FORT CALGARY RESOURCES LTD.

Proposed East Manson Unit No.1

Application for Waterflood EOR
Manson, Manitoba

11/15/2012

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Introduction

In accordance to Section 71 of the Drilling and Production Regulations of Manitoba, Fort Calgary Resources Ltd. is requesting the board's approval of a newly proposed East Manson Unit No.1 (EMU No.1) in Section 29 Township 13 Range 28 W1 with the intent of commencing a section pilot waterflood (WF) study. Since the first vertical discovery well in August 2010, Fort Calgary has drilled a total of 35 horizontal and 15 vertical wells targeting the Middle Bakken in the Manson area with a primary estimated ultimate recovery (EUR) expected to be approximately 14.7%. The proposed pilot SEC 29 study will demonstrate the feasibility of a pool-wide waterflood where Fort Calgary Resources will then elect to unitize a larger WF area extending from SEC 21-13-28W1 to SEC 1-14-29W1.

The proposed SEC 29-13-28W1 pilot waterflood area has been developed with 1 vertical and 11 horizontal wells. Following the success of pilot and developed waterflood areas in analogous Bakken / Three Forks reservoirs in the Daly and Sinclair areas, Fort Calgary believes that similar incremental recovery factors of 14% can be attained using horizontal injection and production waterflood scheme seen in *Appendix D, figure 3.* This result supports a total primary and secondary waterflood oil recovery of 28.0 % of total oil in place reserves in the East Manson Middle Bakken Pool.

Summary

1. The Proposed East Manson Unit No.1 will include all 16 legal subdivisions (LSD) in Section 29-13-28W1 where there is currently 1 existing vertical wells and 11 horizontal wells completed in the Middle Bakken formation. A map of EMU No.1 can be seen in *Appendix A, figure 1*.

2. *Appendix C, figures 2 & 3* show current production from the proposed East Manson Unit No.1 of 78 m3/d and average water cut of 44% as of October 2012. It is to be noted that SEC 29 is assumed to be currently producing at its peak rate. Further infill well drilling and well optimization is possible.

3. Original oil in place (OOIP) for the proposed unit is 882.6 e $^3m^3$ or 55 e $^3m^3$/ LSD. (see *Appendix C, figure 1*)

4. Cumulative oil production from the proposed unit as of October 31st is 20.6 e $^3m^3$, giving a current recovery factor (RF) of 2.33 % within the unit boundary.

5. Declines for the 12 current producing wells show an estimated ultimate recovery (EUR) of 130.39 e $^3m^3$ and remaining recoverable oil in place as of October 31st of 109.79 e $^3m^3$. This equates to an ultimate recovery factor of 14.7% under primary depletion.

6. Initial reservoir pressure (Pi) of the Middle Bakken reservoir was 5500 kPa. This value was consistent with three different static gradients taken in SEC 20, 29 and 28 TWP 13 RNG 28W1. Current reservoir pressure (Pr) is estimated to be approximately 4900 kPa

7. The existing Daly Bakken A water flood in SEC 21, 28 and 29 TWP 10 RNG 29W1 can be used as an analogy with similar geology and reservoir characteristics where an 8% incremental waterflood recovery factor has been seen. Fort Calgary believes that favorable results can be achieved in EMU No.1 utilizing a horizontal injection pattern. An ultimate post flood recovery of approximately 28.0% can be expected (*Appendix C, Figure 4)*.

8. Following approval, East-West multistage hydraulically fractured horizontal wells will be converted into injectors alternating with East-West horizontal producers as shown *in Appendix D, figure 3*. A total of 5 horizontal wells will be converted between 7 producers. Initial injector conversions are planned for Q1 and Q2 2013. The current target for water injection is March 1st, 2013.

9. Contingent on successful results of the pilot waterflood, Fort Calgary will be applying for a larger unit and waterflood area consisting of 8 sections extending from SEC 21-13-28W1 to SEC 1-14-28W1.

Geological Discussion

Stratigraphy

The stratigraphy in EMU No. 1 is defined by the structural cross section A-A` seen in *Appendix B, figure 13.* Cross section A-A` can be observed on each of the Appendix B maps running from the Northwest to the Southeast of EMU No. 1. The section consists of the Upper Bakken Shale, the Middle Bakken Siltstone, the Torquay (Three Forks) Unit 3 shale and the Torquay (Three Forks) Unit 2 siltstone. The Torquay (Three Forks) Unit 2 siltstone, although highly variable, is an oxidized, silty reservoir layer with potential for contribution in areas of better facies development and thin overlying Unit 3. The Torquay (Three Forks) Unit 3 shale is a brick red, oxidized shale that forms the upper seal to Unit 2. Unit 3 is unconformably overlain by the Middle Bakken Siltstone which represents the main reservoir unit and will be later subdivided based on its lithological characteristics. The Upper Bakken Shale is a black, organic rich, platy shale that conformably overlies the Middle Bakken Siltstone to form the upper seal for the main Middle Bakken reservoir.

Reservoir Sedimentology

The Middle Bakken reservoir is composed of coarse grained siltstone to fine grained sandstone which can be subdivided into the upper, middle, and lower units.
The upper unit is generally a bioturbated, pale grey, medium to coarse silt. Although containing varying traces, the bioturbated beds are often represented by possible teichichnus and planolites with thin walled brachiopod shells occurring near the top of bedding surfaces. The upper unit was likely deposited in an offshore marine environment and is considered a non-reservoir unit in the majority of cases.
The middle unit is generally an interlaminated, tan to grey, coarse silt to very find sand and shale. There is an obvious lack of bioturbation in this unit indicating a restrictive environment. Overall, this unit contains multiple fining upwards successions that are dominated by coarse silt to very fine sand deposition near the base. This grades into interlaminated silts and shales near the top of each succession. Although the middle unit contains variability, it is considered a reservoir unit ranging from 0.5 to 1.5 meters thick. It is likely this unit represents a transitional stage between offshore marine and coastal environments.
The lower unit is generally a moderately to well sorted, tanish grey, coarse silt to fine sand with abundant ripple cross laminations. Occasional trough cross bedding and potential rip up clasts near the base indicates a higher energy influence. Lower unit thickness can vary, however it is generally between 2 and 4 meters thick and represents the main reservoir. This unit was likely deposited in a coastal, on-shore environment.

Structure

Structure maps for the Upper Bakken, Middle Bakken, Unit 3 (erosional unconformity of Middle Bakken) and Unit 2 can be seen *in Appendix B, Figures 1 to 4*. The structure in the area of the Bakken and Torquay (Three Forks) consists of a gentle dip to the southwest. As an exception, the southeast corner of Section 32 and southwest corner of Section 29 are structural lows causing slight variations in the regional dip across EMU No. 1. These are likely the result of dissolution of the underlying prairie

evaporites. The dissolution in the southwest corner of Section 29 likely occurred pre, during and post Bakken deposition, whereas the dissolution in the southeast corner of Section 32 likely occurred post Bakken deposition. This is based on the Upper Bakken Shale thickness, where the shale is thickest in the collapse structure of Section 29 and relatively thin in Section 32. It is important to note that while these localized lows are present, they do not represent barriers to lateral fluid flow within the reservoir. This can be seen in cross section A-A`, where lateral continuity of the reservoir beds is present *(Appendix B, Figure 13*).

Reservoir Continuity

The cross section A-A` and isopach, seen in *Appendix B, figures 13 & 5,* confirm there is no significant thinning of the reservoir units in the Middle Bakken within SEC 29-13-28W1. An on-lap edge can however be seen northeast of the pilot area resulting in a pinching of the main reservoir unit. Described briefly in stratigraphy, the Unit 2 siltstone reservoir is generally separated from the main Bakken Siltstone reservoir by the Unit 3 shale that acts as a pressure boundary between the two reservoirs. Although the Unit 2 siltstone is not the main target, it has shown to be productive with the aid of hydraulic fracture stimulation and in penetrating horizontal well paths.

Reservoir Quality

To examine reservoir quality, porosity (phi-h – por*m) and permeability (k-h – mD*m) maps for the main reservoir units are provided in *Appendix B, figures 7 to 10*. By separating each of the 24 cores by reservoir unit and compiling the porosity and permeability data, permeability-porosity cross plots were created to help with the prediction of permeability values for wells that were not cored. This core data was then subjected to a 1 mD permeability cut-off and the intervals greater than or equal to the criteria were multiplied by interval thickness to obtain phi-h and k-h values. A 1 mD permeability cut-off roughly correlates to a 12% porosity cut-off. It is important to note that a permeability cut-off was applied under the concept that contribution from intervals with permeabilities less than 1 mD will be limited. It is likely that there will be contribution from pore volume with less than 1mD of permeability; however the extent of contribution could prove difficult to predict and potentially result in unrealistic phi-h and k-h values. It is recommended the cut-off not be taken in the strictest sense and the absolute potential of the reservoir should still be explored. As a result, a bulk reservoir phi-h map was created and OOIP was calculated with a 1 mD cut-off.

Fluid Contacts

The oil-water contact of the Middle Bakken Reservoir has been interpreted from logs to be at approximately -190m subsea. Based on the structural mapping done, the contact is located too far down dip to appear on any of the EMU No. 1 maps, as the lowest structural elevation for the top of the Middle Bakken is approximately -168m subsea. Fluid contacts pose no risk to this reservoir.

Reservoir Characteristics and Current Recovery

Original Oil in Place

Porosity and water saturation values were taken from a combination of neutron- density logs and core samples where stratigraphic test holes are present. Petrophysical data such as open hole logs and core analyses can be submitted upon request. Volumetric original oil in place (OOIP) was calculated for the proposed waterflood area using a combined beach (lower unit), breccia (middle unit) and marl (upper unit) phi*h map.

Planimetered phi*h and an average Sw of 31.4% over SEC 29-13-28W1 equated to an OOIP of 882.6 e3m3. Planimetered OOIP per LSD can be seen *in Appendix C, figure 1*.

Reservoir and Fluid Properties

Applicable reservoir and fluid properties are outlined in the following table. All information supporting the following values such as fluid analyses and static gradients can be submitted upon request.

Torquay Reservoir and Fluid Properties

Reservoir:		**Comments**
Initial Reservoir Pressure (Pi)	5.5 MPa	From static Gradient
Current Reservoir Pressure (Pr)	4.9 MPa	Estimated
Formation Breakdown Pressure (Pfrac)	14 MPa	Average from fracs
Average Water Saturation (Sw)	0.314	From Core Samples
Core Wettability	Moderate oil wet	From Daly Analogue
Fluid:		
Oil API Gravity @ 15 C	40.29	From 4-21 Oil analysis
Total Sulphur Mass Fraction	0.00193	From 4-21 Oil analysis
Absolute Viscosity @ 25 C (cP)	2.45	From 4-21 Oil analysis
Formation Water Salinity (ppm)	22,000	8-21 water analysis
Formation Water Resistivity @ 25 C	0.312 Ohm*m	8-21 water analysis

Historical Production

Section 29-13-28W1 has been developed with 1 vertical and 11 East-West horizontal wells. Spacing between horizontal wells varies between 200m to 400m as seen in *Appendix A, figure 1*. To date, 20.6 e3m3 of oil has been recovered from Sec 29 with production beginning in December 2010 and peaking at a current October 2012 rate of approximately 76 m3/d oil and 62 m3/d water. A daily rate group plot showing section 29-13-28W1 wells can be seen in *Appendix C, figure 2*.

Primary Depletion

Fort Calgary believes maximum primary depletion can only be achieved with the utilization of multistage hydraulic fracturing. The current number of intervals in the existing horizontal wells in section 29 vary from 12 to 25 stages per well. The amount of proppant has been limited between 2 and 5 tonnes per

stage due to the risk of fracture growth into the overlaying water bearing Lower Lodgepole. Formation breakdown pressure for the proposed Torquay waterflood is on average 14 MPa.

After fracture estimated ultimate oil recovery (EUR) for SEC 29 is 130.39 e3m3 using decline analysis on individual wells and a 0.32 m3/d per well economic cut-off. A group plot of declines for all SEC 29-13-28W1 wells can be seen in *Appendix C, figure 4*, where fractured horizontal wells have fitted to a hyperbolic decline with a hyperbolic exponent b of 0.5. An average yearly decline of 23% is expected in middle and later production periods.

No extensive PVT analysis has yet been conducted on reservoir fluids. Surface gas to oil ratio (GOR) has been measured to be between 2 and 5 m3/m3. Fort Calgary believes that due to the extremely low GOR, all gas can be considered solution gas. This also shows that that the reservoir is currently undersaturated and under depletion drive where all oil can be considered 'dead oil'.
This dictates fluid volume considered for the voidage replacement ratio (VRR) seen in the 'Waterflood Operating Strategy' portion of this application. Gas can be neglected under a reasonable oil formation volume factor (Bo).

Unitization

Unit name: Fort Calgary Resources Ltd. proposes that the name of the new unit will be East Manson Unit No.1 (EMU No.1).

Unit Operator: Fort Calgary Resources Ltd. will assume operatorship of East Manson Unit No.1.

Unitized Zone(s): The proposed unitized zones will be the Bakken and Torquay (Three Forks) formations.

Unit Lands: All of section 29 in township 13, range 28 west of the prime meridian will be included in the proposed Manson Unit No.1.

Unitized wells: East Manson Unit No.1 will consist of 5 injectors and 7 producing wells. Proposed injectors will be converted upon approval of the unit and according to the proposed development plan outlined in *Appendix D, figure 3*. Following is a list of wells within the unit area:

100/02-29-13-28W1/0	Producer
100/07-29-013-28W1/0	Injector
100/05-29-013-28W1/0	Injector
100/04-29-013-28W1/0	Producer
102/2-29-013-28W1/0	Producer
100/12-29-013-28W1/0	Injector
100/14-29-013-28W1/0	Producer
100/15-29-013-28W1/0	Injector
100/10-29-013-28W1/0	Injector
102/05-29-013-28W1/0	Producer
102/07-29-013-28W1/0	Producer
102/10-29-013028W1/0	Producer

Working interest and mineral owners: Fort Calgary is currently the 100% working interest holder in the proposed section 29-13-28W1 and will be the single working interest holder in the East Manson Unit No.1. Furthermore, Section 29-13-28W1 is located on 100% Manitoba Crown land.

Tract Factors: Although mineral and working interest holders are wholly held by their respective owners, EMU No.1 will still consist of tract factors on an LSD basis. Tract factors will be determined as a factor of remaining oil in place per LSD and calculated with the following methodology:

- Original oil in place was first calculated on a per LSD basis.
- Horizontal production allocations per LSD were subsequently determined based on productive meters intercepted by each horizontal wellbore.
- Remaining oil in place per LSD was then determined and tabulated to calculate tract factors.

