SURPRISE-1 Re-Entry

WELL COMPLETION REPORT
(Basic)

EP 115
Amadeus Basin
Northern Territory

11th Nov. – 20th Dec. 2011

Central Petroleum Limited

Well Name:	Surprise-1 Re-Entry
Well Classification:	Exploration
Interest Holders:	Central Petroleum Limited (Operator - 100%)
Petroleum License:	EP 115, Northern Territory
Location:	Northing: 7377073m Easting: 601261m Latitude: 23º 42' 50.758S" South Longitude: 129º 59' 36.091"E East Australian Map Grid Zone : GDA 94, Zone 52
Ground Level (GL):	545m ASL
Kelly Bushing (KB):	548.7m ASL - Datum
Total Depth (KB):	2732m MD RKB
Drilling Contractor:	Hunt Energy
Drilling Rig:	Hunt Rig 3 (See Rig Specifications in Appendix 9)
Contractors:	Drilling Fluids: Australian Mud Company Mud Logging: Geoservices Wireline Logging: Schlumberger Cementing: Trican Casing: Premium Casing Services MWD: PathFinder Schlumberger Directional Drillers: Pathfinder Schlumberger
Spud Date:	19th November 2011
Total Depth Reached:	30th November 2011
Rig Released:	20th December 2011
Well Status:	Cased/Plugged and Side-tracked.

Table of Contents

Tables

Figures

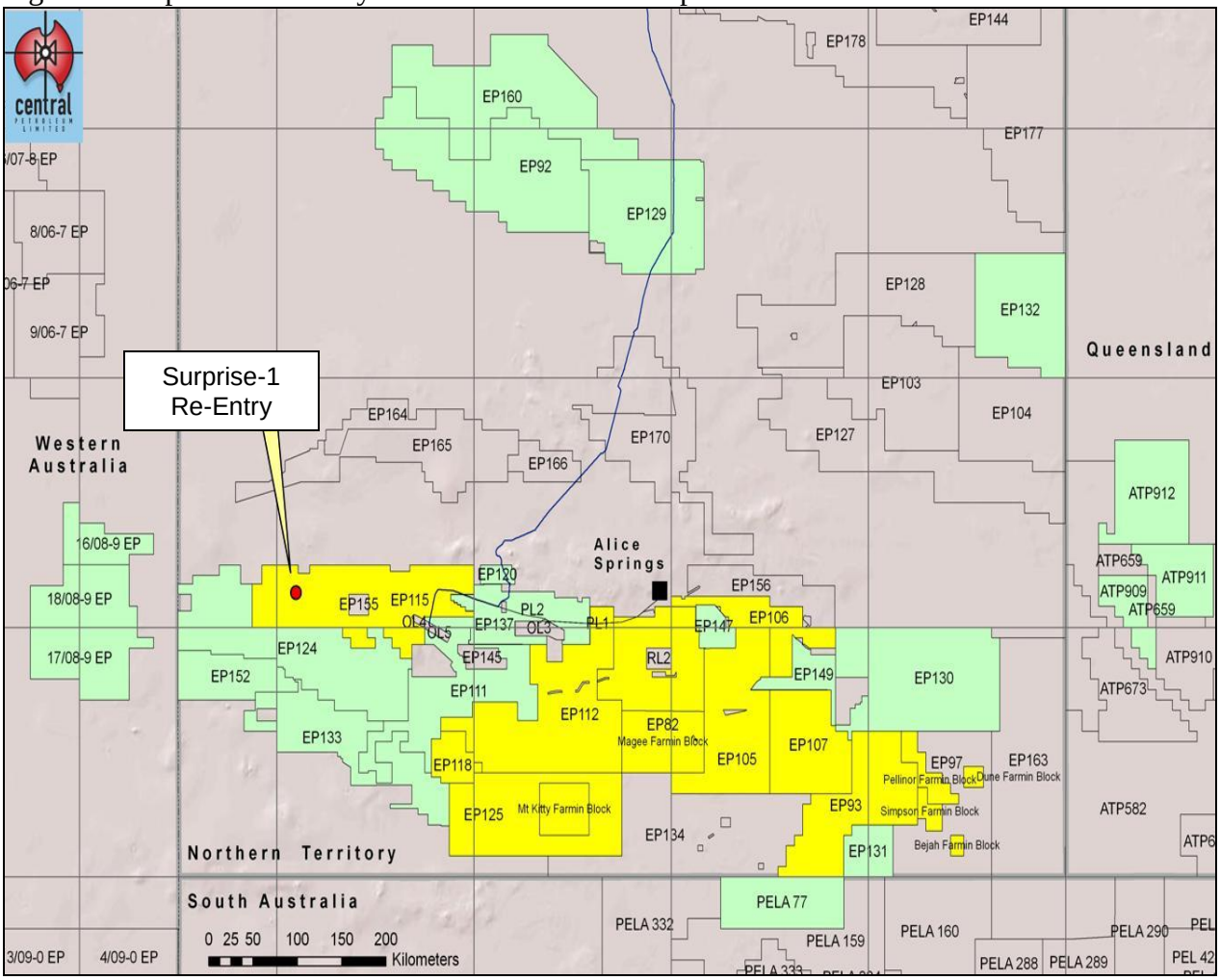
Appendices

1. Daily Drilling Reports
2. Daily Geological Reports
3. Cuttings Descriptions
4. Wireline Logs
5. Bit records
6. Vertical Seismic Profile – Results
7. Drilling Fluid Recap, RMS Pty Ltd
8. Mudlog data and plot.
9. Rig Specifications

