

PROPOSED DALY UNIT NO. 21

Application for Enhanced Oil Recovery Waterflood Project

Bakken Formation

Bakken-Three Forks A Pool (01 62A)

Daly, Manitoba

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INTRODUCTION

The Daly portion of the Daly Sinclair Oilfield is located in Townships 8, 9, 10 and 11, of Ranges 27, 28 & 29 WPM (Figure 1). Within the Daly Oilfield, Bakken reservoirs have been developed with horizontal and vertical producing wells on Primary Production and 40 acre spacing. Horizontal producing wells on 20 acre spacing have been drilled by Tundra Oil and Gas Limited (Tundra) in parts of the Daly field.

Within the area, 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 Oil and Gas Limited (Tundra) to establish Daly Unit No. 21 (N/2 Sec 8, Sec 16, Sec 17, N/2 Sec 18, Sec 19 Section 20, Sec 21, S/2 Sec 30-010-28W1 and LSDs 7-10, 15, 16 Sec 24-010-29W1) 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 an existing designated 01-62A Bakken-Three Forks A Pool of the Daly Sinclair Oilfield (Figure 3).

CONCLUSIONS

1. The proposed Daly Unit No. 21 will include 28 producing horizontal wells and 8 producing vertical locations (3 wells are commingled) within 110 Legal Subdivisions (LSD) of the Bakken producing reservoir. The project is located east of North Ebor Units 1 & 2 and south of Daly Units 8 & 10 (Figure 2).
2. Total Original Oil in Place (OOIP) in the project area has been calculated to be **2,345** e³m³ (14,747 Mbbl) for an average of 21.3 net e³m³ OOIP per 40 acre LSD based on a 0.5 md cutoff for the Middle Bakken & Lyleton 'B'.
3. Cumulative production to the end of July 2019 from the 36 producing wells within the proposed Daly Unit No. 21 project area was 151.2 e³m³ (950.9 Mbbl) of oil and 1065.7 e³m³ (6,703 Mbbl) of water, representing an **6.4%** Recovery Factor (RF) of the calculated gross OOIP.
4. Estimated Ultimate Recovery (EUR) of Primary producing oil reserves in the proposed Daly Unit No. 21 project area is estimated to be 168.4 e³m³ (1,059 Mbbl), with 17.2 e³m³ (108 Mbbl) remaining as of the end of May 2019.
5. Ultimate oil recovery of the proposed Daly Unit No. 21 gross OOIP, under the current Primary production method, is forecasted to be **7.2%**.
6. Figure 4 shows the production from the Daly Unit No. 21 area peaked during November 2012 at 120.4 m³ of oil per day (OPD). As of July 2019, production was 7.6 m³ OPD, 70.8 m³ of water per day (WPD) and an 90.3% watercut (WCUT).
7. In November 2012, production averaged 3.88 m³ OPD per well in Daly Unit No. 21. As of July 2019, average per well production has declined to 0.35 m³ OPD. Decline analysis of the group primary production data forecasts total oil to continue declining at an annual rate of approximately **16%** in the project area.
8. Estimated Ultimate Recovery (EUR) of proved oil reserves under Secondary WF EOR for the proposed Daly Unit No. 21 has been estimated to be 316.9 e³m³. An incremental 148.5 e³m³ of proved oil reserves 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 Daly Unit No. 21 is estimated to be **13.5%**.
10. Based on waterflood response in the adjacent portion of the Daly field, the Three Forks and Middle Bakken Formations in the proposed project area is believed to be suitable for WF EOR operations.
11. Existing horizontal producing wells will be converted to injection wells and horizontal life-long producing wells, with multi-stage hydraulic fractures, will be drilled between the injectors (Figure 5) within the proposed Daly Unit No. 21, to complete waterflood patterns with effective 200m horizontal to horizontal spacing.

DISCUSSION

The proposed Daly Unit No. 21 project area is located in Township 10 Ranges 28-29 W1 of the Daly Sinclair Oil Field (Figure 1). The proposed Daly Unit No. 21 currently consists of 28 producing horizontal wells and 8 producing vertical wells (3 wells are commingled) within an area covering 110 LSDs (Figure 2). A project area well list with recent production statistics is attached as Table 3.

Within the proposed Unit, potential exists for incremental production and reserves from a Waterflood EOR project in the Bakken and/or Three Forks oil reservoirs.

Geology

Stratigraphy:

The stratigraphy of the reservoir section for the proposed unit is shown on the structural cross-section attached as Appendix 2. The section runs SW to NE through the proposed Unit area. The producing sequence in descending order consists of the Upper Bakken Shale, Middle Bakken Siltstone, Lyleton B Siltstone and the Torquay Silty Shale. The reservoir units are represented by the Middle Bakken 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 and Lyleton reservoirs. The reservoir units in the proposed unit are analogous to the Bakken / Lyleton producing reservoirs that have been approved adjacent to the proposed unit (Daly Unit 8, Daly Unit 10, Daly Unit 19, North Ebor Unit 1 and North Ebor Unit 2) as noted on the Offsetting Units Map at Appendix 1.

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.

The Lyleton B reservoir consists of buff to tan fine grained siltstone (occasionally very fine siltstone) made up of quartz, feldspar and detrital dolomite with minor mica and clay mostly in the form of clay clasts or chips. The Lyleton B is generally well bedded and shows evidence of parallel lamination with occasional wind ripples. The coarser siltstones are interbedded with dark grey-green or red very fine grained siltstone which is generally non-reservoir. Within the proposed unit area, the reservoir package of Middle Bakken and Lyleton B ranges from 4.2 to 8.4m. (Appendix 4)

The Torquay (Three Forks) forms the base of the reservoir sequence and is a brick red or mint green dolomitic very fine siltstone similar to the Red Shale Marker and it forms a good basal seal to the Lyleton B reservoir.

Structure:

The structure within the proposed unit area approaches the top of the paleo high over the Daly Field. Through the majority of the unit the structure dips to the south west, consistent with the regional trend. (Appendix 3)

Reservoir Continuity:

Lateral continuity of the reservoir units is an essential requirement of a successful waterflood. As demonstrated by the cross section and the isopach map, all reservoir formations, the Middle Bakken, and Lyleton B, are continuous throughout the proposed unit area. Vertical continuity between the reservoir formations is also unbroken within the unit area.

Fluid Contacts:

There is no oil/water contacts proximal to the proposed unit area.

Gross OOIP Estimates

Total volumetric OOIP for the Middle Bakken and Lyleton B within the proposed unit has been calculated to be **2,345** e³m³ (**14,747** Mbbl) using Tundra internally created maps. Maps used were generated from core data from wells available in the greater Sinclair area (Appendix 5).

An average net to gross ratio was calculated for the reservoir using pressure decay profile permeameter data (PDPK) with a cut off of 0.5mD on surrounding cored wells. To determine net pay these ratios are then applied to each formation thickness from isopach maps based on logs. Porosity is calculated in the same way, using an average from surrounding core data after a 0.5mD cutoff.

Tabulated parameters for each LSD from the calculations can be found in Table 4.

OOIP values were calculated using the following volumetric equation:

$$OOIP = \frac{Area * Net Pay * Porosity * (1 - Water Saturation)}{Initial Formation Volume Factor of Oil}$$

or

$$OOIP(m3) = \frac{A * h * \phi * (1 - Sw)}{Bo} * \frac{10,000m2}{ha}$$

or

$$OOIP(Mbbl) = \frac{A * h * \phi * (1 - Sw)}{Bo} * 3.28084 \frac{ft}{m} * 7,758.367 \frac{bbl}{acre * ft} * \frac{1Mbbl}{1,000bbl}$$

where

OOIP	= Original Oil in Place by LSD (Mbbbl, or m ³)
A	= Area (40acres, or 16.187 hectares, per LSD)
$h * \phi$	= Net Pay * Porosity, or Phi * h (ft, or m)
Bo	= Formation Volume Factor of Oil (stb/rb, or sm ³ /rm ³)
Sw	= Water Saturation (decimal)

The initial oil formation volume factor was adopted from PVT information taken from the 100/02-17-009-29W1 and 100/13-19-009-28W1 Bakken wells and is thought to be representative of the fluid characteristics in the reservoir.

Historical Production

A historical group production history plot for the proposed Daly Unit No. 21 is shown as **Figure 4**. Oil production commenced from the proposed Unit area in June 1987 and peaked during November 2012 at 120.4 m³ OPD. As of July 2019, production was 7.6 m³ OPD, 70.8 m³ WPD and an 90.3% WCUT.

Oil production is currently declining at an average annual rate of approximately **16%** under the current Primary Production method.

The field's production rate indicates the need for pressure restoration and maintenance, and waterflooding is deemed to be the most efficient means of re-introducing energy back into the reservoir system and to provide areal sweep between wells.

UNITIZATION

Unitization and implementation of a Waterflood EOR project is forecasted to increase overall recovery of OOIP from the proposed project area to **13.5%**. The basis for unitization is to develop the lands in an effective manner that will be conducive to waterflooding. Unitizing will enable the reservoir to have the greatest recovery possible by allowing the development of additional drilling and injector conversions over time, in order to maintain reservoir pressure and increase oil production.

Unit Name

Tundra proposes that the official name of the new Unit shall be Daly Unit No. 21.

Unit Operator

Tundra Oil and Gas Limited (Tundra) will be the Operator of record for Daly Unit No. 21.

Unitized Zone

The unitized zone(s) to be waterflooded in Daly Unit No. 21 will be the Middle Bakken and Three Forks formations.

Unit Wells

The 28 horizontal producing wells and 8 vertical producing wells to be included in the proposed Daly Unit No. 21 are outlined in **Table 3**.

Unit Lands

The Daly Unit No. 21 will consist of 110 LSDs as follows:

N/2 Section 8 of Township 10, Range 28, W1M
Section 16 of Township 10, Range 28, W1M
Section 17 of Township 10, Range 28, W1M
N/2 Section 18 of Township 10, Range 28, W1M
Section 19 of Township 10, Range 28, W1M
Section 20 of Township 10, Range 28, W1M
Section 21 of Township 10, Range 28, W1M
S/2 Section 30 of Township 10, Range 28, W1M
LSDs 7-10, 15, 16 of Section 24 of Township 10, Range 29, W1M

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

Tract Factors

The proposed Daly Unit No. 21 will consist of 110 Tracts, based on the 40 acre Legal Sub Divisions (LSD) containing the existing 28 horizontal wells and 8 vertical wells.

The Tract Factor contribution for each of the LSD's within the proposed Daly Unit No. 21 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)
- Last twelve (12) months production to date for the LSD as distributed by the LSD specific PA % in the applicable producing horizontal or vertical well.
- Tract Factor by LSD = Fifty percent (50%) of the product of Remaining Gross OOIP by LSD as a % of total proposed Unit Remaining Gross OOIP, and fifty percent (50%) of the product of the Last 12 Months Production as a % of total proposed Unit Last 12 Months Production.

Tract Factor calculations for all individual LSD's based on the above methodology are outlined within **Table 2**. Tundra believes that the above given method provides the most equitable assignment of tract participation factors to all mineral owners, given the geological and reservoir risks associated with waterflooding horizontal to horizontal wellbores in the Bakken formation.

Working Interest Owners

Table 1 outlines the working interest % (WI) for each recommended Tract within the proposed Daly Unit No. 21. Tundra Oil and Gas Limited holds a 100% WI ownership in all the proposed Tracts.

Tundra Oil and Gas Limited will have a 100% working interest in the proposed Daly Unit No. 21.

