PROPOSED CROMER UNIT NO. 4

APPLICATION FOR ENHANCED OIL RECOVERY WATERFLOOD PROJECT

LODGEPOLE FORMATION

DALY, MANITOBA

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Corex Resources Ltd.

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INTRODUCTION

The Daly portion of the Daly Sinclair Field is located in Townships 8 to 11 Ranges 27 to 29 W1M. The field was originally developed with vertical wells but recent exploitation has shifted to horizontal development. Three vertical wells were drilled on lands within the proposed unit: 03-24-09-28W1 (1954), 06-24-09-28W1 (1955) and 13-24-09-28W1 (2005 Strat test to 16-24 horizontal). Although the two older vertical wells were not economic when drilled, a predecessor of Corex Resources Ltd. ("Corex") drilled the first open hole horizontal well on the proposed unit lands at 100/16-24-009-28 W1M after drilling the 13-24 strat vertical. New technology, specifically hydraulically fractured horizontals, has allowed this area to become economic to develop. Since the original horizontal well was drilled in 2005, Corex has followed up with twelve (12) additional Lodgepole horizontals.

Corex is proposing a unit be created in Section 24 and NE¼ 13 in Township 9 Range 28W1M and believes the potential exists for incremental production and reserves from an Enhanced Oil Recovery (EOR) waterflood project in the Lodgepole formation. Currently, Corex is the operator of the lands within the proposed unit that contains thirteen (13) horizontal wells, which excludes two (2) operated Bakken wells (the Bakken will be unitized in a separate application at a later date). We anticipate converting some of the producing horizontal wells into injectors when implementing the EOR waterflood project. Corex plans to produce any newly drilled wells for at minimum one (1) year before converting them to injectors. Corex hereby submits an application to establish Cromer Unit No. 4 and implement an EOR Waterflood Project within the Lodgepole formation (Figure 1).

The proposed Cromer Unit No. 4 falls within the Daly Sinclair Lodgepole Pool (Figure 2).

SUMMARY

1. The proposed Cromer Unit No. 4 is to include thirteen (13) producing horizontal and three (3) abandoned vertical wells within the twenty (20) legal subdivisions (LSD) that were completed in the Lodgepole formation (Figure 1).

2. The original oil in place (OOIP) for the proposed Cromer Unit No. 4 is calculated as 3.597 10^6m^3 (22.625 MMbbl), for an average of 180 10^3m^3 (1,131 Mbbl) per LSD.

3. Cumulative production in the proposed Cromer Unit No. 4 to the end of February 2018 is 34.7 10^3m^3 (218.1 Mbbl) of oil. This represents a 0.96% recovery factor of the total OOIP.

4. Production began in December 1954 with one (1) vertical well that produced for a year and a half. In 2005 an open hole horizontal was drilled but was uneconomic. In February 2018, with the drilling of horizontal fractured wells in the proposed Cromer Unit No. 4 reached a peak of 127.7 m^3/d (803 b/d), or an average of 10.6 m^3/d (66.9 b/d) per well, with a 29.7% watercut (Figure 3).

5. The Estimated Ultimate Recovery (EUR) of oil on primary production within the proposed Cromer Unit No. 4 through the use of decline analysis and a section model is 206.6 10^3m^3 (1,299.5 Mbbl), with 171.9 10^3m^3 (1,081.4 Mbbl) remaining as of February 2018. The Estimated Ultimate Recovery Factor (EURF) would be 5.7% of the total OOIP within the Lodgepole section.

6. With the implementation of a waterflood within the Middle and Lower Daly members of the Lodgepole formation, incremental reserves of 156.7 10^3m^3 (985.6 Mbbl) are expected while the incremental recovery factor is expected to be 4.4% for a total recovery factor of 10.1%.

7. The development plan will be to continue producing the existing wells for a period of time. Horizontal wells will be converted into water injectors and the waterflood initiated in Q3/Q4 2019 (Figure 4). This timing is contingent upon the approval of the unitization and EOR waterflood application. All horizontal wells in the proposed Cromer Unit No. 4 have been completed using multi-stage hydraulic fracturing.

GEOLOGY

Stratigraphy

The Lodgepole formation in the proposed unit area contains a significant volume of hydrocarbons and conformably overlies the hydrocarbon-bearing Bakken formation. It was deposited in a gently sloping carbonate ramp setting and has been subdivided by Corex into six laterally continuous, shallowing upwards cycles. In ascending order, the sequence consists of two non-reservoir cycles: the Basal Limestone and the Cromer Shale which are overlain by four reservoir cycles: the Cruikshank Crinoidal, the Lower Daly, the Middle Daly and the Flossie Lake. The Lodgepole formation is unconformably overlain by the red silts and shales of the Lower Amaranth, and the anhydrites and shales of the Upper Amaranth which forms the top seal for the hydrocarbon system. The stratigraphy of the Lodgepole formation is shown on the type well and structural section which runs north to south through the existing vertical well control in and around the proposed unit (Appendix I) .

Sedimentology

Starting at the base of the Lodgepole section and working upwards, the first cycle immediately overlying the Bakken formation is the Basal Limestone. The Basal Limestone is a cream to pink cherty, slightly argillaceous limestone with traces of fossil hash. This unit is considered non-reservoir and is capped by an argillaceous marker bed commonly called the "false Bakken" shale.

The next cycle, the Cromer Shale, consists of tan to light brown, occasionally dolomitic, limestone with minor anhydrite, grey-green shale and very fine quartzose siltstone components. The Cromer Shale is a non-reservoir unit and is capped by a light to medium grey "shale" unit.

The overlying Cruikshank Crinoidal is the first reservoir quality cycle deposited within the Lodgepole formation. It is comprised of tan to off white, argillaceous limestone with occasional vertical fracturing. This unit displays little faunal variation and bioclastic components are dominated by crinoids indicating deposition in a slightly restricted marine slope environment. The closest cored well in the area is the 02-14-09-28W1 (the top of the Crinoid unit is at 776m TVD and the base is 781.9m TVD). Using a (6%) porosity cutoff the average porosity is (9%) with a permeability of 149mD (there are fractures in the core, see Appendix XI for analysis). The isopach in the area does not vary much and is between 3-4.5m in thickness (Appendix II). The net pay values from a 6% porosity log cutoff range from 1-4m (Appendix III). Using Archie's equation and the resistivity log from the 100/03-24 strat the water saturation for this zone was calculated to be 40%. The 3-24 well is the only well completed in the Cruikshank Crinoidal within the proposed unit.

The Lower Daly is the next shallowing upwards reservoir cycle and grades from a tan to light brown lime mudstone into bioclastic wackestone. It is occasionally argillaceous with traces of pyrite, dolomite, and biofragments, indicating deposition in a relatively quiet, muddy, slightly upslope environment. The closest core in the area is the 14-13-09-28W1. The Lower Daly, using a 6% core cutoff has a porosity of 8% and permeability of 0.5mD (Appendix XI for analysis). The isopach of the unit has values ranging from 10 to 15m (Appendix IV) with net pays from 2 to 6m using a 6% log porosity cutoff (Appendix V). Using Archie's equation and the resistivity log from the 100/03-24 strat the water saturation for this zone was calculated to be 35%. The 3-24-09-28W1 was completed in the Lower Daly.

The Middle Daly is a light tan to tan, partially recrystallized very fine to fine dolomitic biofragmental wackestone which grades to a cryptocrystalline mudstone with minor anhydrite and shale. The rock becomes increasingly calcareous moving up section. Deposition of this shallowing upward sequence occurred in a more restricted marine ramp environment than the underlying Lower Daly, and is reminiscent of the Midale Marly of Southeast Saskatchewan. Within the proposed unit area, there are no cores. The closest well with core is the 14-13-09-28W1 with a porosity of 9% and average permeability of 1.2mD using a 6% core cutoff. The isopach of this unit varies from 8 to 11m (Appendix VI) with net pays (Appendix VII) using a 6% porosity log cutoff ranging from 4 to 6m. Using Archie's equation and the resistivity log from the 100/03-24 strat the water saturation for this zone was calculated to be 35%. One well, the 3-24-09-28W1 was completed in the Middle Daly. The Middle Daly is the current target within the Lodgepole for the horizontals drilled by Corex in the proposed unit area.

The final reservoir cycle in the Lodgepole sequence is the Flossie Lake. The base of the Flossie Lake is a dolomitic limestone. The cycle then grades upward into an interbedded dolomite and anhydrite, indicating deposition in the uppermost shallow evaporitic ramp setting. This interval is a light to medium brown, horizontally laminated, microsucrosic, occasionally shaly, dolomite interbedded with dense, white anhydrite in beds or as inclusions or lenses. The uppermost 3 to 4m of the Flossie Lake is dominated by anhydrite and contains only minor oil stained dolomite beds. Within the proposed unit area and close by, there are no cores. The isopach is from 12 to 17m with net pay ranging from 5 to 7m using a 6% log cutoff (Appendices X and XI). Using

Archie's equation and the resistivity log from the 100/03-24 strat the water saturation for this zone was calculated to be 25%. Although there are no Flossie Lake cores within the proposed unit area, the 100/04-24-009-28W1/00 horizontal well is producing out of subject sequence.

Structure

The structure within the proposed unit area shows a high running through the W½ 24-9-28 WPM and the NE¼ 13-9-28 WPM. There is however a significant drop in structure in the east half of 24 due to dissolution of the underlying Prairie Evaporites. Localized dissolution events do not appear to represent continuous barriers to lateral fluid flow within the reservoir as they do not appear to interrupt the lateral continuity of the reservoir beds. There is no direct evidence indicating significant natural faulting in the vicinity of the proposed unit area. Structure maps for all four reservoir units are included in the Appendices XII to XV.

Reservoir

Maps for each of the four reservoir units were generated using available openhole logs. There are no wells cored within the proposed unit area with the closest cored well being the 100/14-13-09-28W1. A table with the calculated porosity and permeability meters is included as Appendix XI. Net pay for the Flossie Lake in the proposed unit area ranges from 5 to 7m using a 6% LS density porosity cutoff. Using the same cutoff, net pay for the Middle Daly ranges from 4 to 6m, net pay for the Lower Daly ranges from 2 to 6m, and net pay for the Cruikshank Crinoidal ranges 1 to 4m.

Fluid Contacts

There is no oil-water contact seen in the Flossie Lake, the Middle, Lower Daly or Crinoid on logs within the proposed unit area.

OIL IN PLACE, PRODUCTION HISTORY AND ESTIMATED RECOVERY

Original Oil in Place

The original-oil-in-place (OOIP) for the proposed Cromer Unit No. 4 is 3.597 $10^6 m^3$ (22.625 MMbbl) for the Lodgepole formation. The OOIP was calculated in-house. Values of thickness, porosity and water saturation of each LSD for the various reservoir zones are used to calculate the OOIP on an individual LSD basis. Details of the calculations are summarized in Table 1.

Historical Production

Figure 3 shows the production history of the wells within the proposed Cromer Unit No. 4. There are a total of sixteen (16) existing wells within the unit (2 vertical and 13 horizontal wells and 1 vertical strat), twelve (12) of the horizontals are currently on production (the openhole

horizontal drilled in 2005 is currently shut in). Within the proposed unit there is currently no water disposal. All of the wells are perforated in the Lodgepole formation.

To the end of February 2018, the proposed Cromer Unit No. 4 has produced cumulative volumes of oil of 34.7 10^3m^3 (218.1 Mbbl) and water of 16.5 10^3m^3 (103.8 Mbbl). The current recovery factor is 0.96%.

Production began in December, 1954, with one vertical well that produced for a year and a half and in 2005 an open hole horizontal well was drilled. In February 2018, with the drilling of hydraulically fractured horizontal wells, the proposed Cromer Unit No. 4 reached a peak of 127.7 m^3/d (803 b/d), or an average of 10.6 m^3/d (66.9 b/d) per well, with a 29.7% watercut.

Primary Recovery

Table 3 lists the wells within the proposed unit area, together with the cumulative oil production to the end of January 2017 and the EUR estimated using decline analysis. The total EUR for the proposed Cromer Unit No. 4 with further development is 206.6 10^3m^3 (1,299.5 Mbbl) for a recovery factor of 5.7% of the total OOIP of the Lodgepole section.

Secondary Recovery

Within the Lodgepole formation, the proposed waterflood will target the Middle and Lower Daly members which contains over 46% of the total OOIP. A section model of the Middle and Lower Daly zones was built to estimate the expected recovery from waterflooding. This section model used average reservoir properties and was tuned to match the type production profile of Corex horizontal producers within the Middle Daly member. With 8 horizontal wells at a ~200 m well spacing, model results suggest a EURF of 6.0% under primary depletion. With four of the eight horizontal wells converted into injectors, the section model yields a EURF of 15.5%, or an incremental recovery factor of 9.5%. Note that these recovery factors are based on the OOIP of the Middle and Lower Daly zones and not the entire Lodgepole formation, it is also important to note that these numbers are from the section model and not using the declines of the producing wells. Additional information on the section model is included in Appendix XVI.

UNITIZATION

The basis for unitization is to implement a waterflood to increase the ultimate recovery of the OOIP from the proposed project area.

Unit Name

Corex proposes that the name of the new unit shall be Cromer Unit No. 4.

Unit Operator

Corex will be the Operator for Cromer Unit No. 4.

Unitized Zones

The unitized zone to be waterflooded in the Cromer Unit No. 4 will be the Lodgepole Formation.

Unit Wells

The of sixteen (16) existing wells within the unit (2 vertical and 13 horizontal wells and 1 vertical strat) in the proposed Cromer Unit No. 4 are outlined in Table 2 with their current status.

Unit Lands

The Cromer Unit No. 4 will consist of all 20 LSDs within Section 24 and the Northeast quarter of Section 13 Township 9 Range 28W1. The lands included in the 40 acre tracts are outlined in Appendix XVII.

Tract Factors

The proposed Cromer Unit No. 4 will consist of 20 tracts based on remaining OOIP using maps created internally by Corex per LSD, as of February 2018, with the production from the horizontal wells being divided according to the existing production allocation agreement. The calculation of the tract factors are outlined in Table 1.

Working Interest Owners

Appendix XVII outlines the working interest for each recommended tract within the proposed Cromer Unit No. 4. Corex will have a 100% WI across all tracts.

WATERFLOOD DEVELOPMENT

The objective of implementing a waterflood is to provide pressure support and improve recovery. The Lodgepole formation is relatively shallow, with undersaturated oil having low solution gas-oil ratios. As such, there is not much drive energy within the system. Corex believes additional energy is required to improve the recovery. Waterflooding will enhance the recovery by providing pressure support as well as displacing the oil from the injectors towards the producers.

Rock and Fluid Properties

Rock and fluid properties for the Lodgepole formation are summarized in Table 4. These properties were estimated using standard correlations in the literature as well as existing oil analysis and PVT data.

Using Corex's internal database on fracture treatments and step rate tests, the fracture gradient for the Lodgepole formation is estimated to range between 19.0 kPa/m and 25.9 kPa/m, with an average of 23.3 kPa/m. The surface fracturing pressure is estimated to range between 6,348 kPa and 11,500 kPa with the average gradient the estimated surface fracturing pressure is 9,500 kPa.

Estimated Recovery

Using the results from the Daly section model, incremental reserves of 156.7 10^3m^3 (985.6 Mbbl) are expected. Based on the total OOIP for the Lodgepole formation, the incremental recovery factor is expected to be 4.4% for an overall recovery factor of 10.1%.

Economic Limit

The economic limit will be when the net oil rate and net oil price revenue stream becomes less than the current producing operating costs. Based on current price forecasts, the economic limit for the project would be 1 m^3/d.

Source of Injection Water

The injection water will be from the Lodgepole formation which will be sourced from produced, or if required, a new Lodgepole source well will be drilled near the new 04-19 Battery.

A simplified process flow diagram of the new battery and injection system to the injectors is located in Figure 5. The injector wells will be equipped with surface injection rate and pressure metering with choke valves to control wellhead pressure and injection rates (Figures 7 and 8). The wells will be reviewed for installation of a downhole nozzle system to ensure an even distribution of injection fluid across the horizontal wellbore (Figure 6). The water injection pipeline system will be monitored for leak detection using pressure variance and volume balancing. The corrosion control program outlining the planned system design and operational practices to prevent corrosion is located in Figure 8.

Operating Strategy

Corex's plan is to have alternating producer-injector within the proposed Cromer Unit No. 4 and the proposed injection scheme can be seen in Figure 4.

Injection rates are expected to be in the range of 30 m^3/d to 80 m^3/d, per well, subject to a maximum injection pressure of 8,500 kPa at the well head. This maximum pressure is based on a fracture pressure of 9,500 kPa and a safety factor of 90%. Initially, injection will target a monthly voidage replacement ratio (VRR) between 1.25 and 1.75. This over-injection will serve to replace the existing voidage within the proposed unit area. Once a cumulative VRR of one is attained, the injection rate will be scaled back to maintain the VRR at one, both on a monthly basis and a cumulative basis.

All producers will be kept at pump-off condition.

Pressure

The initial pressure is estimated to be between 7,800 kPa and 8,000 kPa. This is based on the depth of the Middle Daly zone and a static gradient ranging between 10.5 kPa/m and 10.8 kPa/m. Currently, no pressure measurements have been taken in the proposed Cromer Unit No. 4. However, due to minimal production from the area thus far it is estimated that the pressure is quite close to the estimated reservoir pressure. With significant development plans in the near future it is projected that the pressure will decrease rapidly from primary depletion. With a low solution-gas oil, another drive mechanism will need to be implemented in order to improve the recovery within the proposed unit.