1.0 Introduction and Summary

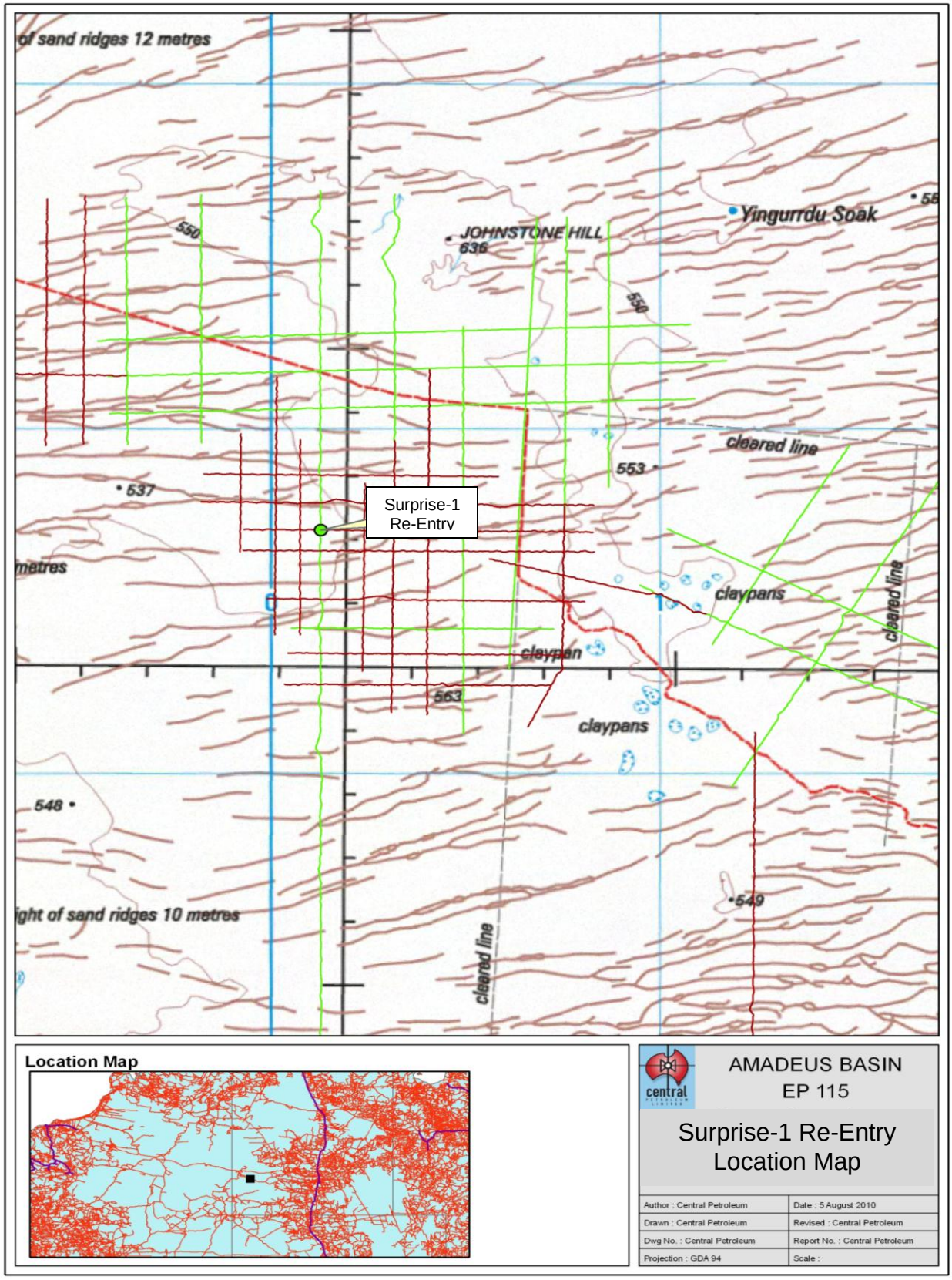
Surprise-1 Re-Entry was drilled by Central Petroleum Ltd in Exploration Permit EP 115 in the western part of the Amadeus Basin, Northern Territory, approximately 400km west of Alice Springs location map (Figure-1). The well was spudded on 19th October 2011 and reached TD of 2732m on 11th December 2011. It was cased and abandoned below the $9^5/_8$" casing for side-track to drill a horizontal well targeted at a new location on the structure based on wireline logs evaluations suggesting possible formation damage around the wellbore.

Figure 1: Surprise-1 Re-Entry Location and Permit Map



The aim of Surprise-1 Re-Entry was to re-test the hydrocarbon potential of a salt cored anticlinal structure mapped at the Pacoota and Stairway sandstones, with primary focus on the potential reservoir zone identified in the cored section of the Lower Stairway sandstone. A secondary aim was to core the shales of the Horn Valley siltstone, a sequence that separates the Pacoota and Stairway sandstones, in order to obtain information regarding the potential shale gas in this area through desorption testing. Evaluation of deeper reservoirs in the Pacoota sandstone was an optional third objective. Basic well results are summarised in the Well Index Sheet (Table-1).

Figure 2: Surprise-1 Re-Entry Location and Seismic lines Map



2.0 General Data

Table 1: Surprise-1 Re-Entry Well Index Sheet

WELL NAME: Surprise-1 Re-Entry **OPERATOR:** Central Petroleum Limited	**CLASSIFICATION:** Exploration Re-entry	
Location: Latitude: 23º 42' 50.758"S Longitude: 129º 59'36.091"E GDA 94 Zone 52	**Rig Details:** Rig Name: Hunt Rig#3 Contractor: Hunt Energy Rig Type: Land D-E SCR	**Dates:** Spud Date: 19th Nov. 2011 TD Date: 30th Nov. 2011 RE HST1: 21st Dec. 2011
Basin: Amadeus **Field:** Wildcat **Permit:** EP-115, Northern Territory, Australia	**Depths:** Surface Elevation (ASL): 545m Rig Datum, KB : 3.7m AGL Total Depth: 2732m MD	**Status:** Cased/Plugged and Side-tracked.
Casing/Liner Details: Size Depth 20"Conductor 21.3m 13⅜" 493.82m 9⅝" 1443.4m 7 " 2729.2m	**Mud Details:** Mud Type: Fresh water + KCL polymer mud (8.8 - 9.2 ppg = 1.05 – 1.1 sg) 2555 – 2732m.	**Trajectory:** Vertical (3 deg. @ TD).
Coring Details: None	**Sidewall Cores:** None	**Cuttings Interval** **Sample Rate** 2553 – 2732 m 3m

FORMATION	MD KB (m)	TVD KB (m)	Isopach TVD (m)	SubSea TVD (m)	TWT msec	Comments
Undiff. Recent alluvium	3.7	3.7	66.3	545	Nd*	Recent-Quaternary
Undiff. Pertnjara Group	70	70	710	478.7	Nd	Mid- Late Devonian
Brewer/Hermannsburg	780	780	515.6	-231.3	100.6	Mid Devonian
Parkes Siltstone	1296	1295.6	461.4	-746.9	319.6	E Devonian
Mereenie Sandstone	1760	1757	513	-1208.3	506.6	Sil-E Devonian
Stokes Siltstone	2275	2270	172.7	-1721.3	742.7	Late. Ordovician
Upper Stairway Sst	2447	2442.7	43.8	-1894.0	811.5	E. Ordovician
Mid Stairway Sst	2475	2486.5	51.5	-1937.8	822.0	E Ordovician
Lwr Stairway Sst	2542	2538	19	-1989.3	854.0	E Ordovician
Horn Valley Siltstone	2561	2557	51.5	-2008.3	861.4	E. Ordovician
Pacoota Sandstone	2613	2608.5		-2059.8	881.9	E. Ordovician
Total Depth	2732	2728.5				

LOGGING

Date	Depth (m)		Description	Remarks
	From	To		
4.12.2011	2725	1446	HRLA-PEX-HNGS	GR to surface
4.12.2011	2725	1446	FMI-ECS-DSI	
6.12.2011	2447.5	2547.3	MDT	Cable stuck, tool fished
12.12.2011	2720	100	VSIT (Check shot)	42 levels

3.0 Drilling

3.1 Summary of Drilling and Related Operations

The original Surprise-1 well that was suspended after the accident on the MB Century Rig 7 in December 2010, was planned to be re-entered and side tracked using the bottom most cement plug. Fresh formation was then to be drilled vertically and tested which included the Lower Stairway sandstone, Horn Valley siltstone, Pacoota sandstone and the Goyder Formation.