WATERFLOOD EOR DEVELOPMENT

Technical Studies

The waterflood performance predictions for the proposed Daly Unit No. 21 are based on internal engineering assessments. Project area specific reservoir and geological parameters were used to guide the overall Secondary Waterflood recovery factor. Internal reviews included analysis of available open-hole logs, core data, petrophysics, seismic, drilling and completion information, and production information. These parameters were reviewed to develop a suite of geological maps and establish reservoir parameters to support the calculation of the proposed Daly Unit No. 21 OOIP (Table 4).

Conversion of Existing Horizontal Production Wells and Drilling of New Horizontal Production Wells

Primary production from the original vertical/horizontal producing wells in the proposed Daly Unit No. 21 has declined significantly from peak rate indicating a need for secondary pressure support. It is anticipated that 27 existing producing horizontal wells will be converted to horizontal injection wells upon approval as shown in Figure 5. After a period injection and pressurization, it is anticipated that 23 new horizontal production wells, with multi-stage hydraulic fractures, will be drilled to infill the existing horizontal injection wells. This will result in effective 20 acre waterflood patterns within Daly Unit No. 21. Since these proposed horizontal injection wells have already been on production for a period of time there will not be a need for an additional pre-production period within this unit. It is believed that converting existing horizontal producers to injection and drilling new horizontal producers will result in higher initial production and reduce the risk of conformance issues in the future.

Tundra monitors reservoir pressure, fluid production and decline rates in each pattern to determine the best time for each existing production well to be converted to water injection and when to drill the infill life-long production well.

Reserves Recovery Profiles and Production Forecasts

The primary performance predictions for the proposed Daly Unit No. 21 are based on oil production decline curve analysis, and the secondary waterflood predictions are based on internal engineering analysis performed by the Tundra reservoir engineering group.

Based on the geological description, primary production decline rate, and waterflood response in Daly Unit No. 8, the Bakken formation in the project area is believed to be a suitable reservoir for WF EOR operations.

Primary Production Forecast

Cumulative production to the end of July 2019 from the 28 horizontal wells and 8 vertical wells within the proposed Daly Unit No. 21 project area was **151.2** e³m³ of oil, and **1065.7** e³m³ of water, representing an **6.4%** Recovery Factor (RF) of the calculated Net OOIP.

Based on decline analysis of the wells currently on production, the estimated ultimate recovery (EUR) for the proposed unit with no further development would be **168.4** e³m³, with **17.2** e³m³ remaining as of the end May 2019. This represents a recovery factor of **7.2%** of the total OOIP.

The expected production decline and forecasted cumulative oil recovery under continued Primary Production is shown in **Figures 6 and 7**.

Timing for Conversion of Existing Horizontal Wells to Water Injection and Drilling of New Horizontal Wells

The injection wells will be converted after unit approval has been received. Timing for the injection conversion of existing produces, and the drilling of infill life-long producers, will be chosen to optimize production performance post unit approval.

Criteria for Conversion to Water Injection Well

Twenty-seven (27) water injection wells are required for the proposed Daly Unit No. 21 as shown in **Figure 5**. Lifelong producers will be drilled offsetting the converted cemented liner injectors. This development is being used to drill wells with higher initial production rates and improved conformance throughout the life of the waterflood. Both Daly Unit No. 10 and Ebor Unit No. 3 are being developed in a similar method.

Tundra will monitor the following parameters to assess the best timing for converting 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 horizontal wells
- Pattern mass balance and/or oil recovery factor estimates
- Reservoir pressure relative to bubble point pressure

The above schedule allows for the proposed Daly Unit No. 21 project to be developed equitably, efficiently, and moves the 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

Secondary Waterflood plots of the expected oil production forecast over time and the expected oil production v. cumulative oil are plotted in **Figures 8 and 9**, respectively. Total Secondary EUR for the proposed Daly Unit No. 21 is estimated to be **316.9** e³m³ with **165.7** e³m³ remaining representing a total secondary recovery factor of **13.5%** for the proposed Unit area. An incremental **148.5** e³m³ of oil, or an incremental **6.3%** recovery factor, are forecasted to be recovered under the proposed Unitization.

WATERFLOOD OPERATING STRATEGY

Water Source

Injection water for the proposed Daly Unit No. 21 will be supplied from the Jurassic source water well at 100/02-25-010-29W1 (2-25). Tundra received approval from the Petroleum Branch in March 2013 to use the 2-25 well as a source water well for waterflood operations. Jurassic-sourced water will be pumped from the 2-25 source well to the Daly 12-24-10-29 battery, where it will be filtered and then pumped up to injection system pressure. A diagram of the Daly 12-24 water injection system and new pipeline connection to the project area injection wells is shown as **Figure 10**.

Produced water is not currently used for any water injection in the Tundra operated Daly Units and there are no current plans to use produced water as a source supply for Daly Unit No. 21. Tundra does not foresee any compatibility issues between the produced and injection waters based on previous compatibility testing performed by a third party, Baker Hughes.

Injection Wells

The water injection wells for the proposed Daly Unit No. 21 will be current producing wells configured downhole for injection as shown in **Figure 11**. The horizontal injection wells have been stimulated by multiple hydraulic fracture treatments to obtain suitable injection. 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 water injection well(s) will be placed on injection after approval to inject. Wellhead injection pressures will be maintained below the least value of either:

1. The area specific known and calculated fracture gradient, or
2. 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 will be surface equipped with injection volume metering and rate/pressure programmable logic control (PLC). 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 Daly Unit No. 21 horizontal water injection well rate is forecasted to average 10 – 25 m³ WPD, based on expected reservoir permeability and pressure.

Estimated Fracture Gradient

Completion data from the producing wells within the project area indicate an actual fracture pressure gradient range of 16 to 18 kPa/m true vertical depth (TVD). Tundra expects the fracture gradient encountered during completion of the proposed horizontal injection well will be lower than these values due to expected reservoir pressure depletion.

Reservoir Pressure

No representative initial pressure surveys are available for the proposed Daly Unit No. 21 project area in the Bakken. Tundra will make all attempts to capture a reservoir pressure survey in the proposed horizontal injection wells during the completion of the well and prior to injection or production. Based on a normally pressured reservoir, it is believed the initial reservoir pressure in this area was on average 8,400 kPa.

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 Voidage Replacement Ratio (VRR) is expected to be approximately 1.25 to 1.75 within the pattern 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

Daly Unit No. 21 EOR response and waterflood surveillance will consist of the following:

- Regular production well rate and WCT 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 increased understanding of reservoir performance, and provide data to continually control and optimize the Daly Unit No. 21 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 Daly Unit No. 21.

Economic Justification

Under the current Primary recovery method, existing wells within the proposed Daly Unit No. 21 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 Daly Unit No. 21 waterflood operation will utilize the Tundra operated well 100/02-25-10-29W1, sourced from the Jurassic, and water plant (WP) facilities located at the Daly 12-24-10-29W1 battery (Figure 10).

A complete description of all planned system design and operational practices to prevent corrosion related failures is shown in Figure 12. Surface facilities and wellheads will have cathodic protection to prevent corrosion, where required. All injection flowlines will be made of fiberglass so corrosion will not be an issue. Injectors will have a packer set above the Middle Bakken and Three Forks formations, and the annulus between the tubing and casing will be filled with inhibited fluid.

NOTIFICATION OF MINERAL AND SURFACE RIGHTS OWNERS

Tundra will notify all mineral rights and surface rights owners of the proposed EOR project and formation of Daly Unit No. 21. Copies of the Notices, and proof of service, to all surface rights owners will be forwarded to the Petroleum Branch, when available, to complete the Daly Unit No. 21 Application.

Daly Unit No. 21 Unitization, and execution of the formal Daly Unit No. 21 Agreement by affected Mineral Owners, is expected during Q1 2020. Copies of same will be forwarded to the Petroleum Branch, when available, to complete the Daly Unit No. 21 Application.

Should the Petroleum Branch have further questions or require more information, please contact Stuart McColl at 587.747.5362 or by email at stuart.mccoll@tundraoilandgas.com.

