

**PROPOSED SINCLAIR UNIT NO. 13**

**Application for Enhanced Oil Recovery Waterflood Project**

**Middle Bakken/Three Forks Formations**

**Bakken – Three Forks B Pool (01 62B)**

**Daly Sinclair Field, Manitoba**

October 21st, 2014  
Tundra Oil and Gas Partnership

## **INTRODUCTION**

The Sinclair portion of the Daly Sinclair Oil Field is located in Ranges 28 and 29 W1 in Townships 7 and 8. Since discovery in 2004, the main oilfield area was developed with vertical and horizontal wells at 40 acre spacing on Primary Production. Since early 2009, a significant portion of the main oilfield has been unitized and placed on Secondary Waterflood (WF) Enhanced Oil Recovery (EOR) Production, mainly from the Lyleton 'A' & 'B' members of the Three Forks Formation. Tundra Oil and Gas (Tundra) currently operates and continues to develop Sinclair Units 1, 2, 3, 5, 6, 7, 8, 10, 11 and Ewart Units 1, 2, 3, 4 and 5 as shown on [Figure 1](#).

In the northwestern part of the Sinclair field, potential exists for incremental production and reserves from a Waterflood EOR project in the Three Forks and Middle Bakken oil reservoirs. The following represents an application by Tundra to establish Sinclair Unit No. 13 (Section 33 Township 8 Range 29 and the S/2 Section 4 Township 9 Range 29) and implement a Secondary Waterflood EOR scheme within the Three Forks and Middle Bakken formations as outlined on [Figure 2](#).

The proposed project area falls within the existing designated 01-62B Bakken-Three Forks Pool of the Daly Sinclair Oilfield ([Figure 3](#)).

## **CONCLUSIONS**

1. The proposed Sinclair Unit No. 13 will include 4 producing horizontal wells and 16 producing vertical wells, within 24 Legal Sub Divisions (LSD) of the Middle Bakken/Three Forks producing reservoir. The project is located northwest of Sinclair Unit No. 6 (Figure 2).
2. Total Net Original Oil in Place (OOIP) in Sinclair Unit No. 13 has been calculated to be **1586 e3m3** (9975.7 thousand barrels or Mbbl) for an average of **39.65 e3m3** (415.65 Mbbl) net OOIP per 40 acre LSD.
3. Cumulative production to the end June 2014 from the 20 wells within the proposed Sinclair Unit No. 13 project area was 85.5 e3m3 (537.7 Mbbl) of oil, and 34.1 e3m3 (215.1 Mbbl) of water, representing a **5.4%** Recovery Factor (RF) of the Net OOIP.
4. Estimated Ultimate Recovery (EUR) of Primary Proved Producing oil reserves in the proposed Sinclair Unit No. 13 project area has been calculated to be **143.8 e3m3** (904.7 Mbbl), with **57.3 e3m3** (360.8 Mbbl) remaining as of the end of June 2014 (Figure 7). There are 8 undrilled LSDs within the proposed unit boundary for which 8 vertical wells are planned. The eight wells are estimated to add an additional **15.9 e3m3** (100 Mbbl) of oil reserves from current primary production. The Estimated Ultimate Recovery calculation includes the forecasted primary production of these eight future vertical wells.
5. Ultimate oil recovery of the proposed Sinclair Unit No. 13 OOIP, under the current Primary Production method, is forecasted to be **9.06%**.
6. Figure 4 shows the production from the Sinclair Unit No. 13 which peaked in November 2007 at **63.3 m3** (398.5 bbl) of oil per day (OPD). As of June 2014, production was **33.2 e3m3** (208.3 bbl) OPD, **11.4 m3** (70.1 bbl) of water per day (WPD) and a 25.5% watercut.
7. In November 2007, production averaged **4.5 m3** (28.4 bbl) OPD per well in Sinclair Unit No. 13. As of June 2014, average per well production has declined to **1.8 m3** (11.57 bbl) OPD. Decline analysis of the group primary production data forecasts total oil to continue declining at an annual rate of approximately **13.14%** in the project area.
8. Estimated Ultimate Recovery (EUR) of proved oil reserves under Secondary WF EOR for the proposed Sinclair Unit No. 13 has been calculated to be **219 e3m3** (1,378 Mbbl), with **131.5 e3m3** (827.2 Mbbl) remaining (Figure 9). An incremental **75.2 e3m3** (473.3 Mbbl) of proved oil reserves, or **4.7%**, are forecasted to be recovered under the proposed Unitization and Secondary EOR production vs the existing Primary Production method.
9. Total RF under Secondary WF in the proposed Sinclair Unit No. 13 is estimated to be **13.7%**. This includes recovery from planned future drills, which would add an estimated **0.53%**
10. Based on waterflood response in the adjacent main portion of the Sinclair field, the Three Forks and Middle Bakken Formations in the proposed project area are believed to be suitable reservoirs for WF EOR operations.
11. Future horizontal injectors, with multi-stage hydraulic fractures, will be drilled between existing vertical & horizontal producing wells (Figure 5) within the proposed Sinclair Unit No.

13, to complete waterflood patterns with effective 20 acre spacing similar to that of Sinclair Units 1, 2, 3, 6, 7, 8 and 10.

## **DISCUSSION**

### **RESOURCE POTENTIAL IN PROPOSED SINCLAIR UNIT NO. 13**

The proposed Sinclair Unit No. 13 project area is located within Townships 8 and 9, Range 29 W1 of the Daly Sinclair oil field. The proposed Sinclair Unit No. 13 currently consists of 4 producing horizontal wells and 16 producing vertical wells, within an area covering 24 LSDs (Figure 2). This includes Section 33 of Township 8 Range 29 and the south half of Section 4 in Township 9 Range 29. A project area well list complete with recent production statistics is attached as Table 3.

Tundra believes that the waterflood response in the adjacent main portion of the Sinclair field demonstrates potential for incremental production and reserves from a Water Flood (WF) Enhanced Oil Recovery (EOR) project in the subject Middle Bakken and/or Three Forks oil reservoirs.

### **Geology**

#### **Stratigraphy:**

The stratigraphy of the producing section in Unit 13 is shown on the structural cross section attached as Appendix 1. The line of section is shown on each of the maps attached as appendices and runs Northwest-Southeast approximately through the mid-point of Unit 13. The producing section in descending order consists of the Upper Bakken Shale, Middle Bakken Siltstone, Lyleton Siltstone, the Red Shale Marker, Lyleton B Siltstone and the Torquay silty shale. The reservoir units are represented by the Middle Bakken, Lyleton A and Lyleton B Siltstones. The Upper Bakken Shale is a black, organic rich, platy shale which forms the top seal for the underlying Middle Bakken/Lyleton reservoirs. The Red Shale Marker is a very fine grained, dolomitic siltstone which effectively forms an aquitard between the Lyleton A and B reservoirs.

#### **Sedimentology:**

The Middle Bakken reservoir consists of fine to coarse grained grey siltstone to fine sandstone which may be subdivided on the basis of lithologic characteristics into upper and lower units. The upper portion is very often heavily bioturbated and is generally non-reservoir. These bioturbated beds often contain an impoverished fauna consisting of well-worn brachiopod, coral and occasional crinoid fragments suggesting deposition in a marginal marine environment. The lower part of the Middle Bakken is generally finely laminated with alternating light and dark laminations with occasional bioturbation. Reservoir quality is highly variable within the Unit area. Over most of the area of Unit 13, the Middle Bakken is generally about 1-1.5 m thick, thickening up to greater than 2 m towards the western side of Unit 13 where the underlying Lyleton A is thinned by erosion (Appendix 2).

The Lyleton A reservoir within the area of Unit 13 consists of buff to tan medium to coarse siltstone (occasionally fine sandstone) made up of quartz, feldspar and detrital dolomite with

minor mica and clay mostly in the form of clay clasts or chips. Clays do not generally occur as pore filling material, but rather as discrete grains within the siltstone. The coarser siltstones are interbedded with finer grained grey-green siltstone similar in composition to the reservoir siltstone, but generally with lower permeability (i.e. < 0.1 md). The lower part of the Lyleton A generally shows a greater proportion of fine-grained siltstone than the Upper and is generally a poorer reservoir. It also tends to show a greater amount of haloturbation which further reduces the reservoir quality. Within the area of Unit 13 the Lyleton A is generally between 7 and 9 m thick, but it thins toward the Western edge of Unit 13 as a result of pre-Middle Bakken erosion removing the upper part of the Lyleton A. This thinning is particularly pronounced in the NW part of Unit 6 where the Lyleton A thins to a zero edge in LSD's 3, 5 and 6 in section 04 (Appendix 3).

The Red Shale Marker forms an aquitard between the Lyleton A and B reservoirs and consists of brick red dolomitic siltstone which is highly water soluble. The Red Shale Marker is generally between 3 and 4 m thick with the Unit area (Appendix 4).

The Lyleton B in Unit 13 is similar to the Lyleton A, but with thinner beds of siltstone interbedded with darker grey-green or red-purple very fine grained siltstone which is generally non-reservoir. The siltstone beds display variable reservoir quality, but the quality is generally less than that in the Lyleton A. The Lyleton B is generally between 4.5 and 6 m thick in Unit 13 and shows no evidence of erosional thinning within the Unit area (Appendix 5).

The Torquay (Three Forks) forms the base of the Unit 13 reservoir sequence and is a brick red-purple dolomitic fine to very fine siltstone that forms a good basal seal to the Lyleton B reservoir.

#### **Structure:**

Structure contour maps are provided for the top of each major reservoir and non-reservoir unit (Appendices 6 through 10). The structure within the area of Unit 13 generally consists of a gentle dip to the SE. Circular shaped lows as shown on the Middle Bakken Structure map (Appendix 2) in LSD's 08 and 09 of Section 04 are likely the result of post Upper Bakken dissolution of the underlying Prairie Evaporites. These solution lows represent potential hazards when drilling and completing horizontal injectors but do not appear to represent continuous barriers to lateral fluid flow within the reservoir as they do not interrupt the lateral continuity of the reservoir beds (see cross section Appendix 1).

No direct evidence of natural faulting is noted from either proprietary seismic data or well/production data in the vicinity of the Unit 13 area, although the presence of such faults/fractures may be interpreted by the presence of the salt dissolution lows. Whether or not such fracture systems conduits for vertical flow across the vertical flow barriers such as the Red Shale Marker is also indeterminate, although if such flow were possible it is highly likely the overlying Upper Bakken shale would have been compromised and the Sinclair hydrocarbon system would have been breached before the emplacement of the hydrocarbon charge which occurred much later than the salt dissolution. Any breaches in the Upper Bakken top seal must have been effectively sealed before this event and it is likely that any breaches in the Red Shale Marker would also have been sealed as well as there are hydrocarbons trapped in the Lyleton B reservoir at least as far downdip as in the Lyleton A and Middle Bakken reservoirs.

### **Reservoir Continuity:**

Lateral continuity of the reservoir units is an essential requirement of a successful waterflood and as demonstrated by the cross section (Appendix 1) and the isopach maps, the lateral continuity of the reservoir in Unit 13 is very good. None of the major reservoir units can be shown to be depositionally thin laterally and where thinning does occur it can be demonstrated to be by pre-Middle Bakken erosion removing the upper part of the Lyleton A reservoir. Vertical continuity between the Middle Bakken and underlying Lyleton A reservoir is also good as there is no evidence of an intervening aquitard between these units. In fact it can be difficult even in core to pick the unconformity surface between these units. The vertical continuity between the Lyleton A and Lyleton B reservoirs is obviously non-existent due to the presence of the Red Shale Marker which represents an effective barrier to vertical flow (Appendix 1). However since the horizontal injector wells will be frac'd, vertical conductivity should be established at least in the area of the induced fractures.

### **Reservoir Quality:**

Porosity ( $\Phi$ -h in por\*m) and permeability (k-h in mD\*m) maps for the three main reservoir units are provided. These maps are generated using core data and are generated as follows. First the core is divided into the reservoir units present. This data is then subject to a 1.0 md cutoff on the permeability and intervals that meet or exceed this criteria are multiplied by the interval thickness and then summed to get the total value for the  $\Phi$ -h or k-h for that particular reservoir unit. This cutoff is similar to the cutoff used by GLJ to generate the OOIP, but doesn't utilize the 12 percent porosity cutoff since for core data the 1 md cutoff effectively removes all porosity less than 12 percent.

As can be noted from the  $\Phi$ -h and k-h maps the bulk of the reservoir in Unit 13 is contained in the Lyleton A section. It is important to note however that the 1.0 md cutoff effectively ignores a considerable pore volume with permeability between 0.2 and 0.99 md that may contain moveable oil. Maps of  $\Phi$ -h and k-h for the Middle Bakken are included as Appendices 11 and 12, Lyleton A maps as Appendices 13 and 14 and Lyleton B maps for the project area as Appendices 15 and 16.

### **Fluid Contacts:**

The oil/water contact for the Middle Bakken and Lyleton reservoir is estimated from production to be at about -525 m subsea. In tight reservoirs such as these the transition zone could be considerable and the top of the transition zone is estimated to be at about -490 m subsea based on production and simulation studies of the reservoir. As mapped these contacts are too far down dip to appear on any of the maps in this application as the minimum structure displayed on the Top Middle Bakken structure map is about -420 m subsea.

## **Gross OOIP Estimates**

OOIP were calculated by Tundra Geologists Barry Larson and Todd Neely. Barry hold a BSc. in Geology from the U of S, and has 35 years of industry experience, 19 of which are in the Williston Basin. Todd Neely holds a BSc. in Geology from the University of Manitoba, and has 15 years of industry experience, 4 of which are in the Williston Basin. The dataset used to determine the OOIP values for Unit 13 was originally compiled by Barry Larson. It consists of conventional core analysis of all available core in the Sinclair area. Todd took over Barry's dataset in 2012. Ultimately, OOIP values for Unit 13 were generated by Todd, using Barry's original dataset.

Total volumetric OOIP for the Middle Bakken, Lyleton 'A', and Lyleton 'B' members of the Three Forks formation, within the proposed Sinclair Unit No. 13, has been calculated to be **9975.7** Mbbl. **Table 4** outlines the proposed Sinclair Unit No. 13 volumetric OOIP estimates on an individual LSD basis by formation. Average OOIP by individual LSD was determined to be **498.7** Mbbl for Sinclair Unit No. 13.

OOIP values were calculated with a 1.0 millidarcy (mD) permeability cutoff in the Upper and Lower Lyleton 'A' zone and a 0.5 millidarcy (mD) permeability cutoff for the Lyleton 'B' and Middle Bakken zones and a 15.4% porosity net pay cutoff.

A complete listing of Middle Bakken/Three Forks formation rock and fluid properties used to characterize the reservoir are provided in **Table 5**.

## **Historical Production**

A historical group production history plot for the proposed Sinclair Unit No. 13 is shown as **Figure 4**. Oil production commenced from the proposed Unit area in November 2005 and peaked in November 2007 at **63.3** m3 OPD. As of June 2014, production was **33.2** e3m3 OPD, **11.4** m3 WPD and a 25.5% watercut.

From peak production in November 2007 to date, oil production from the vertical wells is declining at an annual rate of approximately **7.2%** under the current Primary Production method.

Based on the geological description, primary production decline rate, and waterflood response in the adjacent main portion of the Sinclair field, the Three Forks and Middle Bakken Formations in the project area are believed to be suitable reservoirs for water flood EOR operations.

## **UNITIZATION**

Unitization and implementation of a Waterflood EOR project is forecasted to increase overall recovery of OOIP from the proposed project area. The basis for unitization is to develop the lands in an effective manner that will be conducive to waterflooding.

### **Unit Name**

Tundra proposes that the official name of the new Unit shall be Sinclair Unit No. 13.

### **Unit Operator**

Tundra Oil and Gas Partnership (Tundra) will be the Operator of record for Sinclair Unit No. 13.

### **Unitized Zone**

The Unitized zone(s) to be waterflooded in the Sinclair Unit No. 13 will be the Middle Bakken and Three Forks formations.

### **Unit Wells**

The 4 horizontal wells and 16 vertical wells to be included in the proposed Sinclair Unit No. 13 are outlined in **Table 3**.

### **Unit Lands**

The Sinclair Unit No. 13 will consist of 24 LSDs as follows:

Section 33 of Township 8, Range 29, W1M  
S ½ of Section 4 of Township 9, Range 29, W1M

The lands included in the 40 acre tracts are outlined in **Table 1**.



### **Tract Factors**

The proposed Sinclair Unit No. 13 will consist of 24 Tracts based on the 40 acre LSD containing the existing 4 horizontal and 16 vertical producing wells.

The Tract Factor contribution for each of the LSD's within the proposed Sinclair Unit No. 13 was calculated as follows:

- Gross OOIP by LSD, minus cumulative production to date for the LSD as distributed by the LSD specific Production Allocation (PA) % in the applicable producing horizontal or vertical well (to yield Remaining Gross OOIP)
- Tract Factor by LSD = the product of Remaining Gross OOIP by LSD as a % of total proposed Unit Remaining Gross OOIP

Tract Factor calculations for all individual LSDs based on the above methodology are outlined within **Table 2**.

### **Working Interest Owners**

**Table 1** outlines the working interest (WI) for each recommended Tract within the proposed Sinclair Unit No. 13. Tundra Oil and Gas Partnership holds a 100% WI ownership in all the proposed Tracts.

Tundra Oil and Gas Partnership will have a 100% WI in the proposed Sinclair Unit No. 13.

## **WATERFLOOD EOR DEVELOPMENT**

### **Technical Studies**

The waterflood performance predictions for the proposed Sinclair Unit No. 13 Bakken project are based on internal engineering assessments as well as independent reserve auditors. Project area specific reservoir and geological parameters were utilized and then compared to Sinclair Unit No. 1 parameters, yielding the WF EOR response observed there to date.

As Tundra has a direct comparison of waterflood performance in Sinclair Unit 1, Tundra does not feel it is crucial to construct a simulation model for this area.

### **Pre-Production of New Horizontal Injection Wells**

New horizontal injection wells will be drilled between the existing vertical producing wells as shown in **Figure 5**. Four (4) future horizontal injection wells have been drilled to date with plans to drill an additional two (2) horizontal water injection wells (WIW's), which will result in an effective 20 acre line drive waterflood pattern within Sinclair Unit No. 13.

Primary production from the original vertical/horizontal producing wells in the proposed Sinclair Unit No. 13 has declined significantly from peak rate indicating a need for secondary pressure support. However, through the process of developing similar waterfloods, Tundra has measured a significant variation in reservoir pressure depletion by the existing primary producing wells. Placing new horizontal wells immediately on water injection in areas without significant reservoir pressure depletion has been problematic in similar low permeability formations, and has a negative impact on the ultimate total recovery factor of OOIP.

Considering the expected reservoir pressures and reservoir lithology described, Tundra believes an initial period of producing all 6 new horizontal wells (4 wells are already drilled and on the pre-injection production period) prior to placing them on permanent water injection is essential and all Unit mineral owners will benefit.

Tundra monitors reservoir pressure, fluid production and decline rates in each pattern to determine when the well will be converted to water injection.

### **Reserves Recovery Profiles and Production Forecasts**

The primary waterflood performance predictions for the proposed Sinclair Unit No. 13 are based on oil production decline curve analysis, and the secondary predictions are based on internal engineering analysis performed by the Tundra reservoir engineering group using Sinclair Unit No. 1 as an analogy because it is developed with a similar waterflood pattern design of a horizontal injector with offsetting vertical producers.

#### **Primary Production Forecast**

Cumulative production in the Sinclair Unit No. 13 project area, to the end of June 2014 from 20 wells, was **87.5** e3m3 of oil, and **34.1** e3m3 of water for a recovery factor of **5.5%** of the calculated Net OOIP.

Ultimate Primary Proved Producing oil reserves recovery for Sinclair Unit No. 13 has been estimated to be **904.7** Mbbbl, or a **9.06%** Recovery Factor (RF) of OOIP. Remaining Producing Primary Reserves has been estimated to be **56.2** e3m3 to the end of June 2014. The expected production decline and forecasted cumulative oil recovery under continued Primary Production is shown in **Figures 7-8**.

There are 8 LSDs which currently do not have producing wells. Tundra plans to drill 8 vertical wells in the undrilled LSDs as shown in **Figure 5**. Tundra estimates that the new drills should add approximately 15.9 e3m3 of reserves from primary production methods. The Estimated Ultimate Recovery value of 143.8 e3m3 includes the forecasted primary production of these eight future vertical wells.

#### Pre-Production Schedule/Timing for Conversion of Horizontal Wells to Water Injection

Tundra will plan an injection conversion schedule to allow for the most expeditious development of the waterflood within the proposed Sinclair Unit No. 13, while maximizing reservoir knowledge.

#### Criteria for Conversion to Water Injection Well

Tundra will monitor the following parameters to assess the best timing for each individual horizontal well to be converted from primary production to water injection service.

- Measured reservoir pressures at start of and/or through primary production
- Fluid production rates and any changes in decline rate
- Any observed production interference effects with adjacent vertical and horizontal wells
- Pattern mass balance and/or oil recovery factor estimates
- Reservoir pressure relative to bubble point pressure

Six (6) horizontal injection wells are required for this proposed Unit. They will be placed on production followed by permanent water injection service as shown in **Figure 5**. No existing vertical producer wells within the proposed Sinclair Unit No. 13 project are planned for conversion to water injection, as oil production response is better with horizontal injectors than with four vertical injectors.

The above schedule allows for the proposed Sinclair Unit No. 13 project to be developed equitably, efficiently, and moves to project to the best condition for the start of waterflood as quickly as possible. It also provides the Unit Operator flexibility to manage the reservoir conditions and response to help ensure maximum ultimate recovery of OOIP.

#### Secondary EOR Production Forecast

The proposed project oil production profile under Secondary Waterflood has been developed based on the response observed to date in the Sinclair Pilot WF (**Figure 6**).

The proposed Sinclair Unit No. 13 Secondary Waterflood oil production forecast over time is plotted on **Figure 9**. Total Proved EOR recoverable reserves in the proposed Sinclair Unit No. 13 project under Secondary WF has been estimated at **1378** Mbbbl (**Figure 10**), resulting in a **13.7%** overall RF of calculated Net OOIP.

An incremental **473.3** Mbbl of oil reserves is forecasted, based on a recovery factor estimate using Sinclair Units 1-3 analogy, to be recovered under the proposed Unitization and Secondary EOR production scheme vs. the existing Primary Production method. Incremental Secondary RF is forecasted to be **4.7%** of the calculated OOIP.

### **Estimated Fracture Pressure**

Completion data from the existing producing wells within the project area indicate an actual fracture pressure gradient range of 18.5 to 22.0 kPa/m true vertical depth (TVD). Tundra expects the fracture gradient encountered during completion of the proposed horizontal injection well will be somewhat lower than these values due to expected reservoir pressure depletion.

## **WATERFLOOD OPERATING STRATEGY**

### **Water Source**

The injection water for the proposed Sinclair Unit No. 13 will be supplied from the existing Sinclair Units 1-8 source and injection water system. All existing injection water is obtained from the Lodgepole formation in the 102/16-32-7-29W1 licensed water source well. Lodgepole water from the 102/16-32 source well is pumped to the main Sinclair Units Water Plant at 3-4-8-29W1, filtered, and pumped up to injection system pressure. A diagram of the Sinclair water injection system and new pipeline connection to the proposed Sinclair Unit No. 13 project area injection wells is shown as **Figures 13-14**.

Produced water is not currently used for any water injection in the Tundra operated Sinclair Units and there are no current plans to use produced water as a source supply for Sinclair Unit No. 13

Since all producing Middle Bakken/Three Forks wells in the Daly Sinclair areas, whether vertical or horizontal, have been hydraulically fractured, produced waters from these wells are inherently a mixture of Three Forks and Bakken native sources. This mixture of produced waters has been extensively tested for compatibility with 102/16-32 source Lodgepole water, by a highly qualified third party, prior to implementation by Tundra in Sinclair Unit 1. All potential mixture ratios between the two waters, under a range of temperatures, have been simulated and evaluated for scaling and precipitate producing tendencies. Testing of multiple scale inhibitors has also been conducted and minimum inhibition concentration requirements for the source water volume determined. At present, continuous scale inhibitor application is maintained into the source water stream out of the Sinclair injection water facility. Review and monitoring of the source water scale inhibition system is also part of an existing routine maintenance program.

### **Injection Wells**

New water injection wells for the proposed Sinclair Unit No. 13 will be drilled, cleaned out, and configured downhole for injection as shown in **Figure 12**. The horizontal injection well will be stimulated by multiple hydraulic fracture treatments to obtain suitable injection rates in either an openhole or cemented liner completion. Tundra has extensive experience with horizontal fracturing in the area, and all jobs are rigorously programmed and monitored during execution. This helps ensure optimum placement of each

fracture stage to prevent, or minimize, the potential for out-of-zone fracture growth and thereby limit the potential for future out-of-zone injection.

The new water injection wells will be placed on injection after the pre-production period and approval to inject. Wellhead injection pressures will be maintained below the least value of either:

- the area specific known and calculated fracture gradient, or
- the licensed surface injection Maximum Allowable Pressure (MOP)

Tundra has a thorough understanding of area fracture gradients. A management program will be utilized to set and routinely review injection target rates and pressures vs. surface MOP and the known area formation fracture pressures.

All new water injection wells are surface equipped with injection volume metering and rate/pressure control (**Figure 13**). An operating procedure for monitoring water injection volumes and meter balancing will also be utilized to monitor the entire system measurement and integrity on a daily basis.

The proposed Sinclair Unit No. 13 horizontal water injection well rate is forecasted to average **10 – 25 m<sup>3</sup>** WPD, based on expected reservoir permeability and pressure.

### **Reservoir Pressure**

A bridge plug pressure survey test was taken at the 100/03-33-008-29W1 open hole vertical well in August 2014 (**Appendix 17**).

The bridge plug was set at a depth of 869.4 mKB and the well was shut in for a period of 25 days. The recorders were set at a depth of 870.4 mKB with a last measured stable pressure of 724.94 kPaa. This pressure is a suggestion of an expected pressure depletion, based in the average initial reservoir pressure of 9400 kPa in the Sinclair area.

### **Reservoir Pressure Management during Waterflood**

Tundra expects to inject water for a minimum 2-4 year period to re-pressurize the reservoir due to cumulative primary production voidage and pressure depletion. Initial monthly Voidage Replacement Ratio (VRR) is expected to be approximately 1.25 to 2.00 within the patterns during the fill up period. As the cumulative VRR approaches 1, target reservoir operating pressure for waterflood operations will be 75-90% of original reservoir pressure.

### **Waterflood Surveillance and Optimization**

Sinclair Unit No. 13 EOR response and waterflood surveillance will consist of the following:

- Regular production well rate and water cut testing
- Daily water injection rate and pressure monitoring vs target
- Water injection rate/pressure/time vs. cumulative injection plot
- Reservoir pressure surveys as required to establish pressure trends
- Pattern VRR

- Potential use of chemical tracers to track water injector/producer responses
- Use of some or all of: Water Oil Ratio (WOR) trends, Log WOR vs Cum Oil, Hydrocarbon Pore Volumes Injected, Conformance Plots

The above surveillance methods will provide an ever increasing understanding of reservoir performance, and provide data to continually control and optimize the Sinclair Unit No. 13 waterflood operation. Controlling the waterflood operation will significantly reduce or eliminate the potential for out-of-zone injection, undesired channeling or water breakthrough, or out-of-Unit migration.

The monitoring and surveillance will also provide early indicators of any such issues so that waterflood operations may be altered to maximize ultimate secondary reserves recovery from the proposed Sinclair Unit No. 13.

### **Economic Limits**

Under the current Primary recovery method, existing wells within the proposed Sinclair Unit No. 13 will be deemed uneconomic when the net oil rate and net oil price revenue stream becomes less than the current producing operating costs. With any positive oil production response under the proposed Secondary recovery method, the economic limit will be significantly pushed out into the future. The actual economic cut off point will then again be a function of net oil price, the magnitude and duration of production rate response to the waterflood, and then current operating costs. Waterflood projects generally become uneconomic to operate when Water Oil Ratios (WOR's) exceed 100.

### **WATER INJECTION FACILITIES**

The Sinclair Unit No. 13 waterflood operation will utilize the existing Tundra operated source well supply and water plant (WP) facilities located at 3-4-8-29 W1M which supplies the existing Sinclair Units.

A complete description of all planned system design and operational practices to prevent corrosion related failures is shown in [Figure 11](#).

### **NOTIFICATION OF MINERAL AND SURFACE RIGHTS OWNERS**

Tundra is in the process of notifying all mineral rights and surface rights owners of this proposed EOR project and formation of Sinclair Unit No. 13. Copies of the notices and proof of service, to all surface and mineral rights owners will be forwarded to the Petroleum Branch when available to complete the Sinclair Unit No. 13 Application.

Sinclair Unit No. 13 Unitization, and execution of the formal Sinclair Unit No. 13 Agreement by affected Mineral Owners, is expected during Q4. Copies of same will be forwarded to the Petroleum Branch, when available, to complete the Sinclair Unit No. 13 Application.