Waterflooding will help to re-pressurize and add energy to the reservoir. During the initial over-injection period, the reservoir pressure is expected to increase from the current level. Once the cumulative VRR reaches one, a monthly VRR of one will be maintained. At the stage of the first conversion the reservoir pressure is expected to be below its initial value. Prior to injection Corex will endeavor to record reservoir pressures within the proposed unit and continue upon implementing a secondary recovery scheme.

Waterflood Facilities

The wells will initially be drilled and setup as single well batteries. In Q2/Q3 2018 it is planned to flowline the wells to a newly constructed facility located at 04-19-009-27W1. Test satellites will be located in the field at the pad sites and will accommodate 4-8 wells/satellite. The facility will include a free water knockout, treater, flare system and tank farm to handle the emulsion. The water injection facility will also be located at 4-19 and will include water cleaning tanks, filter package, high pressure injection pump and associated flowlines back to the injection wells. See Figure 6 for a process flow diagram.

Waterflood Surveillance

Waterflood response within the proposed Cromer Unit No. 4 will be closely monitored with the following:

- Regular production well testing to monitor fluid rate and water cut to watch for waterflood response
- Comparison of daily injection rates and pressure monitoring to targets
- Monitor monthly and cumulative voidage replacement ratio by pattern and overall unit
- Evaluation of Hall plots
- New injection targets will be sent to the field on a regular basis

Project Schedule

With the success of the recently drilled horizontal wells within the proposed unit Corex believes that unitization for future waterflooding would be beneficial in the area. After a period of primary recovery, Corex intends to convert several wells to injection in an alternating producer-injector waterflood scheme to support the other existing wells and implement a waterflood.

Conversion of the horizontal producers into injection wells is expected to start in late 2019. This schedule is contingent upon the approval of the Unitization and Waterflood application, as well as the various stake holders coming to agreement.

NOTIFICATIONS

Corex will notify all surface and mineral owners of the proposed EOR project and formation of the Cromer Unit No. 4. 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 Cromer Unit No. 4 Application.

Unitization and execution of the formal Cromer Unit No. 4 agreement by affected mineral owners will occur once the Petroleum Branch has reviewed the tract factors. Copies of the agreement will be forwarded to the Petroleum Branch to complete the Cromer Unit No. 4 application.

Should you have any comments and/or questions regarding this application, please contact Peter Parkinson or Chris Dunn, Engineering, at (403) 718-6371 or peterp@corexresources.ca or (403) 718-6357 or chrisd@corexresources.ca, respectively.

Regards,

COREX RESOURCES LTD.

[redacted]

Table 1 – Summary of Original Oil In Place and Tract Factor Calculations

Cromer Unit No. 4
Lodgepole Unit

Tract LSD	Tract Weighting	Total	9-13 09-13-009-28W1	10-13 10-13-009-28W1	15-13 15-13-009-28W1	16-13 16-13-009-28W1	1-24 01-24-009-28W1
Tract Factor		100.000000000%	5.696549276%	5.093567642%	5.218064997%	5.457983746%	5.064798002%
Flossie							
Area (ac)		800	40	40	40	40	40
h (m)			7.0	6.0	6.0	7.0	6.0
Vb (ac-ft)		16,010	919	787	787	919	787
phi			12.0%	12.0%	12.0%	12.0%	12.0%
Sw			25%	25%	25%	25%	25%
HCPV			0.630	0.540	0.540	0.630	0.540
OOIP (Mbbls)		11,179	641	550	550	641	550
OOIP (Mstb)		10,447	599	514	514	599	514
OOIP (10^3m^3)		1,661	95	82	82	95	82
Middle Daly (Green)							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			5.0	5.0	6.0	5.0	5.0
Vb (ac-ft)		12,467	656	656	787	656	656
phi			9.0%	9.0%	9.0%	9.0%	9.0%
Sw			35%	35%	35%	35%	35%
HCPV		6	0.293	0.293	0.351	0.293	0.293
OOIP (Mbbls)		5,658	298	298	357	298	298
OOIP (Mstb)		5,288	278	278	334	278	278
OOIP (10^3m^3)		841	44	44	53	44	44
Lower Daly (Purple)							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			6.0	5.0	4.0	5.0	4.5
Vb (ac-ft)		11,693	787	656	525	656	591
phi			8.0%	8.0%	8.0%	8.0%	8.0%
Sw			35%	35%	35%	35%	35%
HCPV		5	0.312	0.260	0.208	0.260	0.234
OOIP (Mbbls)		4,717	318	265	212	265	238
OOIP (Mstb)		4,408	297	247	198	247	223
OOIP (10^3m^3)		701	47	39	31	39	35
Crinoid							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			2.0	2.0	2.5	2.0	2.5
Vb (ac-ft)		6,339	262	262	328	262	328
phi			9.0%	9.0%	9.0%	9.0%	9.0%
Sw			40%	40%	40%	40%	40%
HCPV		3	0.108	0.108	0.135	0.108	0.135
OOIP (Mbbls)		2,655	110	110	137	110	137
OOIP (Mstb)		2,482	103	103	128	103	128
OOIP (10^3m^3)		395	16	16	20	16	20
Total Lodgepole							
Total OOIP (Mstb)		**22,625**	**1,277**	**1,142**	**1,174**	**1,228**	**1,143**
Total OOIP (10^3m^3)		3,597	203	182	187	195	182
Cumulative Oil (Mstb)		**218**	**0.9**	**0.9**	**4.9**	**4.9**	**8.3**
OOIP-Cum Prd (Mstb)	**100%**	**22,407**	**1,276**	**1,141**	**1,169**	**1,223**	**1,135**

Well 1			100/10-13-009-28W1/00	100/10-13-009-28W1/00	100/15-13-009-28W1/00	100/15-13-009-28W1/00	100/04-24-009-28W1/0
Factor			0.5	0.5	0.5	0.5	0.25
Cumulative Oil (Mstb)			1.0	1.0	5.1	5.1	14.5
Well 2			102/10-13-009-28W1/00	102/10-13-009-28W1/00	102/15-13-009-28W1/00	102/15-13-009-28W1/00	102/04-24-009-28W1/0
Factor			0.5	0.5	0.5	0.5	0.25
Cumulative Oil (Mstb)			0.8	0.8	4.7	4.7	8.9
Well 3							103/04-24-009-28W1/0
Factor							0.25
Cumulative Oil (Mstb)							9.9
Well 4							
Factor							
Cumulative Oil (Mstb)							

Table 1 – Summary of Original Oil In Place and Tract Factor Calculations (cont'd)

Cromer Unit No. 4
Lodgepole Unit

Tract	Tract	Total	2-24	3-24	4-24	5-24	6-24
LSD	Weighting		02-24-009-28W1	03-24-009-28W1	04-24-009-28W1	05-24-009-28W1	06-24-009-28W1
Tract Factor		100.000000000%	5.069044352%	5.689313464%	4.944838628%	4.663694119%	5.057330721%
Flossie							
Area (ac)		800	40	40	40	40	40
h (m)			6.0	6.4	6.0	6.0	5.6
Vb (ac-ft)		16,010	787	840	787	787	735
phi			12.0%	12.0%	12.0%	12.0%	12.0%
Sw			25%	25%	25%	25%	25%
HCPV			0.540	0.576	0.540	0.540	0.504
OOIP (Mbbls)		11,179	550	586	550	550	513
OOIP (Mstb)		10,447	514	548	514	514	480
OOIP (10^3m^3)		1,661	82	87	82	82	76
Middle Daly (Green)							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			5.0	5.8	4.5	3.0	5.2
Vb (ac-ft)		12,467	656	761	591	394	682
phi			9.0%	9.0%	9.0%	9.0%	9.0%
Sw			35%	35%	35%	35%	35%
HCPV		6	0.293	0.339	0.263	0.176	0.304
OOIP (Mbbls)		5,658	298	345	268	179	310
OOIP (Mstb)		5,288	278	323	250	167	289
OOIP (10^3m^3)		841	44	51	40	27	46
Lower Daly (Purple)							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			4.0	3.9	4.0	4.5	4.5
Vb (ac-ft)		11,693	525	512	525	591	591
phi			8.0%	8.0%	8.0%	8.0%	8.0%
Sw			35%	35%	35%	35%	35%
HCPV		5	0.208	0.203	0.208	0.234	0.234
OOIP (Mbbls)		4,717	212	206	212	238	238
OOIP (Mstb)		4,408	198	193	198	223	223
OOIP (10^3m^3)		701	31	31	31	35	35
Crinoid							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			3.0	4.3	3.0	3.0	3.0
Vb (ac-ft)		6,339	394	564	394	394	394
phi			9.0%	9.0%	9.0%	9.0%	9.0%
Sw			40%	40%	40%	40%	40%
HCPV		3	0.162	0.232	0.162	0.162	0.162
OOIP (Mbbls)		2,655	165	236	165	165	165
OOIP (Mstb)		2,482	154	221	154	154	154
OOIP (10^3m^3)		395	25	35	25	25	25
Total Lodgepole							
Total OOIP (Mstb)		**22,625**	**1,144**	**1,285**	**1,116**	**1,058**	**1,146**
Total OOIP ($10^3 m^3$)		3,597	182	204	177	168	182
Cumulative Oil (Mstb)		**218**	**8.3**	**10.0**	**8.3**	**12.6**	**12.6**
OOIP-Cum Prd (Mstb)	**100%**	**22,407**	**1,136**	**1,275**	**1,108**	**1,045**	**1,133**
Well 1			100/04-24-009-28W1/00	100/04-24-009-28W1/00	100/04-24-009-28W1/00	100/05-24-009-28W1/00	100/05-24-009-28W1/0
Factor			0.25	0.25	0.25	0.25	0.25
Cumulative Oil (Mstb)			14.5	14.5	14.5	36.3	36.3
Well 2			102/04-24-009-28W1/00	102/04-24-009-28W1/00	102/04-24-009-28W1/00	102/05-24-009-28W1/00	102/05-24-009-28W1/0
Factor			0.25	0.25	0.25	0.25	0.25
Cumulative Oil (Mstb)			8.9	8.9	8.9	14.0	14.0
Well 3			103/04-24-009-28W1/00	103/04-24-009-28W1/00	103/04-24-009-28W1/00		100/06-24-009-28W1/0
Factor			0.25	0.25	0.25		1
Cumulative Oil (Mstb)			9.9	9.9	9.9		0.0
Well 4				100/03-24-009-28W1/00			
Factor				1			
Cumulative Oil (Mstb)				1.6			

Table 1 – Summary of Original Oil In Place and Tract Factor Calculations (cont'd)

Cromer Unit No. 4
Lodgepole Unit

Tract LSD	Tract Weighting	Total	7-24 07-24-009-28W1	8-24 08-24-009-28W1	9-24 09-24-009-28W1	10-24 10-24-009-28W1	11-24 11-24-009-28W1
Tract Factor		100.000000000%	5.050111926%	4.820809051%	4.801622245%	4.912027333%	5.022432421%
Flossie							
Area (ac)		800	40	40	40	40	40
h (m)			6.0	6.0	6.0	6.0	6.0
Vb (ac-ft)		16,010	787	787	787	787	787
phi			12.0%	12.0%	12.0%	12.0%	12.0%
Sw			25%	25%	25%	25%	25%
HCPV			0.540	0.540	0.540	0.540	0.540
OOIP (Mbbls)		11,179	550	550	550	550	550
OOIP (Mstb)		10,447	514	514	514	514	514
OOIP (10^3m^3)		1,661	82	82	82	82	82
Middle Daly (Green)							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			5.0	5.0	5.0	5.0	5.0
Vb (ac-ft)		12,467	656	656	656	656	656
phi			9.0%	9.0%	9.0%	9.0%	9.0%
Sw			35%	35%	35%	35%	35%
HCPV		6	0.293	0.293	0.293	0.293	0.293
OOIP (Mbbls)		5,658	298	298	298	298	298
OOIP (Mstb)		5,288	278	278	278	278	278
OOIP (10^3m^3)		841	44	44	44	44	44
Lower Daly (Purple)							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			4.0	4.0	4.0	4.5	5.0
Vb (ac-ft)		11,693	525	525	525	591	656
phi			8.0%	8.0%	8.0%	8.0%	8.0%
Sw			35%	35%	35%	35%	35%
HCPV		5	0.208	0.208	0.208	0.234	0.260
OOIP (Mbbls)		4,717	212	212	212	238	265
OOIP (Mstb)		4,408	198	198	198	223	247
OOIP (10^3m^3)		701	31	31	31	35	39
Crinoid							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			3.0	2.0	2.0	2.0	2.0
Vb (ac-ft)		6,339	394	262	262	262	262
phi			9.0%	9.0%	9.0%	9.0%	9.0%
Sw			40%	40%	40%	40%	40%
HCPV		3	0.162	0.108	0.108	0.108	0.108
OOIP (Mbbls)		2,655	165	110	110	110	110
OOIP (Mstb)		2,482	154	103	103	103	103
OOIP (10^3m^3)		395	25	16	16	16	16
Total Lodgepole							
Total OOIP (Mstb)		**22,625**	**1,144**	**1,093**	**1,093**	**1,118**	**1,142**
Total OOIP (10^3m^3)		3,597	182	174	174	178	182
Cumulative Oil (Mstb)		**218**	**12.6**	**12.6**	**16.9**	**16.9**	**16.9**
OOIP-Cum Prd (Mstb)	**100%**	**22,407**	**1,132**	**1,080**	**1,076**	**1,101**	**1,125**
Well 1			100/05-24-009-28W1/00	100/05-24-009-28W1/00	102/09-24-009-28W1/00	102/09-24-009-28W1/00	102/09-24-009-28W1/0
Factor			0.25	0.25	0.25	0.25	0.25
Cumulative Oil (Mstb)			36.3	36.3	50.1	50.1	50.1
Well 2			102/05-24-009-28W1/00	102/05-24-009-28W1/00	103/09-24-009-28W1/00	103/09-24-009-28W1/00	103/09-24-009-28W1/0
Factor			0.25	0.25	0.25	0.25	0.25
Cumulative Oil (Mstb)			14.0	14.0	17.4	17.4	17.4
Well 3							
Factor							
Cumulative Oil (Mstb)							
Well 4							
Factor							
Cumulative Oil (Mstb)							

Table 1 – Summary of Original Oil In Place and Tract Factor Calculations (cont'd)

Cromer Unit No. 4
Lodgepole Unit

Tract	Tract	Total	12-24	13-24	14-24	15-24	16-24
LSD	Weighting		12-24-009-28W1	13-24-009-28W1	14-24-009-28W1	15-24-009-28W1	16-24-009-28W1
Tract Factor		100.000000000%	5.022432421%	4.599014692%	4.789463468%	4.568653292%	4.458248204%
Flossie							
Area (ac)		800	40	40	40	40	40
h (m)			6.0	6.0	6.0	6.0	6.0
Vb (ac-ft)		16,010	787	787	787	787	787
phi			12.0%	12.0%	12.0%	12.0%	12.0%
Sw			25%	25%	25%	25%	25%
HCPV			0.540	0.540	0.540	0.540	0.540
OOIP (Mbbls)		11,179	550	550	550	550	550
OOIP (Mstb)		10,447	514	514	514	514	514
OOIP (10^3m^3)		1,661	82	82	82	82	82
Middle Daly (Green)							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			5.0	3.5	4.0	4.0	4.0
Vb (ac-ft)		12,467	656	459	525	525	525
phi			9.0%	9.0%	9.0%	9.0%	9.0%
Sw			35%	35%	35%	35%	35%
HCPV		6	0.293	0.205	0.234	0.234	0.234
OOIP (Mbbls)		5,658	298	208	238	238	238
OOIP (Mstb)		5,288	278	195	223	223	223
OOIP (10^3m^3)		841	44	31	35	35	35
Lower Daly (Purple)							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			5.0	4.7	5.0	4.0	3.5
Vb (ac-ft)		11,693	656	617	656	525	459
phi			8.0%	8.0%	8.0%	8.0%	8.0%
Sw			35%	35%	35%	35%	35%
HCPV		5	0.260	0.244	0.260	0.208	0.182
OOIP (Mbbls)		4,717	265	249	265	212	185
OOIP (Mstb)		4,408	247	233	247	198	173
OOIP (10^3m^3)		701	39	37	39	31	28
Crinoid							
Area (ac)		800	40.0	40.0	40.0	40.0	40.0
h (m)			2.0	2.0	2.0	2.0	2.0
Vb (ac-ft)		6,339	262	262	262	262	262
phi			9.0%	9.0%	9.0%	9.0%	9.0%
Sw			40%	40%	40%	40%	40%
HCPV		3	0.108	0.108	0.108	0.108	0.108
OOIP (Mbbls)		2,655	110	110	110	110	110
OOIP (Mstb)		2,482	103	103	103	103	103
OOIP (10^3m^3)		395	16	16	16	16	16
Total Lodgepole							
Total OOIP (Mstb)		**22,625**	**1,142**	**1,044**	**1,087**	**1,037**	**1,012**
Total OOIP (10^3m^3)		3,597	182	166	173	165	161
Cumulative Oil (Mstb)		**218**	**16.9**	**13.4**	**13.4**	**13.4**	**13.4**
OOIP-Cum Prd (Mstb)	**100%**	**22,407**	**1,125**	**1,031**	**1,073**	**1,024**	**999**