TUNDRA OIL & GAS LIMITED

Original Signed by Stuart McColl, E.I.T., December 13, 2019

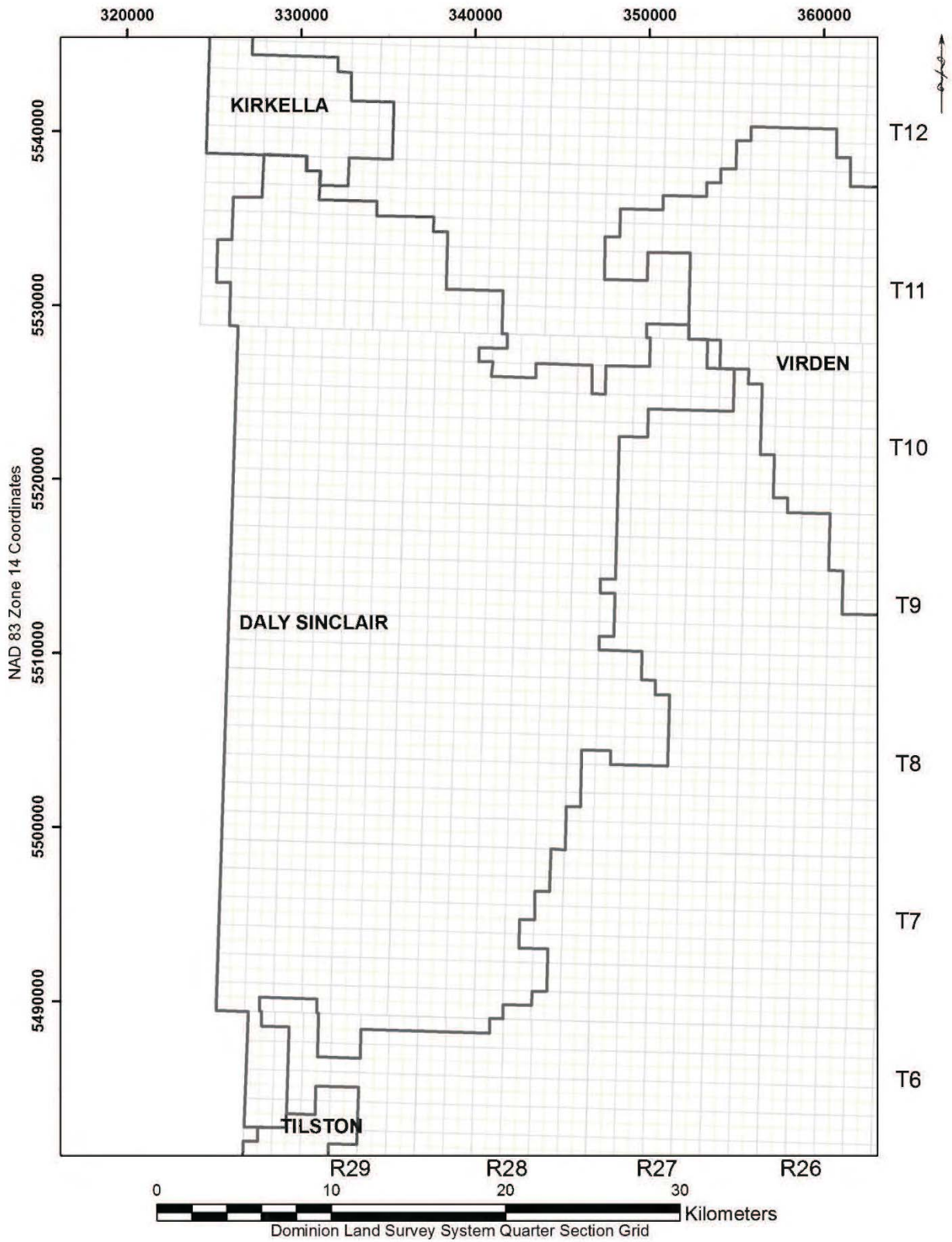
Proposed Daly Unit 21

Application for Enhanced Oil Recovery Waterflood Project

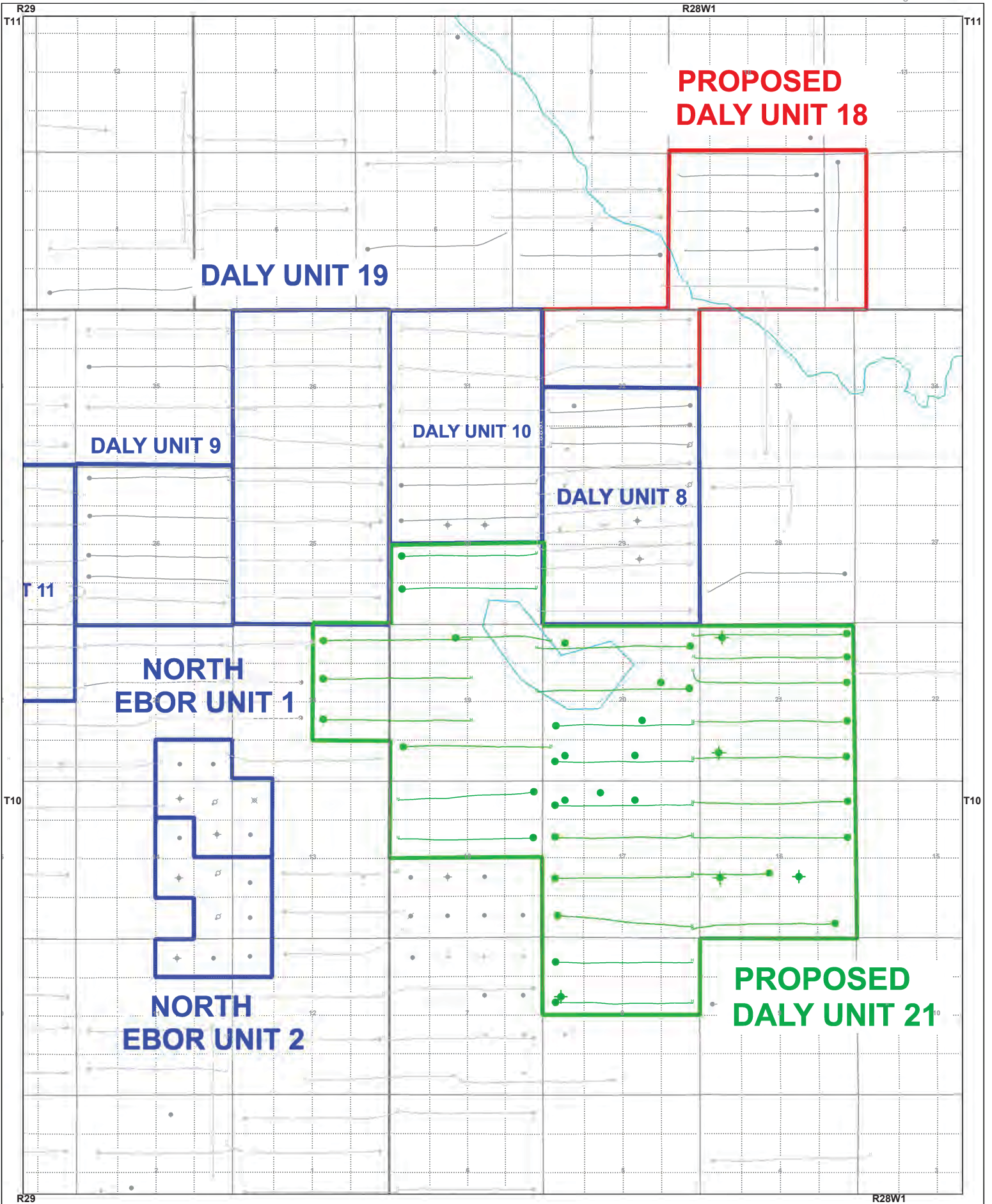
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Figure 1

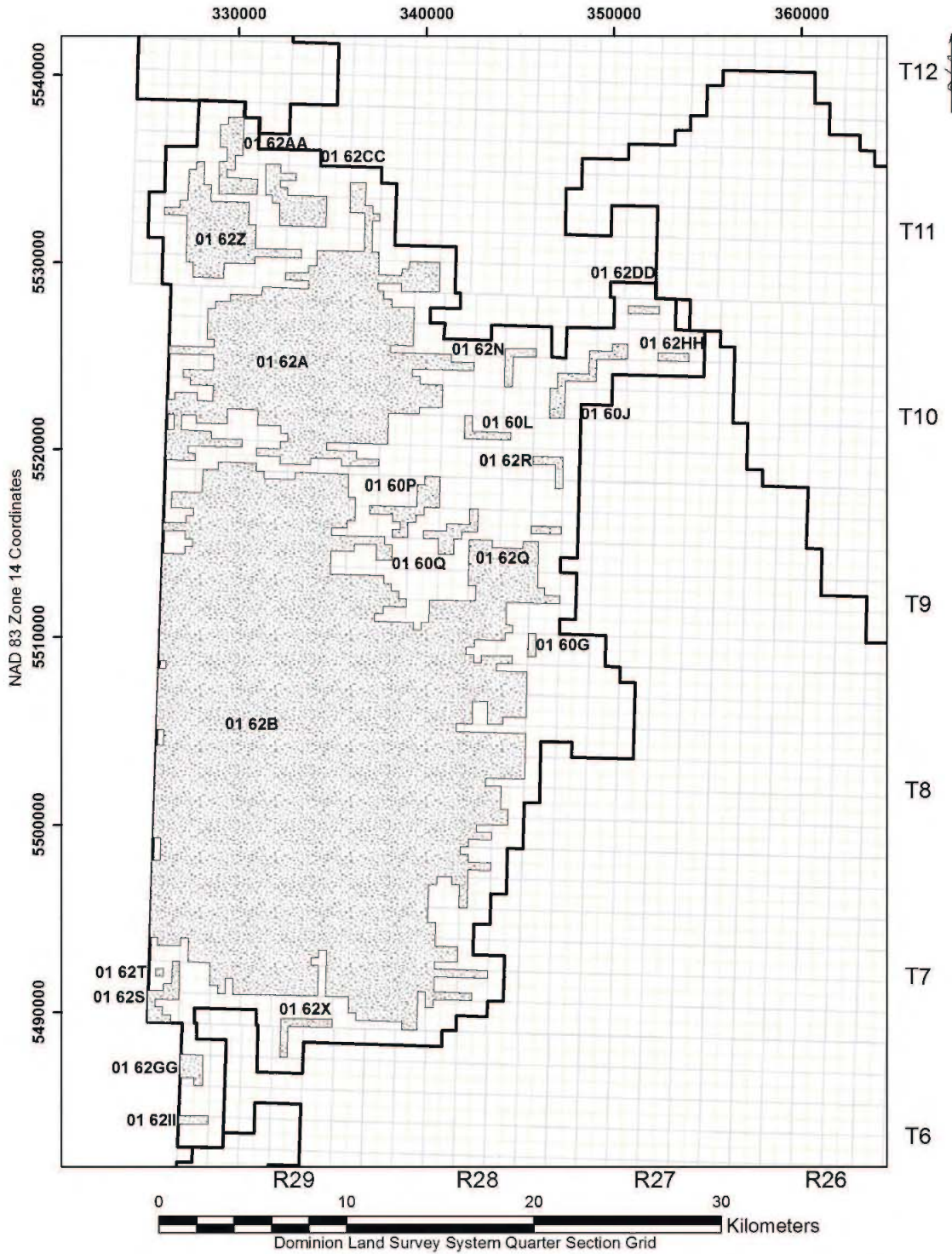


Daly Sinclair Field (01)



Well Legend						
Abandoned Gas	Abandoned Service	Gas Injection	Location	Suspended Oil & Gas	Wells - Sinclair Unit No. 22 Well List	
Abandoned Heavy Oil	Cancelled	Gas Injection Heavy Oil	Oil	Suspended Gas		
Abandoned Oil	Drilling	Heavy Oil Injection	Oil & Gas	Suspended Heavy Oil	Wells - Daly Unit 21 Well List	
Abandoned Oil & Gas	Dry & Abandoned		Service or Drain	Suspended Oil	Wells - Sinclair Bakken Locations	

Figure No. 3



**Daly Sinclair Bakken & Bakken-Three Forks Pools (01 60A -
01 60BB & 01 62A - 01 62II)**

Well Information as of 10/2/2019 - Group Well Report

Figure No. 4

Production Graph

Group: daly unit 21 well list.lwell
of Wells: 41
Fluid: Oil
Mode: Abandoned; Producing; Commingled; Abandoned Zone

On Prod: 1987-06 to 2019-07
Prod Form: BAKKEN; BAKKENM; THREEEFK
Field: DALY (MB1)
Pool Code: MB000162A

Cum Oil: 151182.8 m3
Cum Gas: 0.0 E3m3
Cum Wtr: 1065766.5 m3
Cum Inj Oil: 0.0 m3
Cum Inj Gas: 0.0 E3m3
Cum Inj Wtr: 0.0 m3