### **TUNDRA OIL & GAS PARTNERSHIP**

Calgary, AB

**Proposed Sinclair Unit No. 13**

**Application for Enhanced Oil Recovery Waterflood Project**

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## **Proposed Sinclair Unit No. 13**

### **Application for Enhanced Oil Recovery Waterflood Project**

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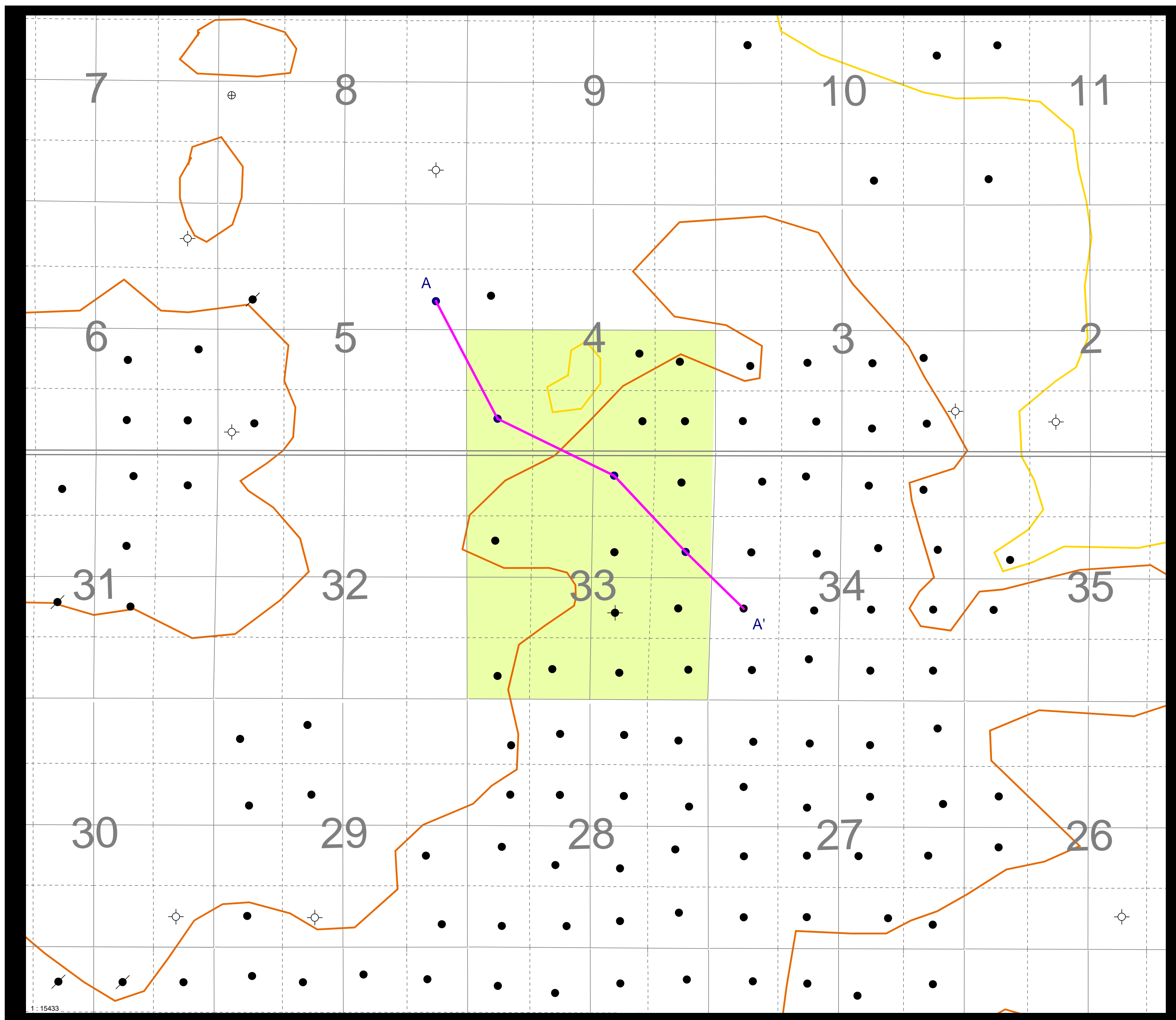
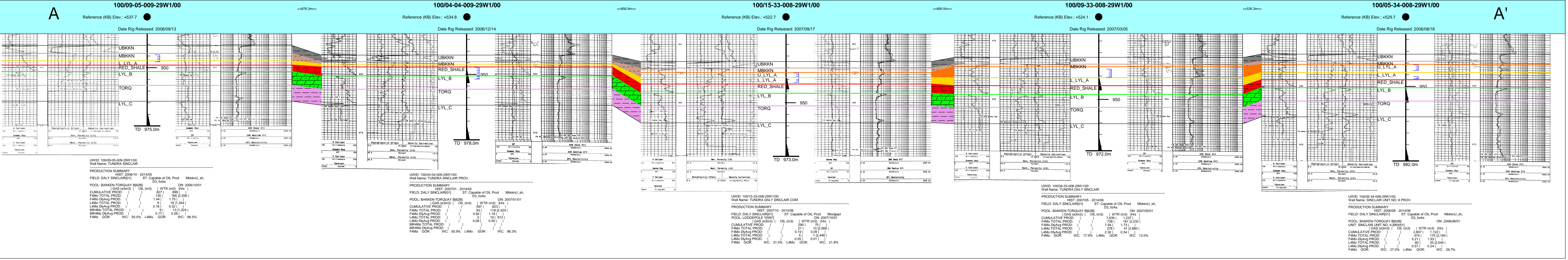


**Proposed Sinclair Unit No. 13**

**Application for Enhanced Oil Recovery Waterflood Project**

**List of Tables**

Table 1	Land Information and Tract Participation
Table 2	Tract Factor Calculations
Table 3	Current Well List and Status
Table 4	Original Oil in Place
Table 5	Reservoir PVT Properties



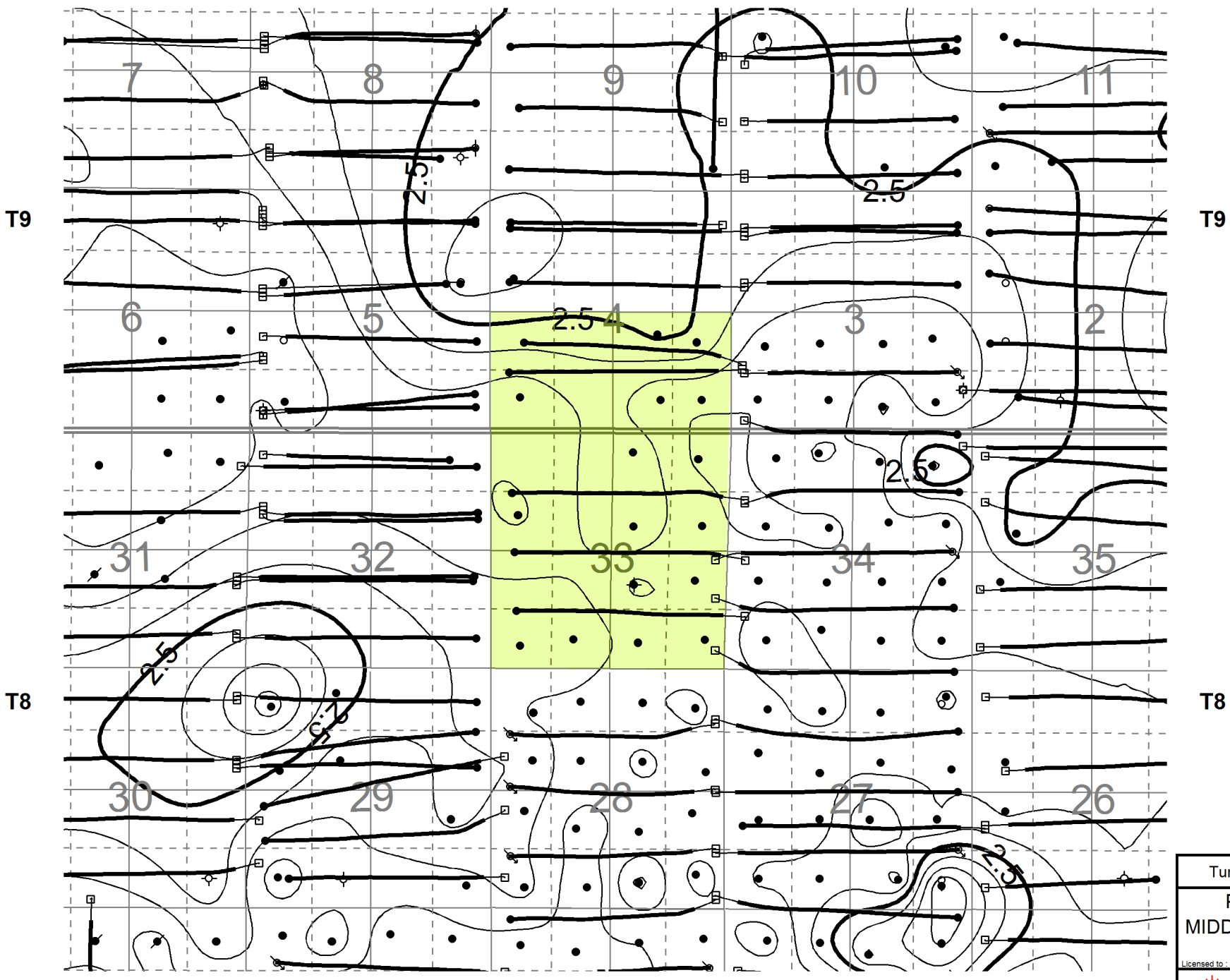
Tundra Oil & Gas Partnership  
 Structural Cross Section A - A'  
 Proposed Unit Area

Licensed to: Tundra Oil and Gas Ltd  
 Date: 20/10/2016  
 Datum: Sea Level | Ref: 0.0 m | Scale: 1:600  
 Interval: From UBKKN to TD

Appendix No. 1

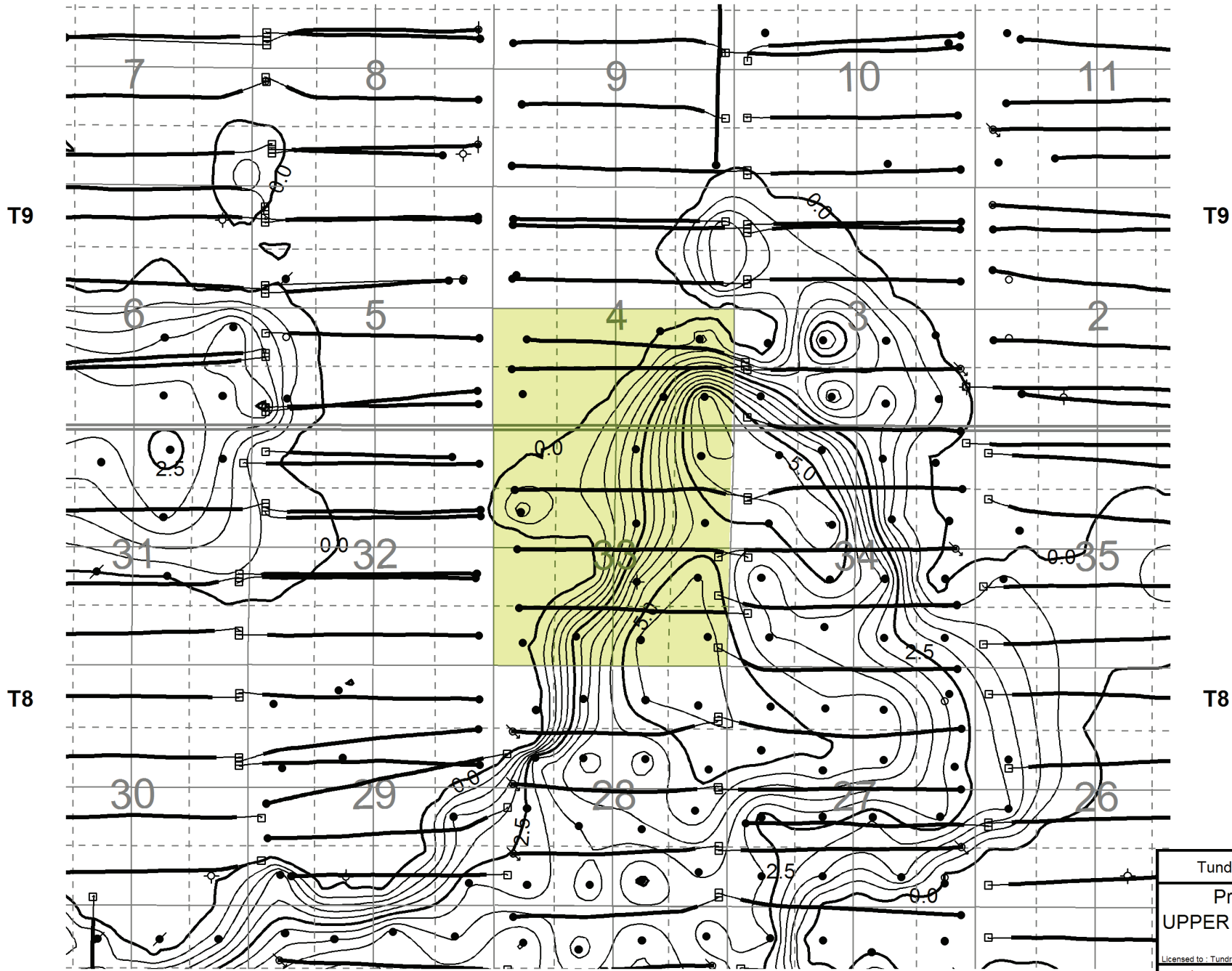
R29W1

# Appendix No. 2



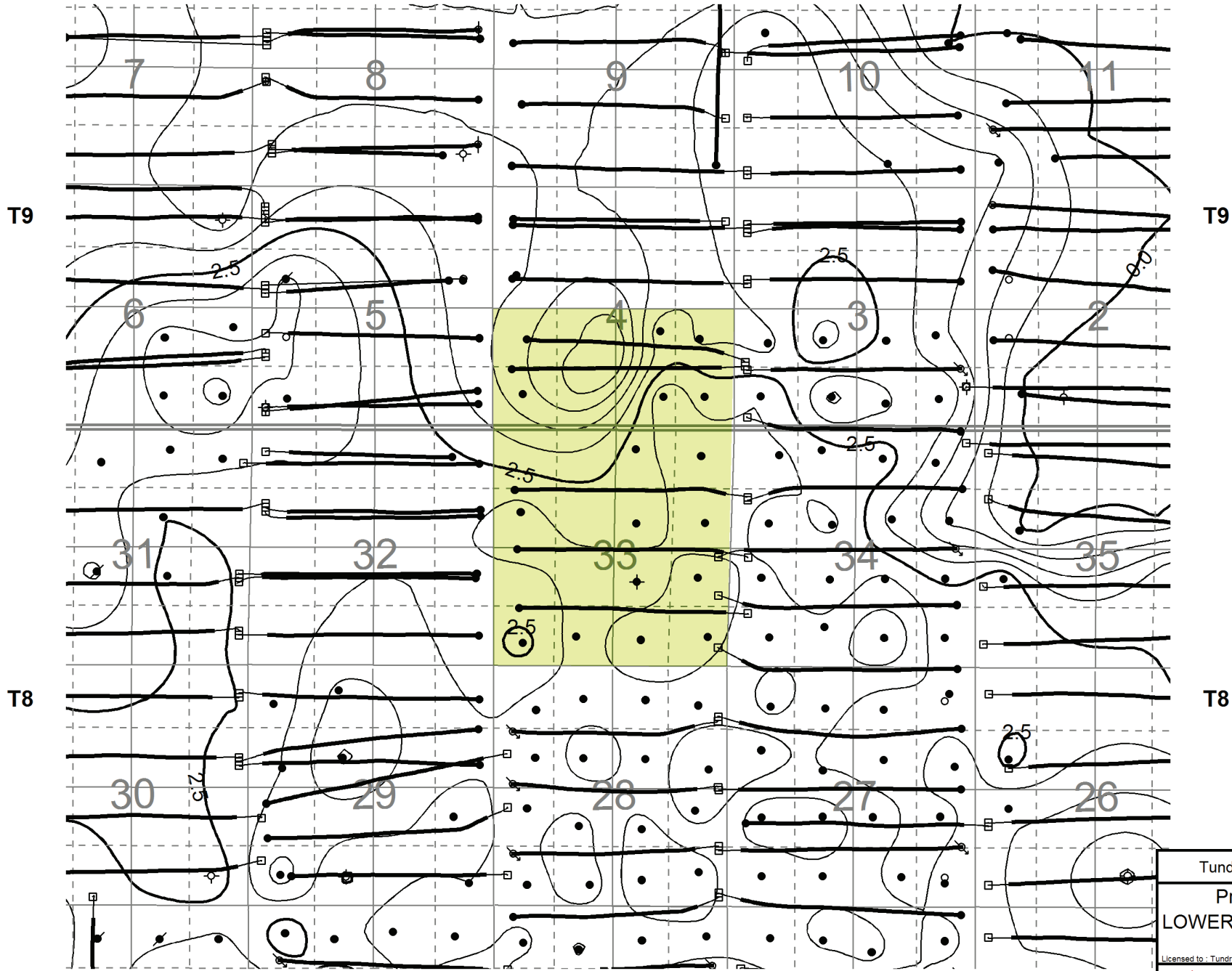
Tundra Oil & Gas Partnership	
Proposed Unit Area	
MIDDLE BAKKEN ISOPACH	
CI=0.5m	
Licensed to : Tundra Oil & Gas Partnership	
By : Hackert	Date : 2014/09/16
Scale = 1:36461	Project : Sinclair - Dalv
geOSCOUT	

R29W1



Tundra Oil & Gas Partnership	
Proposed Unit Area	
UPPER LYLETON A ISOPACH	
CI=0.5m	
Licensed to: Tundra Oil & Gas Partnership	
By: Hackert	Date: 2014/09/16
Scale: 1:36461	Project: Sinclair - Daly
geoSCOUT	

R29W1



T9

T9

T8

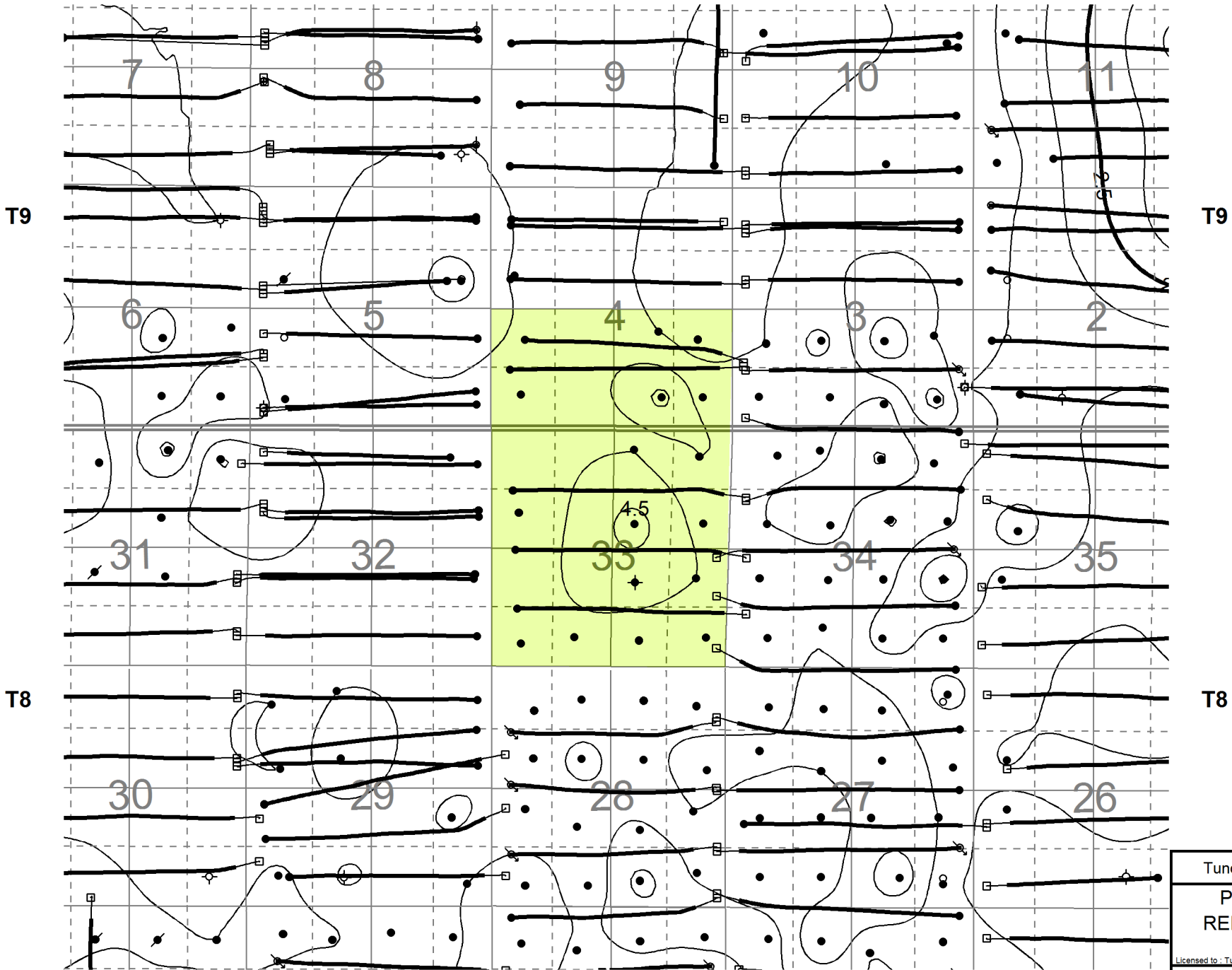
T8

R29W1

Tundra Oil & Gas Partnership	
Proposed Unit Area	
LOWER LYLETON A ISOPACH	
CI=0.5m	
Licensed to: Tundra Oil & Gas Partnership	Date: 2014/09/16
By: Hackerl	Scale = 1:36461
geOSCOUT	Project: Sinclair - Daly

R29W1

# Appendix No. 4

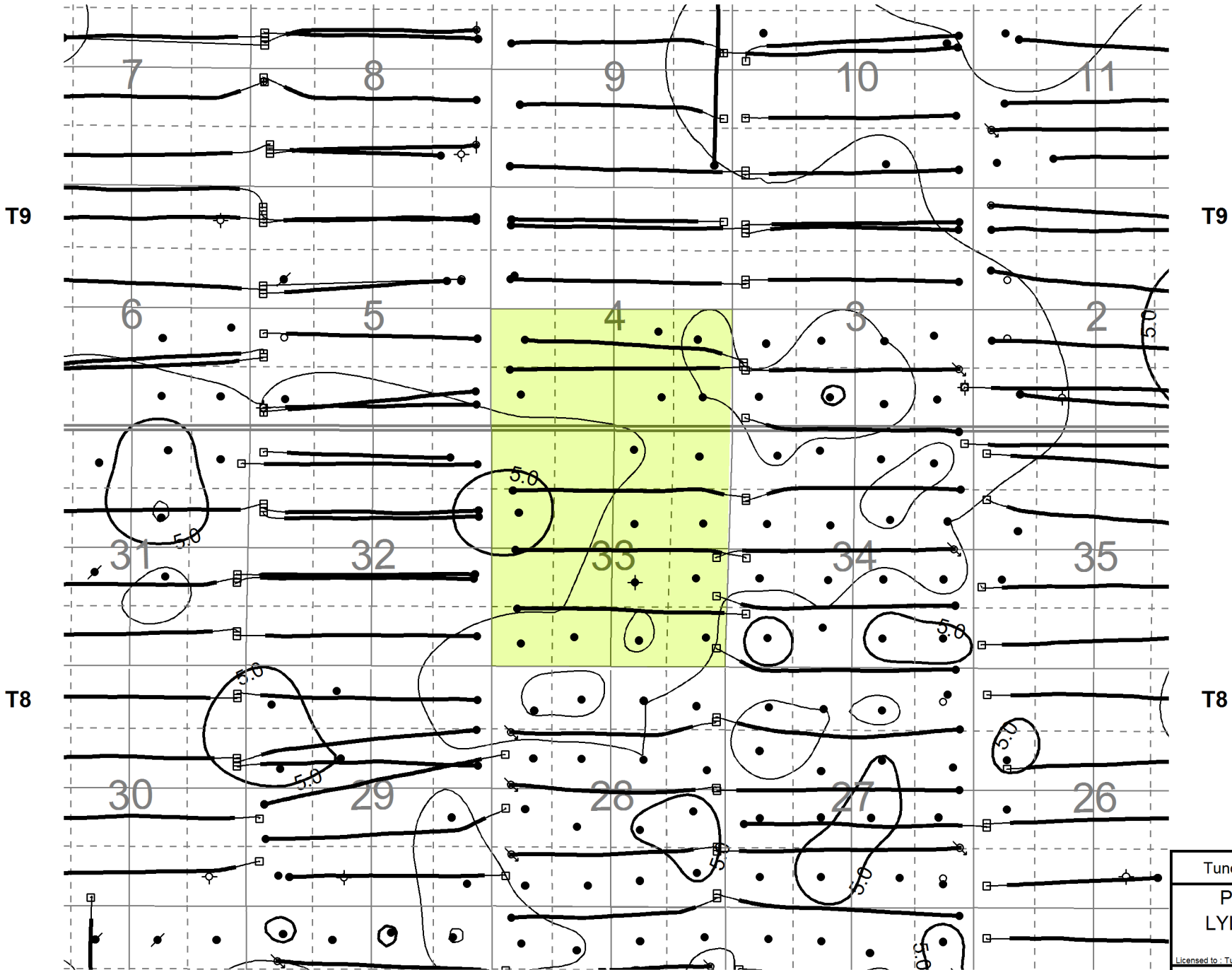


R29W1

Tundra Oil & Gas Partnership		
Proposed Unit Area		
RED SHALE ISOPACH		
CI=0.5m		
Licensed to : Tundra Oil & Gas Partnership		
By: Hackert	Date: 2014/09/16	
Scale = 1:36461	Project: Sinclair - Dalv	

R29W1

# Appendix No. 5

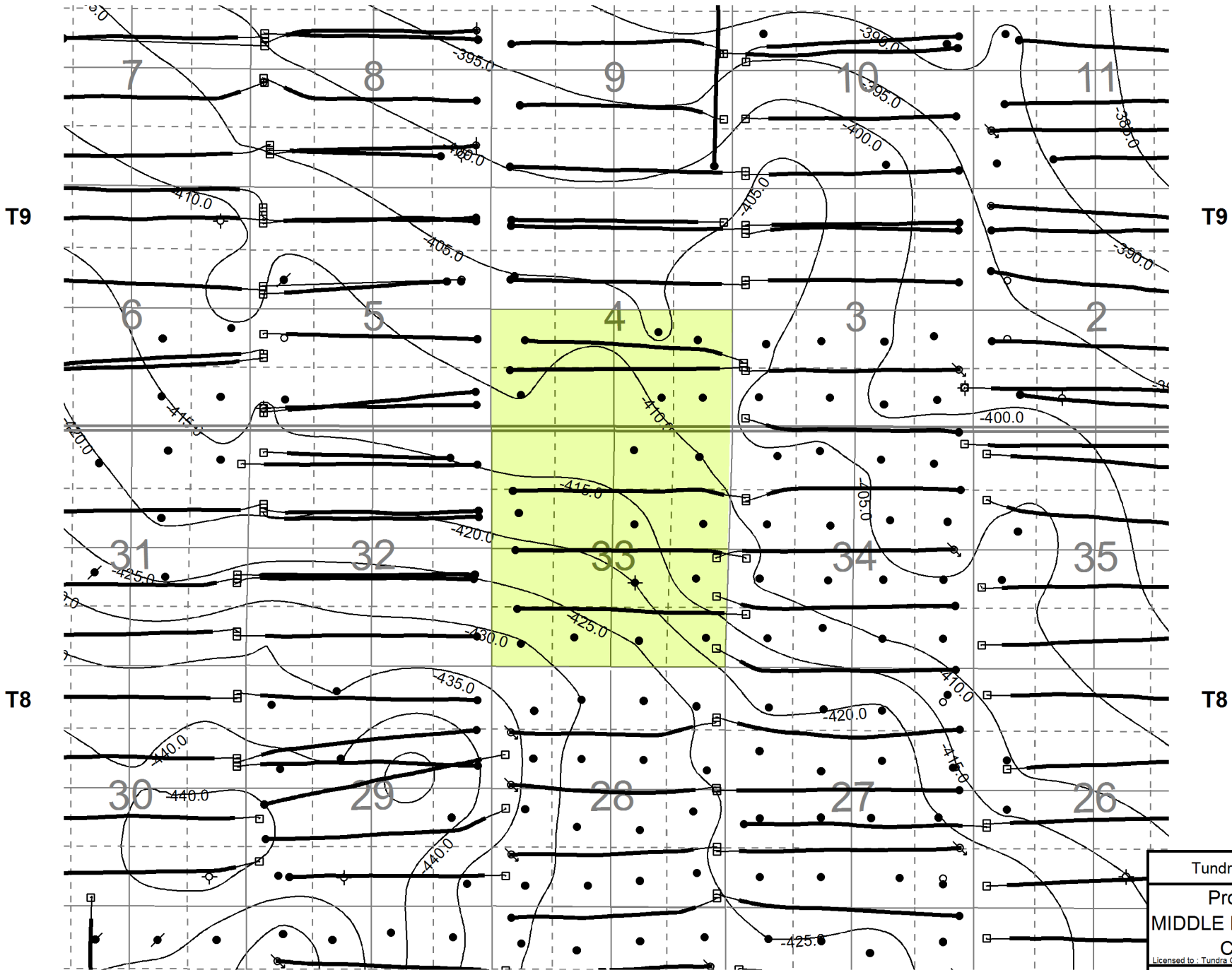


Tundra Oil & Gas Partnership		
Proposed Unit Area		
LYLETON B ISOPACH		
CI=0.5m		
Licensed to : Tundra Oil & Gas Partnership		
By: Hackert	Date: 2014/09/16	
Scale = 1:36461	Project: Sinclair - Dalv	

