture, very clean calcilutite, occasional white secondary? dolomite crystals, dolomitic cement throughout, well indurated, dense, **tight.**

1245 to 1250 DOLOMITE; white, off white, cream, vitreous, massive texture in part to grainy in part, very clean packstone to grainstone, dolomitic cement, **3% to tight intercrystalline porosity, macro crystalline to fine crystalline, no shows.**

1250 to 1255 DOLOMITE; white, off white, cream, vitreous to pearly, massive texture to occasionally sucrosic texture and grainy texture, very clean calcilutite to clean packstone, dolomitic cement, cryptocrystalline to stringers of microcrystalline to very fine crystalline, rare trace of calcite crystals, hard, dense, tight, occasional SHALE; laminae, green, dolomitic, moderately firm.

1255 to 1261 LIMESTONE; medium gray brown, cryptocrystalline, greasy texture, massive in part, slightly bioclastic fabric or ghost fabric (fossil fragments? pellets? limestone breccia? lithic grains?) calcareous cement, well indurated, hard, dense, **tight,** occasional green SHALE laminae.

1261 to 1265 DOLOMITE; white, off white, cream, light gray green, massive texture, sucrosic to grainy in part, cryptocrystalline to microcrystalline and occasionally very fine crystalline, predominantly dolomitic cement, rare calcareous cement, common gray green argillaceous coating on dolomite rhombs in part, common disseminated pyrite and pyrite blebs, well indurated, dense, **tight.**

1265 to 1270 DOLOMITE; white, light buff, off white, very light gray, cryptocrystalline, rare microcrystalline, clean calcilutite to clean packstone in part, predominantly dolomitic cement, rare calcareous crystals and pyrite cubes in minor fractures, trace of ghost bioclastic fabric or breccia fabric, well indurated, dense, **tight,** rare argillaceous laminae and gray green SHALE laminae.

1270 to 1275 DOLOMITE; off white, very light gray, cryptocrystalline, massive texture, clean calcilutite, dolomitic cement, common disseminated pyrite, well indurated, dense, **tight.**

1275 to 1283 DOLOMITE; off white, cream, cryptocrystalline to microcrystalline, massive texture, clean calcisiltite to clean packstone, dolomitic cement, common disseminated pyrite, well indurated, dense, tight, stringers of light gray green very fine to fine crystalline press deformed? dolomite rhombs, **dolomitic cement 3% porosity, no shows.**

1283 to 1285 MUDSTONE; gray green, blocky, non calcareous, non dolomitic, abundant disseminated pyrite and common pyrite blebs, common clear translucent to transparent macro to fine crystalline moderately well developed dolomite rhombs scattered throughout.

1285 to 1290 SHALE;(50%) dark gray green, blocky, greasy, non calcareous, non dolomitic, common disseminated pyrite. LIMESTONE; (50%) medium brown, light gray, pearly, cryptocrystalline, massive texture, occasional ghost fabric of fossil fragments? and breccia?. calcareous cement, rare dolomite rhombs, well indurated, dense, **tight.**

1290 to 1294 DOLOMITE; off white, light gray green, vitreous, cryptocrystalline to microcrystalline, rare macro crystalline, massive texture, clean calcilutite to clean calcisiltite, dolomitic cement, common disseminated pyrite, hard, dense, **tight.**

**Total Depth 1294m LOGGERS TD'd at 1293.2 m.**

**D: GEOLOGY ...continued**

GAS DETECTION REPORT – SEE GEOLOGICAL SUMMARY

DRILL STEM TESTS - NONE

# WELLSITE LOGGING REPORT

## DEVLAN ET AL TREE RIVER

## SECTION 10 N67 19'14" W131 45' 30"

| *HOLE DATA* | *MUD DATA* | *LOGGING COMPANY* |
|---|---|---|
| **Hole Size:** 200 mm. | | **Logging Co.:** TUCKER |
| **TD Driller:** 1294 m. | **Type:** GEL CHEM | **Engineer:** Randy Nitz |
| **Strap:** 1294.23 | **Density:** 1060 | **Truck No.:** 117 |
| **TD Logger:** 1293.2 | **Viscosity:** 56 | **Start Date:** 19 Feb 2001 |
| **Casing Driller:** 388 m. | **W.L.:** 7.0 | **Start Time:** 0415 hrs |
| **Casing Logger:** 387 m. | **pH:** 9.0 | **End Date:** 19 Feb 2001 |
| **Hole Condition:** GOOD | | **End Time:** 0700 hrs |

*LOGGING SEQUENCE*

| Run Number | Logged Interval From | To | Hours | Logs | Remarks |
|---|---|---|---|---|---|
| 1 | 0 | 1293.2 | 2.75 | DIL-SP-CNL-LDT-PE-GR-CAL- | |
| | | | | SONIC | |
| | | | | | |
| | | | | | |
| | | | | | |
| **Total Hours:** | | | 2.75 | | |

*LOGGING OPERATIONS SUMMARY*

| Date | From | To | Description of Operation |
|---|---|---|---|
| 19 Feb 01 | 0 | 1293.2 | Ran logs to Surface casing and continued in casing to surface |
| | | | Logs presented to surface casing. |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

*REMARKS & COMMENTS*

**D: GEOLOGY ...continued**

ANALYSES

MUD SALINITY: Not Applicable

GAS, OIL, & WATER ANALYSES:

No additional fluid analyses were conducted on this well.

FORMATION STIMULATION (Not applicable)

FORMATION AND TEST RESULTS (Not applicable)

DETAILED TEST PRESSURE DATA READINGS (Not applicable)

# Déroulement

**Date :** 14/08/2017 au 15/08/2017 — **Durée :** 1 jour

**Objectif :** Forage — **Type :** Forage — **Nature :** Forage

**Rig :** Rig 1 — **Opérateur :** Opérateur 1

**Puits :** Puits 1 — **Champ :** Champ 1 — **Permis :** Permis 1

**Coordonnées :** 48° 51' 24" N, 2° 21' 07" E — **Projection :** WGS 84

**Profondeur :** 0 m MD — **Profondeur :** 0 m TVD

**Commentaire :** Aucun commentaire

## Opérations

| Début | Fin | Durée | Code | Commentaire |
|---|---|---|---|---|
| 14/08/2017 00:00 | 14/08/2017 06:00 | 6 h | Forage | Forage de la section 1 |
| 14/08/2017 06:00 | 14/08/2017 12:00 | 6 h | Forage | Forage de la section 2 |
| 14/08/2017 12:00 | 14/08/2017 18:00 | 6 h | Forage | Forage de la section 3 |
| 14/08/2017 18:00 | 15/08/2017 00:00 | 6 h | Forage | Forage de la section 4 |

## Boues

| Type | Densité | Viscosité | Volume |
|---|---|---|---|
| Boue 1 | 1,20 | 45 | 100 m³ |
| Boue 2 | 1,25 | 50 | 120 m³ |
| Boue 3 | 1,30 | 55 | 140 m³ |
| Boue 4 | 1,35 | 60 | 160 m³ |

## Tubages

| Type | Diamètre | Profondeur |
|---|---|---|
| Tubage 1 | 20" | 500 m |
| Tubage 2 | 13 3/8" | 1 000 m |
| Tubage 3 | 9 5/8" | 1 500 m |
| Tubage 4 | 7" | 2 000 m |

## Personnel

| Nom | Fonction | Heures |
|---|---|---|
| Personne 1 | Chef de poste | 24 h |
| Personne 2 | Foreur | 24 h |
| Personne 3 | Aide foreur | 24 h |
| Personne 4 | Mécanicien | 24 h |

## Incidents

| Date | Heure | Type | Commentaire |
|---|---|---|---|
| 14/08/2017 | 08:00 | Perte de circulation | Perte de circulation mineure |
| 14/08/2017 | 14:00 | Coincement | Coincement de la garniture |
| 14/08/2017 | 20:00 | Kick | Kick contrôlé |
| 15/08/2017 | 02:00 | Panne | Panne du top drive |

## Mesures

| Profondeur | Inclinaison | Azimut |
|---|---|---|
| 0 m | 0° | 0° |
| 500 m | 1° | 45° |
| 1 000 m | 2° | 90° |
| 1 500 m | 3° | 135° |
| 2 000 m | 4° | 180° |

## Pièces jointes

| Nom | Type | Taille |
|---|---|---|
| Rapport journalier | PDF | 1 Mo |
| Photo 1 | JPG | 2 Mo |
| Photo 2 | JPG | 2 Mo |
| Schéma | PNG | 1 Mo |

## E. APPENDICES TO WELL HISTORY

(See Table of Contents)

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 25-Jan-01 **Day:** PS4

**Depth:** 0 mKB **Progress:** ____ m **Drlg.:** ____ hrs. **Drill Rate:** ____ m/hr **Rig:** Akita #14

**Operation:** Prepare to set conductor

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | | | Underflow Density | | | |
| Liner/Stroke | | | Overflow Density | | | |
| SPM | | | Flow Rate, l/min | | | |
| Volume | | | Operating Hours | | | |

**Pump Pressure:** ____ kPa **Ann. Vel.:** **DC:** ____ m/mi **DP** ____ m/mi **Jet Vel.:** ____ m/sec **kW:** ____

**Drilling Assembly:** ____

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | | | | | |
| | | | Viscosity | | | | | |
| | | | pH | | | | | |
| | | | Water Loss | | | | | |
| | | | P.V. | | | | | |
| | | | Y.P. | | | | | |
| | | | Gels | | | | | |
| | | | Filter Cake | | | | | |
| | | | Solids | | | | Day Cost | |
| | | | Oil | | | | Well Cost | |

**Core No.** ____ **Size/Type:** ____ **In:** ____ mKB **Out:** ____ mKB **Meters** ____ **Rec.:** ____ %

**DST No.:** ____ **Formation** ____ **Interval:** ____ to ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | ____ | 7. Clean to Bottom | ____ | 13. Cement | ____ | 19. Rig Up | ____ |
| 2. Rig Service | ____ | 8. Core | ____ | 14. WOC | ____ | 20. ____ | ____ |
| 3. Trip | ____ | 9. DST | ____ | 15. Nipple Up | ____ | 21. ____ | ____ |
| 4. Survey | ____ | 10. Log | ____ | 16. Pressure Test | ____ | 22. ____ | ____ |
| 5. Circ./Cond. | ____ | 11. Handle Tools | ____ | 17. Repair | ____ | 23. ____ | ____ |
| 6. Ream | ____ | 12. Run Casing | ____ | 18. Slip/Cut | ____ | 24. ____ | ____ |

## REMARKS

Wait on rotary tools. Work on roads, hills and crossings. Move out seismic equipment.

**Well Cost:** 34,856 **Cum. Cost:** 34,856 **AFE No.:** ____ **AFE Amount** ____

**Weather:** -15C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 26-Jan-01 **Day:** PS3

**Depth:** 0 mKB **Progress:** ____ m **Drlg.:** ____ hrs. **Drill Rate:** ____ m/hr **Rig:** Akita #14

**Operation:** Moving in rig and equipment.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | | | Underflow Density | | | |
| Liner/Stroke | | | Overflow Density | | | |
| SPM | | | Flow Rate, l/min | | | |
| Volume | | | Operating Hours | | | |

**Pump Pressure:** ____ kPa **Ann. Vel.: DC:** ____ m/mi **DP** ____ m/mi **Jet Vel.:** ____ m/sec **kW:** ____

**Drilling Assembly:** ____

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | | | | | |
| | | | Viscosity | | | | | |
| | | | pH | | | | | |
| | | | Water Loss | | | | | |
| | | | P.V. | | | | | |
| | | | Y.P. | | | | | |
| | | | Gels | | | | | |
| | | | Filter Cake | | | | | |
| | | | Solids | | | | Day Cost | |
| | | | Oil | | | | Well Cost | |

**Core No.** ____ **Size/Type:** ____ **In:** ____ mKB **Out:** ____ mKB **Meters** ____ **Rec.:** ____ %

**DST No.:** ____ **Formation** ____ **Interval:** ____ to ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

Wait on rotary tools. Drilled and cemented 12m of 403mm conductor pipe. 1.8m of frost at surface then moist clays to setting depth (12m).

**Well Cost:** 28,356 **Cum. Cost:** 63,212 **AFE No.:** ____ **AFE Amount** ____

**Weather:** **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 27-Jan-01 **Day:** PS2

**Depth:** 0 mKB **Progress:** ____ m **Drlg.:** ____ hrs. **Drill Rate:** ____ m/hr **Rig:** Akita #14

**Operation:** Wait on diverter.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | | | Underflow Density | | | |
| Liner/Stroke | | | Overflow Density | | | |
| SPM | | | Flow Rate, l/min | | | |
| Volume | | | Operating Hours | | | |

**Pump Pressure:** ____ kPa **Ann. Vel.:** **DC:** ____ m/mi **DP** ____ m/mi **Jet Vel.:** ____ m/sec **kW:** ____

**Drilling Assembly:** ____

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | | | | | |
| | | | Viscosity | | | | | |
| | | | pH | | | | | |
| | | | Water Loss | | | | | |
| | | | P.V. | | | | | |
| | | | Y.P. | | | | | |
| | | | Gels | | | | | |
| | | | Filter Cake | | | | | |
| | | | Solids | | | | Day Cost | |
| | | | Oil | | | | Well Cost | |

**Core No.** ____ **Size/Type:** ____ **In:** ____ mKB **Out:** ____ mKB **Meters** ____ **Rec.:** ____ %

**DST No.:** ____ **Formation** ____ **Interval:** ____ to ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | 5.00 |
| 2. Rig Service | | 8. Core | | 14. WOC | | 20. Move Rig | 7.00 |
| 3. Trip | | 9. DST | | 15. Nipple Up | | 21. Other | 12.00 |
| 4. Survey | | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

Move on rig and equipment, assemble mast onto drawworks. Spot rig and components. Raise mast. Rig up, wait on water to start boiler. Rig in water lines and steam lines. Put up floor tarps, etc. Akita delayed diverter from leaving Nisku. Will have to wait on diverter (will be here tonight).

**Well Cost:** 27,956 **Cum. Cost:** 91,168 **AFE No.:** ____ **AFE Amount** ____

**Weather:** -18C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 28-Jan-01 **Day:** PS1

**Depth:** 0 mKB **Progress:** m **Drlg.:** hrs. **Drill Rate:** m/hr **Rig:** Akita #14

**Operation:** Prepare to spud.

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 311 | L-127 | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | | | Flow Rate, l/min | | | |
| Volume | | | Operating Hours | | | |

**Pump Pressure:** kPa **Ann. Vel.:** **DC:** 22 m/mi **DP** 19 m/mi **Jet Vel.:** m/sec **kW:**

**Drilling Assembly:**

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | | | | | |
| | | | Viscosity | | | | | |
| | | | pH | | | | | |
| | | | Water Loss | | | | | |
| | | | P.V. | | | | | |
| | | | Y.P. | | | | | |
| | | | Gels | | | | | |
| | | | Filter Cake | | | | | |
| | | | Solids | | | | Day Cost | |
| | | | Oil | | | | Well Cost | |

**Core No.** **Size/Type:** **In:** mKB **Out:** mKB **Meters** **Rec.:** %

**DST No.:** **Formation** **Interval:** to **PF:** **ISI:** **VO:** **FSI:**

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | | 8. Core | | 14. WOC | | 20. Other | 18.00 |
| 3. Trip | | 9. DST | | 15. Nipple Up | 6.00 | 21. | |
| 4. Survey | | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0200: Wait on diverter, spool and hydraulic valve. Measure same and weld on flange. Head up diverter.
0200 - 0800: Nipple up BOPs. Make up bit and run in. Break circulation.

**Well Cost:** 35,591 **Cum. Cost:** 126,759 **AFE No.:** **AFE Amount**

**Weather:** Light Snow -12C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 29-Jan-01 **Day:** 1

**Depth:** 38 mKB **Progress:** 26 m **Drlg.:** 6.25 hrs. **Drill Rate:** 4.16 m/hr **Rig:** Akita #14

**Operation:** Wait on cement (recemented conductor bbl).

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 311 | L-127 | 140638 | 12 | 38 | 26 | 6.25 | 2/3 | 60/100 | 3 x 12.7 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 120 | | Flow Rate, l/min | | | |
| Volume | 1.25 | | Operating Hours | | | |

**Pump Pressure:** _____ kPa **Ann. Vel.:** **DC:** _____ m/mi **DP** _____ m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, bit sub, DCs

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1070 | Gel | 1 | | |
| 29 | 1.00 | | Viscosity | 35 | Caustic | 1 | | |
| | | | pH | 10.0 | Soda Ash | 1 | | |
| | | | Water Loss | 18.2 | Sawdust | 6 | | |
| | | | P.V. | 5.0 | | | | |
| | | | Y.P. | 1.0 | | | | |
| | | | Gels | trc/3 | | | | |
| | | | Filter Cake | 0.5 | | | | |
| | | | Solids | 0.04 | | | Day Cost | 583 |
| | | | Oil | | | | Well Cost | 583 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB** **Out:** ____ **mKB** **Meters** _____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 6.25 | 7. Clean to Bottom | | 13. Cement | 2.00 | 19. Rig Up | |
| 2. Rig Service | | 8. Core | | 14. WOC | 1.00 | 20. Held Safety Meeting | 0.25 |
| 3. Trip | 0.50 | 9. DST | | 15. Nipple Up | 6.50 | 21. Wait On Cementer | 7.00 |
| 4. Survey | 0.25 | 10. Log | | 16. Pressure Test | | 22. Function Test | 0.25 |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

Nipple up diverter. Work on Koomey. Make up 311mm bit. Work on HCR valve and lines. Function test diverter. Spud with 311mm bit at 1500 hours 2001-01-28. Drill ahead to 38m KB. Conductor barrel washed out. Pull out of hole. Run in hole open ended to 28.5m KB. Wait on cement bulker. Rig to and cement with 12.0 tonnes Polar Set plus additives. Close annular and squeeze last 3 tonnes in 0.75m3 stages. Hoist drill pipe and flush out diverter. Disconnect flare line, wash out HCR. Pumper not flushed properly.
GL = 184.1m, KB 188.2m

**Well Cost:** 38,739 **Cum. Cost:** 165,498 **AFE No.:** _____ **AFE Amount** _____

**Weather:** -17C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# NOWSCO-FRACMASTER

A BJ SERVICES COMPANY

## CEMENTING TREATMENT REPORT

| CUSTOMER | LOCATION | SERVICE ORDER | DATE |
|---|---|---|---|
| Devlan | | A22976 | 2001/01/29 |

MAILING ADDRESS

WELL NAME: Devlan et al / Tree River B-10

TYPE OF JOB: Surface ___ Intermediate ___ Production ___ Liner ___ Abandonment ___ Multistage ___ Plug Back ___ Squeeze ___ Pumping ___ Other ___

CONTRACTOR: Akita 14

PROVINCE: NWT

### WELL DATA

Hole Size 311 mm Total Depth 336 m Mud Type ___ Viscosity ___ mPa·s Density ___ kg/m³

| | | | | | |
|---|---|---|---|---|---|
| CASING OR LINER: | Size 403 mm | Lin. Density ___ kg/m | Grade ___ | Depth 13 m | TYPE OF PLUGS |
| | Size ___ mm | Lin. Density ___ kg/m | Grade ___ | Depth ___ m | Top ___ mm ___ W ___ R |
| | | | | TOTAL ___ m | Btm ___ mm ___ W ___ R |
| DRILL PIPE OR TUBING: | Size 114.3 mm | Lin. Density 24.7 kg/m | Grade ___ | Depth 28 m | TYPE OF HEAD |
| | Size ___ mm | Lin. Density ___ kg/m | Grade ___ | Depth ___ m | ___ PL ___ Swage ___ Oth. |

PERFORATIONS: From ___ m To ___ m

From ___ m To ___ m

From ___ m To ___ m

PUMP OUT LINES: ___ Yes ___ No

FLOAT HOLDING: ___ Yes ___ No

TYPE OF PACKER or SPECIAL TOOL: ___ DEPTH ___ m

RETURNS ___ CEMENT ___ MUD ___ OTHER

___ FULL ___ PARTIAL ___ NIL AMT. ___ m³

| TEMPERATURE °C | MIXING WATER °C | DRY CEMENT °C | SLURRY °C |
|---|---|---|---|
| | | | |

TIME ARRIVED AT LOCATION ___ TIME LEFT LOCATION ___

### CEMENT DATA

| | Amount, t | Cement Blend | Additives | Density, kg/m³ Slurry | Density, kg/m³ D.H. Foamed | Yield, m³/t | Total Yield, m³ Slurry | Total Yield, m³ D.H. Foamed |
|---|---|---|---|---|---|---|---|---|
| Scavenger | | | | | | | | |
| Fill | | | | | | | | |
| Tail In | 12.50 | Polar Set | | 1881 | | .738 | 8.9 | |
| Fill | | | | | | | | |
| Tail In | | | | | | | | |
| | | | | | | | | |