Unit Code: 162A10

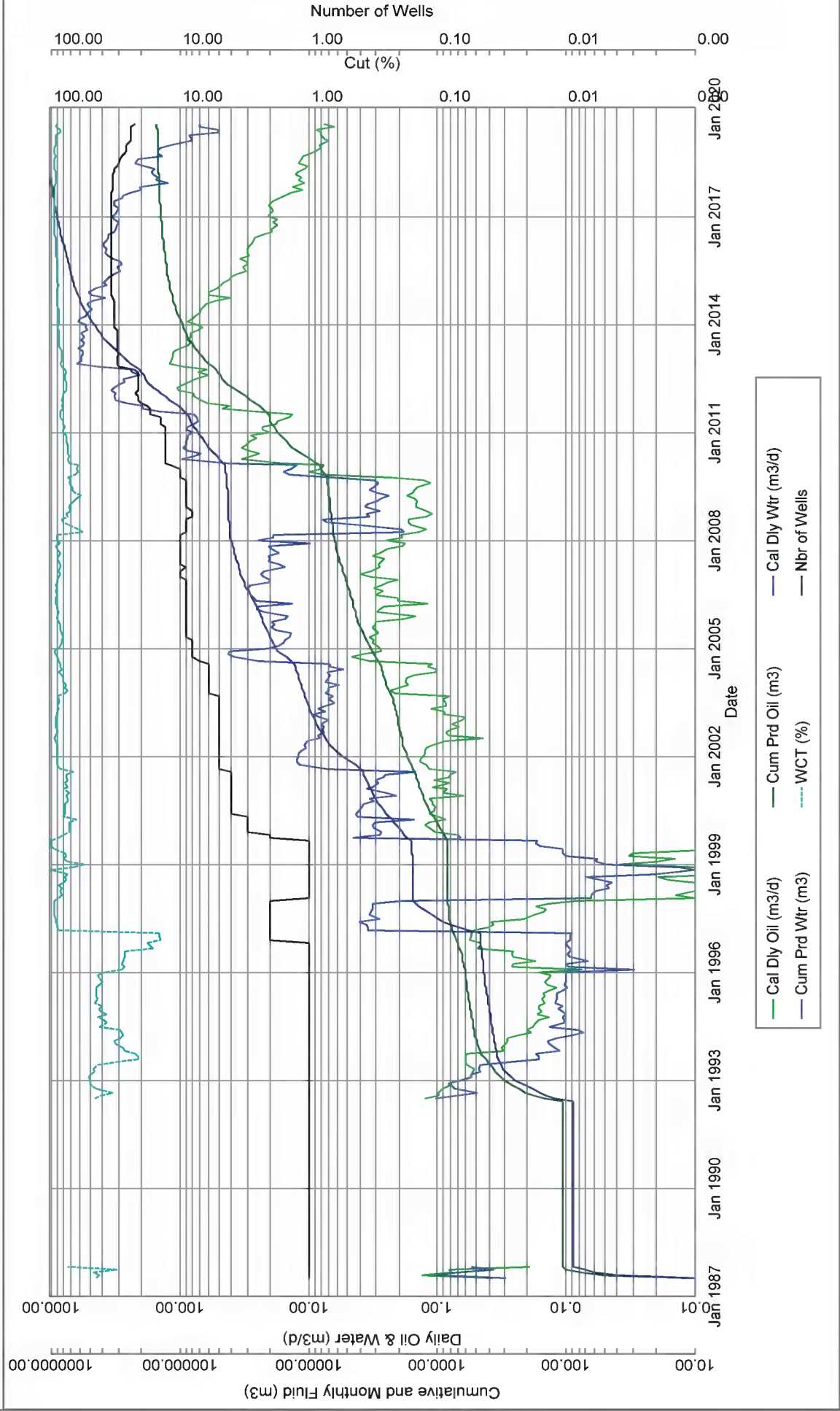
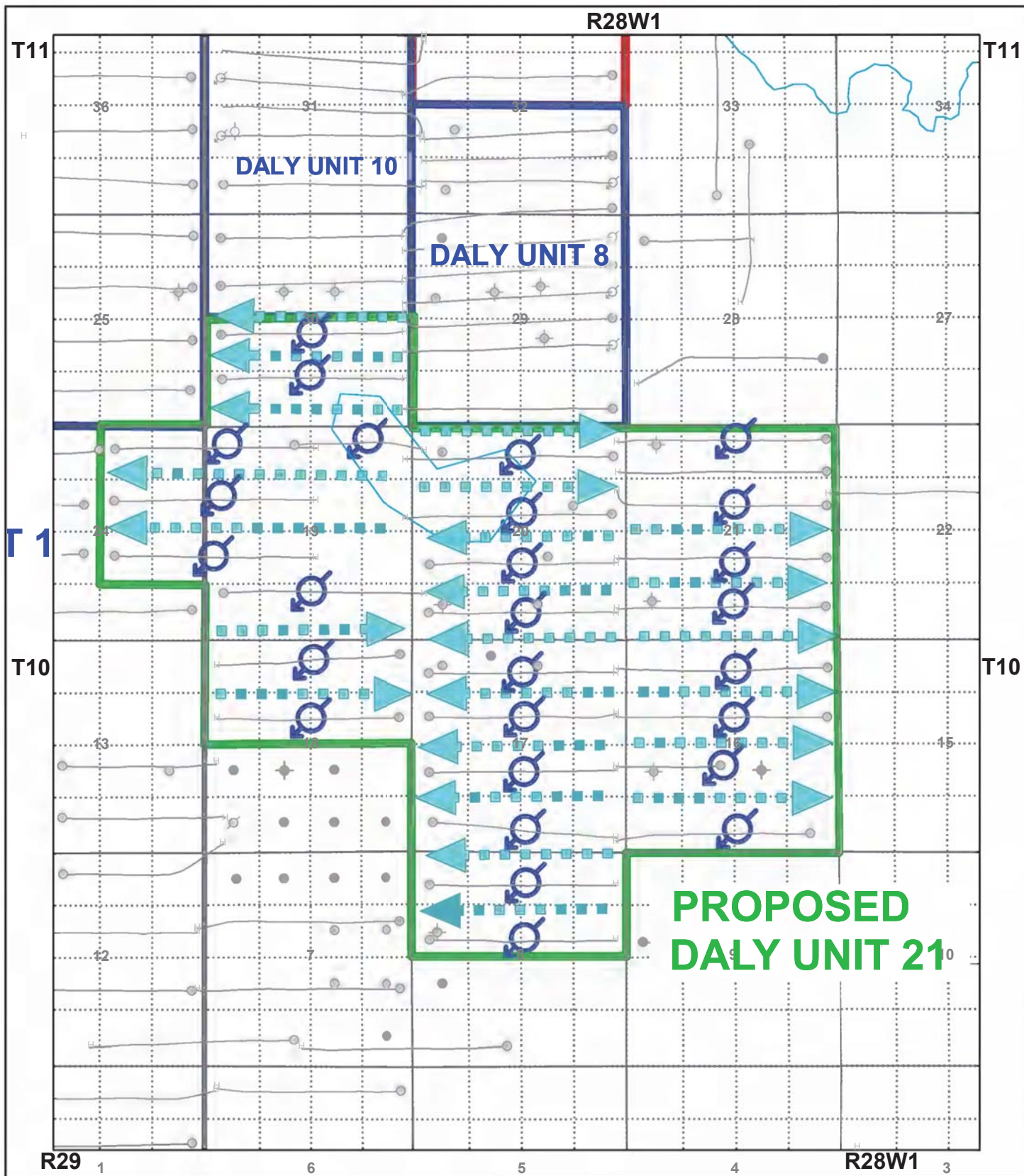


Figure No. 5



DALY UNITS

Well Legend			
Abandoned Gas	Drilling	Location	Suspended Heavy Oil
Abandoned Heavy Oil	Dry & Abandoned	Oil	Suspended Oil
Abandoned Oil	Gas	Oil & Gas	Suspended Oil & Gas
Abandoned Oil & Gas	Gas Injection	Service or Drain	Lists
Abandoned Service	Heavy Oil	Suspended	
Cancelled	Injection	Suspended Gas	Wells - Sinclair Bakken Locations

DALY UNITS
Sharon Baker, December 12, 2019
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Figure 6. Primary Production – Rate vs Time