R29W1

R29W1

# Appendix No. 6



R29W1

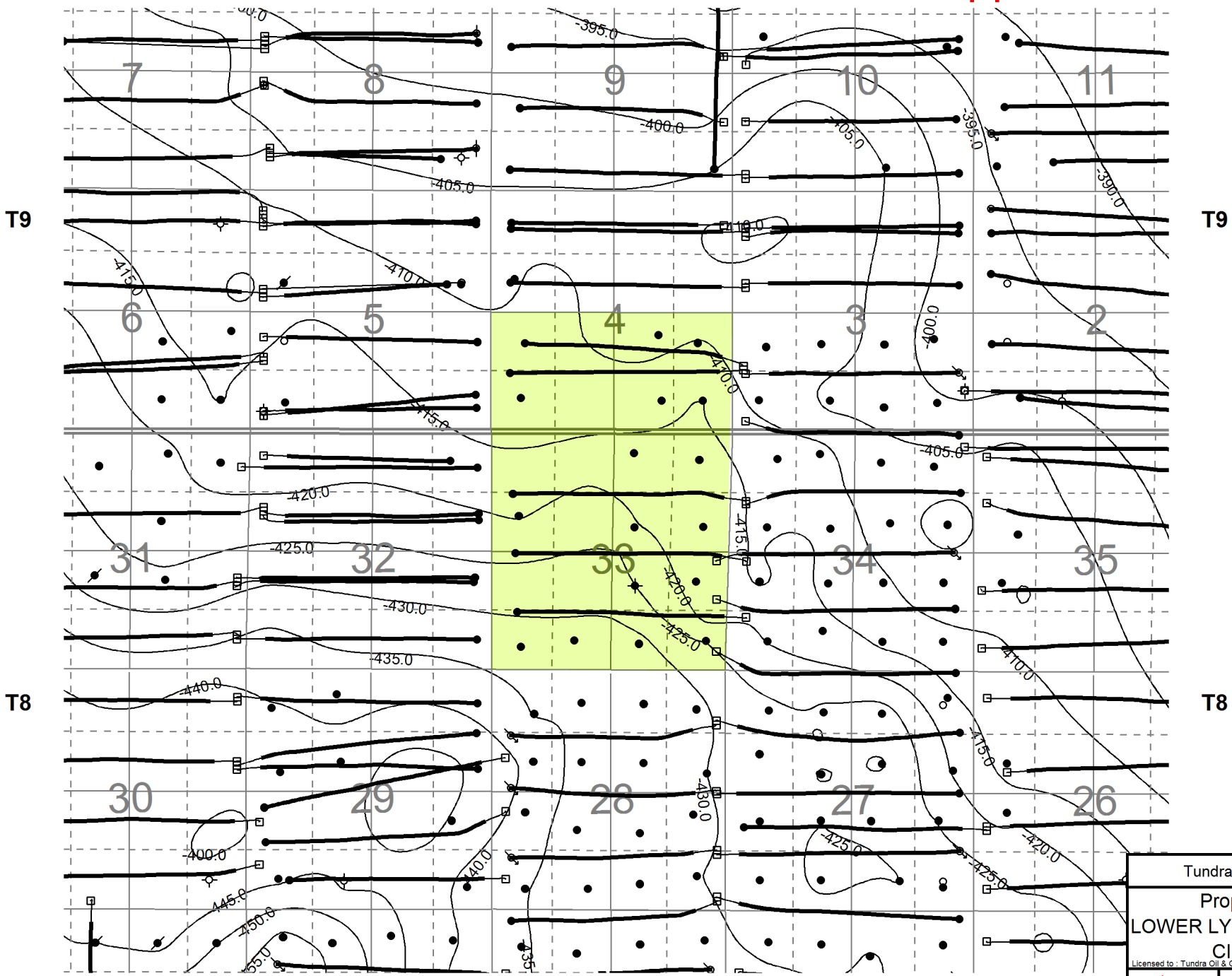
Tundra Oil & Gas Partnership	
Proposed Unit Area	
MIDDLE BAKKEN STRUCTURE	
CI=5.0m Subsea	
Licensed to : Tundra Oil & Gas Partnership	
By: Hacker	Date: 2014/09/16
Scale = 1:36461	Project: Sinclair - Dalv





R29W1

# Appendix No. 7

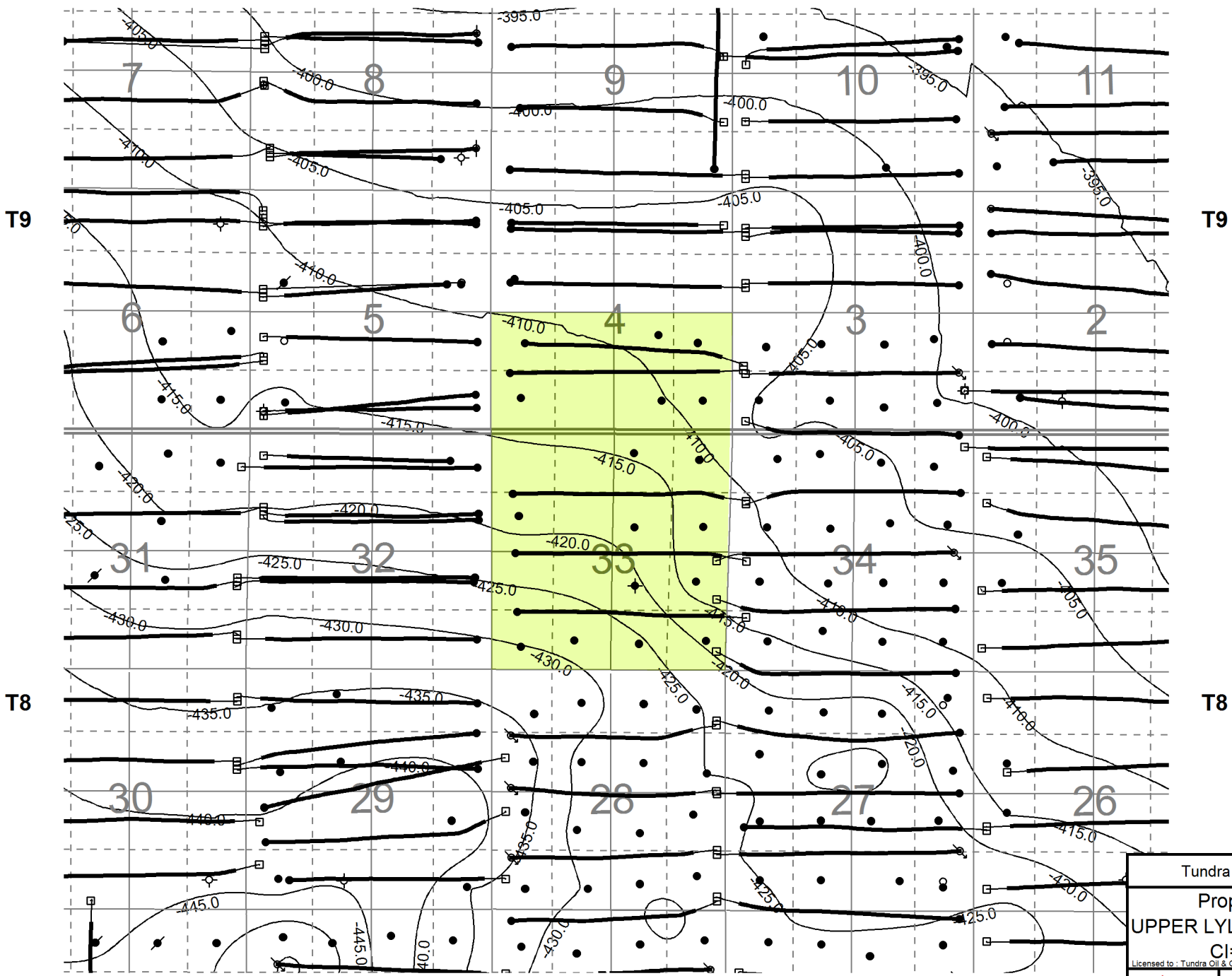


R29W1

Tundra Oil & Gas Partnership	
Proposed Unit Area	
LOWER LYLETON A STRUCTURE	
CI=5.0m Subsea	
Licensed to : Tundra Oil & Gas Partnership	
By : Hackert	Date : 2014/09/16
Scale = 1:36461	Project : Sinclair - Dglv



R29W1



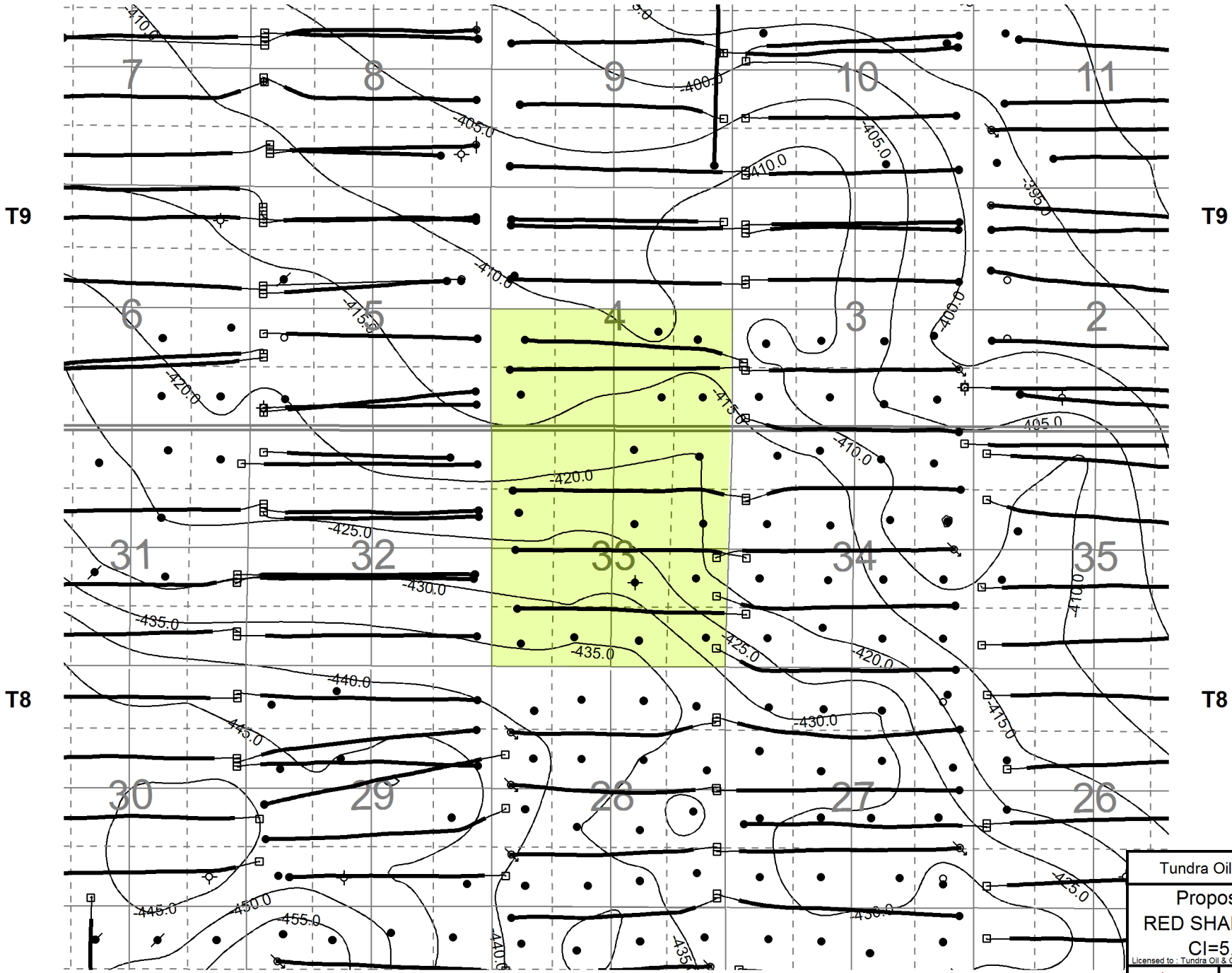
Tundra Oil & Gas Partnership		
Proposed Unit Area		
UPPER LYLETON A STRUCTURE		
CI=5.0m Subsea		
Licensed to : Tundra Oil & Gas Partnership		
By : Hackert	Date : 2014/09/16	
Scale = 1:36461	Project : Sinclair - Daly	

R29W1



# Appendix No. 8

R29W1



R29W1

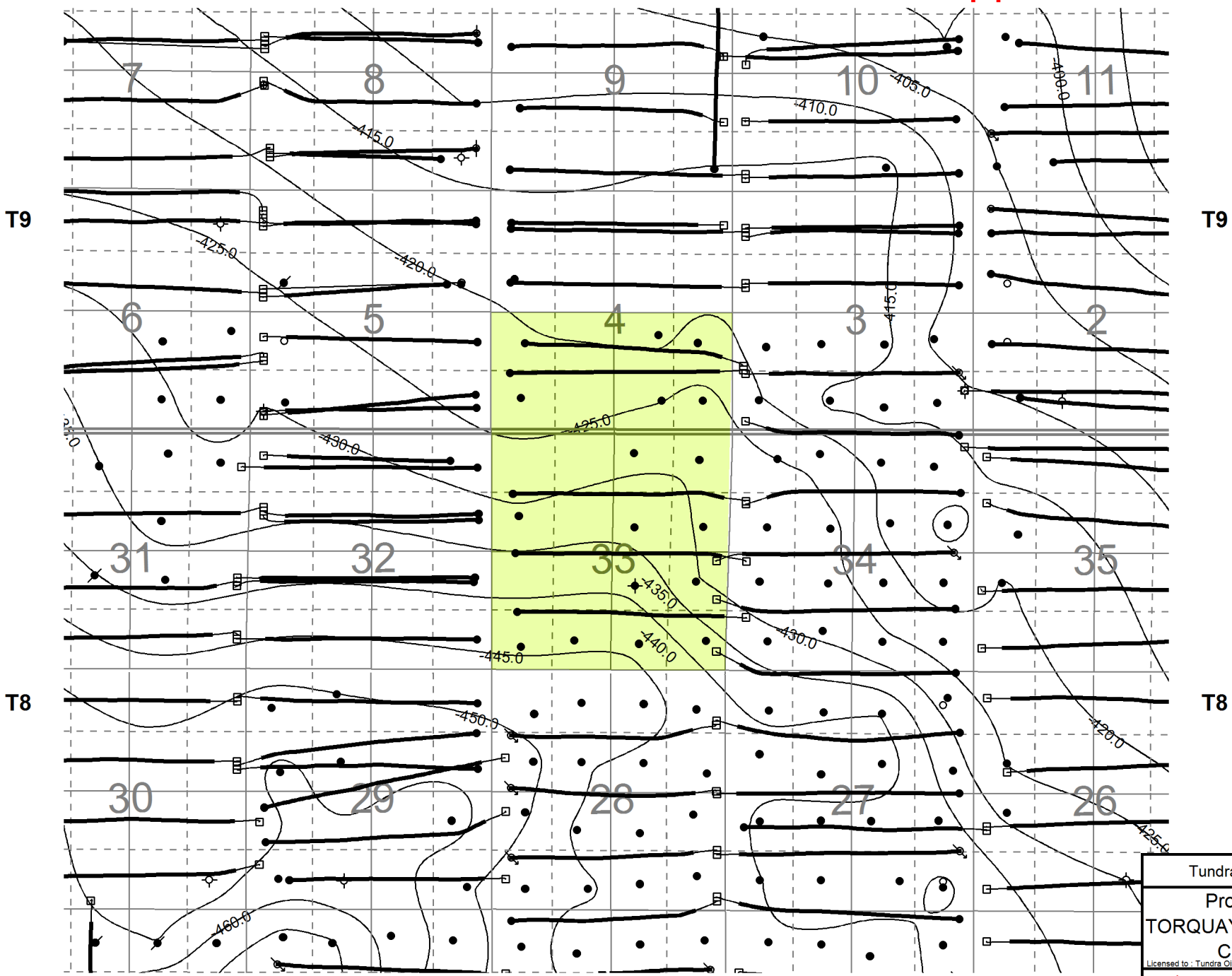
Tundra Oil & Gas Partnership	
Proposed Unit Area	
RED SHALE STRUCTURE	
CI=5.0m Subsea	
Licensed to : Tundra Oil & Gas Partnership	
By : Hackert	Date : 2014/09/16
Scale = 1:36461	Project : Sinclair - Daly





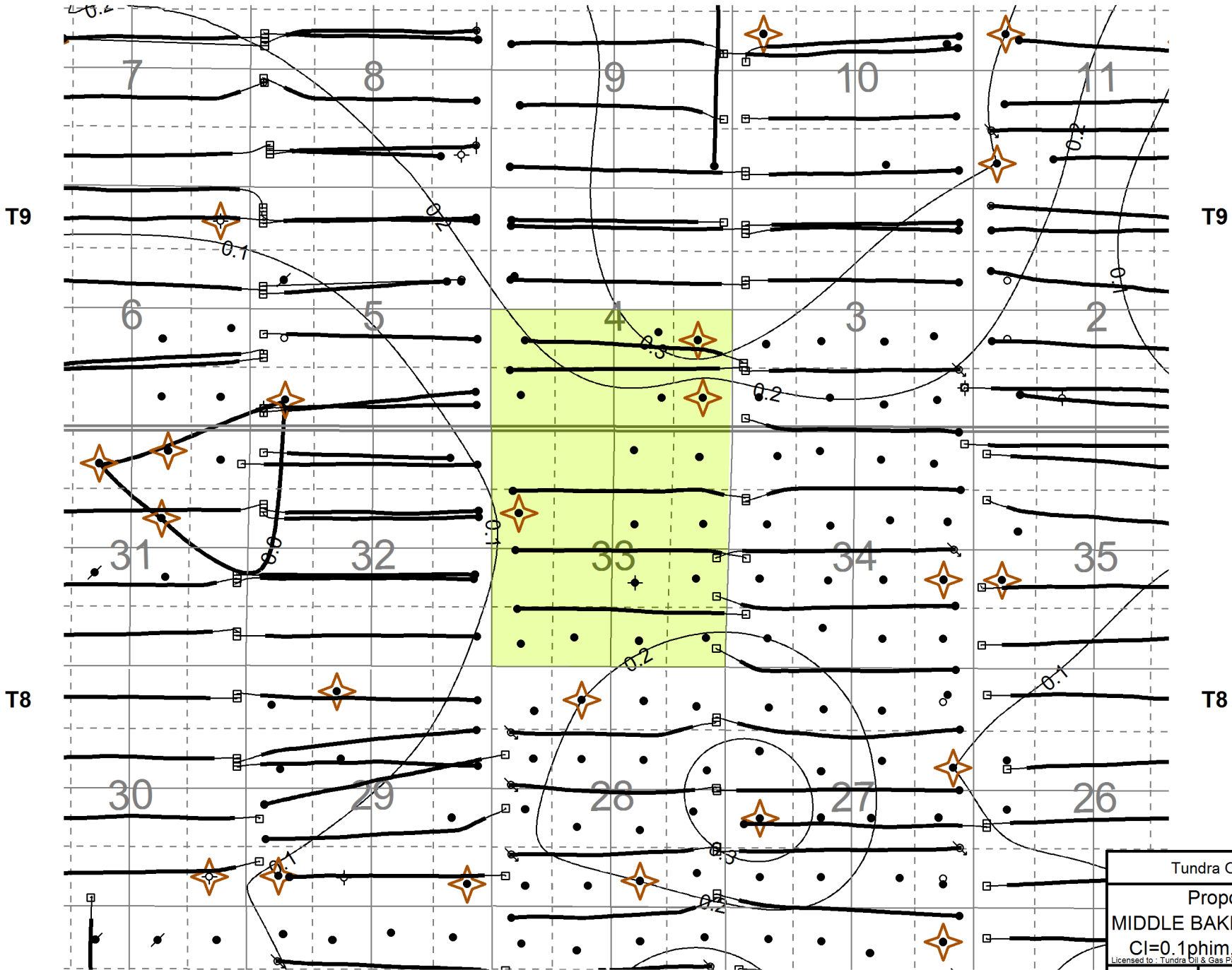
R29W1

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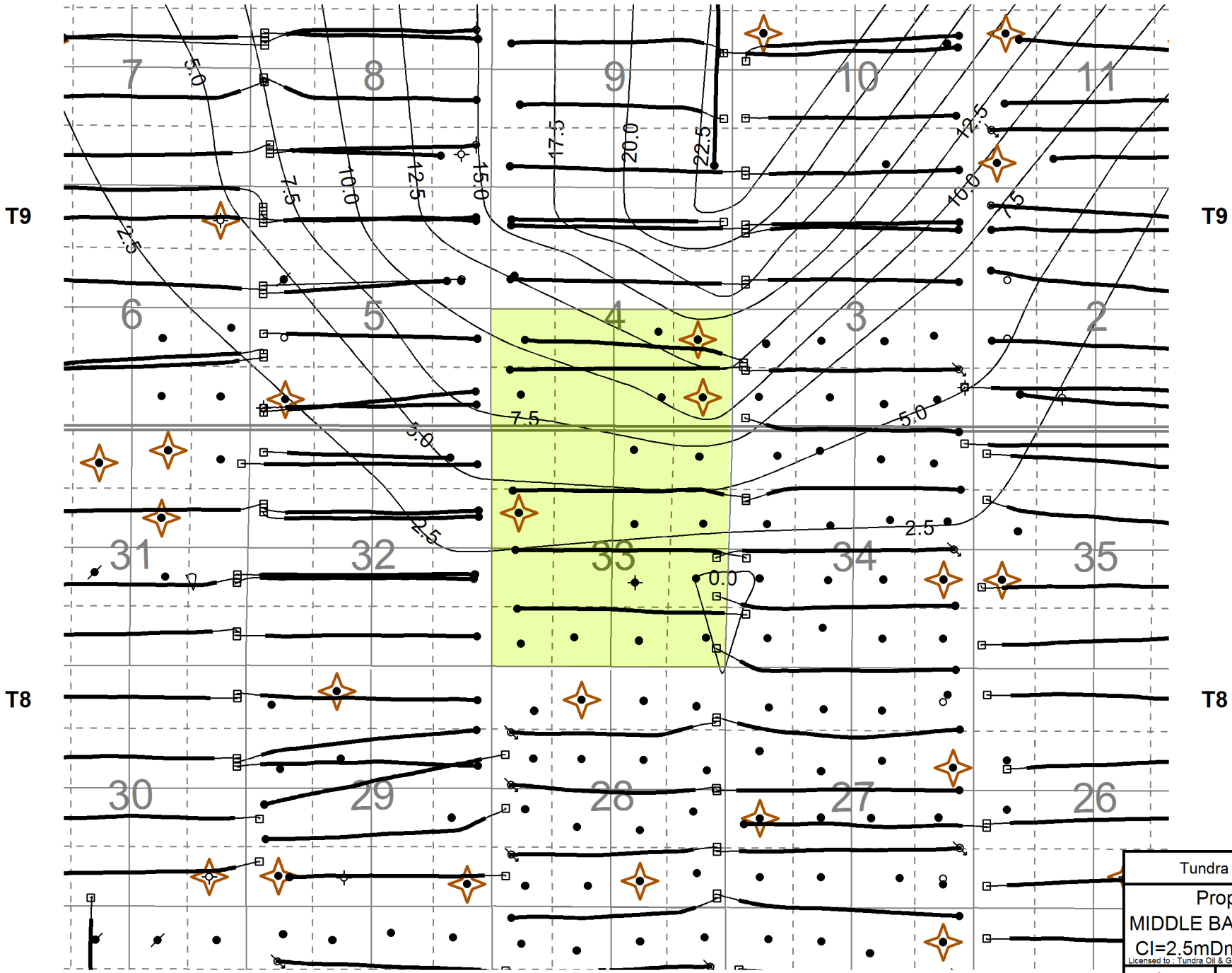


Tundra Oil & Gas Partnership	
Proposed Unit Area	
TORQUAY SHALE STRUCTURE	
CI=5.0m Subsea	
Licensed to: Tundra Oil & Gas Partnership	
By: Hackert	Date: 2014/09/16
Scale = 1:36461	Project: Sinclair - Dalv

R29W1



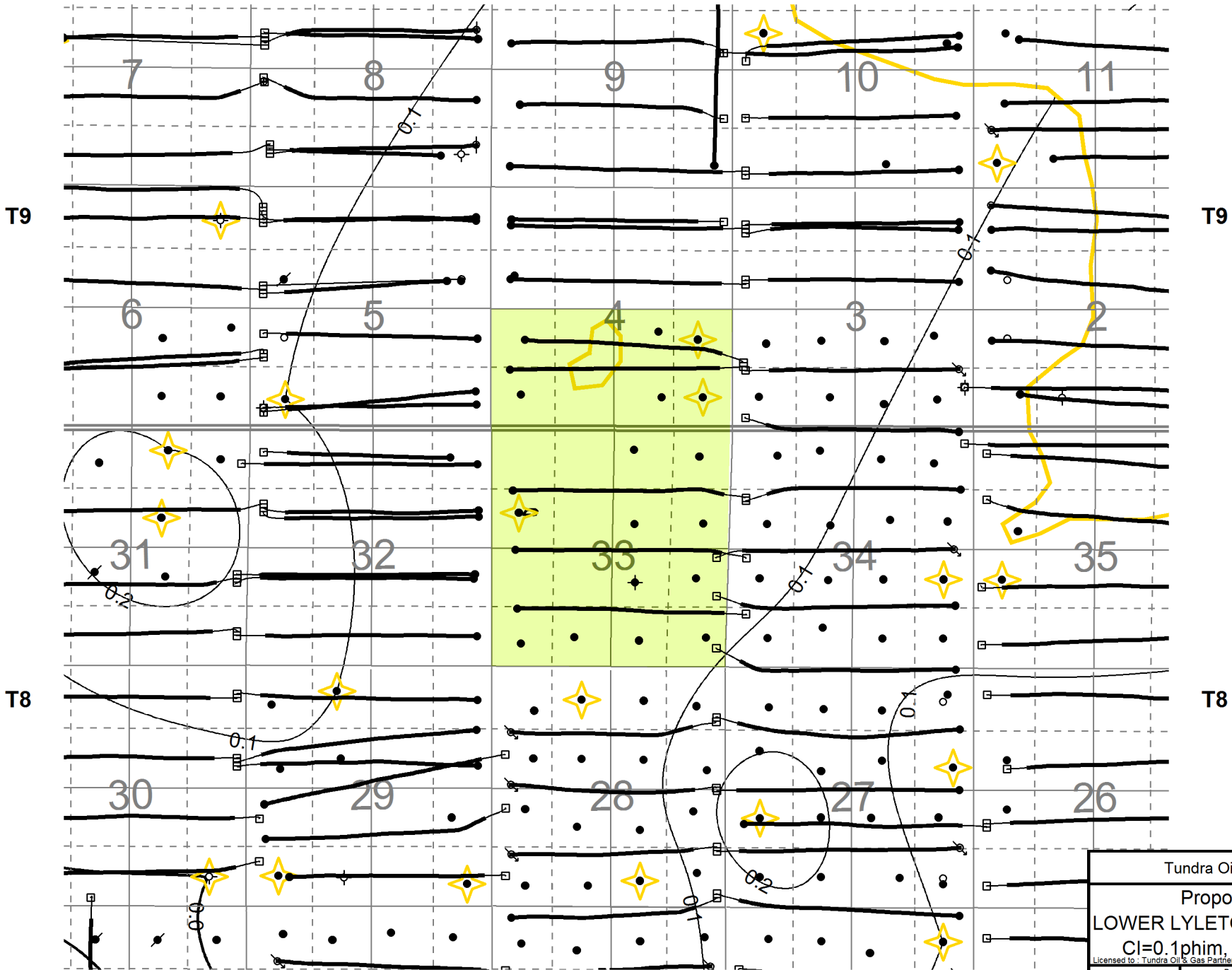
Tundra Oil & Gas Partnership	
Proposed Unit Area	
MIDDLE BAKKEN $\Phi^*h@0.5mD$ CO	
CI=0.1phim, Cored Wells Starred	
<small>Licensed to: Tundra Oil &amp; Gas Partnership</small>	
<small>By: Heckerl</small>	<small>Date: 2014/09/16</small>
<small>Scale = 1:36461</small>	<small>Project: Sinclair - Dalv</small>



Tundra Oil & Gas Partnership		
Proposed Unit Area		
MIDDLE BAKKEN k*h@0.5mD CO		
CI=2.5mDm, Cored Wells Starred		
<small>Licensed to: Tundra Oil &amp; Gas Partnership</small>		
<small>By: Hackert</small>	<small>Date: 2014/09/16</small>	
<small>geoscOUT</small>	<small>Scale = 1:36461</small>	<small>Project: Sinclair - Daly</small>

R29W1

# Appendix No. 13



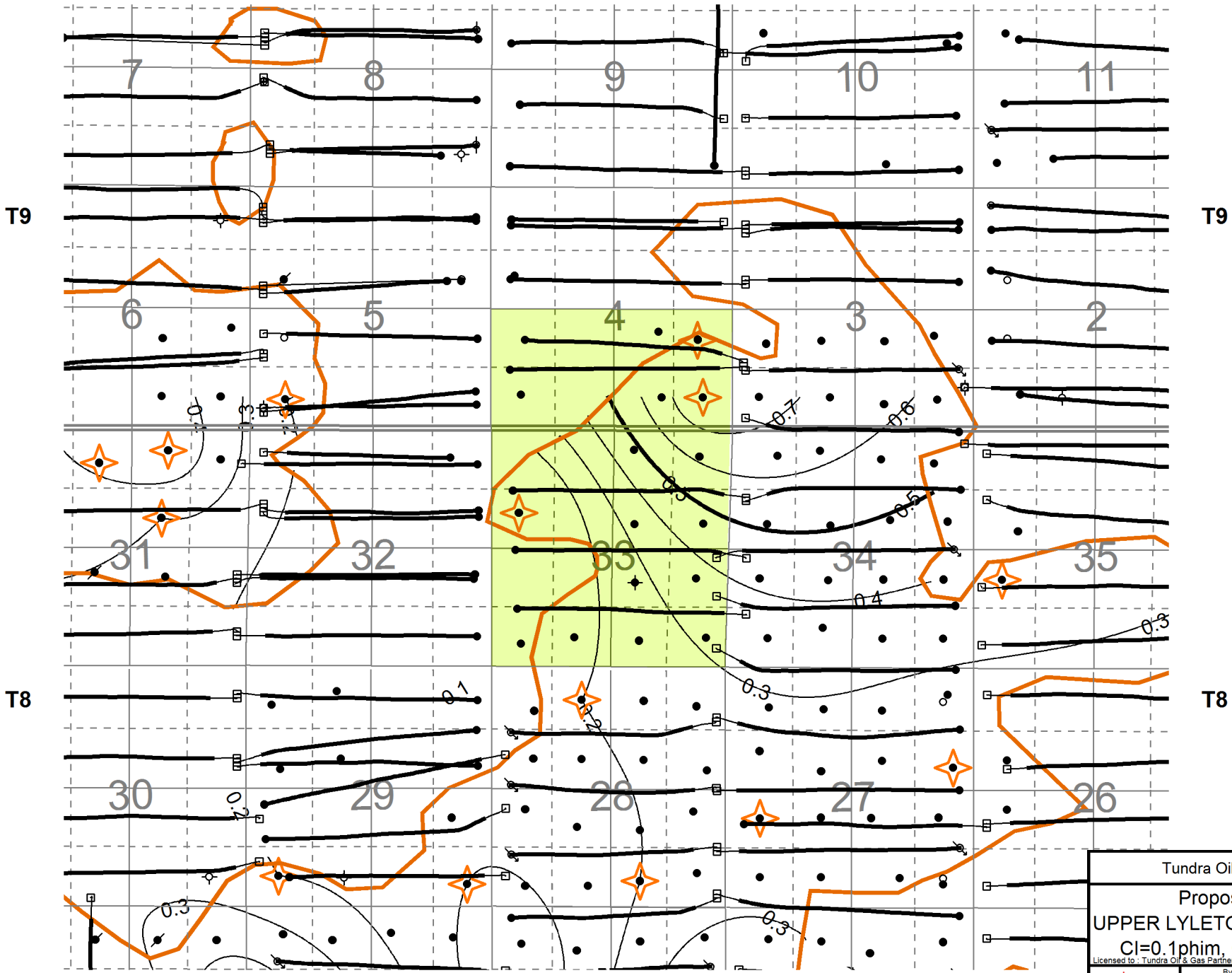
R29W1

Tundra Oil & Gas Partnership		
Proposed Unit Area		
LOWER LYLETON A $\phi_i \cdot h @ 1.0 \text{mD CO}$		
CI=0.1phim, Cored Wells Starred		
<small>Licensed to: Tundra Oil &amp; Gas Partnership</small>		
<small>By: Hecker</small>	<small>Date: 2014/09/16</small>	
<small>geOSCOUT</small>	<small>Scale = 1:36461</small>	<small>Project: Sinclair - Dalv</small>