### CASING OR LINER DATA

### PLUG BACK DATA

| REMARKS | TIME Start | TIME Finish | RATE m³/min. | PRESSURE, kPa Max. | PRESSURE, kPa Min. | Volume Pumped m³ | Plug # | Top m | Btm. m | CEMENT t | Displacement m³ | Time Plug Down |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Safety Meeting | | | | | | | | | | | | |
| Press Test | 0555 | | | 7000 | | | | | | | | |
| H2O Ahead | 0616 | 0617 | .5 | 1000 | 0 | .5 | | | | | | |
| Mix Cement | 0617 | 0630 | .5 | 1000 | 500 | 7.4 | | | | | | |
| Squeeze | 0644 | 0646 | .25 | 800 | 500 | .5 | | | | | | |
| /Squeeze | 0648 | 0650 | .25 | 2000 | 500 | .5 | | | | | | |
| Squeeze | 0653 | 0655 | .25 | 800 | 500 | .5 | | | | | | |
| /Bleed Off | | | | 500 | | | | | | | | |

PREFLUSH TYPE (m³)

1. ___ ___ 3. ___ ___

2. ___ ___ 4. ___ ___

STAGE $N_2$ RATIOS (m³/m³)

1. ___ ___ 4. ___ ___

2. ___ ___ 5. ___ ___

3. ___ ___ 6. ___ ___

SQUEEZE DATA (m³)

TOTAL SLURRY IN FORMATION ___

TOTAL SLURRY IN CASING ___

TOTAL BACKWASHED ___

TOTAL SLURRY ___

NOWSCO-FRACMASTER REPRESENTATIVE: B Pickett

CUSTOMER REPRESENTATIVE: Erwin Alvea

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 30-Jan-01 **Day:** 2

**Depth:** 201 mKB **Progress:** 163 m **Drlg.:** 8.00 hrs. **Drill Rate:** 20.38 m/hr **Rig:** Akita #14

**Operation:** Drilling pilot hole.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 311 | L-127 | 140638 | 12 | 38 | 26 | 6.25 | 2/4 | 60/100 | 3 x 12.7 | 1-1-I |
| 2pilot | 222 | L-127 | 159716 | 38 | | 163 | 8.00 | 4/6 | 180 | 3 x 12.7 | In |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 120 | | Flow Rate, l/min | | | |
| Volume | 1.25 | | Operating Hours | | | |

**Pump Pressure:** 3,300 kPa **Ann. Vel.: DC:** 22 m/mi **DP** 19 m/mi **Jet Vel.:** m/sec **kW:**

**Drilling Assembly:**

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1130 | Gel | 18 | | |
| 56 | 0.50 | | Viscosity | 51 | Bicarbonate | 7 | | |
| 84 | 0.25 | | pH | 10.5 | Sawdust | 2 | | |
| 112 | Misrun | | Water Loss | 20.0 | | | | |
| 122 | 0.50 | | P.V. | 16.0 | | | | |
| 151 | 0.75 | | Y.P. | 12.0 | | | | |
| 180 | 1.00 | | Gels | 10/16 | | | | |
| | | | Filter Cake | 2 | | | | |
| | | | Solids | 0.08 | | | Day Cost | 408 |
| | | | Oil | | | | Well Cost | 991 |

**Core No.** **Size/Type:** **In:** mKB **Out:** mKB **Meters** **Rec.:** %

**DST No.:** **Formation** **Interval:** to **PF:** **ISI:** **VO:** **FSI:**

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 8.00 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.25 | 8. Core | | 14. WOC | 8.00 | 20. | |
| 3. Trip | 0.50 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 1.50 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 2.50 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | 3.25 | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 1600: Wait on cement. 1600 - 1915: Drill out cement from 12 m to 38 m. Good cement. 1915 - 1945: Trip, circulate and hoist out. Run in with 222 mm pilot bit. 1945 - 2215: Mix mud, build properties and viscosity. 2215 - 2345: Drill, capturing 5 m samples, rocks, gravel and pea gravel at 40 - 43 m. 2345 - 2400: Survey. 2400 - 0015: Rig service. 0015 - 0645: Drill ahead, 222 m pilot hole. 0645 - 0800: Survey.

**Well Cost:** 63,044 **Cum. Cost:** 228,542 **AFE No.:** **AFE Amount**

**Weather:** -23 C, overcast **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 31-Jan-01 **Day:** 3

**Depth:** 378 mKB **Progress:** 177 m **Drlg.:** 21.75 hrs. **Drill Rate:** 8.14 m/hr **Rig:** Akita #14

**Operation:** Drilling pilot hole.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 311 | L-127 | 140638 | 12 | 38 | 26 | 6.25 | 2/4 | 60/100 | 3 x 12.7 | 1-1-I |
| 2pilot | 222 | L-127 | 159716 | 38 | 378 | 340 | 29.75 | 6/10 | 180 | 3 x 12.7 | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 120 | | Flow Rate, l/min | | | |
| Volume | 1.25 | | Operating Hours | | | |

**Pump Pressure:** 3,800 kPa **Ann. Vel.: DC:** 22 m/mi **DP** 19 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** _____

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1230 | Gel | 31 | | |
| 209 | 1.00 | | Viscosity | 59 | Bicarbonate | 2 | | |
| 237 | 1.25 | | pH | 9.5 | Caustic | 1 | | |
| 266 | 1.13 | | Water Loss | | | | | |
| 296 | 1.00 | | P.V. | | | | | |
| 326 | 0.50 | | Y.P. | | | | | |
| 354 | 0.75 | | Gels | | | | | |
| | | | Filter Cake | | | | | |
| | | | Solids | | | | Day Cost | 682 |
| | | | Oil | | | | Well Cost | 1,673 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ mKB **Out:** ____ mKB **Meters** _____ **Rec.:** ____ %

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 21.75 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 1.50 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1515: Drill. 1515 - 1600: Survey. 1600 - 1615: Rig service. 1615 - 2345: Drill. 2345 - 2400: Survey. 2400 - 0015: Rig service. 0015 - 0730: Drill. 0730 - 0800: Survey. Fanning connections to hold deviation within limits.

**Well Cost:** 46,368 **Cum. Cost:** 274,910 **AFE No.:** _____ **AFE Amount** _____

**Weather:** -34 C, clear & calm **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 01-Feb-01 **Day:** 4

**Depth:** 384 mKB **Progress:** 6 m **Drlg.:** 1.25 hrs. **Drill Rate:** 4.80 m/hr **Rig:** Akita #14

**Operation:** Opening 222mm pilot hole out to 311mm.

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2pilot | 222 | L-127 | 159716 | 38 | 384 | 346 | 31.00 | 6/10 | 180 | 3 x 12.7 | 3-2-I |
| 3A-RR | 311 | L-127 | 140638 | 38 | | 346 | | 3/6 | 200 | 3 x 12.7 | IN-Ream |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 120 | | Flow Rate, l/min | | | |
| Volume | 1.25 | | Operating Hours | | | |

**Pump Pressure:** 3,780 kPa **Ann. Vel.: DC:** 22 m/mi **DP** 19 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** _____

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1220 | Gel | 34 | | |
| 95 | 0.50 | | Viscosity | 82 | | | | |
| | | | pH | 9.0 | | | | |
| | | | Water Loss | 7.8 | | | | |
| | | | P.V. | 34.0 | | | | |
| | | | Y.P. | 13.0 | | | | |
| | | | Gels | 12/20 | | | | |
| | | | Filter Cake | 3 | | | | |
| | | | Solids | 0.13 | | | Day Cost | 639 |
| | | | Oil | | | | Well Cost | 2,312 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 1.25 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. Mix Mud | 0.75 |
| 3. Trip | 6.50 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.50 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 0.75 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | 13.50 | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 0930: Drill and survey to 385m KB. 0930 - 1015: Circulate hole clean. 1015 - 1645: Hoist out. Work very tight hole at 160m and again at 60m up to 38m. Pipe stuck 3 times in gravel and rocks at 60 - 40m KB. Work free and continue out (raise viscosity to 90 - 100 sec/litre). 1645 - 1730. Make up 311mm bit and ream pilot hole. Rocks, boulders and gravel from 50 - 58m KB (raise viscosity to 110 sec/litre). 1730 - 1815: Mix mud. 1815 - 1930: Ream gravel. 1930 - 2215: Ream, worked several times, very tight, falling in above bit, back ream out. 2215 - 2230: Survey (survey every 100m to confirm hole tracking). 2230 - 2245: Rig service. 2245 - 2400: Continue to ream hole from 222mm to 311mm. 2400 - 0015: Rig service. 0015 - 0630: Reaming hole from 222mm to 311mm. 0630 - 0645: Survey. 0645 - 0800: Reaming hole from 222mm to 311mm.

**Well Cost:** 51,532 **Cum. Cost:** 326,442 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Overcast -26C **Supervisor:** Erwin Alvea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 02-Feb-01 **Day:** 5

**Depth:** 384 mKB **Progress:** ____ m **Drlg.:** ____ hrs. **Drill Rate:** ____ m/hr **Rig:** Akita #14

**Operation:**

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3A-RR | 311 | L-127 | 140638 | 38 | 384 | 346 | 34.25 | 3/6 | 200 | 3 x 12.7 | IN-Ream |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 120 | | Flow Rate, l/min | | | |
| Volume | 1.25 | | Operating Hours | | | |

**Pump Pressure:** 3,400 kPa **Ann. Vel.: DC:** 22 m/mi **DP** 19 m/mi **Jet Vel.:** ____ m/sec **kW:** ____

**Drilling Assembly:** Bit, bit sub, 12 - 159mm DCs, X-over, 114.3mm DP

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1325 | Gel | 17 | | |
| 200 | 1.00 | | Viscosity | 69 | Bicarbonate | 1 | | |
| 295 | 1.00 | | pH | 9.0 | | | | |
| | | | Water Loss | 6.6 | | | | |
| | | | P.V. | 40.0 | | | | |
| | | | Y.P. | 7.0 | | | | |
| | | | Gels | 10.5/15 | | | | |
| | | | Filter Cake | 3 | | | | |
| | | | Solids | 0.19 | | | Day Cost | 362 |
| | | | Oil | | | | Well Cost | 2,674 |

**Core No.** ____ **Size/Type:** ____ **In:** ____ mKB **Out:** ____ mKB **Meters** ____ **Rec.:** ____ %

**DST No.:** ____ **Formation** ____ **Interval:** ____ to ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. Blow Kelly | 0.25 |
| 3. Trip | 0.75 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.50 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 1.00 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | 20.75 | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1645: Ream hole from 222mm to 311mm. 1645 - 1700: Survey. 1700 - 1715: Rig service. 1715 - 2400: Ream hole from 222mm to 311mm. Very firm formations. Penetration rates corresponded with pilot hole drilling. 0000 - 0015: Rig service. 0015 - 0600: Ream hole from 222mm to 311mm. 0600 - 0700: Circulate hole clean at 384m, condition mud. 0700 - 0715: Blow kelly and hoist out, SLM. 0715 - 0800: Hoist out.

If hole is good we can drill 4 m, circulate and run casing. We may have to make 2 wiper trips at setting depth before running casing.

**Well Cost:** 47,147 **Cum. Cost:** 373,589 **AFE No.:** ____ **AFE Amount** ____

**Weather:** Light Snow -22C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 03-Feb-01 **Day:** 6

**Depth:** 388 mKB **Progress:** 4 m **Drlg.:** 1.75 hrs. **Drill Rate:** 2.29 m/hr **Rig:** Akita #14

**Operation:** Circulating casing.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3A-RR | 311 | L-127 | 140638 | 38 | 384 | 346 | 33.00 | 3/6 | 200 | 3 x 12.7 | 4-2-I |
| 4A | 311 | L-127 | 140640 | 384 | 388 | 4 | 1.75 | 8/10 | 180 | 4 x 12.7 | 1-1-I |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 120 | | Flow Rate, l/min | | | |
| Volume | 1.25 | | Operating Hours | | | |

**Pump Pressure:** 3,400 kPa **Ann. Vel.: DC:** 22 m/mi **DP** 19 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, bit sub, 12 - 159mm DC, X-over, 114.3mm drill pipe to surface.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1310 | Gel | 5 | | |
| 380 | 1.00 | | Viscosity | 117 | | | | |
| | | | pH | 9.0 | | | | |
| | | | Water Loss | 5.8 | | | | |
| | | | P.V. | 44.0 | | | | |
| | | | Y.P. | 15.0 | | | | |
| | | | Gels | 13/22 | | | | |
| | | | Filter Cake | 3 | | | | |
| | | | Solids | 0.19 | | | Day Cost | 94 |
| | | | Oil | | | | Well Cost | 2.768 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 1.75 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.50 | 8. Core | | 14. WOC | | 20. Circulate Casing | 1.50 |
| 3. Trip | 14.25 | 9. DST | | 15. Nipple Up | | 21. Rig In Tongs | 1.00 |
| 4. Survey | 0.25 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 1.75 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | 3.00 | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 1015: Hoist out, several tight spots, 160m - 140m KB was the worst. 1015 - 1700: Run in with new bit, ream pea gravel from 38 - 153m KB. Clean through several bridges to bottom. 1700 - 1845: Drill from 384 - 388m KB. 1845 - 1930: Circulate hole clean.
1930 - 1945: Survey. 1945 - 2215: Hoist out and check bit. 2215 - 2230: Rig service. 2230 - 2345: Run back in, hole good.
2345 - 0045: Circulate bottoms up. 0045 - 0100: Rig service. 0100 - 0230: Hoist out, rotating slowly. 0230 - 0330: Rig in tongs.
0330 - 0630: Rig to and run casing. Ran 28 joints of 219.1mm, 35.7 kg/m, J-55, ST&C casing (389.16m). Landed at 388.0m KB.
0630 - 0830: Circulate casing, work string, condition hole and mud.

.../2

A derrick man rolled some skin off the back of his left hand when it got between a DC and the tong line. He was not using a feed out lanyard. When I took him to the medic at camp I was informed the medic had vacated his post at 0700 hours that morning. Patient was air lifted to Inuvik and is doing fine. Patient is back at work - light duty.

**Well Cost:** 85,526 **Cum. Cost:** 459,115 **AFE No.:** _____ **AFE Amount** _____

**Weather:** _____ **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 04-Feb-01 **Day:** 7

**Depth:** 388 mKB **Progress:** ____ m **Drlg.:** ____ hrs. **Drill Rate:** ____ m/hr **Rig:** Akita #14

**Operation:** Heading up. Cleaning up

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | | | Flow Rate, l/min | | | |
| Volume | | | Operating Hours | | | |

**Pump Pressure:** ____ kPa **Ann. Vel.: DC:** ____ m/mi **DP** ____ m/mi **Jet Vel.:** ____ m/sec **kW:** ____

**Drilling Assembly:** Bit, bit sub, 12 - 159mm DC, X-over, 114.3mm DP to surface.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1260 | Desco | 2 | | |
| | | | Viscosity | 69 | Celloflake | 2 | | |
| | | | pH | 9.0 | Sawdust | 10 | | |
| | | | Water Loss | 5.8 | SAPP | 7 | | |
| | | | P.V. | | | | | |
| | | | Y.P. | | | | | |
| | | | Gels | | | | | |
| | | | Filter Cake | | | | | |
| | | | Solids | | | | Day Cost | 1,192 |
| | | | Oil | | | | Well Cost | 3,960 |

**Core No.** ____ **Size/Type:** ____ **In:** ____ mKB **Out:** ____ mKB **Meters** ____ **Rec.:** ____ %

**DST No.:** ____ **Formation** ____ **Interval:** ____ to ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | | 7. Clean to Bottom | | 13. Cement | 2.00 | 19. Rig Up | |
| 2. Rig Service | | 8. Core | | 14. WOC | 11.00 | 20. Circulate Casing | 6.00 |
| 3. Trip | | 9. DST | | 15. Nipple Up | | 21. Weld On Bowl | 5.00 |
| 4. Survey | | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 1400: Circulate casing. Work on vacuum truck. Got vacuum operating. Pumped 1m3 preflush with red dye. Pressure tested surface lines. Pumped 3m3 of fresh water. 1400 - 1600: Mixed 40 tonnes Polar Set regular cement with 0.2% F-7. Released plug and displaced cement. Vacuum broke down. No surface induction of dyed preflush or clean preflush. After pumping 1.7m3 of displacement very heavy filter cake returns. Plugged flow line, kept pumping and unplug same. Pumped 4m3 more of displacement. Cement returns. Good steady returns. Pressure starting building up to 13.5 MPa. Stop and bleed off several times. Aborted displacement with 2m3 of cement above float collar. Maximum casing pressure reached and held (70%). Float held.

.../2

1600 - 0300: Wait on cement and clean up mess. Remove diverter, dig cellar, work on welder. No vacuum truck available until later today. All mud has to be discarded. 0300 - 0800: Weld on bowl.
Costs include 5 loads from Nisku and Pentastar standby.

**Well Cost:** 209,489 **Cum. Cost:** 668,604 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Overcast -23C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# NOWSCO-FRACMASTER

A BJ SERVICES COMPANY

## CEMENTING TREATMENT REPORT

| CUSTOMER | LOCATION | SERVICE ORDER | DATE |
|---|---|---|---|
| Devlan | B-10 | A22977 | Feb 03/01 |
| MAILING ADDRESS | | WELL NAME | |
| | | Devlan et al Tree River | |
| TYPE OF JOB: Surface X, Intermediate, Production, Liner, Abandonment; Multistage, Plug Back, Squeeze, Pumping, Other | | CONTRACTOR | PROVINCE |
| | | ARita 14 | NWT |

### WELL DATA

Hole Size 311 mm Total Depth 398 m Mud Type GelChem Viscosity 53 mPa·s Density 1260 kg/m³

| | | | | | | |
|---|---|---|---|---|---|---|
| CASING OR LINER: | Size 219 mm | Lin. Density 35.7 kg/m | Grade J55 | Depth 389.23 m | TYPE OF PLUGS | |
| | Size ____ mm | Lin. Density ____ kg/m | Grade ____ | Depth ____ m | Top 219 mm W X R | |
| | | | | TOTAL ____ m | Btm ____ mm W ____ R | |
| DRILL PIPE OR TUBING: | Size ____ mm | Lin. Density ____ kg/m | Grade ____ | Depth ____ m | TYPE OF HEAD | |
| | Size ____ mm | Lin. Density ____ kg/m | Grade ____ | Depth ____ m | X PL ____ Swage ____ Oth. | |

PERFORATIONS: From ____ m To ____ m; From ____ m To ____ m; From ____ m To ____ m

PUMP OUT LINES: ____ Yes X No

FLOAT HOLDING: X Yes ____ No

RETURNS X CEMENT ____ MUD ____ OTHER

X FULL ____ PARTIAL ____ NIL AMT. ~~3.0~~ m³

TYPE OF PACKER or SPECIAL TOOL: Float Collar DEPTH 374.22 m

| TEMPERATURE °C | MIXING WATER °C | DRY CEMENT °C | SLURRY °C |
|---|---|---|---|
| | | | |

TIME ARRIVED AT LOCATION ____ TIME LEFT LOCATION ____

### CEMENT DATA

| | Amount, t | Cement Blend | Additives | Density, kg/m³ Slurry | Density, kg/m³ D.H. Foamed | Yield, m³/t | Total Yield, m³ Slurry | Total Yield, m³ D.H. Foamed |
|---|---|---|---|---|---|---|---|---|
| Scavenger | | | | | | | | |
| Fill | | | | | | | | |
| Tail In | ~~4.2~~ | PolarSet | .2% R-7C | 1881 | | .738 | 31.7 | |
| Fill | | | | | | | | |
| Tail In | | | | | | | | |
| | | | | | | | | |