Well 1			102/09-24-009-28W1/00	103/16-24-009-28W1/00	103/16-24-009-28W1/00	103/16-24-009-28W1/00	103/16-24-009-28W1/0
Factor			0.25	0.25	0.25	0.25	0.25
Cumulative Oil (Mstb)			50.1	52.2	52.2	52.2	52.2
Well 2			103/09-24-009-28W1/00	100/16-24-009-28W1/02	100/16-24-009-28W1/02	100/16-24-009-28W1/02	100/16-24-009-28W1/0
Factor			0.25	0.25	0.25	0.25	0.25
Cumulative Oil (Mstb)			17.4	1.4	1.4	1.4	1.4
Well 3							
Factor							
Cumulative Oil (Mstb)							
Well 4							
Factor							
Cumulative Oil (Mstb)							

Table 2 – Well List – Status

Well ID	Prod./Inject. Formation	First Prod. YYYY/MM	Last Prod. YYYY/MM	Type
100/10-13-009-28W1/00	Mlodgepl	2018/02	2018/02	Horizontal
102/10-13-009-28W1/00	Mlodgepl	2018/02	2018/02	Horizontal
100/15-13-009-28W1/00	Mlodgepl	2017/12	2018/02	Horizontal
102/15-13-009-28W1/00	Mlodgepl	2017/12	2018/02	Horizontal
100/03-24-009-28W1/00	Mldgpl_U	1954/12	1956/05	Vertical
100/04-24-009-28W1/00	Mlodgepl	2013/08	2018/02	Horizontal
102/04-24-009-28W1/00	Mlodgepl	2017/11	2018/02	Horizontal
103/04-24-009-28W1/00	Mlodgepl	2017/11	2018/02	Horizontal
100/05-24-009-28W1/00	Mlodgepl	2016/11	2018/02	Horizontal
102/05-24-009-28W1/00	Mlodgepl	2017/09	2018/02	Horizontal
100/06-24-009-28W1/00	Mlodgepl			Vertical (D&A)
102/09-24-009-28W1/00	Mlodgepl	2016/01	2018/02	Horizontal
103/09-24-009-28W1/00	Mlodgepl	2017/10	2018/02	Horizontal
100/13-24-009-28W1/00				Vertical Strat
100/16-24-009-28W1/02	Mlodgepl	2006/07	2014/07	Horizontal
103/16-24-009-28W1/00	Mlodgepl	2015/09	2018/02	Horizontal

Table 3 – Cumulative Oil Production and Estimated Ultimate Recovery

Well	Type	Cumulative Oil (Mbbl)	Expected Ultimate Recovery (Mbbl)
100/10-13-009-28W1/00	Horizontal	1.037	103.504
102/10-13-009-28W1/00	Horizontal	0.834	95.971
100/15-13-009-28W1/00	Horizontal	5.144	102.097
102/15-13-009-28W1/00	Horizontal	4.684	66.77
100/03-24-009-28W1/00	Vertical	1.645	1.645
100/04-24-009-28W1/00	Horizontal	14.547	25.356
102/04-24-009-28W1/00	Horizontal	8.881	121.008
103/04-24-009-28W1/00	Horizontal	9.906	136.609
100/05-24-009-28W1/00	Horizontal	36.287	115.561
102/05-24-009-28W1/00	Horizontal	14.016	112.549
100/06-24-009-28W1/00	Vertical (D&A)	0.000	0.000
102/09-24-009-28W1/00	Horizontal	50.081	166.441
103/09-24-009-28W1/00	Horizontal	17.419	124.083
100/13-24-009-28W1/00	Vertical Strat	0.000	0.000
100/16-24-009-28W1/02	Horizontal	1.428	1.428
103/16-24-009-28W1/00	Horizontal	52.231	126.480

Table 4 – Summary of Rock and Fluid Properties

Proposed Cromer Unit No. 4		
Rock and Fluid Properties Lodgepole Formation		
Formation Pressure	kPa	7,800
Oil Gravity	°API	35.5
Solution Gas-Oil Ratio	m^3/m^3	15
Oil Formation Volume Factor	Rm^3/Sm^3	1.07
Average Porosity	fraction	0.09
Average Air Permeability	mD	1.2