R29W1

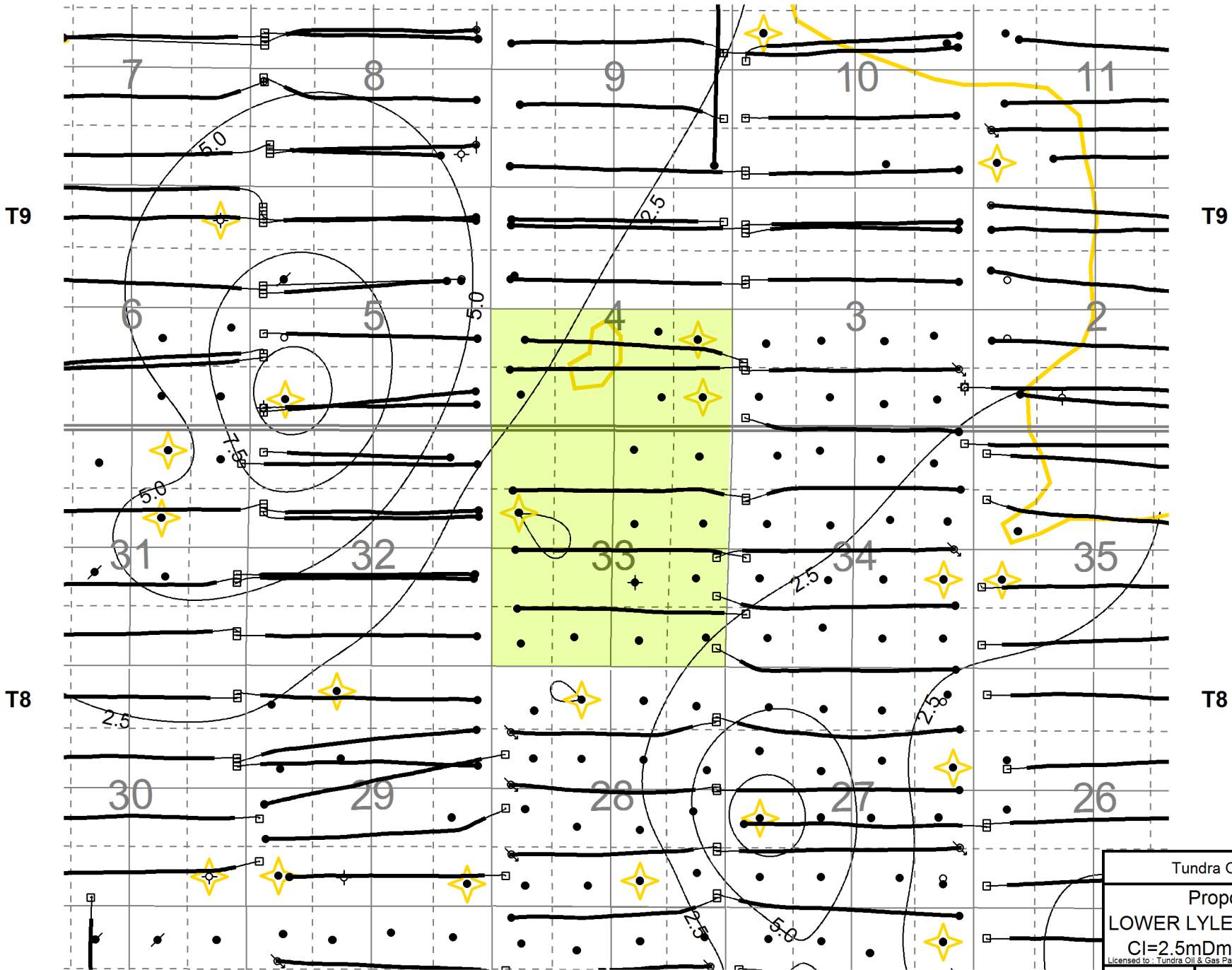


Tundra Oil & Gas Partnership		
Proposed Unit Area		
UPPER LYLETON A $\phi^*h@1.0mD$ CO		
CI=0.1 $\phi$ im, Cored Wells Starred		
<small>Licensed to: Tundra Oil &amp; Gas Partnership</small>		
<small>By: Hackert</small>	<small>Date: 2014/09/16</small>	
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R29W1

R29W1

# Appendix No. 14

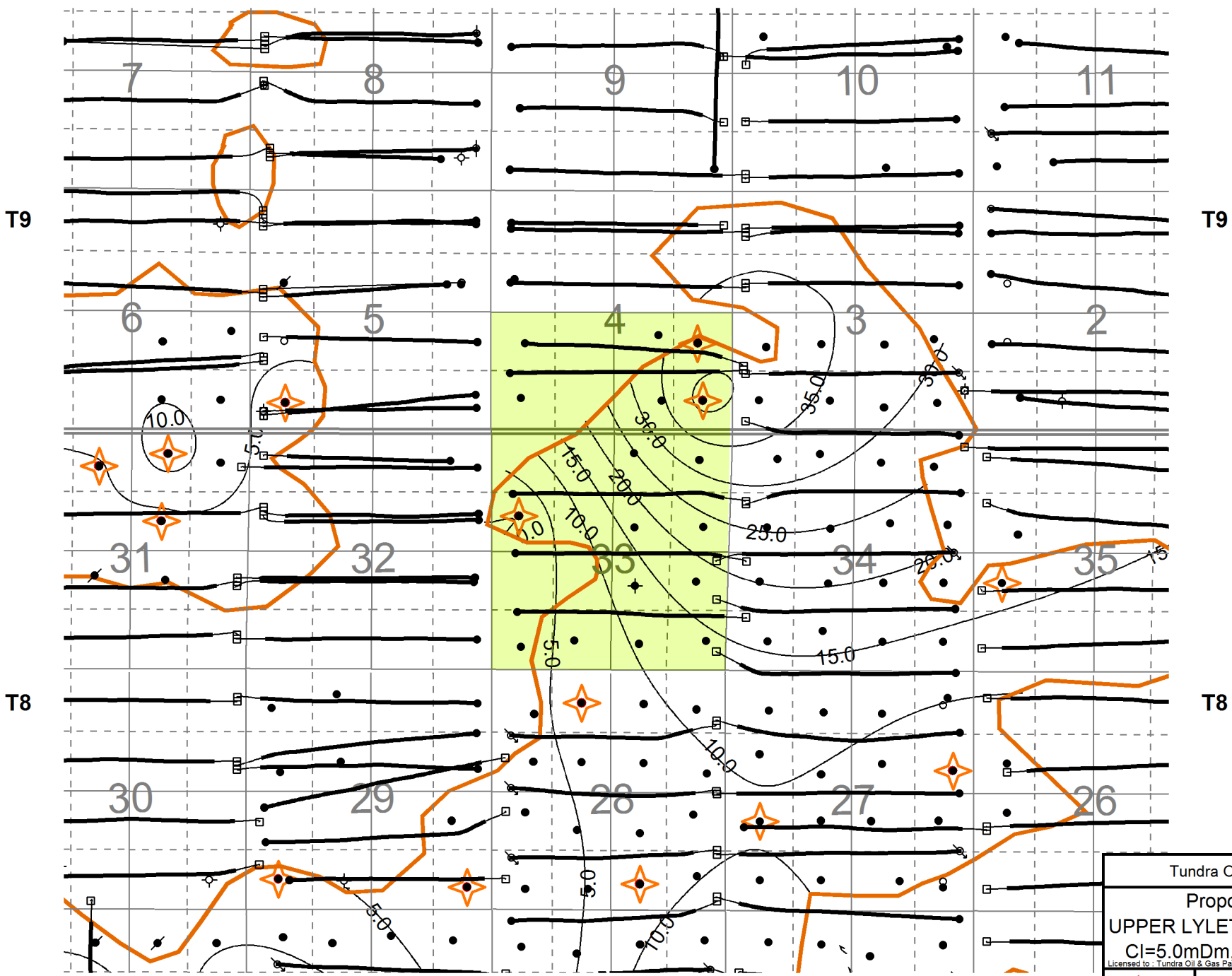


R29W1

Tundra Oil & Gas Partnership		
Proposed Unit Area		
LOWER LYLETON A k*h@1.0mD CO		
CI=2.5mDm, Cored Wells Starred		
<small>Licensed to: Tundra Oil &amp; Gas Partnership</small>		
<small>By: Hecker</small>	<small>Date: 2014/09/16</small>	
<small>Scale = 1:36461</small>	<small>Project: Sinclair - Daly</small>	

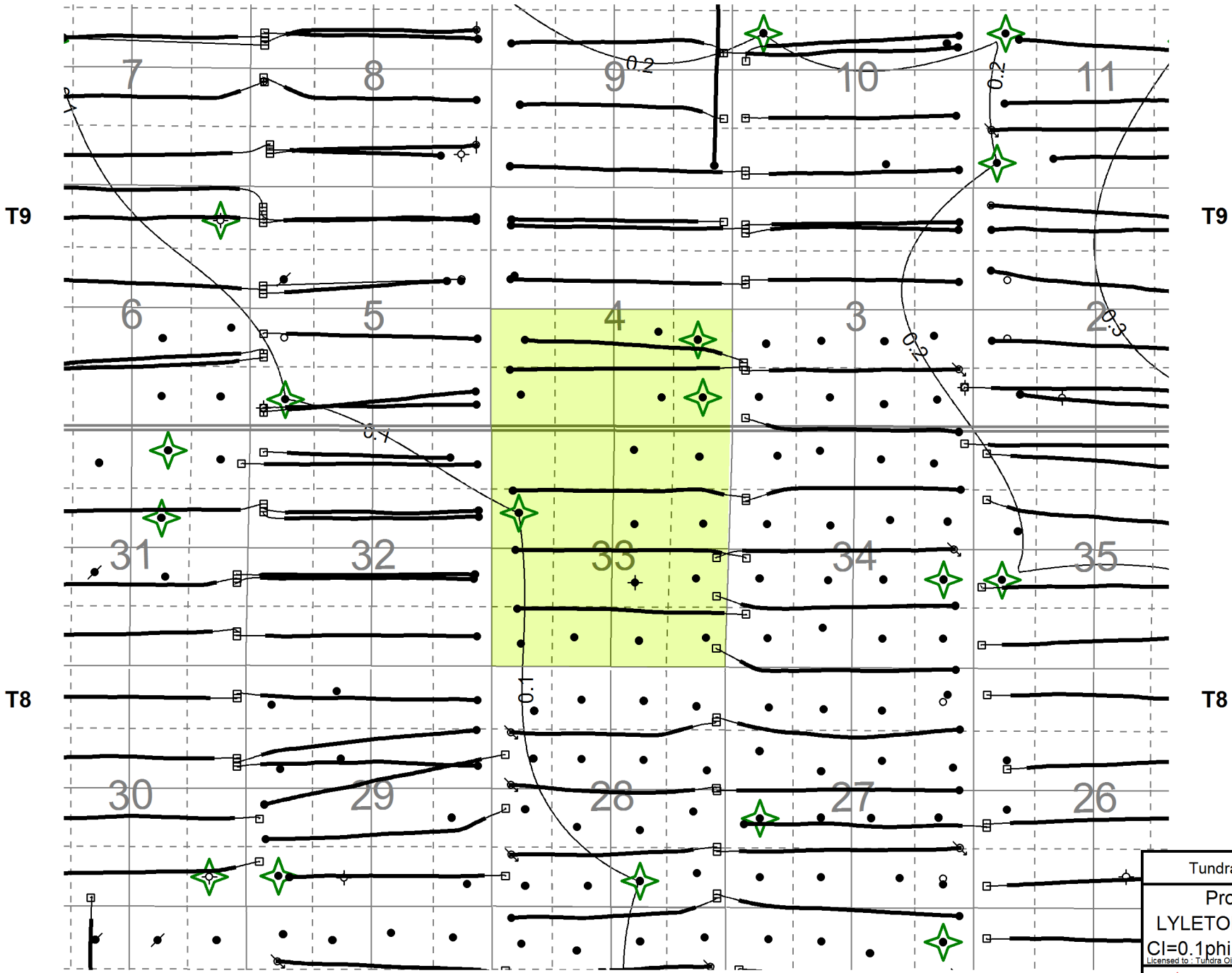


R29W1



Tundra Oil & Gas Partnership		
Proposed Unit Area		
UPPER LYLETON A k*h@1.0mD CO		
CI=5.0mDm, Cored Wells Starred		
<small>Licensed to : Tundra Oil &amp; Gas Partnership</small>		
<small>By : Hacker</small>	<small>Date : 2014/09/16</small>	
<small>geOSCOUT</small>	<small>Scale = 1:38461</small>	<small>Project : Sinclair - Dalv</small>

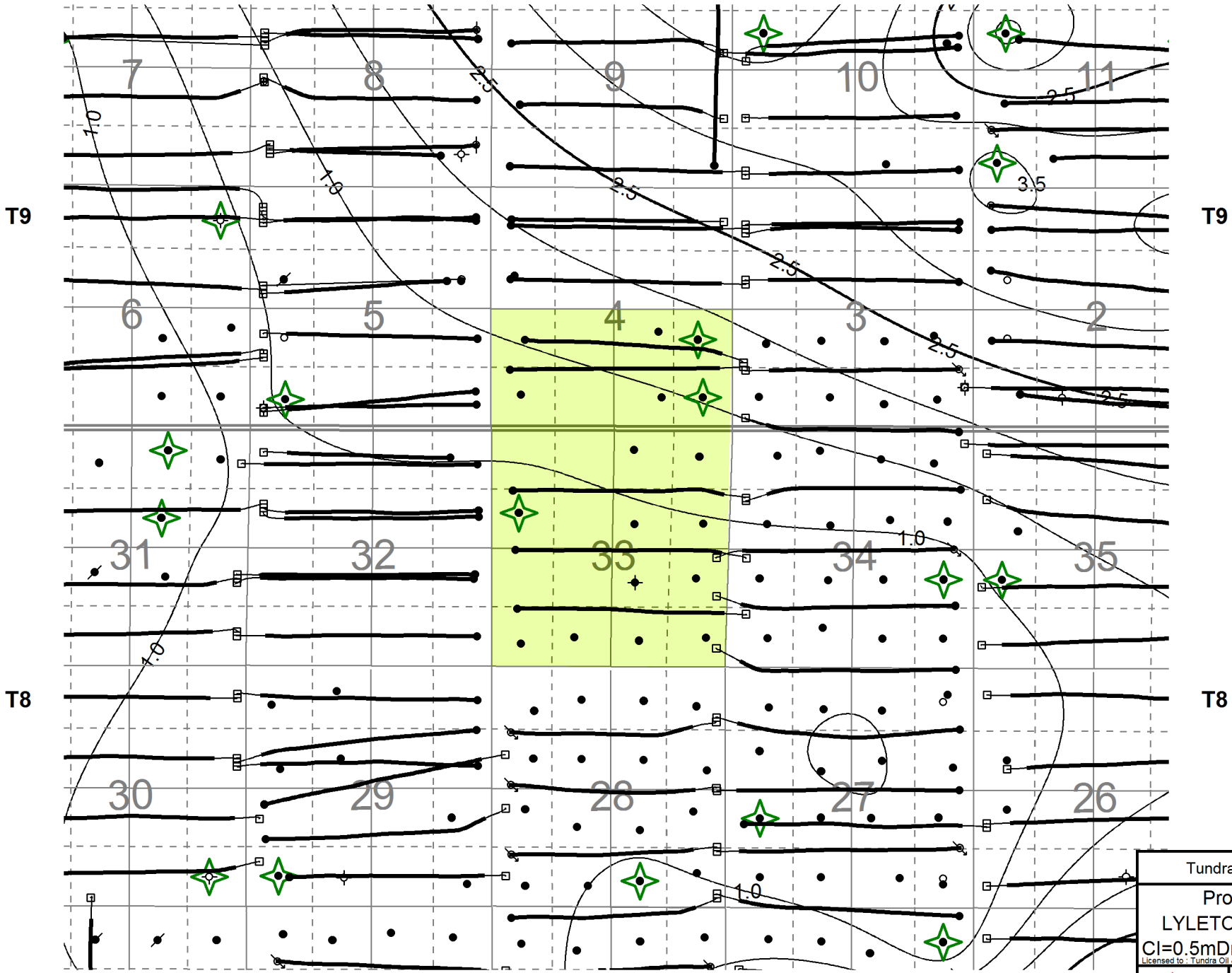
R29W1



Tundra Oil & Gas Partnership	
Proposed Unit Area	
LYLETON B phi*h@0.5mD CO	
CI=0.1phim, Cored Wells Starred	
<small>Licensed to: Tundra Oil &amp; Gas Partnership</small>	
<small>By: Hackert</small>	<small>Date: 2014/09/16</small>
<small>Scale = 1:36461</small>	<small>Project: Sinclair - Dalv</small>
<small>geoSCOUT</small>	

R29W1

# Appendix No. 16



Tundra Oil & Gas Partnership	
Proposed Unit Area	
LYLETON B k*h@0.5mD CO	
CI=0.5mDm, Cored Wells Starred	
<small>Licensed to: Tundra Oil &amp; Gas Partnership</small>	
<small>By: Hackert</small>	<small>Date: 2014/09/16</small>
<small>geOSCOUT</small>	<small>Scale = 1:36461</small>
<small>Project: Sinclair - Daly</small>	

R29W1



## TUNDRA OIL & GAS PARTNERSHIP

TUNDRA SINCLAIR 3-33-8-29

100/03-33-008-29W1/0

LICENSE #: 5605

BAKKEN FORMATION

RESERVOIR PRESSURE SURVEY TEST

AUGUST 2<sup>nd</sup> – 25<sup>th</sup>, 2014

Prepared by: **DOLLCO Well Data Services**

e-mail: [dollco@shaw.ca](mailto:dollco@shaw.ca)

PO Box 326  
417A Mississippian Drive  
Esteran, SK  
S4A 2A4

Cell: (306) 421 - 7330  
Fax: (306) 634 - 7976  
Res: (306) 634 - 8761

E-mail: [qualityw@sasktel.net](mailto:qualityw@sasktel.net)

# Pressure Survey Report

## Company Information

Company Name	TUNDRA OIL & GAS PARTNERSHIP
Contact	CRAIG LANE
e-mail	craig.lane@tundraoilandgas.com
Phone	(204) 748-4409
Site Contact	DAN RUDINSKI
Site Phone	(204) 851-5013

## Well Information

Well Name	TUNDRA SINCLAIR 3-33-8-29
Unique Well ID	100/03-33-008-29W1/00
Surface Location	3-33-8-29W1
Well License Number	5605
Well Type	Vertical
Well Fluid Type	01 Oil
Field	SINCLAIR

KB Elevation (SL)	529.60 m
CF Elevation (SL)	525.30 m
GL Elevation (SL)	525.30 m
Distance from KB to CF (Log)	4.30 m
KB-GL Offset	4.30 m

Tubing ID	mm
Tubing OD	mm
Tubing Depth(Log KB)	m
Casing ID	mm
Casing OD	139.7 mm
Casing Depth(Log KB)	993.00 m
PBTD(Log KB)	982.60 m



# Pressure Survey Report

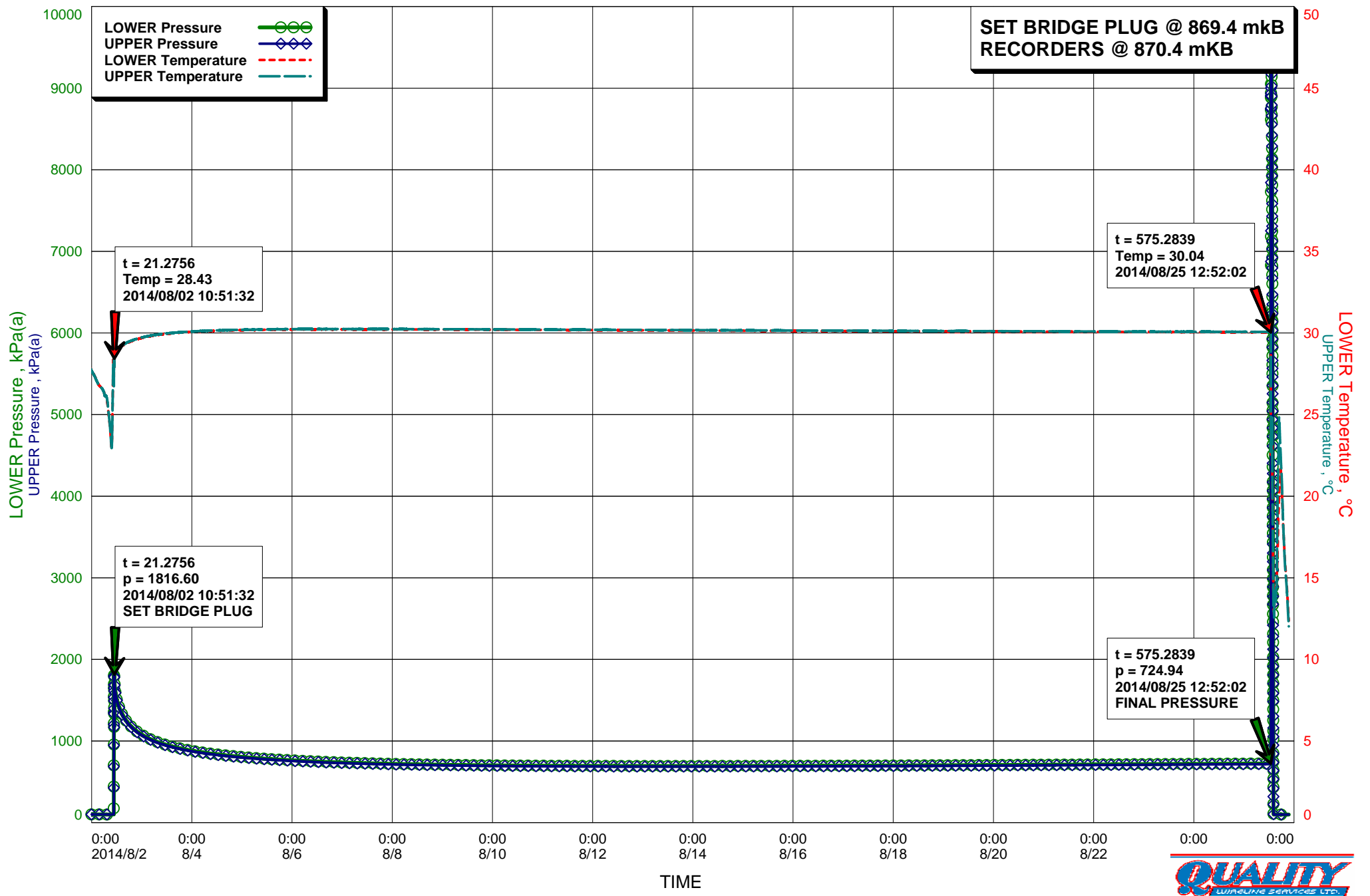
## Test Information

Well Name	TUNDRA SINCLAIR 3-33-8-29
Unique Well ID	100/03-33-008-29W1/00
Surface Location	3-33-8-29W1
Well License Number	5605
Well Fluid Type	01 Oil
Test Purpose	Initial Test
Test Type	RESERVOIR PRESSURE SURVEY
Field	SINCLAIR
Formation	BAKKEN
Well Type Indicator	Vertical
Test/Prod. Interval Top KB (Log)	869.40 m
Test/Prod. Interval Base KB (Log)	870.00 m
MPP(Log KB)	869.70 m
Date/Time Gauge on Bottom	2014/08/02 10:49:32
Date/Time Gauge Off Bottom	2014/08/25 12:55:32
Time/Date Well Shut-In	2014/08/02 10:52:02
Tubing Pressure Initial	kPa(a)
Casing Pressure Initial	kPa(a)
Tubing Pressure: Final	kPa(a)
Casing Pressure: Final	kPa(a)
Last Measured Pressure at Run Depth	724.94 kPa(a)
Reservoir Temperature	30.04 °C
Service Company	Quality Wireline Services Ltd.
Representative	IVORY HERMAN
Prepared By	DOLLCO Well Data Services
Qualified By	RICK DOLL
Report Date	2014/08/26