### CASING OR LINER DATA

| REMARKS | TIME Start | TIME Finish | RATE m³/min. | PRESSURE, kPa Max. | PRESSURE, kPa Min. | Volume Pumped m³ |
|---|---|---|---|---|---|---|
| Safety Meeting | | | | | | |
| Preflush | 1410 | 1412 | .5 | 500 | 0 | 1.0 |
| Press Test Lines | 1413 | | | 17000 | | |
| Cent. Preflush | 1424 | 1427 | 1.0 | 2500 | 500 | 3.0 |
| Mix Cement | 1427 | 1508 | 1.0 | 3000 | 1500 | 31.7 |
| Drop Plug | 1510 | | | | | |
| Displace | 1515 | 1605 | .2 | 13500 | 0 | ~~19.4~~ |
| Stop Pump | 1605 | | | 13500 | | |
| Bleed Off | 1606 | | | 0 | | |
| Did not Bump Plug | | | | | | |

### PLUG BACK DATA

| Plug # | Top m | Btm. m | CEMENT t | Displacement m³ | Time Plug Down |
|---|---|---|---|---|---|
| | | | | | |

PREFLUSH TYPE (m³)

1. $H_2O$ 3.0 3. ____ ____

2. ____ ____ 4. ____ ____

STAGE $N_2$ RATIOS (m³/m³)

1. ____ ____ 4. ____ ____

2. ____ ____ 5. ____ ____

3. ____ ____ 6. ____ ____

SQUEEZE DATA (m³)

TOTAL SLURRY IN FORMATION ____

TOTAL SLURRY IN CASING ____

TOTAL BACKWASHED ____

TOTAL SLURRY ____

NOWSCO-FRACMASTER REPRESENTATIVE: R Pickett | CUSTOMER REPRESENTATIVE Erwin Alyea

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 05-Feb-01 **Day:** 8

**Depth:** 388 mKB **Progress:** ____ m **Drlg.:** ____ hrs. **Drill Rate:** ____ m/hr **Rig:** Akita #14

**Operation:** Drilling out cement.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 200 | EDT24XG | | 388 | | 0 | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | | | Flow Rate, l/min | | | |
| Volume | | | Operating Hours | | | |

**Pump Pressure:** ____ kPa **Ann. Vel.: DC:** ____ m/mi **DP** ____ m/mi **Jet Vel.:** ____ m/sec **kW:** ____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 114.3mm DP to surface.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | | | | | |
| | | | Viscosity | | | | | |
| | | | pH | | | | | |
| | | | Water Loss | | | | | |
| | | | P.V. | | | | | |
| | | | Y.P. | | | | | |
| | | | Gels | | | | | |
| | | | Filter Cake | | | | | |
| | | | Solids | | | | Day Cost | 0 |
| | | | Oil | | | | Well Cost | 3,960 |

**Core No.** ____ **Size/Type:** ____ **In:** ____ mKB **Out:** ____ mKB **Meters** ____ **Rec.:** ____ %

**DST No.:** ____ **Formation** ____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.25 | 8. Core | | 14. WOC | | 20. Weld On Bowl | 1.25 |
| 3. Trip | 3.00 | 9. DST | | 15. Nipple Up | 6.75 | 21. Wait On Vacuum Truck | 7.00 |
| 4. Survey | | 10. Log | | 16. Pressure Test | 5.75 | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0915: Cut off casing. Weld on bowl and test weld to 7 MPa. 0915 - 1600: Nipple up BOPs. 1600 - 2300: Wait on vacuum truck and pressure testers. 2300 - 0315: Pressure test blind ram, manifold and all outside BOP valves to 1400 kPa low and 7000 kPa high. 0315 - 0330: Rig service. 0330 - 0530: Make up BHA and run in hole with 1 single. 0530 - 0700: Pressure test pipe rams, hydril and all inside BOP valves to 1400 kPa low and 7000 kPa high. 0700 - 0800: Run in hole with bit. Top of cement at approximately 296m KB. Start drilling cement.
Filled manifold line and manifold with 60/40 antifreeze and water. Modify nipples on flare tank, hook up manifold and flare lines.

**Well Cost:** 50,762 **Cum. Cost:** 719,366 **AFE No.:** ____ **AFE Amount** ____

**Weather:** Clear & Calm -33C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 06-Feb-01 **Day:** 9

**Depth:** 454 mKB **Progress:** 66 m **Drlg.:** 11.50 hrs. **Drill Rate:** 5.74 m/hr **Rig:** Akita #14

**Operation:** Drilling 200mm hole.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 200 | EDT24XG | 163225 | 388 | | 66 | 11.50 | 10 | 120 | 3 x 11.1 | IN |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 120 | | Flow Rate, l/min | | | |
| Volume | 1.25 | | Operating Hours | | | |

**Pump Pressure:** 5,500 kPa **Ann. Vel.: DC:** 108 m/min **DP** 54 m/min **Jet Vel.:** m/sec **kW:**

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 114.3mm DP to surface

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1090 | Gel | 16 | | |
| | | | Viscosity | 34 | Soda Ash | 1 | | |
| | | | pH | 9.0 | Caustic | 1 | | |
| | | | Water Loss | | | | | |
| | | | P.V. | | | | | |
| | | | Y.P. | | | | | |
| | | | Gels | | | | | |
| | | | Filter Cake | | | | | |
| | | | Solids | | | | Day Cost | 421 |
| | | | Oil | | | | Well Cost | 4,381 |

**Core No.** **Size/Type:** **In:** mKB **Out:** mKB **Meters** **Rec.:** %

**DST No.:** **Formation:** **Interval:** to **PF:** **ISI:** **VO:** **FSI:**

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 11.50 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. Held BOP Drill | 0.50 |
| 3. Trip | 0.50 | 9. DST | | 15. Nipple Up | | 21. Drill Out Cement | 6.00 |
| 4. Survey | 0.25 | 10. Log | | 16. Pressure Test | 0.50 | 22. Thaw Lines | 1.50 |
| 5. Circ./Cond. | 0.25 | 11. Handle Tools | | 17. Repair | | 23. Blow Manifold Line | 2.25 |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0830: Trip in hole with bit #1. 0830 - 0845: Held BOP drill. 0845 - 0900: Rig service. 0900 - 1500: Drill out cement to 388m. 1500 - 1630: Drill ahead from 388 - 397m KB. 1630 - 1645: Rig service. 1645 - 1700: Circulate hole clean. 1700 - 1830: BJ's cementing line froze up (66% anti-freeze), thaw same. 1830 - 1900: Ran leak off test. Test fluid, water 9.81 gradient. Shoe at 388m KB. Pressure readings every 10 strokes or 0.062m3. 1900 - 2115: Check out the manifold line, it had some fluid in it. Blew out all lines tested with inferior fluid. 2115 - 2130: Held BOP drill. 2130 - 2400: Drill ahead. 0000 - 0015: Rig service. 0015 - 0745: Drill ahead, capturing 5m samples. 0745 - 0800: Survey.

.../2

Held a fire drill in camp, all personnel accounted for. New RPG is 19.49 kPa/m. Rig & camp check by Mr. Rick Turner of the NEB, everything okay. KB = 188.20m, GL = 184.10m, CF = 184.10m. RRPP = 1530 kPa at 60 spm. Hook load = 26,000.

**Well Cost:** 67.157 **Cum. Cost:** 786.523 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Overcast -27C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# NOWSCO-FRACMASTER

A BJ SERVICES COMPANY

## CEMENTING TREATMENT REPORT

| CUSTOMER | LOCATION | SERVICE ORDER | DATE |
|---|---|---|---|
| Devlan | B-10 | A22978 | Feb 5/01 |
| MAILING ADDRESS | | WELL NAME | |
| Press Test Manifold + BOP's | | Devlan Beta / Tree River | |
| TYPE OF JOB: Surface ___ Intermediate ___ Production ___ Liner ___ Abandonment ___ Multistage ___ Plug Back ___ Squeeze ___ Pumping ___ Other X | | CONTRACTOR: Akita 14 | PROVINCE: NWT |

### WELL DATA

Hole Size _____ mm Total Depth _____ m Mud Type _____ Viscosity _____ mPa·s Density _____ kg/m³

| | | | | | |
|---|---|---|---|---|---|
| CASING OR LINER: | Size _____ mm | Lin. Density _____ kg/m | Grade _____ | Depth _____ m | TYPE OF PLUGS |
| | Size _____ mm | Lin. Density _____ kg/m | Grade _____ | Depth _____ m | Top _____ mm ___ W ___ R |
| | | | | TOTAL _____ m | Btm _____ mm ___ W ___ R |
| DRILL PIPE OR TUBING: | Size _____ mm | Lin. Density _____ kg/m | Grade _____ | Depth _____ m | TYPE OF HEAD |
| | Size _____ mm | Lin. Density _____ kg/m | Grade _____ | Depth _____ m | ___ PL ___ Swage ___ Oth. |

PERFORATIONS: From _____ m To _____ m | PUMP OUT LINES: ___ Yes ___ No | RETURNS ___ CEMENT ___ MUD ___ OTHER

From _____ m To _____ m | FLOAT HOLDING: ___ Yes ___ No | ___ FULL ___ PARTIAL ___ NIL AMT. _____ m³

From _____ m To _____ m | TYPE OF PACKER or SPECIAL TOOL: _____ DEPTH _____ m

| TEMPERATURE °C | MIXING WATER °C | DRY CEMENT °C | SLURRY °C |
|---|---|---|---|
| | | | |

TIME ARRIVED AT LOCATION _____ TIME LEFT LOCATION _____

### CEMENT DATA

| | Amount, t | Cement Blend | Additives | Density, kg/m³ Slurry | Density, kg/m³ D.H. Foamed | Yield, m³/t | Total Yield, m³ Slurry | Total Yield, m³ D.H. Foamed |
|---|---|---|---|---|---|---|---|---|
| Scavenger | | | | | | | | |
| Fill | | | | | | | | |
| Tail In | | | | | | | | |
| Fill | | | | | | | | |
| Tail In | | | | | | | | |
| | | | | | | | | |

### CASING OR LINER DATA

| REMARKS | TIME Start | TIME Finish | RATE m³/min. | PRESSURE, kPa Max. | PRESSURE, kPa Min. | Volume Pumped m³ |
|---|---|---|---|---|---|---|
| Safety Meeting | | | | | | |
| Press Test Lines | 0031 | | | 14000 | | |
| Low Test | | | | | | |
| #1 Values 13-14-15 | 0042 | | | 1400 | 0 | |
| #2 Values 8-12 | 0052 | | | 1200 | | |
| #3 Values 9-10-5 | 0102 | | | 1100 | Chart #1 | |
| #4 Value 7 | 0112 | | | 1000 | | |
| #5 Value 4 | 0121 | | | 1000 | | |
| Bleed Off | | 0128 | | 1000 | | |
| High Test | | | | | | |
| #1 Values 13-14-15 | 0128 | | | 7200 | 0 | |
| #2 Values 8-12 | 0139 | | | 7200 | | |
| #3 Values 5-9-10 | 0149 | | | 6800 | | |
| #4 Value 7 | 0159 | | | 6500 | | |
| #5 Value 4 | 0209 | | | 6500 | | |
| #6 Main Valve | 0220 | | | 6500 | | |
| #7 Manual Choke | 0235 | | | 6400 | | |
| #8 HCR | 0245 | | | 6300 | | |
| Bleed Off | 0253 | | | 6200 | | |

### PLUG BACK DATA

| Plug # | Top m | Btm. m | CEMENT t | Displacement m³ | Time Plug Down |
|---|---|---|---|---|---|
| | | | | | |

PREFLUSH TYPE (m³)

1. _____ _____ 3. _____ _____

2. _____ _____ 4. _____ _____

STAGE $N_2$ RATIOS (m³/m³)

1. _____ _____ 4. _____ _____

2. _____ _____ 5. _____ _____

3. _____ _____ 6. _____ _____

SQUEEZE DATA (m³)

TOTAL SLURRY IN FORMATION _____

TOTAL SLURRY IN CASING _____

TOTAL BACKWASHED _____

TOTAL SLURRY _____

NOWSCO-FRACMASTER REPRESENTATIVE: B Pickett

CUSTOMER REPRESENTATIVE: E Alyea

# NOWSCO-FRACMASTER

A BJ SERVICES COMPANY

## CEMENTING TREATMENT REPORT

| CUSTOMER | LOCATION | SERVICE ORDER | DATE |
|---|---|---|---|
| Devlan | B-10 | A22978 | Feb 05/01 |

| MAILING ADDRESS | WELL NAME |
|---|---|
| Test BOP's | Devlan et al Tree River |

| TYPE OF JOB | | | | | | CONTRACTOR | PROVINCE |
|---|---|---|---|---|---|---|---|
| | Surface ___ | Intermediate ___ | Production ___ | Liner ___ | Abandonment ___ | Akita 14 | NWT |
| | Multistage ___ | Plug Back ___ | Squeeze ___ | Pumping ___ | Other X | | |

### WELL DATA

Hole Size _____ mm Total Depth _____ m Mud Type _____ Viscosity _____ mPa·s Density _____ kg/m³

CASING OR LINER:
Size _____ mm Lin. Density _____ kg/m Grade _____ Depth _____ m
Size _____ mm Lin. Density _____ kg/m Grade _____ Depth _____ m
TOTAL _____ m

DRILL PIPE OR TUBING:
Size _____ mm Lin. Density _____ kg/m Grade _____ Depth _____ m
Size _____ mm Lin. Density _____ kg/m Grade _____ Depth _____ m

TYPE OF PLUGS
Top _____ mm ___ W ___ R
Btm _____ mm ___ W ___ R

TYPE OF HEAD
___ PL ___ Swage ___ Oth.

PERFORATIONS:
From _____ m To _____ m
From _____ m To _____ m
From _____ m To _____ m

PUMP OUT LINES: ___ Yes ___ No
FLOAT HOLDING: ___ Yes ___ No
TYPE OF PACKER or SPECIAL TOOL: _____ DEPTH _____ m

RETURNS ___ CEMENT ___ MUD ___ OTHER
___ FULL ___ PARTIAL ___ NIL AMT. _____ m³

| TEMPERATURE °C | MIXING WATER °C | DRY CEMENT °C | SLURRY °C |
|---|---|---|---|
| | | | |

TIME ARRIVED AT LOCATION _____ TIME LEFT LOCATION _____

### CEMENT DATA

| | Amount, t | Cement Blend | Additives | Density, kg/m³ Slurry | Density, kg/m³ D.H. Foamed | Yield, m³/t | Total Yield, m³ Slurry | Total Yield, m³ D.H. Foamed |
|---|---|---|---|---|---|---|---|---|
| Scavenger | | | | | | | | |
| Fill | | | | | | | | |
| Tail In | | | | | | | | |
| Fill | | | | | | | | |
| Tail In | | | | | | | | |
| | | | | | | | | |

### CASING OR LINER DATA

| REMARKS | TIME Start | TIME Finish | RATE m³/min. | PRESSURE, kPa Max. | PRESSURE, kPa Min. | Volume Pumped m³ |
|---|---|---|---|---|---|---|
| Test Pipe Rams Low | 0510 | | | 12000 | 0 | |
| Test Annular Low | 0530 | | | 1200 | | Chart #2 |
| Test Pipe Rams High | 0553 | | | 8000 | | |
| Test Annular High | 0603 | | | 8000 | | |
| Bleed Off | 0610 | | | 6500 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Leak Off Test | | | | | | |
| Start | 1838 | | | 0 | | |
| Stop | 1839 | | .2 | 1200 | | |
| Start | 1841 | | | 1200 | | |
| Stop | | | .2 | 2100 | | Chart #3 |
| Start | 1842 | | | 2100 | | |
| Stop | | | .2 | 4000 | | |
| Start | 1843 | | | 4000 | | |
| Stop | | | .2 | 5200 | | |
| Start | 1844 | | | 5200 | | |
| Stop | | | .2 | 6800 | | |
| Bleed Off | 1846 | | | 6800 | | |
| | | | | | | |
| | | | | | | |

### PLUG BACK DATA

| Plug # | Top m | Btm. m | CEMENT t | Displacement m³ | Time Plug Down |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

PREFLUSH TYPE (m³)
1. _____ 3. _____
2. _____ 4. _____

STAGE $N_2$ RATIOS (m³/m³)
1. _____ 4. _____
2. _____ 5. _____
3. _____ 6. _____

SQUEEZE DATA (m³)
TOTAL SLURRY IN FORMATION _____
TOTAL SLURRY IN CASING _____
TOTAL BACKWASHED _____
TOTAL SLURRY _____

NOWSCO-FRACMASTER REPRESENTATIVE:

CUSTOMER REPRESENTATIVE

**DEVLAN Exploration Inc:**

**Devlan et-al Tree River B-10**

**AKITA # 14**

**Feb. 5-2001**

Tested with BJ Unit. 114mm x 203 mm - .0062 m3/stroke.

10 stroke readings ( .062 m3 )

Testing fluid-- fresh water

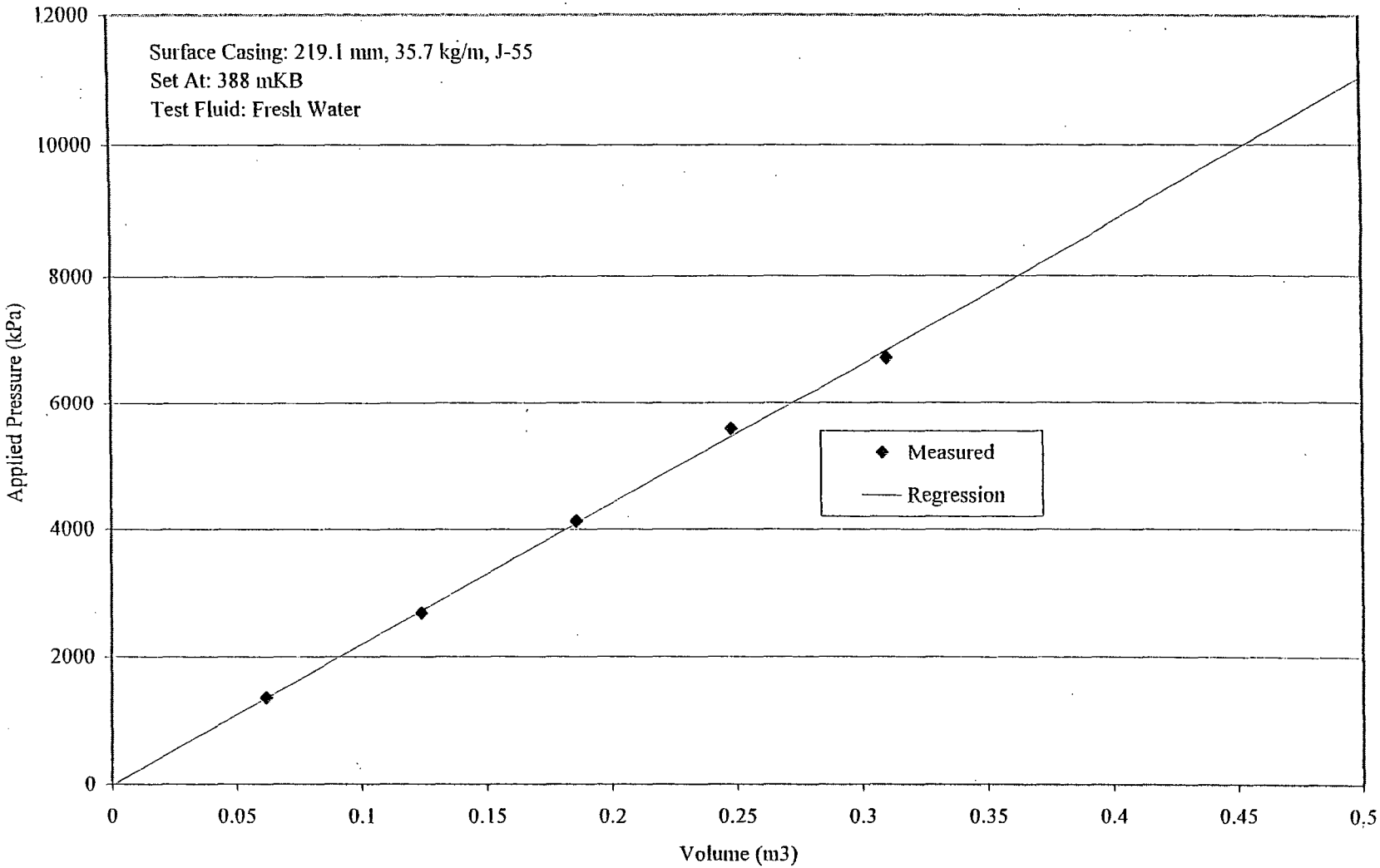
| | | |
|---|---|---|
| 10 Strokes | .062 m3 | 1350 kPa |
| 20 Strokes | .124 m3 | 2680 kPa |
| 30 Strokes | .186 m3 | 4120 kPa |
| 40 Strokes | .248 m3 | 5580 kPa |
| 50 Strokes | .310 m3 | 6710 kPa |

| | | |
|---|---|---|
| Hydrostatic | 388m x 9.81 | 3806 kPa |
| Leak Off Point | | 5580 kPa |
| Total Pressure @ shoe | | 9386 kPa |

9386 kPa / 388m = 24.19 kPa

**80% of 24.19 kPa/m = 19.35 kPa/m ( RPG )**

# Devlan et al Tree River B-10
# Formation Integrity Test

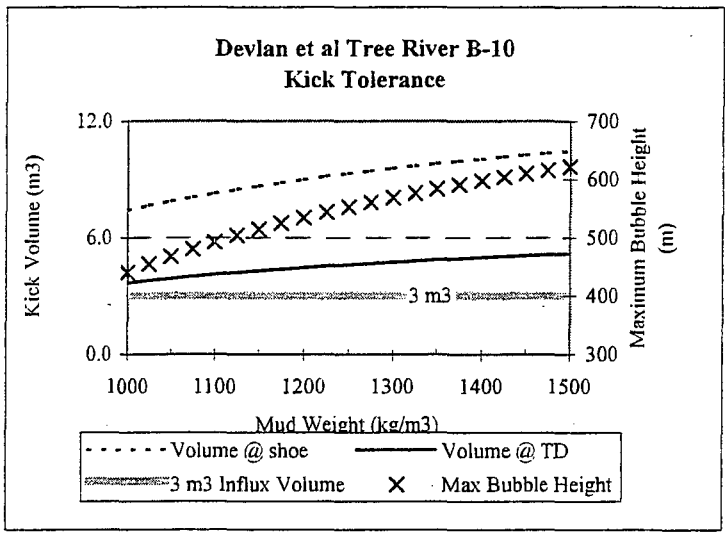


Codeco Consulting (2000) Inc.

