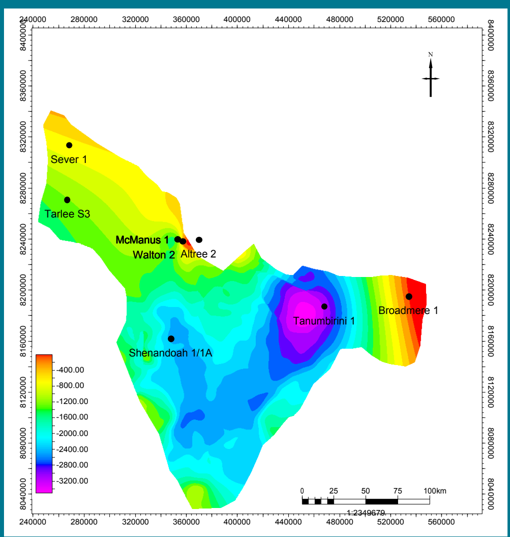
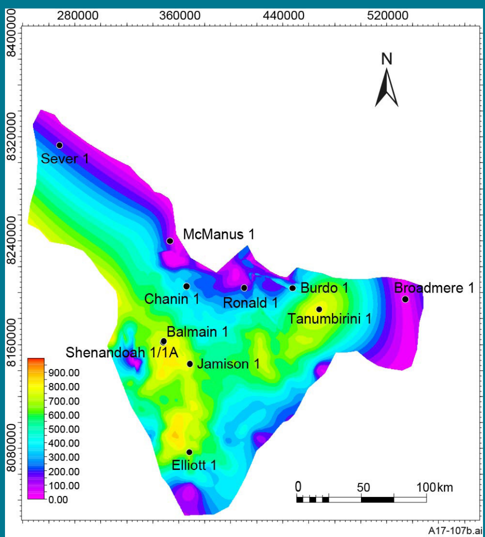
NORTHERN TERRITORY GEOLOGICAL SURVEY

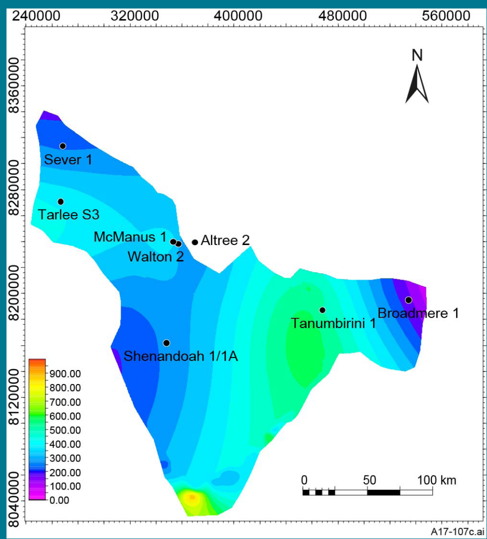
NTGS RECORD 2017-003

Kyalla and middle Velkerri Resource Assessment: Gorrie, Beetaloo, OT Downs, and Broadmere Sub-basins

Study Project No. AB-74329







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NORTHERN TERRITORY GOVERNMENT

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FOREWORD

The Northern Territory Geological Survey (NTGS) is undertaking a project to improve understanding of the unconventional petroleum potential of the greater McArthur Basin through the identification of horizons that meet the established minimum requirements for suitable shale gas targets. The project involves compiling key parameter data comprising new analytical datasets from the sampling of core held at NTGS Core Facilities and the Geoscience Australia Repository, and existing data sourced from open file company reports, core sampling records, and government publications. All new analytical work, with the exception of whole rock geochemistry, was performed at Weatherford Laboratories (Australia) using the procedures as outlined in NTGS Record 2015-004 (Revie 2015[1]). The full dataset is available in Revie (Revie 2015[2]).