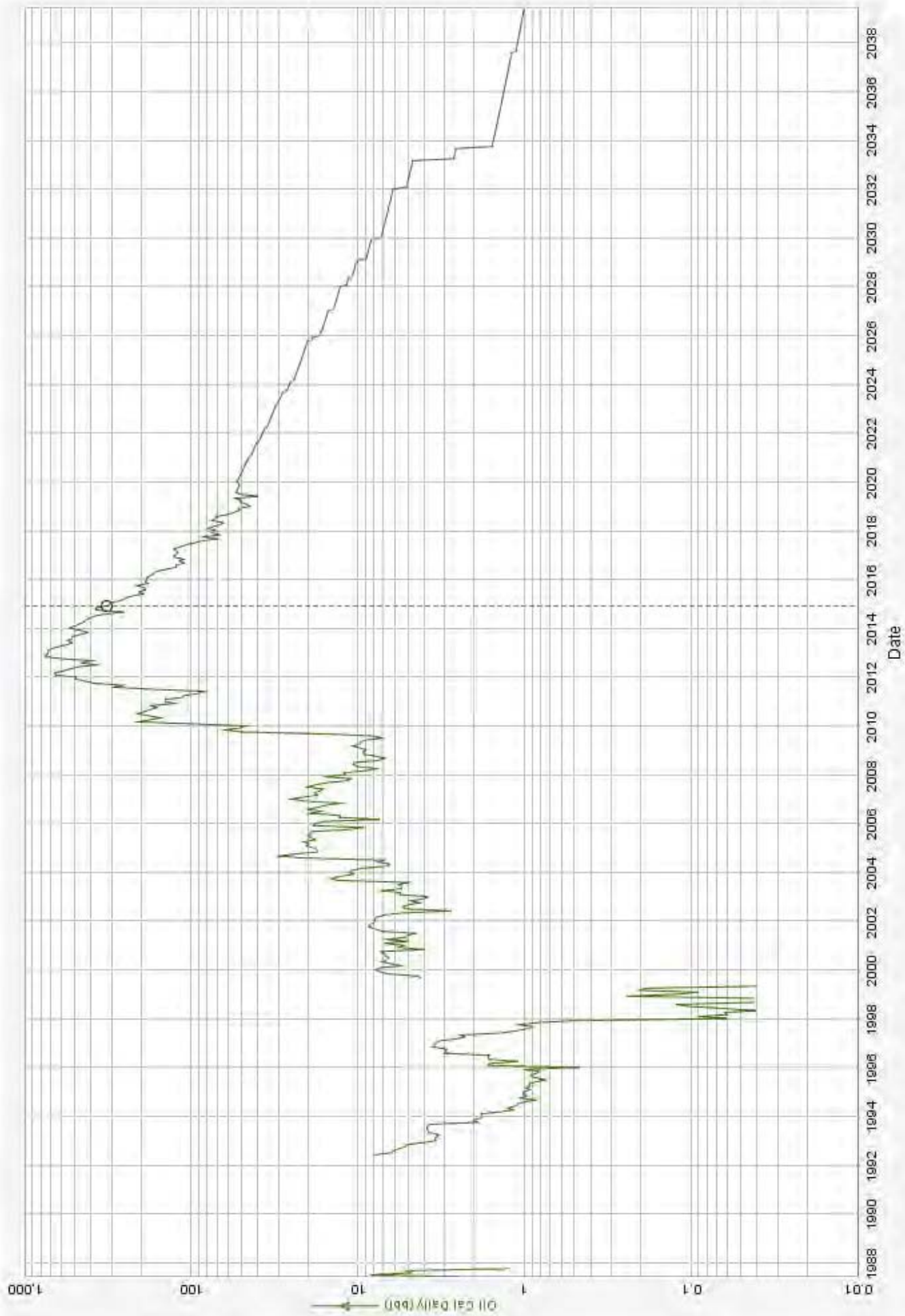


Figure 7. Primary Production – Rate vs Cumulative Production

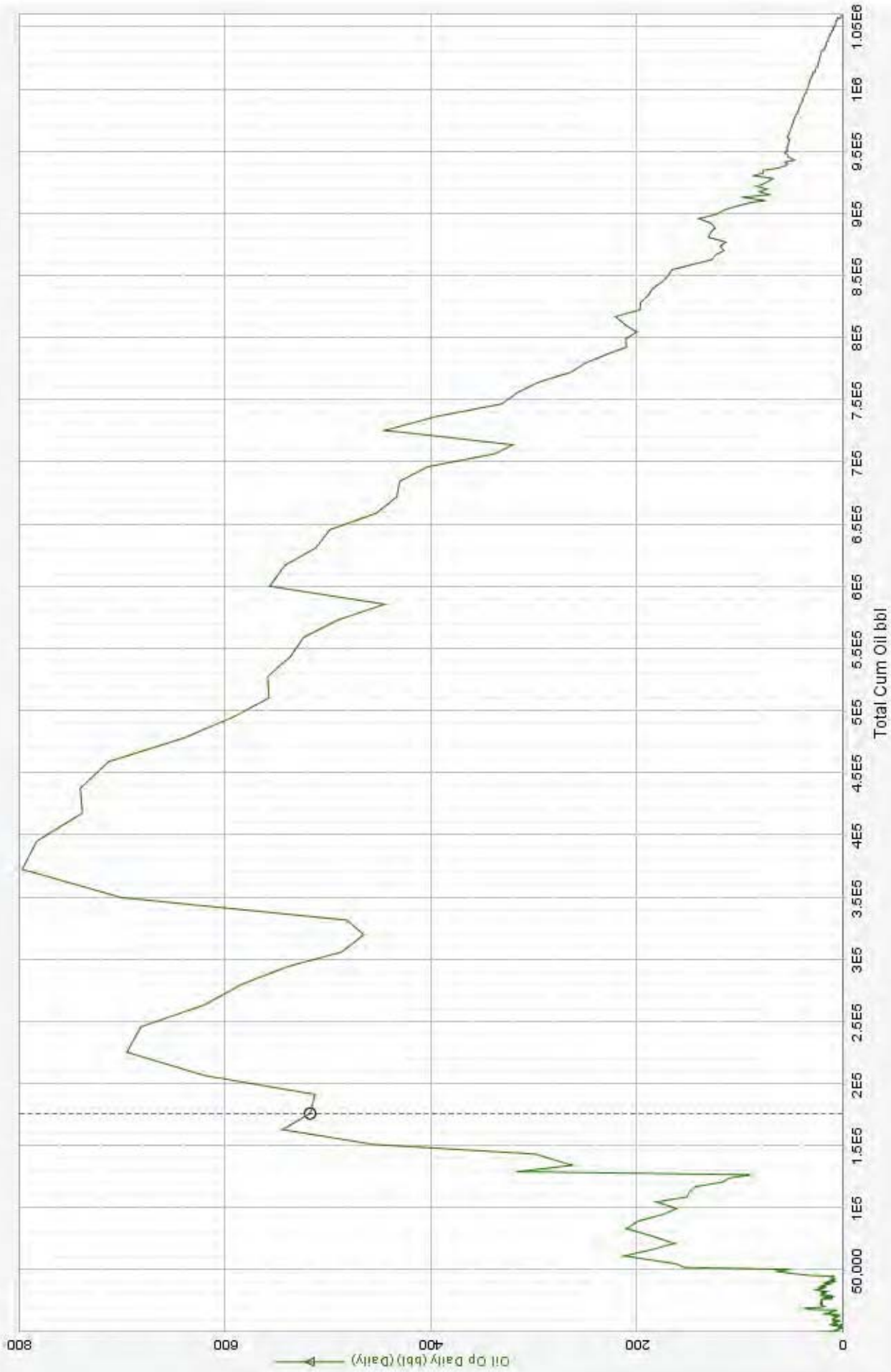


Figure 8. Waterflood Production – Rate vs Time

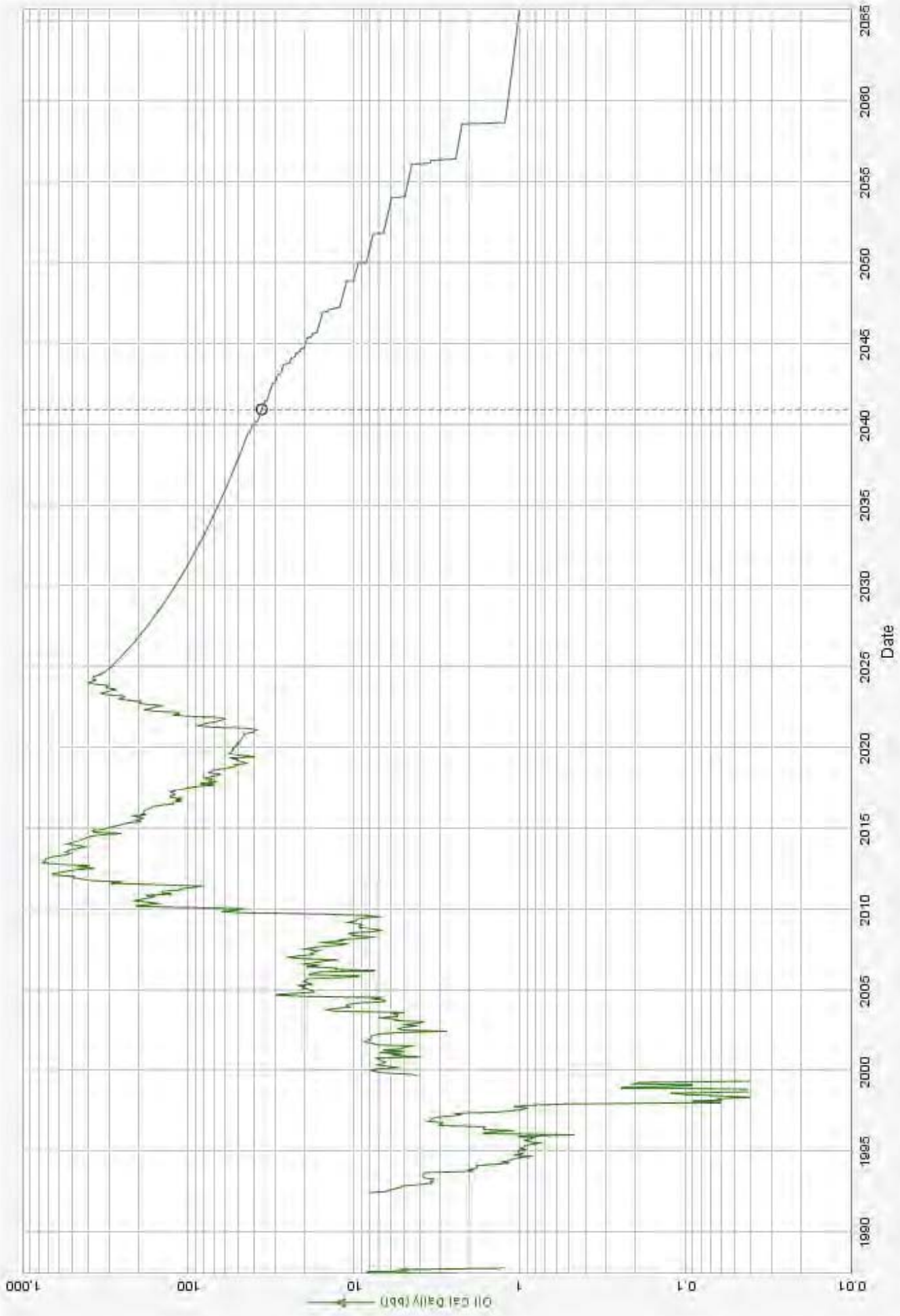
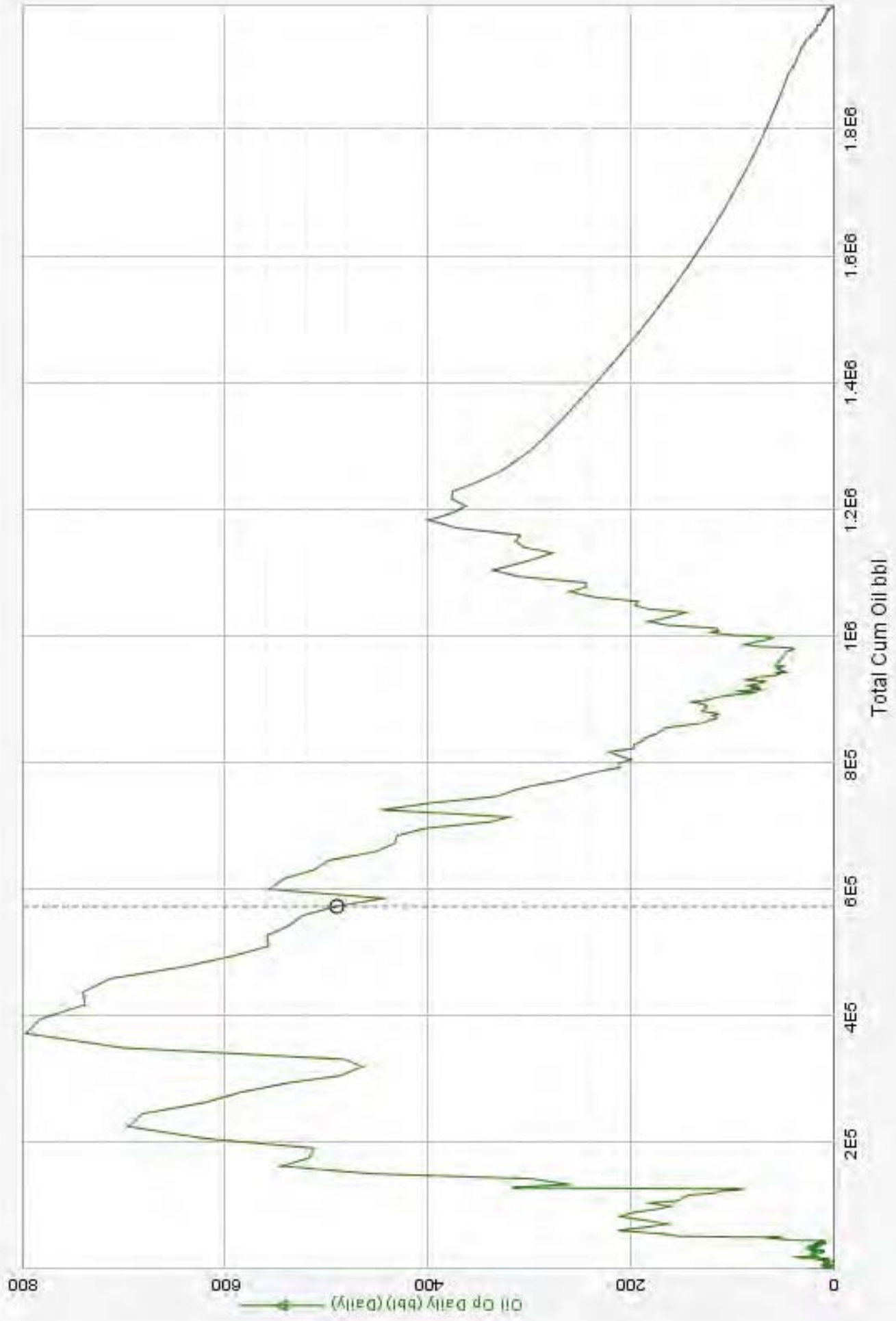
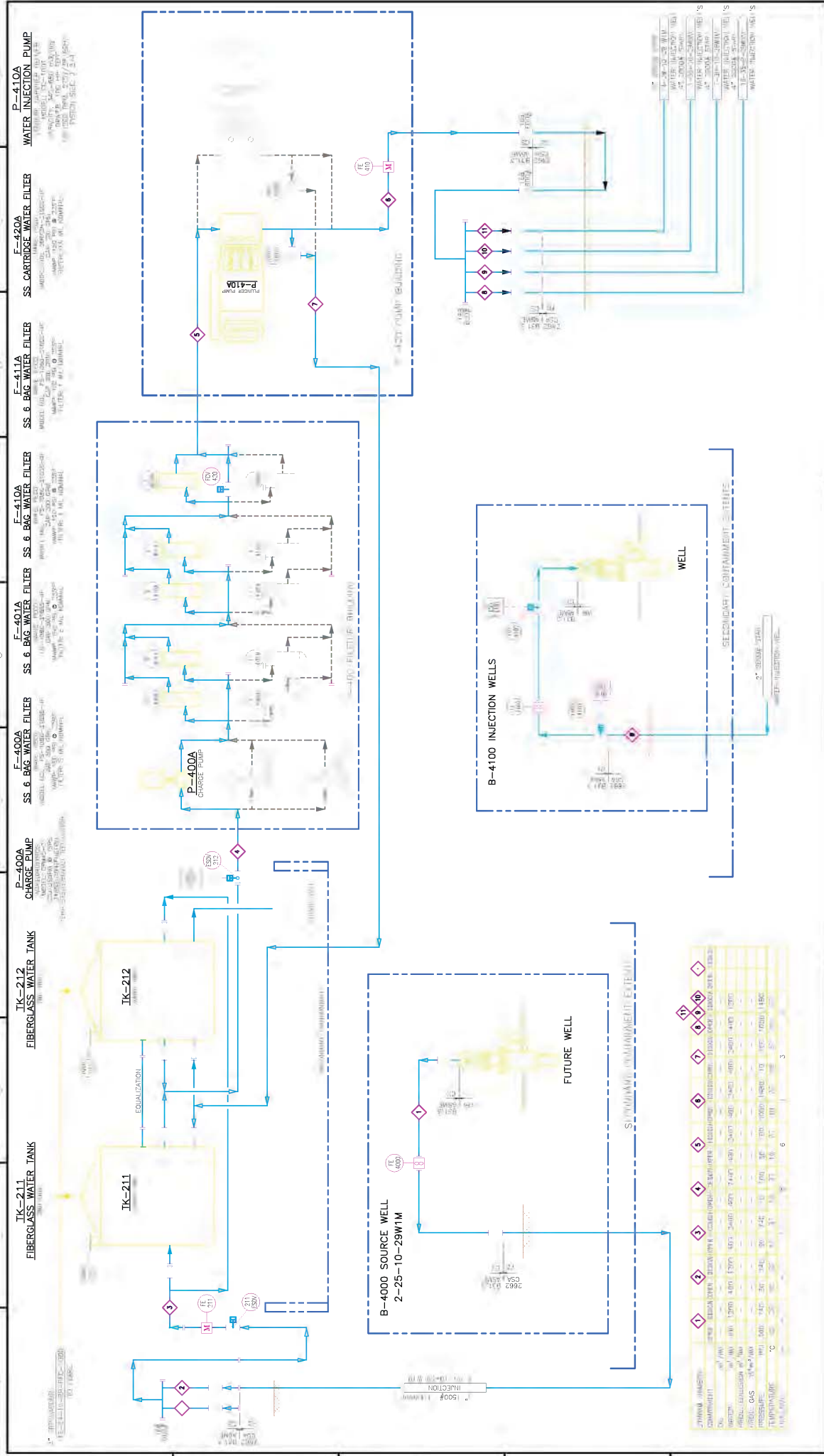