## Kick Tolerance Calculation

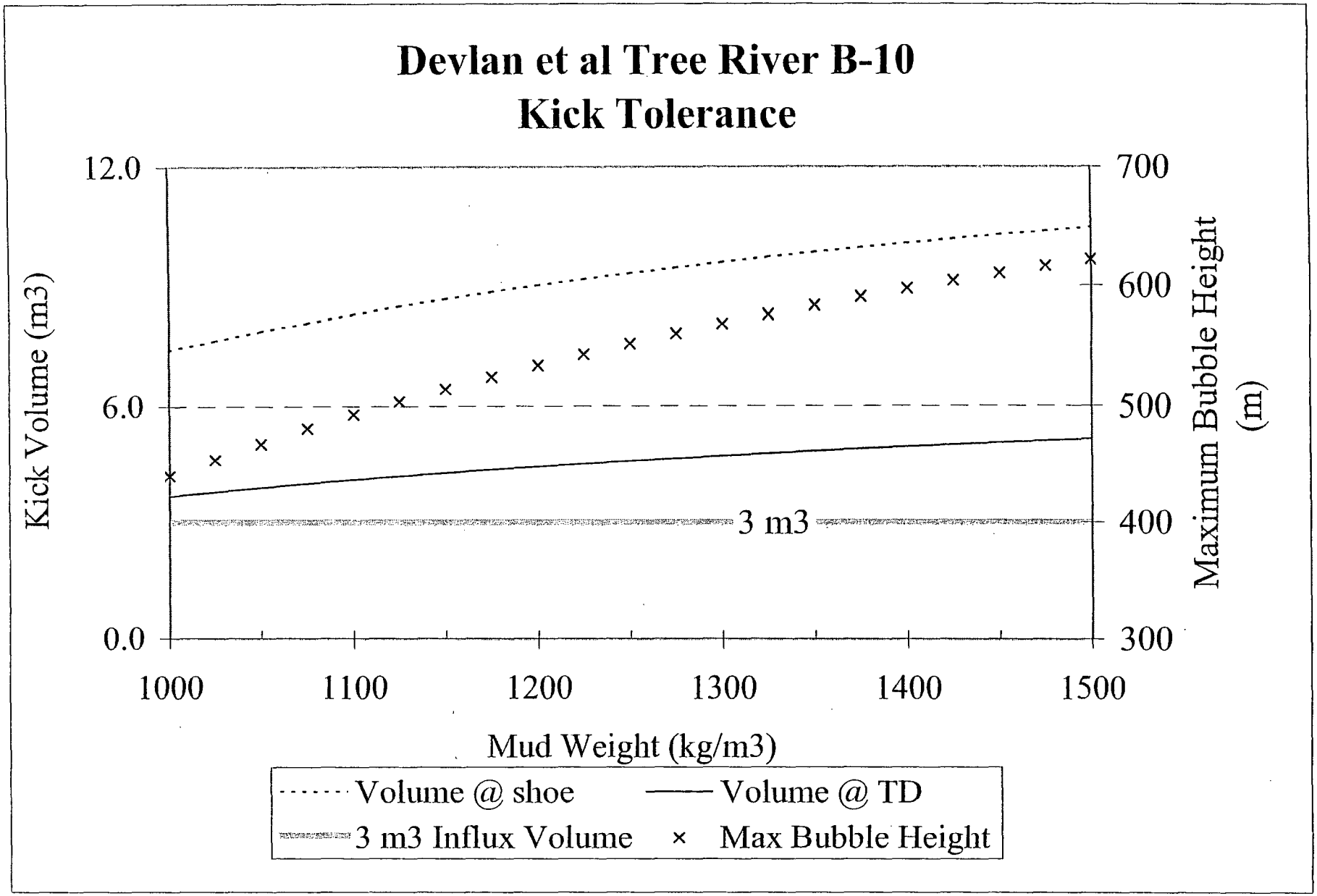
# Devlan et al Tree River B-10

| | | |
|---|---|---|
| Drill Pipe Size | 101.60 | mm |
| Drill Collar Size | 171.45 | mm |
| Bit Size | 200.03 | mm |
| DP Annular Volume | 0.02332 | m3/m |
| DC Annular Volume | 0.00834 | m3/m |
| Assumed Frac Gradient at SC shoe | 24.19 | kPa/m |
| SC Setting Depth | 388 | m |
| MAHSCP Gradient (20% sf) | 19.352 | kPa/m |
| Pore Pressure Gradient | 10 | kPa/m |
| Ordovician | 1300 | m |
| Gas Density | 200 | kg/m3 |
| Specified Kick Tolerance | 3 | m3 |
| 3 m3 Bubble Height (DP) | 128.7 | m |
| 3 m3 Bubble Height (DC) | 359.8 | m |

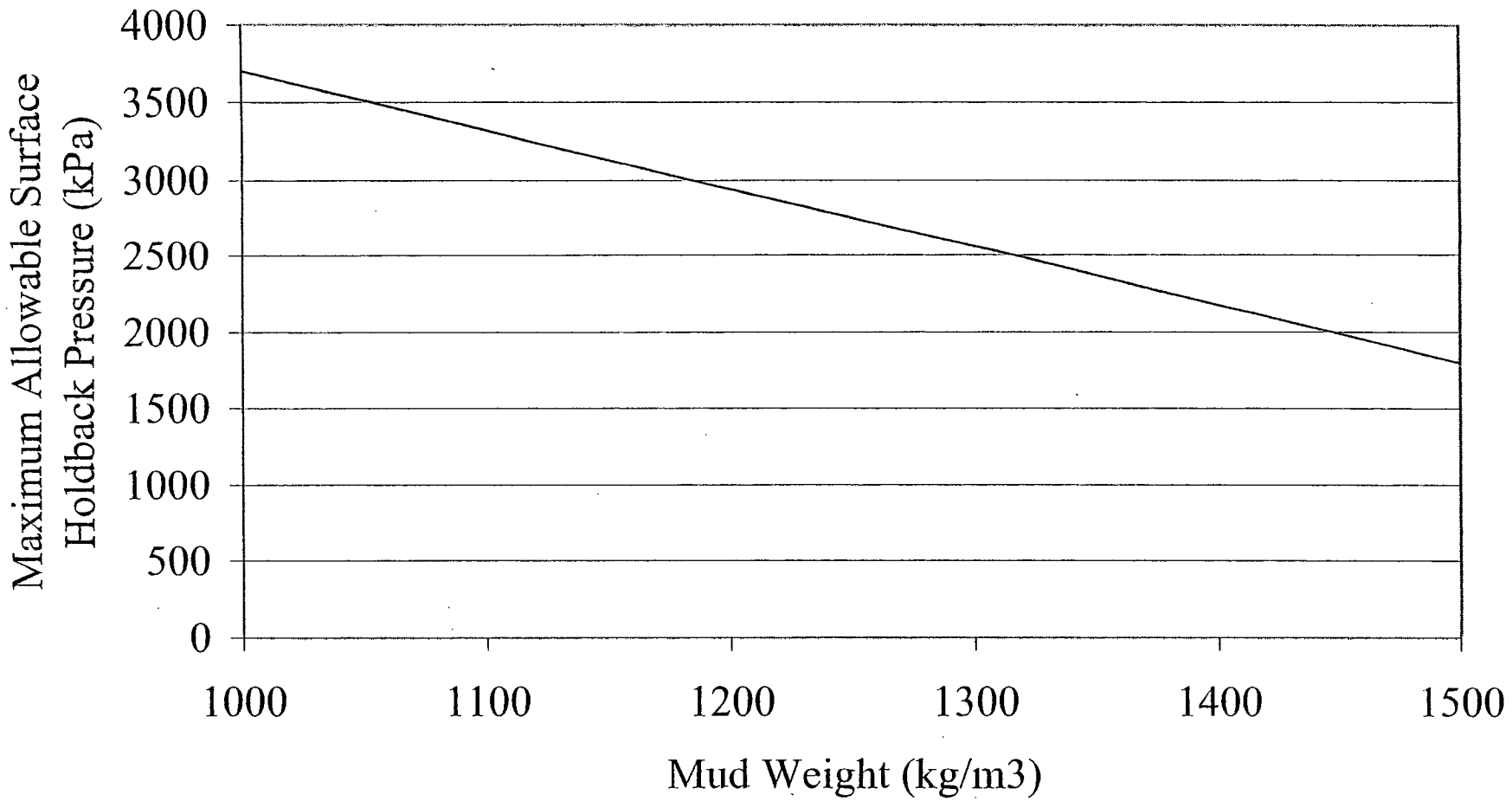



| MW (kg/m3) | MAHSCP (kPa) | Hmax (m) | Kick Tolerance Volume DP* (m3) | Kick Tolerance Volume DC (m3) |
|---|---|---|---|---|
| 1000 | 3702.3 | 440.28 | 7.4 | 3.7 |
| 1025 | 3607.1 | 454.57 | 7.7 | 3.8 |
| 1050 | 3512.0 | 468.03 | 7.9 | 3.9 |
| 1075 | 3416.8 | 480.71 | 8.1 | 4.0 |
| 1100 | 3321.7 | 492.69 | 8.3 | 4.1 |
| 1125 | 3226.5 | 504.02 | 8.5 | 4.2 |
| 1150 | 3131.4 | 514.76 | 8.7 | 4.3 |
| 1175 | 3036.2 | 524.95 | 8.8 | 4.4 |
| 1200 | 2941.0 | 534.62 | 9.0 | 4.5 |
| 1225 | 2845.9 | 543.83 | 9.2 | 4.5 |
| 1250 | 2750.7 | 552.59 | 9.3 | 4.6 |
| 1275 | 2655.6 | 560.95 | 9.4 | 4.7 |
| 1300 | 2560.4 | 568.93 | 9.6 | 4.7 |
| 1325 | 2465.3 | 576.55 | 9.7 | 4.8 |
| 1350 | 2370.1 | 583.85 | 9.8 | 4.9 |
| 1375 | 2274.9 | 590.83 | 9.9 | 4.9 |
| 1400 | 2179.8 | 597.52 | 10.1 | 5.0 |
| 1425 | 2084.6 | 603.94 | 10.2 | 5.0 |
| 1450 | 1989.5 | 610.10 | 10.3 | 5.1 |
| 1475 | 1894.3 | 616.02 | 10.4 | 5.1 |
| 1500 | 1799.2 | 621.71 | 10.5 | 5.2 |

* Corrected to point of influx


Devlan et al Tree River B-10
Kick Tolerance
12.0
6.0
0.0
Kick Volume (m3)
700
600
500
400
300
Maximum Bubble Height (m)
3 m3
1000
1100
1200
1300
1400
1500
Mud Weight (kg/m3)
Volume @ shoe
Volume @ TD
3 m3 Influx Volume
Max Bubble Height

# Devlan et al Tree River B-10
# Maximum Allowable Surface Holdback Pressure



# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 07-Feb-01 **Day:** 10

**Depth:** 546 mKB **Progress:** 92 m **Drlg.:** 18.75 hrs. **Drill Rate:** 4.91 m/hr **Rig:** Akita #14

**Operation:** Drilling 200mm hole.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 200 | EDT24XG | 163225 | 388 | 480 | 92 | 17.00 | 10 | 100 | 3 x 11.1 | 3-1-I |
| 2 | 200 | EDT24XG | 164305 | 480 | | 66 | 13.25 | 8/10 | 85/90 | 3 x 12.7 | IN |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 120 | | Flow Rate, l/min | | | |
| Volume | 1.25 | | Operating Hours | | | |

**Pump Pressure:** 4,900 kPa **Ann. Vel.: DC:** 108 m/mi **DP** 54 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 101.6mm DP to surface

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1090 | Gel | 14 | | |
| 454 | 0.75 | | Viscosity | 44 | Lignite | 3 | | |
| | | | pH | 9.5 | Aquapac | 3 | | |
| | | | Water Loss | 7.8 | | | | |
| | | | P.V. | 14.0 | | | | |
| | | | Y.P. | 5.0 | | | | |
| | | | Gels | 2/12 | | | | |
| | | | Filter Cake | 0.5 | | | | |
| | | | Solids | 0.05 | | | Day Cost | 1,457 |
| | | | Oil | | | | Well Cost | 5,838 |

**Core No.** ____ **Size/Type:** _____ **In:** _____ mKB **Out:** _____ mKB **Meters** _____ **Rec.:** _____ %

**DST No.:** ____ **Formation** _____ **Interval:** _____ **to** _____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 18.75 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.50 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | 4.00 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 0.75 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1345: Drill ahead to 480m KB. 1345 - 1430: Circulate up bottom hole same. 1430 - 1830: Trip for bit, hole good. 1830 - 2400: Drill ahead. 0000 - 0015: Rig service. 0015 - 0800: Drill ahead.

RRPP = 1430 kPa at 60 spm.

**Well Cost:** 52,344 **Cum. Cost:** 838,867 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Clear & Calm -29C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 08-Feb-01 **Day:** 11

**Depth:** 620 mKB **Progress:** 74 m **Drlg.:** 21.00 hrs. **Drill Rate:** 3.52 m/hr **Rig:** Akita #14

**Operation:** Hoisting bit #2.

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 200 | EDT24XG | 164305 | 480 | 620 | 140 | 34.25 | 8/10 | 85/90 | 3 x 12.7 | hoisting |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1060 |
| SPM | 120 | | Flow Rate, l/min | | | 20 |
| Volume | 1.25 | | Operating Hours | | | 10.00 |

**Pump Pressure:** 4,270 kPa **Ann. Vel.: DC:** 108 m/mi **DP** 54 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1090 | Gel | 6 | | |
| 540 | 1.00 | | Viscosity | 42 | Caustic | 1 | | |
| | | | pH | 9.0 | Lignite | 3 | | |
| | | | Water Loss | 11.2 | Aquapac | 2 | | |
| | | | P.V. | 10.0 | | | | |
| | | | Y.P. | 7.0 | | | | |
| | | | Gels | 1/5 | | | | |
| | | | Filter Cake | 0.5 | | | | |
| | | | Solids | 0.05 | | | Day Cost | 1,009 |
| | | | Oil | | | | Well Cost | 6,847 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 21.00 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.50 | 8. Core | | 14. WOC | | 20. Held BOP Drill | 0.25 |
| 3. Trip | 1.50 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.25 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 0.50 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 1030: Drill ahead. 1030 - 1045: Survey. 1045 - 1100: Rig service. 1100 - 2300: Drill ahead. 2300 - 2315: Held BOP drill. 2315 - 2330: Rig service. 2330 - 0600: Drill ahead. 0600 - 0630: Circulate sample. Blow kelly. 0630 - 0800: Hoist out.

Very hard shale up to 560m, spotty breaks to 584 then into hard lime/shale. Penetration dropped off to 2.5 m/hr and remained low, torque dropped off. Centrifuge up and running. Department of Indian & Northern Affairs stopped by for a visit.

**Well Cost:** 43,650 **Cum. Cost:** 882,517 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Clear & Calm -30C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 09-Feb-01 **Day:** 12

**Depth:** 696 mKB **Progress:** 76 m **Drlg.:** 19.75 hrs. **Drill Rate:** 3.85 m/hr **Rig:** Akita #14

**Operation:** Drilling 200mm hole.

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 200 | EDT24XG | 164305 | 480 | 620 | 140 | 34.25 | 8/10 | 85/90 | 3 x 12.7 | 2-1-I |
| 3 | 200 | EDT24XG | 164291 | 620 | | 76 | 19.75 | 10/11 | 85/95 | 3 x 12.7 | IN |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1055 |
| SPM | 120 | | Flow Rate, l/min | | | 20 |
| Volume | 1.25 | | Operating Hours | | | 16.00 |

**Pump Pressure:** 6,280 kPa **Ann. Vel.: DC:** 108 m/mi **DP** 54 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1080 | Gel | 8 | | |
| 665 | 1.00 | | Viscosity | 43 | Caustic | 1 | | |
| | | | pH | 9.0 | Lignite | 1 | | |
| | | | Water Loss | 8.4 | Aquapac | 1 | | |
| | | | P.V. | 14.0 | Sawdust | 5 | | |
| | | | Y.P. | 6.0 | | | | |
| | | | Gels | 2/7 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.01 | | | Day Cost | 1,153 |
| | | | Oil | | | | Well Cost | 8,000 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 19.75 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.50 | 8. Core | | 14. WOC | | 20. Held BOP Drill | 0.25 |
| 3. Trip | 3.25 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.25 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 1115: Finish trip for bit. Hole in very good shape. 1115 - 1600: Pattern in new bit and drill ahead. 1600 - 1615: Rig service. 1615 - 2000: Drill ahead. 2000 - 2015: Held BOP drill. 2015 - 0115: Drill ahead. 0115 - 0130: Survey at 665 mKB. 0130 - 0145: Rig service. 0145 - 0800: Drill ahead.

RRPP = 2100 kPa at 60 spm.

**Well Cost:** 54,554 **Cum. Cost:** 937,071 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Clear -23C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 10-Feb-01 **Day:** 13

**Depth:** 784 mKB **Progress:** 88 m **Drlg.:** 23.00 hrs. **Drill Rate:** 3.83 m/hr **Rig:** Akita #14

**Operation:**

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 200 | EDT24XG | 164291 | 620 | | 164 | 42.75 | 11/12 | 100 | 3 x 12.7 | In |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 116 | | Flow Rate, l/min | | | |
| Volume | 1.20 | | Operating Hours | | | |

**Pump Pressure:** 6,280 kPa **Ann. Vel.: DC:** 104 m/mi **DP** 52 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159 mm DC.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1055 | Gel | 6 | | |
| 762 | 1.50 | | Viscosity | 45 | Aquapac | 2 | | |
| | | | pH | 9.0 | Lignite | 2 | | |
| | | | Water Loss | 9.2 | Sawdust | 2 | | |
| | | | P.V. | 12.0 | | | | |
| | | | Y.P. | 8.0 | | | | |
| | | | Gels | 2-4 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.03 | | | Day Cost | 955 |
| | | | Oil | | | | Well Cost | 8,955 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ mKB **Out:** ____ mKB **Meters** ____ **Rec.:** ____ %

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 23.00 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.25 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800-0815: Rig service. 0815-1600: Drill. 1600-1615: Rig service. 1615-2400: Drill. 2400-0015: Rig service. 0015-0300: Drill. 0300-0315: survey. 0315-0800: Drill. Increased RPM to 100, increased penetration very slightly. Picking up periodic breaks, same as above Rampart. Pendemak is sending an EDT 15 E on the plane today, softer than this.