The selection of suitable horizons by NTGS for resource assessment was based on integration, interrogation and interpretation of all data compiled. The most prospective black shale horizons in the Mesoproterozoic Roper Group were determined to be the middle Velkerri Formation and the Kyalla Formation. NTGS contracted Weatherford Laboratories to conduct a resource assessment to evaluate the unconventional petroleum prospectivity of these two formations, and the results are presented in the following report. It consists of 6 parts - the main assessment report and 5 appendices.

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[1] Revie D, 2015. Methodology for shale analysis of onshore basins, Northern Territory: a compilation of analytical methodologies used by Weatherford Laboratories (Australia) Pty Ltd. *Northern Territory Geological Survey, Record* 2015-004

[2] Revie D, 2017. Shale resource data from the greater McArthur Basin. *Northern Territory Geological Survey, Digital Information Package* DIP 014.

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Kyalla and middle Velkerri Resource Assessment

Gorrie, Beetaloo, OT Downs, and Broadmere Sub-basins

Produced for Northern Territory Geological Survey, Department of Primary Industries and Resources, Darwin, Northern Territory, Australia.

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INTRODUCTION

The Kyalla and middle Velkerri Formations of the Mesoproterozoic Roper Group in the Beetaloo Sub-basin are self-sourced, continuous petroleum reservoirs that have documented oil and gas shows in several wells (Revie, 2016a). Weatherford Laboratories (WFT Labs) was commissioned by the Northern Territory Geological Survey to conduct a resource assessment to evaluate hydrocarbon prospectivity of the Kyalla and middle Velkerri Formations in fourteen (14) wells located in the Gorrie, Beetaloo, OT Downs, and Broadmere Sub-basins, Northern Territory, Australia. Core data used in this assessment were determined using a variety of methods including total organic carbon, programmed pyrolysis, adsorbed gas isotherm, and shale rock properties (SRP, which is a GRI based WFT Labs methodology to determine bulk density, fluid saturations, and total porosity). The wells included in this study are listed in Table 1 and illustrated in the map provided in Figure 1 (Revie, 2016b).