The Hunt Rig #3 was mobilized to location and the well was re-entered on 19th November 2011. The first cement plug and the Halliburton bridge plug were drilled out from 100m to 131.9m MDRT. The bit was then RIH down to the 2nd cement plug at 1378m MDRT, above the 9 5/8" casing shoe. Prior to drilling out the plug, the casing integrity was pressure tested to 3000 psi.

Once the 2nd cement plug was drilled out, the 8 ½" open hole was reamed and washed down to the top of the 3rd cement plug at 2297m MDRT. The assembly was POOH and the draw-works brakes had to be repaired due to damage from driller error. The BOPs were tested as per weekly schedule.

It was then decided instead of side-tracking the well, the original borehole below the cement plug would be re-entered and evaluated prior to consideration being given to side-track the well. The drilling assembly was then RIH but later tripped out due to obstruction. The mud line also had to be repaired with a temporary installation. The drilling assembly was RIH and the tight spots washed and reamed to the top of the 3rd cement plug.

After the 3rd cement plug was drilled out, the hole was washed and reamed down to the suspended depth of 2555m MDRT. The well was then deepened to a TD of 2732m MDRT penetrating the Horn Valley siltstone and Pacoota sandstone. The Goyder Formation was not intersected as planned due to limitations in rig capability.

Open hole wireline logging was conducted as specified in Section 2.0 of this report. However during the MDT run, due to hole rugosities, the MDT tool got stuck. The tool was successfully fished by using the cut and thread method. The BOPs were then tested and the checkshot survey was conducted.

Initial log interpretation results had indicated that the Lower Stairway sandstone was prospective and the Pacoota sandstone was water wet. It was thus planned to run and cement 7" casing to TD and then drill a horizontal leg in the Lower Stairway sandstone. A whipstock was set in the 7" casing at 2423m MDRT in preparation to kick off the well.

The daily drilling reports are provided in Appendix 1.

3.2 Particulars of Drilling

3.2.1 Particulars of the equipment installed in/or on the well

Other than casing, there is no other equipment that is installed in the well.

3.2.2 Casing strings in situ/run.

Conductor Casing

- 20” conductor casing in situ at 21.3m MDRT.

Surface Casing

- 13 $^{3}/_{8}$” surface casing in situ at 493.8m MDRT.

Intermediate Casing

- 9 $^{5}/_{8}$” intermediate casing in situ at 1,443.44m MDRT.

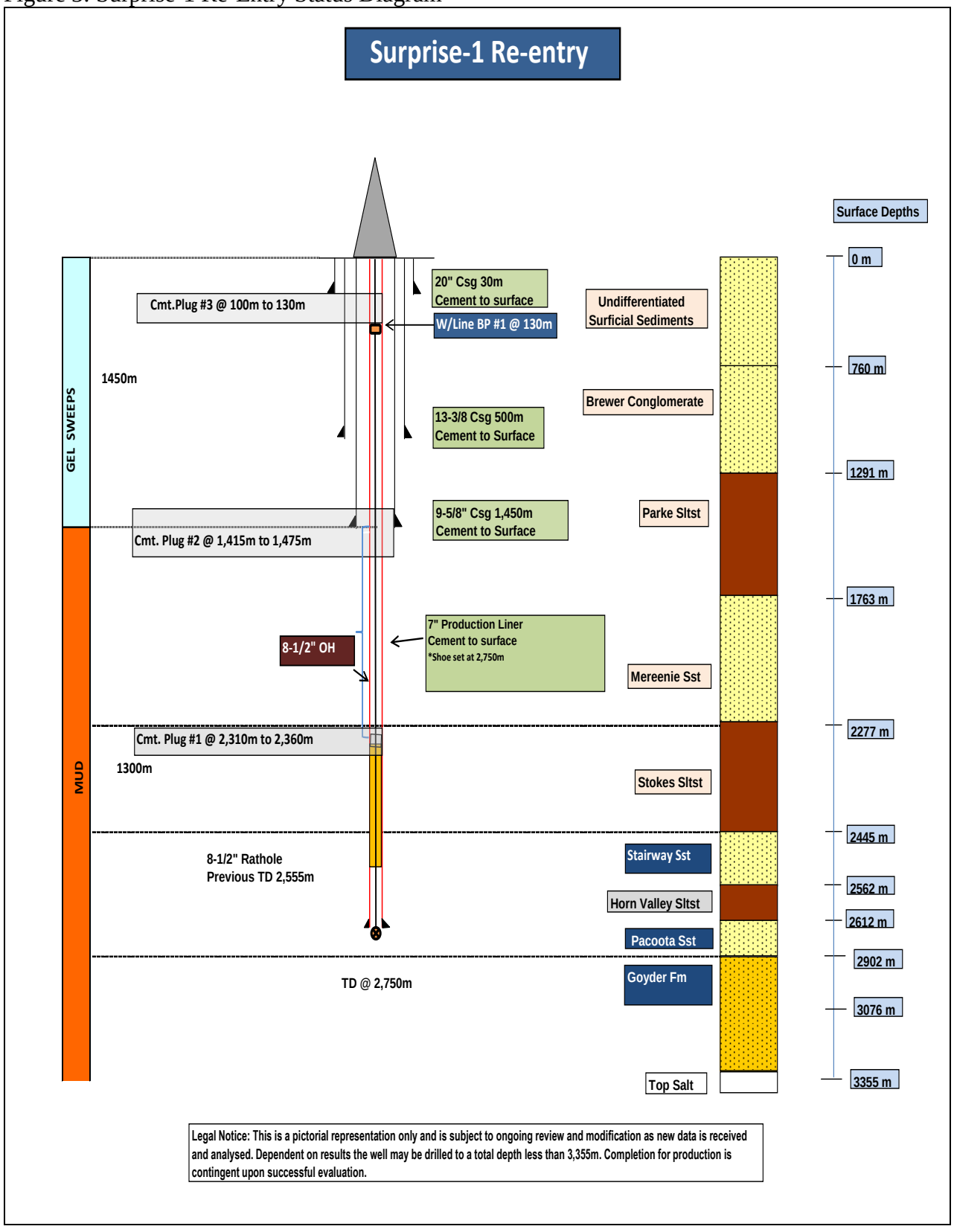
Production Casing

- 7” production casing run and set at 2729.2 m MDRT.