**Well Cost:** 42,231 **Cum. Cost:** 979,302 **AFE No.:** _____ **AFE Amount** _____

**Weather:** -29 C, overcast **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 11-Feb-01 **Day:** 14

**Depth:** 871 mKB **Progress:** 87 m **Drlg.:** 20.50 hrs. **Drill Rate:** 4.24 m/hr **Rig:** Akita #14

**Operation:** Tripping for bit.

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 200 | EDT24XG | 164291 | 620 | 871 | 251 | 63.25 | 11-12 | 100 | 3 x 12.7 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | 1045 | |
| SPM | 116 | | Flow Rate, l/min | | 20 | |
| Volume | 1.21 | | Operating Hours | | 16.00 | |

**Pump Pressure:** 6,300 kPa **Ann. Vel.: DC:** 104 m/mi **DP** 52 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159 mm DC.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1045 | Aquapac | 2 | | |
| 850 | 1.75 | | Viscosity | 43 | Lignite | 2 | | |
| | | | pH | 9.0 | | | | |
| | | | Water Loss | 8.2 | | | | |
| | | | P.V. | 13.0 | | | | |
| | | | Y.P. | 7.5 | | | | |
| | | | Gels | 1-3 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | | | | Day Cost | 796 |
| | | | Oil | 0.03 | | | Well Cost | 9,751 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 20.50 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | 2.25 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.25 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 0.25 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0000-0815: Rig service, flow checks as required. 0815-1600: Drill, from 784 m to 871 m. 1600-1615: Rig service. 1615-0145: Drill. 0145-0200: Survey. 0200-0215: Rig service. 0215-0530: Drill. 0530-0545: Circulated sample. 0545-0800: Trip for bit. Hole in good condition coming out.

**Well Cost:** 56,348 **Cum. Cost:** 1,035,650 **AFE No.:** _____ **AFE Amount** _____

**Weather:** -29 C, clear, calm **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 12-Feb-01 **Day:** 15

**Depth:** 932 mKB **Progress:** 61 m **Drlg.:** 20.00 hrs. **Drill Rate:** 3.05 m/hr **Rig:** Akita #14

**Operation:** Drilling ahead at 2.9 to 3.5 m/hr.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 200 | EDT24XG | 164291 | 620 | 871 | 251 | 63.25 | 11/12 | 100 | 3 x 12.7 | 3-1-I |
| 4 | 200 | EDT15XG | 119676 | 871 | | 61 | 20.00 | 11/12 | 95 | 3 x 12.7 | IN |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1050 |
| SPM | 116 | | Flow Rate, l/min | | | 20 |
| Volume | 1.21 | | Operating Hours | | | 24.00 |

**Pump Pressure:** 6,300 kPa **Ann. Vel.: DC:** 104 m/mi **DP** 52 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1060 | Aquapac | 1 | | |
| | | | Viscosity | 47 | Lignite | 1 | | |
| | | | pH | 9.0 | Sawdust | 4 | | |
| | | | Water Loss | 8.2 | | | | |
| | | | P.V. | 18.0 | | | | |
| | | | Y.P. | 8.0 | | | | |
| | | | Gels | 3/7 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.04 | | | Day Cost | 842 |
| | | | Oil | | | | Well Cost | 10,593 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** _____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 20.00 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | 3.25 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1130: Trip for bit. 1130 - 1600: Drill ahead. No weight to variate, but varying weigh on bit to try to enhance penetration. 1600 - 1615: Rig service. 1615 - 2400: Drill ahead. 0000 - 0015: Rig service. 0015 - 0800: Drill ahead.
Hole and mud both in good condition.

**Well Cost:** 52,679 **Cum. Cost:** 1,088,329 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Overcast -20C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 13-Feb-01 **Day:** 16

**Depth:** 1002 mKB **Progress:** 70 m **Drlg.:** 23.00 hrs. **Drill Rate:** 3.04 m/hr **Rig:** Akita #14

**Operation:** Drilling 200mm hole.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 200 | EDT15XG | 119676 | 871 | | 131 | 41.00 | 11/12 | 95 | 3 x 12.7 | IN |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1050 |
| SPM | 110 | | Flow Rate, l/min | | | 20 |
| Volume | 1.14 | | Operating Hours | | | 24.00 |

**Pump Pressure:** 5,380 kPa **Ann. Vel.: DC:** 99 m/mi **DP** 49 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1055 | Aquapac | 2 | | |
| 955 | 2.00 | | Viscosity | 49 | Lignite | 2 | | |
| | | | pH | 9.5 | Caustic | 1 | | |
| | | | Water Loss | 9.2 | Barite | 2 | | |
| | | | P.V. | 18.0 | Super Carb | 6 | | |
| | | | Y.P. | 9.0 | | | | |
| | | | Gels | 2/5 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.03 | | | Day Cost | 1,003 |
| | | | Oil | | | | Well Cost | 11,596 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 23.00 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.25 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1600: Drill ahead. 1600 - 1615: Rig service. 1615 - 1945: Drill ahead. 1945 - 2000: Survey. 2000 - 2400: Drill ahead. 0000 - 0015: Rig service. 0015 - 0800: Drill ahead.

Rotary drill from 932 - 1002m KB with rig services and survey as required. No problems to report. Plugged jets in bit, varied pump strokes to keep within pump limits. Unplugged at 2345 hours (978m).

**Well Cost:** 43,394 **Cum. Cost:** 1,131,723 **AFE No.:** _____ **AFE Amount** _____

**Weather:** _____ **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 14-Feb-01 **Day:** 17

**Depth:** 1087 mKB **Progress:** 85 m **Drlg.:** 23.00 hrs. **Drill Rate:** 3.70 m/hr **Rig:** Akita #14

**Operation:** Drilling ahead (Bear Rock formation).

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 200 | EDT15XG | 119676 | 871 | | 216 | 66.00 | 11/12 | 100 | 3 x 12.7 | IN |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1050 |
| SPM | 110 | | Flow Rate, l/min | | | 20 |
| Volume | 1.14 | | Operating Hours | | | 24.00 |

**Pump Pressure:** 6,000 kPa **Ann. Vel.: DC:** 99 m/mi **DP** 49 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1050 | Aquapac | 1 | | |
| 1050 | 2.25 | | Viscosity | 45 | Lignite | 1 | | |
| | | | pH | 9.5 | Caustic | 1 | | |
| | | | Water Loss | 8.0 | Sawdust | 15 | | |
| | | | P.V. | 15.0 | | | | |
| | | | Y.P. | 9.0 | | | | |
| | | | Gels | 2/4 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.03 | | | Day Cost | 639 |
| | | | Oil | | | | Well Cost | 12,235 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 23.00 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.25 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1600: Drill ahead. 1600 - 1615: Rig service. 1615 - 2215: Drill ahead. 2215 - 2230: Survey. 2230 - 0115: Drill ahead. 0115 - 0130: Rig service. 0130 - 0800: Drill ahead.

RRPP = 2200 kPa at 60 spm. KB ELEVATION CHANGE 185.10m. GL = 181.00m.

**Well Cost:** 55,390 **Cum. Cost:** 1,187,113 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Overcast -9C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 15-Feb-01 **Day:** 18

**Depth:** 1141 mKB **Progress:** 54 m **Drlg.:** 15.75 hrs. **Drill Rate:** 3.43 m/hr **Rig:** Akita #14

**Operation:** Drilling ahead with bit #5 at 3.1 m/hr.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 200 | EDT15XG | 119676 | 871 | 1123 | 252 | 74.00 | 11/12 | 100 | 3 x 12.7 | 8-2-I |
| 5 | 200 | EDT24XG | 164299 | 1123 | | 18 | 7.75 | 11/12 | 100 | 3 x 12.7 | IN |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1050 |
| SPM | 110 | | Flow Rate, l/min | | | 20 |
| Volume | 1.14 | | Operating Hours | | | 24.00 |

**Pump Pressure:** 4,700 kPa **Ann. Vel.: DC:** 99 m/mi **DP** 49 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface.

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1050 | Aquapac | 1 | | |
| | | | Viscosity | 43 | Lignite | 1 | | |
| | | | pH | 9.5 | Sawdust | 6 | | |
| | | | Water Loss | 8.2 | Caustic | 1 | | |
| | | | P.V. | 14.0 | | | | |
| | | | Y.P. | 7.0 | | | | |
| | | | Gels | 2/4 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.03 | | | Day Cost | 536 |
| | | | Oil | | | | Well Cost | 12,771 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 15.75 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.50 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | 7.50 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 0.25 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1615: Drill ahead. 1615 - 1630: Circulate. 1630 - 2400: Trip for bit. 0000 - 0015: Rig service. 0015 - 0800: Drill ahead.

Drilled to 1123m KB, penetration dropped to 2.0 m/hr. Torque increased, circulate 15 minutes and hoist out.

Gauge was good, bearings were still tight, outer buttons and middle buttons were gone. Inner buttons showed usual wear.

***NOTE: CHANGE IN GL AND KB ELEVATIONS (this only affects sub sea depths) GL = 104.0m, KB = 108.1m, KB to GL = 4.10m.

**Well Cost:** 52,373 **Cum. Cost:** 1,239,486 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Overcast -8C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 16-Feb-01 **Day:** 19

**Depth:** 1187 mKB **Progress:** 46 m **Drlg.:** 17.00 hrs. **Drill Rate:** 2.71 m/hr **Rig:** Akita #14

**Operation:** Drilling ahead.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 200 | EDT24XG | 164299 | 1123 | 1172 | 49 | 17.50 | 11/12 | 100 | 3 x 12.7 | 2-1-I |
| 6 | 200 | EDT13XG | 161585 | 1172 | | 15 | 7.25 | 11/12 | 80/85 | 3 x 12.7 | IN |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1050 |
| SPM | 110 | | Flow Rate, l/min | | | 20 |
| Volume | 1.14 | | Operating Hours | | | 24.00 |

**Pump Pressure:** 4,700 kPa **Ann. Vel.: DC:** 99 m/mi **DP** 49 m/mi **Jet Vel.:** m/sec **kW:**

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1055 | Gel | 13 | | |
| 1168 | 2.00 | | Viscosity | 42 | Aquapac | 1 | | |
| | | | pH | 9.0 | Lignite | 1 | | |
| | | | Water Loss | 8.2 | Sawdust | 6 | | |
| | | | P.V. | 12.0 | | | | |
| | | | Y.P. | 5.5 | | | | |
| | | | Gels | 1/3 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.03 | | | Day Cost | 711 |
| | | | Oil | | | | Well Cost | 13,482 |

**Core No.** ____ **Size/Type:** ____ **In:** ____ mKB **Out:** ____ mKB **Meters** ____ **Rec.:** ____ %

**DST No.:** ____ **Formation** ____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 17.00 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | 5.25 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.50 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 0.50 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1600: Drill ahead. 1600 - 1615: Rig service. 1615 - 1815: Drill ahead. 1815 - 1845: Circulate sample. 1845 - 2400: Trip for bit. Run in hole and pattern bit #6. 0000 - 0015: Rig service. 0015 - 0415: Drill ahead. 0415 - 0445: Survey at 1168m KB. 0445 - 0800: Drill ahead.

RRPP = 2200 kPa at 60 spm.

**Well Cost:** 52,548 **Cum. Cost:** 1,292,034 **AFE No.:** **AFE Amount**

**Weather:** Overcast -24C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 17-Feb-01 **Day:** 20

**Depth:** 1235 mKB **Progress:** 48 m **Drlg.:** 23.25 hrs. **Drill Rate:** 2.06 m/hr **Rig:** Akita #14

**Operation:** Drilling ahead.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 200 | EDT13XG | 161585 | 1172 | | 63 | 30.50 | 11/12 | 80/85 | 3 x 12.7 | IN |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1050 |
| SPM | 110 | | Flow Rate, l/min | | | 20 |
| Volume | 1.14 | | Operating Hours | | | 24.00 |

**Pump Pressure:** 6,700 kPa **Ann. Vel.: DC:** 99 m/mi **DP** 49 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1050 | Gel | 17 | | |
| | | | Viscosity | 40 | Aquapac | 2 | | |
| | | | pH | 9.0 | Lignite | 2 | | |
| | | | Water Loss | 8.0 | Sawdust | 4 | | |
| | | | P.V. | 13.0 | | | | |
| | | | Y.P. | 4.5 | | | | |
| | | | Gels | 1.5/3 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.03 | | | Day Cost | 1,162 |
| | | | Oil | | | | Well Cost | 14,644 |

**Core No.** _____ **Size/Type:** _____ **In:** _____ **mKB Out:** _____ **mKB Meters** _____ **Rec.:** _____ **%**

**DST No.:** _____ **Formation** _____ **Interval:** _____ **to** _____ **PF:** _____ **ISI:** _____ **VO:** _____ **FSI:** _____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 23.25 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.75 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1600: Drill ahead. 1600 - 1615: Rig service. 1615 - 2400: Drill ahead. 0000 - 0015: Rig service. 0015 - 0800: Drill ahead.

RRPP = 2500 kPa at 60 spm.

**Well Cost:** 41,553 **Cum. Cost:** 1,333,587 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Clear -32C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 18-Feb-01 **Day:** 21

**Depth:** 1267 mKB **Progress:** 32 m **Drlg.:** 15.50 hrs. **Drill Rate:** 2.06 m/hr **Rig:** Akita #14

**Operation:** Drilling ahead.

| Bit No. | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 200 | EDT13XG | 161585 | 1172 | | 95 | 46.00 | 11/12 | 95/100 | 3 x 12.7 | IN |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1050 |
| SPM | 110 | | Flow Rate, l/min | | | 20 |
| Volume | 1.14 | | Operating Hours | | | 24.00 |

**Pump Pressure:** 6,700 kPa **Ann. Vel.: DC:** 99 m/mi **DP** 49 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1055 | Gel | 10 | | |
| 1265 | 2.00 | | Viscosity | 43 | Aquapac | 1 | | |
| | | | pH | 9.0 | Lignite | 1 | | |
| | | | Water Loss | 7.6 | Caustic | 1 | | |
| | | | P.V. | 13.0 | | | | |
| | | | Y.P. | 4.5 | | | | |
| | | | Gels | 1.5/3 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.03 | | | Day Cost | 654 |
| | | | Oil | | | | Well Cost | 15,298 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 15.50 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.50 | 8. Core | | 14. WOC | | 20. | |
| 3. Trip | 6.50 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | 0.50 | 10. Log | | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 0.50 | 11. Handle Tools | | 17. Repair | 0.50 | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 0900: Drill ahead. 0900 - 0930: Circulate. 0930 - 1600: Trip to check bit. Run back in with same bit. 1600 - 2145: Drill ahead. 2145 - 2200: Held BOP drill. 2200 - 2230: Repair. 2230 - 2400: Drill ahead. 0000 - 0015: Rig service. 0015 - 0730: Drill ahead. 0730 - 0800: Survey.

Rotary drilled to 1237m. Pump pressure went from 6700 to 12,000 (90 spm). Worked string, confirmed obstruction was internal. Capture sample. Blow mud lines and hoist out to check blockage (ROP dropped to 1.4 m/hr). Hoisted out, recovered 3 washers and 2 bolts from inside bit (valve rubber retaining ring bolts). Check bit and run back in (same bit). Drill ahead. Pump pressure normal at 110 spm.

**Well Cost:** 53,361 **Cum. Cost:** 1,386,948 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Clear -34C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 19-Feb-01 **Day:** 22

**Depth:** 1294 mKB **Progress:** 27 m **Drlg.:** 13.00 hrs. **Drill Rate:** 2.08 m/hr **Rig:** Akita #14

**Operation:** Logging with Tucker.

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 200 | EDT13XG | 161585 | 1172 | 1294 | 122 | 59.00 | 11/12 | 95/100 | 3 x 12.7 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | 1050 |
| SPM | 110 | | Flow Rate, l/min | | | 20 |
| Volume | 1.14 | | Operating Hours | | | 24.00 |

**Pump Pressure:** 6,700 kPa **Ann. Vel.: DC:** 99 m/mi **DP** 49 m/mi **Jet Vel.:** _____ m/sec **kW:** _____

**Drilling Assembly:** Bit, shock sub, 12 - 159mm DCs, X-over, 102mm DP to surface

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1055 | Gel | 23 | | |
| | | | Viscosity | 43 | Aquapac | 1 | | |
| | | | pH | 9.0 | Lignite | 1 | | |
| | | | Water Loss | 7.6 | Caustic | 1 | | |
| | | | P.V. | 13.0 | Sawdust | 30 | | |
| | | | Y.P. | 4.5 | Vis-Plus | 1 | | |
| | | | Gels | 1.5/3 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.03 | | | Day Cost | 1,577 |
| | | | Oil | | | | Well Cost | 16,875 |

**Core No.** ____ **Size/Type:** _____ **In:** ____ **mKB Out:** ____ **mKB Meters** ____ **Rec.:** ____ **%**

**DST No.:** ____ **Formation** _____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | 13.00 | 7. Clean to Bottom | | 13. Cement | | 19. Rig Up | |
| 2. Rig Service | 0.50 | 8. Core | | 14. WOC | | 20. Held BOP Drill | 0.25 |
| 3. Trip | 4.00 | 9. DST | | 15. Nipple Up | | 21. | |
| 4. Survey | | 10. Log | 5.25 | 16. Pressure Test | | 22. | |
| 5. Circ./Cond. | 1.00 | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 0815: Rig service. 0815 - 1245: Drill ahead. 1245 - 1300: Held BOP drill. 1300 - 1600: Drill ahead. 1600 - 1615: Rig service. 1615 - 2145: Drill ahead to TD (1294m). 2145 - 2245: Circulate and condition hole and mud. 2245 - 0245: Chain out to log, flow check as required. 0245 - 0800: Rig in Tucker wireline and log well.

**Well Cost:** 56,284 **Cum. Cost:** 1,443,232 **AFE No.:** _____ **AFE Amount** _____

**Weather:** Clear -32C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 20-Feb-01 **Day:** 23

**Depth:** 1294 mKB **Progress:** m **Drlg.:** hrs. **Drill Rate:** m/hr **Rig:** Akita #14

**Operation:** Cementing production casing.

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 200 | EDT13XG | 161585 | 1172 | 1294 | 122 | 59.00 | 11/12 | 90/100 | 3 x 12.7 | 3-1-I |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | 90 | | Flow Rate, l/min | | | |
| Volume | 0.94 | | Operating Hours | | | |

**Pump Pressure:** 1,400 kPa **Ann. Vel.: DC:** 81 m/mi **DP** 40 m/mi **Jet Vel.:** m/sec **kW:**

**Drilling Assembly:** Down

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | 1060 | | | | |
| | | | Viscosity | 42 | | | | |
| | | | pH | 9.0 | | | | |
| | | | Water Loss | 7.8 | | | | |
| | | | P.V. | 13.0 | | | | |
| | | | Y.P. | 5.0 | | | | |
| | | | Gels | 2/4 | | | | |
| | | | Filter Cake | 1 | | | | |
| | | | Solids | 0.04 | | | Day Cost | 0 |
| | | | Oil | | | | Well Cost | 16,875 |

**Core No.** **Size/Type:** **In:** mKB **Out:** mKB **Meters** **Rec.:** %

**DST No.:** **Formation** **Interval:** to **PF:** **ISI:** **VO:** **FSI:**

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | | 7. Clean to Bottom | | 13. Cement | 1.50 | 19. Rig Up | |
| 2. Rig Service | | 8. Core | | 14. WOC | | 20. Lay Down DP & DCs | 4.00 |
| 3. Trip | 3.50 | 9. DST | | 15. Nipple Up | | 21. Wait On Orders | 1.00 |
| 4. Survey | | 10. Log | 2.50 | 16. Pressure Test | | 22. Blow Kelly | 1.00 |
| 5. Circ./Cond. | 1.00 | 11. Handle Tools | 2.00 | 17. Repair | | 23. Circulate Casing | 1.75 |
| 6. Ream | | 12. Run Casing | 4.75 | 18. Slip/Cut | 1.00 | 24. | |

## REMARKS

0800 - 1030: Log, dart in logs. 1030 - 1130: Wait on orders. 1130 - 1230: Slip and cut line, strap casing. 1230 - 1600: Run in hole with bit. 1600 - 1700: Circulate hole clean. 1700 - 1800: Blow kelly. 1800 - 2200: Lay down DP and DCs. 2200 - 2400: Handle tools. 0000 - 0445: Rig to and run casing. Ran 93 joints of 139.7mm, 20.8 kg/m, J-55, ST&C casing. Total = 1294.97m. Landed at 1294.0m KB. 0445 - 0630: Circulate casing and blend up mix water with 2 water trucks. 0630 - 0800: Prepare to mix and pump 9 tonnes Fill-Lite 2-100 + 1% CaCl2 followed by 23 tonnes 0:1:0 'G' + 0.3% FL-63 + 0.5% CD-31.