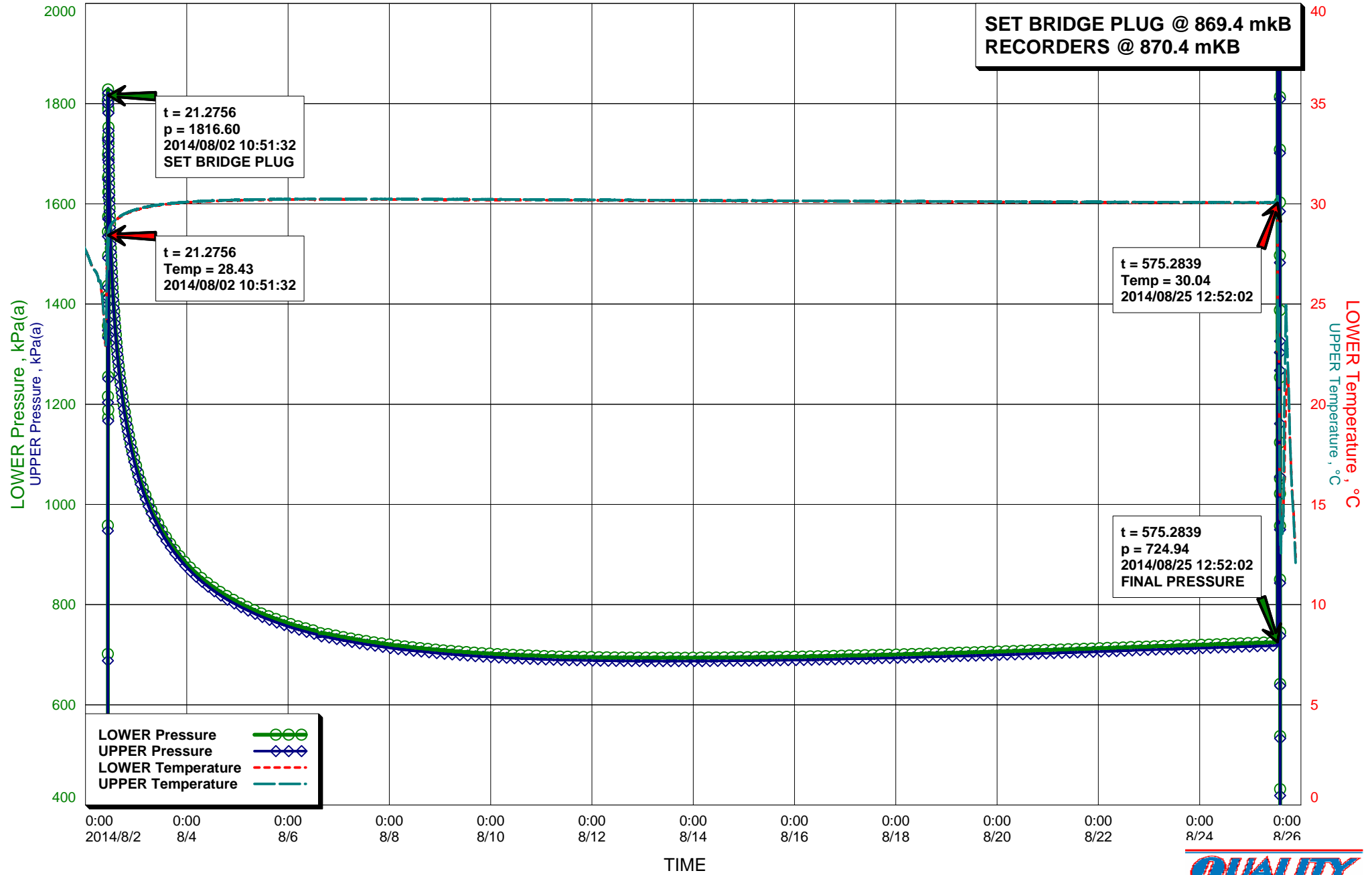




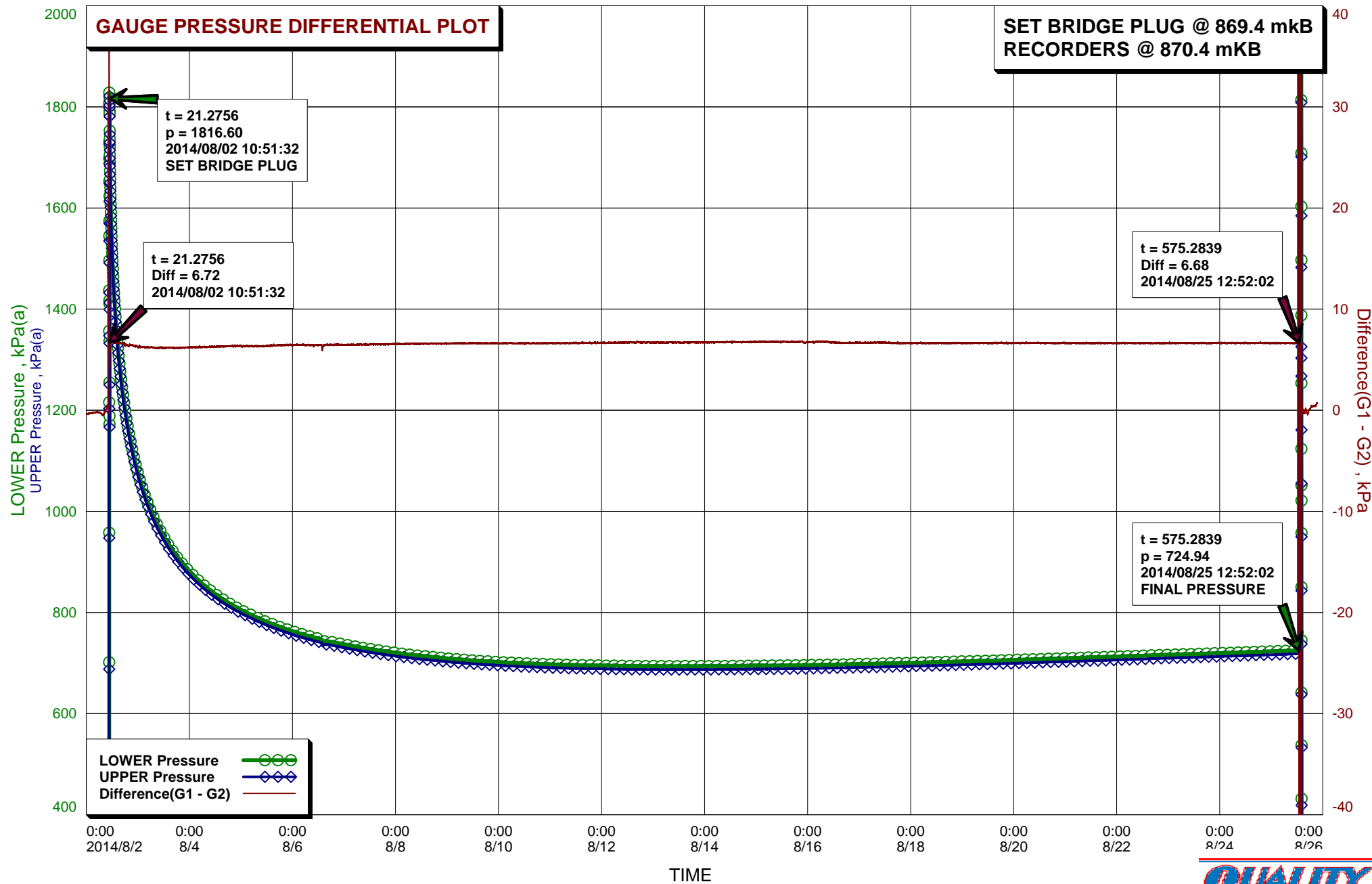
# TUNDRA SINCLAIR 3-33-8-29



# TUNDRA SINCLAIR 3-33-8-29



# TUNDRA SINCLAIR 3-33-8-29



# Recorder Information

<b>Company Name</b>	TUNDRA OIL & GAS PARTNERSHIP
<b>Unique Well ID</b>	100/03-33-008-29W1/00
<b>Well Name</b>	TUNDRA SINCLAIR 3-33-8-29
<b>Formation</b>	BAKKEN
<b>Start Test Date</b>	2014/08/02
<b>Final Test Date</b>	2014/08/25

## Gauge 1

<b>Gauge Name</b>	LOWER	<b>Gauge Type</b>	ELECTRONIC
<b>Gauge Serial Number</b>	2643	<b>Gauge Manufacturer</b>	PIONEER PETROTECH SERVICES
<b>Run Depth (Log KB)</b>	870.40 m	<b>Gauge Model</b>	SILICON SAPPHIRE
<b>Date of Last Calibration</b>	2014/01/07	<b>Maximum Recorder Range</b>	20680.00 kPa
<b>Gauge Start Date</b>	2014/08/01	<b>Gauge Start Time</b>	13:35:00
<b>Gauge Stop Date</b>	2014/08/25	<b>Gauge Stop Time</b>	21:30:02
<b>Date Gauge On Bottom</b>	2014/08/02	<b>Time Gauge On Bottom</b>	10:49:32
<b>Date Gauge Off Bottom</b>	2014/08/25	<b>Time Gauge Off Bottom</b>	12:55:32

## Gauge 2

<b>Gauge Name</b>	UPPER	<b>Gauge Type</b>	ELECTRONIC
<b>Gauge Serial Number</b>	2598	<b>Gauge Manufacturer</b>	PIONEER PETROTECH SERVICES
<b>Run Depth (Log KB)</b>	870.40 m	<b>Gauge Model</b>	SILICON SAPPHIRE
<b>Date of Last Calibration</b>	2014/01/07	<b>Maximum Recorder Range</b>	20680.00 kPa
<b>Gauge Start Date</b>	2014/08/01	<b>Gauge Start Time</b>	13:35:00
<b>Gauge Stop Date</b>	2014/08/25	<b>Gauge Stop Time</b>	21:30:02
<b>Date Gauge On Bottom</b>	2014/08/02	<b>Time Gauge On Bottom</b>	10:49:32
<b>Date Gauge Off Bottom</b>	2014/08/25	<b>Time Gauge Off Bottom</b>	12:55:32



TUNDRA OIL & GAS PARTNERSHIP  
 100/03-33-008-29W1/00  
 Start Test Date: 2014/08/02  
 Final Test Date: 2014/08/25

TUNDRA SINCLAIR 3-33-8-29  
 Formation: BAKKEN

**RESERVOIR PRESSURE SURVEY**

	LOWER Date yyyy/mm/dd	LOWER Clk Time hh:mm:ss	LOWER Time hr	LOWER Pres. kPa(a)	LOWER Temp. °C	UPPER Time hr	UPPER Pres. kPa(a)	UPPER Temp. °C	Diff. G1 - G2 kPa	
1	2014/08/01	13:35:01	0.0003	102.12	27.60	0.0003	103.17	27.38	-1.05	
2	2014/08/01	13:35:01	0.0003	ACTIVATE RECORDERS S/N: 2643(L) & 2598(U)						
3	2014/08/01	13:35:02	0.0006	102.12	27.65	0.0006	103.16	27.43	-1.05	
4	2014/08/01	15:35:02	2.0006	100.85	28.04	2.0006	101.50	28.24	-0.65	
5	2014/08/01	17:35:02	4.0006	101.22	28.10	4.0006	101.33	28.08	-0.11	
6	2014/08/01	19:35:02	6.0006	100.69	28.30	6.0006	101.34	28.26	-0.65	
7	2014/08/01	21:35:02	8.0006	100.59	28.24	8.0006	101.12	28.19	-0.53	
8	2014/08/01	23:35:02	10.0006	100.48	27.79	10.0006	100.92	27.77	-0.43	
9	2014/08/02	01:35:02	12.0006	100.43	27.33	12.0006	100.68	27.31	-0.25	
10	2014/08/02	03:35:02	14.0006	100.21	26.79	14.0006	100.46	26.79	-0.25	
11	2014/08/02	05:35:32	16.0089	100.08	26.46	16.0089	100.27	26.45	-0.19	
12	2014/08/02	07:35:32	18.0089	99.45	25.62	18.0089	99.91	25.76	-0.45	
13	2014/08/02	09:35:32	20.0089	99.34	22.89	20.0089	98.94	22.95	0.40	
14	2014/08/02	10:32:02	20.9506	103.46	28.13	20.9506	102.11	28.06	1.35	
15	2014/08/02	10:32:02	20.9506	RIH WITH RECORDERS BELOW BRIDGE PLUG						
16	2014/08/02	10:32:32	20.9589	103.68	28.11	20.9589	102.26	28.03	1.42	
17	2014/08/02	10:49:32	21.2422	1818.27	28.17	21.2422	1811.76	28.17	6.51	
18	2014/08/02	10:49:32	21.2422	RECORDERS ON BOTTOM @ 870.4 mKB						
19	2014/08/02	10:50:02	21.2506	1818.01	28.28	21.2506	1811.45	28.29	6.56	
20	2014/08/02	10:51:32	21.2756	1816.60	28.43	21.2756	1809.88	28.45	6.72	
21	2014/08/02	10:51:32	21.2756	SET BRIDGE PLUG @ 869.4 mKB						
22	2014/08/02	10:52:02	21.2839	1786.94	28.46	21.2839	1781.23	28.49	5.71	
23	2014/08/02	11:35:32	22.0089	1566.66	28.82	22.0089	1559.95	28.85	6.71	
24	2014/08/02	13:35:32	24.0089	1384.95	29.11	24.0089	1378.27	29.15	6.68	
25	2014/08/02	15:35:32	26.0089	1284.69	29.29	26.0089	1278.07	29.32	6.62	
26	2014/08/02	17:35:32	28.0089	1214.57	29.42	28.0089	1207.85	29.45	6.72	
27	2014/08/02	19:35:32	30.0089	1161.25	29.53	30.0089	1154.91	29.55	6.35	
28	2014/08/02	21:35:32	32.0089	1118.21	29.61	32.0089	1111.77	29.64	6.44	
29	2014/08/02	23:35:32	34.0089	1083.16	29.68	34.0089	1076.86	29.71	6.31	
30	2014/08/03	01:35:32	36.0089	1053.48	29.74	36.0089	1047.21	29.77	6.27	
31	2014/08/03	03:35:32	38.0089	1027.94	29.79	38.0089	1021.73	29.82	6.21	
32	2014/08/03	05:35:32	40.0089	1005.60	29.84	40.0089	999.38	29.87	6.22	
33	2014/08/03	07:35:32	42.0089	985.87	29.88	42.0089	979.68	29.90	6.19	
34	2014/08/03	09:35:32	44.0089	968.46	29.91	44.0089	962.28	29.94	6.18	
35	2014/08/03	11:35:32	46.0089	952.78	29.94	46.0089	946.61	29.97	6.17	
36	2014/08/03	13:35:32	48.0089	938.20	29.97	48.0089	932.02	29.99	6.18	
37	2014/08/03	15:35:32	50.0089	925.26	29.99	50.0089	919.08	30.01	6.18	
38	2014/08/03	17:35:32	52.0089	913.17	30.02	52.0089	907.05	30.04	6.12	
39	2014/08/03	19:35:32	54.0089	902.18	30.03	54.0089	896.01	30.06	6.17	
40	2014/08/03	21:35:32	56.0089	891.96	30.05	56.0089	885.81	30.07	6.15	

LOWER Serial Number: 2643 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 UPPER Serial Number: 2598 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 Print Filter: Print every 2 hour

TUNDRA OIL & GAS PARTNERSHIP  
 100/03-33-008-29W1/00  
 Start Test Date: 2014/08/02  
 Final Test Date: 2014/08/25

TUNDRA SINCLAIR 3-33-8-29  
 Formation: BAKKEN

**RESERVOIR PRESSURE SURVEY**

	LOWER Date yyyy/mm/dd	LOWER Clk Time hh:mm:ss	LOWER Time hr	LOWER Pres. kPa(a)	LOWER Temp. °C	UPPER Time hr	UPPER Pres. kPa(a)	UPPER Temp. °C	Diff. G1 - G2 kPa
41	2014/08/03	23:35:32	58.0089	882.54	30.07	58.0089	876.32	30.09	6.22
42	2014/08/04	01:35:32	60.0089	873.76	30.08	60.0089	867.53	30.10	6.24
43	2014/08/04	03:35:32	62.0089	865.60	30.09	62.0089	859.37	30.11	6.23
44	2014/08/04	05:35:32	64.0089	857.85	30.11	64.0089	851.60	30.13	6.25
45	2014/08/04	07:35:32	66.0089	850.67	30.11	66.0089	844.38	30.14	6.29
46	2014/08/04	09:35:32	68.0089	843.95	30.12	68.0089	837.66	30.15	6.29
47	2014/08/04	11:35:32	70.0089	837.60	30.13	70.0089	831.30	30.15	6.30
48	2014/08/04	13:35:32	72.0089	831.52	30.14	72.0089	825.19	30.16	6.33
49	2014/08/04	15:35:32	74.0089	825.81	30.15	74.0089	819.54	30.17	6.27
50	2014/08/04	17:35:32	76.0089	820.45	30.16	76.0089	814.14	30.18	6.30
51	2014/08/04	19:35:32	78.0089	815.33	30.16	78.0089	808.99	30.18	6.34
52	2014/08/04	21:35:32	80.0089	810.59	30.17	80.0089	804.29	30.19	6.30
53	2014/08/04	23:35:32	82.0089	806.08	30.17	82.0089	799.73	30.19	6.35
54	2014/08/05	01:35:32	84.0089	801.57	30.18	84.0089	795.25	30.20	6.32
55	2014/08/05	03:35:32	86.0089	797.47	30.18	86.0089	791.13	30.20	6.35
56	2014/08/05	05:35:32	88.0089	793.36	30.19	88.0089	787.02	30.21	6.34
57	2014/08/05	07:35:32	90.0089	789.39	30.19	90.0089	783.03	30.21	6.36
58	2014/08/05	09:35:32	92.0089	785.58	30.19	92.0089	779.27	30.22	6.31
59	2014/08/05	11:35:32	94.0089	782.00	30.20	94.0089	775.69	30.22	6.31
60	2014/08/05	13:35:32	96.0089	778.58	30.20	96.0089	772.24	30.22	6.34
61	2014/08/05	15:35:32	98.0089	775.39	30.21	98.0089	768.99	30.22	6.40
62	2014/08/05	17:35:32	100.0089	772.16	30.21	100.0089	765.69	30.23	6.47
63	2014/08/05	19:35:32	102.0089	769.34	30.21	102.0089	762.91	30.23	6.42
64	2014/08/05	21:35:32	104.0089	766.43	30.21	104.0089	759.95	30.23	6.47
65	2014/08/05	23:35:32	106.0089	763.50	30.21	106.0089	757.08	30.24	6.42
66	2014/08/06	01:35:32	108.0089	760.71	30.22	108.0089	754.23	30.24	6.47
67	2014/08/06	03:35:32	110.0089	758.08	30.22	110.0089	751.59	30.24	6.49
68	2014/08/06	05:35:32	112.0089	755.65	30.22	112.0089	749.24	30.24	6.41
69	2014/08/06	07:35:32	114.0089	753.31	30.22	114.0089	746.85	30.24	6.46
70	2014/08/06	09:35:32	116.0089	751.07	30.22	116.0089	744.57	30.24	6.50
71	2014/08/06	11:35:32	118.0089	748.88	30.22	118.0089	742.45	30.24	6.43
72	2014/08/06	13:35:32	120.0089	746.94	30.22	120.0089	740.48	30.24	6.46
73	2014/08/06	15:35:32	122.0089	743.06	30.22	122.0089	736.61	30.24	6.46
74	2014/08/06	17:35:32	124.0089	742.16	30.22	124.0089	735.70	30.24	6.46
75	2014/08/06	19:35:32	126.0089	740.51	30.22	126.0089	734.04	30.24	6.47
76	2014/08/06	21:35:32	128.0089	738.87	30.22	128.0089	732.38	30.24	6.49
77	2014/08/06	23:35:32	130.0089	737.10	30.22	130.0089	730.66	30.24	6.44
78	2014/08/07	01:35:32	132.0089	735.49	30.22	132.0089	729.02	30.24	6.47
79	2014/08/07	03:35:32	134.0089	733.99	30.22	134.0089	727.47	30.24	6.52
80	2014/08/07	05:35:32	136.0089	732.44	30.22	136.0089	725.96	30.24	6.47

LOWER Serial Number: 2643 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 UPPER Serial Number: 2598 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 Print Filter: Print every 2 hour

TUNDRA OIL & GAS PARTNERSHIP  
 100/03-33-008-29W1/00  
 Start Test Date: 2014/08/02  
 Final Test Date: 2014/08/25

TUNDRA SINCLAIR 3-33-8-29  
 Formation: BAKKEN

**RESERVOIR PRESSURE SURVEY**

	LOWER Date yyyy/mm/dd	LOWER Clk Time hh:mm:ss	LOWER Time hr	LOWER Pres. kPa(a)	LOWER Temp. °C	UPPER Time hr	UPPER Pres. kPa(a)	UPPER Temp. °C	Diff. G1 - G2 kPa
81	2014/08/07	07:35:32	138.0089	730.96	30.22	138.0089	724.42	30.24	6.54
82	2014/08/07	09:35:32	140.0089	729.43	30.22	140.0089	722.97	30.24	6.46
83	2014/08/07	11:35:32	142.0089	727.98	30.22	142.0089	721.51	30.24	6.48
84	2014/08/07	13:35:32	144.0089	726.65	30.22	144.0089	720.18	30.24	6.46
85	2014/08/07	15:35:32	146.0089	725.44	30.22	146.0089	718.93	30.24	6.51
86	2014/08/07	17:35:32	148.0089	724.18	30.22	148.0089	717.63	30.24	6.55
87	2014/08/07	19:35:32	150.0089	722.88	30.22	150.0089	716.35	30.24	6.53
88	2014/08/07	21:35:32	152.0089	721.69	30.22	152.0089	715.14	30.24	6.55
89	2014/08/07	23:35:32	154.0089	720.49	30.22	154.0089	713.97	30.24	6.52
90	2014/08/08	01:35:32	156.0089	719.31	30.22	156.0089	712.71	30.24	6.60
91	2014/08/08	03:35:32	158.0089	718.21	30.22	158.0089	711.70	30.24	6.51
92	2014/08/08	05:35:32	160.0089	717.30	30.22	160.0089	710.72	30.24	6.58
93	2014/08/08	07:35:32	162.0089	716.25	30.22	162.0089	709.64	30.24	6.61
94	2014/08/08	09:35:32	164.0089	715.26	30.22	164.0089	708.68	30.23	6.57
95	2014/08/08	11:35:32	166.0089	714.28	30.22	166.0089	707.72	30.23	6.56
96	2014/08/08	13:35:32	168.0089	713.50	30.22	168.0089	706.90	30.23	6.60
97	2014/08/08	15:35:32	170.0089	712.69	30.21	170.0089	706.15	30.23	6.54
98	2014/08/08	17:35:32	172.0089	711.84	30.21	172.0089	705.25	30.23	6.59
99	2014/08/08	19:35:32	174.0089	711.02	30.21	174.0089	704.41	30.23	6.62
100	2014/08/08	21:35:32	176.0089	710.17	30.21	176.0089	703.57	30.23	6.60
101	2014/08/08	23:35:32	178.0089	709.35	30.21	178.0089	702.76	30.23	6.60
102	2014/08/09	01:35:32	180.0089	708.62	30.21	180.0089	702.04	30.23	6.57
103	2014/08/09	03:35:32	182.0089	707.99	30.21	182.0089	701.34	30.23	6.64
104	2014/08/09	05:35:32	184.0089	707.28	30.21	184.0089	700.63	30.23	6.65
105	2014/08/09	07:35:32	186.0089	706.55	30.21	186.0089	699.95	30.23	6.60
106	2014/08/09	09:35:32	188.0089	705.90	30.21	188.0089	699.27	30.23	6.64
107	2014/08/09	11:35:32	190.0089	705.25	30.20	190.0089	698.57	30.23	6.68
108	2014/08/09	13:35:32	192.0089	704.81	30.20	192.0089	698.23	30.22	6.58
109	2014/08/09	15:35:32	194.0089	704.15	30.20	194.0089	697.54	30.23	6.61
110	2014/08/09	17:35:32	196.0089	703.56	30.20	196.0089	696.93	30.22	6.63
111	2014/08/09	19:35:32	198.0089	703.12	30.20	198.0089	696.53	30.22	6.59
112	2014/08/09	21:35:32	200.0089	702.55	30.20	200.0089	695.95	30.22	6.60
113	2014/08/09	23:35:32	202.0089	702.13	30.20	202.0089	695.51	30.22	6.62
114	2014/08/10	01:35:32	204.0089	701.44	30.20	204.0089	694.88	30.22	6.56
115	2014/08/10	03:35:32	206.0089	701.04	30.20	206.0089	694.44	30.22	6.59
116	2014/08/10	05:35:32	208.0089	700.76	30.20	208.0089	694.09	30.22	6.67
117	2014/08/10	07:35:32	210.0089	700.42	30.20	210.0089	693.79	30.22	6.63
118	2014/08/10	09:35:32	212.0089	699.87	30.20	212.0089	693.24	30.22	6.63
119	2014/08/10	11:35:32	214.0089	699.50	30.20	214.0089	692.87	30.21	6.63
120	2014/08/10	13:35:32	216.0089	699.20	30.19	216.0089	692.57	30.21	6.63

LOWER Serial Number: 2643 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 UPPER Serial Number: 2598 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
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TUNDRA OIL & GAS PARTNERSHIP  
 100/03-33-008-29W1/00  
 Start Test Date: 2014/08/02  
 Final Test Date: 2014/08/25

TUNDRA SINCLAIR 3-33-8-29  
 Formation: BAKKEN

**RESERVOIR PRESSURE SURVEY**

	LOWER Date yyyy/mm/dd	LOWER Clk Time hh:mm:ss	LOWER Time hr	LOWER Pres. kPa(a)	LOWER Temp. °C	UPPER Time hr	UPPER Pres. kPa(a)	UPPER Temp. °C	Diff. G1 - G2 kPa
121	2014/08/10	15:35:32	218.0089	698.73	30.19	218.0089	692.07	30.21	6.66
122	2014/08/10	17:35:32	220.0089	698.50	30.19	220.0089	691.87	30.21	6.62
123	2014/08/10	19:35:32	222.0089	698.19	30.19	222.0089	691.50	30.21	6.69
124	2014/08/10	21:35:32	224.0089	697.97	30.19	224.0089	691.38	30.21	6.59
125	2014/08/10	23:35:32	226.0089	697.60	30.19	226.0089	690.96	30.21	6.63
126	2014/08/11	01:35:32	228.0089	697.24	30.19	228.0089	690.58	30.21	6.66
127	2014/08/11	03:35:32	230.0089	697.02	30.19	230.0089	690.36	30.21	6.66
128	2014/08/11	05:35:32	232.0089	696.49	30.19	232.0089	689.87	30.21	6.62
129	2014/08/11	07:35:32	234.0089	696.51	30.18	234.0089	689.85	30.20	6.66
130	2014/08/11	09:35:32	236.0089	696.06	30.18	236.0089	689.43	30.20	6.63
131	2014/08/11	11:35:32	238.0089	695.99	30.18	238.0089	689.33	30.20	6.66
132	2014/08/11	13:35:32	240.0089	695.75	30.18	240.0089	689.10	30.20	6.65
133	2014/08/11	15:35:32	242.0089	695.72	30.18	242.0089	689.10	30.20	6.62
134	2014/08/11	17:35:32	244.0089	695.51	30.18	244.0089	688.88	30.20	6.63
135	2014/08/11	19:35:32	246.0089	695.38	30.18	246.0089	688.73	30.20	6.65
136	2014/08/11	21:35:32	248.0089	695.31	30.18	248.0089	688.66	30.20	6.65
137	2014/08/11	23:35:32	250.0089	695.20	30.18	250.0089	688.53	30.20	6.67
138	2014/08/12	01:35:32	252.0089	694.87	30.17	252.0089	688.22	30.20	6.65
139	2014/08/12	03:35:32	254.0089	694.75	30.17	254.0089	688.05	30.20	6.70
140	2014/08/12	05:35:32	256.0089	694.62	30.17	256.0089	687.90	30.19	6.72
141	2014/08/12	07:35:32	258.0089	694.51	30.17	258.0089	687.83	30.19	6.68
142	2014/08/12	09:35:32	260.0089	694.54	30.17	260.0089	687.78	30.19	6.75
143	2014/08/12	11:35:32	262.0089	694.28	30.17	262.0089	687.56	30.19	6.71
144	2014/08/12	13:35:32	264.0089	694.08	30.17	264.0089	687.35	30.19	6.73
145	2014/08/12	15:35:32	266.0089	694.13	30.17	266.0089	687.44	30.19	6.69
146	2014/08/12	17:35:32	268.0089	694.09	30.17	268.0089	687.41	30.19	6.67
147	2014/08/12	19:35:32	270.0089	694.07	30.16	270.0089	687.34	30.19	6.73
148	2014/08/12	21:35:32	272.0089	694.00	30.17	272.0089	687.26	30.19	6.74
149	2014/08/12	23:35:32	274.0089	694.06	30.16	274.0089	687.30	30.19	6.75
150	2014/08/13	01:35:32	276.0089	693.98	30.16	276.0089	687.27	30.19	6.71
151	2014/08/13	03:35:32	278.0089	693.99	30.16	278.0089	687.28	30.18	6.71
152	2014/08/13	05:35:32	280.0089	693.89	30.16	280.0089	687.22	30.18	6.67
153	2014/08/13	07:35:32	282.0089	693.89	30.16	282.0089	687.17	30.18	6.72
154	2014/08/13	09:35:32	284.0089	693.83	30.16	284.0089	687.12	30.18	6.71
155	2014/08/13	11:35:32	286.0089	693.77	30.16	286.0089	687.05	30.18	6.72
156	2014/08/13	13:35:32	288.0089	693.89	30.16	288.0089	687.16	30.18	6.73
157	2014/08/13	15:35:32	290.0089	693.95	30.15	290.0089	687.25	30.18	6.70
158	2014/08/13	17:35:32	292.0089	693.88	30.15	292.0089	687.19	30.18	6.69
159	2014/08/13	19:35:32	294.0089	693.92	30.15	294.0089	687.16	30.18	6.76
160	2014/08/13	21:35:32	296.0089	693.92	30.15	296.0089	687.21	30.17	6.71

LOWER Serial Number: 2643 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 UPPER Serial Number: 2598 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
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TUNDRA OIL & GAS PARTNERSHIP  
 100/03-33-008-29W1/00  
 Start Test Date: 2014/08/02  
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TUNDRA SINCLAIR 3-33-8-29  
 Formation: BAKKEN

**RESERVOIR PRESSURE SURVEY**

	LOWER Date yyyy/mm/dd	LOWER Clk Time hh:mm:ss	LOWER Time hr	LOWER Pres. kPa(a)	LOWER Temp. °C	UPPER Time hr	UPPER Pres. kPa(a)	UPPER Temp. °C	Diff. G1 - G2 kPa
161	2014/08/13	23:35:32	298.0089	693.99	30.15	298.0089	687.30	30.18	6.69
162	2014/08/14	01:35:32	300.0089	693.95	30.15	300.0089	687.26	30.17	6.69
163	2014/08/14	03:35:32	302.0089	693.93	30.15	302.0089	687.22	30.17	6.71
164	2014/08/14	05:35:32	304.0089	694.03	30.15	304.0089	687.28	30.17	6.75
165	2014/08/14	07:35:32	306.0089	694.21	30.15	306.0089	687.47	30.17	6.75
166	2014/08/14	09:35:32	308.0089	694.12	30.15	308.0089	687.45	30.17	6.67
167	2014/08/14	11:35:32	310.0089	694.27	30.15	310.0089	687.54	30.17	6.73
168	2014/08/14	13:35:32	312.0089	694.39	30.15	312.0089	687.66	30.17	6.72
169	2014/08/14	15:35:32	314.0089	694.37	30.14	314.0089	687.65	30.16	6.72
170	2014/08/14	17:35:32	316.0089	694.38	30.14	316.0089	687.64	30.16	6.74
171	2014/08/14	19:35:32	318.0089	694.53	30.14	318.0089	687.80	30.16	6.72
172	2014/08/14	21:35:32	320.0089	694.79	30.14	320.0089	688.00	30.16	6.79
173	2014/08/14	23:35:32	322.0089	694.82	30.14	322.0089	688.02	30.16	6.79
174	2014/08/15	01:35:32	324.0089	694.75	30.14	324.0089	687.98	30.16	6.77
175	2014/08/15	03:35:32	326.0089	694.88	30.14	326.0089	688.10	30.16	6.78
176	2014/08/15	05:35:32	328.0089	694.95	30.14	328.0089	688.22	30.16	6.74
177	2014/08/15	07:35:32	330.0089	695.11	30.14	330.0089	688.33	30.16	6.78
178	2014/08/15	09:35:32	332.0089	695.20	30.14	332.0089	688.47	30.16	6.73
179	2014/08/15	11:35:32	334.0089	695.27	30.13	334.0089	688.46	30.16	6.81
180	2014/08/15	13:35:32	336.0089	695.42	30.13	336.0089	688.68	30.16	6.75
181	2014/08/15	15:35:32	338.0089	695.46	30.13	338.0089	688.75	30.16	6.72
182	2014/08/15	17:35:32	340.0089	695.61	30.13	340.0089	688.83	30.15	6.78
183	2014/08/15	19:35:32	342.0089	695.68	30.13	342.0089	688.96	30.15	6.72
184	2014/08/15	21:35:32	344.0089	695.82	30.13	344.0089	689.01	30.15	6.81
185	2014/08/15	23:35:32	346.0089	695.99	30.13	346.0089	689.26	30.15	6.73
186	2014/08/16	01:35:32	348.0089	696.09	30.13	348.0089	689.35	30.15	6.74
187	2014/08/16	03:35:32	350.0089	696.19	30.13	350.0089	689.43	30.15	6.76
188	2014/08/16	05:35:32	352.0089	696.31	30.13	352.0089	689.55	30.15	6.76
189	2014/08/16	07:35:32	354.0089	696.52	30.13	354.0089	689.73	30.15	6.79
190	2014/08/16	09:35:32	356.0089	696.66	30.13	356.0089	689.90	30.15	6.76
191	2014/08/16	11:35:32	358.0089	696.83	30.12	358.0089	690.08	30.14	6.75
192	2014/08/16	13:35:32	360.0089	697.00	30.12	360.0089	690.30	30.14	6.69
193	2014/08/16	15:35:32	362.0089	697.16	30.12	362.0089	690.52	30.14	6.64
194	2014/08/16	17:35:32	364.0089	697.38	30.12	364.0089	690.71	30.14	6.68
195	2014/08/16	19:35:32	366.0089	697.52	30.12	366.0089	690.81	30.14	6.71
196	2014/08/16	21:35:32	368.0089	697.80	30.12	368.0089	691.14	30.14	6.66
197	2014/08/16	23:35:32	370.0089	698.01	30.12	370.0089	691.35	30.14	6.66
198	2014/08/17	01:35:32	372.0089	698.27	30.12	372.0089	691.59	30.14	6.68
199	2014/08/17	03:35:32	374.0089	698.44	30.12	374.0089	691.74	30.14	6.70
200	2014/08/17	05:35:32	376.0089	698.44	30.11	376.0089	691.72	30.14	6.71