Tables outlining all 16 tracts calculations are shown in *Appendix A, figure 3*. The shown tract factor methodology will be the basis of a potential pool-wide waterflood contingent on the success of the current proposed pilot flood.

Waterflood Project Development

Proposed Water Injection Well Conversions and Timing

Fort Calgary proposes to convert a total of 5 horizontal wells to Middle Bakken Injectors with injection set for Q2 of 2013 or upon the board's approval. A typical injector well schematic can be seen in *Appendix D, figure 1*.

Total daily injection demand is expected to be approximately 427 m3/d, as outlined in the below table, where injection demand will be met from the following sources:

- 329 m3/d from existing pool-wide Manson production
- 80 m3/d from the reversal of the current 3-32-13-28W1 Lodgepole disposal well
- 150 m3/d from a proposed 15-30-13-28W1 Shaunavon Source well

An extensive study has been conducted by J.N. Fox & C.D. Martiniuk (1994) from Manitoba Energy and Mines on analogous Middle Bakken pools and waterfloods in the Daly area. Fox and Martiniuk outline waterflood compatibility and sensitivity studies indicate that produced water from the Lodgepole and Jurassic source water were compatible with Bakken formation fluids and would not cause clay swelling problems.

This study offer a valuable insight on compatible water for the proposed SEC 29 flood where Fort Calgary will also be executing a compatibility study using the above proposed Lodgepole and Jurassic source water.

Produced injection water will be treated, separated at the Fort Calgary 13-29-13-28W1 battery then filtered and pumped to the proposed injection wells. Vacant fiber reinforced polyethylene lines are installed adjacent to current production lines and will be utilized for injection. A flow diagram of the proposed injection system and addition to the current 13-29-13-28W1 battery can be seen *in Appendix D, figure 2.* Corrosion mitigation measures will also be implemented throughout the duration of the proposed water flood and are outlined in *Appendix D, figure 4.* A schedule of injectors and anticipated injection rates can be seen below:

UWI	Conversion Timing	Anticipated Injection Rate
100/07-29-013-28W1/0	Q2 2013	70 m3/d
100/05-29-013-28W1/0	Q2 2013	77 m3/d
100/12-29-013-28W1/0	Q2 2013	110 m3/d
100/15-29-013-28W1/0	Q2 2013	90 m3/d
100/10-29-013-28W1/0	Q2 2013	80 m3/d

Anticipated injection rates are based on historical fluid production for each well and will vary according to the following injection parameters:

Formation Fracture Pressure	14 MPa
Formation Fracture Wellhead Pressure	12.6 MPa
Injection line Maximum Working Pressure	10.3 MPa

Formation and wellhead fracture pressures were determined from extensive hydraulic fracture data throughout section 29 and the Manson field. The lowest limiting pressure will be approximately 10.3 MPa on the surface injection line. Therefore Fort Calgary requests a maximum injection pressure of 90% of the limiting pressure or 9 MPa.

Waterflood Operating Strategy

With the assumption of initial injection in April 2013, a fill-up period of 8 months to 1 year is expected while maintaining a voidage replacement ratio (VRR) of 2.0. As the reservoir pressure approaches a target of 4.73 MPa or 86% or initial reservoir pressure, VRR will be incrementally reduced to 1.
The VRR will vary between 1 and 1.2 throughout the duration of the flood to maintain the target reservoir pressure. Voidage replacement will be monitored and modeled throughout the injection process to maximize reserves recovery.
The following surveillance data and calculations will be acquired throughout the duration of the SEC 29 pilot flood:

- Initial dye and chemical tracers to observe potential communication and breakthrough
- Frequent buildup and static gradient of both producers and injectors to monitor reservoir pressure and dictate VRR
- Wellhead flow meters on all wells to acquire daily rates
- Continuous wellhead injection pressure monitoring
- Weekly water cuts on all wells
- The use of fractional flow and Hall plots
- Analysis of acquired data and observation of trends in: water oil ratio (WOR), reservoir pressure (Pr), production rate, injection rate, cumulative production, etc.

In accordance to Section 73 of the Drilling and Production Regulations, an annual EOR report outlining the above data and calculations will be submitted within 60 days of initial injection and within 60 days after the end of each calendar year.

Technical Studies

Extensive core analyses have been conducted on 24 wells throughout the Manson field where 7 have been taken within and adjacent to EMU No.1. Special Core Analysis (SCAL) is currently being performed to determine important rock and flood parameters such as wettability and relative permeability.

To date, no reservoir simulation study has been conducted. However, Fort Calgary strongly believes that the Daly Bakken A pool and waterflood, operated by Tundra Oil & Gas Ltd., in Sections 21, 28 and 29 TWP 10 RNG 29W1 can be used as a direct analogue.
The following conclusions can be made to deem the Daly Bakken A pool analogous:

- The Middle Bakken facies in both Daly and Manson area consist of the same upper bioturbated medium to fine silt, middle interlaminated silts and lower coarse silt to fine sand. In both cases, main reservoir thickness is 2 to 4 m. The regional Bakken Shale also offers a pressure boundary.
- Daly A Bakken reservoir properties exhibiting similar permeability of 3 to 25md and average porosity of 17%.
- Similar fine sand to coarse mixed lithology also demonstrates that the reservoir is moderately oil wet. True contact angle (wettability) will also be determined through the previously mentioned SCAL.

Secondary Recovery and Production Forecast

An incremental post-flood recovery factor of 8% was achieved in the Daly Bakken A pool with four vertical incomplete 9 spot injection patterns. A map showing the Daly Bakken A analogue along with decline analysis for the pool can be seen in *Appendix C, figure 5 & 6* respectively. Although the previous Daly Bakken A pool is a direct analogue in terms of reservoir characteristics, Fort Calgary believes that incremental recovery upwards of 14% can be forecasted in the Manson Section 29 flood with the proposed injection scheme where horizontal injectors will allow for uniform lateral sweep from well paths. Furthermore, inflatable packers will enable adaptable injection patterns by isolating chosen injection intervals and know heterogeneity or fractured areas can subsequently be avoided. Selective intervals can also be mirrored in the horizontal producers to isolate or delay breakthrough.

Recovery has been calculated for the pilot WF area based on forecasted individual well declines under pressure support. An elevated economic cut-off of 0.4 m3/d of oil was used in this scenario as fixed injection well costs were allocated to the remaining producers. The resultant post flood EUR is 247.13 e3m3 which yields an incremental and ultimate post flood recovery factor of 13.3% and 28.0% respectively. Forecasted production profiles for both primary and waterflood can be seen in *Appendix C, figure 4*.

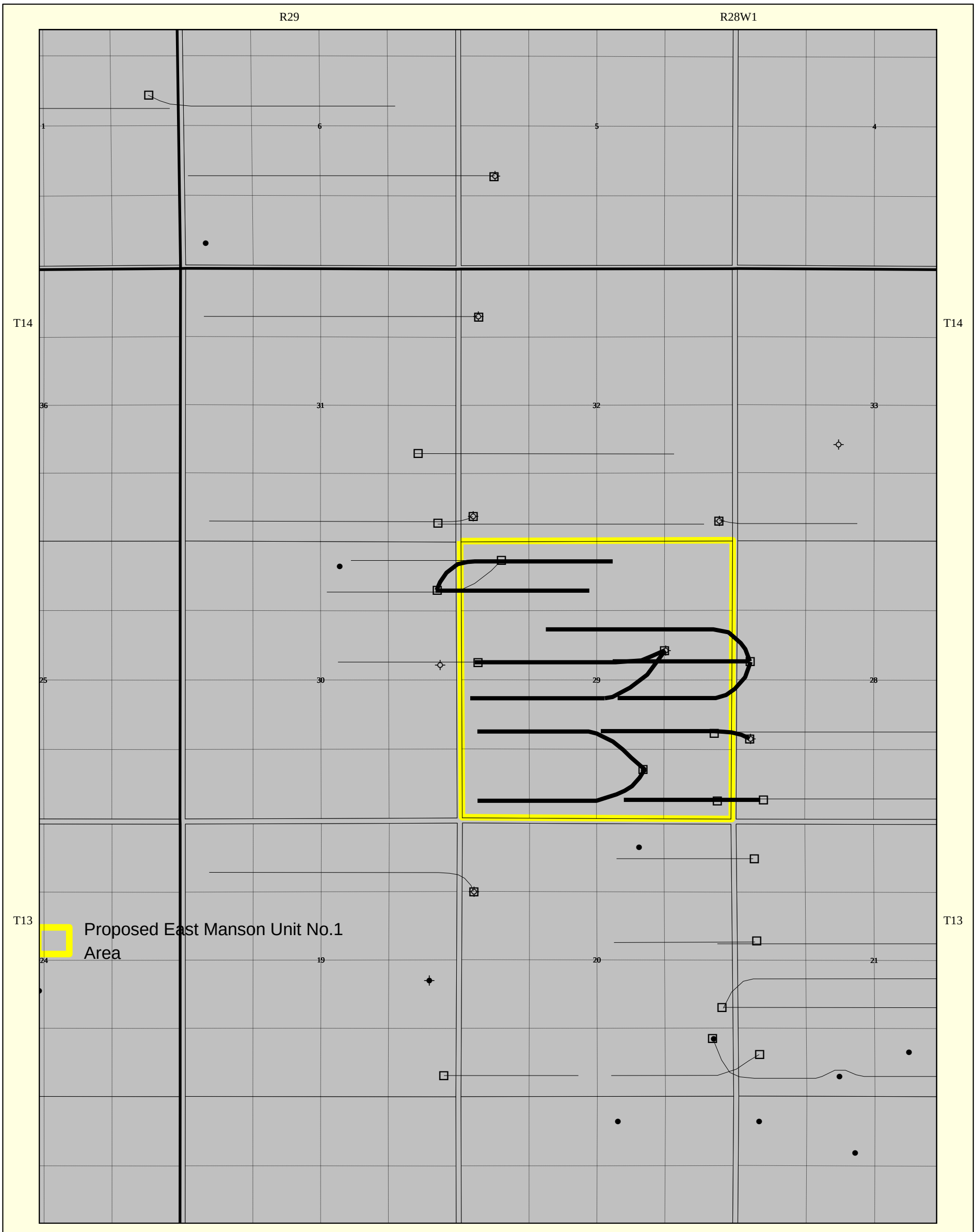
After water flood implementation, project success will be evaluated by:

- Recording continuous incremental recovery
- Recovery comparisons with adjacent sections, forecasted recovery and Sinclair analogues
- A regularly updated reservoir model to predict breakthrough time, viscous fingering, etc.

Contingent on the deemed success of the EMU.No.1 pilot, Fort Calgary will then apply for a second unit and larger water flood area comprising of 7 additional sections in the Manson area.

Appendix A: Unit & Notification

Appendix A, Figure 1: East Manson Unit No.1 Map



WELL LEGEND

Bottom Hole Locations:

- Oil
- Dry & Abandoned
- Abandoned Oil

Fort Calgary Resources Ltd.

East Manson Unit No.1
Pilot Waterflood

Created in AccuMap™
Product of IHS
Datum: NAD83
Vol. 22 No. 09, Sep 20 2012
(403) 770-4646
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Author: Tristan
Date: November 14, 2012
File: East Manson Unit 1.MAP
Scale: 1 : 21599
Projection: Stereographic
Center: N50.13308 W101.28454

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: MLI07

Scale 1:21599

0 Kilometers 0.9

0 Miles 0.6

Appendix A, Figure 2: Sample Notification Letter

November 13th, 2012

Dan Surzyshyn
360-1395 Ellice Avenue
Winnipeg, Manitoba
R3G 3 P2

Attention: Dan Surzyshyn

RE: Fort Calgary SEC 29-13-28W1 East Manson Unit No.1 Proposal & Pilot Water Flood

Please be advised that Fort Calgary Resources Ltd. will be applying under Section 71 of the Drilling and Production Regulations for a pilot water flood in SEC 29-13-28W1. Upon approval of a waterflood application, the following wells will be converted to Three Forks water injectors:

(2-29) 5-29-13-28W1 HZ
(5-28) 7-29-13-28W1 HZ
(9-29) 12-29-13-28W1 HZ
(12-28) 10-29-13-28W1 HZ
(16-30) 15-29-13-28W1 HZ

Injected water will be transported via flow line to the above wells from the 13-29-13-28W1 battery site. Source water will be Three Forks produced water and from the 15-30-13-28W1 Shaunavon source well.

If you have any questions or concerns please contact me at 403-800-6601 or twillson@fortcal.com.

Sincerely,

FORT CALGARY RESOURCES LTD.