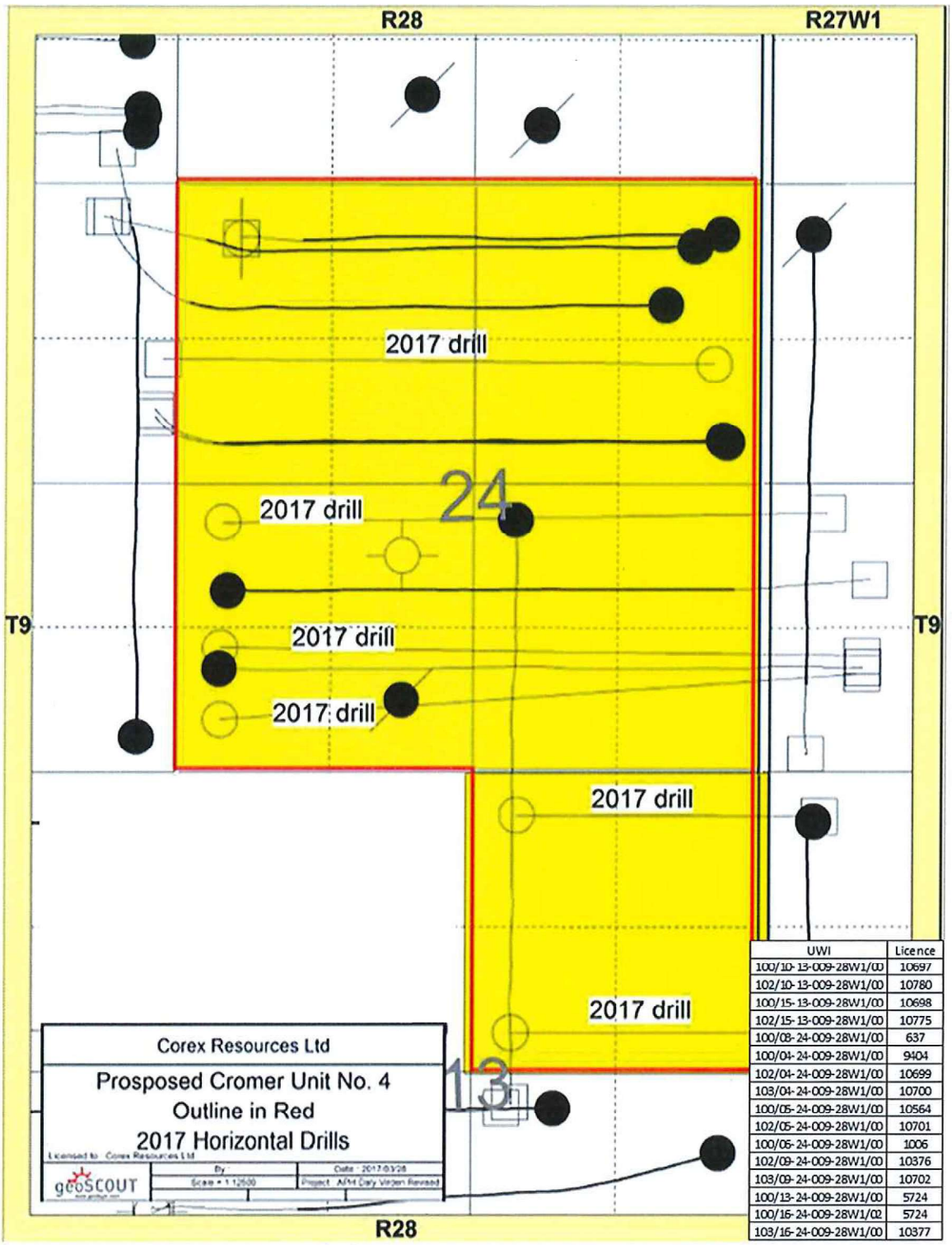


Figure 1 – Location of Proposed Cromer Unit No. 4

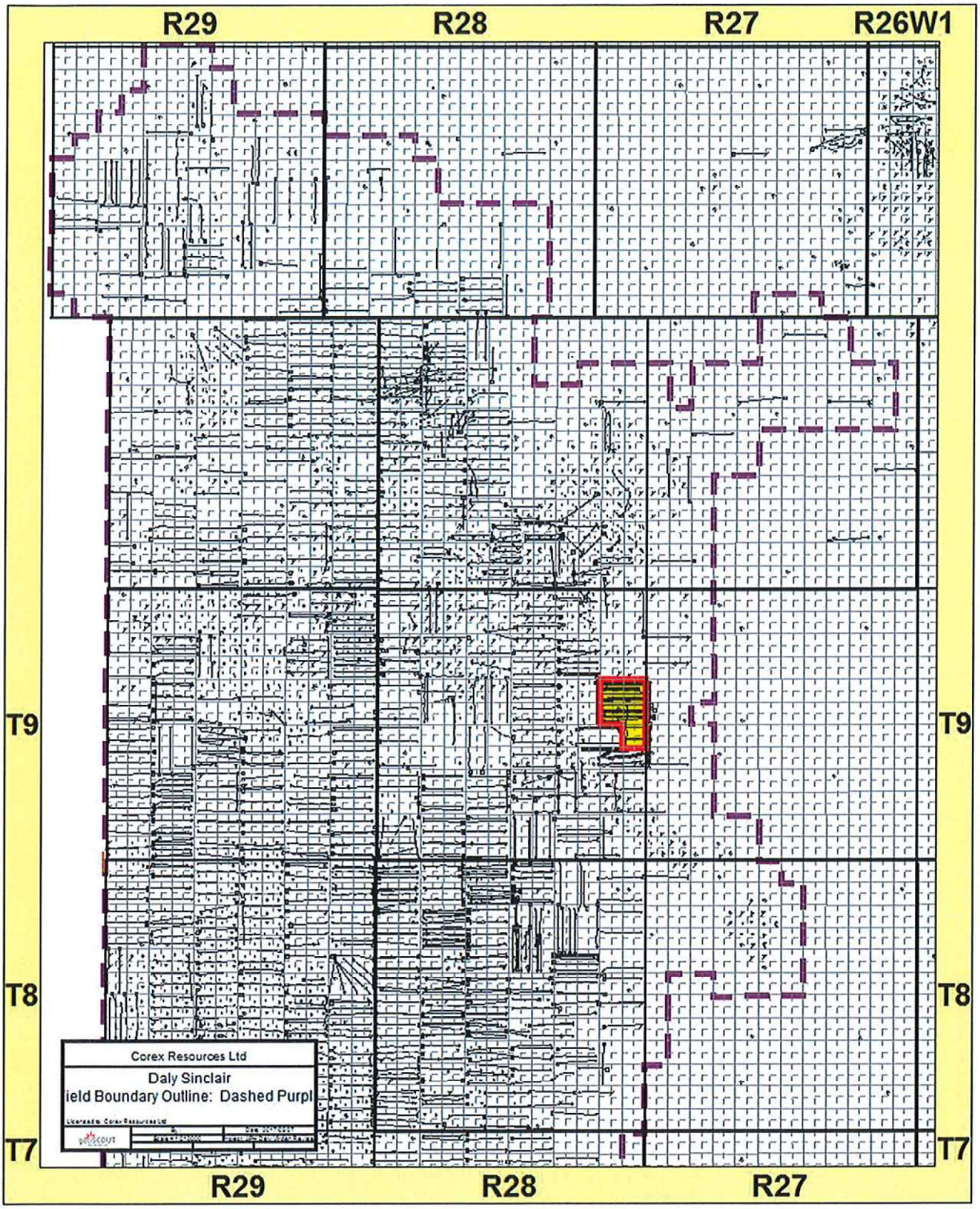


Figure 2 – Location of Proposed Cromer Unit No. 4 within the Daly Sinclair Field

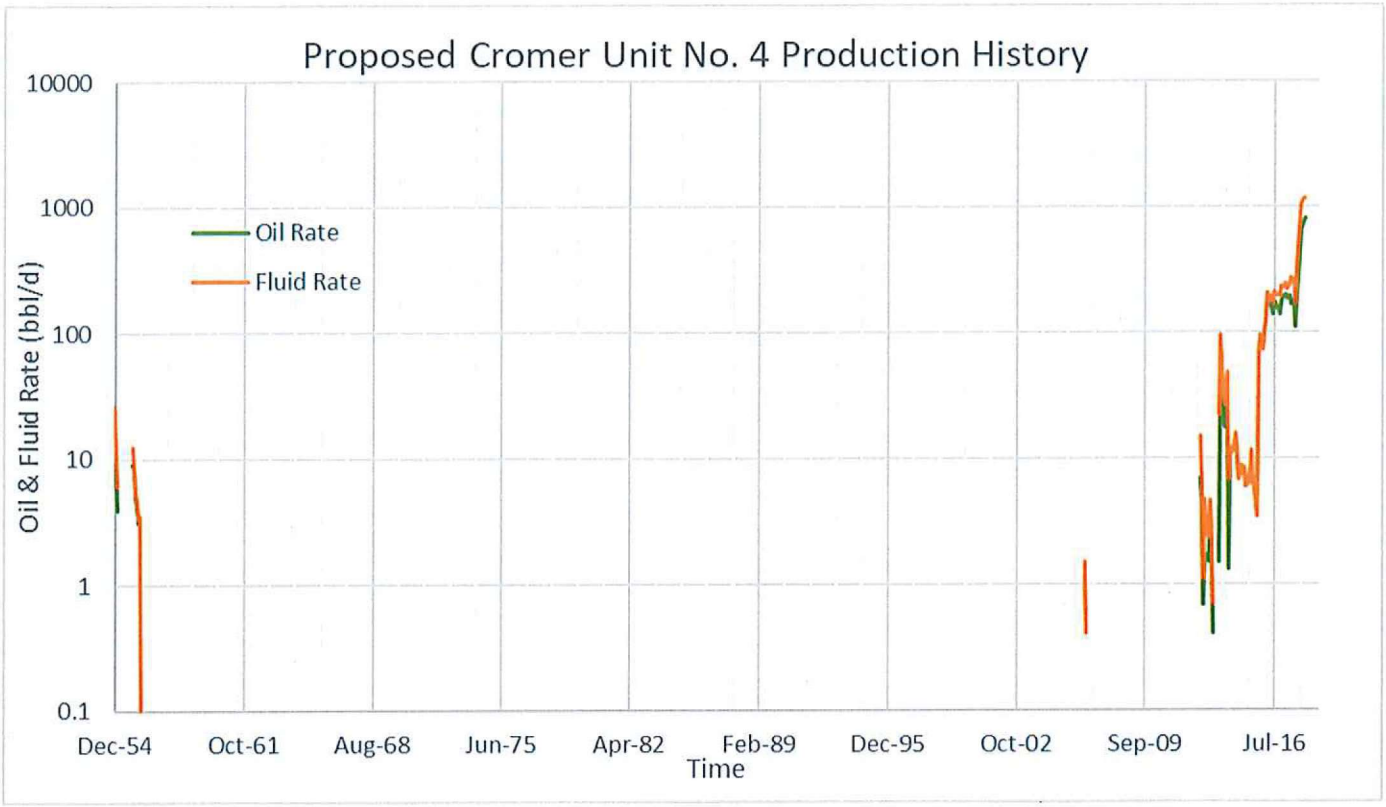


Figure 3 – Production History of Wells within Proposed Cromer Unit No. 4

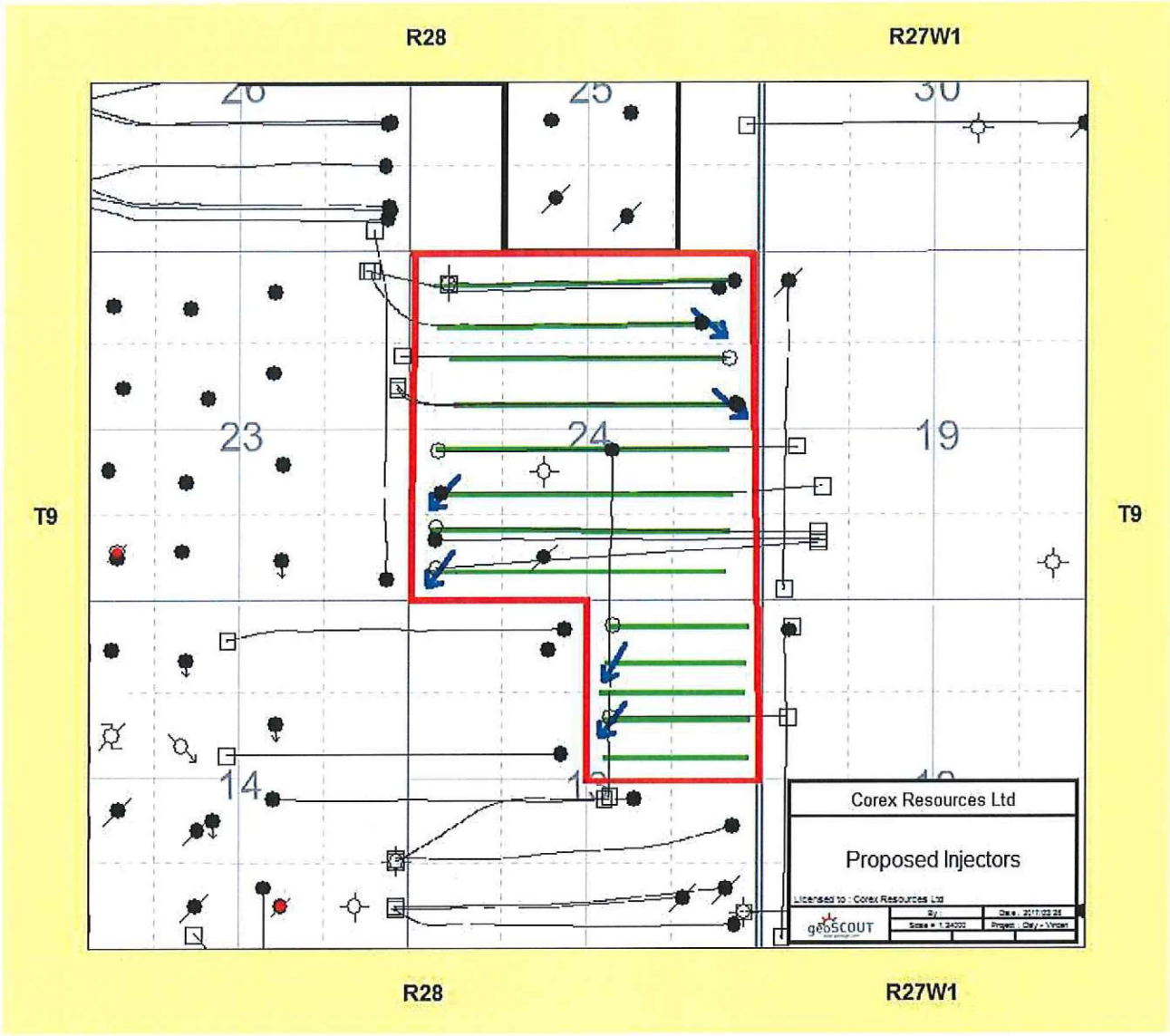


Figure 4 – Proposed Injector Locations

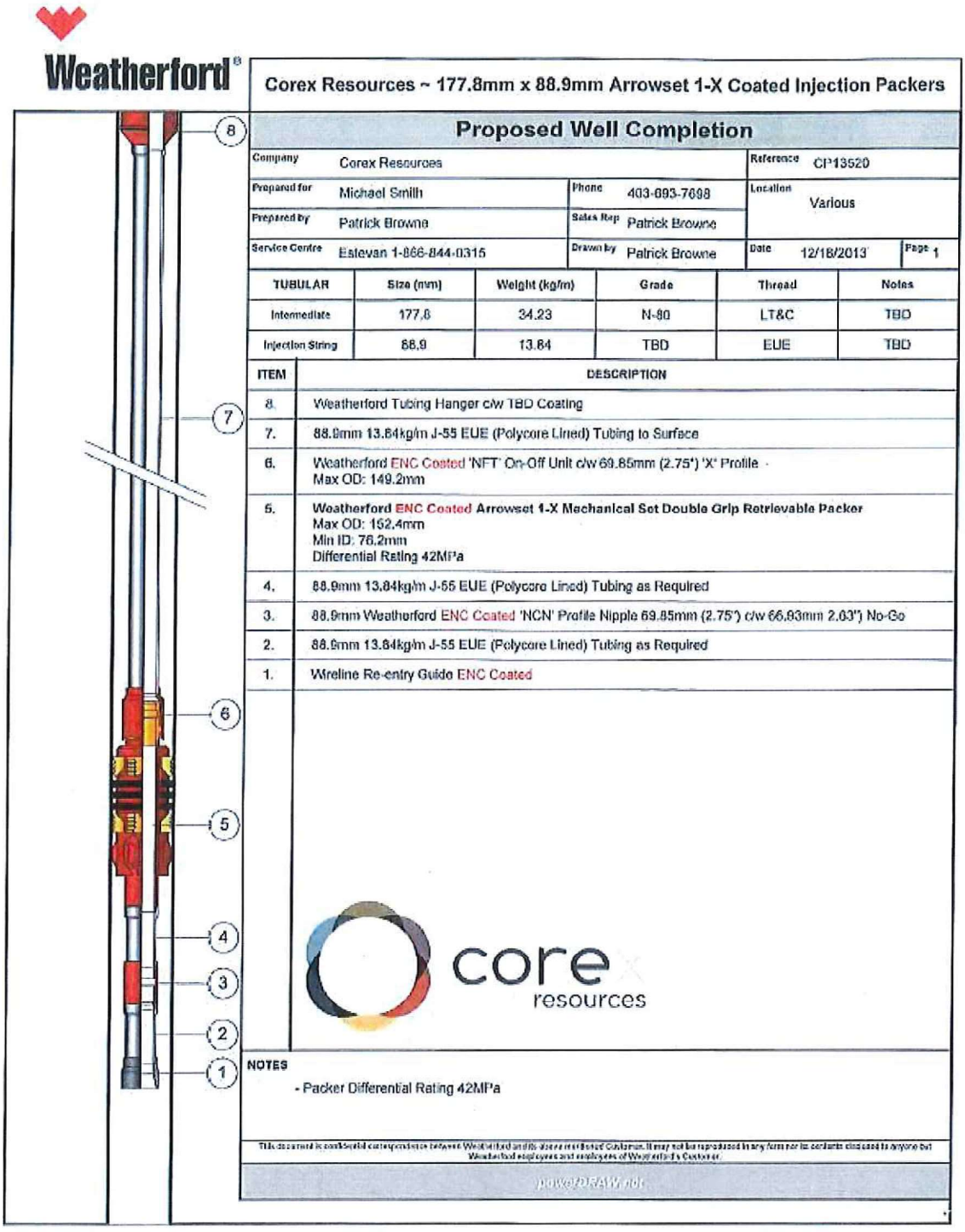


Figure 5 – Wellbore Schematic for Typical Injector

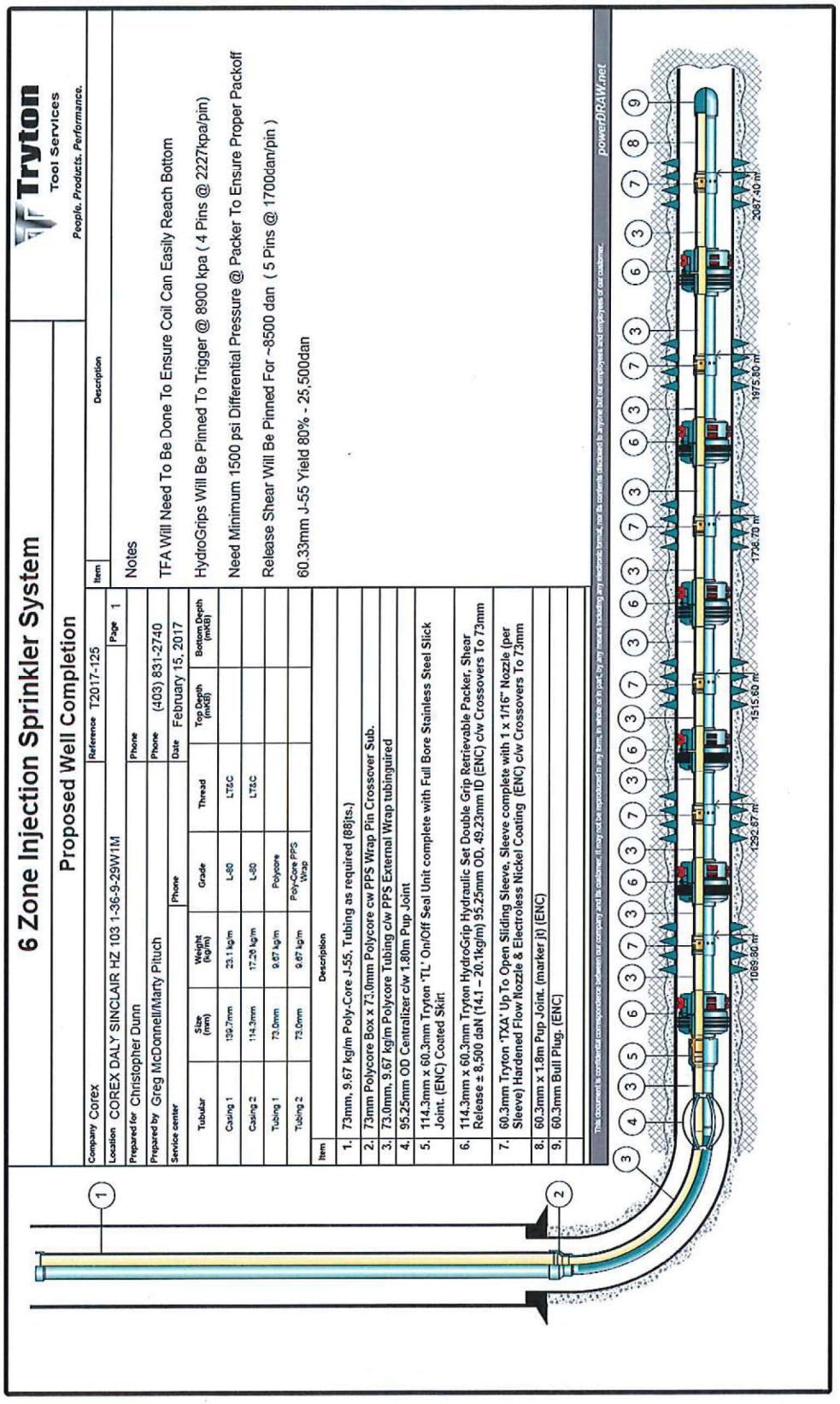


Figure 6 – Wellbore Schematic for Injector Nozzle System

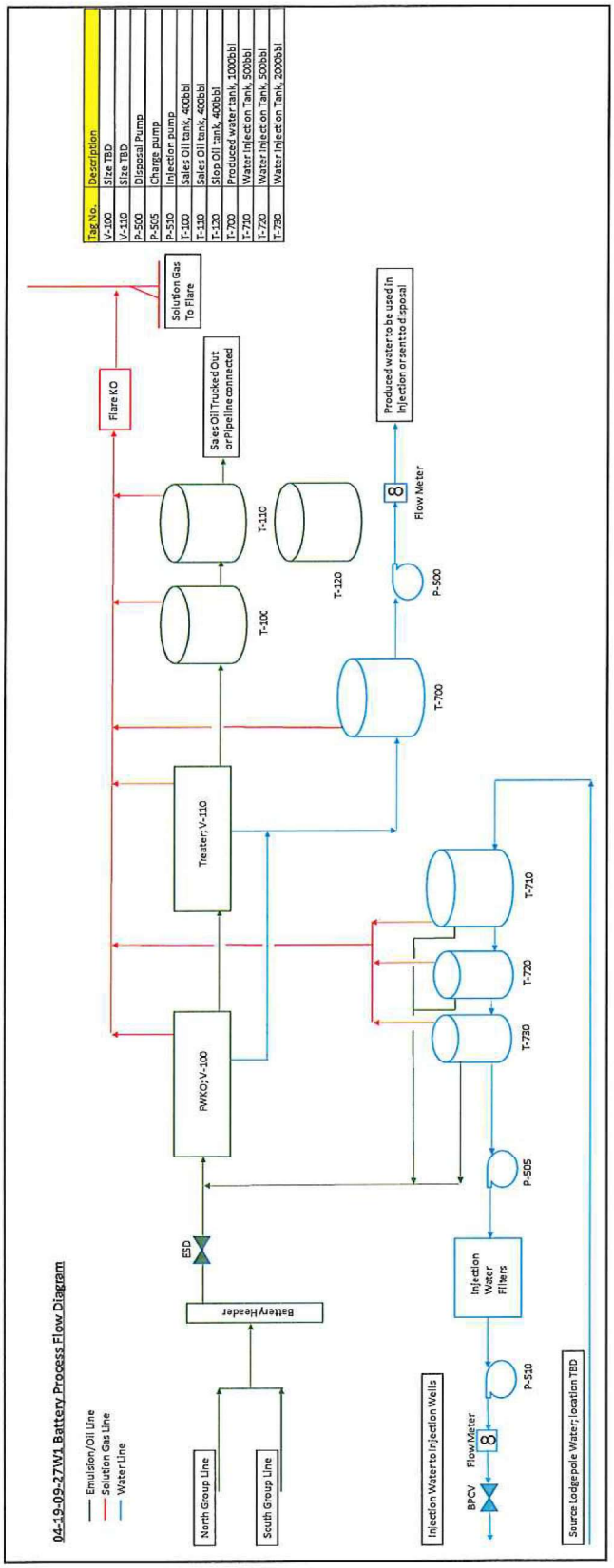


Figure 7 – Simplified Flow Diagram from Battery

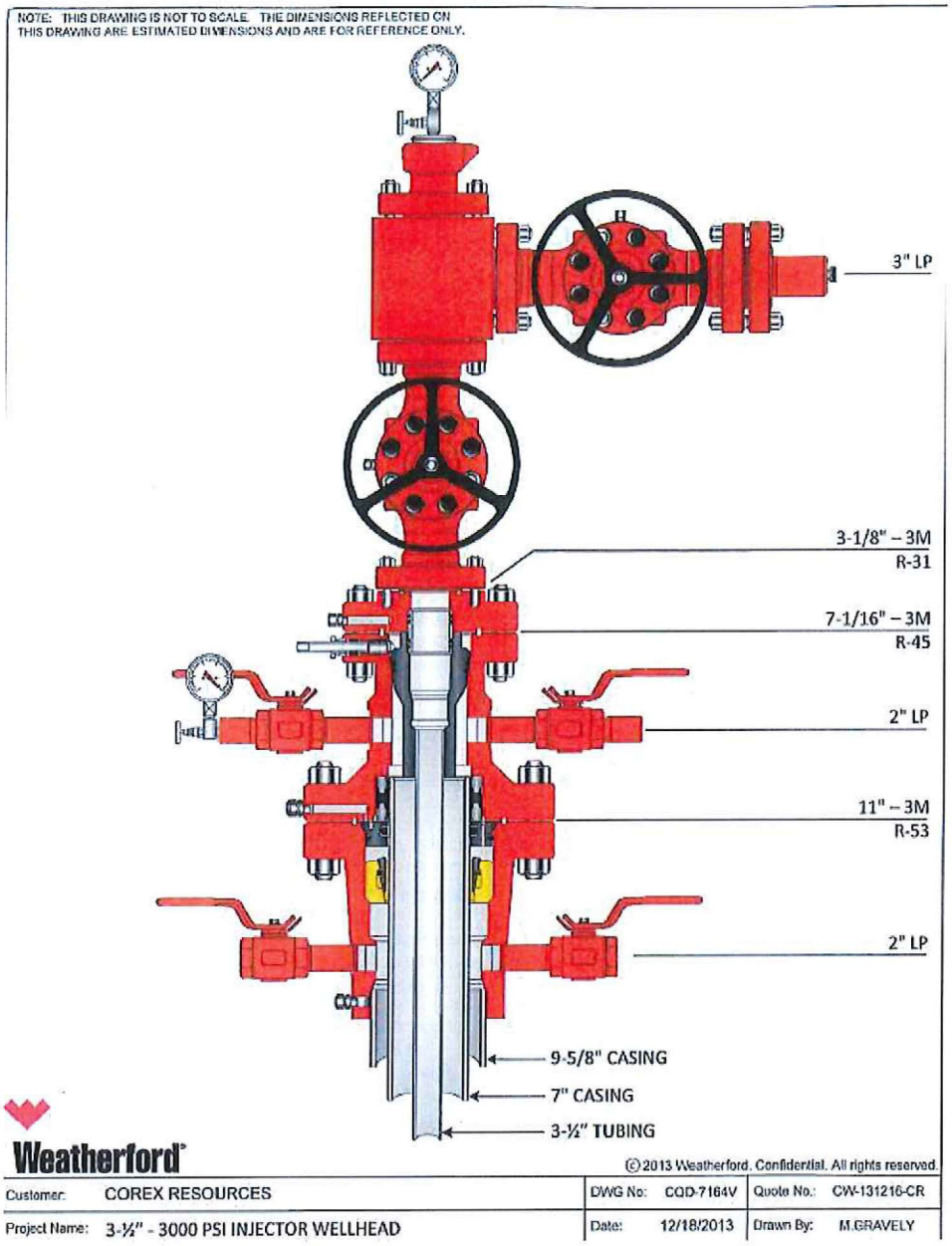
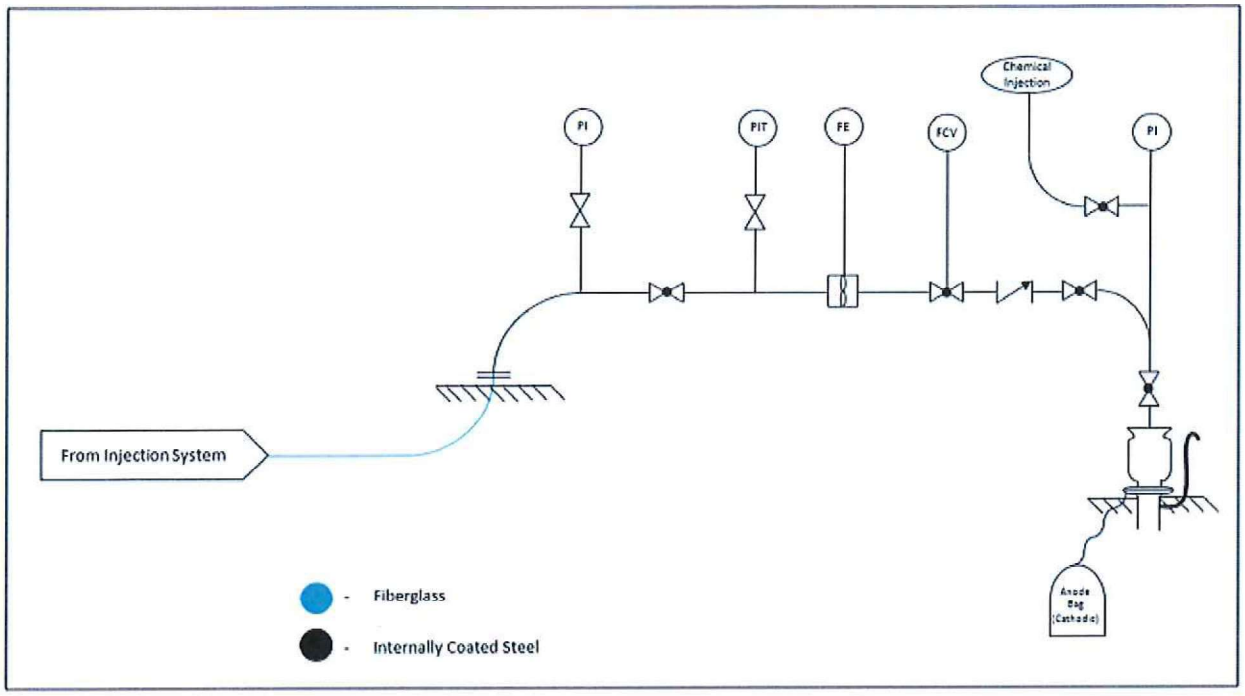