**Well Cost:** 103,175 **Cum. Cost:** 1,546,407 **AFE No.:** **AFE Amount**

**Weather:** -22C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# CODECO CONSULTING (2000) INC.
# DAILY DRILLING REPORT

410, 311 - 6th Avenue S.W.
Calgary, Alberta T2P 3H2
Phone: (403)237-7808
Fax: (403)265-1760

**Well Name:** Devlan et al Tree River B-10 67°20'131°45' **Date:** 21-Feb-01 **Day:** 24

**Depth:** 1294 mKB **Progress:** ____ m **Drlg.:** ____ hrs. **Drill Rate:** ____ m/hr **Rig:** Akita #14

**Operation:** Rig released at 2400 hours 2001-02-20.

| Bit No | Size | Type | Serial Number | In | Out | Meters | Hours | Weight | RPM | Nozzles | Condition |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | Pump No. 1 | Pump No. 2 | | Desander | Desilter | Centrifuge |
|---|---|---|---|---|---|---|
| Model | F-500 | | Underflow Density | | | |
| Liner/Stroke | 152 x 191 | | Overflow Density | | | |
| SPM | | | Flow Rate, l/min | | | |
| Volume | | | Operating Hours | | | |

**Pump Pressure:** ____ kPa **Ann. Vel.: DC:** ____ m/mi **DP** ____ m/mi **Jet Vel.:** ____ m/sec **kW:** ____

**Drilling Assembly:** ____

| SURVEYS | | | MUD | | ADDITIVES (SACKS) | | | |
|---|---|---|---|---|---|---|---|---|
| Depth (mKB) | Inclination (deg) | Direction (deg) | Weight | | | | | |
| | | | Viscosity | | | | | |
| | | | pH | | | | | |
| | | | Water Loss | | | | | |
| | | | P.V. | | | | | |
| | | | Y.P. | | | | | |
| | | | Gels | | | | | |
| | | | Filter Cake | | | | | |
| | | | Solids | | | | Day Cost | 0 |
| | | | Oil | | | | Well Cost | 16,875 |

**Core No.** ____ **Size/Type:** ____ **In:** ____ mKB **Out:** ____ mKB **Meters** ____ **Rec.:** ____ %

**DST No.:** ____ **Formation** ____ **Interval:** ____ **to** ____ **PF:** ____ **ISI:** ____ **VO:** ____ **FSI:** ____

## RIG TIME

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Drill | | 7. Clean to Bottom | | 13. Cement | 3.00 | 19. Rig Up | |
| 2. Rig Service | | 8. Core | | 14. WOC | | 20. Circulate Casing | 2.50 |
| 3. Trip | | 9. DST | | 15. Nipple Up | | 21. Nipple Down BOPs | 2.50 |
| 4. Survey | | 10. Log | | 16. Pressure Test | | 22. Rig Out | 8.00 |
| 5. Circ./Cond. | | 11. Handle Tools | | 17. Repair | | 23. | |
| 6. Ream | | 12. Run Casing | | 18. Slip/Cut | | 24. | |

## REMARKS

0800 - 1030: Circulate casing. Wait on BJ Services to blend their chemicals. 1030 - 1330: Mix and pump cement. Cemented with 9 tonnes Fill Lite 2-100 + 1% CaCl2 followed by 23 tonnes 0:1:0 'G' + 0.3% FL-63 + 0.5% CD-31. Plug down at 1305 hours 2001-01-20. 2.5m3 of 3.0m3 preflush returned to surface. End of preflush was cement contaminated. Flush out BOPs, lift same and set slips. Cut casing and remove BOPs. Tear out rig and equipment. Thaw rig and prepare same for move. Rig released at 2400 hours 2001-02-20.

**Well Cost:** 108,139 **Cum. Cost:** 1,654,546 **AFE No.:** ____ **AFE Amount** ____

**Weather:** Overcast -22C **Supervisor:** Erwin Alyea **Mobile:** 403-977-2529 **Taken By:** Michael Woofter

# NOWSCO-FRACMASTER

A BJ SERVICES COMPANY

## CEMENTING TREATMENT REPORT

| CUSTOMER | LOCATION | SERVICE ORDER | DATE |
|---|---|---|---|
| Pan Orla Resources | et al Tree River D-10 | A22980 74 | Feb 20/02 |
| MAILING ADDRESS | | WELL NAME | |
| 410 - 31 Ave SW Calgary AB T2S-3H2 | | D-10 | |
| TYPE OF JOB: Surface ___ Intermediate ___ Production ✓ Liner ___ Abandonment ___ / Multistage ___ Plug Back ___ Squeeze ___ Pumping ___ Other ___ | | CONTRACTOR Akita #14 | PROVINCE NWT |

### WELL DATA

Hole Size 200 mm mm Total Depth 1300 m Mud Type ___ Viscosity ___ mPa•s Density ___ kg/m³

| | | | | | | |
|---|---|---|---|---|---|---|
| CASING OR LINER: | Size 139.7 mm | Lin. Density 20.8 kg/m | Grade J55 | Depth 300 m | TYPE OF PLUGS | |
| | Size ___ mm | Lin. Density ___ kg/m | Grade ___ | Depth ___ m | Top 139.7 mm ___ W ✓ R | |
| | | | | TOTAL ___ m | Btm 139.7 mm ___ W ✓ R | |
| DRILL PIPE OR TUBING: | Size ___ mm | Lin. Density ___ kg/m | Grade ___ | Depth ___ m | TYPE OF HEAD | |
| | Size ___ mm | Lin. Density ___ kg/m | Grade ✓ | Depth ___ m | ✓ PL ___ Swage ___ Oth. | |

PERFORATIONS: From ___ m To ___ m | PUMP OUT LINES: ___ Yes ___ No | RETURNS ___ CEMENT ___ MUD ___ OTHER

From ___ m To ___ m | FLOAT HOLDING: ✓ Yes ___ No | ___ FULL ___ PARTIAL ✓ NIL AMT. ___ m³

From ___ m To ___ m | TYPE OF PACKER or SPECIAL TOOL: ___ DEPTH ___ m

| TEMPERATURE °C | MIXING WATER °C | DRY CEMENT °C | SLURRY °C |
|---|---|---|---|
| | | | |

TIME ARRIVED AT LOCATION Feb 19 1300hr TIME LEFT LOCATION Feb 20 1600hr

### CEMENT DATA

| | Amount, t | Cement Blend | Additives | Density, kg/m³ Slurry | Density, kg/m³ D.H. Foamed | Yield, m³/t | Total Yield, m³ Slurry | Total Yield, m³ D.H. Foamed |
|---|---|---|---|---|---|---|---|---|
| Scavenger | 9 + | Fill-Lite 9-100 | 1% CaCl² | 1502 | | 1.317 | 11.4 | |
| Fill | 23 + | 50:50 | 30% FL-63 + .9% CD-31 | 1901 | | .757 | 17.41 | |
| Tail In | | | | | | | | |
| Fill | | | | | | | | |
| Tail In | | | | | | | | |

### CASING OR LINER DATA

| REMARKS | TIME Start | TIME Finish | RATE m³/min. | PRESSURE, kPa Max. | PRESSURE, kPa Min. | Volume Pumped m³ |
|---|---|---|---|---|---|---|
| ~~Fill lines~~ | ~~1310~~ | ~~1312~~ | | | | |
| ~~Test lines~~ | | | | | | |
| Fill lines | 1010 | 1015 | | — | | 3M3 |
| Test lines | 1052 | 1055 | | 16 MPA | | — |
| Pre flush | 1056 | 1104 | | 2 MPA | | 2.7 M³ |
| Lead Slurry | 1104 | 1130 | | 2.5 MPA | | 11.4 M³ |
| Tail Slurry | 1130 | 1215 | | 3.5 MPA | | 42.4 M³ |
| Drop Plug | 1215 | 1220 | | — | | — |
| Displace | 1220 | 1305 | | 10 MPA | | 16.3 M³ |
| Bump Plug | 1305 | 1308 | | 16 MPA | | — |
| Check Float | | | | | | |

### PLUG BACK DATA

| Plug # | Top m | Btm. m | CEMENT t | Displacement m³ | Time Plug Down |
|---|---|---|---|---|---|
| | | | | | |

PREFLUSH TYPE (m³)

1. Water ___ 3. ___ ___
2. ___ ___ 4. ___ ___

STAGE $N_2$ RATIOS (m³/m³)

1. ___ ___ 4. ___ ___
2. ___ ___ 5. ___ ___
3. ___ ___ 6. ___ ___

SQUEEZE DATA (m³)

TOTAL SLURRY IN FORMATION ___

TOTAL SLURRY IN CASING ___

TOTAL BACKWASHED ___

TOTAL SLURRY ___

NOWSCO-FRACMASTER REPRESENTATIVE: | CUSTOMER REPRESENTATIVE

# CODECO CONSULTING (2000) INC.
# DAILY WELL COSTS



**Well Name:** DEVLAN ET AL TREE RIVER
**Location:** B-10 67°20'131°45'
**Supervisor:** Erwin Alyea

| DAY NO. | Budget | Prespud | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|---|---|
| DATE | (D&A) | | 28-Jan-01 | 29-Jan-01 | 30-Jan-01 | 31-Jan-01 | 1-Feb-01 | 2-Feb-01 | 3-Feb-01 | CUM. |
| **LEASE PREPARATION** | | | | | | | | | | |
| Lease, Survey, Permits | | | | | | | | | | |
| Construction / Conductor Hole | | 6,500 | -6,500 | | | | | | | |
| **DRILLING COSTS** | | | | | | | | | | |
| Rig Move | | | | | | | | | 79,261 | 79,261 |
| Rig Up/Out | | 61,824 | | | | | | | | 61,824 |
| Daywork Drilling | | | 19,896 | 19,896 | 19,896 | 19,896 | 19,896 | 19,896 | 19,896 | 139,272 |
| Boiler | | 2,400 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 10,800 |
| Camp & Crew Travel | | 8,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 22,000 |
| Mud Tech | | | | | 2,400 | 600 | | 1,200 | 1,200 | 5,400 |
| **SERVICE & SUPPLIES** | | | | | | | | | | |
| Mud & Chemicals | | | 583 | 408 | 682 | 639 | 362 | 94 | 1,192 | 3,960 |
| Water | | 15,200 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 41,800 |
| Rental Equipment | | | | | | | | | | |
| - Wellsite Trailer | | 1,400 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 3,850 |
| - Garbage Bin | | 340 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 795 |
| - Flare Tank | | | | | | 90 | 90 | 90 | 90 | 360 |
| - Shock Sub | | | | | | | | | | |
| - Shale Sloop | | 260 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 715 |
| - Loader | | 4,800 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 13,200 |
| - Medic | | | | | | | | 600 | 600 | 1,200 |
| - Vacuum Truck | | | | 5,000 | 5,000 | 5,000 | 2,000 | 2,000 | 2,000 | 21,000 |
| Bits | | 7,635 | | 4,310 | 4,310 | | | 7,635 | | 23,890 |
| Cement Service | | | | 19,350 | | | | | 76,765 | 96,115 |
| Casing & Accessories | | | | | | | | 17,181 | | 17,181 |
| Power Tongs | | | | | | | | | 9,755 | 9,755 |
| Fuel | | | 7,480 | | | 2,477 | 10,719 | | | 20,676 |
| Trucking | | | | | | 8,750 | | 22,750 | 4,650 | 36,150 |
| Centrifuge | | | | | | | | | | |
| Engineering Supervision | | 1,600 | 2,400 | 800 | 800 | 800 | 800 | 800 | 800 | 8,800 |
| Geological Supervision | | 1,600 | 2,400 | 800 | 800 | 800 | 800 | 800 | 800 | 8,800 |
| Misc. Services | | | | | | | | | | |
| Enviro. Services (LSWD) | | | | | | | | | | |
| O/H & Misc. & Contingency | | 15,200 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 41,800 |
| **EVALUATION COSTS** | | | | | | | | | | |
| Logging | | | | | | | | | | |
| Testing | | | | | | | | | | |
| Coring | | | | | | | | | | |
| **LEASE CLEANUP** | | | | | | | | | | |
| **DAILY COST** | | 126,759 | 38,739 | 63,044 | 46,368 | 51,532 | 47,147 | 85,526 | 209,489 | 668,604 |
| **ACCUMULATED COST** | | 126,759 | 165,498 | 228,542 | 274,910 | 326,442 | 373,589 | 459,115 | 668,604 | |

# CODECO CONSULTING (2000) INC.
# DAILY WELL COSTS



**Well Name:** DEVLAN ET AL TREE RIVER
**Location:** B-10 67°20'131°45'
**Supervisor:** Erwin Alyea

| DAY NO. | Budget | Carried | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
|---|---|---|---|---|---|---|---|---|---|---|
| DATE | (D&A) | Forward | 4-Feb-01 | 5-Feb-01 | 6-Feb-01 | 7-Feb-01 | 8-Feb-01 | 9-Feb-01 | 10-Feb-01 | CUM. |
| **LEASE PREPARATION** | | | | | | | | | | |
| Lease, Survey, Permits | | | | | | | | | | |
| Construction / Conductor Hole | | | | | | | | | | |
| **DRILLING COSTS** | | | | | | | | | | |
| Rig Move | | 79,261 | | | | | | | | 79,261 |
| Rig Up/Out | | 61,824 | | | | | | | | 61,824 |
| Daywork Drilling | | 139,272 | 19,896 | 19,896 | 19,896 | 19,896 | 19,896 | 19,896 | 19,896 | 278,544 |
| Boiler | | 10,800 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 19,200 |
| Camp & Crew Travel | | 22,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 36,000 |
| Mud Tech | | 5,400 | | | | 1,200 | 600 | 600 | 600 | 8,400 |
| **SERVICE & SUPPLIES** | | | | | | | | | | |
| Mud & Chemicals | | 3,960 | | 421 | 1,457 | 1,009 | 1,153 | 955 | 796 | 9,751 |
| Water | | 41,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 68,400 |
| Rental Equipment | | | | | | | | | | |
| - Wellsite Trailer | | 3,850 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 6,300 |
| - Garbage Bin | | 795 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 1,250 |
| - Flare Tank | | 360 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 990 |
| - Shock Sub | | | | 125 | 125 | 125 | 125 | 125 | 125 | 750 |
| - Shale Sloop | | 715 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 1,170 |
| - Loader | | 13,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 21,600 |
| - Medic | | 1,200 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 5,400 |
| - Vacuum Truck | | 21,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 35,000 |
| Bits | | 23,890 | 9,446 | | 9,446 | | | | | 42,782 |
| Cement Service | | 96,115 | | | | | | | | 96,115 |
| Casing & Accessories | | 17,181 | | | | | | | | 17,181 |
| Power Tongs | | 9,755 | | | | | | | | 9,755 |
| Fuel | | 20,676 | | 12,345 | | | | | 13,161 | 46,182 |
| Trucking | | 36,150 | 4,650 | 4,650 | 4,650 | 4,650 | 16,010 | 3,000 | 4,650 | 78,410 |
| Centrifuge | | | | | | | | 350 | 350 | 700 |
| Engineering Supervision | | 8,800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 14,400 |
| Geological Supervision | | 8,800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 14,400 |
| Misc. Services | | | | 12,950 | | | | 535 | | 13,485 |
| Enviro. Services (LSWD) | | | | | | | | | | |
| O/H & Misc. & Contingency | | 41,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 68,400 |
| **EVALUATION COSTS** | | | | | | | | | | |
| Logging | | | | | | | | | | |
| Testing | | | | | | | | | | |
| Coring | | | | | | | | | | |
| **LEASE CLEANUP** | | | | | | | | | | |
| **DAILY COST** | | 668,604 | 50,762 | 67,157 | 52,344 | 43,650 | 54,554 | 42,231 | 56,348 | 1,035,650 |
| **ACCUMULATED COST** | | 668,604 | 719,366 | 786,523 | 838,867 | 882,517 | 937,071 | 979,302 | 1,035,650 | |

# CODECO CONSULTING (2000) INC.
# DAILY WELL COSTS



**Well Name:** DEVLAN ET AL TREE RIVER
**Location:** B-10 67°20'131°45'
**Supervisor:** Erwin Alyea

| DAY NO. | Budget | Carried | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
|---|---|---|---|---|---|---|---|---|---|---|
| DATE | (D&A) | Forward | 11-Feb-01 | 12-Feb-01 | 13-Feb-01 | 14-Feb-01 | 15-Feb-01 | 16-Feb-01 | 17-Feb-01 | CUM. |
| **LEASE PREPARATION** | | | | | | | | | | |
| Lease, Survey, Permits | | | | | | | | | | |
| Construction / Conductor Hole | | | | | | | | | | |
| **DRILLING COSTS** | | | | | | | | | | |
| Rig Move | | 79,261 | | | | | | | | 79,261 |
| Rig Up/Out | | 61,824 | | | | | | | | 61,824 |
| Daywork Drilling | | 278,544 | 19,896 | 19,896 | 19,896 | 19,896 | 19,896 | 19,896 | 19,896 | 417,816 |
| Boiler | | 19,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 27,600 |
| Camp & Crew Travel | | 36,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 50,000 |
| Mud Tech | | 8,400 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 12,600 |
| **SERVICE & SUPPLIES** | | | | | | | | | | |
| Mud & Chemicals | | 9,751 | 842 | 1,003 | 639 | 536 | 711 | 1,162 | 654 | 15,298 |
| Water | | 68,400 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 1,800 | 1,800 | 91,000 |
| Rental Equipment | | | | | | | | | | |
| - Wellsite Trailer | | 6,300 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 8,750 |
| - Garbage Bin | | 1,250 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 1,705 |
| - Flare Tank | | 990 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 1,620 |
| - Shock Sub | | 750 | 125 | 125 | 125 | 125 | 125 | 125 | 125 | 1,625 |
| - Shale Sloop | | 1,170 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 1,625 |
| - Loader | | 21,600 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 30,000 |
| - Medic | | 5,400 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 9,600 |
| - Vacuum Truck | | 35,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 49,000 |
| Bits | | 42,782 | 9,446 | | | 9,446 | 9,446 | | | 71,120 |
| Cement Service | | 96,115 | | | | | | | | 96,115 |
| Casing & Accessories | | 17,181 | | | | | | | | 17,181 |
| Power Tongs | | 9,755 | | | | | | | | 9,755 |
| Fuel | | 46,182 | | | 12,360 | | | | 12,316 | 70,858 |
| Trucking | | 78,410 | 4,650 | 4,650 | 4,650 | 4,650 | 4,650 | 4,650 | 4,650 | 110,960 |
| Centrifuge | | 700 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 3,150 |
| Engineering Supervision | | 14,400 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 20,000 |
| Geological Supervision | | 14,400 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 20,000 |
| Misc. Services | | 13,485 | | | | | | | | 13,485 |
| Enviro. Services (LSWD) | | | | | | | | | | |
| O/H & Misc. & Contingency | | 68,400 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 3,800 | 95,000 |
| **EVALUATION COSTS** | | | | | | | | | | |
| Logging | | | | | | | | | | |
| Testing | | | | | | | | | | |
| Coring | | | | | | | | | | |
| **LEASE CLEANUP** | | | | | | | | | | |
| **DAILY COST** | | 1,035,650 | 52,679 | 43,394 | 55,390 | 52,373 | 52,548 | 41,553 | 53,361 | 1,386,948 |
| **ACCUMULATED COST** | | 1,035,650 | 1,088,329 | 1,131,723 | 1,187,113 | 1,239,486 | 1,292,034 | 1,333,587 | 1,386,948 | |