Tristan Willson

Tristan Willson

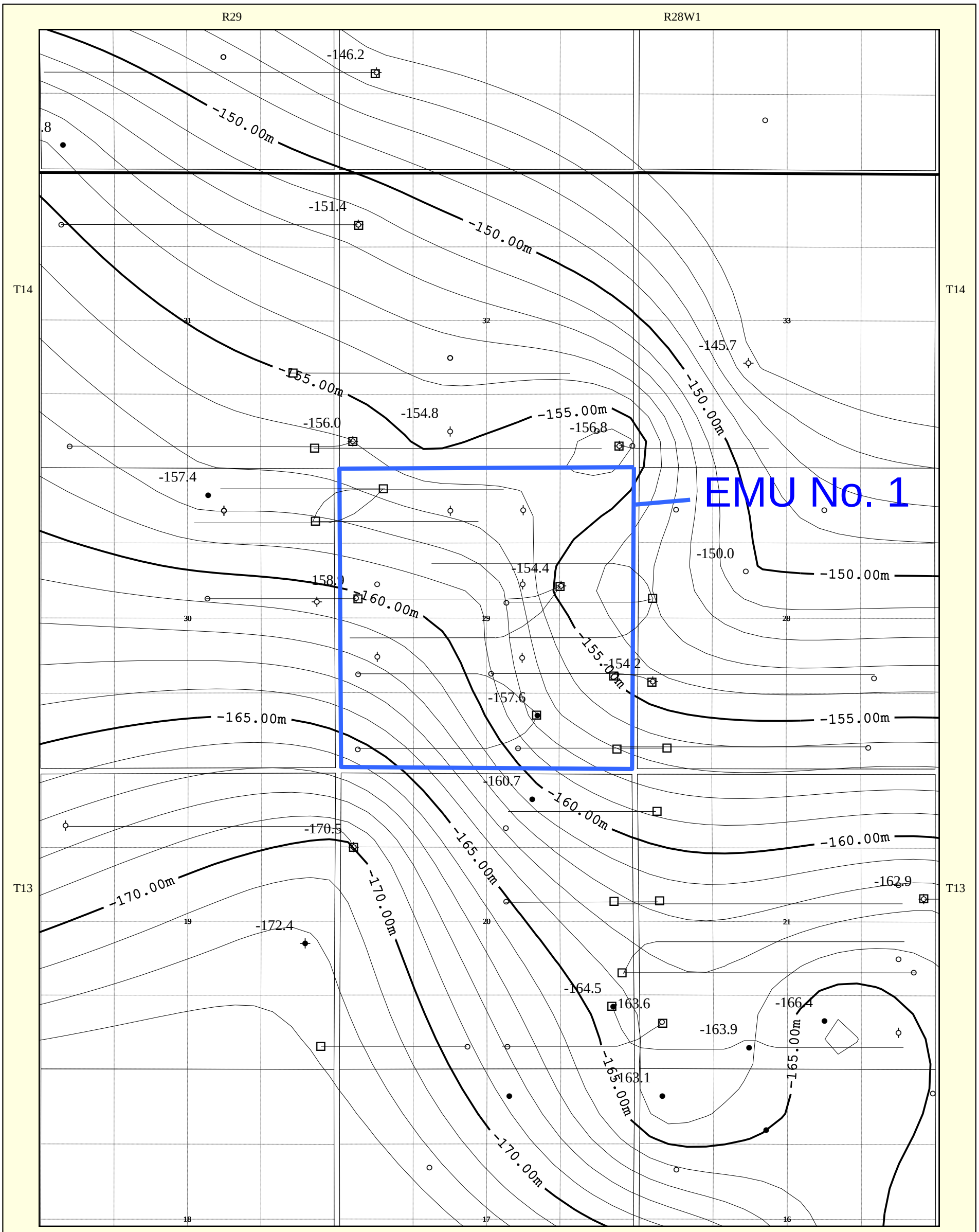
TW

Appendix A, Figure 3: Tract Factors

East Manson Unit No.1 Tract Factors										
			Beach Facies	Breccia Unit	Rythmite Unit	Oil Production			Volume Allocation (e3m3)	Tract Factor
Legal Desciption	Royalty Owner	Working Interest	OOIP (e3m3)	OOIP (e3m3)	OOIP (e3m3)	Wellbores	Cumulative Production per Well (e3m3)	Production Allocation		
1-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	61.43	0.00	12.69	102/2-29-013-28W1/0	4.05	50%	72.10	**8.34%**
2-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	52.34	0.00	12.22	102/2-29-013-28W1/0	4.05	50%	58.83	**6.81%**
						100/02-29-13-28W1/0	3.70	100%		
3-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	37.81	0.00	18.96	100/04-29-013-28W1/0	2.18	57%	55.54	**6.43%**
4-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	23.86	0.00	18.09	100/04-29-013-28W1/0	2.18	44%	41.00	**4.74%**
5-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	47.15	0.00	14.41	100/05-29-013-28W1/0	2.08	43%	60.67	**7.02%**
						102/05-29-013-28W1/0	0.00	50%		
6-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	60.62	0.00	18.24	100/05-29-013-28W1/0	2.08	57%	77.67	**8.99%**
						102/05-29-013-28W1/0	0.00	50%		
7-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	57.83	0.00	8.08	102/07-29-013-28W1/0	0.16	50%	64.14	**7.42%**
						100/07-29-013-28W1/0	2.84	60%		
8-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	48.96	0.00	7.77	102/07-29-013-28W1/0	0.16	50%	55.50	**6.42%**
						100/07-29-013-28W1/0	2.84	40%		
9-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	15.36	9.01	4.05	100/10-29-013-28W1/0	0.97	50%	27.90	**3.23%**
						102/10-29-013028W1/0	0.16	24%		
10-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	33.89	0.80	8.89	100/10-29-013-28W1/0	0.97	50%	42.87	**4.96%**
						100/12-29-013-28W1/0	1.40	12%		
						102/10-29-013028W1/0	0.16	41%		
11-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	57.14	0.00	18.95	102/10-29-013028W1/0	0.16	35%	75.34	**8.72%**
						100/12-29-013-28W1/0	1.40	50%		
12-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	57.16	0.00	10.53	100/12-29-013-28W1/0	1.40	39%	67.15	**7.77%**
13-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	34.97	0.62	8.19	100/14-29-013-28W1/0	0.32	43%	43.44	**5.03%**
						100/15-29-013-28W1/0	0.56	35%		
14-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	28.21	4.88	18.67	100/14-29-013-28W1/0	0.32	57%	51.28	**5.93%**
						100/15-29-013-28W1/0	0.56	52%		
15-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	20.95	10.52	9.10	100/15-29-013-28W1/0	0.56	13%	40.51	**4.69%**
16-29-13-28W1	100% Crown	100% Fort Calgary Resources Ltd.	12.13	15.50	2.59				30.22	**3.50%**
Total			**649.83**	**41.32**	**191.44**				864.17	**100.00%**

Appendix B: Geological Maps

Appendix B, Figure 1: Upper Bakken Structure Contour Map



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

BKKN SHAL(U-Sub) (m)

Fort Calgary Resources Ltd.

Top Upper Bakken Structure

Created in AccuMap™
Product of IHS
Datum: NAD83
Vol. 22 No. 09, Sep 20 2012
(403) 770-4646

Author:	David Rose
Date:	November 14, 2012
File:	Torq Waterflood Middle Bakken
Scale:	1 : 20000
Projection:	Stereographic
Center:	N50.12975 W101.27533

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: MLI07

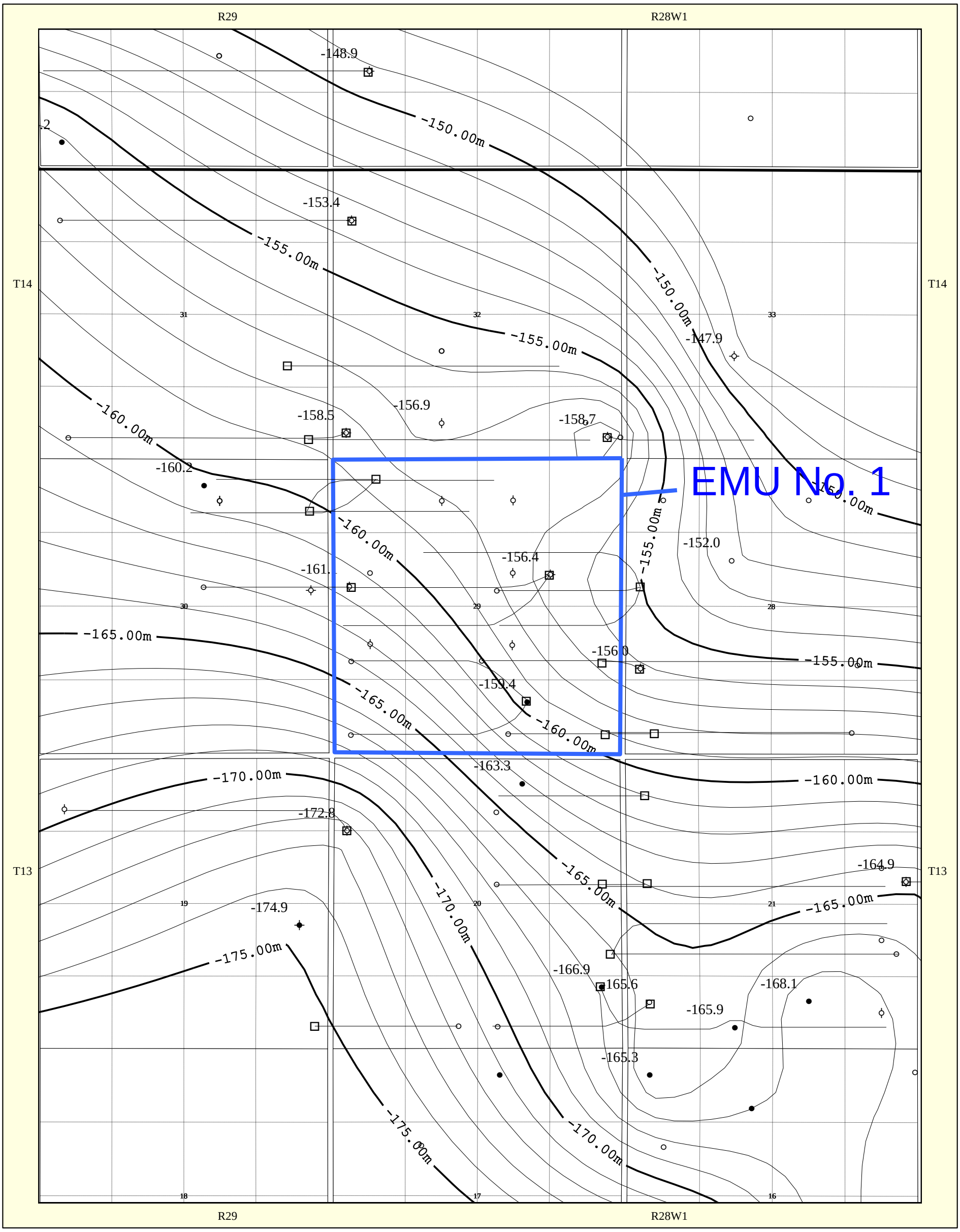
Scale 1:20000

0 Kilometers 0.9

0 Miles 0.5

Contours: BKKN SHAL(U-Sub) (m)
Contour interval = 1m

Appendix B, Figure 2: Middle Bakken Structure Contour Map



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

Marl(U-Sub) (m)

Fort Calgary Resources Ltd.

Top Middle Bakken Structure

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(403) 770-4646

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Author:	David Rose
Date:	November 14, 2012
File:	Torq Waterflood Middle Bakken
Scale:	1 : 20000
Projection:	Stereographic
Center:	N50.12975 W101.27533

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: ML107

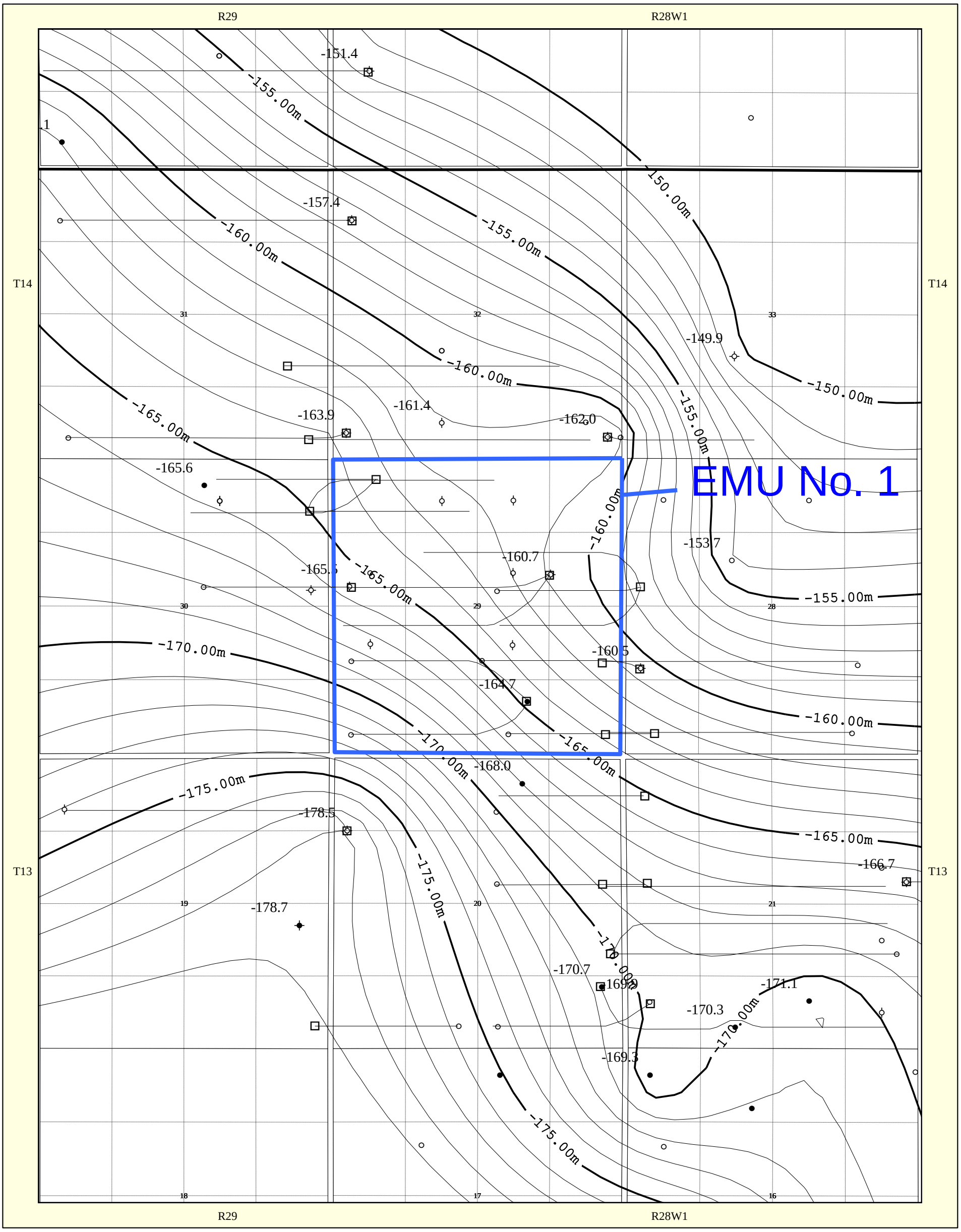
Scale 1:20000

0 Kilometers 0.9

0 Miles 0.5

Contours: Marl(U-Sub) (m)
Contour interval = 1m

Appendix B, Figure 3: Torquay Unit 3 (Middle Bakken Unconformity) Structure Contour Map



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

Unit 3(U-Sub) (m)

Fort Calgary Resources Ltd.