LOWER Serial Number: 2643 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 UPPER Serial Number: 2598 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 Print Filter: Print every 2 hour

TUNDRA OIL & GAS PARTNERSHIP  
 100/03-33-008-29W1/00  
 Start Test Date: 2014/08/02  
 Final Test Date: 2014/08/25

TUNDRA SINCLAIR 3-33-8-29  
 Formation: BAKKEN

**RESERVOIR PRESSURE SURVEY**

	LOWER Date yyyy/mm/dd	LOWER Clk Time hh:mm:ss	LOWER Time hr	LOWER Pres. kPa(a)	LOWER Temp. °C	UPPER Time hr	UPPER Pres. kPa(a)	UPPER Temp. °C	Diff. G1 - G2 kPa
201	2014/08/17	07:35:32	378.0089	698.60	30.11	378.0089	691.94	30.14	6.66
202	2014/08/17	09:35:32	380.0089	698.84	30.11	380.0089	692.16	30.14	6.68
203	2014/08/17	11:35:32	382.0089	699.17	30.11	382.0089	692.45	30.13	6.72
204	2014/08/17	13:35:32	384.0089	699.24	30.11	384.0089	692.56	30.13	6.68
205	2014/08/17	15:35:32	386.0089	699.47	30.11	386.0089	692.83	30.13	6.64
206	2014/08/17	17:35:32	388.0089	699.80	30.11	388.0089	693.12	30.13	6.68
207	2014/08/17	19:35:32	390.0089	699.90	30.11	390.0089	693.25	30.13	6.65
208	2014/08/17	21:35:32	392.0089	699.98	30.11	392.0089	693.33	30.13	6.64
209	2014/08/17	23:35:32	394.0089	700.19	30.11	394.0089	693.58	30.13	6.61
210	2014/08/18	01:35:32	396.0089	700.48	30.11	396.0089	693.83	30.13	6.65
211	2014/08/18	03:35:32	398.0089	700.70	30.11	398.0089	694.06	30.13	6.64
212	2014/08/18	05:35:32	400.0089	700.84	30.10	400.0089	694.21	30.13	6.63
213	2014/08/18	07:35:32	402.0089	701.21	30.10	402.0089	694.62	30.13	6.59
214	2014/08/18	09:35:32	404.0089	701.35	30.10	404.0089	694.71	30.12	6.64
215	2014/08/18	11:35:32	406.0089	701.61	30.10	406.0089	695.01	30.12	6.60
216	2014/08/18	13:35:32	408.0089	701.93	30.10	408.0089	695.29	30.12	6.64
217	2014/08/18	15:35:32	410.0089	702.27	30.10	410.0089	695.59	30.12	6.68
218	2014/08/18	17:35:32	412.0089	702.25	30.10	412.0089	695.63	30.12	6.63
219	2014/08/18	19:35:32	414.0089	702.52	30.10	414.0089	695.88	30.12	6.65
220	2014/08/18	21:35:32	416.0089	702.86	30.10	416.0089	696.25	30.12	6.62
221	2014/08/18	23:35:32	418.0089	703.13	30.10	418.0089	696.53	30.12	6.60
222	2014/08/19	01:35:32	420.0089	703.31	30.10	420.0089	696.66	30.12	6.65
223	2014/08/19	03:35:32	422.0089	703.49	30.10	422.0089	696.84	30.12	6.65
224	2014/08/19	05:35:32	424.0089	703.77	30.10	424.0089	697.15	30.12	6.62
225	2014/08/19	07:35:32	426.0089	704.05	30.10	426.0089	697.41	30.11	6.65
226	2014/08/19	09:35:32	428.0089	704.29	30.10	428.0089	697.60	30.12	6.69
227	2014/08/19	11:35:32	430.0089	704.61	30.09	430.0089	697.95	30.12	6.65
228	2014/08/19	13:35:32	432.0089	704.63	30.09	432.0089	698.00	30.11	6.64
229	2014/08/19	15:35:32	434.0089	704.97	30.09	434.0089	698.31	30.11	6.66
230	2014/08/19	17:35:32	436.0089	705.32	30.09	436.0089	698.67	30.11	6.65
231	2014/08/19	19:35:32	438.0089	705.61	30.09	438.0089	699.01	30.11	6.60
232	2014/08/19	21:35:32	440.0089	705.77	30.09	440.0089	699.11	30.11	6.67
233	2014/08/19	23:35:32	442.0089	706.07	30.09	442.0089	699.41	30.11	6.67
234	2014/08/20	01:35:32	444.0089	706.41	30.09	444.0089	699.74	30.11	6.67
235	2014/08/20	03:35:32	446.0089	706.74	30.09	446.0089	700.07	30.11	6.68
236	2014/08/20	05:35:32	448.0089	706.99	30.09	448.0089	700.37	30.11	6.62
237	2014/08/20	07:35:32	450.0089	707.14	30.09	450.0089	700.49	30.11	6.64
238	2014/08/20	09:35:32	452.0089	707.38	30.09	452.0089	700.70	30.11	6.68
239	2014/08/20	11:35:32	454.0089	707.67	30.08	454.0089	700.98	30.10	6.69
240	2014/08/20	13:35:32	456.0089	707.97	30.08	456.0089	701.28	30.10	6.69

LOWER Serial Number: 2643 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 UPPER Serial Number: 2598 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 Print Filter: Print every 2 hour

TUNDRA OIL & GAS PARTNERSHIP  
 100/03-33-008-29W1/00  
 Start Test Date: 2014/08/02  
 Final Test Date: 2014/08/25

TUNDRA SINCLAIR 3-33-8-29  
 Formation: BAKKEN

**RESERVOIR PRESSURE SURVEY**

	LOWER Date yyyy/mm/dd	LOWER Clk Time hh:mm:ss	LOWER Time hr	LOWER Pres. kPa(a)	LOWER Temp. °C	UPPER Time hr	UPPER Pres. kPa(a)	UPPER Temp. °C	Diff. G1 - G2 kPa
241	2014/08/20	15:35:32	458.0089	708.30	30.08	458.0089	701.62	30.10	6.68
242	2014/08/20	17:35:32	460.0089	708.65	30.08	460.0089	702.02	30.10	6.63
243	2014/08/20	19:35:32	462.0089	708.82	30.08	462.0089	702.19	30.10	6.63
244	2014/08/20	21:35:32	464.0089	709.09	30.08	464.0089	702.44	30.10	6.65
245	2014/08/20	23:35:32	466.0089	709.42	30.08	466.0089	702.76	30.10	6.66
246	2014/08/21	01:35:32	468.0089	709.52	30.08	468.0089	702.86	30.10	6.66
247	2014/08/21	03:35:32	470.0089	709.87	30.08	470.0089	703.20	30.10	6.67
248	2014/08/21	05:35:32	472.0089	710.18	30.08	472.0089	703.49	30.10	6.69
249	2014/08/21	07:35:32	474.0089	710.50	30.08	474.0089	703.86	30.10	6.64
250	2014/08/21	09:35:32	476.0089	710.82	30.08	476.0089	704.16	30.10	6.66
251	2014/08/21	11:35:32	478.0089	711.09	30.08	478.0089	704.48	30.10	6.61
252	2014/08/21	13:35:32	480.0089	711.24	30.07	480.0089	704.61	30.10	6.63
253	2014/08/21	15:35:32	482.0089	711.57	30.07	482.0089	704.94	30.09	6.62
254	2014/08/21	17:35:32	484.0089	711.73	30.08	484.0089	705.09	30.09	6.64
255	2014/08/21	19:35:32	486.0089	712.05	30.07	486.0089	705.44	30.09	6.61
256	2014/08/21	21:35:32	488.0089	712.35	30.07	488.0089	705.72	30.09	6.63
257	2014/08/21	23:35:32	490.0089	712.65	30.07	490.0089	706.04	30.09	6.61
258	2014/08/22	01:35:32	492.0089	712.95	30.07	492.0089	706.31	30.09	6.64
259	2014/08/22	03:35:32	494.0089	713.24	30.07	494.0089	706.59	30.09	6.65
260	2014/08/22	05:35:32	496.0089	713.57	30.07	496.0089	706.94	30.09	6.64
261	2014/08/22	07:35:32	498.0089	713.80	30.07	498.0089	707.18	30.09	6.62
262	2014/08/22	09:35:32	500.0089	714.07	30.07	500.0089	707.38	30.09	6.69
263	2014/08/22	11:35:32	502.0089	714.39	30.07	502.0089	707.74	30.09	6.65
264	2014/08/22	13:35:32	504.0089	714.77	30.07	504.0089	708.10	30.09	6.67
265	2014/08/22	15:35:32	506.0089	715.13	30.06	506.0089	708.47	30.09	6.66
266	2014/08/22	17:35:32	508.0089	715.48	30.07	508.0089	708.85	30.09	6.64
267	2014/08/22	19:35:32	510.0089	715.80	30.07	510.0089	709.12	30.08	6.68
268	2014/08/22	21:35:32	512.0089	715.89	30.06	512.0089	709.24	30.08	6.64
269	2014/08/22	23:35:32	514.0089	716.18	30.06	514.0089	709.54	30.08	6.63
270	2014/08/23	01:35:32	516.0089	716.50	30.06	516.0089	709.89	30.08	6.61
271	2014/08/23	03:35:32	518.0089	716.83	30.06	518.0089	710.21	30.08	6.61
272	2014/08/23	05:35:32	520.0089	717.15	30.06	520.0089	710.48	30.08	6.67
273	2014/08/23	07:35:32	522.0089	717.29	30.06	522.0089	710.63	30.08	6.66
274	2014/08/23	09:35:32	524.0089	717.53	30.06	524.0089	710.86	30.08	6.67
275	2014/08/23	11:35:32	526.0089	717.79	30.06	526.0089	711.14	30.08	6.65
276	2014/08/23	13:35:32	528.0089	718.17	30.06	528.0089	711.50	30.08	6.67
277	2014/08/23	15:35:32	530.0089	718.40	30.06	530.0089	711.76	30.08	6.64
278	2014/08/23	17:35:32	532.0089	718.64	30.06	532.0089	711.99	30.08	6.66
279	2014/08/23	19:35:32	534.0089	718.95	30.06	534.0089	712.35	30.08	6.60
280	2014/08/23	21:35:32	536.0089	719.28	30.06	536.0089	712.64	30.08	6.65

LOWER Serial Number: 2643 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 UPPER Serial Number: 2598 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 Print Filter: Print every 2 hour

TUNDRA OIL & GAS PARTNERSHIP  
 100/03-33-008-29W1/00  
 Start Test Date: 2014/08/02  
 Final Test Date: 2014/08/25

TUNDRA SINCLAIR 3-33-8-29  
 Formation: BAKKEN

**RESERVOIR PRESSURE SURVEY**

	LOWER Date yyyy/mm/dd	LOWER Clk Time hh:mm:ss	LOWER Time hr	LOWER Pres. kPa(a)	LOWER Temp. °C	UPPER Time hr	UPPER Pres. kPa(a)	UPPER Temp. °C	Diff. G1 - G2 kPa		
281	2014/08/23	23:35:32	538.0089	719.56	30.06	538.0089	712.90	30.07	6.65		
282	2014/08/24	01:35:32	540.0089	719.96	30.05	540.0089	713.28	30.08	6.68		
283	2014/08/24	03:35:32	542.0089	720.04	30.05	542.0089	713.43	30.07	6.60		
284	2014/08/24	05:35:32	544.0089	720.35	30.05	544.0089	713.71	30.07	6.64		
285	2014/08/24	07:35:32	546.0089	720.69	30.05	546.0089	714.07	30.08	6.62		
286	2014/08/24	09:35:32	548.0089	720.99	30.05	548.0089	714.37	30.07	6.63		
287	2014/08/24	11:35:32	550.0089	721.36	30.05	550.0089	714.66	30.07	6.70		
288	2014/08/24	13:35:32	552.0089	721.49	30.05	552.0089	714.81	30.07	6.68		
289	2014/08/24	15:35:32	554.0089	721.81	30.05	554.0089	715.18	30.07	6.63		
290	2014/08/24	17:35:32	556.0089	722.13	30.05	556.0089	715.46	30.07	6.67		
291	2014/08/24	19:35:32	558.0089	722.51	30.05	558.0089	715.83	30.07	6.68		
292	2014/08/24	21:35:32	560.0089	722.86	30.05	560.0089	716.21	30.07	6.65		
293	2014/08/24	23:35:32	562.0089	722.95	30.05	562.0089	716.35	30.07	6.60		
294	2014/08/25	01:35:32	564.0089	723.29	30.05	564.0089	716.64	30.07	6.65		
295	2014/08/25	03:35:32	566.0089	723.60	30.05	566.0089	716.98	30.07	6.62		
296	2014/08/25	05:35:32	568.0089	723.98	30.05	568.0089	717.35	30.07	6.63		
297	2014/08/25	07:35:32	570.0089	724.31	30.05	570.0089	717.66	30.07	6.65		
298	2014/08/25	09:35:32	572.0089	724.51	30.05	572.0089	717.86	30.06	6.65		
299	2014/08/25	11:35:32	574.0089	724.82	30.04	574.0089	718.16	30.06	6.65		
300	2014/08/25	12:52:02	575.2839	724.94	30.04	575.2839	718.26	30.06	6.68		
301	2014/08/25	12:52:02	575.2839	FINAL PRESSURE, PREPARE TO UNSET BRIDGE PLUG							
302	2014/08/25	12:52:32	575.2922	725.29	30.04	575.2922	718.54	30.06	6.75		
303	2014/08/25	12:55:32	575.3422	727.17	30.04	575.3422	720.39	30.06	6.78		
304	2014/08/25	12:55:32	575.3422	BRIDGE PLUG UNSET							
305	2014/08/25	12:56:02	575.3506	9311.09	30.18	575.3506	8909.72	30.39	401.36		
306	2014/08/25	13:26:32	575.8589	8511.18	24.68	575.8589	8505.30	24.74	5.88		
307	2014/08/25	13:26:32	575.8589	PULL OUT OF HOLE							
308	2014/08/25	13:27:02	575.8672	8402.62	24.68	575.8672	8425.10	24.75	-22.47		
309	2014/08/25	13:35:32	576.0089	7026.01	21.70	576.0089	7029.58	21.86	-3.56		
310	2014/08/25	14:21:32	576.7756	99.46	12.94	576.7756	98.97	12.94	0.48		
311	2014/08/25	14:21:32	576.7756	RECORDERS AT SURFACE							
312	2014/08/25	14:22:02	576.7839	99.43	12.94	576.7839	98.95	12.94	0.48		
313	2014/08/25	15:35:32	578.0089	99.29	14.57	578.0089	99.63	14.41	-0.34		
314	2014/08/25	17:35:32	580.0089	99.77	21.65	580.0089	99.71	22.61	0.06		
315	2014/08/25	19:35:32	582.0089	99.43	16.16	582.0089	99.02	16.00	0.41		
316	2014/08/25	21:30:02	583.9172	99.62	12.37	583.9172	98.90	12.02	0.72		

LOWER Serial Number: 2643 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 UPPER Serial Number: 2598 Start Date: 2014/08/01 13:35:00 Run Depth: 870.40  
 Print Filter: Print every 2 hour



COMMENTS: Tools were ran in the well by a service rig to collect the BHP + BHT below a bridge plug. Tools were then pulled by a service rig.

DESCRIPTION OF WORK DONE:

Tools were ran in the well by a service rig to collect the BHP + BHT below a bridge plug. Tools were then pulled by a service rig.

August 1<sup>st</sup>, 2014

13:35:01 - Batteries connected

August 2<sup>nd</sup>, 2014

10:32:02 - RIH

10:49:32 - On bottom

10:52:02 - Bridge plug set @869.4 mKB

August 25<sup>th</sup>, 2014

12:55:32 - Final stable BHP + BHT

12:56:02 - Bridge plug un-set

13:26:32 - POOH

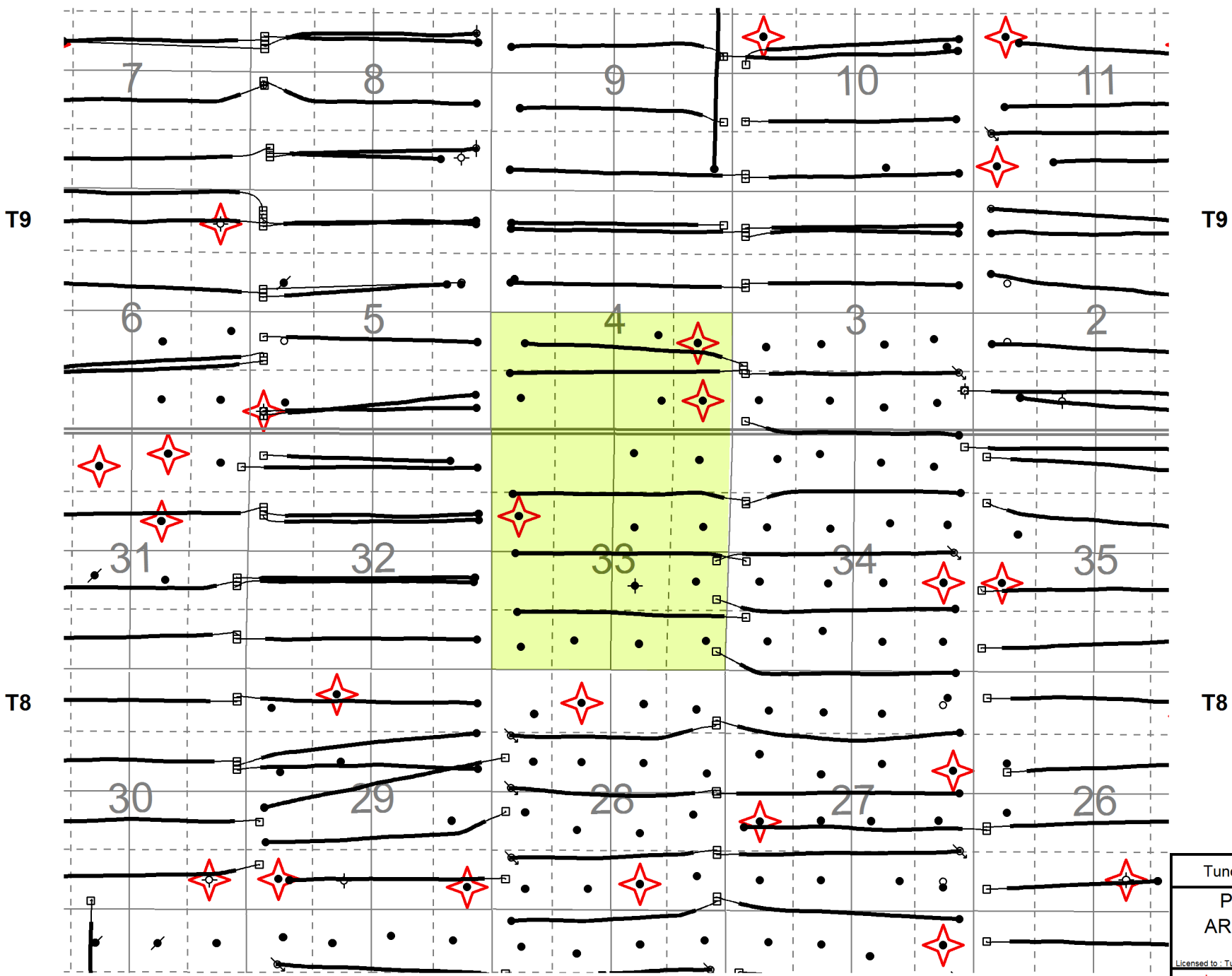
14:21:32 - Surface

August 26<sup>th</sup>, 2014

09:00:32 - Download data



R29W1



Tundra Oil & Gas Partnership		
Proposed Unit Area		
AREA CORED WELLS		
Licensed to : Tundra Oil & Gas Partnership		
By: Hackert	Date: 2014/09/16	
Scale = 1:36461	Project: Sinclair - Dalv	