Plugged/Side-track

A whipstock was set in the 7” casing at 2423m MDRT in preparation to mill a window to kick off the well.

Figure 3: Surprise-1 Re-Entry Status Diagram



3.2.3 Cementing operations

The only cementing operation was performed on the 7" casing as described below:

Production Casing: An 8 ½" hole was initially drilled to 2,555m MDRT which was then deepened to 2,732m MDRT in the re-entry. The 7" 26ppf N-80/L-80 BTC and 29ppf L-80 BTC production casing was cemented in place with 12.8ppg lead cement consisting of 155 sacks of Class G cement. This was followed by 15.6ppg tail cement consisting of 353 sacks of Class G cement. The plug was bumped at 3,000psi. There were 3bbls of cement returns.

3.2.4 Bit Records

A record of drilling bits used on Surprise 1 Re-Entry is presented in Appendix 5.

3.2.5 Deviation Surveys

Deviation surveys were taken using a Totco survey tool. No survey results were recorded due to miss run.

3.2.6 Drilling Fluids

9 5/8" Casing, 0 – 1447m MDRT

Gel Sweeps

Mud weight was kept between 8.55 – 8.9ppg to the top of 2nd cement plug. Gel sweeps were run to assist with cleaning out the drilled cement.

8 ½" Production Hole, Original Hole, 1,447m – 2,555m MDRT

KCl Mud

Mud weight was kept between 8.7 – 8.95ppg to the base of the suspension depth, 2,555m MDRT. This mud was contaminated with the suspension mud left in the original borehole since December 2010.

8 ½" Production Hole (new hole), 2,555m – 2,732m MDRT

Residrill Mud

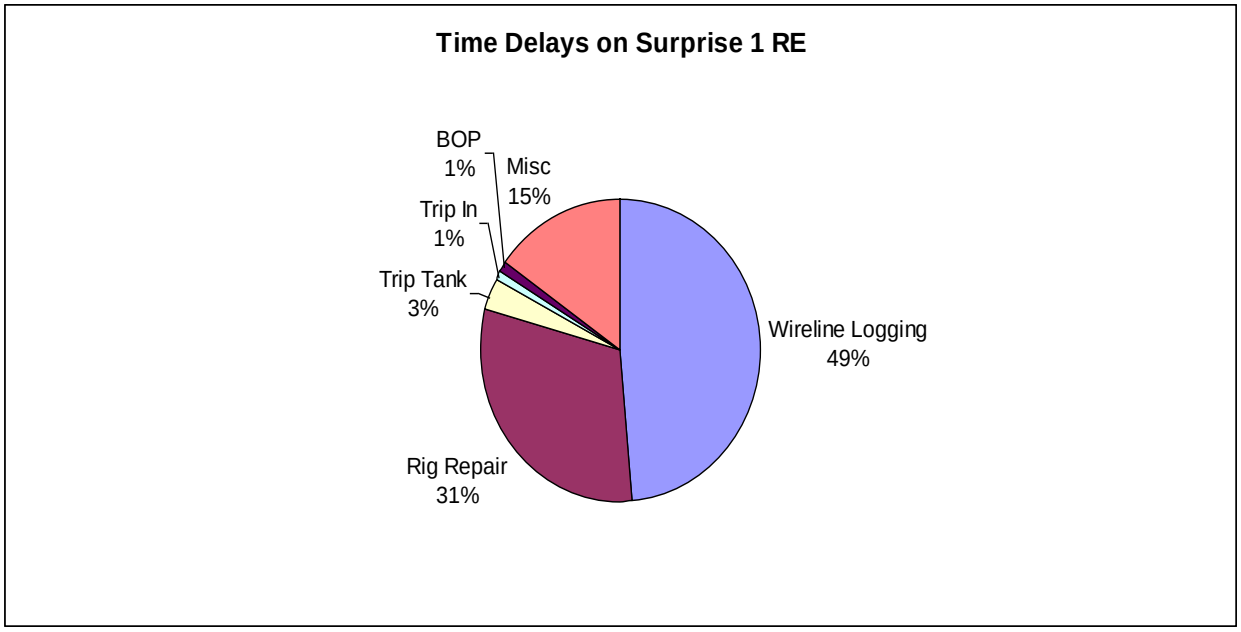
The new and old KCl mud was circulated out from the bore hole. This mud was replaced with new Residrill mud which was aimed at reducing formation damage. Mud weight was kept between 8.75 – 9.1ppg. API fluid loss had been reduced with this mud type to reduce filtrate invasion.

The details of daily record of drilling fluid properties are provided in Appendix 7.

3.2.7 Lost Time

A total of 144 hours were summed as actual lost time. The big item that contributed to the lost time was the time taken to fish out the stuck MDT tool amounting to 70 hours. This is graphically illustrated on the following pie chart.

Figure 4: Surprise-1 Re-Entry Time Delays



3.2.8 Water Supply

Water for drilling purposes and human consumption was taken from the high flow water bore past the Surprise 1 lease and the road side bore on the CPL private road, 30km from the Surprise 1 lease. Water from these bores was carted to the turkey's nest built at the well site where it was then pumped to the rig to be used as drill water. Water was also pumped to the RO plant at the camp to be treated for human consumption as the water had a high salt content.

4.0 Logging, Sampling and Testing

4.1 Cuttings Samples Inventory

Sample type	Interval mRT	Frequency
B (Bulk unwashed)	2563 – 2613 m	Spot+composites
F (Fluids)	Whilst circulating	Spot as required
G (Gas bag -Tedlar)	On Gas peaks	3 x 1 litre volume
S (Samplex trays)	2553 m – 2732 m MD	3 m (15 m per tray)
W (Washed & air dried)	2553 m – 2732 m MD	3 m (2 sets)

Samples were distributed as follows:

Type B: to CTP Perth for selective HC / source rock analysis.

Type F: to Weatherford Labs Perth for HC fluids analysis.

Type G: to Bureau Veritas Adelaide for full spectrum HC Chromatogram plus He.

Type S: to CTP Geology Perth

Type W: to CTP Warehouse Alice Springs thence 1 x set to CTP Perth, 1 x set to NTDME.

4.2 Conventional Cores

No cores were cut in Surprise-1 Re-Entry.

4.3 Sidewall Cores

There were no sidewall cores taken in Surprise-1 Re-Entry.

4.4 Mudlogging

Mudlogging services were contracted to Geoservices who supplied a Standard Unit module monitoring drilling parameters, continuous gas monitoring, pit levels, cuttings sampling and bagging. 4 x remote VDUs serviced the Drill floor, Tool pusher, Company man and Well-site Geologist with real time drilling data. Daily reports and Mudlogs were supplied to Central Petroleum onsite and Perth office. The final Mudlog and gas datasheets are contained in Appendix 8.