Top Torquay Unit 3 Structure

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Datum: NAD83
Vol. 22 No. 09, Sep 20 2012
(403) 770-4646

Author: David Rose
Date: November 14, 2012
File: Torq Waterflood Middle Bakken
Scale: 1 : 20000
Projection: Stereographic
Center: N50.12975 W101.27533

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: MLI07

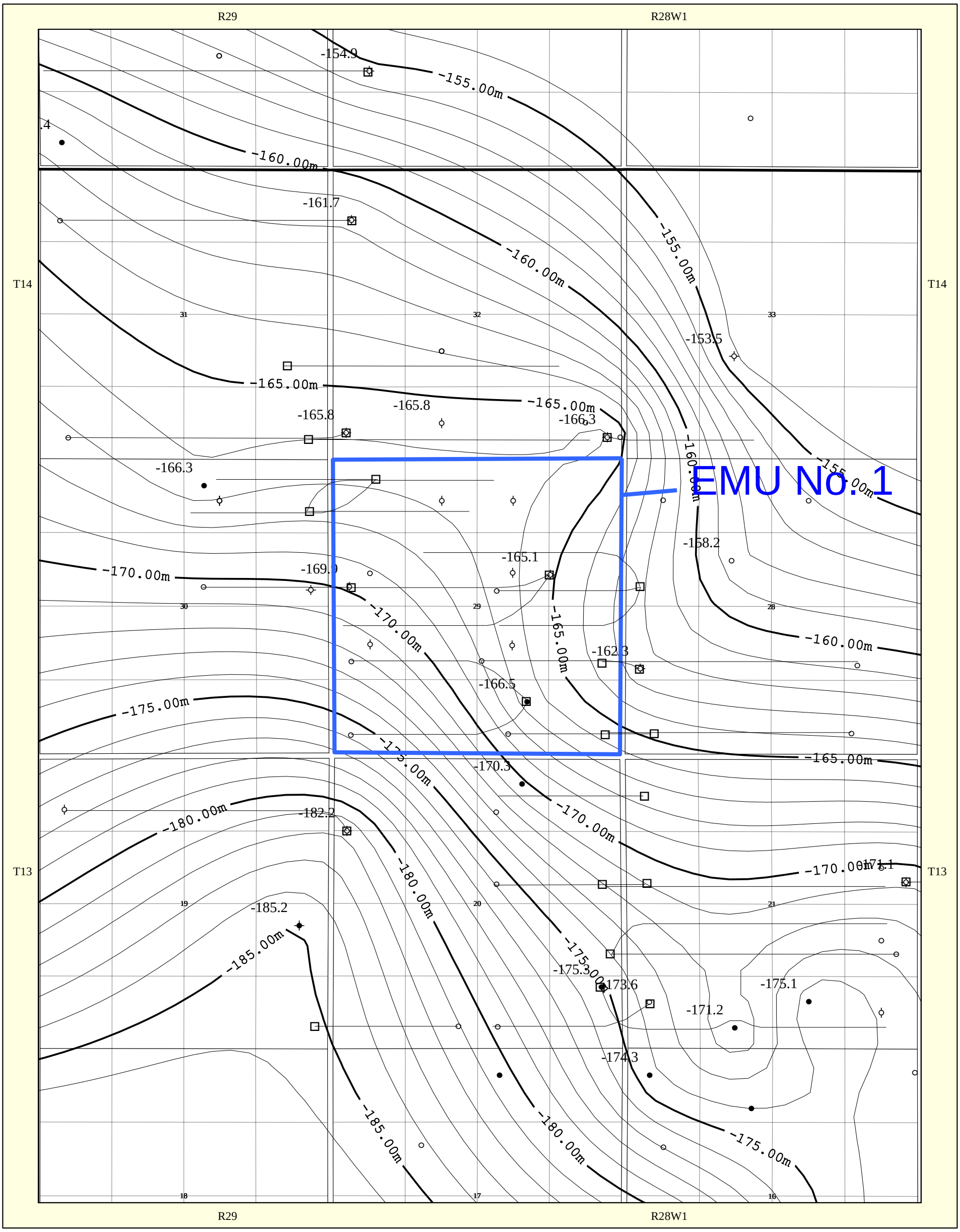
Scale 1:20000

0 Kilometers 0.9

0 Miles 0.5

Contours: Unit 3(U-Sub) (m)
Contour interval = 1m

Appendix B, Figure 4: Torquay Unit 2 Structure Contour Map



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

Unit 2(U-Sub) (m)

Fort Calgary Resources Ltd.

Top Torquay Unit 2 Structure

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Author: David Rose
Date: November 14, 2012
File: Torq Waterflood Middle Bakken
Scale: 1 : 20000
Projection: Stereographic
Center: N50.12975 W101.27533

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: MLI07

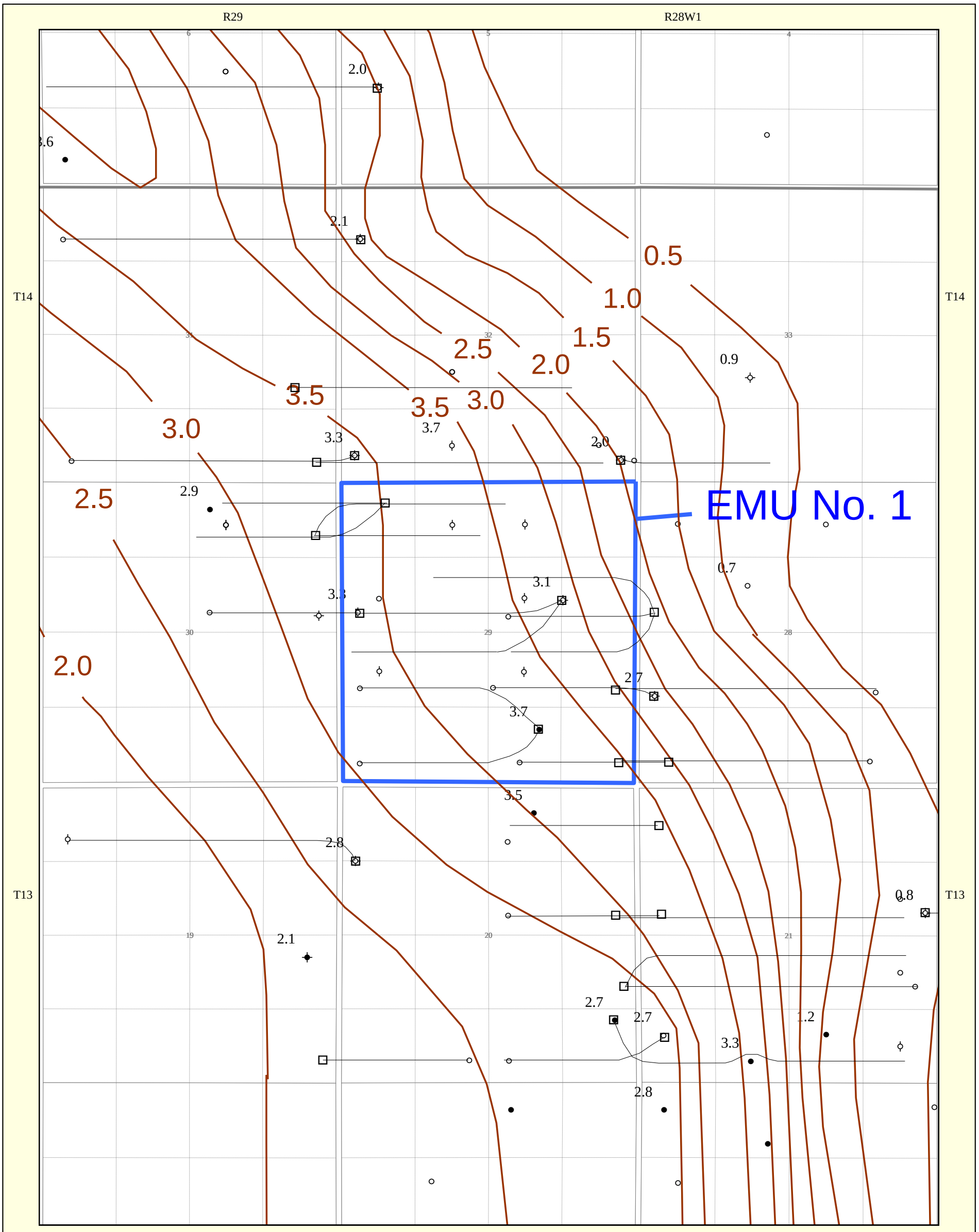
Scale 1:20000

0 Kilometers 0.9

0 Miles 0.5

Contours: Unit 2(U-Sub) (m)
Contour interval = 1m

Appendix B, Figure 5: Middle Bakken Reservoir Isopach Including Middle and Lower Units



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

nmite to Unit 3(U-IsC) (m)

Fort Calgary Resources Ltd.

Middle Bakken Reservoir
Isopach 0.5 m Contour Interv

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Datum: NAD83
Vol. 22 No. 09, Sep 20 2012
(403) 770-4646

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Author: David Rose
Date: November 14, 2012
File: Torq Waterflood Reservoir Isop
Scale: 1 : 20000
Projection: Stereographic
Center: N50.13048 W101.27550

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

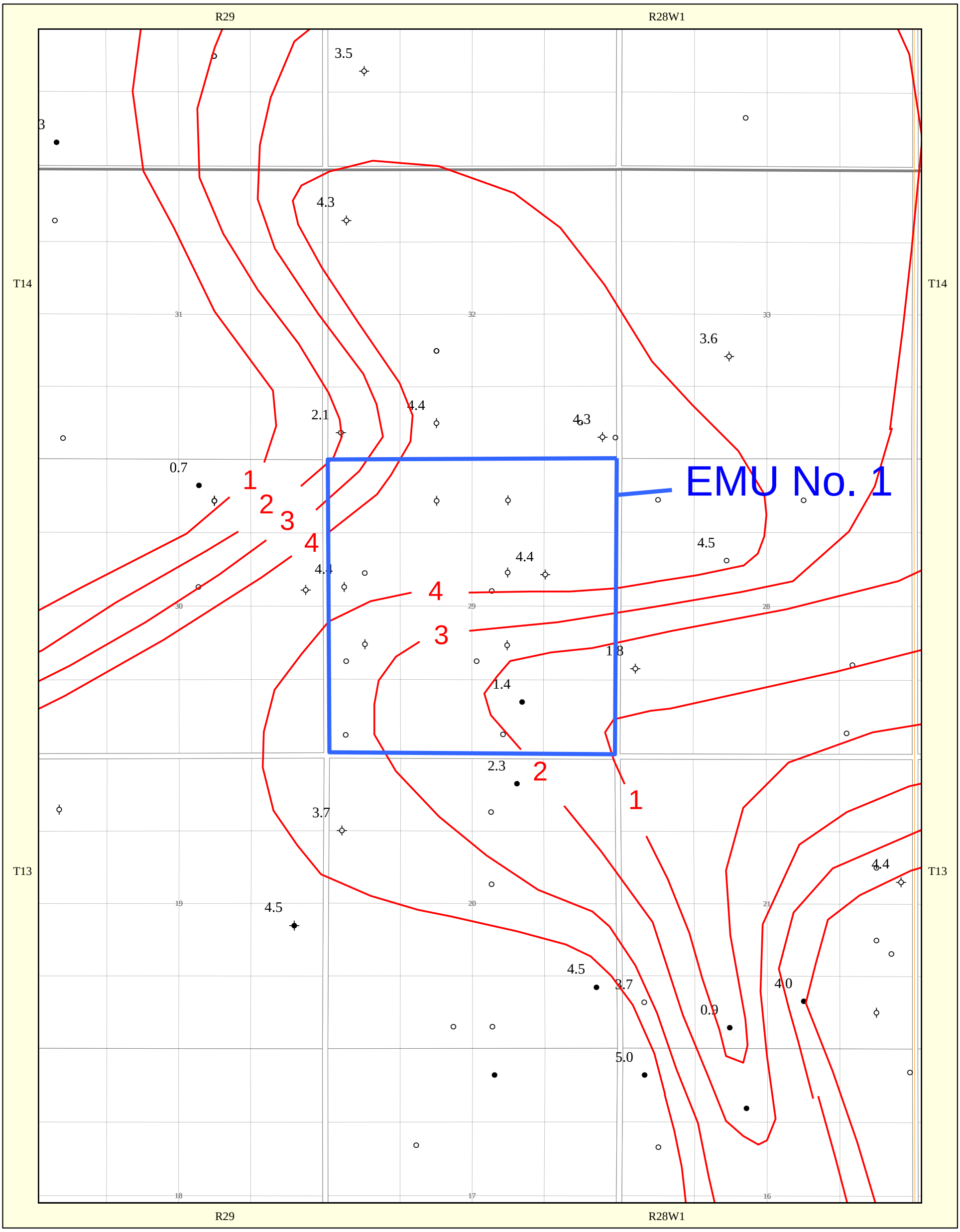
DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: MLI07

Scale 1:20000

0 Kilometers 0.9

0 Miles 0.5

Appendix B, Figure 6: Torquay Unit 3 Isopach Map



WELL LEGEND	
Bottom Hole Locations:	
Location	Suspended
Oil	Dry & Abandoned
Abandoned Oil	
Well Postings:	
Unit 3(U-Iso) (m)	

Fort Calgary Resources Ltd.

Torquay Unit 3 Isopach
1 m Contour Interval

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Author: David Rose
Date: November 14, 2012
File: None
Scale: 1 : 20000
Projection: Stereographic
Center: N50.12975 W101.27493

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

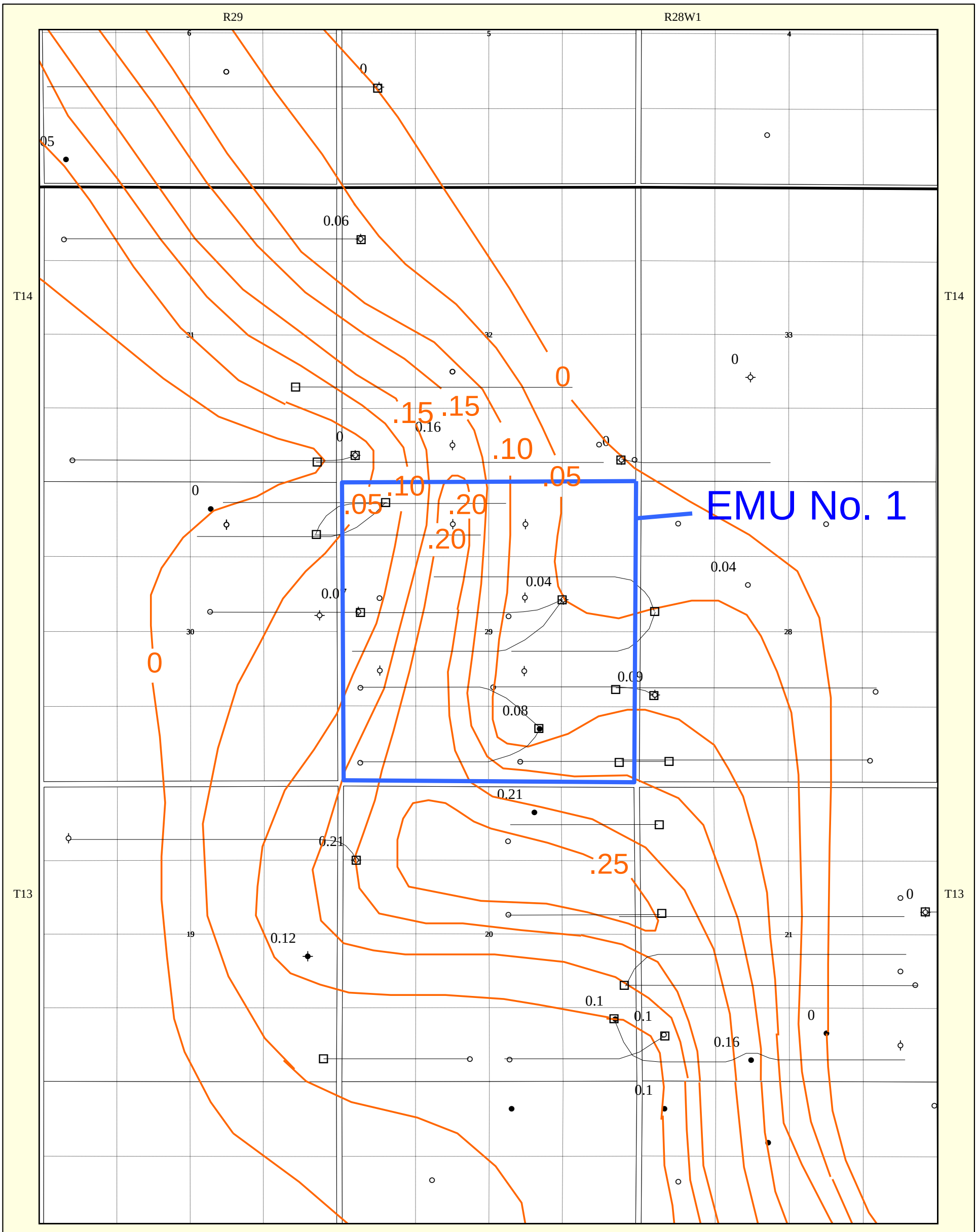
DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: MLI07

Scale 1:20000

0 Kilometers 0.9

0 Miles 0.5

Appendix B, Figure 7: Phi-h Map of Middle Unit of the Middle Bakken Reservoir (1 md Cutoff)



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

Column 4

Fort Calgary Resources Ltd.