Figure 9. Waterflood Production – Rate vs Cumulative Production





REV	DESCRIPTION	BY	DATE	CHK	APP
0	ISSUED FOR CONSTRUCTION	JC	30MAR2013	BE	-
	REV DESCRIPTION				REFERENCE DRAWING

DRAWN BY: RM

 SCALE: N/S

 AFE:

 DRAWING NUMBER: 12-24-10-29-PPD-1400

 REV NO: 0

Figure No. 10

ITEM NO.	DESCRIPTION	DATE	BY	CHK	APP
1	ISSUED FOR CONSTRUCTION	30MAR2013	JC	BE	-
2	REV DESCRIPTION				REFERENCE DRAWING

Figure No. 10

Figure 12 – Corrosion Controls

Source Well

- Located at 02-25-010-29
- Continuous downhole corrosion inhibition
- Downhole scale inhibitor injection
- Corrosion resistant valves and internally coated surface piping
- Biocide injected at source well for entire system

Pipelines

- The water source line will be composite from source well to 12-24-10-29 water plant.
- Injection lines will be a mix of 2000psi high pressure fiberglass and composite pipe.
- Producing lines existing as per original flowline licenses.

Facilities

12-24-10-29 Water Plant

- Plant piping – 600 ANSI stainless steel schedule 80 pipe, fiberglass or internally coated
- Filtration – Stainless steel bodies, PVC piping or stainless steel piping
- Pumping – Ceramic plungers, stainless 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 Wells

- 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
- Scale inhibition (pellets & injected post pump at battery)

Producing Wells

- Downhole corrosion inhibitor, either batch or daily injection, as needed.
- Scale inhibitor treatment daily injection as required for horizontal wells.
- Casing cathodic protection where required.

Proposed Daly Unit No. 21

Application for Enhanced Oil Recovery Waterflood Project

List of Tables

Table 1	Land Information and Tract Participation
Table 2	Original Oil in Place and Recovery Factors
Table 3	Current Well List and Status
Table 4	Original Oil in Place

Tract No.	LSD-SEC	UWI	OOIP (m3)	Ht Cum Allocated Prodn (m3)	Vertical Cum Prodn (m3)	Total Cum Prodn	OOIP Minus Cum Prodn (m3)	Tract Factor (%)	Last 12 Mth Alloc-Hz Prodn	Last 12 Mth Vert Prodn	% of Last 12 Mth Prodn	50% of OOIP - Cum TF + 50% Last 12 Mth Prodn TF	UWI
96	16-21	16-21-010-28W1	23,474	2,101.2	0.0	2,101.2	21,373	0.974307482%	39.1	0.0	1.29966270%	1.136986876%	16-21-010-28W1
97	01-30	01-30-010-28W1	29,400	878.0	0.0	878.0	28,522	1.300205071%	15.3	0.0	0.59968205%	0.904749563%	01-30-010-28W1
98	02-30	02-30-010-28W1	25,200	1,397.1	0.0	1,397.1	23,803	1.085077648%	24.4	0.0	0.810416528%	0.947747088%	02-30-010-28W1
99	03-30	03-30-010-28W1	22,237	1,293.6	0.0	1,293.6	20,944	0.954732345%	22.6	0.0	0.750332690%	0.85252517%	03-30-010-28W1
100	04-30	04-30-010-28W1	20,832	1,292.3	0.0	1,292.3	19,540	0.890736038%	22.5	0.0	0.749617406%	0.820176721%	04-30-010-28W1
101	05-30	05-30-010-28W1	19,320	1,850.1	0.0	1,850.1	17,470	0.796384600%	72.7	0.0	2.419333676%	1.60789138%	05-30-010-28W1
102	06-30	06-30-010-28W1	21,840	2,048.2	0.0	2,048.2	19,792	0.902229332%	81.8	0.0	2.608383734%	1.755306533%	06-30-010-28W1
103	07-30	07-30-010-28W1	26,116	2,114.9	0.0	2,114.9	24,001	1.094133176%	81.8	0.0	2.721579817%	1.907856496%	07-30-010-28W1
104	08-30	08-30-010-28W1	30,759	1,270.2	0.0	1,270.2	29,489	1.344289189%	50.2	0.0	1.670724066%	1.507506627%	08-30-010-28W1
105	07-24	07-24-010-29W1	27,399	1,207.9	0.0	1,207.9	26,191	1.193962515%	42.4	0.0	1.409317653%	1.301640084%	07-24-010-29W1
106	08-24	08-24-010-29W1	26,697	1,381.2	0.0	1,381.2	25,316	1.154034413%	48.4	0.0	1.611567303%	1.382800858%	08-24-010-29W1
107	09-24	09-24-010-29W1	25,544	2,337.9	0.0	2,337.9	24,206	1.103458280%	142.9	0.0	4.75450299%	2.928854289%	09-24-010-29W1
108	10-24	10-24-010-29W1	25,658	2,070.4	0.0	2,070.4	23,588	1.075272579%	16.6	0.0	4.210240001%	2.642756290%	10-24-010-29W1
109	15-24	15-24-010-29W1	22,344	1,599.9	0.0	1,599.9	20,744	0.945643151%	39.1	0.0	1.301864728%	1.123753940%	15-24-010-29W1
110	16-24	16-24-010-29W1	24,436	1,822.4	0.0	1,822.4	22,614	1.038882165%	44.6	0.0	1.482932996%	1.256907580%	16-24-010-29W1
									2,344,837	36.0	1.000000000	1.000000000	
									151,182.8	2969.8	1.000000000	1.000000000	
									2,193,654	36.0	1.000000000	1.000000000	

Table No. 4 - OOIP Calculation

UWI	Area (m2)	Reservoir Iso (m)	N/G	OOIP (m3)	OOIP (bbl)
09-08-010-28	160000	6.0	23.00	21,076	132,549
10-08-010-28	160000	6.1	23.00	21,428	134,758
11-08-010-28	160000	6.0	23.00	21,076	132,549
12-08-010-28	160000	6.1	23.00	21,428	134,758
13-08-010-28	160000	6.1	23.00	21,428	134,758
14-08-010-28	160000	6.0	23.00	21,076	132,549
15-08-010-28	160000	5.9	23.00	20,725	130,340
16-08-010-28	160000	5.8	23.00	20,374	128,131
01-16-010-28	160000	4.9	23.00	17,212	108,249
02-16-010-28	160000	4.9	23.00	17,212	108,249
03-16-010-28	160000	5.1	23.00	17,915	112,667
04-16-010-28	160000	5.2	23.00	18,266	114,876
05-16-010-28	160000	5.1	23.00	17,915	112,667
06-16-010-28	160000	5.0	23.00	17,564	110,458
07-16-010-28	160000	5.0	23.00	17,564	110,458
08-16-010-28	160000	4.9	23.00	17,212	108,249
09-16-010-28	160000	5.0	23.00	17,564	110,458
10-16-010-28	160000	5.0	23.00	17,564	110,458
11-16-010-28	160000	5.1	23.00	17,915	112,667
12-16-010-28	160000	5.1	23.00	17,915	112,667
13-16-010-28	160000	5.2	23.00	18,266	114,876
14-16-010-28	160000	5.1	23.00	17,915	112,667
15-16-010-28	160000	5.0	23.00	17,564	110,458
16-16-010-28	160000	5.0	24.00	18,327	115,260
01-17-010-28	160000	5.5	23.00	19,320	121,503
02-17-010-28	160000	5.6	23.00	19,671	123,713
03-17-010-28	160000	5.6	23.00	19,671	123,713
04-17-010-28	160000	5.7	23.00	20,023	125,922
05-17-010-28	160000	5.2	23.00	18,266	114,876
06-17-010-28	160000	5.3	23.00	18,617	117,085
07-17-010-28	160000	5.3	23.00	18,617	117,085
08-17-010-28	160000	5.3	23.00	18,617	117,085
09-17-010-28	160000	5.2	23.00	18,266	114,876
10-17-010-28	160000	5.2	23.00	18,266	114,876
11-17-010-28	160000	5.1	23.00	17,915	112,667
12-17-010-28	160000	5.0	23.00	17,564	110,458
13-17-010-28	160000	5.1	24.00	18,694	117,565
14-17-010-28	160000	4.9	24.00	17,961	112,955
15-17-010-28	160000	5.2	23.00	18,266	114,876
16-17-010-28	160000	5.2	23.00	18,266	114,876
09-18-010-28	160000	5.1	24.00	18,694	117,565
10-18-010-28	160000	5.6	24.00	20,527	129,091
11-18-010-28	160000	6.2	24.00	22,726	142,923
12-18-010-28	160000	6.7	24.00	24,559	154,449
13-18-010-28	160000	6.7	24.00	24,559	154,449
14-18-010-28	160000	6.2	24.00	22,726	142,923
15-18-010-28	160000	5.9	24.00	21,626	136,007
16-18-010-28	160000	5.5	24.00	20,160	126,786