4.5 Wireline Logging

Schlumberger Australia supplied Unit 1909 (offshore modules) with 2 x full crews plus MDT technician.
The logging suite was revised from earlier programs dropping the planned MSCT (Run 5) and removing the Cross Dipole Sonic configured for Run 2. The final log suites are presented in Appendix 4.

Run #1: Super Combo HRLA-PEX-HNGS

Run #2: FMI-DSI-ECS-GR

Run #3: MDT (38 Pre-test, plus 12 x 450 ml samples, 2 x 3.78 litre chambers)

Run #4: Check shot/VSI (42 levels)

Run #1 refined the known HC zone in the Lower Stairway Sandstone and QL interpretations indicated a possible 8 metre pay zone straddling the cored section, with a possible OWC at 2551m.

4.6 Vertical Seismic Profile

A Check shot survey was conducted by Schlumberger Wire line services. A total of 42 levels were recorded, the survey data and report in Appendix 6.

4.7 Drill Stem Testing

No drill stem tests were conducted.

5.0 Geology and Formation Evaluation

5.1 Regional Geological Setting and Discussion of the Surprise Prospect

5.1.1 Structural Elements

The Amadeus Basin is a part of series of Neoproterozoic intracratonic basins on the Australian continent that share their origins in the breakup of the supercontinent Rodinia. Strong stratigraphic ties have been made between the Officer, Ngalia and Georgina Basins, leading to them being referred to collectively as the Centralian Superbasin. The Amadeus Basin is a broad intracratonic structure in the north-westerly trending Amadeus Transverse Zone and is the product of a number of tectonic cycles. The basin was formed by a series of tectonic events incorporating a variety of mechanisms.

The Amadeus Basin is a multiphase rift-foreland basin with thrusting occurring in the Late Neoproterozoic and Devonian-Carboniferous eras. The basin hosts thick sequences of Proterozoic to Carboniferous sediments. The tectonic elements of the Amadeus Basin in the Neoproterozoic are shown in the following figure.

Figure 5: Amadeus Basin structural elements map

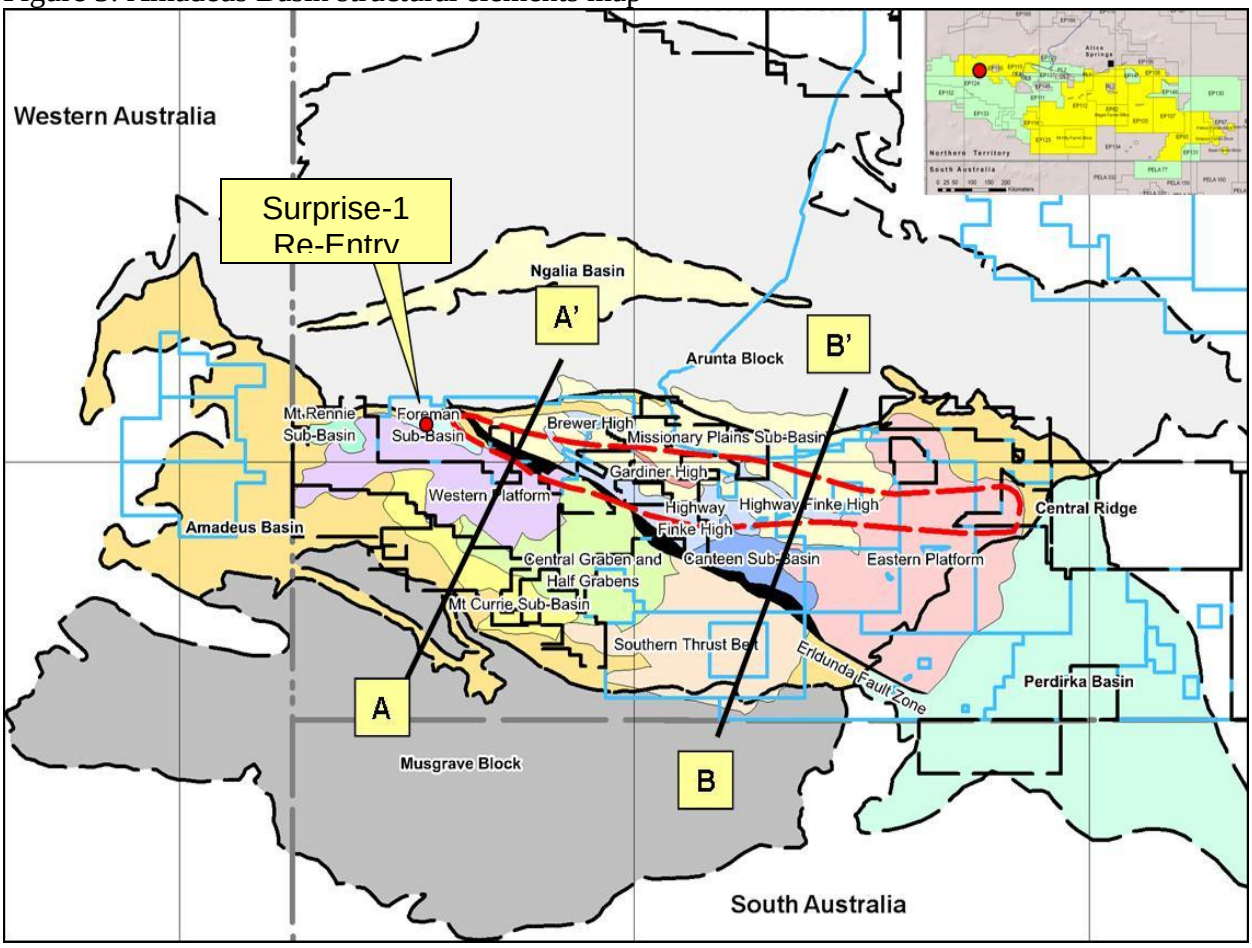
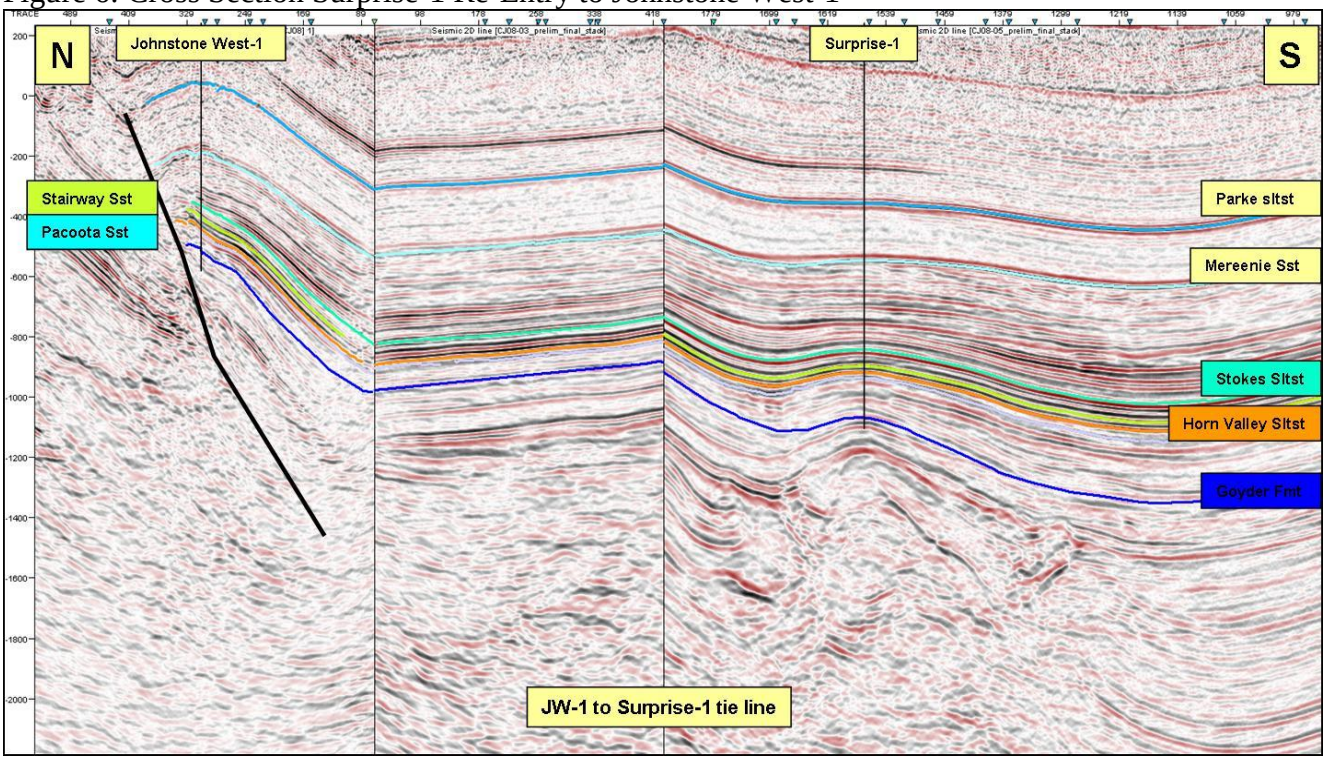