Middle Unit - Middle Bakken
0.05 por*m Contour Interval

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Datum: NAD83
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Author: David Rose
Date: November 14, 2012
File: Torq Rythmite phi-h 1md cutoff
Scale: 1 : 20000
Projection: Stereographic
Center: N50.13048 W101.27556

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

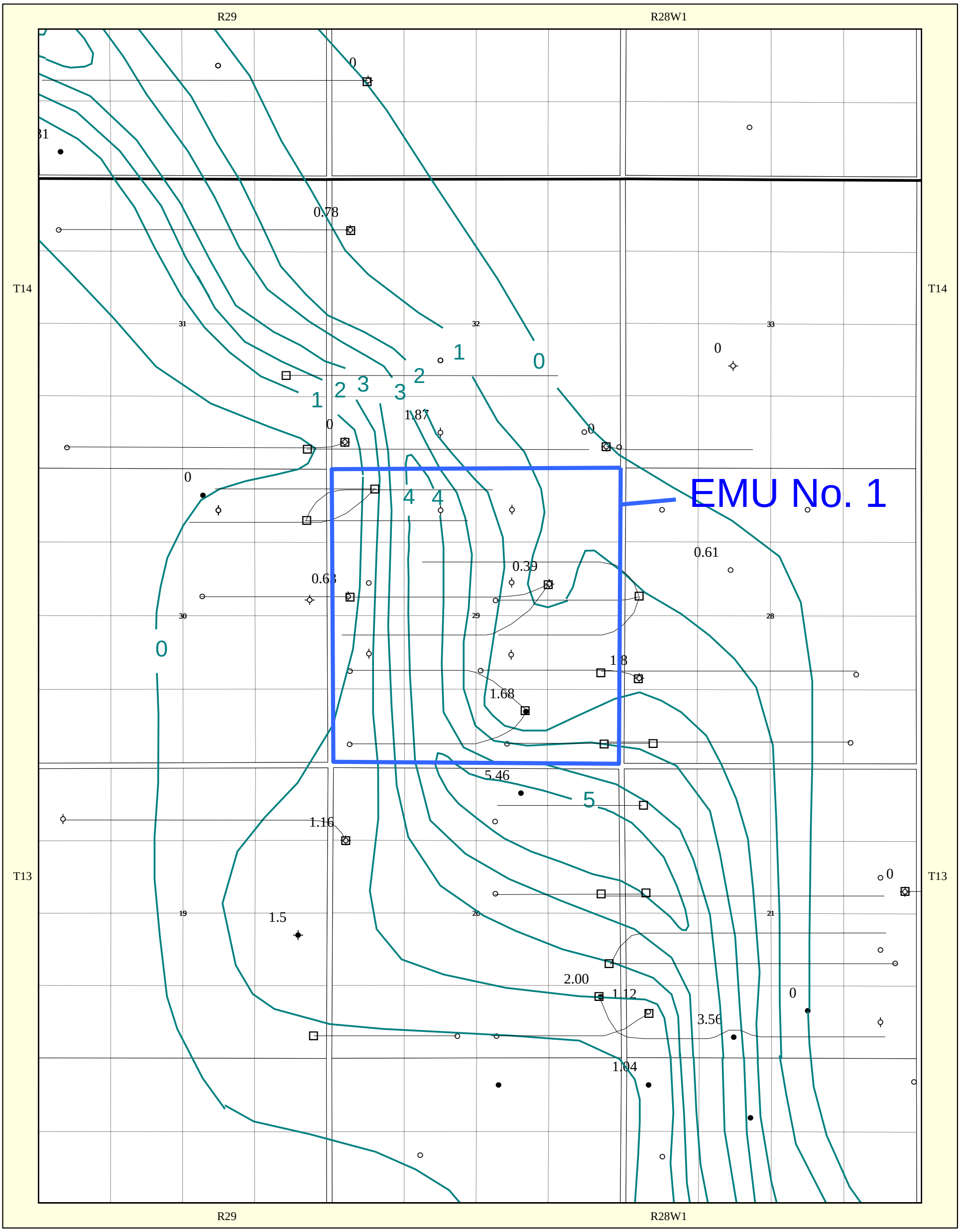
DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: ML107

Scale 1:20000

0 Kilometers 0.9

0 Miles 0.5

Appendix B, Figure 8: K-h Map of the Middle Unit of the Middle Bakken Reservoir (1 md Cutoff)



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

Column 7

Fort Calgary Resources Ltd.

Middle Unit - Middle Bakken
1 md*m Contour Interval

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Author: David Rose
Date: November 14, 2012
File: Torq Rythmite k-h 1 md cutoff.
Scale: 1 : 20000
Projection: Stereographic
Center: N50.13023 W101.27524

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

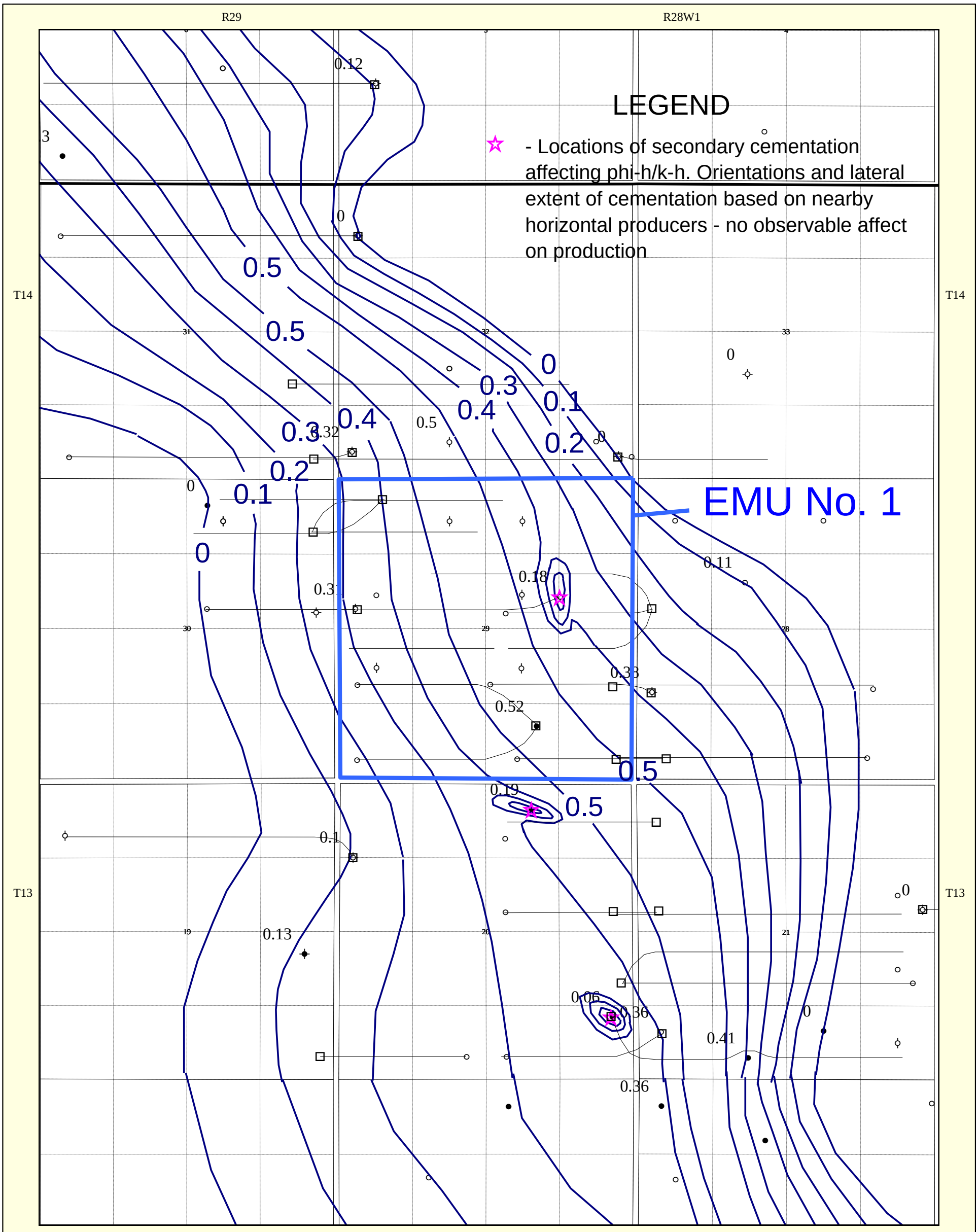
DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: ML107

Scale 1:20000

0 Kilometers 0.9

0 Miles 0.5

Appendix B, Figure 9: Phi-h Map of the Lower Unit of the Middle Bakken Reservoir (1 md Cutoff)



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

Column 3

Fort Calgary Resources Ltd.

Lower Unit - Middle Bakken
0.1 por*m Contour Interval

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Product of IHS
Datum: NAD83
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(403) 770-4646
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Author: David Rose
Date: November 14, 2012
File: Torq Waterflood Beach+Hz Phi-h
Scale: 1 : 20000
Projection: Stereographic
Center: N50.13031 W101.27529

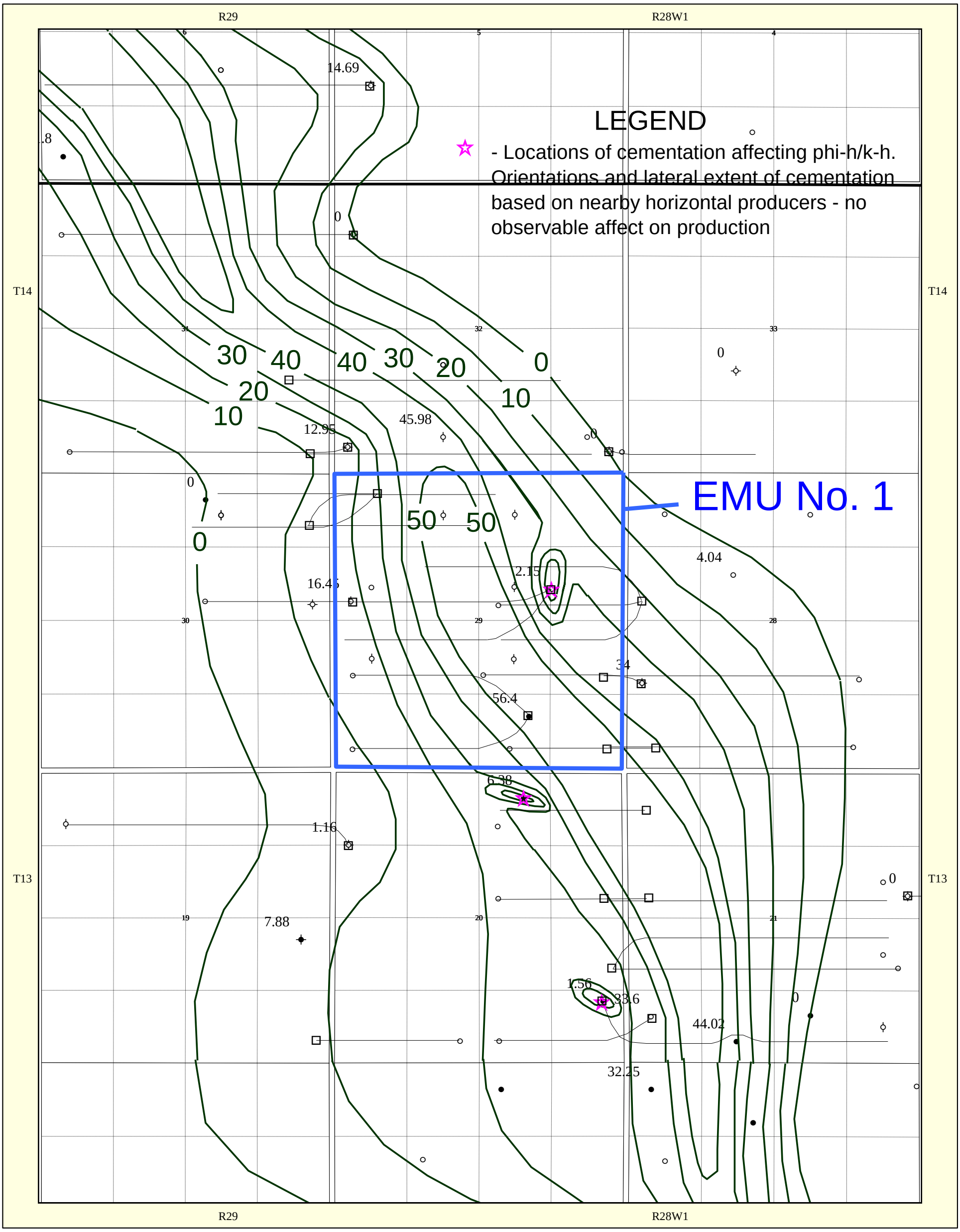
Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: ML107

Scale 1:20000

0 Kilometers 0.9
0 Miles 0.5

Appendix B, Figure 10: k-h Map of the Lower Unit of the Middle Bakken Reservoir (1 md Cutoff)



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

Column 6

Fort Calgary Resources Ltd.