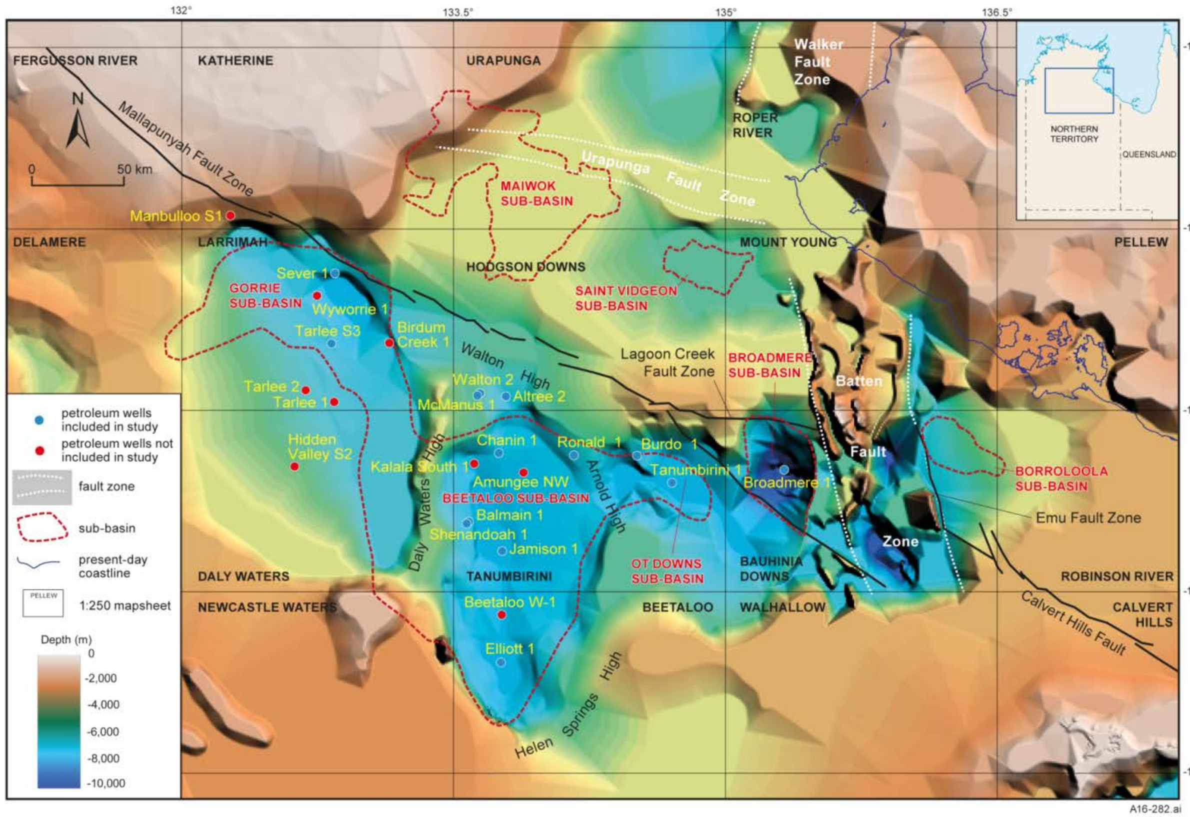

Figure 1.Location map outlining the Gorrie, Beetaloo, OT Downs, and Broadmere Sub-basins, Northern Territory, Australia. Key wells included in the current study are identified with blue colored markers (Revie, 2016b).

Well Name	Lat Coord. (X)	Long Coord. (Y)	Kyalla Top Depth (m)	Kyalla Bottom Depth (m)	Kyalla Thickness (m)	middle Velkerri Top Depth (m)	middle Velkerri Bottom Depth (m)	middle Velkerri Thickness (m)
Gorrie Sub-basin								
Sever 1	-15.24646	132.843963	151.5	331.35	179.85	673.45	917.22	243.77
Tarlee S3	-15.6324	132.8259				1209.5	1595.47	385.97
Beetaloo Sub-basin								
Altree 2	-15.923645	133.786592				672	948.25	276.25
Balmain 1	-16.619002	133.578581	938.5	1050	111.5			
Chanin 1	-16.235113	133.747827	948	1328	380			
Elliott 1	-17.388886	133.759723	664.73	1322.28	657.55			
Jamison 1	-16.774862	133.767191	968.8	1714.32	745.52			
McManus 1	-15.919115	133.630659	552.9	668	115.1	1199	1549.7	350.7
Ronald 1	-16.247722	134.162739	871.7	1042	170.3			
Shenandoah 1/1A	-16.62288027	133.5772768	939.5	1716.3	776.8	2450.1	2713.6	263.5
Walton 2	-15.931863	133.667893				259.6	555.5	295.9
OT Downs Sub-basin								
Burdo 1	-16.251109	134.510403	749.4	1144.6	395.2			
Tanumbirini 1	-16.399083	134.703833	1297	2069	772	3143	3646	503
Broadmere Sub-basin								
Broadmere 1	-16.328559	135.322584				0	161.54	161.54

Table 1. Summary of wells within the Gorrie, Beetaloo, OT Downs, and Broadmere Sub-basins, Northern Territory, Australia included in the resource assessment.