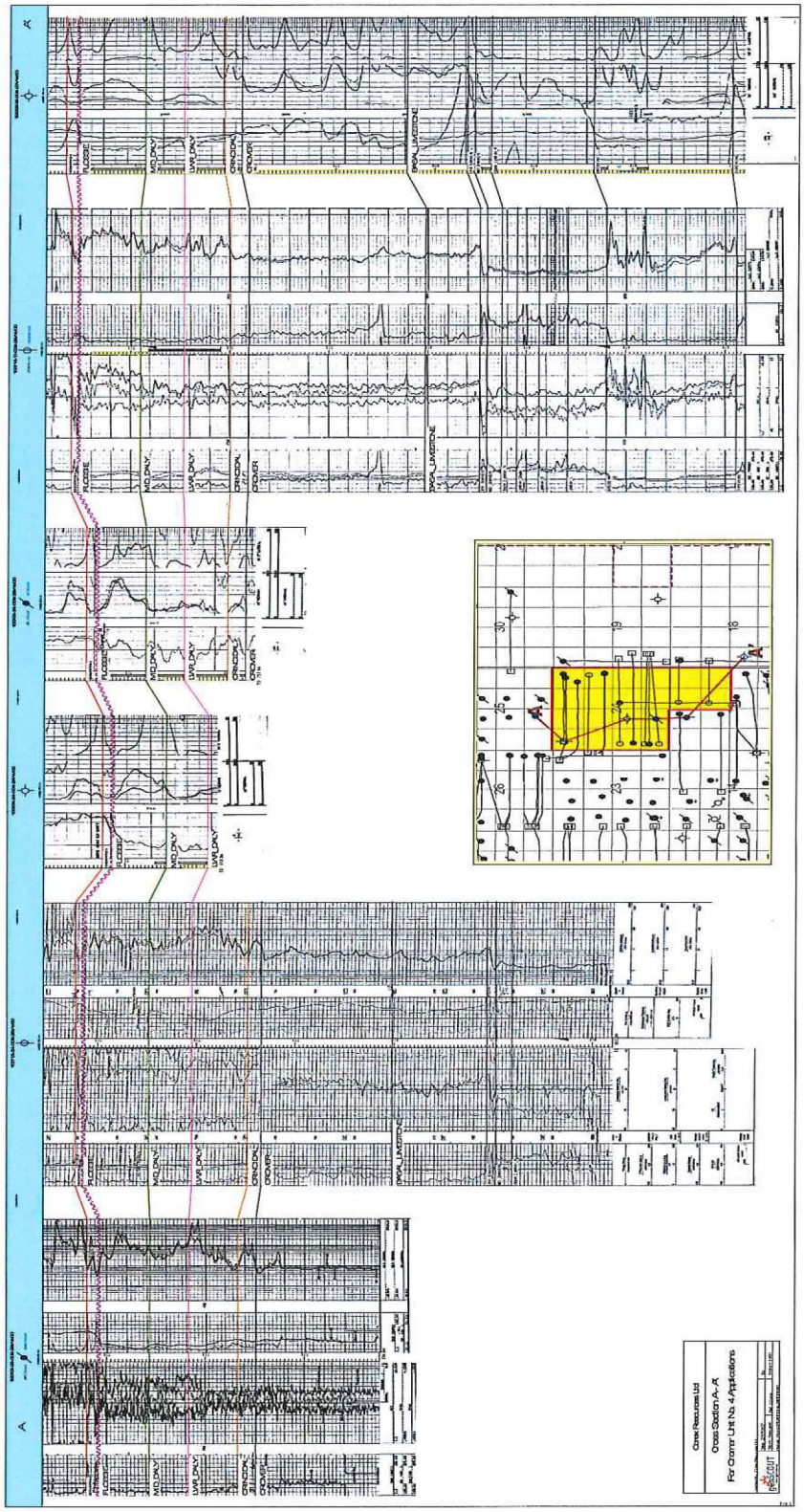
Figure 8 – Wellhead Design



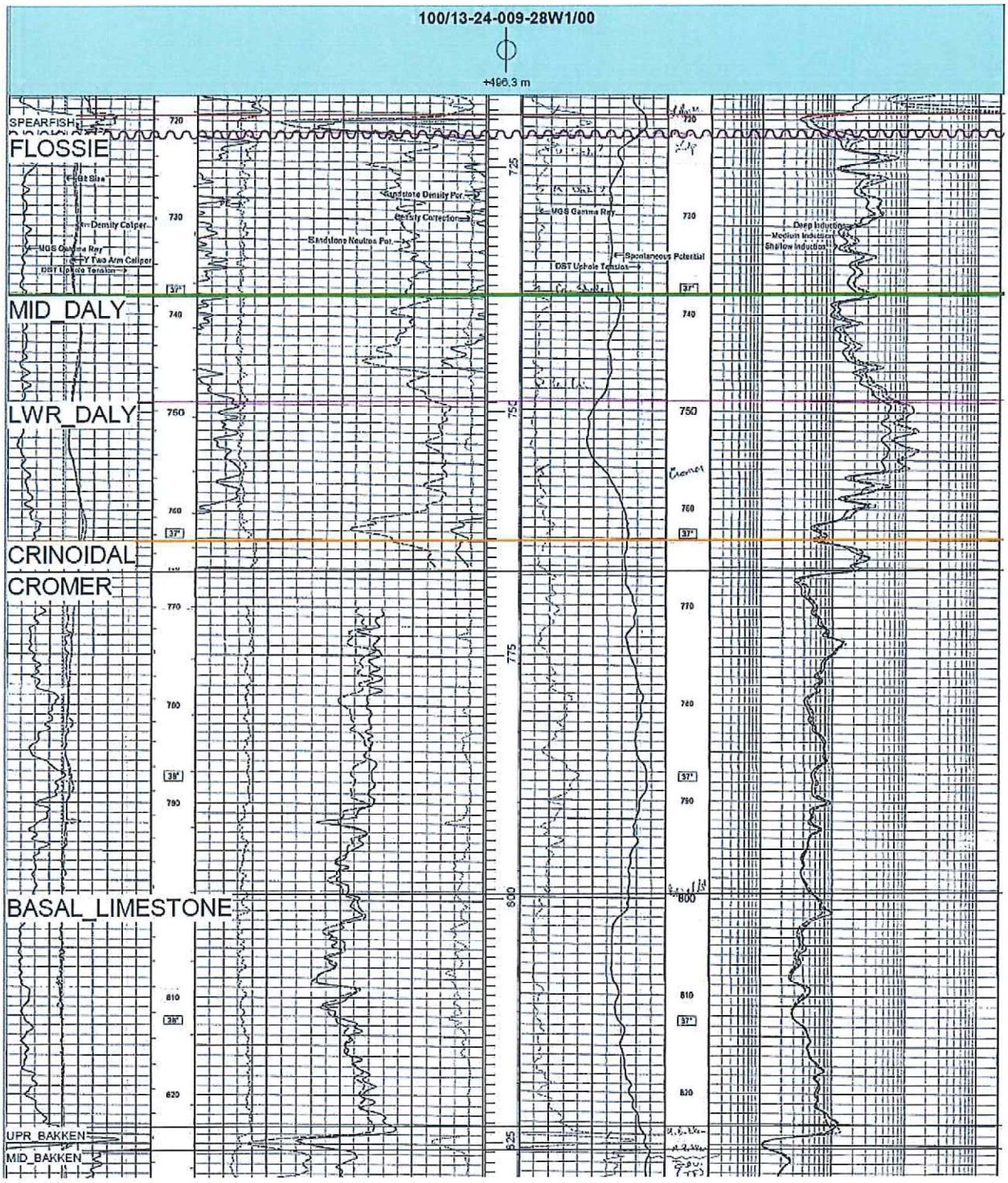
All injection pipelines will have corrosion inhibitor injected at the 04-19 facility, which will carry through to the wellhead for downhole corrosion control (wellhead injection points will be available as needed). Scale inhibitor will be injected in as well at the wellhead through continuous pumps as necessary. Both of these chemicals are also injected upstream at the producing source wells to protect the pipelines and the injection facilities at the battery. Wellbore casing will have cathodic protection installed for corrosion control. The PIT and FE on the diagram will be setup through a monitoring system in addition to one at the injection plant to monitor pipelines for any leaks through pressure and flow balance. Alarm points will be setup with callouts.

Figure 9 – Corrosion Control System & Monitoring

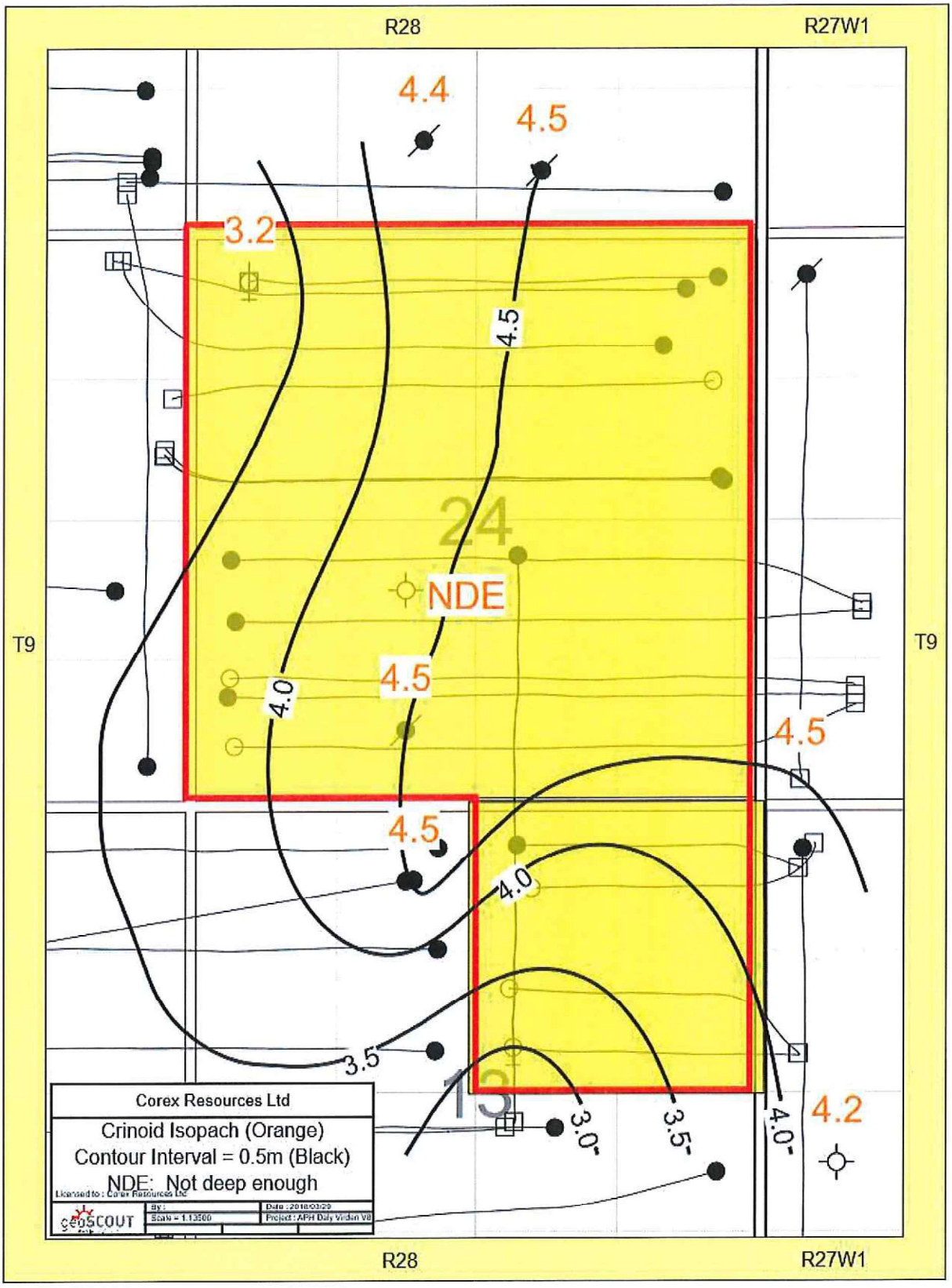
Appendix I – Stratigraphy of Lodgepole Formation-Cross Section



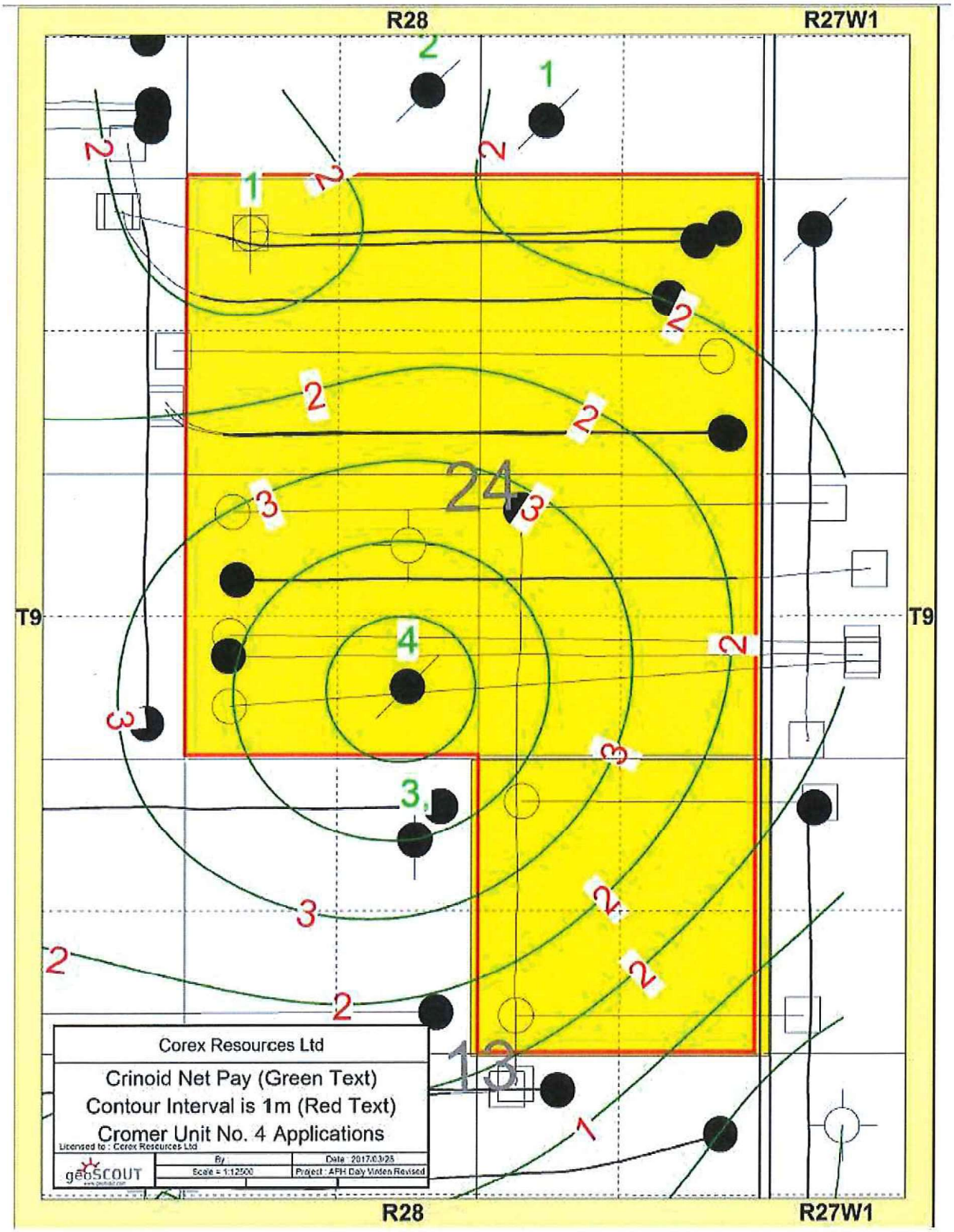
Stratigraphy of the Lodgepole Formation: Type Log