Lower Unit - Middle Bakken
10 md*m Contour Interval

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Author: David Rose
Date: November 14, 2012
File: Torq Waterflood Beach k-h 1 md
Scale: 1 : 20000
Projection: Stereographic
Center: N50.13047 W101.27545

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

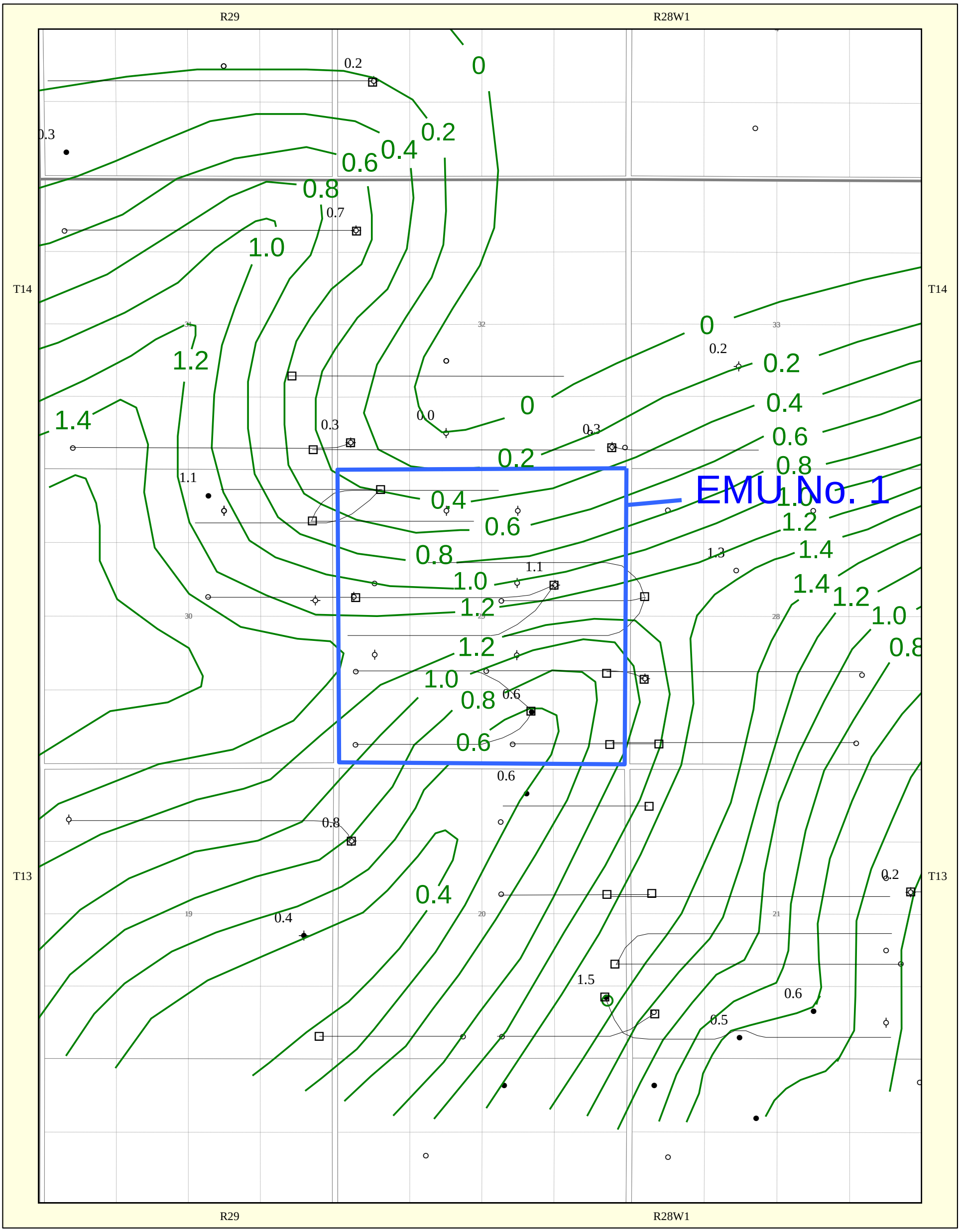
DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: ML107

Scale 1:20000

0 Kilometers 0.9

0 Miles 0.5

Appendix B, Figure 11: Torquay Unit 2 Net Pay Map



R29 R28W1

WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Suspended
- Dry & Abandoned

Well Postings:

Unit 2(U-NPy) (m)

Fort Calgary Resources Ltd.

Torquay Unit 2 Net Pay
0.2 m Contour Interval

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Datum: NAD83
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Author: David Rose
Date: November 14, 2012
File: Manson Unit 2 Net Pay.MAP
Scale: 1 : 20000
Projection: Stereographic
Center: N50.13025 W101.27568

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

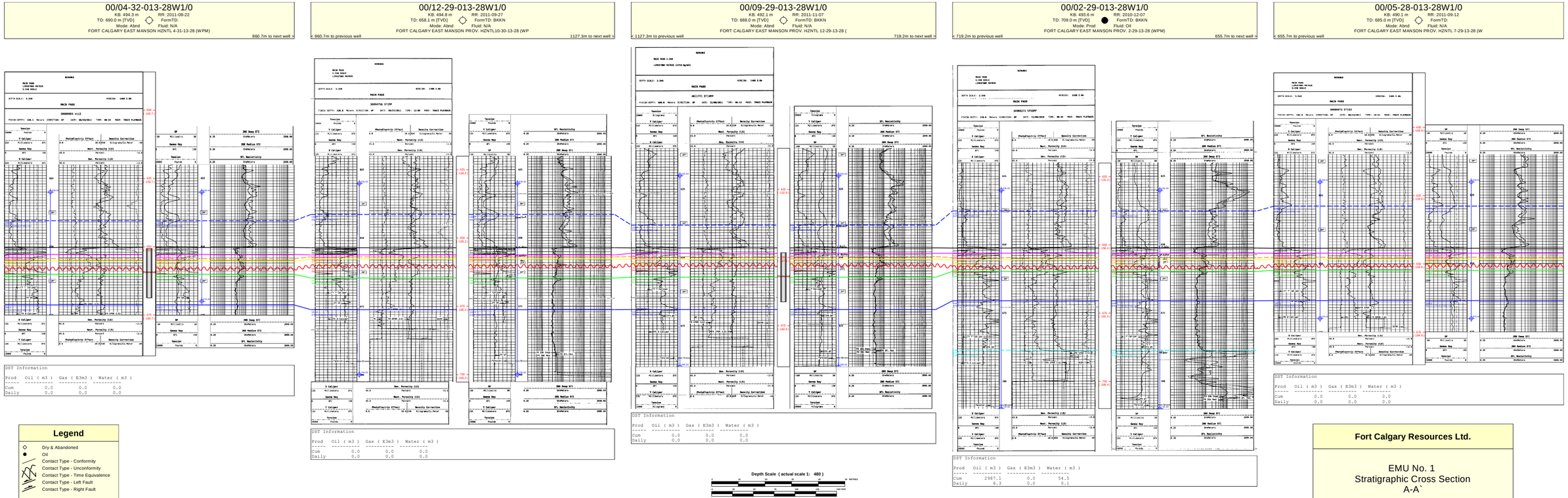
DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: MLI07

Scale 1:20000

0 Kilometers 0.9

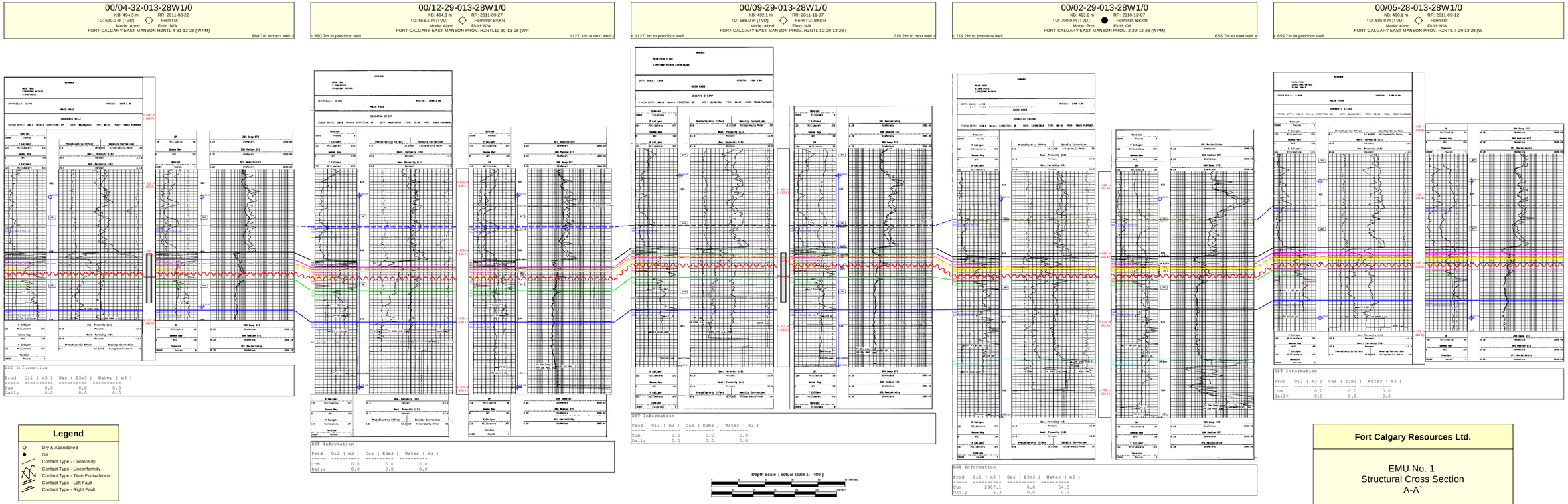
0 Miles 0.5

Appendix B, Figure 12: Stratigraphic Cross Section A-A' (Northwest to Southeast) across EMU No.1



** Orange and Yellow tops represent subdivision of Middle Bakken into the middle and lower reservoir units, respectively.

Appendix B, Figure 13: Structural Cross Section A-A' (Northwest to Southeast) across EMU No.1



**Orange and Yellow tops represent subdivision of Middle Bakken into the middle and lower reservoir units, respectively.

Appendix C: Reservoir Characteristics & Recovery

Appendix C, Figure 1: East Manson Unit No.1 (SEC 29-13-28W1) OOIP

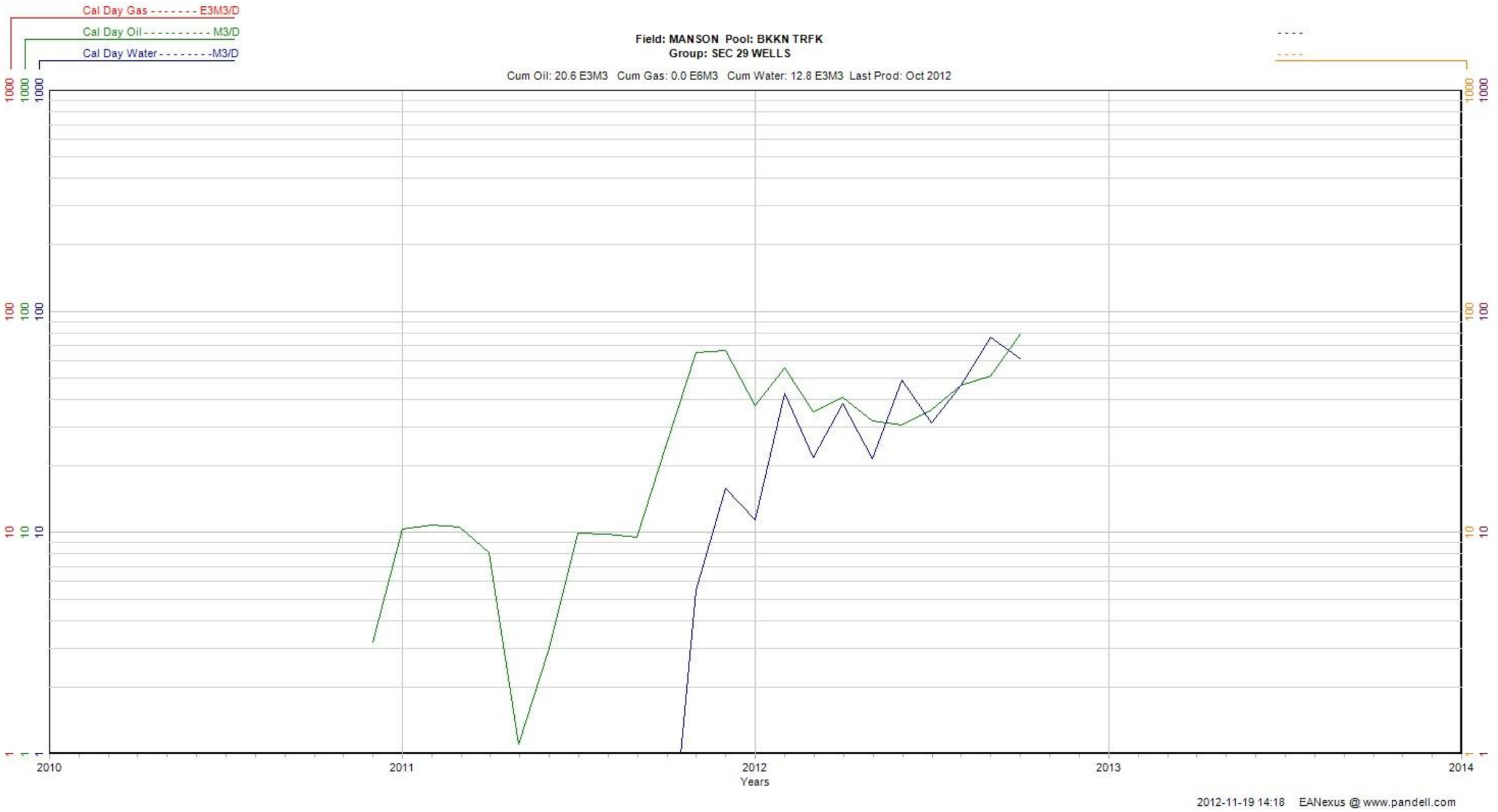
East Manson Unit No.1 OOIP Calculation						
	Beach Facies		Breccia Unit		Rythmite Unit	
Legal Desciption	Total Pore Vo	OOIP (e3m3)	Total Pore Volume (e3m3)	OOIP (e3m3)	Total Pore Vo	OOIP (e3m3)
1-29-13-28W1	94.87	61.43	0.00	0.00	19.60	12.69
2-29-13-28W1	80.83	52.34	0.00	0.00	18.88	12.22
3-29-13-28W1	58.39	37.81	0.00	0.00	29.28	18.96
4-29-13-28W1	36.85	23.86	0.00	0.00	27.93	18.09
5-29-13-28W1	72.82	47.15	0.00	0.00	22.25	14.41
6-29-13-28W1	93.62	60.62	0.00	0.00	28.17	18.24
7-29-13-28W1	89.31	57.83	0.00	0.00	12.49	8.08
8-29-13-28W1	75.61	48.96	0.00	0.00	12.00	7.77
9-29-13-28W1	23.73	15.36	13.91	9.01	6.26	4.05
10-29-13-28W1	52.34	33.89	1.23	0.80	13.73	8.89
11-29-13-28W1	88.25	57.14	0.00	0.00	29.26	18.95
12-29-13-28W1	88.27	57.16	0.00	0.00	16.26	10.53
13-29-13-28W1	54.01	34.97	0.95	0.62	12.64	8.19
14-29-13-28W1	43.56	28.21	7.53	4.88	28.83	18.67
15-29-13-28W1	32.36	20.95	16.25	10.52	14.06	9.10
16-29-13-28W1	18.74	12.13	23.93	15.50	4.00	2.59
Total	1003.52	649.83	63.81	41.32	295.63	191.44