RESOURCE ASSESSMENT METHODOLOGY

STOCK TANK OIL-INITIALLY-IN-PLACE ESTIMATES

Core-based stock tank oil-initially-in-place (STOIIP) estimates were calculated three ways for comparison. First, STOIIP was calculated using oil saturations determined from shale rock properties, SRP, data. Second, STOIIP was calculated using free, thermally extractable hydrocarbon contents (S1 values) from programmed pyrolysis data. The difference in STOIIP between these two methods is due to several reasons. Pyrolysis S1 values represent the mass of hydrocarbons volatilized at a temperature of 300°C for 3 minutes and in some instances heavy components of the oil (e.g. high-molecular-weight waxes, asphaltenes and polar compounds) can carry over into the S2 pyrolysis peak. This would result in underestimated STOIIP values due to under-representation of the oil content in the sample. Furthermore, the SRP solvent extraction removes all organic components that are soluble in the rock sample, which includes solid bitumen, resulting in possible overestimation of oil content. Because of these processes, SRP-based STOIIP values are typically higher than those determined from S1 pyrolysis values. However, the fraction of oil represented by the S1 pyrolysis peak is the more mobile (i.e. lower molecular weight and lower viscosity) volume and likely better represents a “producible” STOIIP. Regardless of these caveats, these data often represent potential minimum and maximum STOIIP values and are still found to be useful for assessing the potential oil currently stored in reservoirs of interest. The third method for calculating STOIIP was using estimated oil yields and assumed 37% retained oil volumes based upon geochemical hydrocarbon yield data for comparison as well as to assess an overall quality of all the calculated oil values. The methodology for determining hydrocarbon yields based upon geochemical data was described in Ruble et al., 2016.

STOIIP estimates based upon oil saturation values reported from SRP analysis are determined on a unit area-thickness volume basis using Equation 1. The oil formation factor (B_o) used in the traditional form of this equation has been removed since the components from analyzed core are tested at surface conditions and do not require a correction.

$$\frac{STOIIP}{Ah} = 7,758\phi S_o \tag{1}$$

where:

STOIIP *stock tank oil-initially-in-place volume, bbl (stock tank barrels of oil)*
A *reservoir area, acres*
h *reservoir thickness, ft*
ϕ *total porosity, bulk volume fraction*
S_o *oil saturation within the total porosity, fraction of total pore volume*

STOIIP estimates for a unit area-thickness volume based upon S1 values reported from the programmed pyrolysis results were calculated using Equation 2.

$$\frac{STOIIP}{Ah} = \frac{7.7584\rho_b S1}{\rho_o} \tag{2}$$

where:

STOIIP *stock tank oil-initially-in-place volume, bbl (stock tank barrels of oil)*
A *reservoir area, acres*
h *reservoir thickness, ft*
ρ_b *bulk density, g/cm*^{3}
S1 *free, thermally extractable hydrocarbon content of the source rock, mg HC/g rock*
ρ_o *oil density, g/cm*^{3}

To maintain consistency with the reported shale rock properties data, an assumed oil density of 0.85 g/cm^3 was used in this equation. Bulk density determined from shale rock properties analysis was used in this equation when available. Otherwise, a bulk density value of 2.5 g/cm^3 was assumed. Previously reported S1-based STOIIP per volume numbers provided in the Geochemical Interpretation phase of this study were determined using a conversion factor where S1 was multiplied by 21.89 to calculate a value in units of barrels per acre-ft (Jarvie and Tobey, 1999). Using this conversion factor assumes the sample bulk density equals 2.5 g/cm^3 and the sample oil density equals 0.886 g/cm^3. These values are arbitrary and are the generally accepted average or typical values for this purpose. While reporting S1-based STOIIP per volume values using the conversion factor is acceptable, the results would be further refined if sample bulk density and oil density were available instead. Also, oil density was a required parameter needed to complete the material balance of the reported shale rock properties data. Therefore, it is recommended that the same oil density used for the SRP results also be used in the calculation of S1-based STOIIP per volume and in hydrocarbon yields based calculations. This modified methodology to the values previously reported was applied throughout the present resource assessment.