Figure 6: Cross Section Surprise-1 Re-Entry to Johnstone West-1



5.1.2 Lithology and Formation Tops

Table 2: Surprise-1 Re-Entry Formation Tops Actual / Predicted.

Formation Top	Actual				Prognosis		
	Depth KB (m)	Depth GL(m)	Isopach (m)	TVDSS (m)	TVDSS (m)	TVDR (Tm)	**Hi**/**L**o (m)
Undiff. Surficial Sediments	3.7	0	66.3	+545	550	3.7	-
Undiff Perthjara Gp	70	66.3	710	+478.7			-
Brewer / Hermannsberg	780	776.30	515.6	-231.3	-210	760	21.3 **L**
Parkes Siltstone	1296	1292.3	461.4	-746.9	-754	1304	7.1 **H**
Mereenie Sandstone	1760	1756.3	513	-1208.3	-1234	1784	25.7 **H**
Stokes Siltstone	2275	2771.3	172.7	-1721.3	-1901	2451	179.7 **H**
Upr Stairway Sandstone	2447	2443.3	43.8	-1894.0	-2031	2581	137.0 **H**
Mid Stairway Sandstone	2493	2471.3	51.5	-1937.8			
Lwr Stairway Sandstone	2543	2538.3	19	-1989.3			
Horn Valley Siltstone	2561	2557.3	51.5	-2008.3	-2106	2656	97.7 **H**
Pacoota Sandstone	2613	2609.3		-2059.8	-2144	2694	84.2 **H**
Goyder Formation	Np				-2416	2966	
Total Depth	2732	2738.3		-1130.5			

Elevations: GL 545m ASL, KB 3.7m AGL. Depths are driller's from mudlog. Np (Not penetrated).

NOTE: Lithology summaries to base Lower Stairway Sandstone are extracted from Surprise-1 Well Completion Report.

5.1.3 Undifferentiated Recent Alluvium and Pertnjara Group

5.2-70m

This section comprised Aeolian alluvium down to 70m. This is essentially the Quaternary to Recent dune deposits seen at surface, comprising white to light grey quartz grains stained yellow-orange and common reworked grey brown siltstone grains. The grains are fine to coarse and rounded, sub-spherical and frosted. There are abundant composite grains of quartz sand and siltstone grains weakly bound with yellow-orange iron oxide cement. Many grains are irregular and broken indicating it is possibly pebbly. Gypsum appeared in the form of white to off-white, chalky, soft material. It is occasionally micro to coarsely crystalline and abundant in parts, commonly with a vuggy porosity possibly after halite crystals. It is probably distributed as nodular clumps, and often exposed at the surface in that manner.

70-230m

Firm bedrock was observed at 70m in the form of weathered arkosic sandstone. It is white to light grey, dark brown grey where silty and argillaceous, friable to firm, fine to coarse, sub-angular to sub-rounded, moderately sorted, with occasional pebbly conglomeratic lags. It is slightly calcareous and carbonaceous with common kaolin and mica flakes and lithic grains. Porosity is poor to fair. This is variably interbedded with claystone and siltstone and becomes predominantly interbedded sandstone and siltstone with depth.

The claystone is medium red brown, mottled greenish grey in parts, soft to firm, blocky, silty and micaceous. The siltstone is similar being medium to dark red brown, soft, blocky to sub-fissile, very argillaceous and very micaceous.

230-780m

This is predominantly a siltstone sequence with various thin interbeds of sandstone, claystone and gypsum.

The siltstone is medium grey brown to dark grey, soft to hard, generally blocky, argillaceous and sandy, grading to very fine sandstone in parts. It is micaceous and occasionally gypsiferous with occasionally carbonaceous laminae and coarse sandy lamination.

Sandstone is generally light brown to light grey with clear to translucent white quartz grains, loose to friable, fine to very coarse, predominantly medium grained, sub-angular to rounded and poorly sorted. Grains are commonly frosted. It is slightly calcareous, with argillaceous and silty matrix, traces of mica and traces of crystalline pyrite. Porosity is generally poor. The claystone is light to medium grey, soft, blocky, silty, and micro-micaceous with traces of carbonaceous specks. Gypsum occurs as white chalky nodular material and coarsely crystalline fibrous material.