Swc (frac)	0.3136
Bo (res m3/m3)	1.06

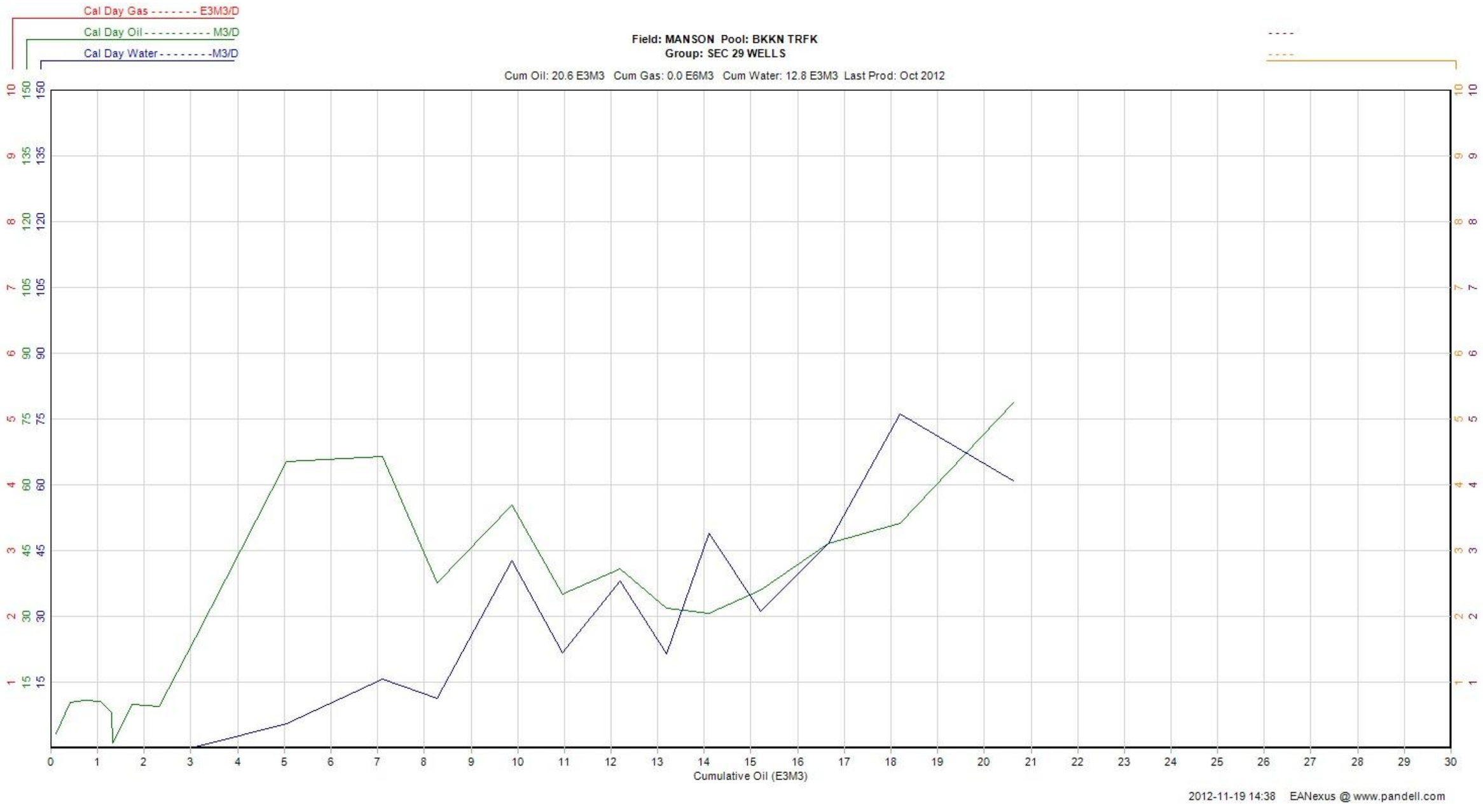
Total Section 29 OOIP (e3m3)	882.6
Total Section 29 OOIP (mbbl)	5554.1

** 1 md used for phi * h interpretation

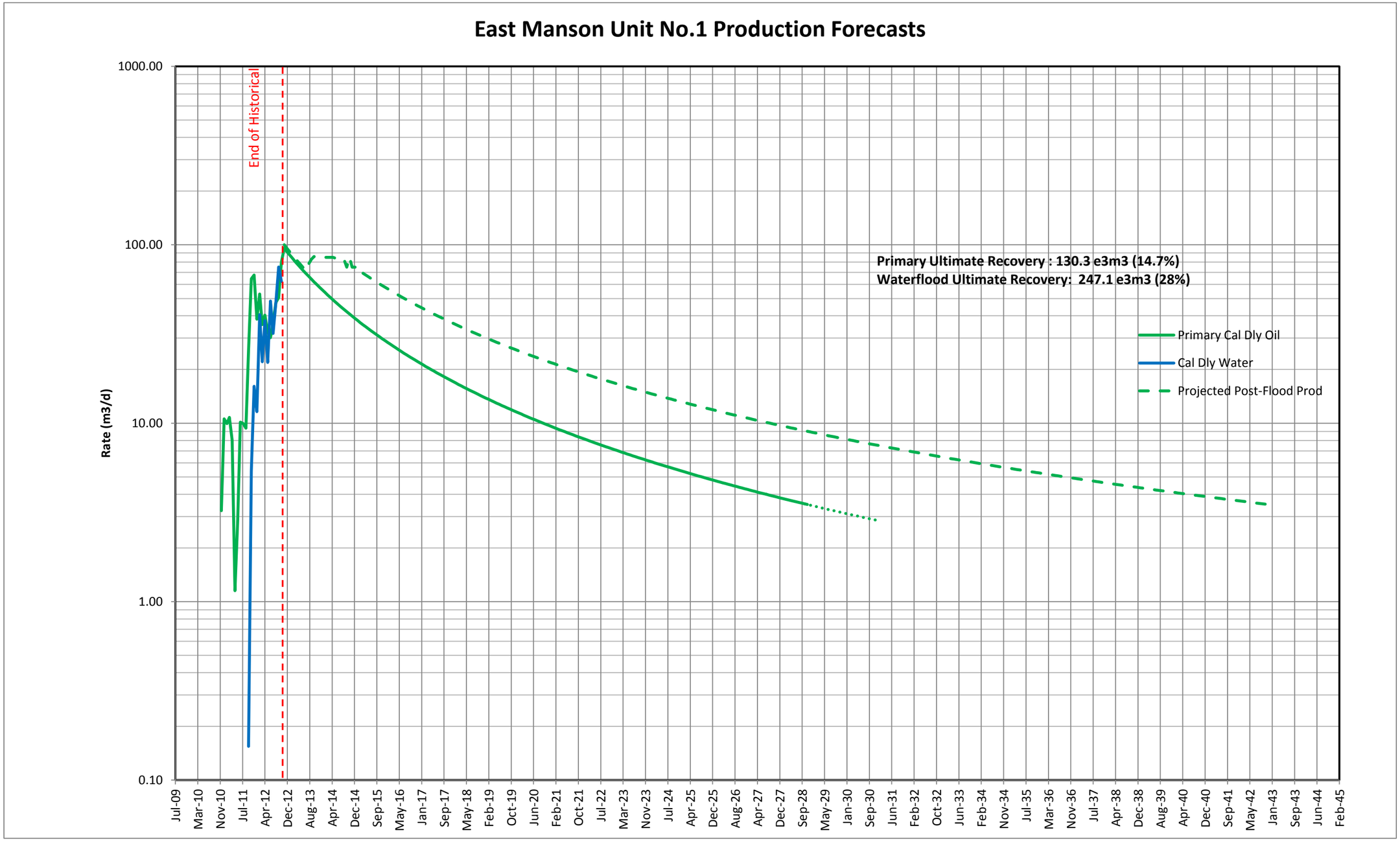
Appendix C, Figure 2: SEC 29-13-28W1 Production History



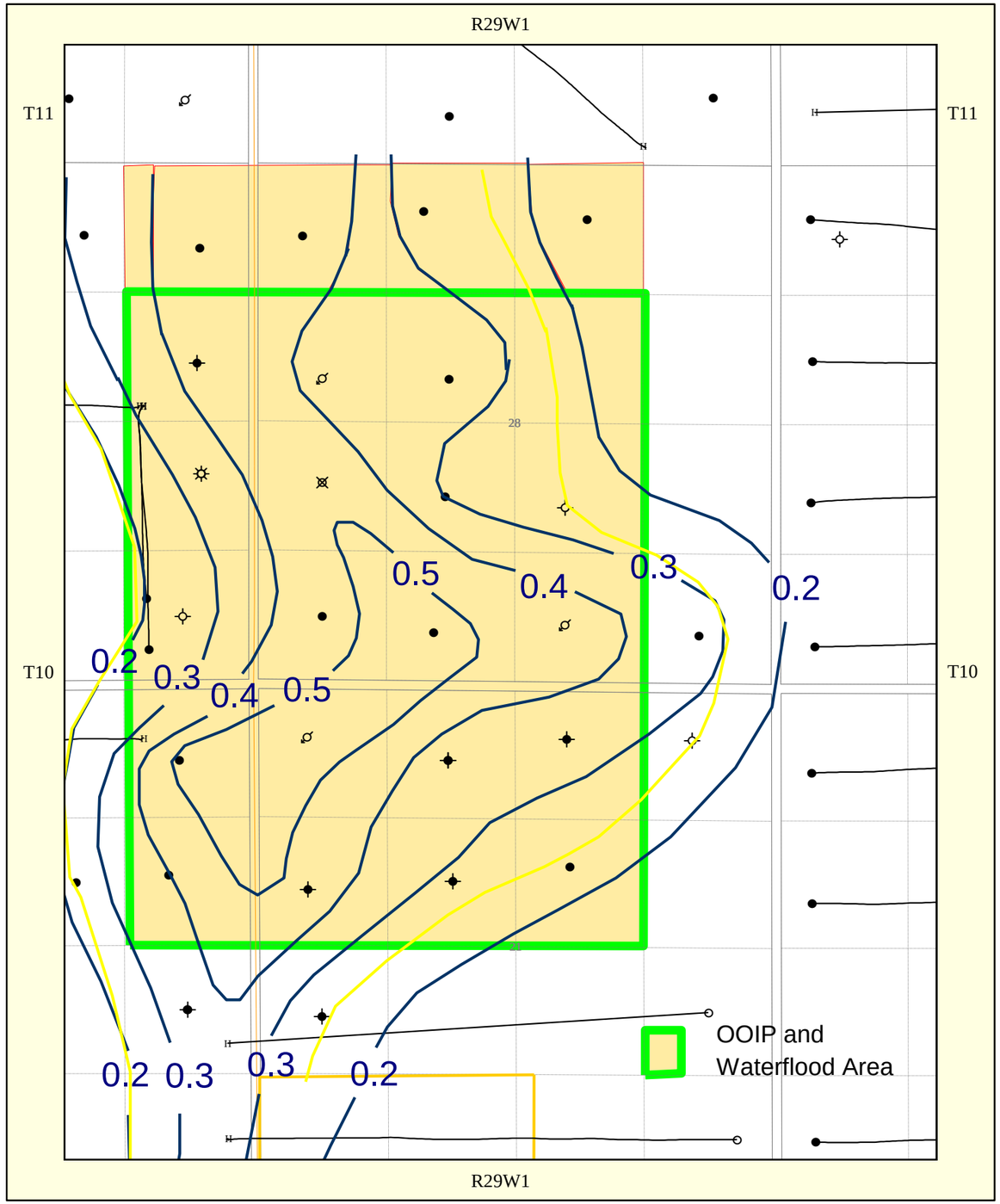
Appendix C, Figure 3: SEC 29-13-28W1 Production Rate vs Cumulative Production



Appendix C, Figure 4: East Manson Unit No.1 Production Forecasts



Appendix C, Figure 5: Daly Bakken A Analogue Map



WELL LEGEND

Bottom Hole Locations:

- Location
- Oil
- Abandoned Oil
- Injection
- Service or Drain
- Dry & Abandoned
- Abandoned Service

Surface Hole Locations:

- Horizontal

PROPRIETARY DATA LEGEND

Regions:

- Fort Calgary Land

Scale 1:18329

0 Kilometers 0.8

0 Miles 0.5

Fort Calgary Resources Ltd.