# CODECO CONSULTING (2000) INC.
## DAILY WELL COSTS



**Well Name:** DEVLAN ET AL TREE RIVER
**Location:** B-10 67°20'131°45'
**Supervisor:** Erwin Alyea

| DAY NO. / DATE | Budget (D&A) | Carried Forward | 22 18-Feb-01 | 23 19-Feb-01 | 24 20-Feb-01 | 25 21-Feb-01 | 26 22-Feb-01 | 27 23-Feb-01 | 28 24-Feb-01 | CUM. |
|---|---|---|---|---|---|---|---|---|---|---|
| **LEASE PREPARATION** | | | | | | | | | | |
| Lease, Survey, Permits | | | | | | | | | | |
| Construction / Conductor Hole | | | | | | | | | | |
| **DRILLING COSTS** | | | | | | | | | | |
| Rig Move | | 79,261 | | | | | | | | 79,261 |
| Rig Up/Out | | 61,824 | | | | | | | | 61,824 |
| Daywork Drilling | | 417,816 | 19,896 | 19,896 | 19,896 | | | | | 477,504 |
| Boiler | | 27,600 | 1,200 | 1,200 | 1,200 | | | | | 31,200 |
| Camp & Crew Travel | | 50,000 | 2,000 | 2,000 | 2,000 | | | | | 56,000 |
| Mud Tech | | 12,600 | 600 | 600 | 600 | | | | | 14,400 |
| **SERVICE & SUPPLIES** | | | | | | | | | | |
| Mud & Chemicals | | 15,298 | 1,577 | | | | | | | 16,875 |
| Water | | 91,000 | 3,800 | 3,800 | 3,800 | | | | | 102,400 |
| Rental Equipment | | | | | | | | | | |
| - Wellsite Trailer | | 8,750 | 350 | 350 | 350 | | | | | 9,800 |
| - Garbage Bin | | 1,705 | 65 | 65 | 65 | | | | | 1,900 |
| - Flare Tank | | 1,620 | 90 | 90 | 90 | | | | | 1,890 |
| - Shock Sub | | 1,625 | 125 | 125 | 125 | | | | | 2,000 |
| - Shale Sloop | | 1,625 | 65 | 65 | 65 | | | | | 1,820 |
| - Loader | | 30,000 | 1,200 | 1,200 | 1,200 | | | | | 33,600 |
| - Medic | | 9,600 | 600 | 600 | 600 | | | | | 11,400 |
| - Vacuum Truck | | 49,000 | 2,000 | 2,000 | 2,000 | | | | | 55,000 |
| Bits | | 71,120 | | | | | | | | 71,120 |
| Cement Service | | 96,115 | | | 28,448 | | | | | 124,563 |
| Casing & Accessories | | 17,181 | | 42,600 | | | | | | 59,781 |
| Power Tongs | | 9,755 | | 1,500 | | | | | | 11,255 |
| Fuel | | 70,858 | 12,316 | -12,316 | | | | | | 70,858 |
| Trucking | | 110,960 | 4,650 | 4,650 | 4,650 | | | | | 124,910 |
| Centrifuge | | 3,150 | 350 | 350 | | | | | | 3,850 |
| Engineering Supervision | | 20,000 | 800 | 800 | 800 | | | | | 22,400 |
| Geological Supervision | | 20,000 | 800 | 800 | 800 | | | | | 22,400 |
| Misc. Services | | 13,485 | | | | | | | | 13,485 |
| Enviro. Services (LSWD) | | | | | | | | | | |
| O/H & Misc. & Contingency | | 95,000 | 3,800 | 3,800 | 3,800 | | | | | 106,400 |
| **EVALUATION COSTS** | | | | | | | | | | |
| Logging | | | | 29,000 | | | | | | 29,000 |
| Testing | | | | | 37,650 | | | | | 37,650 |
| Coring | | | | | | | | | | |
| **LEASE CLEANUP** | | | | | | | | | | |
| **DAILY COST** | | 1,386,948 | 56,284 | 103,175 | 108,139 | | | | | 1,654,546 |
| **ACCUMULATED COST** | | 1,386,948 | 1,443,232 | 1,546,407 | 1,654,546 | | | | | |

# CODECO CONSULTING (2000) INC.
## MUD REPORT

410, 311 - 6th Avenue S. W.
Calgary, Alberta
T2P 3H2
Phone: 237-7808
FAX: 265-1760

**Well Name:** DEVLAN ET AL TREE RIVER **Spud Date:** 01-01-28

**Location:** B-10 67°20'131°45' **Rig Release Date:** 01-02-20

| DATE | DEPTH (mKB) | WEIGHT (kg/m^3) | VISCOSITY (sec/l) | WATER LOSS (cm^3) | pH | ADDITIVES |
|---|---|---|---|---|---|---|
| 01-01-27 | 0 | | | | | Nil. |
| 01-01-28 | 0 | | | | | Nil. |
| 01-01-29 | 38 | 1070 | 35 | 18.2 | 10.0 | Gel 1, Caustic 1, Soda Ash 1, Sawdust 6. |
| 01-01-30 | 201 | 1130 | 51 | 20.0 | 10.5 | Gel 18, Bicarbonate 7, Sawdust 2. |
| 01-01-31 | 378 | 1230 | 59 | | 9.5 | Gel 31, Bicarbonate 2, Caustic 1. |
| 01-02-01 | 384 | 1220 | 83 | 7.8 | 9.0 | Gel 34. |
| 01-02-02 | 384 | 1325 | 69 | 6.6 | 9.0 | Gel 17, Bicarbonate 1. |
| 01-02-03 | 388 | 1310 | 117 | 5.8 | 9.0 | Gel 5. |
| 01-02-04 | 388 | 1260 | 69 | 5.8 | 9.0 | Desco 2, Celloflake 2, Sawdust 10, SAPP 7. |
| 01-02-05 | 388 | | | | | Nil. |
| 01-02-06 | 454 | 1090 | 34 | | 9.0 | Gel 16, Soda Sah 1, Caustic 1. |
| 01-02-07 | 546 | 1090 | 44 | 7.8 | 9.5 | Gel 14, Lignite 3, Aquapac 3. |
| 01-02-08 | 620 | 1090 | 42 | 11.2 | 9.0 | Gel 6, Caustic 1, Lignite 3, Aquapac 2. |
| 01-02-09 | 696 | 1080 | 43 | 8.4 | 9.0 | Gel 8, Caustic 1, Lignite 1, Aquapac 1, Sawdust 5. |
| 01-02-10 | 784 | 1055 | 45 | 9.2 | 9.0 | Gel 6, Lignite 2, Aquapac 2, Sawdust 2. |
| 01-02-11 | 871 | 1045 | 43 | 8.2 | 9.0 | Aquapac 2, Lignite 2. |
| 01-02-12 | 932 | 1060 | 47 | 8.2 | 9.0 | Aquapac 1, Lignite 1, Sawdust 4. |

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# CODECO CONSULTING (2000) INC.
## MUD REPORT

410, 311 - 6th Avenue S. W.
Calgary, Alberta
T2P 3H2
Phone: 237-7808
FAX: 265-1760

**Well Name:** DEVLAN ET AL TREE RIVER **Spud Date:** 01-01-28

**Location:** B-10 67°20'131°45' **Rig Release Date:** 01-02-20

| DATE | DEPTH (mKB) | WEIGHT (kg/m^3) | VISCOSITY (sec/l) | WATER LOSS (cm^3) | pH | ADDITIVES |
|---|---|---|---|---|---|---|
| 01-02-13 | 1002 | 1055 | 49 | 9.2 | 9.5 | Aquapac 2, Lignite 2, Caustic 1, Barite 2, Super Carb. 6. |
| 01-02-14 | 1087 | 1050 | 45 | 8.0 | 9.5 | Aquapac 1, Lignite 1, Caustic 1, Sawdust 15. |
| 01-02-15 | 1141 | 1050 | 43 | 8.2 | 9.5 | Aquapac 1, Lignite 1, Caustic 1, Sawdust 6. |
| 01-02-16 | 1187 | 1055 | 42 | 8.2 | 9.0 | Gel 13, Aquapac 1, Lignite 1, Sawdust 6. |
| 01-02-17 | 1235 | 1050 | 40 | 8.0 | 9.0 | Gel 17, Aquapac 2, Lignite 2, Sawdust 4. |
| 01-02-18 | 1267 | 1055 | 43 | 7.6 | 9.0 | Gel 10, Aquapac 1, Lignite 1, Caustic 1. |
| 01-02-19 | 1294 | 1055 | 43 | 7.6 | 9.0 | Gel 23, Aquapac 1, Lignite 1, Caustic 1, Sawdust 30, Vis-Plus 1. |
| 01-02-20 | 1294 | 1060 | 42 | 7.8 | 9.0 | Nil. |
| 01-02-21 | 1294 | | | | | Nil. |

# CODECO CONSULTING (2000) INC.
# BIT RECORD

410, 311 - 6th Avenue S. W.
Calgary, Alberta
T2P 3H2
Phone: 237-7808
FAX: 265-1760

**Well Name:** DEVLAN ET AL TREE RIVER
**Location:** B-10 67°20'131°45'
**Operator:** Devlan Exploration Inc. **Supervisor:** Erwin Alyea
**Contractor:** Akita Drilling **Rig No.:** 14 **Toolpusher:** Mel Zerr
**Field:** Grandview Hills/Tree River **Province:** N.W.T.

**Spud Date:** 01-01-28 @ 1500 hrs.
**Set Surface:** 01-02-03 @ 1510 hrs.
**Under Surface:** 01-02-05 @ 1500 hrs.
**Under Intermediate:** _____ @ _____ hrs.
**Completion:** 01-02-18 @ 2145 hrs.
**Rig Release:** 01-02-20 @ 2400 hrs.

| BIT NO. | SIZE (mm) | TYPE | NOZZLES | DEPTH IN (mKB) | DEPTH OUT (mKB) | METERS | HOURS | CUM. HOURS | DRLG. RATE (m/hr) | CONDITION | WT. (daN) | RPM | VERT. DEV. (deg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1A | 311 | L-127 | 3 x 12.7 | 0 | 38 | 38 | 6.25 | 6.25 | 6.1 | 1-1-I | 2/4 | 60/100 | 1.00 |
| 2pilot | 222 | L-127 | 3 x 12.7 | 38 | 384 | 346 | 31.00 | 37.25 | 11.2 | 3-2-I | 6/10 | 180 | 9.75 |
| 3A-RR | 311 | L-127 | 3 x 12.7 | 38 | 384 | 346 | 34.25 | REAM | | 4-2-I | 3/6 | 200 | |
| 4A | 311 | L-127 | 4 x 12.7 | 384 | 388 | 4 | 1.75 | 39.00 | 2.3 | 1-1-I | 8/10 | 180 | 1.00 |
| 1 | 200 | EDT24XG | 3 x 11.1 | 388 | 480 | 92 | 17.00 | 56.00 | 5.4 | 3-1-I | 10 | 100 | 0.75 |
| 2 | 200 | EDT24XG | 3 x 12.7 | 480 | 620 | 140 | 34.25 | 90.25 | 4.1 | 2-1-I | 8/10 | 85/90 | 1.00 |
| 3 | 200 | EDT24XG | 3 x 12.7 | 620 | 871 | 251 | 63.25 | 153.50 | 4.0 | 3-1-I | 11/12 | 100 | 1.75 |
| 4 | 200 | EDT15XG | 3 x 12.7 | 871 | 1123 | 252 | 74.00 | 227.50 | 3.4 | 8-2-I | 11/12 | 100 | 2.25 |
| 5 | 200 | EDT24XG | 3 x 12.7 | 1123 | 1172 | 49 | 17.50 | 245.00 | 2.8 | 2-1-I | 11/12 | 100 | 2.00 |
| 6 | 200 | EDT13XG | 3 x 12.7 | 1172 | 1294 | 122 | 59.00 | 304.00 | 2.1 | 3-1-I | 11/12 | 90/100 | 2.00 |
| | | | | | | | | | | | | | |
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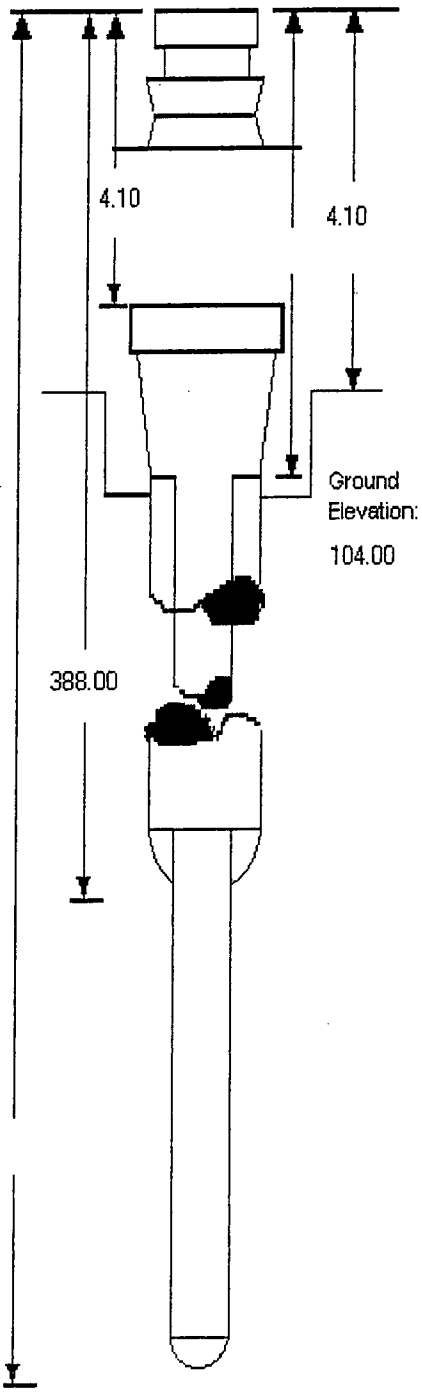
# CODECO CONSULTING (2000) INC.
## CASING & CEMENTING REPORT

DATE: 01-02-03 TYPE OF STRING: Surface

WELL NAME & LOCATION: DEVLAN ET AL TREE RIVER B-10 67°20'131°45' K.B. ELEV.: 108.10 m

SIZE: 219.1 mm WT.: 35.72 kg/m GRADE: J-55 THREAD: ST&C MAKE: Stelco

CASING BOWL: (MAKE/MODEL) Crown SIZE: 228.6mm x 219.1 mm RATING: 14,000 kPa




TYPE OF SHOE: Topco Float

OTHER FITTINGS: Topco Float Collar

CENTRALIZERS:

SCRATCHERS:

PLUG USED: Wooden

WELDING: Thread Lock

CASING SHOE AT: 388.0 mKB

TIME STARTED IN HOLE: 0230 hours

TIME CASING COMPLETED: 0630 hours

PIPE MOVEMENT: Reciprocate

TIME STARTED CIRCULATING: 0630 hours

TIME STOPPED CIRCULATING: 0800 hours

TIME STARTED CEMENTING: 1410 hours

TIME CEMENT IN PIPE: 60 minutes

TIME PLUG ON BOTTOM: 1510 hours

TONNES OF CEMENT USED: 40.0

TYPE OF CEMENT: Polar Set

ADDITIVES: 0.2% R-7C

CEMENTING COMPANY: BJ Services

CEMENTER: R. Pickett

REMARKS: Full cement returns throughout job. Float held.

7m3 cement returns.

SUPERVISOR: Erwin Alyea

# CODECO CONSULTING (2000) INC.
## PIPE TALLY


Date: 01-02-03

Well Name & Location: DEVLAN ET AL TREE RIVER B-10 67°20'131°45'

Size: 219.1mm Wt: 35.72 kg/m Grade: J-55 Thrd: ST&C Make: Nusco

| NO. | LENGTH | NO. | LENGTH | NO. | LENGTH | NO. | LENGTH | NO. | LENGTH |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 14.21 | 21 | 14.20 | 41 | | 61 | | 81 | |
| 2 | 14.22 | 22 | 14.25 | 42 | | 62 | | 82 | |
| 3 | 14.20 | 23 | 14.20 | 43 | | 63 | | 83 | |
| 4 | 12.36 | 24 | 12.06 | 44 | | 64 | | 84 | |
| 5 | 14.05 | 25 | 14.20 | 45 | | 65 | | 85 | |
| 6 | 14.20 | 26 | 13.93 | 46 | | 66 | | 86 | |
| 7 | 14.15 | 27 | 11.81 | 47 | | 67 | | 87 | |
| 8 | 14.23 | 28 | 14.23 | 48 | | 68 | | 88 | |
| 9 | 14.22 | 29 | *14.18 | 49 | | 69 | | 89 | |
| 10 | 14.19 | 30 | | 50 | | 70 | | 90 | |
| A | 140.03 | C | 108.88 | E | | G | | I | |
| 11 | 14.17 | 31 | | 51 | | 71 | | 91 | |
| 12 | 14.15 | 32 | | 52 | | 72 | | 92 | |
| 13 | 14.18 | 33 | | 53 | | 73 | | 93 | |
| 14 | 14.18 | 34 | | 54 | | 74 | | 94 | |
| 15 | 14.15 | 35 | | 55 | | 75 | | 95 | |
| 16 | 14.16 | 36 | | 56 | | 76 | | 96 | |
| 17 | 14.18 | 37 | | 57 | | 77 | | 97 | |
| 18 | 14.18 | 38 | | 58 | | 78 | | 98 | |
| 19 | 11.91 | 39 | | 59 | | 79 | | 99 | |
| 20 | 14.26 | 40 | | 60 | | 80 | | 100 | |
| B | 139.52 | D | | F | | H | | J | |

| | | |
|---|---|---|
| A | 140.03 | SUBTOTAL |
| B | 139.52 | 279.55 |
| C | 108.88 | 388.43 |
| D | | 388.43 |
| E | | 388.43 |
| F | | 388.43 |
| G | | 388.43 |
| H | | 388.43 |
| I | | 388.43 |
| J | | 388.43 |
| TOTAL | 388.43 | |

| | |
|---|---|
| SHOE | 0.28 |
| COLLAR | 0.45 |
| OTHER | |

| | JOINTS | LENGTH |
|---|---|---|
| Page Total | 28 | 388.43 |
| Brought Fwd. | | |
| Grand Total | 28 | 388.43 |

Joints on Location: 29

Total Length of Joints Left Out: 14.18

REMARKS: Left out joint #29.

**NOTE:** Use a new page for each casing type. Number joints in order of running. Indicate joints not run by a * and do not include in total length

**SUPERVISOR:** Erwin Alyea

# CODECO CONSULTING (2000) INC.
## CASING & CEMENTING SUMMARY

DATE: 01-02-03 TYPE OF STRING: Surface

WELL NAME & LOCATION: DEVLAN ET AL TREE RIVER B-10 67°20'131°45' K.B. ELEV.: 108.10 m

SIZE: 219.1 mm WT.: 35.72 kg/m GRADE: J-55 THREAD: ST&C MAKE: Stelco

CASING BOWL: (MAKE/MODEL) Crown H SIZE: 228.6mm x 219.1 mm RATING: 14,000 kPa

| | | | |
|---|---|---|---|
| TOTAL JOINTS ON LEASE: | 29 | TOTAL LENGTH: | 402.61 m |
| TOTAL JOINTS RUN IN HOLE | 28 | TOTAL LENGTH: | 388.43 m |
| TYPE OF SHOE: | Topco Float | LENGTH OF SHOE: | 0.28 m |
| TYPE OF COLLAR: | Topco Float | LENGTH OF COLLAR: | 0.45 m |
| OTHER: | | LENGTH OF OTHER: | m |
| TOTAL LENGTH OF STRING: | 389.16 | CASING LANDED @: | 388.00 mKB |

CENTRALIZERS:

SCRATCHERS:

FLOAT COLLAR @: 374.22 mKB STAGE COLLAR @: mKB

MARKER JOINT @: mKB @: mKB

PIPE MOVEMENT:

CEMENT STAGE #1

LEAD SLURRY: TYPE: Polar Set MASS: 43.0 tonne

VOLUME: 31.7 m3 from 388.00 mKB to Surface mKB

ADDITIVES: 0.2% R-7C

TAIL SLURRY: TYPE: MASS: tonne

VOLUME: m3 from mKB to mKB

ADDITIVES:

CEMENT STAGE #2

LEAD SLURRY: TYPE: MASS: tonne

VOLUME: m3 from mKB to mKB

ADDITIVES:

TAIL SLURRY: TYPE: MASS: tonne

VOLUME: m3 from mKB to mKB

ADDITIVES:

REMARKS: Preflushed with 3.0m3 fresh water. Displaced with 5.7m3 water. 7m3 cement returns. Float held. Plug down at 1510 hours, 01-02-03.