5.1.4 Brewer Conglomerate/Hermannsburg Sandstone

780-1296m
This section is stratigraphically part of the Pertnjara Group and is essentially similar to the overlying units. It comprises predominantly siltstone with thin sandstone and claystone interbeds and intergradations and minor limestone interbeds. The siltstone is medium brown to dark grey brown, firm to hard, blocky, argillaceous, sandy, and slightly calcareous with common dark mica flakes. Sandstones are light grey green and dark brown, translucent in parts, loose to friable and hard in parts, very fine to coarse, predominantly fine, sub-angular to rounded, poorly to moderately sorted, silty, argillaceous, slightly calcareous, with traces of feldspar grains, mica and microcrystalline pyrite. Porosity is generally very poor. Claystones are light grey, light yellowish brown and dark brown in places, soft to firm, blocky, silty, micro-micaceous, calcareous in parts and occasionally with traces of gypsum.

5.1.5 Parke Siltstone (mid Devonian)

1296-1768m
The Parke Siltstone is predominantly a siltstone sequence although the top 25 m is predominantly very fine sandstone. It is pale red brown and grey-orange, firm to hard, fine to coarse, sub-angular to sub-rounded, moderately well sorted, trace calcareous cement, poor visible porosity. This is underlain by a thick siltstone/claystone sequence with minor gradations to sandstone.

The siltstone is medium grey and dark blue grey, hard to very hard, sub-fissile in part, interbedded with pale brown to dark red brown claystone, soft, calcareous and sandy. Claystone is the dominant lithology from 1400m to the base of the unit.

5.1.6 Mereenie Sandstone (early Devonian)

1768-2282m
This is a generally Aeolian sand unit with some marginal marine argillaceous inundations. The sandstone is clear to translucent, commonly with red ferruginous staining. It is generally loose, fine to very coarse, predominantly medium, moderately sorted, spherical and frosted grains, commonly with ferruginous cement and good visible or inferred porosity. The claystones are white to pale grey, mottled orange in part, soft, occasionally sandy, and micro-micaceous. Some minor siltstone occurs toward the base of the interval. It is black, brittle, carbonaceous and pyritic.

5.1.7 Stokes Siltstone (late Ordovician)

2282-2450m
This is an argillaceous unit, comprising mostly claystone in the upper section, becoming predominantly siltstone in the lower part. Minor sandstone and carbonate beds are also present. The claystone is medium to dark reddish brown, orange brown and medium grey in parts, moderately hard to hard, but occasionally soft and plastic. It is slightly calcareous and dolomitic, sub-fissile, micaceous and silty. It becomes marly in places. Minor thin sandstone bands are

medium grey brown, hard, siliceous, very fine to fine, sub-angular to rounded, moderately sorted with poor visible porosity. The siltstone that occurs towards the base of the interval is moderate red, pale red brown, hard to moderately friable. Arenaceous with local to common argillaceous matrix, laminae in parts with very fine quartz sandstone, generally granular, moderately strong to strong dolomitic and siliceous cement, occasional lithics. Rare carbonate bands are dolomite, mottled pale pink and off-white, occasionally medium dark grey, hard, with a coarsely crystalline (sucrosic) texture and silty to sandy in parts.

5.1.8 Upper Stairway Sandstone (Early Ordovician)

2450-2475m
This unit is sandstone with interbedded siltstone claystone, dolomite and limestone. A good gas show with a weak oil show was observed in the lower sandy unit of this sequence.

The Upper sandstone unit is patchy pale pink with clear to translucent grains, also light to medium grey and dark reddish brown and hard. It is generally very fine to fine with some medium, angular to sub-rounded, moderately sorted, silica cemented, minor silt, trace lithic grains with poor visible porosity. This is in turn underlain by dolomitic sandstone with dolomite bands. The dolomitic sandstone is off-white to pale grey, red brown in parts, hard, very fine grained, angular to sub-rounded, well sorted, with strong dolomitic cement and poor visible porosity. The middle unit of this formation is mostly siltstone and claystone interbeds. The siltstone is described as being moderate red brown, medium grey, firm to brittle, argillaceous and occasionally sandy, sub-fissile, slightly dolomitic. The claystone is medium to dark grey, commonly red brown, moderately hard, silty to sandy, trace micro-micaceous, slightly dolomitic.

The basal 10m of this unit is sandy and contains gas and displays oil fluorescence. The sandstone is clear to translucent, light grey to pale brown, moderately hard, very fine to coarse, predominantly fine, angular to sub-rounded, poor to moderate sorting, strong calcareous and siliceous cement, slightly dolomitic, with common interstitial brown bitumen grain coatings which were fluorescent.

5.1.9 Middle Stairway Sandstone (Early Ordovician)

2475-2542m
This unit comprises siltstone and sandstone interbeds and seems to provide an effective seal to the hydrocarbons contained in the lower Stairway sands underlying. The siltstone is dark grey, blocky to laminated (with fine sandstone), hard, siliceous, argillaceous, micaceous, trace pyrite and dolomitic. The sandstones are pale to medium grey, friable to hard, very fine to fine, angular to sub-rounded, well sorted, variable dolomitic cement, silty, trace pyrite, poor visible porosity. Traces of hydrocarbon fluorescence were observed.

5.1.10 Lower Stairway Sandstone (E Ordovician)

2542-2555m
The unit is composed of sandstone. Excellent oil shows prompted a decision to core on the original Surprise-1 from 2542m. Full recovery was obtained. The sandstone above the cored

interval is clear to translucent and pale grey, friable to hard, fine to very coarse, angular to rounded, poorly sorted, well cemented with silica, trace pyrite, poor to good visible porosity. Good oil shows were observed and free oil was noted in the mud and petroliferous odour noted in the cuttings while coring on Surprise-1 and on circulating out the hole re-entered on Surprise-1 RE.

Note: Core was cut from 2546.2m to 2555m (driller's depth); however the core in the laboratory was marked from 2542 to 2554.8m.

The core was described from chip samples taken at 1m intervals. It was 100% sandstone, clear to translucent with pale brown patches and commonly light to medium grey. It is fine to very coarse, predominantly medium grained, angular to sub-rounded, poorly to moderately well sorted, generally very strong siliceous cement (quartz overgrowths), thin carbonaceous wavy laminae indicative of bioturbation is evident, with micro pyrite in parts, common mica flakes, occasional shale clasts, trace bituminous material, fair to good visual porosity. Good fluorescent shows were described with weak to strong petroliferous odour.