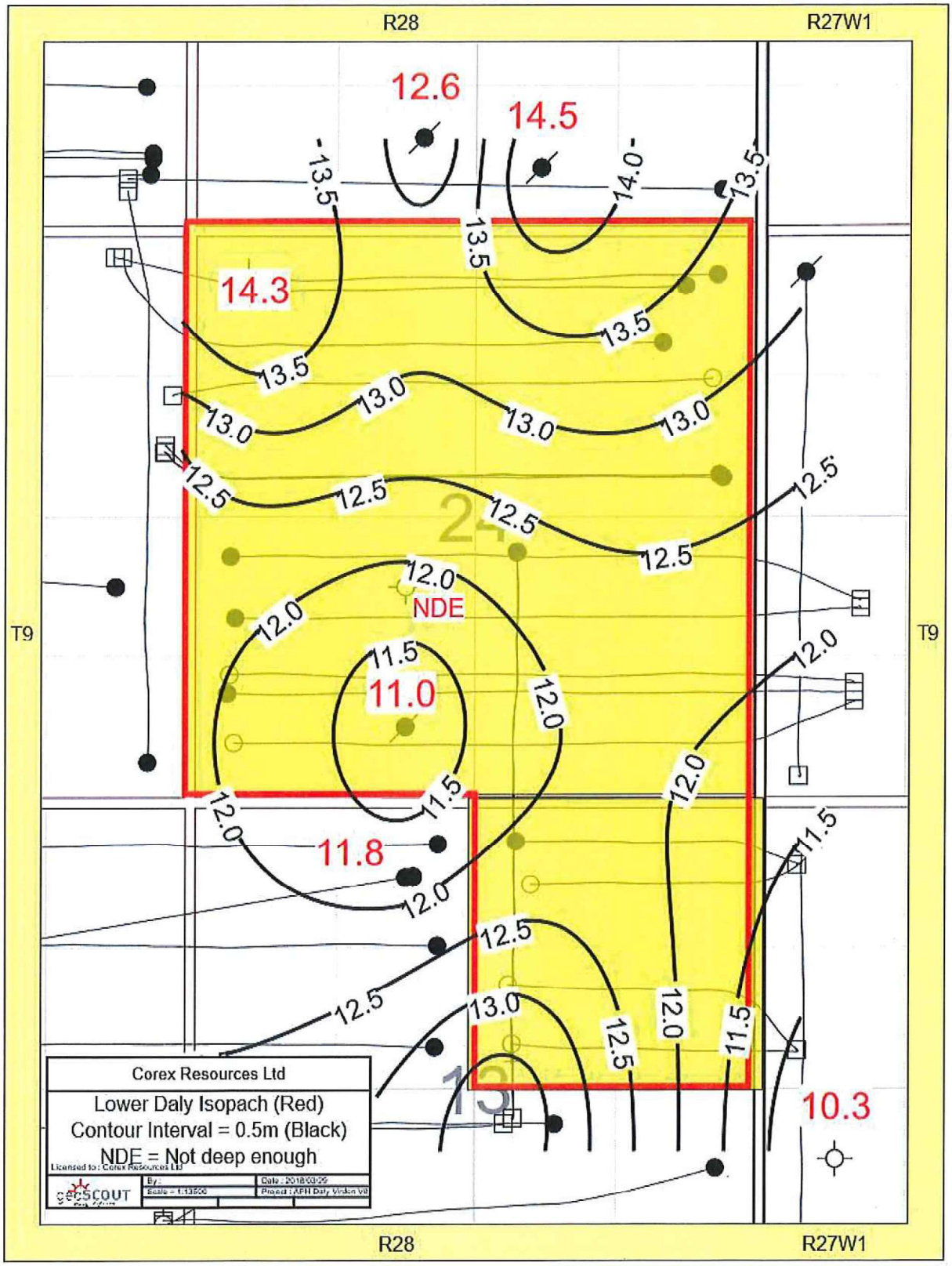
Appendix II – Crinoidal– Isopach



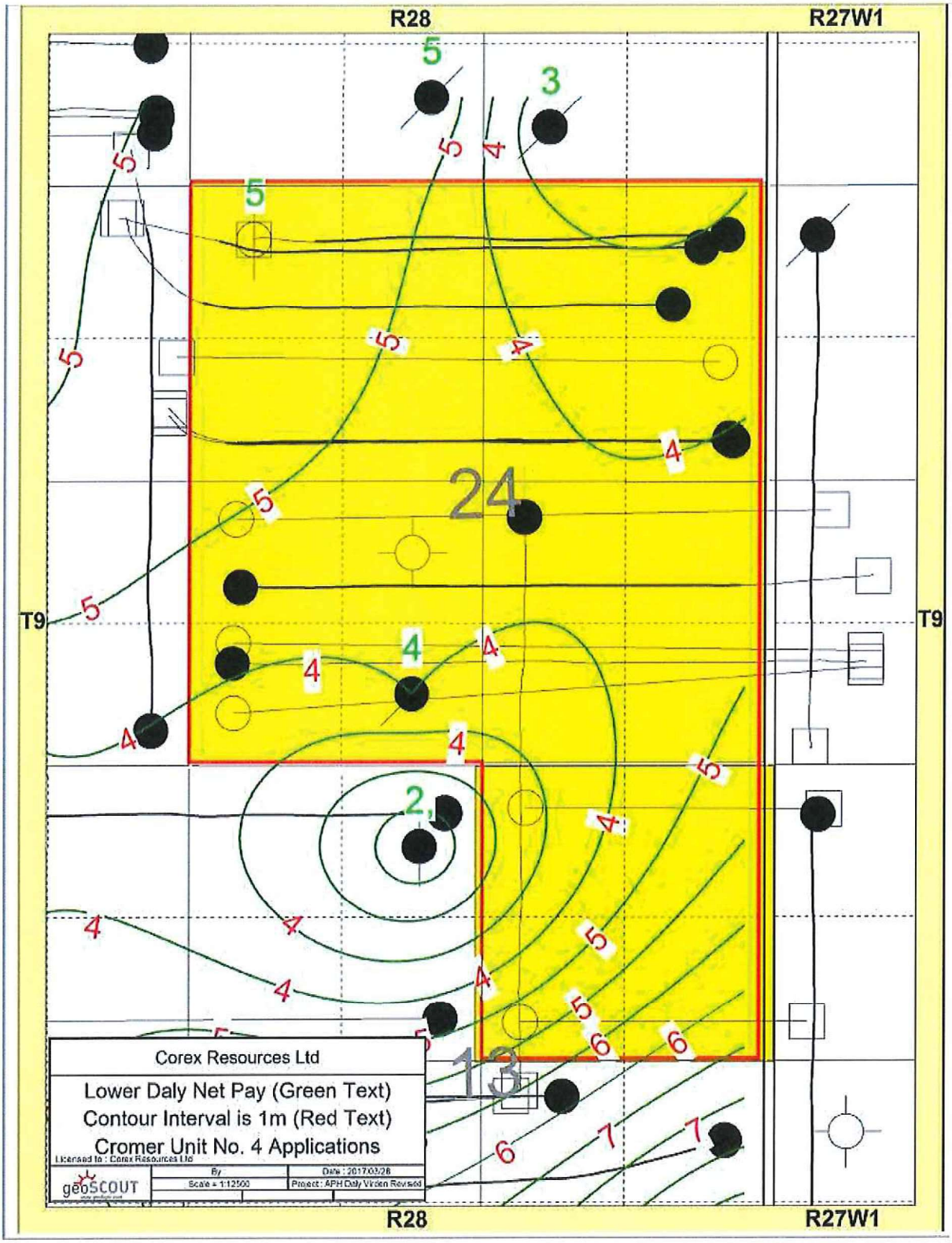
Appendix III – Crinoidal– Net Pay



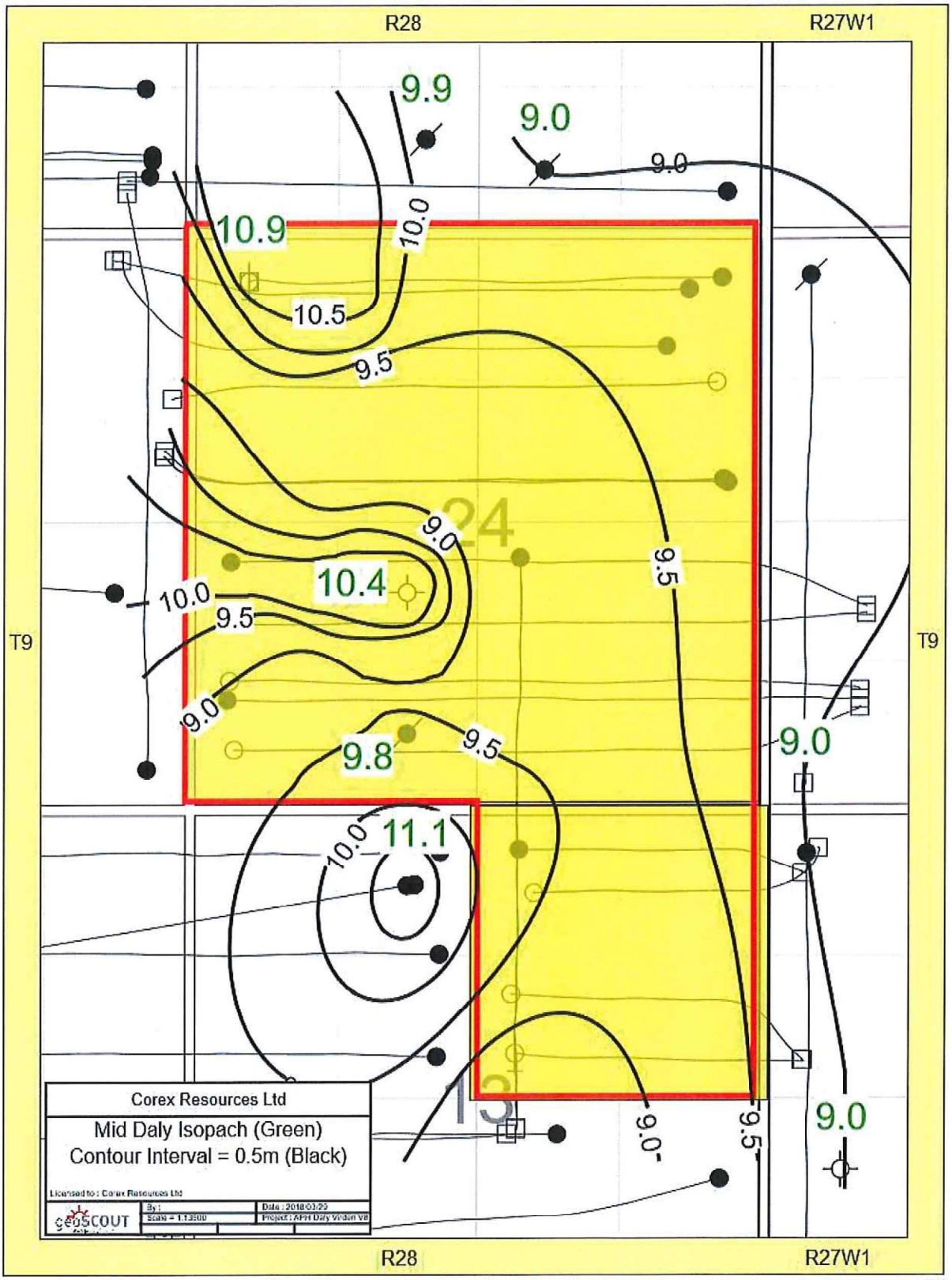
Appendix IV – Lower Daly – Isopach



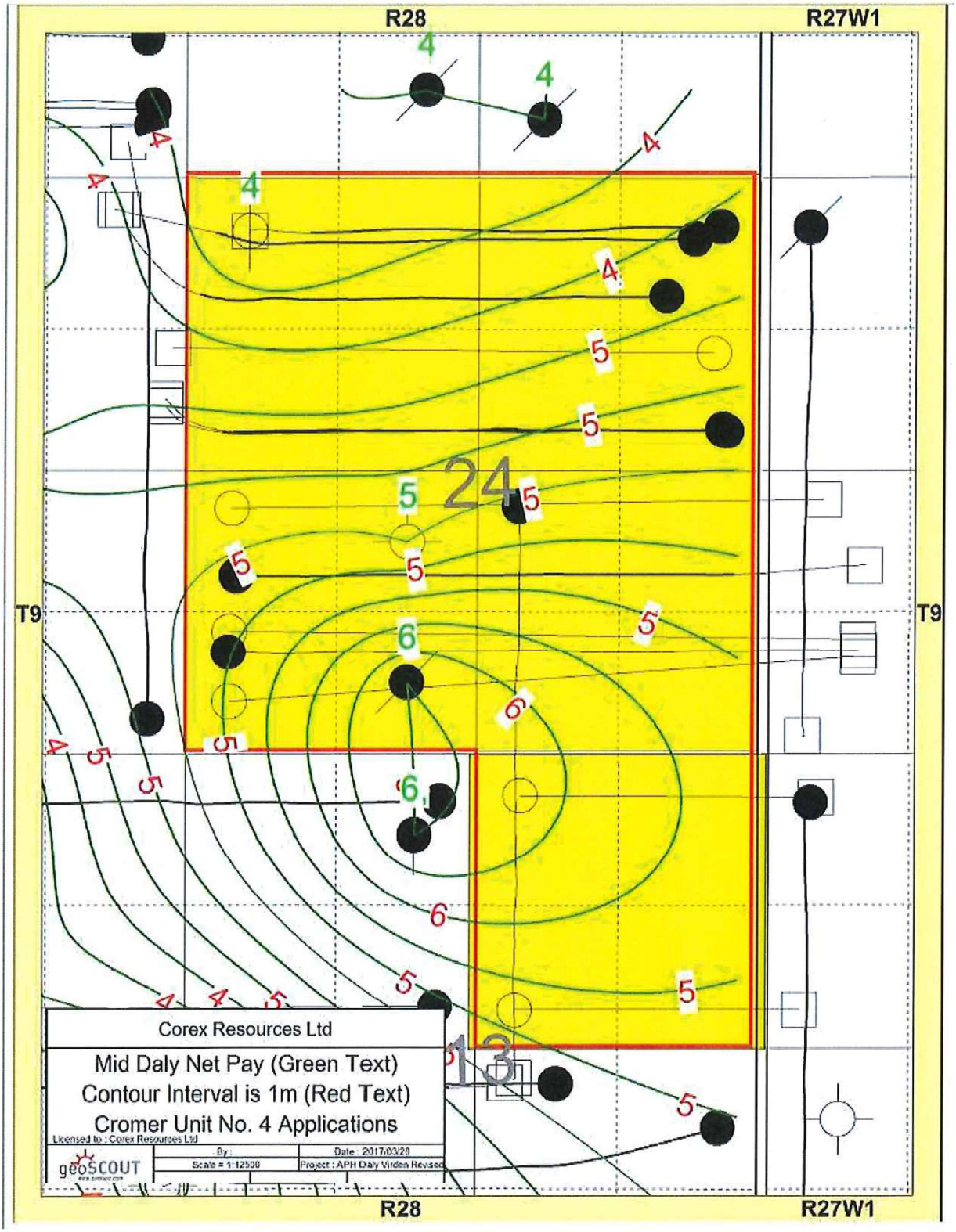
Appendix V – Lower Daly – Net Pay



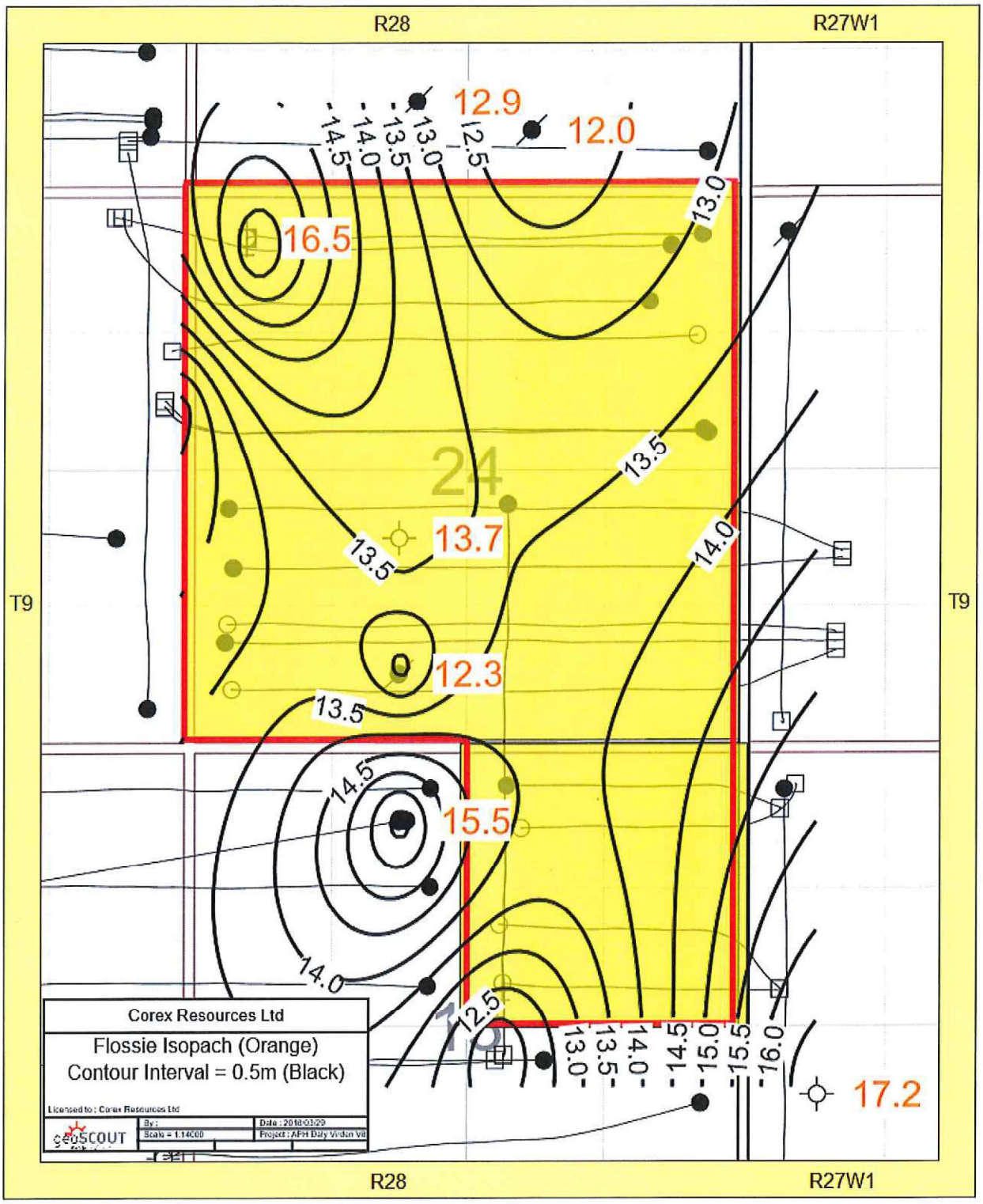
Appendix VI – Middle Daly – Isopach