R29W1

R30

R29

R28W1

Figure No. 1

T9

T9

T8

T8

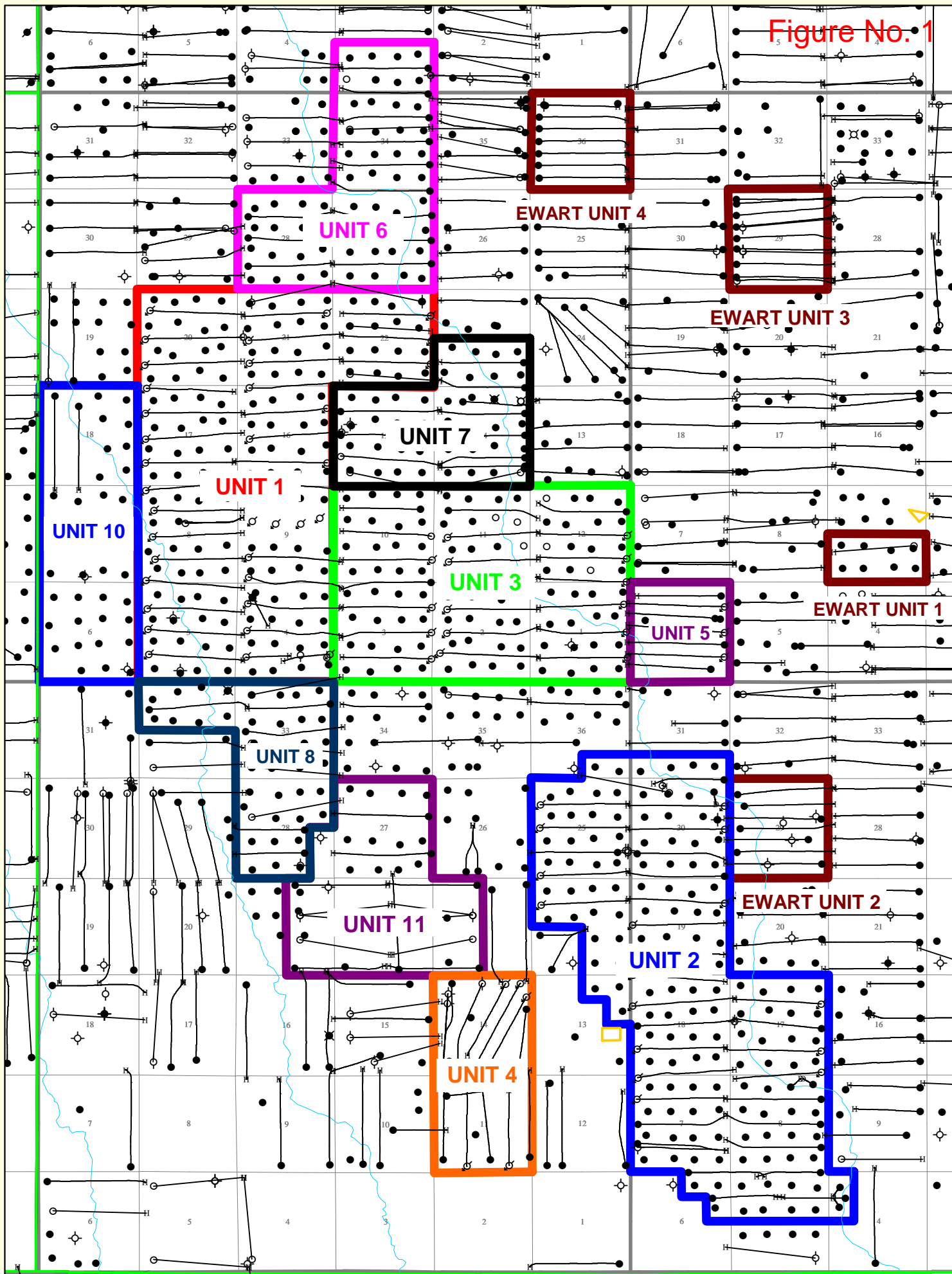
T7

T7

R30

R29

R28W1



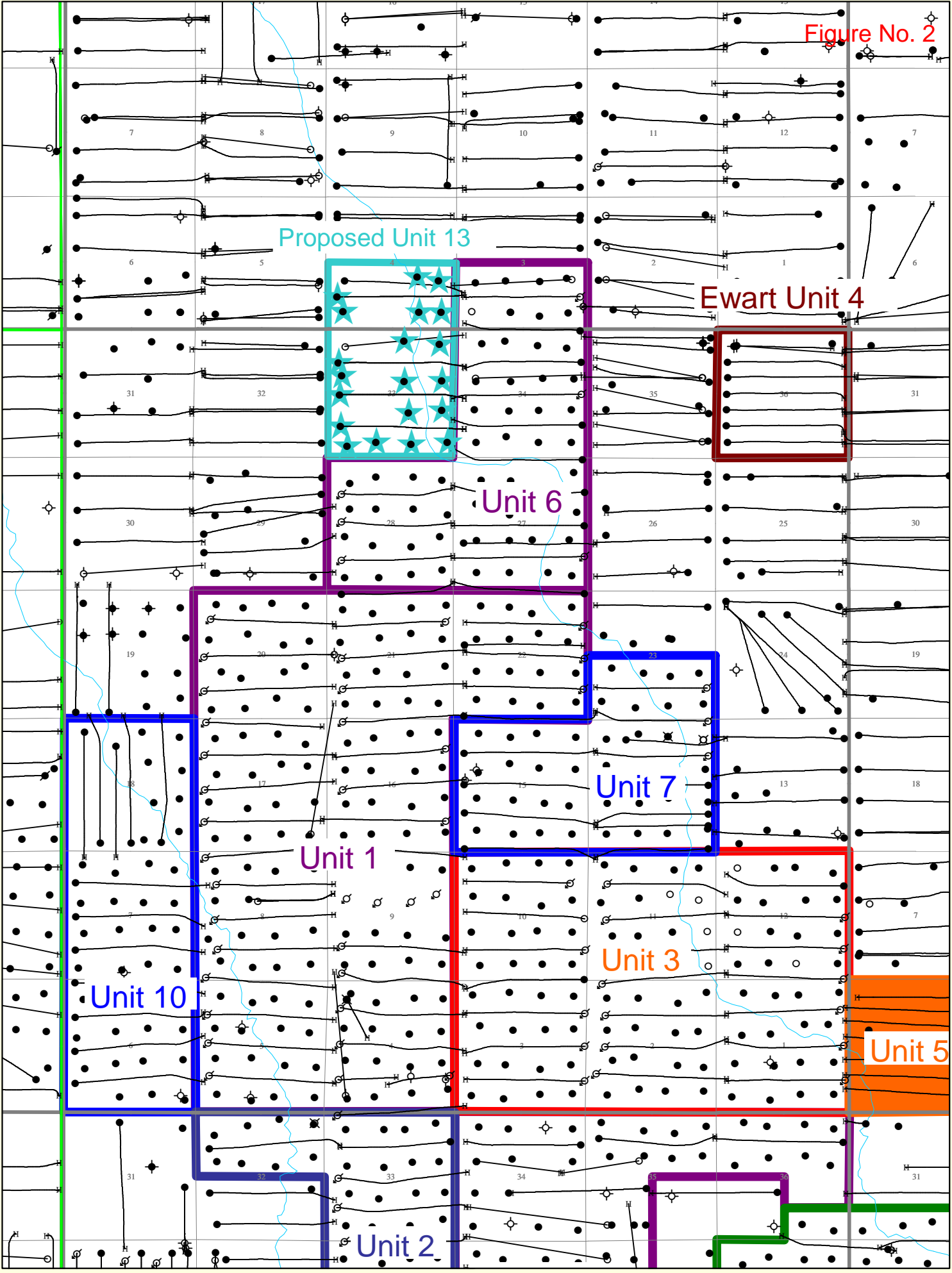


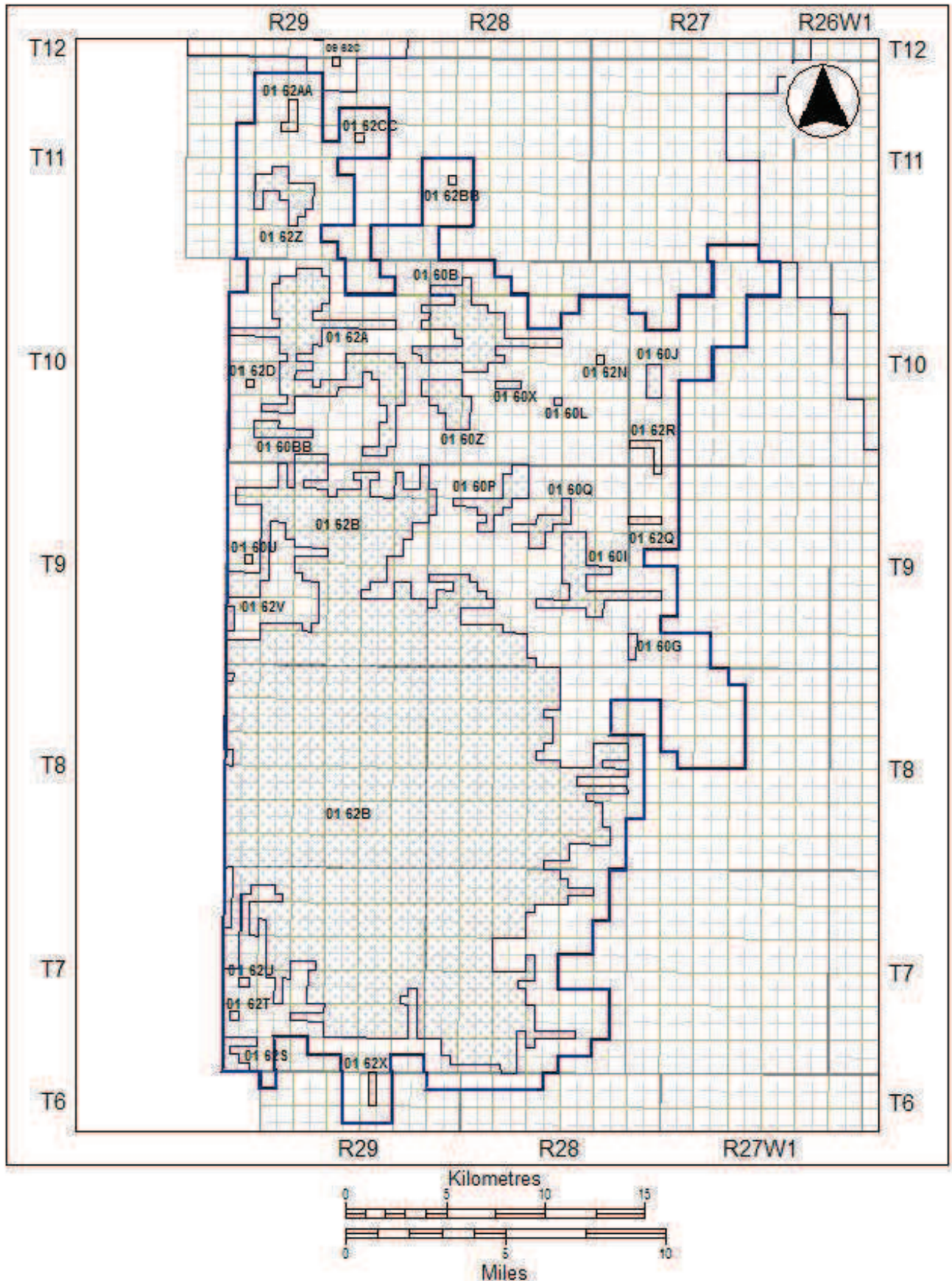
T9

T9

T8

T8

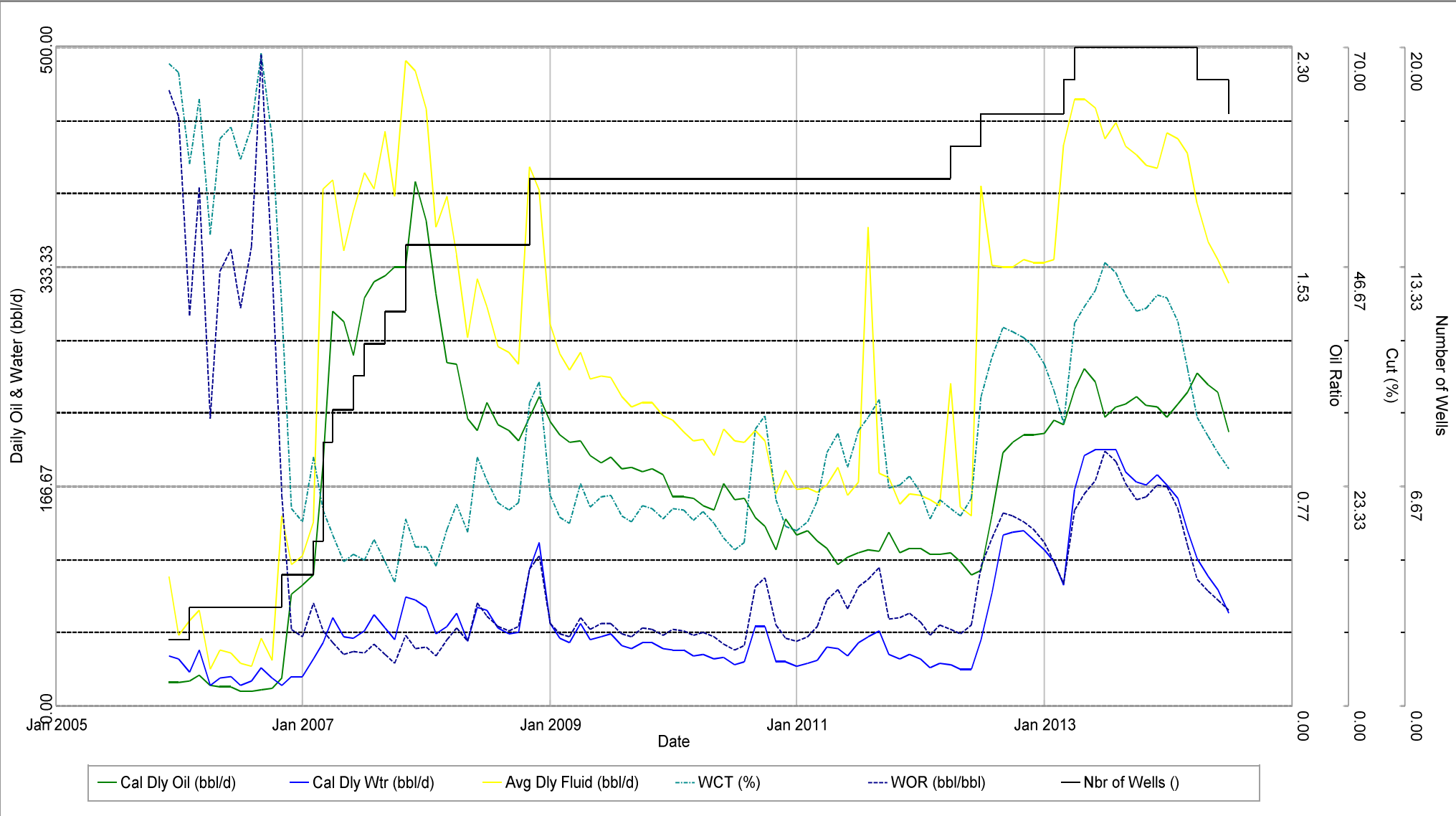




**FIGURE 14 - DALY SINCLAIR BAKKEN & BAKKEN-THREE FORKS POOLS (01 60A - 01 60BB & 01 62A – 01 62CC)** (Drawn on the DLS System Quarter Section Grid)

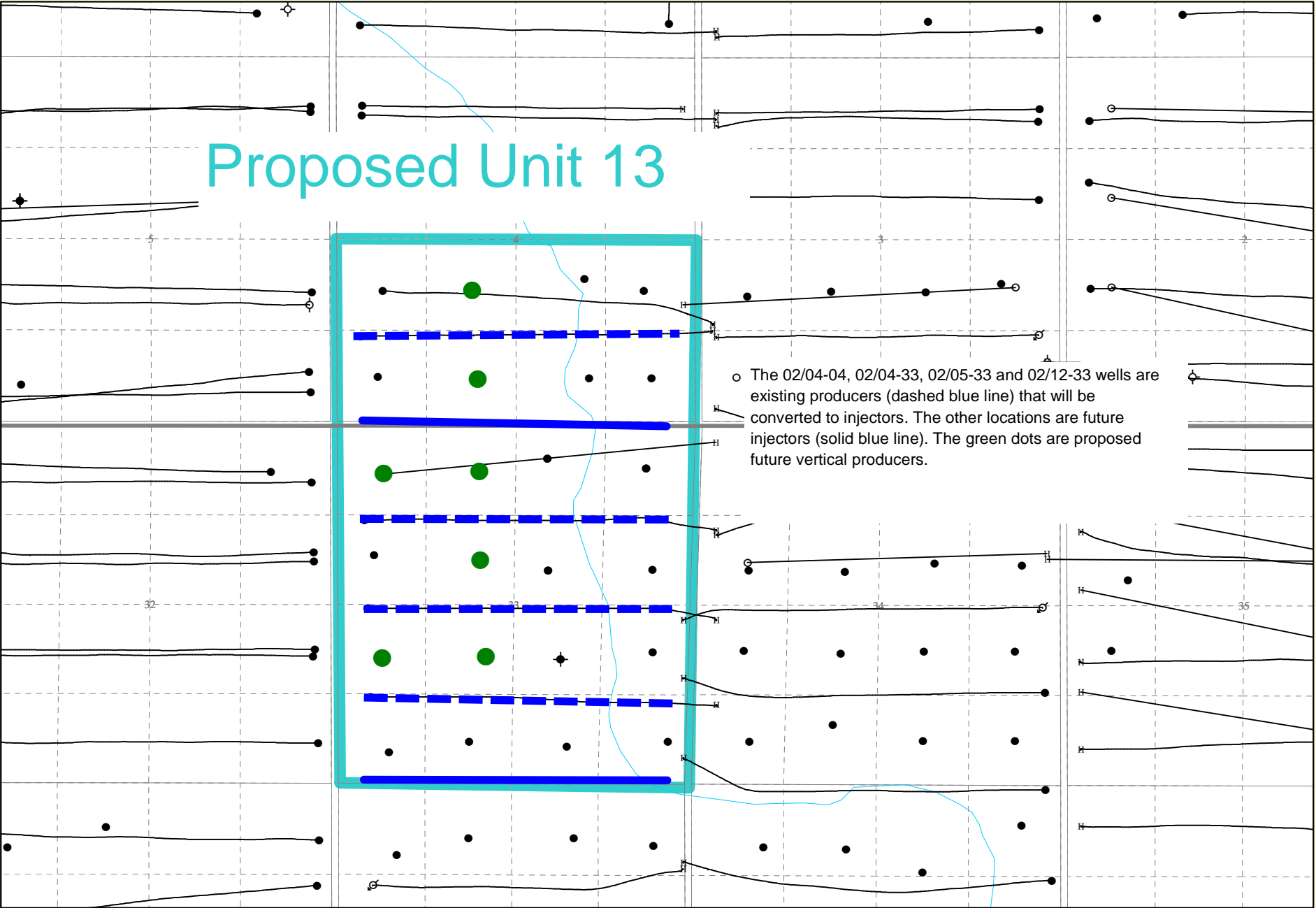
Production Graph

# of Wells:	20	Prod Zone:	BAKKEN; TORQUAY; THREEFK	On Prod:	2005-11 to 2014-06
Fluid:	Oil	Field:	DALY (1)	Cum Oil:	550890.4 bbl
Mode:	Producing; Comingled	Pool Code:	62B	Cum Gas:	0.0 mcf
		Unit Code:		Cum Wtr:	215107.9 bbl



— Cal Dly Oil (bbl/d)    — Cal Dly Wtr (bbl/d)    — Avg Dly Fluid (bbl/d)    ···· WCT (%)    - - - - WOR (bbl/bbl)    — Nbr of Wells ( )

# Proposed Unit 13

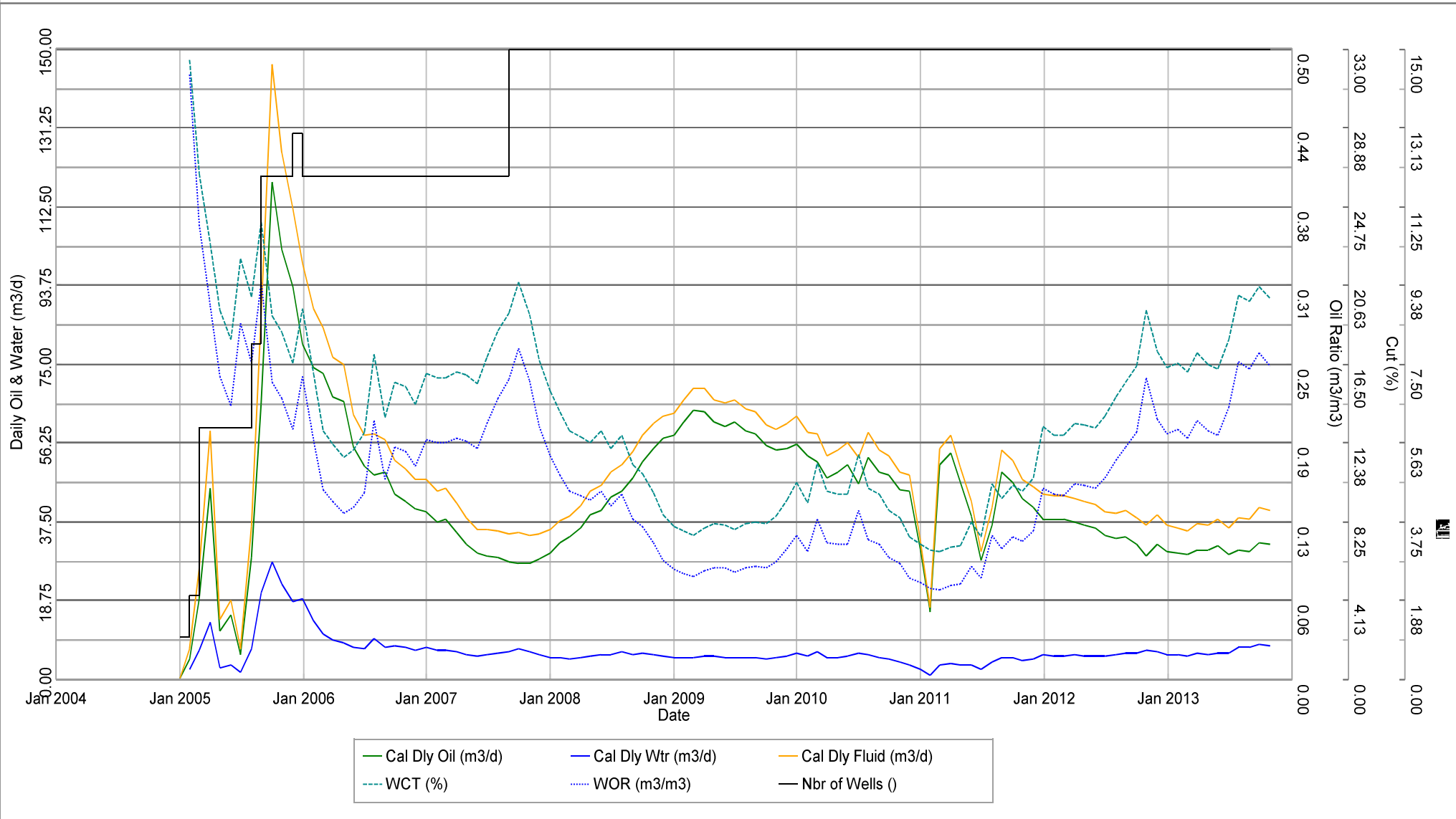


# Sinclair Unit 1 Pilot Waterflood

Figure No. 6

**Production Graph**

# of Wells:	16	Prod Zone:	BAKKEN; TORQUAY	On Prod:	2004-12 to 2013-10
Fluid:	Oil; Water Injection	Field:	DALY (1)	Cum Oil:	141701.5 m3
Mode:	Producing; Injection	Pool Code:	62B	Cum Gas:	0.0 E3m3
		Unit Code:	162B01	Cum Wtr:	21722.6 m3



— Cal Dly Oil (m3/d)      — Cal Dly Wtr (m3/d)      — Cal Dly Fluid (m3/d)  
- - - WCT (%)      - - - WOR (m3/m3)      — Nbr of Wells ( )

# Figure No. 7

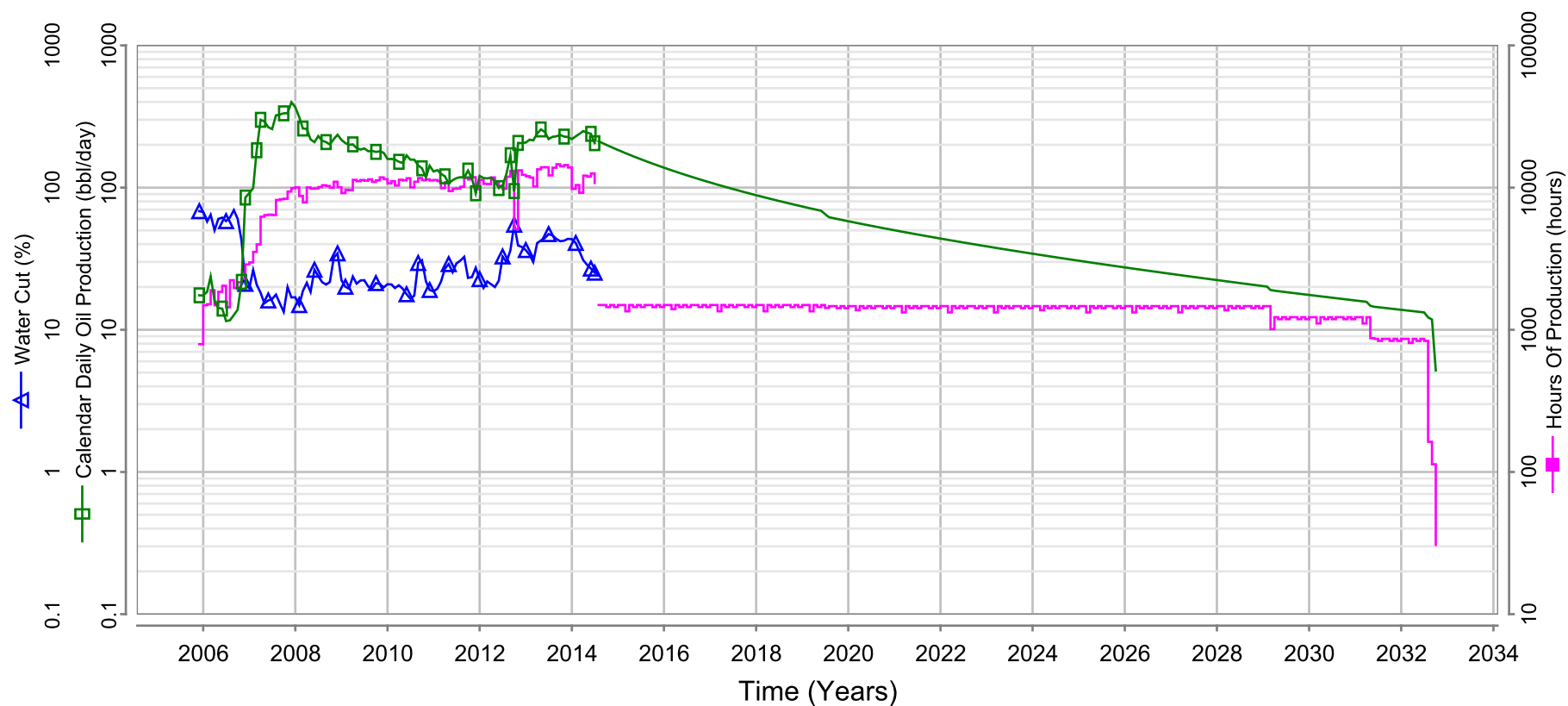
## CONSOLIDATED PRODUCTION AND FORECAST

Effective July 01, 2014

Selection: Current selection from current workbench list

Type:

Category: Base

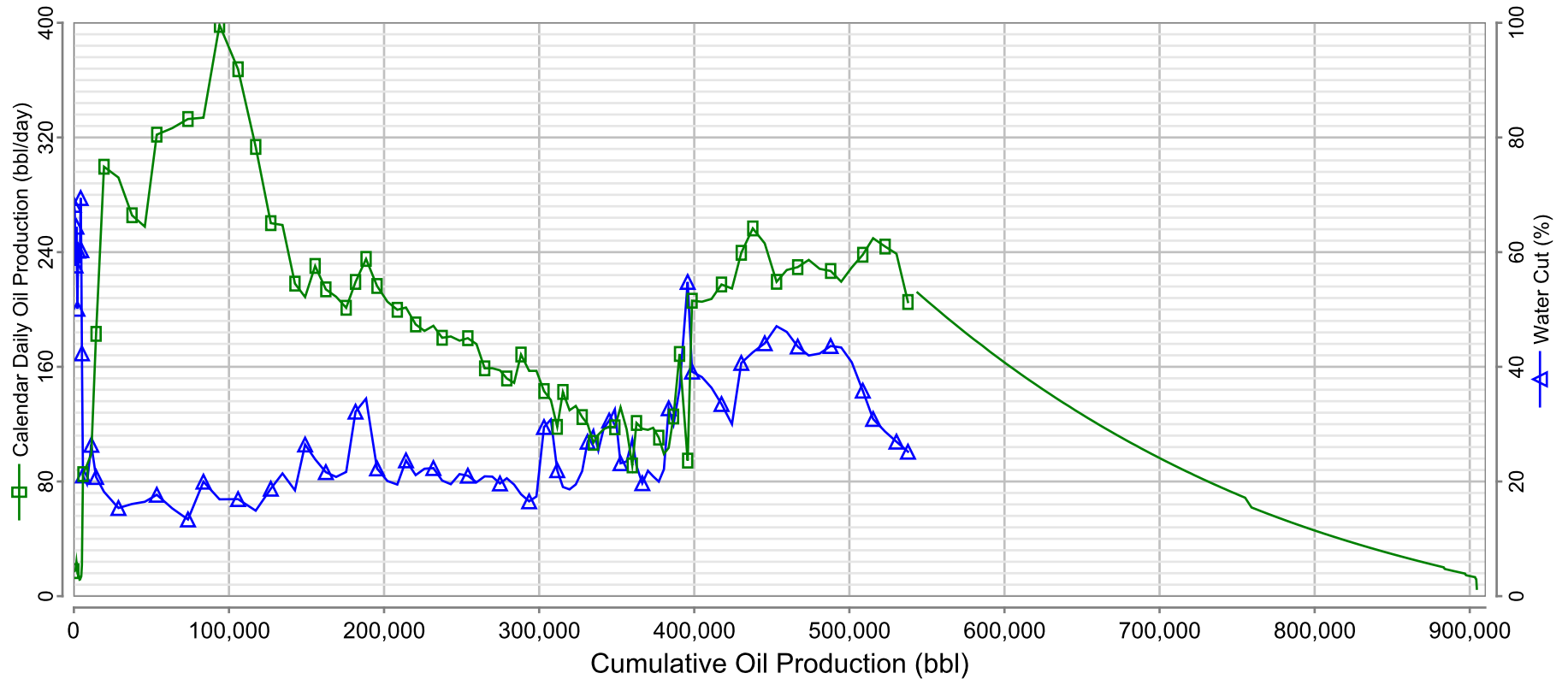


Cum Oil (bbl)	537,773	Cum Gas (Mcf)	0	Cum Water (bbl)	210,037	Cum Cond (bbl)	0
Forecast Start	2014/07/01	Calculation Type		Est. Cum Prod (bbl)	543,930	Decline Exponent	
Forecast End	2032/09/30	OVIP (bbl)		Remaining (bbl)	360,790	Initial Decline (%/yr)	36.8
Initial Rate (bbl/day)	2,110.1	Recovery Factor		Surface Loss		Life Index	5.81
Final Rate (bbl/day)	1,333.1	Ult. Recoverable (bbl)	904,720	Total Sales (Mcf)		Half Life (years)	3.81

# Figure No. 8

## CONSOLIDATED PRODUCTION AND FORECAST

Effective July 01, 2014  
 Selection: Current selection from current workbench list  
 Type:  
 Category: Base

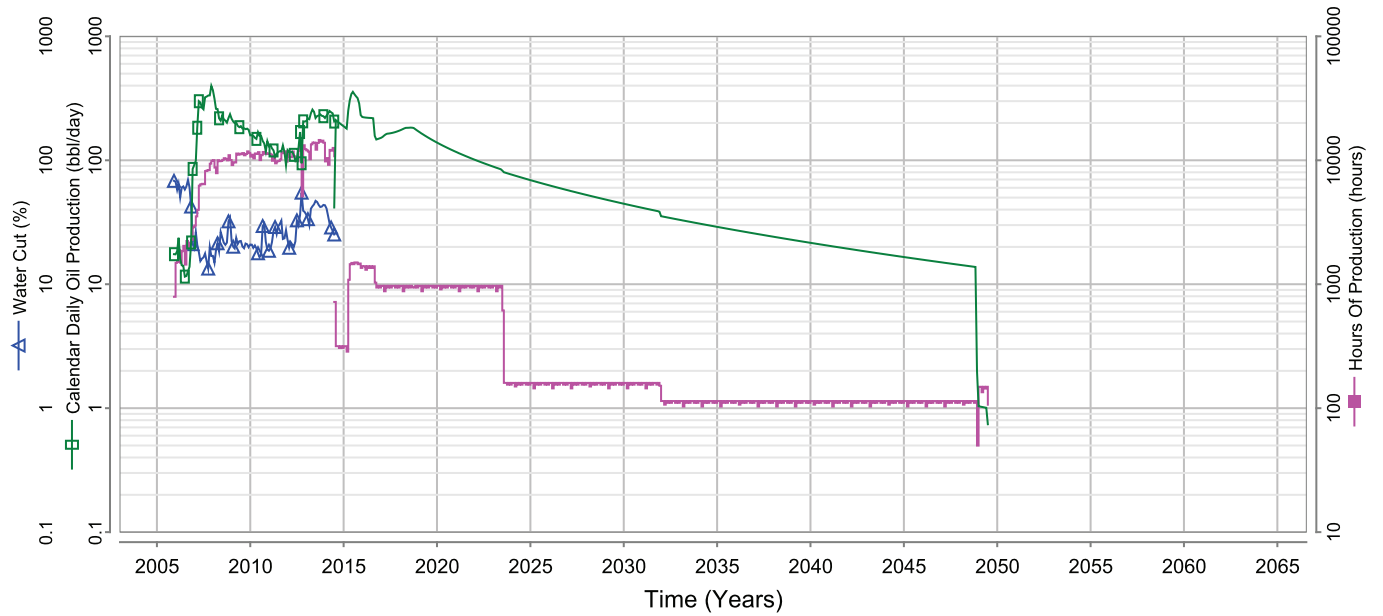


Cum Oil (bbl)	537,773	Cum Gas (Mcf)	0	Cum Water (bbl)	210,037	Cum Cond (bbl)	0
Forecast Start	2014/07/01	Calculation Type		Est. Cum Prod (bbl)	543,930	Decline Exponent	
Forecast End	2032/09/30	OVIP (bbl)		Remaining (bbl)	360,790	Initial Decline (%/yr)	36.8
Initial Rate (bbl/day)	2,110.1	Recovery Factor		Surface Loss		Life Index	5.81
Final Rate (bbl/day)	1,333.1	Ult. Recoverable (bbl)	904,720	Total Sales (Mcf)		Half Life (years)	3.81

CONSOLIDATED PRODUCTION AND FORECAST

Figure No. 9

Effective July 01, 2014  
 Selection: Current selection from current workbench list  
 Type:  
 Category: Base + Growth 1



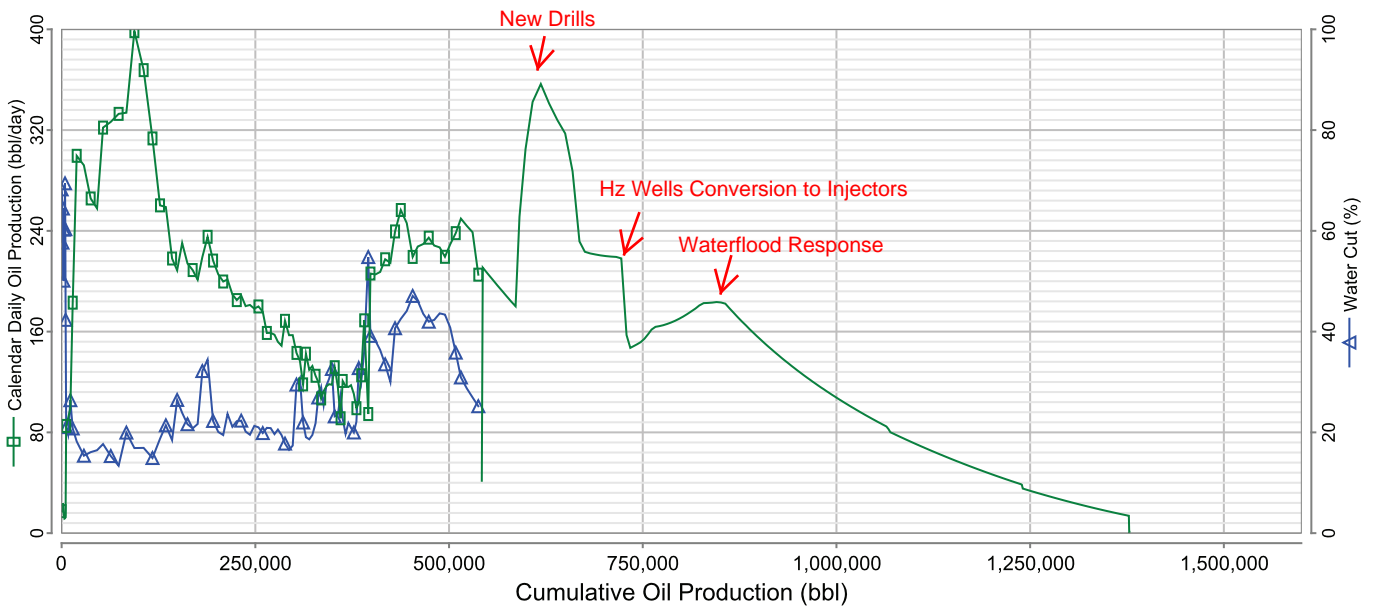
Cum Oil (bbl)	537,773	Cum Gas (Mcf)	0	Cum Water (bbl)	210,037	Cum Cond (bbl)	0
Forecast Start	2014/06/01	Calculation Type		Est. Cum Prod (bbl)	543,523	Decline Exponent	
Forecast End	2049/06/30	OVIP (bbl)		Remaining (bbl)	834,566	Initial Decline (%/yr)	39.8
Initial Rate (bbl/day)	41.6	Recovery Factor		Surface Loss		Life Index	12.73
Final Rate (bbl/day)	25.1	Ult. Recoverable (bbl)	1,378,090	Total Sales (Mcf)		Half Life (years)	6.23