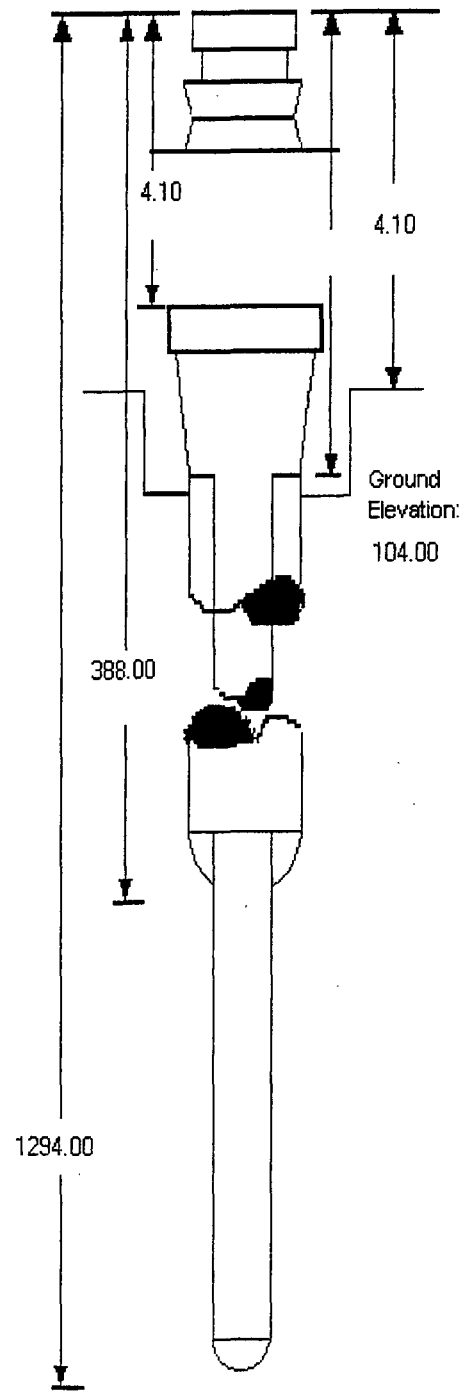
# CODECO CONSULTING (2000) INC.
## CASING & CEMENTING REPORT

DATE: 01-02-20 TYPE OF STRING: Production

WELL NAME & LOCATION: DEVLAN ET AL TREE RIVER B-10 67°20'131°45' K.B. ELEV.: 108.10 m

SIZE: 139.7 mm WT.: 20.83 kg/m GRADE: J-55 THREAD: ST&C MAKE: Nusco

CASING BOWL: (MAKE/MODEL) Crown H SIZE: 228.6mm x 219.1 mm RATING: 14,000 kPa




TYPE OF SHOE: Topco Float

OTHER FITTINGS: Topco Float Collar

CENTRALIZERS: 18

SCRATCHERS: Nil

PLUG USED: Rubber - Top and Bottom

WELDING: Thread Lock

CASING SHOE AT: 1294.00 mKB

TIME STARTED IN HOLE: 0001 hours

TIME CASING COMPLETED: 0445 hours

PIPE MOVEMENT: Reciprocated 9 meters

TIME STARTED CIRCULATING: 0500 hours

TIME STOPPED CIRCULATING: 1010 hours

TIME STARTED CEMENTING: 1104 hours

TIME CEMENT IN PIPE: 121 minutes

TIME PLUG ON BOTTOM: 1305 hours

TONNES OF CEMENT USED: Fill: 9.0 / Tail: 23.0

TYPE OF CEMENT: Fill: Fill-lite 2-100 / Tail: 0:1:0 'G'

ADDITIVES: Fill: 1% CaCl2
Tail: 0.3% FL-63 + 0.5% CD-31

CEMENTING COMPANY: BJ Services

CEMENTER: Tom White

REMARKS: Steady returns throughout. Floats held.

SUPERVISOR: Erwin Alyea

# CODECO CONSULTING (2000) INC.
## PIPE TALLY


Date: 01-02-20

Well Name & Location: DEVLAN ET AL TREE RIVER B-10 67°20'131°45'

Size: 139.7mm Wt: 20.83 kg/m Grade: J-55 Thrd: ST&C Make: Nusco

| NO. | LENGTH | NO. | LENGTH | NO. | LENGTH | NO. | LENGTH | NO. | LENGTH |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 14.11 | 21 | 14.12 | 41 | 14.12 | 61 | 14.14 | 81 | 11.91 |
| 2 | 14.05 | 22 | 14.16 | 42 | *10.89 | 62 | 14.14 | 82 | 14.14 |
| 3 | 12.89 | 23 | 14.40 | 43 | 14.17 | 63 | 14.19 | 83 | 14.16 |
| 4 | 14.12 | 24 | 14.11 | 44 | 14.13 | 64 | 11.87 | 84 | 14.18 |
| 5 | 14.12 | 25 | 14.17 | 45 | 14.17 | 65 | 14.15 | 85 | 14.13 |
| 6 | 14.13 | 26 | 14.13 | 46 | 14.14 | 66 | 14.12 | 86 | 14.15 |
| 7 | 14.12 | 27 | 14.11 | 47 | 14.15 | 67 | 14.12 | 87 | 14.14 |
| 8 | 14.12 | 28 | 14.06 | 48 | 14.12 | 68 | 14.09 | 88 | 14.15 |
| 9 | 14.02 | 29 | 14.10 | 49 | *10.96 | 69 | 14.15 | 89 | 14.14 |
| 10 | 14.15 | 30 | 14.10 | 50 | 14.12 | 70 | 14.14 | 90 | 14.17 |
| A | 139.83 | C | 141.46 | E | 113.12 | G | 139.11 | I | 139.27 |
| 11 | 14.16 | 31 | 14.17 | 51 | 14.13 | 71 | 14.13 | 91 | 10.70 |
| 12 | 14.15 | 32 | 13.97 | 52 | 14.15 | 72 | 14.15 | 92 | 14.14 |
| 13 | 11.21 | 33 | 12.89 | 53 | 14.14 | 73 | 14.17 | 93 | 14.14 |
| 14 | 14.14 | 34 | 14.17 | 54 | 14.14 | 74 | 11.10 | 94 | 11.08 |
| 15 | 14.17 | 35 | 14.15 | 55 | 14.12 | 75 | 14.13 | 95 | 14.09 |
| 16 | 14.10 | 36 | 14.14 | 56 | 14.16 | 76 | 14.12 | 96 | 14.17 |
| 17 | 14.14 | 37 | 14.15 | 57 | 14.14 | 77 | 14.14 | 97 | *14.19 |
| 18 | 14.11 | 38 | 13.37 | 58 | 14.08 | 78 | 14.14 | 98 | *14.16 |
| 19 | 14.07 | 39 | *11.72 | 59 | 14.10 | 79 | 14.10 | 99 | *14.13 |
| 20 | 14.17 | 40 | 14.16 | 60 | 14.14 | 80 | 14.06 | 100 | *14.14 |
| B | 138.42 | D | 125.17 | F | 141.30 | H | 138.24 | J | 78.32 |

| | | |
|---|---|---|
| A | 139.83 | SUBTOTAL |
| B | 138.42 | 278.25 |
| C | 141.46 | 419.71 |
| D | 125.17 | 544.88 |
| E | 113.12 | 658.00 |
| F | 141.30 | 799.30 |
| G | 139.11 | 938.41 |
| H | 138.24 | 1076.65 |
| I | 139.27 | 1215.92 |
| J | 78.32 | 1294.24 |
| TOTAL | 1294.24 | |

| | |
|---|---|
| SHOE | 0.28 |
| COLLAR | 0.45 |
| OTHER | |

| | JOINTS | LENGTH |
|---|---|---|
| Page Total | 93 | 1294.24 |
| Brought Fwd. | | |
| Grand Total | 93 | 1294.24 |

Joints on Location: 100

Total Length of Joints Left Out: 90.19

REMARKS: Left out joints #39, #42, #49, #97, #98, #99 and #100.

NOTE: Use a new page for each casing type. Number joints in order of running. Indicate joints not run by a * and do not include in total length

**SUPERVISOR:** Erwin Alyea

# CODECO CONSULTING (2000) INC.
## CASING & CEMENTING SUMMARY

DATE: 01-02-20 TYPE OF STRING: Production

WELL NAME & LOCATION: DEVLAN ET AL TREE RIVER B-10 67°20'131°45' K.B. ELEV.: 108.10 m

SIZE: 139.7 mm WT.: 20.83 kg/m GRADE: J-55 THREAD: ST&C MAKE: Stelco

CASING BOWL: (MAKE/MODEL) Crown H SIZE: 228.6mm x 219.1 mm RATING: 14,000 kPa

TOTAL JOINTS ON LEASE: 100 TOTAL LENGTH: 1384.43 m

TOTAL JOINTS RUN IN HOLE 93 TOTAL LENGTH: 1294.24 m

TYPE OF SHOE: Float LENGTH OF SHOE: 0.28 m

TYPE OF COLLAR: Float LENGTH OF COLLAR: 0.45 m

OTHER: LENGTH OF OTHER: m

TOTAL LENGTH OF STRING: 1294.97 CASING LANDED @: 1294.00 mKB

CENTRALIZERS: 18

SCRATCHERS:

FLOAT COLLAR @: 1279.00 mKB STAGE COLLAR @: mKB

MARKER JOINT @: mKB @: mKB

PIPE MOVEMENT: Reciprocated 9 meters.

CEMENT STAGE #1

LEAD SLURRY: TYPE: Fill-lite 2-100 MASS: 9.0 tonne

VOLUME: 11.9 m3 from mKB to mKB

ADDITIVES: 1% CaCl2

TAIL SLURRY: TYPE: 0:1:0 'G' MASS: 23.0 tonne

VOLUME: 17.4 m3 from mKB to mKB

ADDITIVES: 0.3% FL-63 + 0.5% CD-31

CEMENT STAGE #2

LEAD SLURRY: TYPE: MASS: tonne

VOLUME: m3 from mKB to mKB

ADDITIVES:

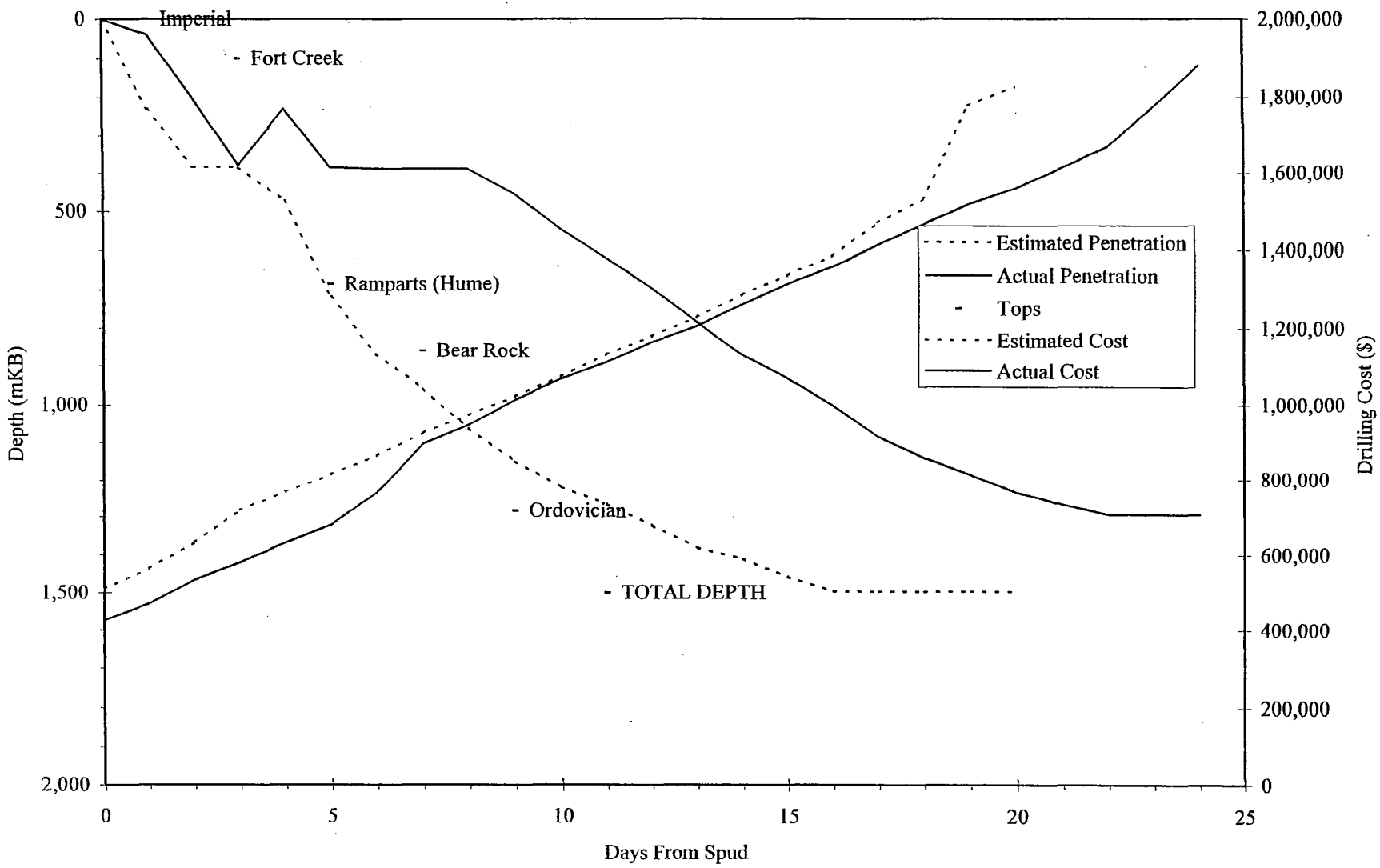
TAIL SLURRY: TYPE: MASS: tonne

VOLUME: m3 from mKB to mKB

ADDITIVES:

REMARKS: Plug down at 1305 hours, 01-02-20. Steady returns throughout. 2.5m3 of preflush water back.

Devlan et al Tree River B-10
Drilling and Cost Curves



**DEVLAN Exploration Inc:**

**Devlan et-al Tree River B-10**

**AKITA # 14**

**Feb. 5-2001**

Tested with BJ Unit. 114mm x 203 mm - .0062 m3/stroke.

10 stroke readings ( .062 m3 )

Testing fluid-- fresh water

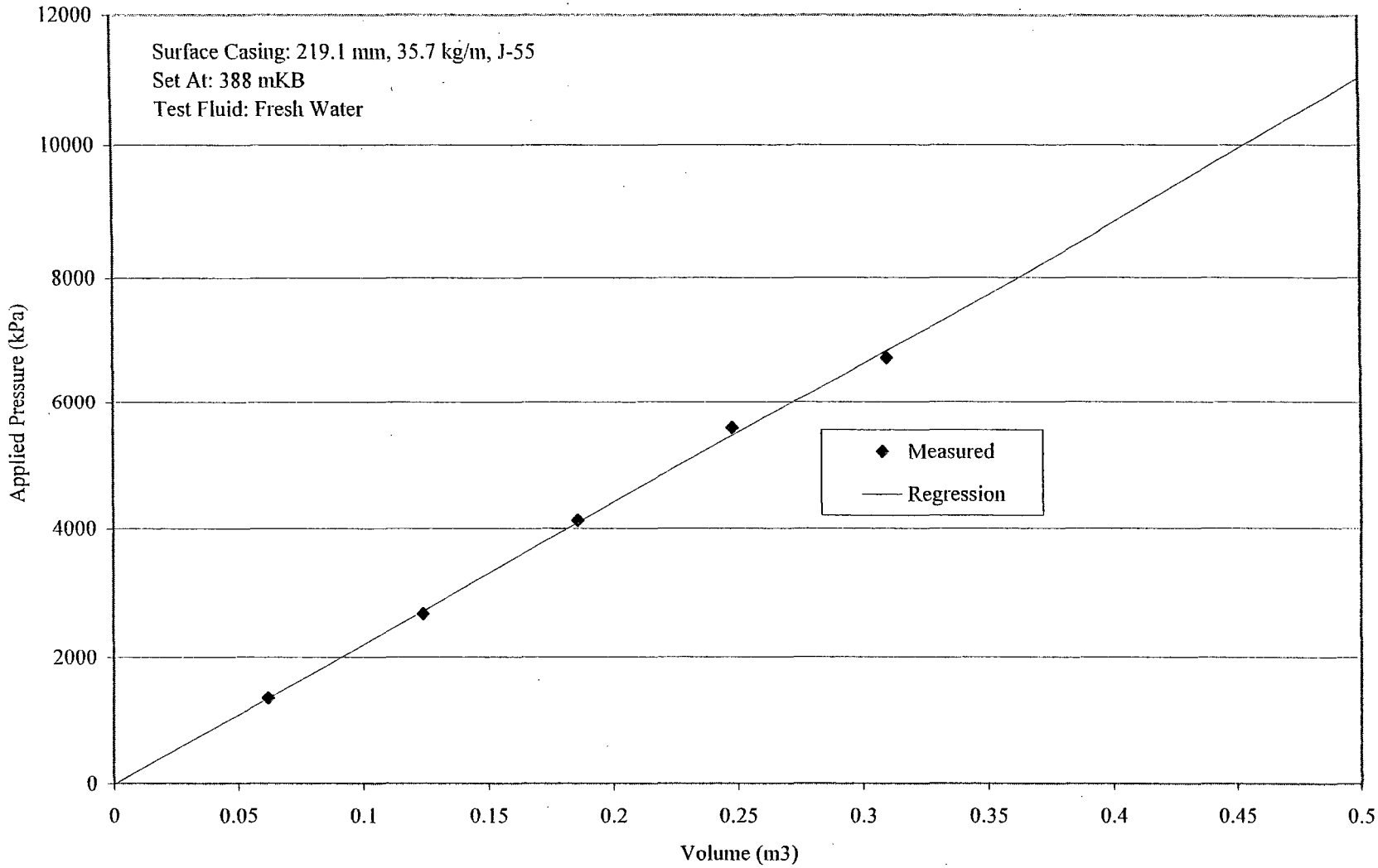
| | | |
|---|---|---|
| 10 Strokes | .062 m3 | 1350 kPa |
| 20 Strokes | .124 m3 | 2680 kPa |
| 30 Strokes | .186 m3 | 4120 kPa |
| 40 Strokes | .248 m3 | 5580 kPa |
| 50 Strokes | .310 m3 | 6710 kPa |

| | | |
|---|---|---|
| Hydrostatic | 388m x 9.81 | 3806 kPa |
| Leak Off Point | | 5580 kPa |
| Total Pressure @ shoe | | 9386 kPa |

9386 kPa / 388m = 24.19 kPa

**80% of 24.19 kPa/m = 19.35 kPa/m ( RPG )**

# Devlan et al Tree River B-10
## Formation Integrity Test



# N.W.T; SPILL REPORT

( Oil,Gas,Hazardous Chemical or other Materials)


**National Energy Board**

**Phone ( 403) 292-6614 Home ( 403 ) 275-6256**

**FAX: (403) 292-5876 or 292-5875**


| Date & Time | B Date-Time of spill | C Original/Update report | Spill Number |
|---|---|---|---|
| 11.00. Feb;20-2001 | 09.00,Feb;20-2001 | Original | "One" |

**D Location & map coordinates,(if known) direction**

Devlan B-10: LAT 67o-19"-14" LONG: 131o-45"-30"

**E Party responsible for spill**

BJ Services Ltd.

**F Product(s) spilled,metric volumes,(weights if possible)**

Anti freeze- 1liter +/-:, FL-63 CD-31 (base unknown) CaCl-2 amount unknown,(Very minor amount)

**G Cause of spill.**

Lack of blending facilities, and poor maintenance !

| H Is spill terminated | I Is spill cont,give est rates | J further spilage poss | K Contaminated area (m2) |
|---|---|---|---|
| Yes | Not Continuing | No | 16 m2 |

| L Factors affecting spill recovery,(Weather,terrain,snow cover, etc) | M Containment ? |
|---|---|
| None: Spill is being gathered and disposed of Feb; 21-2001 | Ice and snow burms |

**N Action taken,or proposed,recovery,cleanup,dispose of products, Contaminated materials.**

Removing contaminated ice and snow with track hoe and front end loader. Disposing into off site disposal pit.

| O Do you require assistance,( No / yes ) | P Possible hazards to persons ,property, or enviroment |
|---|---|
| Describe: No assistance is necessary, thanks. | A none hazardous situation. |

**Q Comments and/or recommendations.**

A water proof lined burm is planned for all future sites.

A higher maintenance standard for all service equipment.

Along with a better contingency plan for service and support equipment !

**For Spill Line Use Only**

Lead Agency

Spill Signifance

Lead Agency Contact Time

Is this file now closed ?

No

| Reported by | Position,Employer, Location | Phone |
|---|---|---|
| Erwin Alyea | Drilling Supervisor: CODECO Consulting.Well site | 1 (403 ) 997-2529 |
| Reported to | Position,Employer, Location | Phone |
| Michael Woofter | Drlg; Engineer. CODECO Consulting: Calgary | 1 ( 403 ) 237-7808 |