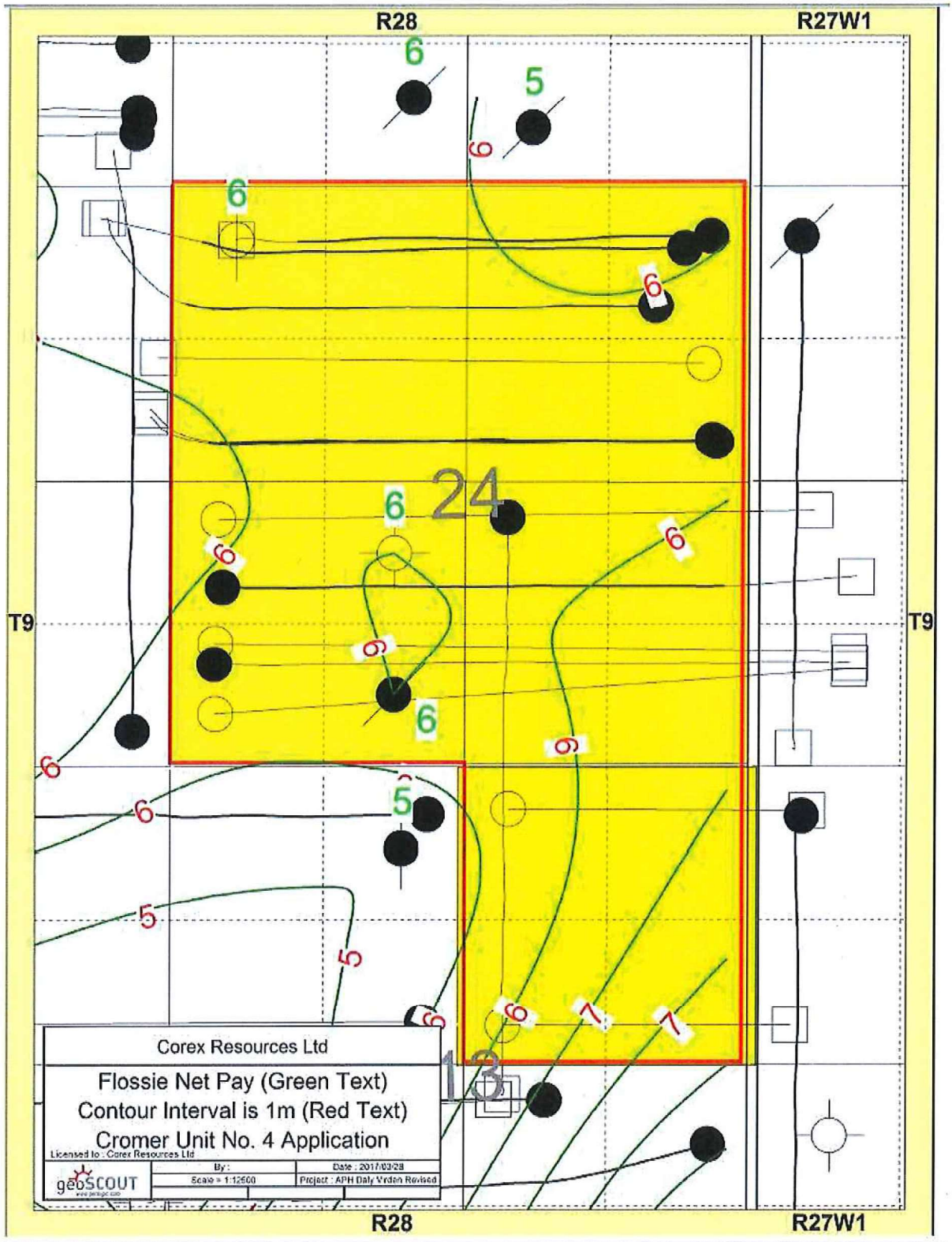
Appendix VII – Middle Daly – Net Pay



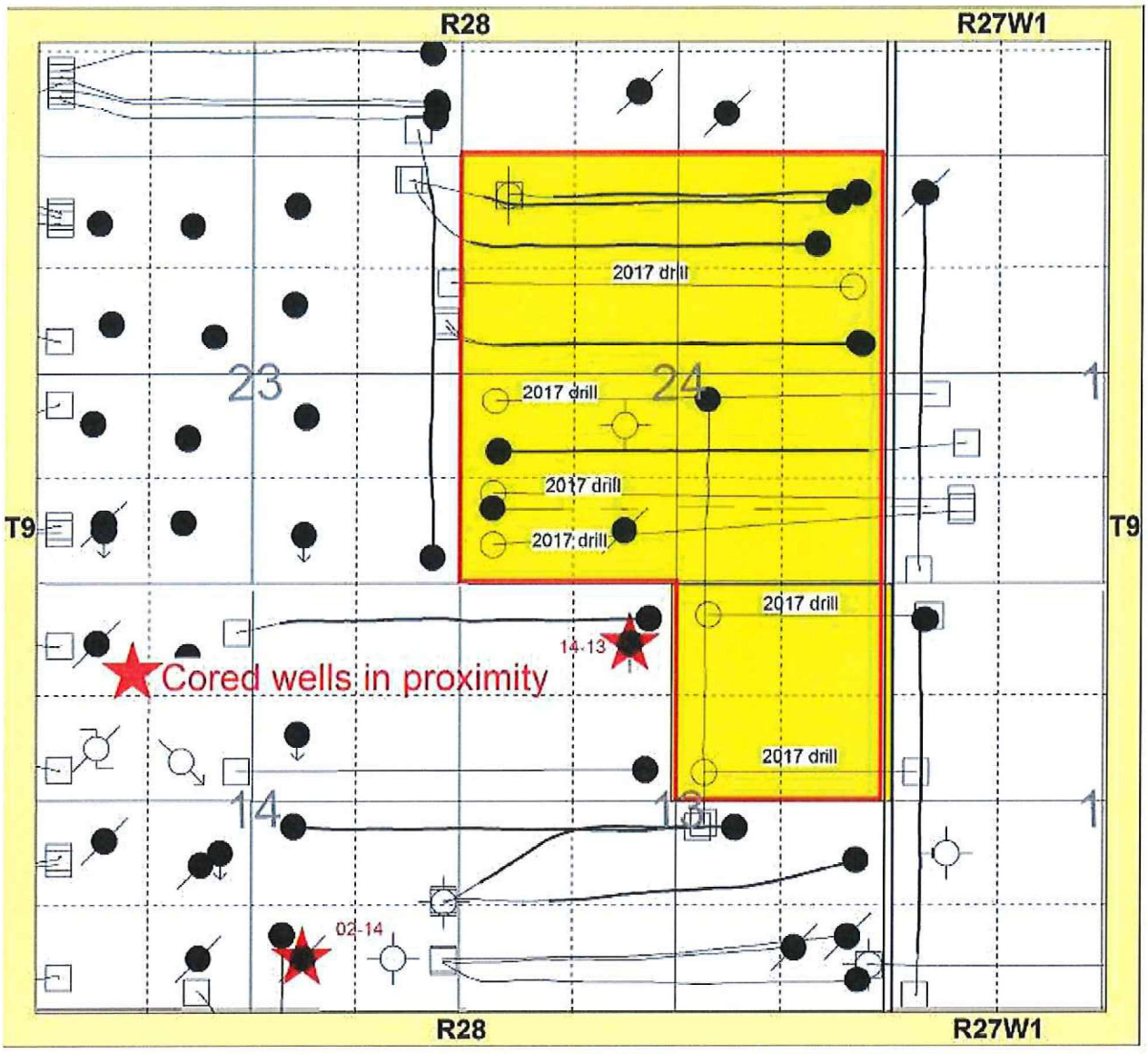
Appendix VIII – Flossie Lake – Isopach



Appendix IX – Flossie Lake – Net Pay



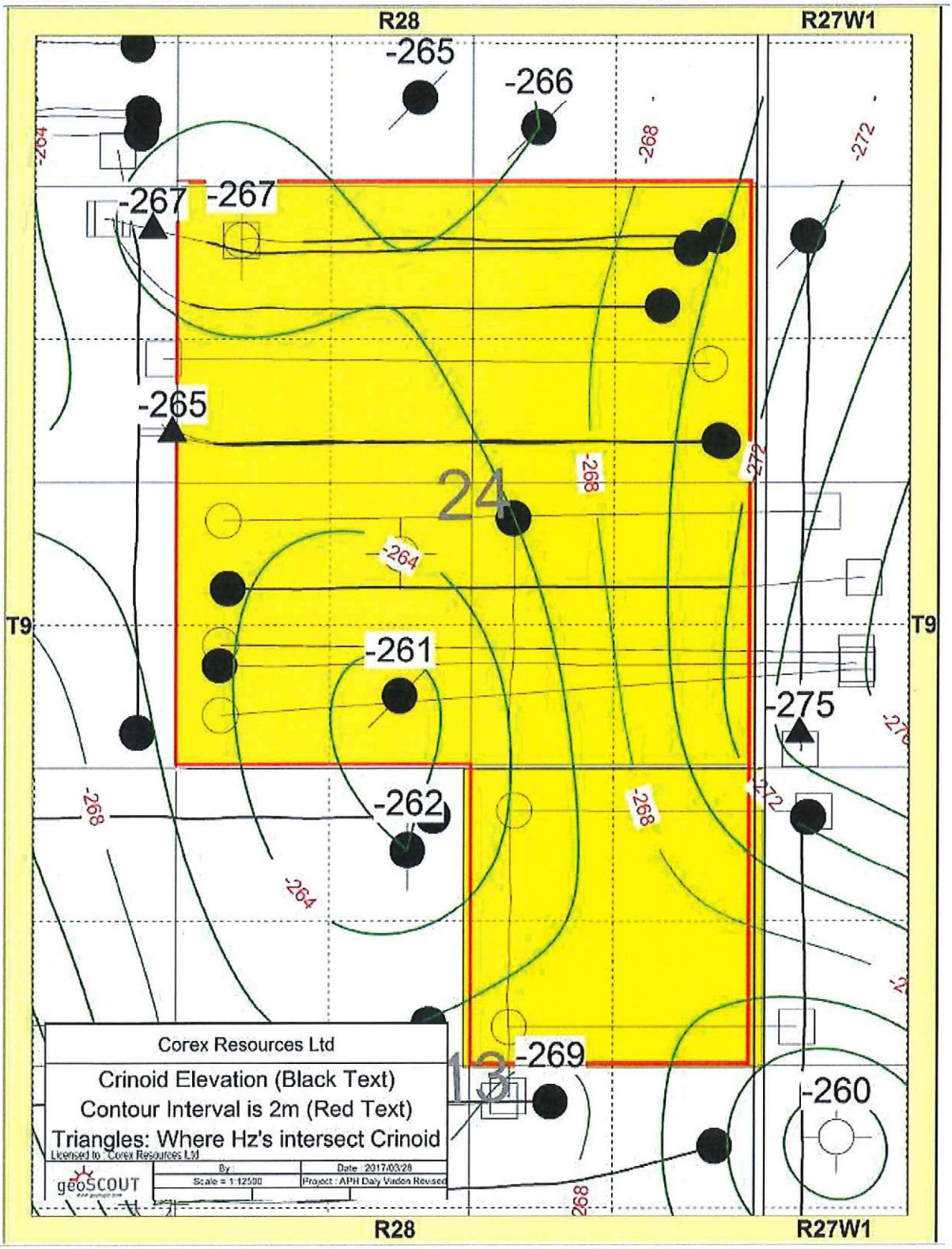
Appendix X – Cored Wells



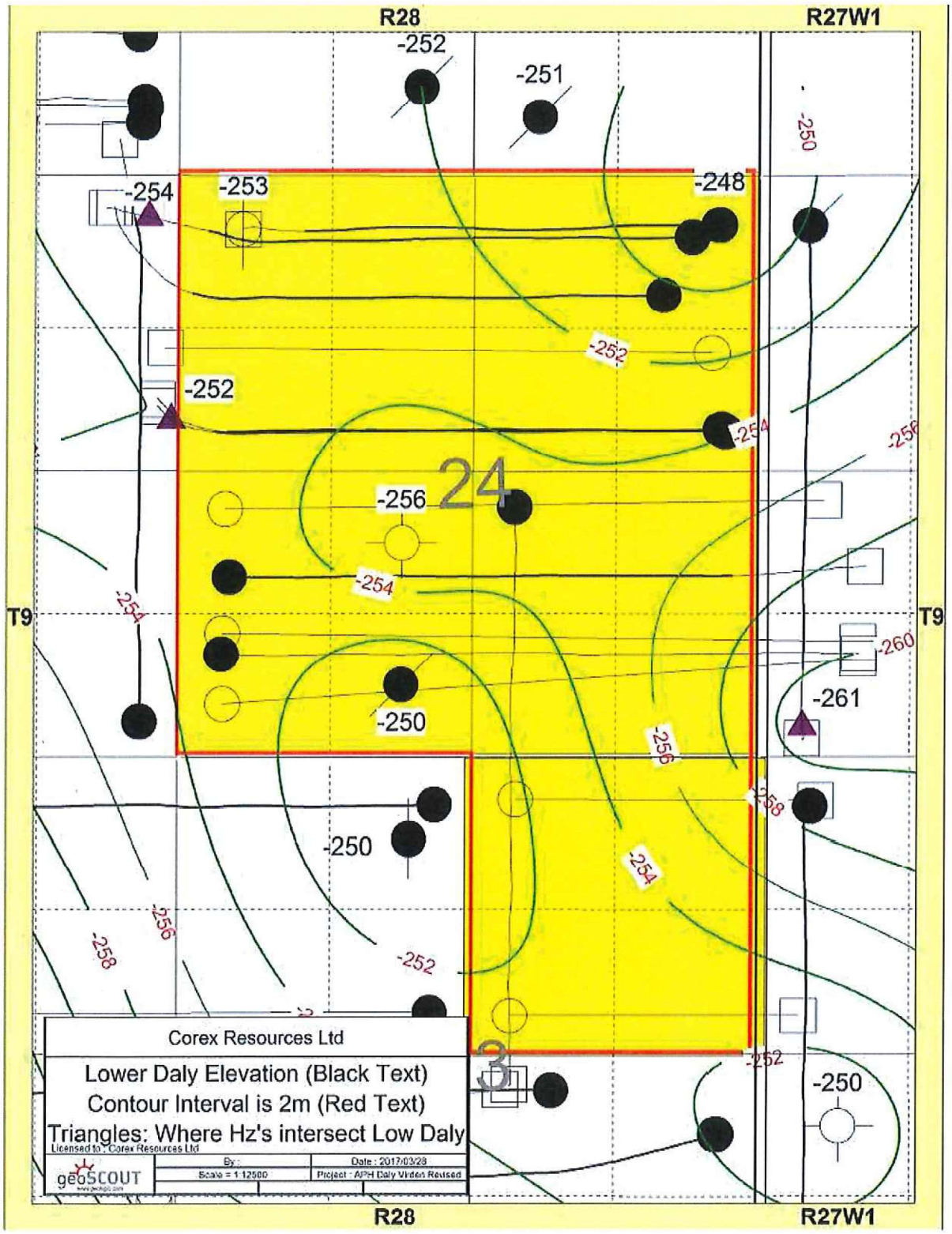
Appendix XI –Proximal Cored Wells Phih and mDm Using 6% Core Porosity Cutoff