STOIIP per volume values using either hydrocarbon yield based, S1-based, or SRP-based data were determined on a sample-by-sample basis. Cumulative probability functions were then applied to these data to determine the 90, 50, and 10% probability values of each data set. Each interval of interest was evaluated separately. To determine STOIIP values per section, the STOIIP per volume 90, 50, and 10% probability estimates were multiplied by a reservoir thickness provided by NTGS and assuming an area of 640 acres. These values were reported in millions of stock tank barrels of oil at standard conditions per section. In U.S. land surveying under the Public Land Survey System (PLSS), a section is an area nominally one square mile (2.6 square kilometers), containing 640 acres (260 hectares), with 36 sections making up one survey township on a rectangular grid. The values for these three probabilities may be used to assess the range in potential oil-in-place of the evaluated interval. The 90% probability represents pessimistic results while the 10% probability represents optimistic results and the 50% probability represents average results. In instances when there was an insufficient number of samples (less than three) available, either the individual data point or an arithmetic average if two samples were available was used to determine a STOIIP per section value as described above.

GAS-IN-PLACE ESTIMATES

Gas-in-place (GIP) estimates reported at standard conditions were determined using data from total organic carbon, hydrocarbon yields calculated from programmed pyrolysis, SRP, and adsorption isotherm analyses when available. TOC contents, SRP, and adsorption isotherm data were mathematical combined to determine how much gas can be stored in the rock at present day. Estimated cracked gas yields and assumed 37% retained gas volumes were calculated using geochemical hydrocarbon yield data for comparison as well as to assess an overall quality of all the calculated gas values. The methodology for hydrocarbon yield calculations based upon geochemical data was described in Ruble et al., 2016. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. The conversion from units of bbl/acre-ft of oil to scf/acre-ft of gas applied to the hydrocarbon yield data is shown below in Equation 3.

$$6000\left(\frac{scf}{bbl}\right)*\frac{bbl}{acre-ft}=\frac{scf}{acre-ft} \quad (3)$$

The 6000 factor is based upon the energy conversion of gas and oil and is highly dependent upon the exact BTU of the gas and the characteristics of the oil. However, the 6000 value appears to be the "standard" assumed conversion factor.

Gas is stored within shale reservoirs by three primary mechanisms. These are compression within gas-filled porosity as for conventional gas reservoirs, adsorption within organic material, which is generally kerogen and bitumen referred to as total organic carbon (TOC), and solution within hydrocarbon liquids and water. The total gas storage capacity is expressed by Equation 4 with the volume of gas per unit mass of rock in units of scf/ton (standard cubic feet of gas at 14.7 psia and 60°F per ton, 2,000 lbm, of rock).

$$G_{st} = G_f + G_a + G_{so} + G_{sw} \tag{4}$$

where:

G_{st}	*total gas storage capacity, scf/ton*
G_f	*free (compressed) gas storage capacity, scf/ton*
G_a	*adsorbed gas storage capacity, scf/ton*
G_{so}	*dissolved gas-in-oil storage capacity, scf/ton*
G_{sw}	*dissolved gas-in-water storage capacity, scf/ton*

In current practice, adsorbed gas storage capacity measurements (adsorption isotherm data) are performed on samples that may contain oil. The adsorbed gas storage capacity and the dissolved gas-in-oil storage capacity are lumped together for shale reservoirs containing significant oil content due to the current inability to remove oil from a sample without altering the water or TOC content. The dissolved gas-in-water storage capacity is usually negligible unless there is no free, adsorbed, or dissolved gas-in-oil present in the reservoir.

The volume of gas stored by compression in the gas-filled porosity was computed using data from shale rock properties measurements, but required a correction first for in-situ conditions. The gas-filled porosity must take into account the volume of the adsorbed gas that fills the porosity. Without accounting for the adsorbed gas in the porosity, the gas-filled porosity would be overestimated and in turn overestimate the free gas storage capacity. The correction that is required is the bulk volume of adsorbed gas divided by the bulk rock volume as defined in Equation 5. Ambrose et al, 2010, discusses the basis for this correction.

$$\frac{V_a}{V_b} = 1.318\left(10^{-6}\right)\hat{M}\,\frac{\rho_b}{\rho_a}G_a \tag{5}$$

where:

V_a	*adsorbed gas volume, ft³*
V_b	*bulk rock volume, ft³*
$\hat{M}$	*adsorbed gas molecular weight, lbm/lbmol*
ρ_b	*bulk density, g/cm³*
ρ_a	*adsorbed gas density, g/cm³*
G_a	*adsorbed gas storage capacity, scf/ton*

Using a methane adsorbed gas density of 0.375 g/cm^3, approximately 1% of the bulk volume is occupied by 90 scf/ton (2.81 scm^3/g) of methane reducing the gas-filled porosity by this amount.

The volume computed for each sample with the volume correction equation above was subtracted from the reported gas-filled porosity as determined by SRP analysis to provide the corrected gas-filled porosity as defined in Equation 6. This is also equal to the corrected effective gas-filled porosity. By rearranging this equation the corrected free gas saturation can also be computed as is defined in Equation 7.

$$\phi_e S'_{ge} = \phi S'_g = \phi S_g - \frac{V_a}{V_b} \tag{6}$$

$$S'_{ge} = \frac{\phi_e S_{ge} - \dfrac{V_a}{V_b}}{\phi_e} \tag{7}$$

where:

ϕ *total porosity, volume fraction*
S_g *gas saturation, volume fraction*
S'_g *corrected free gas saturation, volume fraction*
$\phi_e S'_{ge}$ *corrected effective gas-filled porosity, volume fraction*

The free gas storage capacity or volume of gas stored by compression was finally calculated with Equations 8 and 9.

$$G_f = 32.0369 \frac{\phi_e S'_{ge}}{\rho B_g} \tag{8}$$

$$B_g = \frac{z\left(T + 459.67\right)}{p} \frac{p_{sc}}{z_{sc}\left(T_{sc} + 459.67\right)} \tag{9}$$

where:

G_f *free (compressed) gas storage capacity, scf/ton*
ϕ_e *effective porosity, fraction of bulk volume*
S'_{ge} *corrected gas saturation within the effective porosity, fraction of effective pore volume*
ρ *rock density, g/cm*^{3}
B_g *gas formation volume factor, reservoir volume / surface volume*
z *real gas deviation factor, dimensionless*
T *reservoir temperature, °F*
p *reservoir pressure, psia*
p_{sc} *pressure at standard conditions, psia*
z_{sc} *real gas deviation factor at standard conditions (usually 0.998), dimensionless*
T_{sc} *temperature at standard conditions, °F*

The dissolved gas-in-water storage capacity was determined with Equation 10. The solution gas-water ratio and water formation volume factor are almost always estimated from correlations (Whitson and Brule, 2000).

$$G_{sw} = \frac{32.0369}{5.6146} \frac{\phi_e S_{we} R_{sw}}{\rho B_w} \tag{10}$$

where:

G_{sw} *dissolved gas-in-water storage capacity, scf/ton*
ϕ_e *effective porosity, fraction of bulk volume*
S_{we} *water saturation within the effective porosity, fraction of effective pore volume*
R_{sw} *solution gas-water ratio, scf/STB*
ρ *rock density, g/cm*^{3}
B_w *water formation volume factor, reservoir volume / surface volume*

Total gas storage capacity (Equation 4) was converted to volume per volume units with Equation 11.

$$\frac{G}{Ah} = 1.3597 \rho G_{st} \tag{11}$$

where:

G/Ah	*gas-in-place volume per unit reservoir volume, Mscf/acre-ft*
ρ	*rock density, g/cm*^{3}
G_{st}	*total gas storage capacity, scf/ton*

Gas-in-place (GIP) per volume values using hydrocarbon yield data were determined on a sample-by-sample basis. Cumulative probability functions were then applied to these data to determine the 90, 50, and 10% probability values of each data set. Each interval of interest was evaluated separately. To determine GIP values per section, the GIP per volume 90, 50, and 10% probability estimates were multiplied by a reservoir thickness provided by NTGS and assuming an area of 640 acres. These values were reported in billions of standard cubic feet of gas per section. The values for these three probabilities may be used to assess the range in potential oil-in-place of the evaluated interval. The 90% probability represents pessimistic results while the 10% probability represents optimistic results and the 50% probability represents average results. In instances when there was an insufficient number of samples (less than three) available, either the individual data point or an arithmetic average if two samples were available was used to determine a GIP per section value as described above.