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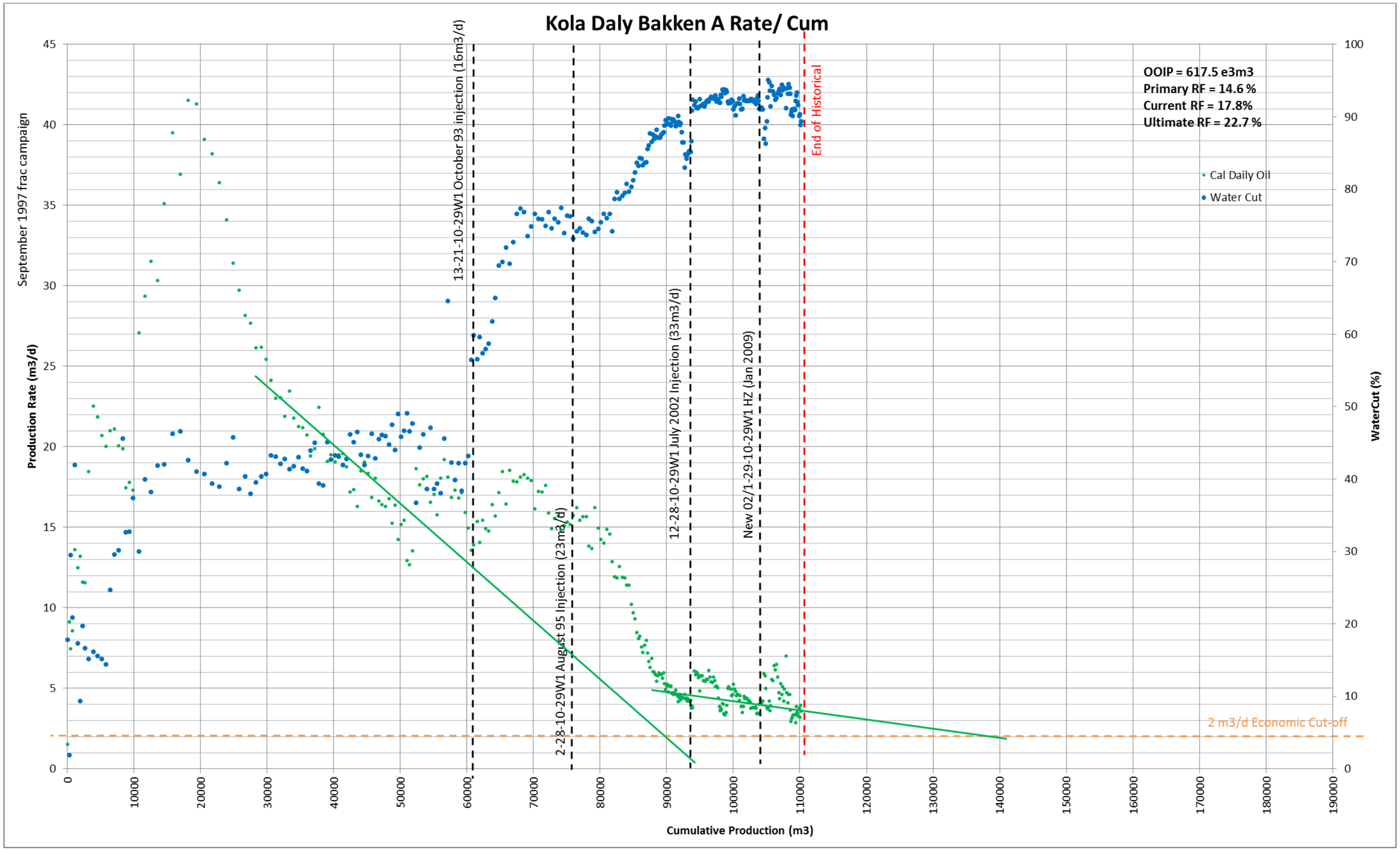
Datum: NAD83
Vol. 22 No. 11, Nov 12 2012
(403) 770-4646

Author: David Rose
Date: December 13, 2012
File: Kola phi-h.MAP
Scale: 1 : 18329
Projection: Stereographic
Center: N49.85959 W101.36174

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: MLI07

Appendix C, Figure 6: Daly Bakken A Analogue Recovery



Appendix D: Proposed Waterflood Design

Appendix D, Figure 1: Typical Injector

FORT CALGARY RESOURCES LTD.

Downhole Well Profile				Year (yyyy)	Mth (Mon)	Day (dd)
WELL NAME	Fort Calgary East Manson Typical HZ Injector		DATE	2012	Oct	23
UWI			Licence #	N/A		

KB ELEV (m)	GL ELEV (m)	KB TO THF (m)	KB TO SCF (m)	KB TO GL (m)	PBTD (m)
494.94	490.81	0.38		4.13	1500

CASING DESCRIPTION	OD (mm)	LANDED DEPTH	WEIGHT (kg/m)	Grade
Surface Casing	244.5	140	48.07	H-40 ST&C
Intermediate Casing	177.8	775	34.23	J-55 LT&C
Tubing	73.02	700	9.67	J-55

Perf Date	Zones	Top Shot	Bottom Shot	Status	Gun Data
MM/DD/YYYY	Torquay	775.00	1500.00	Open-Hole	N/A

DOWNHOLE DESCRIPTION FROM BOTTOM UP (Tubing String / Incl. Tubing Pumps)

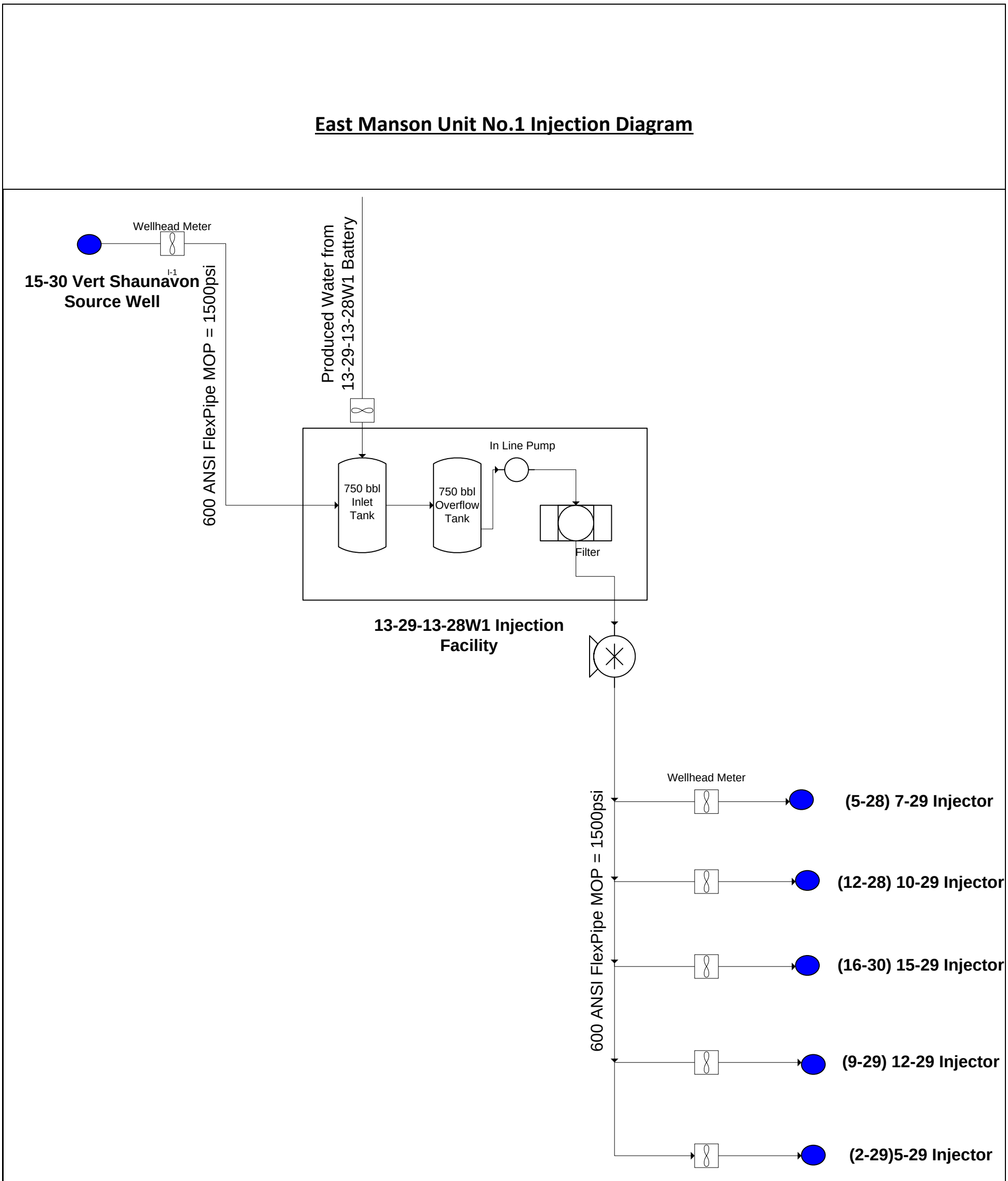
ITEM #	DESCRIPTION	LENGTH	TOP OF (mKB)
1	139.7 x 73.02 mm Coated Double Grip Packer	1.38	759.31
2	78 jts 73.02 mm 9.67 kg/m Coated J-55 EUE tbg	751.14	8.17
3	73.02 mm 9.67 kg/m Coated J-55 EUE pup jt	4.36	3.81
4	Tbg Hanger	0.13	3.68
	Packer Center Element @ 760 mKB		-

WEIGHT OF TUBING STRING (daN)		TOTAL STRING LENGTH	757.01
TENSION/COMPRESSION (+/- daN)		STRETCH/SLACKOFF (+/- m)	
LANDED STRING WEIGHT (daN)	-	TUBING BOTTOM (mKB)	760.69

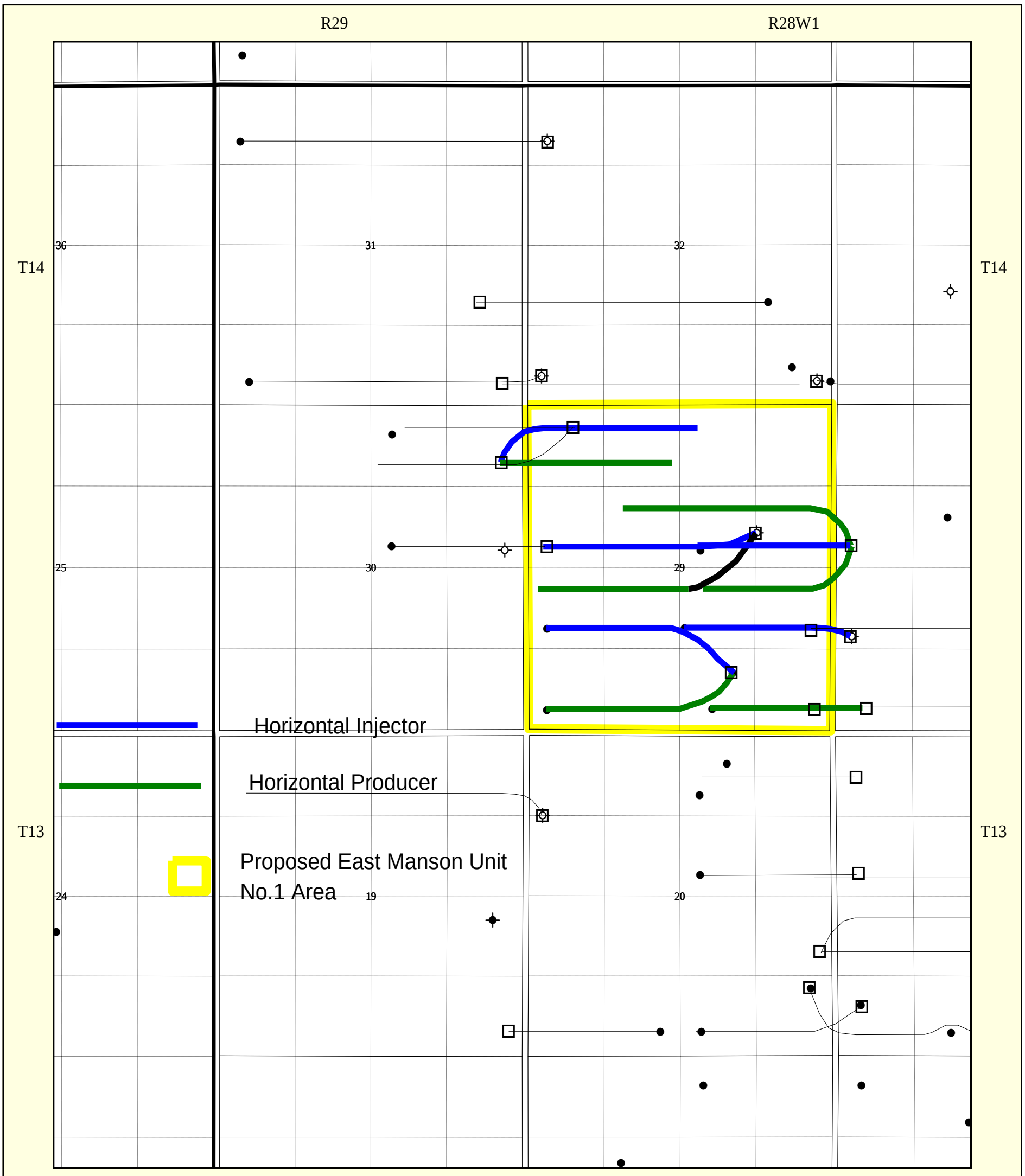
REMARKS

This represents a typical horizontal Torquay injection well. Depths for actual wells will vary from the model shown.

Appendix D, Figure 2: Injection Diagram



Appendix D, Figure 3: Injection Scheme



WELL LEGEND

Bottom Hole Locations:

- Oil
- Dry & Abandoned
- Abandoned Oil

Fort Calgary Resources Ltd.

East Manson Unit No.1
Pilot Waterflood

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Datum: NAD83
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(403) 770-4646

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Author: Well Ops
Date: November 21, 2012
File: East Manson Unit 1.MAP
Scale: 1 : 26699
Projection: Stereographic
Center: N50.12854 W101.28792

Grid Information:
DLS: IHS Enhanced Grid
NTS: Theoretical Grid
FPS: Theoretical Grid
US: IHS US Grid

DLS Version Information:
AB: ATS 4.1
BC: PRB 2.0
SK: STS 2.5
MB: MLI07

Scale 1:26699

0 Kilometers 1.2

0 Miles 0.7

Appendix D, Figure 4: Corrosion Control

East Manson Unit No.1 Corrosion Control Program

Surface Lines:

- All surface flow lines will consists of Flexpipe fiberglass reinforced polyethylene pipe.
- Surface lines to injection wells will be have a maximum allowable pressure of 1500 psi
- Stainless steel valves and fittings
- Isolation valves at wellheads and injection facility
- High a low pressure shut-down

Injection Facilities

- Internally coated storage tanks
- Stainless steel filtration system
- Pump unit consisting of ceramic plungers, stainless steel disc valves

Injection Wells

- Injector tubing will be fusion epoxy coated (FBE)
- Casing, tubing and wellhead cathodic protection
- Corrosion resistant surface line and master valves
- Inhibited water in annular space

Producing and Source Wells

- Fusion epoxy coated tubing
- Downhole corrosion inhibitor batch treatments
- Cathodic protection