Phi 0.15
Sw 0.3
Boi 1.1

UWI	Area (m2)	Reservoir Iso (m)	N/G	OOIP (m3)	OOIP (bbl)
01-19-010-28	160000	5.8	25.00	22,145	139,273
02-19-010-28	160000	6.0	25.00	22,909	144,075
03-19-010-28	160000	6.3	24.00	23,092	145,228
04-19-010-28	160000	6.8	24.00	24,925	156,754
05-19-010-28	160000	7.0	23.00	24,589	154,641
06-19-010-28	160000	6.5	24.00	23,825	149,838
07-19-010-28	160000	6.1	26.00	24,223	152,336
08-19-010-28	160000	5.8	27.00	23,917	150,415
09-19-010-28	160000	5.8	29.00	25,689	161,556
10-19-010-28	160000	6.1	27.00	25,154	158,195
11-19-010-28	160000	6.5	25.00	24,818	156,082
12-19-010-28	160000	7.2	23.00	25,292	159,059
13-19-010-28	160000	7.1	23.00	24,940	156,850
14-19-010-28	160000	6.2	25.00	23,673	148,878
15-19-010-28	160000	5.8	28.00	24,803	155,985
16-19-010-28	160000	5.8	32.00	28,346	178,269
01-20-010-28	160000	4.9	24.00	17,961	112,955
02-20-010-28	160000	4.6	24.00	16,861	106,039
03-20-010-28	160000	4.9	25.00	18,709	117,661
04-20-010-28	160000	5.5	25.00	21,000	132,069
05-20-010-28	160000	5.4	27.00	22,268	140,041
06-20-010-28	160000	4.7	27.00	19,381	121,888
07-20-010-28	160000	4.5	26.00	17,869	112,379
08-20-010-28	160000	4.8	25.00	18,327	115,260
09-20-010-28	160000	4.7	28.00	20,099	126,402
10-20-010-28	160000	4.4	30.00	20,160	126,786
11-20-010-28	160000	4.5	30.00	20,618	129,668
12-20-010-28	160000	5.3	30.00	24,284	152,720
13-20-010-28	160000	5.7	35.00	30,469	191,620
14-20-010-28	160000	5.0	35.00	26,727	168,088
15-20-010-28	160000	4.7	34.00	24,406	153,488
16-20-010-28	160000	5.0	32.00	24,436	153,680
01-21-010-28	160000	4.8	24.00	17,594	110,650
02-21-010-28	160000	4.9	24.00	17,961	112,955
03-21-010-28	160000	5.1	23.00	17,915	112,667
04-21-010-28	160000	5.2	24.00	19,060	119,871
05-21-010-28	160000	5.1	25.00	19,473	122,464
06-21-010-28	160000	5.1	25.00	19,473	122,464
07-21-010-28	160000	5.0	25.00	19,091	120,063
08-21-010-28	160000	5.0	25.00	19,091	120,063
09-21-010-28	160000	5.1	27.00	21,031	132,261
10-21-010-28	160000	5.2	27.00	21,443	134,854
11-21-010-28	160000	5.3	27.00	21,855	137,448
12-21-010-28	160000	5.2	27.00	21,443	134,854
13-21-010-28	160000	5.5	31.00	26,040	163,766
14-21-010-28	160000	5.5	30.00	25,200	158,483
15-21-010-28	160000	5.4	29.00	23,917	150,415
16-21-010-28	160000	5.3	29.00	23,474	147,629
01-30-010-28	160000	5.5	35.00	29,400	184,897
02-30-010-28	160000	5.5	30.00	25,200	158,483

UWI	Area (m2)	Reservoir Iso (m)	N/G	OOIP (m3)	OOIP (bbl)
03-30-010-28	160000	5.6	26.00	22,237	139,849
04-30-010-28	160000	6.2	22.00	20,832	131,012
05-30-010-28	160000	5.5	23.00	19,320	121,503
06-30-010-28	160000	5.5	26.00	21,840	137,352
07-30-010-28	160000	5.7	30.00	26,116	164,246
08-30-010-28	160000	5.3	38.00	30,759	193,445
07-24-010-29	160000	7.8	23.00	27,399	172,314
08-24-010-29	160000	7.6	23.00	26,697	167,896
09-24-010-29	160000	7.9	22.00	26,544	166,935
10-24-010-29	160000	8.0	21.00	25,658	161,364
15-24-010-29	160000	7.7	19.00	22,344	140,521
16-24-010-29	160000	8.0	20.00	24,436	153,680
				2,344,837	14,746,680

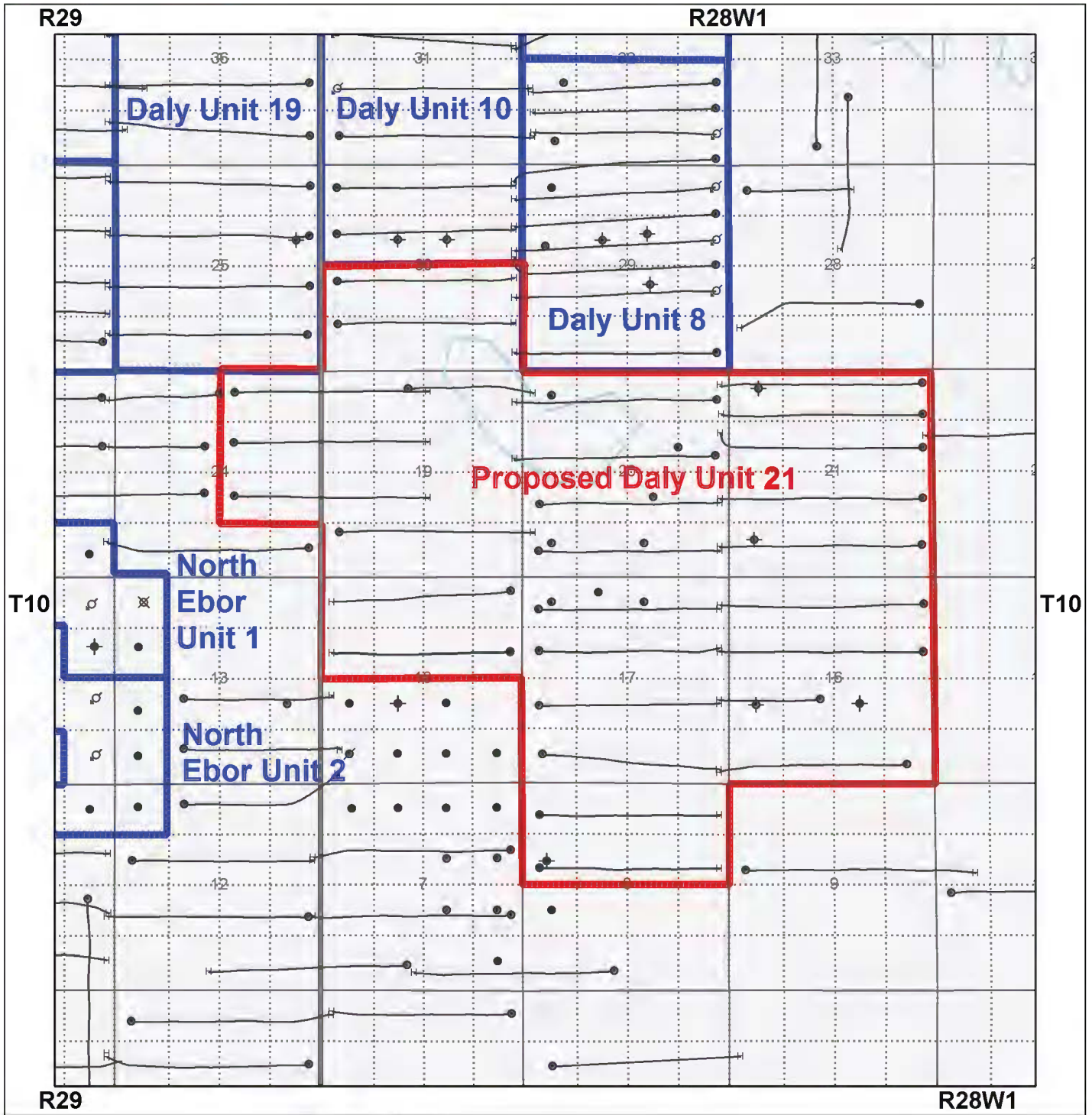
Proposed Daly Unit No. 21

Application for Enhanced Oil Recovery Waterflood Project

LIST OF APPENDICES

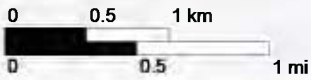
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| Appendix 1 | Daly Unit No. 21 – Offsetting Units |
| Appendix 2 | Daly Unit No. 21 - Structural Cross Section |
| Appendix 3 | Daly Unit No. 21 – Middle Bakken Structure |
| Appendix 4 | Daly Unit No. 21 – Middle Bakken Isopach |
| Appendix 5 | Core PDPK Data |

APPENDIX 1



Center: 49.8435, -101.2562

Scale: 1:45,246



Proposed Daly Unit 21
Offsetting Bakken Units

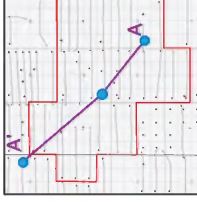
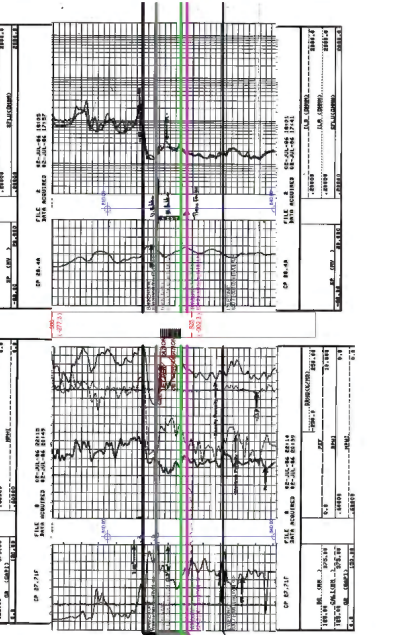
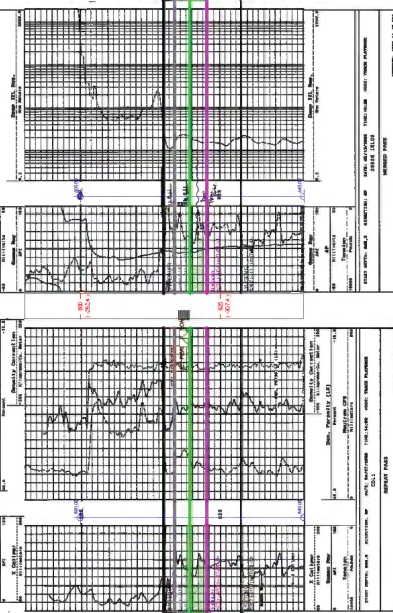
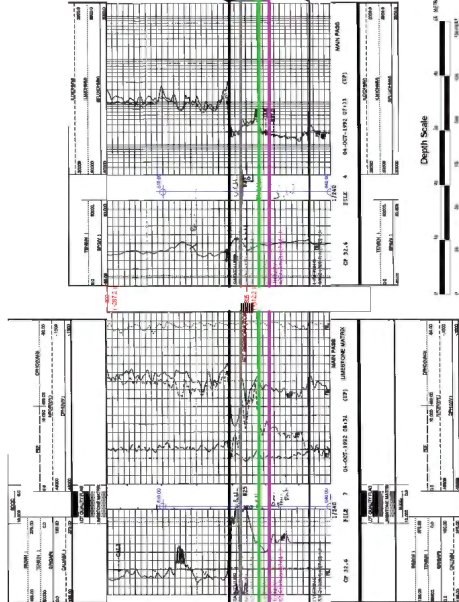
A APPENDIX 2

A'

00/05-16-010-28W1/0
 KS 512.8 m
 RE 1825-10-06
 TD 841.0 m
 RI 1825-10-06
 Mod: Abd
 Flud: OI
 TUNDRA DAILY PROV. 5-16-10-38
 2027 6m to next well >