GORRIE SUB-BASIN

Core data from the Kyalla and middle Velkerri Formations from the Sever 1 and Tarlee S3 wells in the Gorrie Sub-basin were analyzed for potential hydrocarbon resources. As explained in the previous section, Kyalla and middle Velkerri stock tank oil-in-place and gas-in-place per volume data were log-normally or normally distributed using a cumulative probability function. Using the 90, 50, and 10% probability results, reservoir thicknesses as supplied by NTGS, and an assumed area of 640 acres, the stock tank oil-in-place and gas-in-place per section values were determined. All the calculated results used to derive the data reported in this section of the report are provided in Appendix I.

Some samples in this study were analyzed from core that was not preserved and has been exposed to atmospheric conditions over an extended period. This likely resulted in a change of the fluid saturations as compared with the in-situ state of the rocks. If a change did occur, the rate and degree of change would be dependent on the permeability of the rock, the time the core was exposed to atmospheric conditions, the fluid composition, and several other factors. It is important to understand this when reviewing hydrocarbon-in-place results from core data such as these as it could adversely affect the results from programmed pyrolysis, shale rock properties, and adsorption isotherms, which are the main data sets used in this study.

Throughout the following discussion comments were provided regarding the confidence WFT Labs had in the data reported. A variety of factors can influence data quality. Confidence in the analytical results depends on adherence to sample collection, preservation, and processing protocols as well as reliability of client provided information, such as reservoir pressure. Further confidence when these data are applied to an entire depth interval depend on the quantity and distribution of the data within the interval being evaluated as well as the reliability of client provided interval thickness information used in the calculations. Relative confidence levels assigned to the data discussed in this report are defined as the following:

- Low confidence — Data should not be considered representative of reservoir properties and conditions.
- Moderate confidence — Data are suspect but may be useful in conjunction with other information to describe reservoir properties and conditions.
- High confidence — Data are believed to represent reservoir properties and conditions (assuming data accurately describe initial reservoir conditions).

KYALLA FORMATION

Sever 1 Well

Table 2 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon ten Kyalla core samples from the Sever 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 179.85 m (590.06 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.89. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 0.15 MMbbl, a 50% probability of 0.34 MMbbl, and a 10% probability of 0.80 MMbbl.

Another approach shown in Table 2 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation.

Using this method, the in-situ resource potential for the Kyalla STOIIP per section resulted in a 90% probability of 5.25 MMbbl, a 50% probability of 9.94 MMbbl, and a 10% probability of 18.80 MMbbl.

Confidence in these data was moderate. The S1 values used in these calculations were very low with an average value of 0.05 mg HC/g rock. Using data with very low oil content potentially increased the degree of error in the calculated results. However, in a qualitative sense these rocks were simply oil lean and the data support that interpretation. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values. The thickness of the analyzed interval of 48.7 m was much less than the total thickness used in the calculations. STOIIP per section data using S1 and hydrocarbon yield results may not represent the entire interval thickness of 179.85 m for the Kyalla source rock interval in the Sever 1 well.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
S1 STOIIP	MMbbl	Sever 1	0.15	0.34	0.80
Estimated Oil	MMbbl	Sever 1	14.19	26.86	50.82
37% Retained Oil	MMbbl	Sever 1	5.25	9.94	18.80

Table 2. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 data for the Kyalla Formation core data penetrated by the Sever 1 well located in the Gorrie Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

MIDDLE VELKERRI FORMATION

Sever 1 Well

Table 3 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 45 middle Velkerri core samples from the Sever 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 243.77 m (799.77 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.99. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 0.48 MMbbl, a 50% probability of 1.59 MMbbl, and a 10% probability of 5.26 MMbbl.