100/14-13-09-28W1							100/02-14-09-28W1					
Depth	Length	Kmax	Porosity	Description	Formation		Depth	Length	Kmax	Porosity	Description	Formation
730.9	0.4	0.95	0.074	ls,lntgran,hfrac	MID_DALY		758.95	0.6	1	0.12	lntgran,frac	MID_DALY
731.3	0.59	0.18	0.07	ls,lntgran	MID_DALY		762.03	0.06	1	0.12	lntgran,frac	MID_DALY
732.27	0.13	1.38	0.069	ls,lntgran	MID_DALY		762.57	0.18	0.73	0.065	ppv,lntgran	MID_DALY
732.4	0.15	1.35	0.106	ls,lntgran	MID_DALY			0.84	0.942142857	0.108214286		
732.99	0.06	0.56	0.086	ls,lntgran	MID_DALY			0.7914	mDm			
733.23	0.15	0.94	0.09	ls,lntgran	MID_DALY			0.0909	Phih			
733.38	0.18	0.24	0.084	ls,lntgran	MID_DALY							
733.56	0.2	0.5	0.067	ls,lntgran,ppv,sv	MID_DALY		764.4	0.48	1.6	0.067	lntgran,frac	LWR_DALY
733.83	0.2	0.57	0.082	ls,lntgran	MID_DALY		764.89	0.54	1.6	0.071	lntgran	LWR_DALY
734.03	0.24	1.05	0.074	ls,lntgran,anhy,vfrac	MID_DALY		765.62	0.57	1	0.064	lntgran	LWR_DALY
734.27	0.19	0.44	0.083	ls,lntgran	MID_DALY		766.2	0.39	11	0.087	lntgran,frac	LWR_DALY
734.46	0.18	0.32	0.072	ls,lntgran	MID_DALY		769.01	0.18	1.4	0.079	lntgran	LWR_DALY
734.64	0.26	0.89	0.102	ls,lntgran,hfrac	MID_DALY		769.19	0.48	3.2	0.143	ppv,lntgran	LWR_DALY
734.9	0.31	0.88	0.076	ls,lntgran,ppv,hfrac	MID_DALY		769.68	0.45	3.4	0.155	ppv,lntgran	LWR_DALY
735.21	0.17	0.61	0.088	ls,lntgran,ppv	MID_DALY		770.13	0.54	1.5	0.084	lntgran	LWR_DALY
735.38	0.19	0.62	0.105	ls,lntgran,hfrac	MID_DALY		770.68	0.15	2.3	0.082	ppv,frac,lntgran	LWR_DALY
735.57	0.17	1.02	0.095	ls,lntgran,ppv,hfrac	MID_DALY		771.02	0.24	9.1	0.069	ppv,frac,lntgran	LWR_DALY
735.91	0.21	2.73	0.104	ls,lntgran,ppv	MID_DALY		771.93	0.15	2	0.064	lntgran,ppv,frac	LWR_DALY
736.16	0.28	8.23	0.102	ls,lntgran,hfrac	MID_DALY		772.6	0.12	0.94	0.094	ppv,lntgran	LWR_DALY
736.44	0.27	3.57	0.123	ls,lntgran,ppv	MID_DALY		773.33	0.06	0.94	0.094	ppv,lntgran	LWR_DALY
736.71	0.23	0.61	0.1	ls,lntgran,vfrac	MID_DALY		774.25	0.09	0.64	0.08	ppv,lntgran	LWR_DALY
736.94	0.1	0.23	0.078	ls,lntgran,vfrac	MID_DALY		774.64	0.24	5.8	0.072	ppv,lntgran,frac	LWR_DALY
737.04	0.23	0.34	0.077	ls,lntgran,hfrac	MID_DALY		775.38	0.06	1.6	0.083	lntgran,ppv	LWR_DALY
737.27	0.25	0.25	0.076	ls,lntgran,ppv,hfrac	MID_DALY		775.5	0.15	1.6	0.083	lntgran,ppv	LWR_DALY
737.52	0.13	0.15	0.078	ls,lntgran,hfrac	MID_DALY		776.02	0.42	1	0.093	lntgran,ppv	LWR_DALY
737.75	0.19	0.11	0.082	ls,lntgran,ppv	MID_DALY			5.31	2.98	0.089497175		
738.11	0.23	2.6	0.098	ls,lntgran,ppv	MID_DALY			15.8238	mDm			
738.34	0.24	0.8	0.071	ls,lntgran,ppv	MID_DALY			0.47523	Phih			
	6.13	1.234616639	0.085383361									
	7.5682	mDm					777.42	0.27	0.74	0.063	lntgran,ppv	CRINOIDAL
	0.5234	Phih					779.31	0.51	61	0.072	lntgran,frac	CRINOIDAL
							779.83	0.24	503	0.117	lntgran,sv	CRINOIDAL
							780.07	0.21	146	0.119	sv,lntgran	CRINOIDAL
741.62	0.28	1.79	0.065	ls,lntgran,ppv,frac	LWR_DALY			1.23	148.5282927	0.086829268		
741.91	0.4	0.2	0.093	ls,lntgran,ppv	LWR_DALY			182.6898	mDm			
742.31	0.15	0.21	0.059	ls,lntgran,ppv	LWR_DALY			0.1068	Phih			
742.78	0.3	0.27	0.088	ls,lntgran,ppv	LWR_DALY							
744.08	0.39	0.32	0.074	ls,lntgran,ppv	LWR_DALY							
744.79	0.1	0.03	0.066	ls,lntgran	LWR_DALY							
744.89	0.28	0.32	0.101	ls,lntgran	LWR_DALY							
	1.9	0.479526316	0.081257895									
	0.9111	mDm										
	0.15439	Phih										

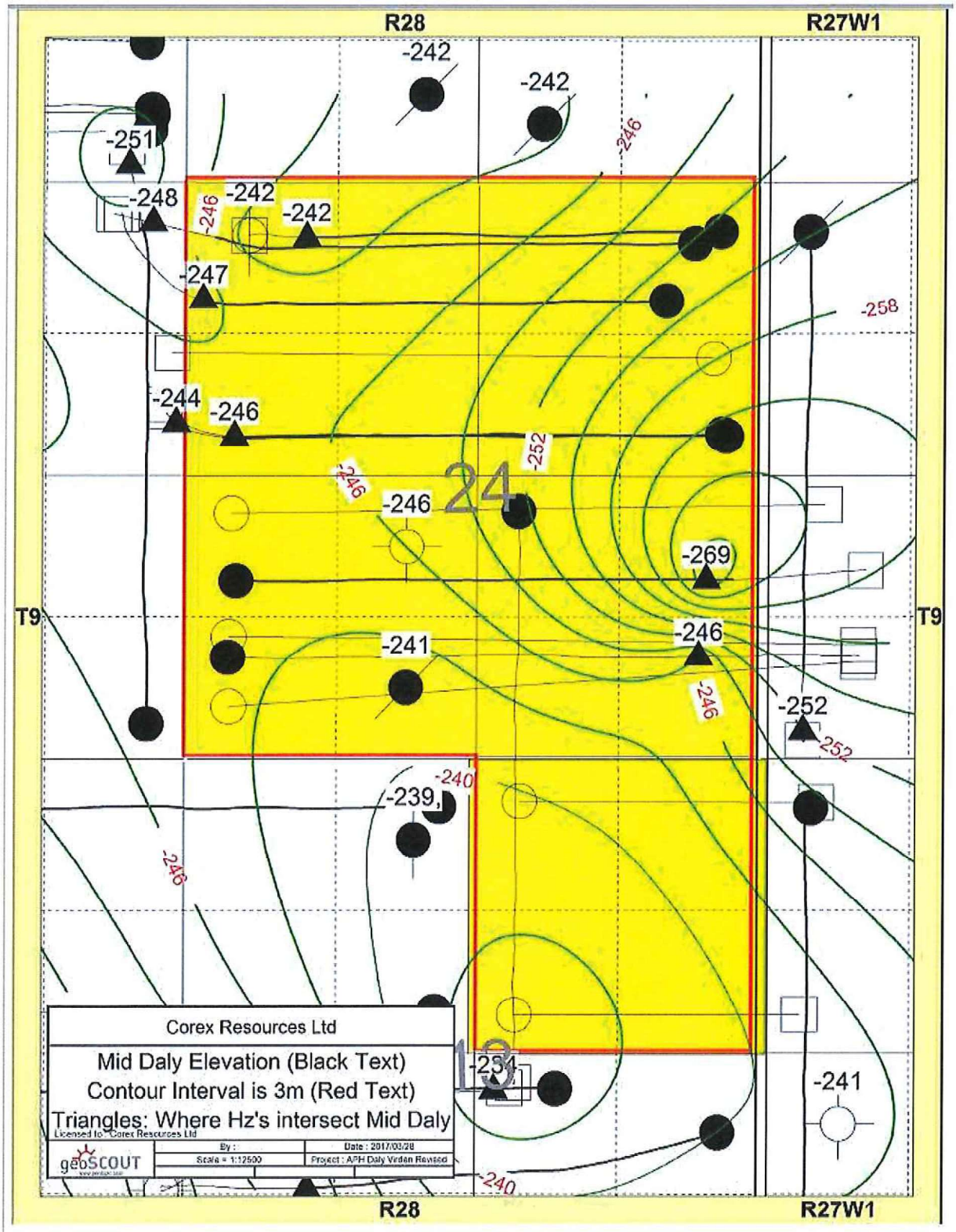
Appendix XII – Crinoidal – Top of Structure



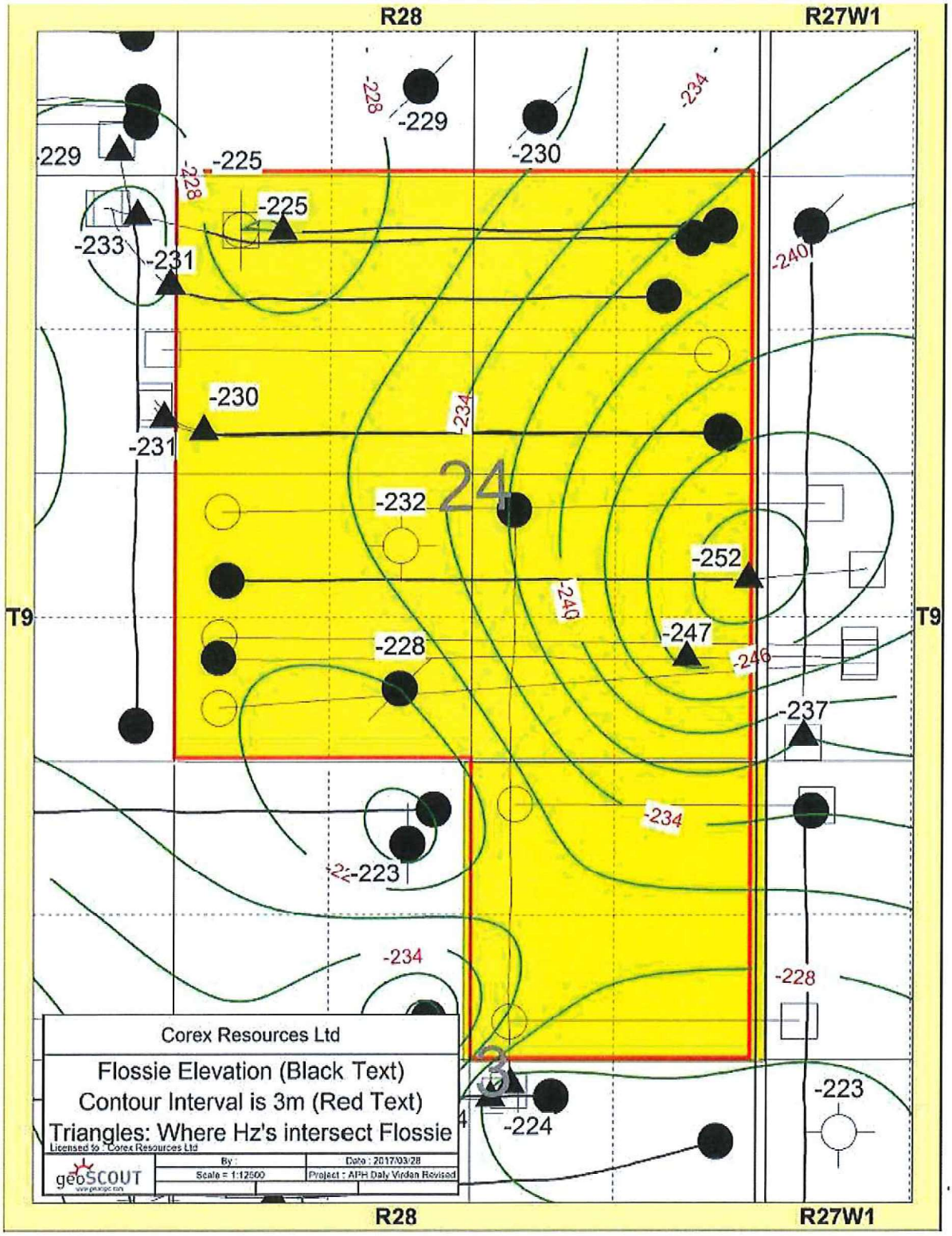
Appendix XIII – Lower Daly – Top of Structure



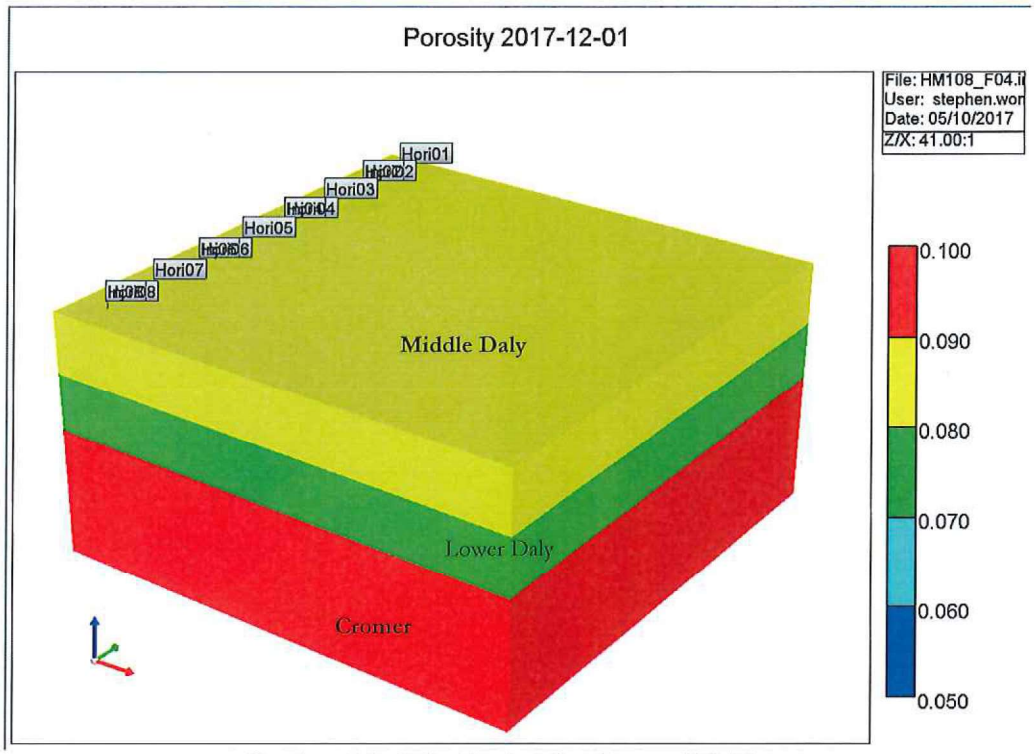
Appendix XIV – Middle Daly – Top of Structure



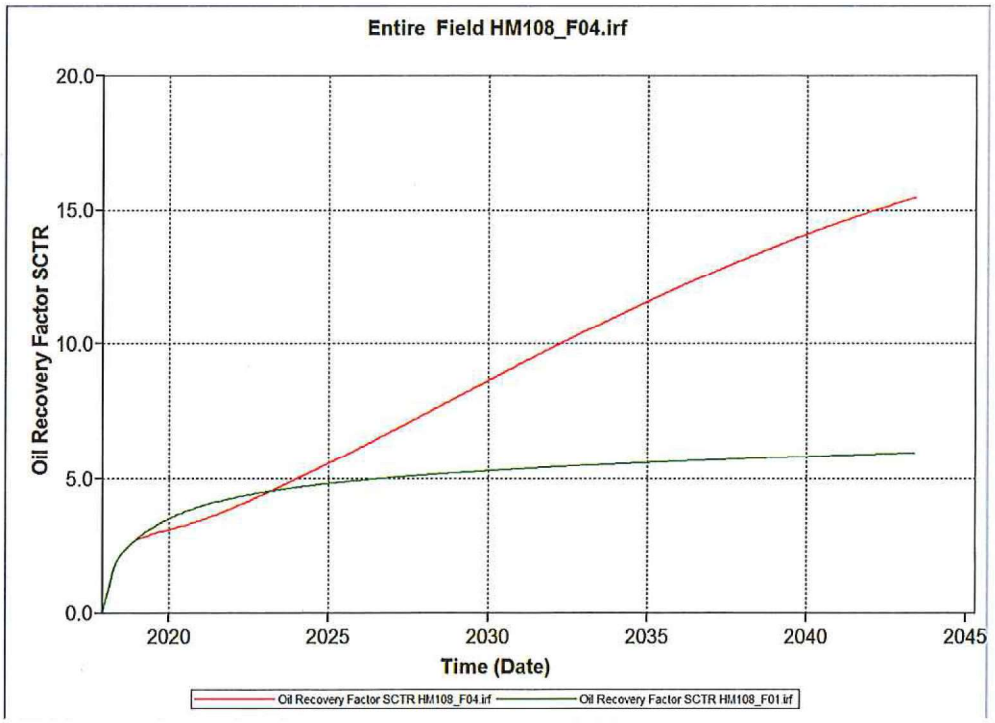
Appendix XV – Flossie Lake – Top of Structure



Appendix XVI – Daly Members – Section Model



Section Model – Daly Members– 3D View



Section Model – Daly Members – Primary and Secondary Forecast – Oil Recovery Factor versus Time