CONSOLIDATED PRODUCTION AND FORECAST

Figure No. 10

Effective July 01, 2014  
 Selection: Current selection from current workbench list  
 Type:  
 Category: Base + Growth 1



Cum Oil (bbl)	537,773	Cum Gas (Mcf)	0	Cum Water (bbl)	210,037	Cum Cond (bbl)	0
Forecast Start	2014/06/01	Calculation Type		Est. Cum Prod (bbl)	543,523	Decline Exponent	
Forecast End	2049/06/30	OVIP (bbl)		Remaining (bbl)	834,566	Initial Decline (%/yr)	39.8
Initial Rate (bbl/day)	41.6	Recovery Factor		Surface Loss		Life Index	12.73
Final Rate (bbl/day)	25.1	Ult. Recoverable (bbl)	1,378,090	Total Sales (Mcf)		Half Life (years)	6.23

# Sinclair Unit No. 13

## EOR Waterflood Project

### Planned Corrosion Control Program \*\*

#### Source Well

- Continuous downhole corrosion inhibition
- Continuous surface corrosion inhibitor injection
- Downhole scale inhibitor injection
- Corrosion resistant valves and internally coated surface piping

#### Pipelines

- Source well to 3-4-8-29 Water Plant – Fiberglass
- New High Pressure Pipeline to Unit 9 injection wells – 2000 psi high pressure Fiberglass

#### Facilities

- 3-4-8-29 Water Plant and New Injection Pump Station
  - Plant piping – 600 ANSI schedule 80 pipe, Fiberglass or Internally coated
  - Filtration – Stainless steel bodies and PVC piping
  - Pumping – Ceramic plungers, stainless steel disc valves
  - Tanks – Fiberglass shell, corrosion resistant valves

#### Injection Wellhead / Surface Piping

- Corrosion resistant valves and stainless steel and/or internally coated steel surface piping

#### Injection Well

- Casing cathodic protection where required
- Wetted surfaces coated downhole packer
- Corrosion inhibited water in the annulus between tubing / casing
- Internally coated tubing surface to packer
- Surface freeze protection of annular fluid
- Corrosion resistant master valve
- Corrosion resistant pipeline valve

#### Producing Wells

- Casing cathodic protection where required
- Downhole batch corrosion inhibition as required
- Downhole scale inhibitor injection as required

**Figure 11**

\*\* subject to final design and engineering

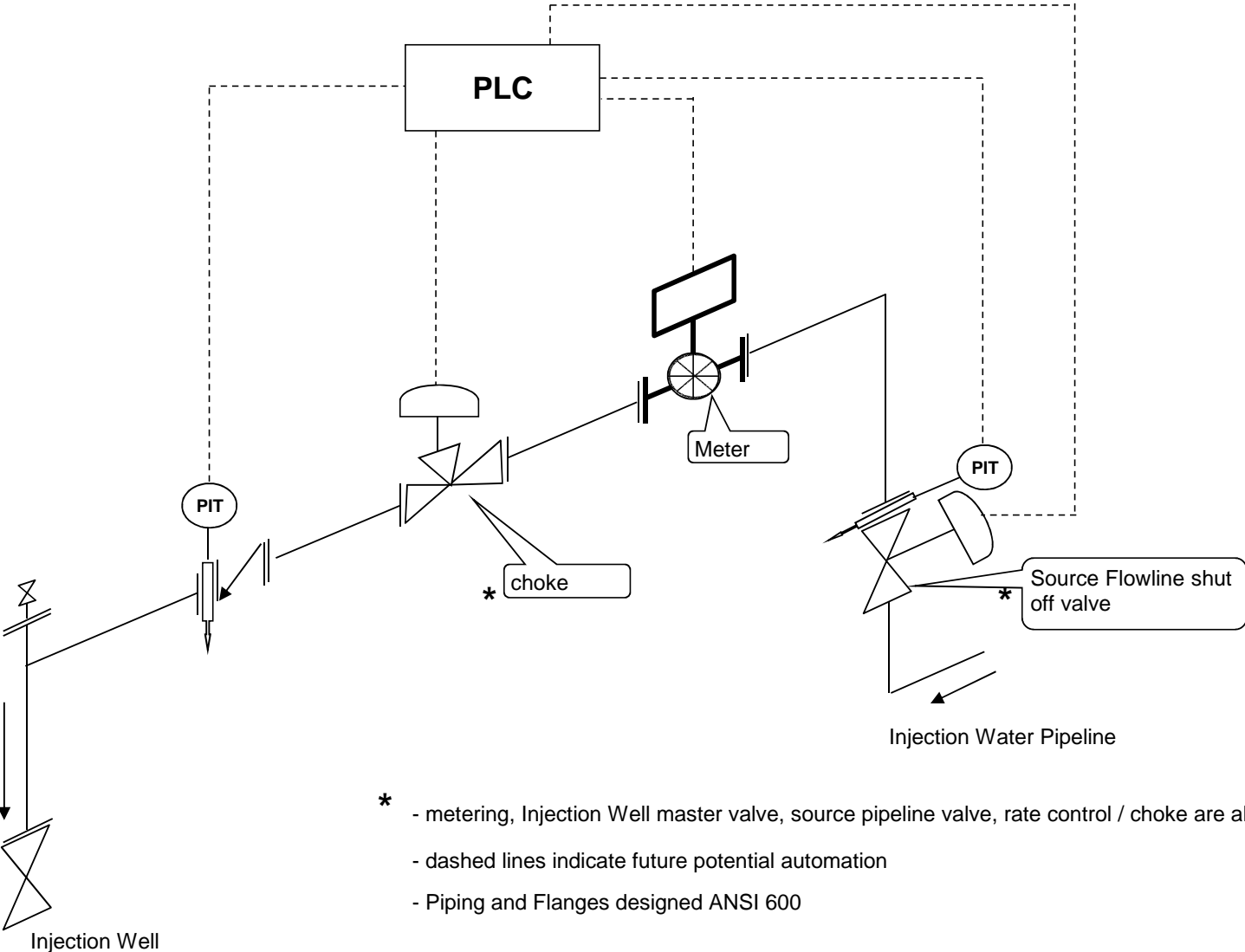




Figure No. 13

Sinclair Unit No. 13

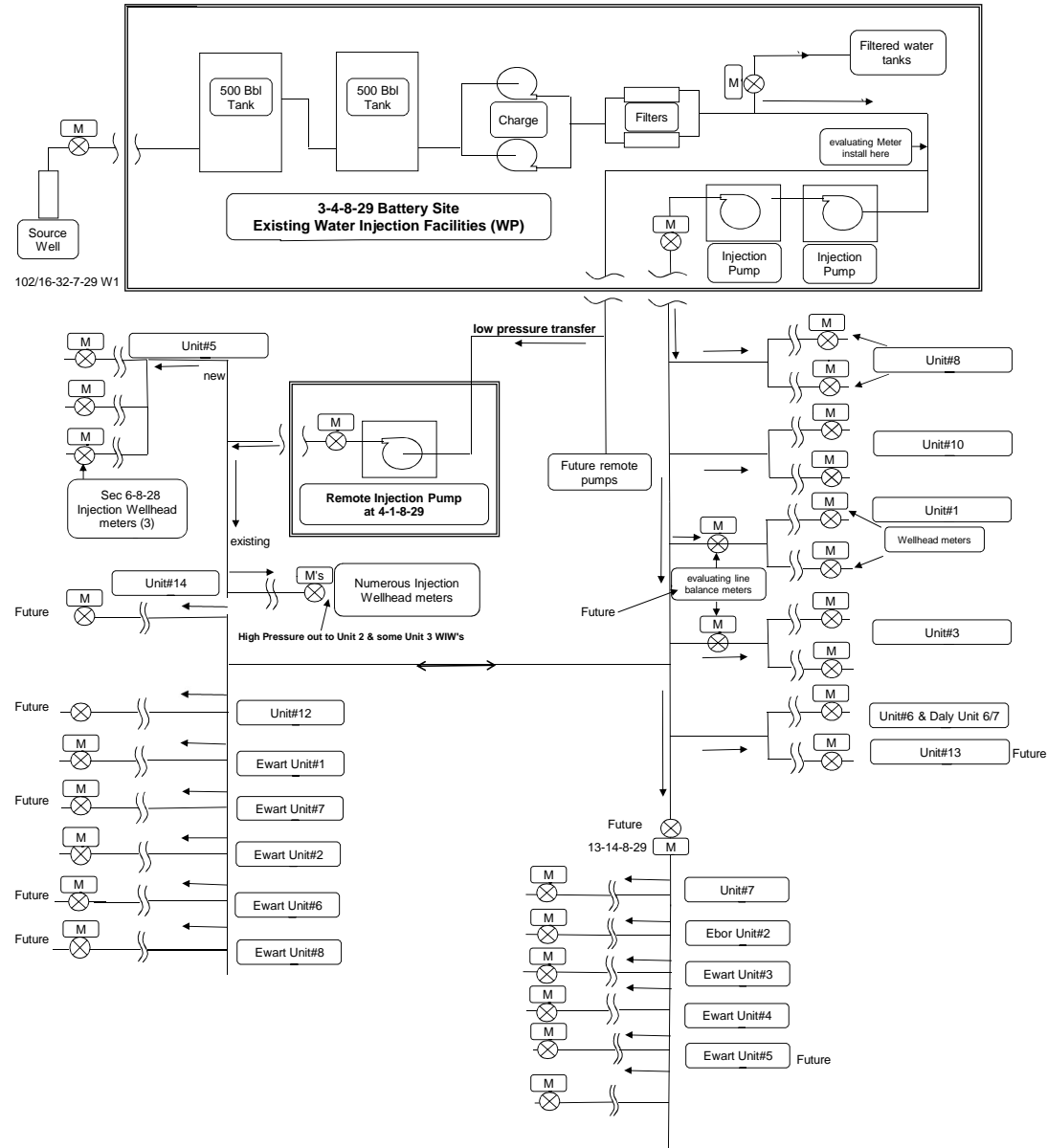
Proposed Injection Well Surface Piping P&ID



- \* - metering, Injection Well master valve, source pipeline valve, rate control / choke are all standard
- dashed lines indicate future potential automation
- Piping and Flanges designed ANSI 600

FIGURE NO. 14

### Sinclair Water Injection System



**TABLE NO. 1: TRACT PARTICIPATION FOR PROPOSED SINCLAIR UNIT NO. 13**

Working Interest				Royalty Interest		Tract Participation
Tract No.	Land Description	Owner	Share (%)	Owner	Share (%)	
1	01-33-008-29W1M	Tundra Oil & Gas Partnership	100%	5396353 Manitoba Ltd. 5495939 Manitoba Ltd. 5515778 Manitoba Ltd. JM Kohls Resources, LLC 0798419 BC Ltd. 5408696 Manitoba Ltd.	25.00% 12.50% 12.50% 25.00% 12.50% 12.50%	4.136478855%
2	02-33-008-29W1M	Tundra Oil & Gas Partnership	100%	5396353 Manitoba Ltd. 5495939 Manitoba Ltd. 5515778 Manitoba Ltd. JM Kohls Resources, LLC 0798419 BC Ltd. 5408696 Manitoba Ltd.	25.00% 12.50% 12.50% 25.00% 12.50% 12.50%	3.297397048%
3	03-33-008-29W1M	Tundra Oil & Gas Partnership	100%	Nancy Marion Payne Kim Brent Sharratt Lynda Diane MacDougall	33.33% 33.33% 33.33%	2.982861270%
4	04-33-008-29W1M	Tundra Oil & Gas Partnership	100%	Nancy Marion Payne Kim Brent Sharratt Lynda Diane MacDougall	33.33% 33.33% 33.33%	2.408427383%
5	05-33-008-29W1M	Tundra Oil & Gas Partnership	100%	Nancy Marion Payne Kim Brent Sharratt Lynda Diane MacDougall	33.33% 33.33% 33.33%	1.968812095%
6	06-33-008-29W1M	Tundra Oil & Gas Partnership	100%	Nancy Marion Payne Kim Brent Sharratt Lynda Diane MacDougall	33.33% 33.33% 33.33%	2.790458168%
7	07-33-008-29W1M	Tundra Oil & Gas Partnership	100%	5396353 Manitoba Ltd. 5495939 Manitoba Ltd. 5515778 Manitoba Ltd. JM Kohls Resources, LLC 0798419 BC Ltd. 5408696 Manitoba Ltd.	25.00% 12.50% 12.50% 25.00% 12.50% 12.50%	3.425641491%
8	08-33-008-29W1M	Tundra Oil & Gas Partnership	100%	5396353 Manitoba Ltd. 5495939 Manitoba Ltd. 5515778 Manitoba Ltd. JM Kohls Resources, LLC 0798419 BC Ltd. 5408696 Manitoba Ltd.	25.00% 12.50% 12.50% 25.00% 12.50% 12.50%	4.116232191%
9	09-33-008-29W1M	Tundra Oil & Gas Partnership	100%	Nancy Marion Payne Kim Brent Sharratt Lynda Diane MacDougall	33.33% 33.33% 33.33%	4.488555645%
10	10-33-008-29W1M	Tundra Oil & Gas Partnership	100%	Nancy Marion Payne Kim Brent Sharratt Lynda Diane MacDougall	33.33% 33.33% 33.33%	4.001962281%
11	11-33-008-29W1M	Tundra Oil & Gas Partnership	100%	WM. James Duncan Oil Partnership	100%	2.894629660%
12	12-33-008-29W1M	Tundra Oil & Gas Partnership	100%	WM. James Duncan Oil Partnership	100%	1.909583255%
13	13-33-008-29W1M	Tundra Oil & Gas Partnership	100%	WM. James Duncan Oil Partnership	100%	2.490977719%
14	14-33-008-29W1M	Tundra Oil & Gas Partnership	100%	WM. James Duncan Oil Partnership	100%	3.436149691%
15	15-33-008-29W1M	Tundra Oil & Gas Partnership	100%	Nancy Marion Payne Kim Brent Sharratt Lynda Diane MacDougall	33.33% 33.33% 33.33%	4.483807932%
16	16-33-008-29W1M	Tundra Oil & Gas Partnership	100%	Nancy Marion Payne Kim Brent Sharratt Lynda Diane MacDougall	33.33% 33.33% 33.33%	4.894897507%
17	01-04-009-29W1M	Tundra Oil & Gas Partnership	100%	Manitoba Mineral Resources	100%	6.633657430%
18	02-04-009-29W1M	Tundra Oil & Gas Partnership	100%	Manitoba Mineral Resources	100%	6.205404023%
19	03-04-009-29W1M	Tundra Oil & Gas Partnership	100%	Manitoba Mineral Resources	100%	5.104602966%
20	04-04-009-29W1M	Tundra Oil & Gas Partnership	100%	Manitoba Mineral Resources	100%	4.110354854%
21	05-04-009-29W1M	Tundra Oil & Gas Partnership	100%	Manitoba Mineral Resources	100%	2.563763334%
22	06-04-009-29W1M	Tundra Oil & Gas Partnership	100%	Manitoba Mineral Resources	100%	6.290253707%
23	07-04-009-29W1M	Tundra Oil & Gas Partnership	100%	Manitoba Mineral Resources	100%	7.363899485%
24	08-04-009-29W1M	Tundra Oil & Gas Partnership	100%	Manitoba Mineral Resources	100%	8.001192011%

**100.00000000%**

**TABLE NO. 2: TRACT FACTOR CALCULATIONS FOR SINCLAIR UNIT NO. 13**  
**TRACT FACTORS BASED ON OIL-IN-PLACE (OOIP) MINUS CUMULATIVE PRODUCTION TO JUNE 2014**

LS-SE	Tract	OOIP (m3)	HZ Wells Alloc Prod (m3)	Vert Wells Cum Prodn (m3)	Sum Hz + Vert Alloc Cum Prodn	OOIP - Cum Prodn	Tract Factor	Tract
01-33	01-33-008-29W1M	69,781	858.9	6,938.9	7,797.8	61,984	4.136478855%	01-33-008-29W1M
02-33	02-33-008-29W1M	58,610	827.3	8,372.8	9,200.1	49,410	3.297397048%	02-33-008-29W1M
03-33	03-33-008-29W1M	47,225	723.1	1,804.5	2,527.6	44,697	2.982861270%	03-33-008-29W1M
04-33	04-33-008-29W1M	37,272	680.5	502.3	1,182.8	36,089	2.408427383%	04-33-008-29W1M
05-33	05-33-008-29W1M	30,436	933.7	0.0	933.7	29,502	1.968812095%	05-33-008-29W1M
06-33	06-33-008-29W1M	42,787	972.5	0.0	972.5	41,814	2.790458168%	06-33-008-29W1M
07-33	07-33-008-29W1M	57,203	865.7	5,005.0	5,870.7	51,332	3.425641491%	07-33-008-29W1M
08-33	08-33-008-29W1M	70,429	754.6	7,993.9	8,748.5	61,680	4.116232191%	08-33-008-29W1M
09-33	09-33-008-29W1M	75,671	777.1	7,634.7	8,411.8	67,259	4.488555645%	09-33-008-29W1M
10-33	10-33-008-29W1M	62,463	859.1	1,636.4	2,495.5	59,968	4.001962281%	10-33-008-29W1M
11-33	11-33-008-29W1M	44,227	851.9	0.0	851.9	43,375	2.894629660%	11-33-008-29W1M
12-33	12-33-008-29W1M	30,555	799.5	1,140.7	1,940.2	28,614	1.909583255%	12-33-008-29W1M
13-33	13-33-008-29W1M	37,789	462.2	0.0	462.2	37,326	2.490977719%	13-33-008-29W1M
14-33	14-33-008-29W1M	51,968	478.0	0.0	478.0	51,490	3.436149691%	14-33-008-29W1M
15-33	15-33-008-29W1M	70,681	470.7	3,021.9	3,492.6	67,188	4.483807932%	15-33-008-29W1M
16-33	16-33-008-29W1M	85,341	445.0	11,547.3	11,992.3	73,348	4.894897507%	16-33-008-29W1M
01-04	01-04-009-29W1M	109,347	269.5	9,674.9	9,944.4	99,403	6.633657430%	01-04-009-29W1M
02-04	02-04-009-29W1M	96,250	301.5	2,962.4	3,263.9	92,986	6.205404023%	02-04-009-29W1M
03-04	03-04-009-29W1M	76,804	313.0	0.0	313.0	76,491	5.104602966%	03-04-009-29W1M
04-04	04-04-009-29W1M	62,499	309.7	596.9	906.6	61,592	4.110354854%	04-04-009-29W1M
05-04	05-04-009-29W1M	38,671	253.7	0.0	253.7	38,417	2.563763334%	05-04-009-29W1M
06-04	06-04-009-29W1M	94,540	282.7	0.0	282.7	94,257	6.290253707%	06-04-009-29W1M
07-04	07-04-009-29W1M	112,480	292.4	1,842.5	2,134.9	110,345	7.363899485%	07-04-009-29W1M
08-04	08-04-009-29W1M	122,980	276.7	2,808.0	3,084.7	119,895	8.001192011%	08-04-009-29W1M
<b>m3</b>		<b>1,586,007</b>				<b>1,498,465</b>	<b>100.00000000%</b>	
<b>Mbbl</b>		<b>9,976</b>						



TABLE NO. 3: SINCLAIR UNIT NO. 13 WELL LIST

UWI	License Number	Type	Pool Name	Producing Zone	Mode	On Prod Date	Last Prod Date	Cal Dly Oil (m3/d)	Monthly Oil (m3)	Cum Prd Oil (m3)	Cal Dly Water (m3/d)	Monthly Water (m3)	Cum Prd Water (m3)	WCT (%)	
100/01-33-008-29W1/0	006138	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Producing	2/1/2007	Jun-2014	1.2	36.2	6,938.9	0.2	4.7	1,081.1	11.49	
100/02-33-008-29W1/0	006215	Vertical	BAKKEN-THREE FORKS B	BAKKEN,TORQUAY	Producing	2/1/2007	Jun-2014	1.6	46.9	8,372.8	0.1	2.4	795.9	4.87	
100/03-33-008-29W1/0	005605	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Producing	11/1/2005	Jun-2014	0.1	3.8	1,804.5	0.4	10.9	2,152.7	74.15	
100/04-33-008-29W1/0	005613	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Producing	11/1/2005	Jun-2014	0.1	2.0	502.3	0.3	9.4	2,315.6	82.46	
102/04-33-008-29W1/0	008587	Horizontal	BAKKEN-THREE FORKS B	BAKKEN,THREEFK	Producing	6/1/2012	Jun-2014	6.3	189.9	5,327.5	2.0	60.2	3,854.7	24.07	
100/05-33-008-29W1/0	009164	Horizontal	BAKKEN-THREE FORKS B	THREEFK,BAKKEN	Producing	2/1/2013	Jun-2014	7.1	214.1	2,349.1	2.1	62.0	3,217.5	22.46	
100/07-33-008-29W1/2	006216	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Producing	6/1/2007	Jun-2014	1.2	34.7	5,005.0	0.1	3.7	1,253.9	9.64	
100/08-33-008-29W1/0	006063	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Producing	10/1/2006	Jun-2014	1.0	29.1	7,993.9	0.1	1.6	1,013.2	5.21	
100/09-33-008-29W1/0	006213	Vertical	BAKKEN-THREE FORKS B	BAKKEN,TORQUAY	Producing	5/1/2007	Jun-2014	2.0	60.9	7,634.7	0.3	9.5	1,236.7	13.49	
100/10-33-008-29W1/2	006404	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Producing	10/1/2007	May-2014	0.1	3.2	1,636.4	0.1	2.6	1,192.6	44.83	
100/12-33-008-29W1/0	005769	Vertical	BAKKEN-THREE FORKS B	TORQUAY	Producing	1/1/2006	Jun-2014	0.0	1.4	1,140.7	0.2	7.2	1,699.1	83.72	
102/12-33-008-29W1/0	008583	Horizontal	BAKKEN-THREE FORKS B	BAKKEN,THREEFK	Producing	3/1/2012	Jun-2014	3.2	96.9	4,083.1	1.4	43.1	3,052.6	30.79	
100/15-33-008-29W1/2	006383	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Producing	10/1/2007	Jun-2014	0.5	15.6	3,021.9	0.2	5.6	1,418.7	26.42	
100/16-33-008-29W1/0	006214	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Commingled	3/1/2007	Jun-2014	1.9	57.6	11,547.3	0.3	8.5	1,400.8	12.86	
100/01-04-009-29W1/0	006372	Vertical	BAKKEN-THREE FORKS B	BAKKEN,TORQUAY	Producing	8/1/2007	Jun-2014	1.6	47.1	9,674.9	0.4	10.5	1,488.4	18.23	
100/02-04-009-29W1/0	006782	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Producing	10/1/2008	Jun-2014	0.4	12.1	2,962.4	0.1	4.2	1,046.8	25.77	
100/04-04-009-29W1/0	006163	Vertical	BAKKEN-THREE FORKS B	TORQUAY	Producing	1/1/2007	Feb-2014	0.0	0.0	596.9	0.2	4.4	822.8	100.00	
102/04-04-009-29W1/0	009041	Horizontal	BAKKEN-THREE FORKS B	THREEFK,BAKKEN	Producing	3/1/2013	Jun-2014	4.1	121.5	2,299.2	2.8	82.8	3,194.9	40.53	
100/07-04-009-29W1/0	006783	Vertical	BAKKEN-THREE FORKS B	BAKKEN	Producing	10/1/2008	Jun-2014	0.4	11.9	1,842.5	0.1	3.7	953.9	23.72	
100/08-04-009-29W1/0	006237	Vertical	BAKKEN-THREE FORKS B	BAKKEN,TORQUAY	Producing	2/1/2007	Jun-2014	0.4	11.7	2,808.0	0.1	4.2	990.9	26.42	
											87,542.0			34,182.8	

This location(s) are abandoned, did not produce and will not be included in the Unit Well list.  
100/07-33-008-29W1/0

**TABLE NO. 4: OOIP FOR SINCLAIR UNIT NO. 13**

UWI	MBKKN	Lyleton UA	Lyleton LA	Lyleton B	Total OOIP GLJ cut offs (m3)	MB Phi-h	UA Phi-h	LA Phi-h	LB Phi-h	SW MBKKN	SW Lyleton UA	SW Lyleton LA	SW Lyleton B
	0.5 md	1.0 md	1.0 md	0.5 md	0.5 md	0.5 md	1.0 md	1.0 md	0.5 md				
01-33-008-29W1M	15,894	33,369	8,088	12,430	69,781	0.18214	0.32260	0.08471	0.13018	0.45	0.35	0.40	0.40
02-33-008-29W1M	14,591	28,504	4,082	11,433	58,610	0.16628	0.27557	0.04275	0.11975	0.45	0.35	0.40	0.40
03-33-008-29W1M	13,111	22,081	1,789	10,244	47,225	0.14884	0.21347	0.01873	0.10729	0.45	0.35	0.40	0.40
04-33-008-29W1M	11,264	14,976	1,789	9,243	37,272	0.12773	0.14478	0.01874	0.09681	0.45	0.35	0.40	0.40
05-33-008-29W1M	10,064	9,821	1,590	8,960	30,436	0.11416	0.09495	0.01666	0.09384	0.45	0.35	0.40	0.40
06-33-008-29W1M	11,341	19,863	1,311	10,272	42,787	0.12954	0.19202	0.01373	0.10758	0.45	0.35	0.40	0.40
07-33-008-29W1M	12,061	30,488	2,893	11,761	57,203	0.13868	0.29475	0.03030	0.12317	0.45	0.35	0.40	0.40
08-33-008-29W1M	12,593	38,913	5,998	12,925	70,429	0.14434	0.37620	0.06281	0.13537	0.45	0.35	0.40	0.40
09-33-008-29W1M	9,764	47,571	4,110	14,227	75,671	0.11148	0.45990	0.04304	0.14900	0.45	0.35	0.40	0.40
10-33-008-29W1M	9,760	37,779	1,863	13,062	62,463	0.11472	0.36523	0.01951	0.13680	0.45	0.35	0.40	0.40
11-33-008-29W1M	10,171	22,289	658	11,109	44,227	0.11780	0.21548	0.00689	0.11635	0.45	0.35	0.40	0.40
12-33-008-29W1M	9,810	10,349	874	9,522	30,555	0.11318	0.10005	0.00915	0.09972	0.45	0.35	0.40	0.40
13-33-008-29W1M	10,863	14,710	1,361	10,854	37,789	0.12038	0.14221	0.01426	0.11368	0.45	0.35	0.40	0.40
14-33-008-29W1M	10,960	27,928	571	12,508	51,968	0.11928	0.27000	0.00598	0.13100	0.45	0.35	0.40	0.40
15-33-008-29W1M	9,319	45,685	1,002	14,675	70,681	0.10526	0.44166	0.01050	0.15370	0.45	0.35	0.40	0.40
16-33-008-29W1M	8,444	58,156	2,668	16,073	85,341	0.08973	0.56223	0.02795	0.16833	0.45	0.35	0.40	0.40
01-04-009-29W1M	14,810	73,297	1,701	19,539	109,347	0.11954	0.70861	0.01781	0.20464	0.45	0.35	0.40	0.40
02-04-009-29W1M	15,718	61,455	976	18,102	96,250	0.15035	0.59412	0.01022	0.18958	0.45	0.35	0.40	0.40
03-04-009-29W1M	15,896	43,705	1,417	15,786	76,804	0.17455	0.42252	0.01484	0.16533	0.45	0.35	0.40	0.40
04-04-009-29W1M	14,497	31,076	2,781	14,144	62,499	0.16370	0.30043	0.02913	0.14813	0.45	0.35	0.40	0.40
05-04-009-29W1M	18,322	0	4,047	16,302	38,671	0.21011	0.00000	0.04239	0.17073	0.45	0.35	0.40	0.40
06-04-009-29W1M	21,611	52,153	2,703	18,073	94,540	0.25083	0.50419	0.02831	0.18928	0.45	0.35	0.40	0.40
07-04-009-29W1M	25,089	65,146	1,995	20,250	112,480	0.29629	0.62981	0.02090	0.21207	0.45	0.35	0.40	0.40
08-04-009-29W1M	25,023	73,665	2,296	21,996	122,980	0.30930	0.71216	0.02405	0.23037	0.45	0.35	0.40	0.40

**1,586,007**

**9,976**

**m3**

**Mbbl**

**Table No. 5**

**Proposed Sinclair Unit No. 13**

**LYLETON / THREE FORKS FORMATION ROCK & FLUID PARAMETERS**

Formation Pressure	9500 kPa	Initial Average Reservoir Pressure	
Formation Temperature	31°C		
Saturation Pressure	2,034 Kpa	Bubble Point	
GOR	6 - 10 m3/m3	Gas Oil Ratio	
API Oil Gravity	40		
Swi (fraction)	0.40	Initial Water Saturation	
Produced Water Specific Gravity	1.08		
Produced Water pH	7.1 - 7.3		
Produced Water TDS	125,000		
Wettability	Moderately oil-wet		
Average Air Permeability*	Middle Bakken	0.31	Wt. Average Core Data
	Lyleton Upper A	4.03	Wt. Average Core Data
	Lyleton Lower A	2.4	Wt. Average Core Data
	Lyleton B	0.93	Wt. Average Core Data
Average Porosity (fraction)*	Middle Bakken	15.180	Wt. Average Core Data
	Lyleton Upper A	16.990	Wt. Average Core Data
	Lyleton Lower A	15.440	Wt. Average Core Data
	Lyleton B	14.130	Wt. Average Core Data
* Wt. Average from MBKKEN/Lyleton cores in 14-28-008-29W1, 12-33-008-29, 01-04 and 08-04-009-29W1			