2555-2561m
This section of the base Lower Stairway Sandstone comprised the remaining reservoir sand tagged from bottom core on re-entry. The sandstone was described as clear to colourless to light grey, translucent, very fine to very coarse predominantly medium grained, angular to sub-rounded, very poor to moderate sorting, common silica cement and quartz overgrowths, friable to well cemented with trace to common calcite/dolomite cement, trace weathered arkose, feldspars, pisolithic Fe, nodular pyrite, trace disseminated microcrystalline pyrite, poor to fair inferred porosity. Fluorescence ranged from 100 % of grains tapering to 5 % or less below the inferred OWC as described below in Section 5.2

5.1.11 Horn Valley Siltstone (Early Ordovician)

2561-2613m
This well indurated Claystone separates the base Lower Stairway Sandstone from the Pacoota Sandstone and acts as both a regional source and seal over the Pacoota reservoir sands. Cuttings were described as a medium grey Claystone with minor reddish brown and green grey, silty, firm to hard, shaly in part but mainly blocky to sub-fissile, micro-micaceous, trace to slightly calcareous, pyrite specks and rare loose pyrite nodules, competent to increasingly well indurated, occasional silt to very fine quartz inclusions. The upper 10-15 metres had 10-20 % Limestone interbeds, increasing to 40 % towards the base. The Limestone was described from cuttings as off white to cream to very pale brown to light grey, firm to hard, brittle, microcrystalline to sub-crystalline, slightly dolomitic, dense, trace organic debris, trace pyrite inclusions, trace ooids, common silt inclusions. The upper sections graded to a calcareous Siltstone/Marl in part with the tighter, more indurated and dolomitic parts towards the base, where common to abundant glauconite grains were also noted over a 6 metre interval just above the Pacoota.

5.1.12 Pacoota Sandstone (Early Ordovician)

2613-2732m

The Pacoota Sandstone hosts gas and oil reservoirs in the West Mereenie and Mereenie fields. The well intersected a water-wet leg from the top sands through the P1-280 sand to TD at 2732 m. The sand was initially described as clear to very light grey, translucent, fine to medium sub-angular grains, friable to loose with nil matrix but with abundant very fine to fine sub-rounded aggregates with silica cement, sucrosic texture, trace microcrystalline disseminated pyrite, goethite, sideritic pisolites and concretions, traces altered feldspars, traces kaolin and weathered granite/lithics with poor inferred porosity and no fluorescence. The Claystone occurred as minor interbeds over the interval ranging from 5-30 % in the samples and described as light grey to dark grey green with traces of red brown to dark reddish brown, moderately hard, dominantly sub-blocky to occasionally sub-fissile, trace micro-micaceous, trace pyrite specks. Minor occurrences of Limestone from traces to 10 % were seen and generally described as clear to translucent to light grey with occasional medium grey, traces of greenish grey and rare pink , moderately hard, calcisiltic in part, microcrystalline, no visual and poor inferred porosity

From 2673m the Pacoota was generically described as a massive, homogenous unit of clear to very light blue to very light grey, translucent to rarely opaque, very fine to coarse sub-angular to rounded grains of medium to high sphericity and generally loose medium to coarse grains with occasional finer aggregates with weak silica cement and trace kaolinitic matrix. Trace accessories/inclusions of brown micas, lithic fragments, feldspars, kaolin. Visual and inferred porosity was poor with no fluorescence seen. The proportion of Claystone in the cuttings gradually decreased with depth from 10 % to caving only over the last 10 metres to 2732 m and was described as a uniform medium to dark grey hard blocky to sub-fissile micro-micaceous claystone, generally non-calcareous but slightly dolomitic in part, common disseminated pyrite and traces of pyritic laminae and silty lithics.

5.2 Hydrocarbon Indications and Sample Analysis

5.2.1 Gas while drilling

Gas readings are deemed unreliable in the Surprise-1 original hole but in Surprise-1 Re-Entry are considered to be reliable. A different mudlogging company was used for the Re-Entry.

When reaming over the hydrocarbon cored zone in the re-entry well, mud gas was monitored and shows significant heavy components up to the limit of the chromatograph (i.e. C1-C5) indicating liquid hydrocarbons.

Conventional Wh, Bh and Ch values are indicative of residual oil, however, from experience ratios indicate residual oil in producing fields (e.g. Laminaria)**.** The ratios seem to be unreliable in under-saturated oils (i.e. those with no gas cap or low GOR's).

Other analysis methods, e.g. C1/C2, C1/C3, C1/C4 (rectangular plots) gave figures indicating productive oil in the zone in question. But decreasing values indicate it is possibly non-productive. The C1/C4 ratio is marginally higher in places than the C1/C3 ratio which implies productive zones.

Triangular plots were executed by Geoservice over the interval 2553-2565m. These indicate the interval is in the productive oil zone though some points are marginal to the non-productive zone.

On balance, fluorescence and gas are indicators subject to interpretation. Fluorescence can be diminished due to flushing by mud in permeable zones and poor fluorescence is known to exist in productive fields. Gas ratios can be unique to certain areas and rock ages and there is little data on these older basins.

Overall, the presence of life oil in the mud and oil in the core plus gas indicating liquid components all points to a productive zone. However, formation damage may be blocking pore throats. PDC bits have a tendency to grind sandstones into rock flour and consequently block pore throats. Minimising formation damage while drilling will give this reservoir the best chance of flowing.

5.2.2 Fluorescent Hydrocarbon Shows

The Lower Stairway Sandstone was penetrated over the interval 2547-2562mRT (Loggers depth Surprise-1 Re-Entry).
This is the depth reference for the ongoing discussion although Surprise-1 core depths will be quoted for HC indications observed in the core. The core was cut from 2546.2-2555m.

Cuttings described while coring show Trace to 100% dull to moderately bright yellow solid, patchy and pinpoint fluorescence with an immediate slow to fast streaming to blooming variably yellow and pale blue solvent fluorescent cut and a very thick yellow to pale blue fluorescent residual ring. No natural light cut or ring was described. Oil was observed toward the end of the coring run at the shakers and 'distinct' oil odours were also described. The quantity was not mentioned nor its colour or viscosity. Samples ceased at 2534m and the core was pulled. Shows were assessed by the well-site geologist from the cuttings description as trace to good and the best interval being 2497-2499m.
The core samples were also examined for fluorescence and sent for core analysis.
No oil staining was observed by the geologist on core chip samples at well site. This contradicts the core photos and whole core which had obvious bleeding oil stain and strong petroleum odour. Fluorescence in core chip samples taken every metre was generally 100% with some minor sections estimated at 80%. However it was also described as patchy to even which is assumed to refer to the brightness, being dull yellow or golden orange to moderately bright yellow in colour. Solvent cut varied from immediate slow streaming moderately bright yellow to diffuse blue and a generally thick blue and occasionally bright yellow residual ring or film. No white light cut or residual ring was described. The show in the core was rated as fair to good for most but the bottom 4m which was rated poor to fair. There was no comment on odour in the core chip samples.

6.0 Reference

Surprise-1 Well Completion Report, (CTP 2012),