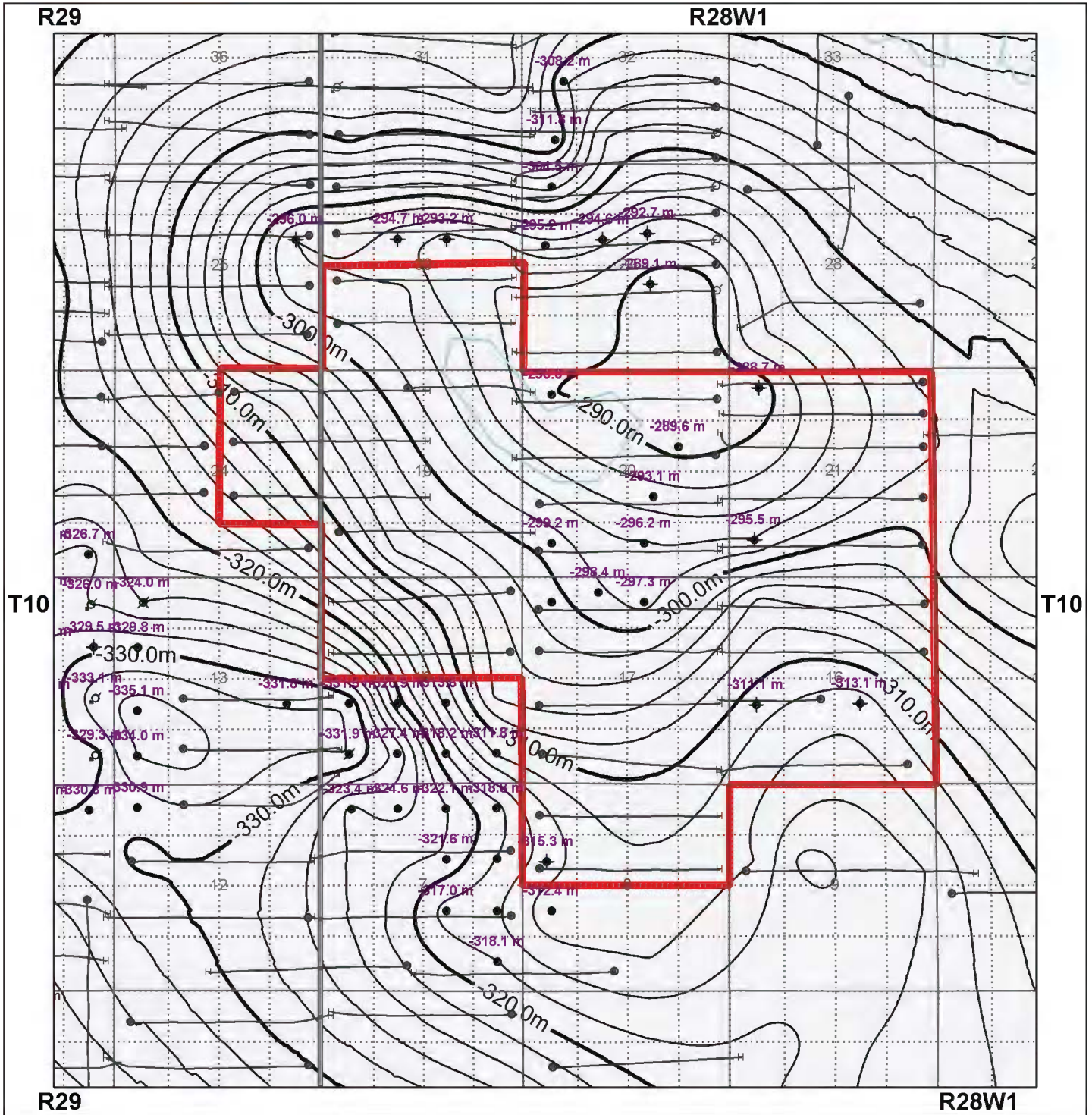
00/04-20-010-28W1/0
 KS 517.6 m
 RE 1825-10-06
 TD 842.0 m
 RI 1825-10-06
 Mod: Contingent
 Flud: OI
 TUNDRA DAILY SIMILAR COM 4-20-10-28(WPM)
 315 6m to next well >

00/09-25-010-29W1/0
 KS 572.7 m
 RE 1825-10-06
 TD 849.0 m
 RI 1825-10-06
 Mod: Abd
 Flud: OI
 PENGINNEETA DAILY 9-25-10-29
 4-315 6m to previous well



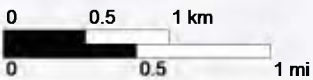
Proposed Daily Unit 21
 Structural Cross Section
 Through Proposed Unit Area

APPENDIX 3



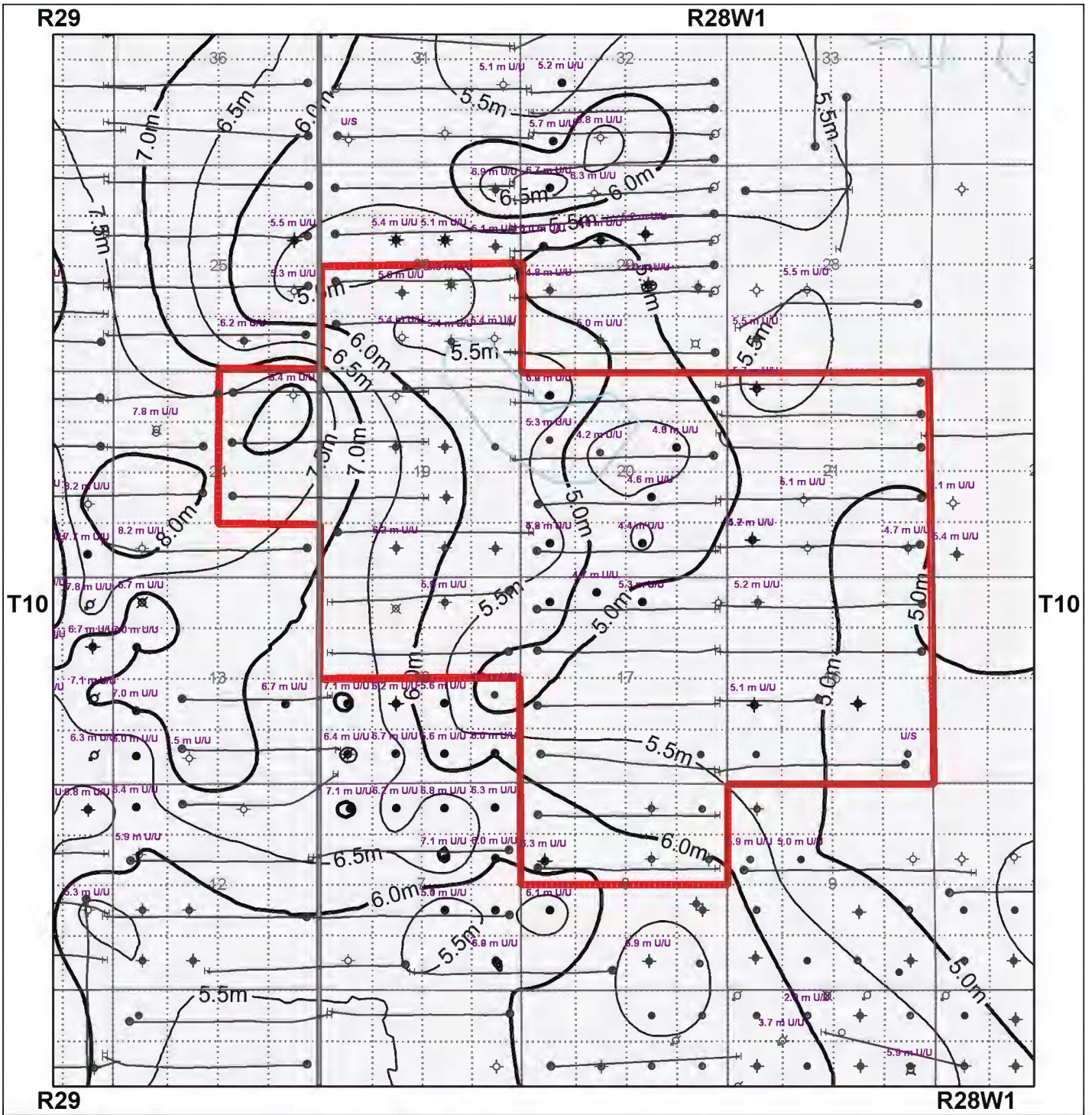
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Proposed Daly Unit 21
Middle Bakken Structure
(mSS)

APPENDIX 4



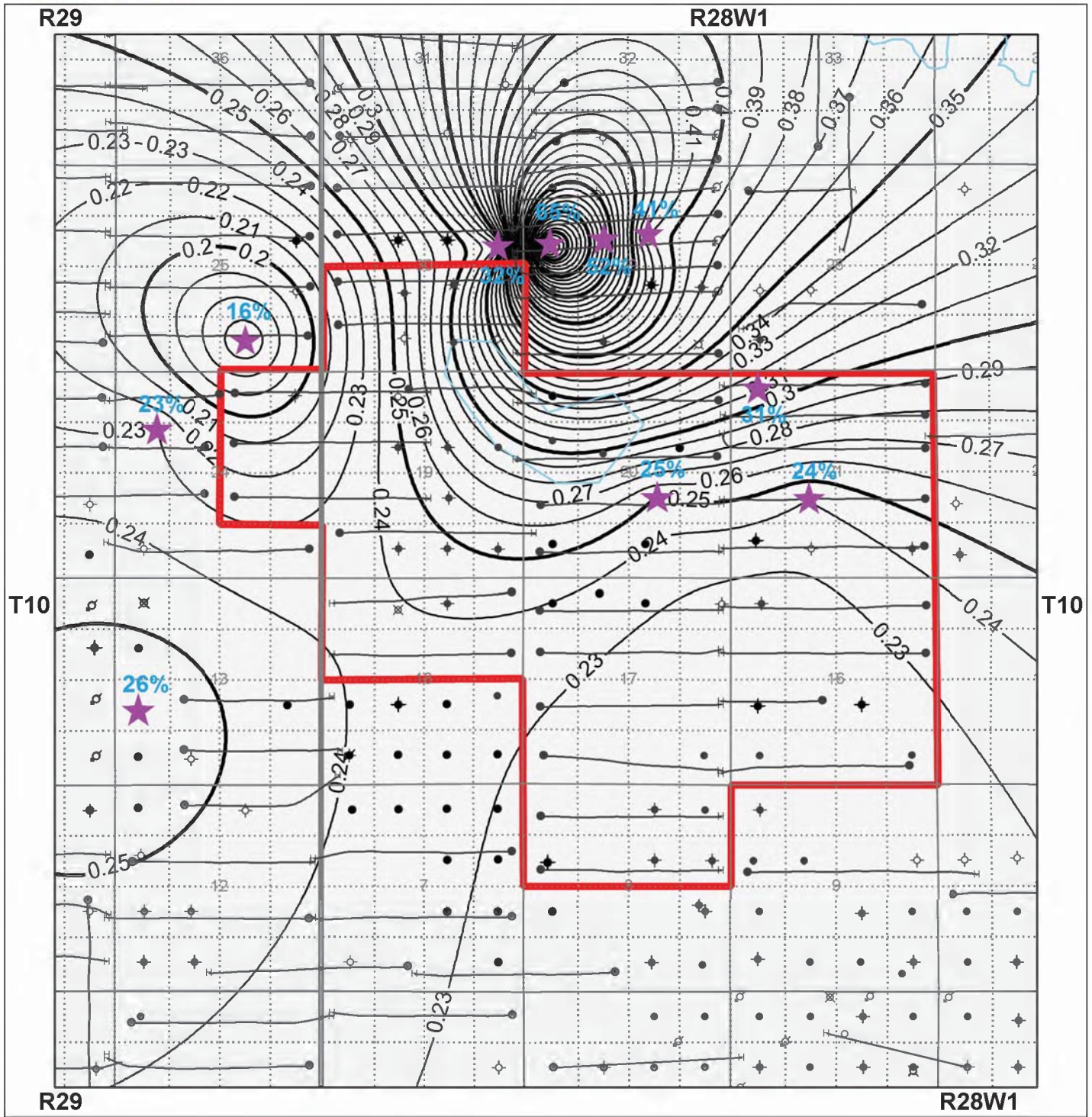
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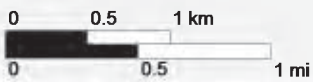
Proposed Daly Unit 21
Reservoir Isopach (m)

APPENDIX 5



Center: 49.8435, -101.2562

Scale: 1:45,246



Proposed Daly Unit 21
PDPK Net to Gross Ratio