Also summarized in Table 3 are the SRP-based STOIIP 90, 50, and 10% probability values calculated based upon four middle Velkerri core samples from the Sever 1 well. These data were reported in units of million stock tank barrels of oil per section. The SRP STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.65. Converting the probability values to a SRP STOIIP per section resulted in a 90% probability of 1.20 MMbbl, a 50% probability of 4.23 MMbbl, and a 10% probability of 14.92 MMbbl.

Another approach shown in Table 3 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the middle Velkerri STOIIP per section resulted in a 90% probability of 0.00 MMbbl, a 50% probability of 2.88 MMbbl, and a 10% probability of 9.85 MMbbl. A negative 90% probability value was actually calculated for this distribution because two samples had an in-situ resource potential of 0 bbl/acre-ft (both samples were estimated to have 100% oil cracking on the basis of measured %R_o). While this was statistically correct, in a physical sense this simply means that the 90% probability value equates to zero (i.e. no oil-in-place).

Confidence in these data was moderate to high. S1-based STOIIP per section probability values were lower than SRP-based STOIIP per section probability values suggesting that the oil content determined from SRP analysis was slightly greater than that determined from the S1 peak. A possible explanation for this was that the S1 STOIIP per section values represent mobile oil present in the rocks while the SRP STOIIP per section values include both mobile and immobile hydrocarbons. The assumed 37% retention factor may have been correct in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were in line with the S1 STOIIP per section values. The quantity and distribution of S1 and hydrocarbon yield data were sufficient so that the STOIIP per section results using these data well represent the entire interval thickness of 243.77 m for the middle Velkerri penetrated by the Sever 1 well. However, only four SRP samples collected from the deeper section of the middle Velkerri spanning a depth range of 158.51 m were available. Thus, STOIIP per section data using SRP results may not represent the entire interval thickness of 243.77 m for the middle Velkerri in the Sever 1 well.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
S1 STOIIP	MMbbl	Sever 1	0.48	1.59	5.26
SRP STOIIP	MMbbl	Sever 1	1.20	4.23	14.92
Estimated Oil	MMbbl	Sever 1	0.00 (-11.07)	7.77	26.62
37% Retained Oil	MMbbl	Sever 1	0.00 (-4.10)	2.88	9.85

Table 3. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the middle Velkerri Formation core data penetrated by the Sever 1 well located in the Gorrie Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Adsorption isotherm data were not available for the Sever 1 well. In lieu of isotherm data the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale) were used to estimate gas-in-place (GIP) per section in the middle Velkerri source rock interval. As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Estimated GIP 90, 50, and 10% probability values were calculated based upon 45 middle Velkerri core samples from the Sever 1 well and are summarized in Table 4. These data were reported in units of billion standard cubic feet of gas per section, Bscf. The interval thickness provided by NTGS was 243.77 m (799.77 ft). The in-situ resource potential (37% retained gas) per volume data were log-normally distributed and had a squared correlation coefficient of 0.98. Converting these values to an in-situ resource potential per section resulted in a 90% probability of 62.13 Bscf, a 50% probability of 294.80 Bscf, and a 10% probability of 1398.81 Bscf.

While not knowing the actual present day gas retention, the 50% in-situ resource potential probability value was greater than reported Barnett Shale gas-in-place data of 150 to 200 Bscf by Jarvie, 2012. Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. Estimated in-situ resource potential using hydrocarbon yield data were encouraging and further evaluation of the present day gas potential of the middle Velkerri penetrated in the Sever 1 well is recommended.

Confidence in these data was moderate. As with the oil data discussed above, the quantity and distribution of hydrocarbon yield data were sufficient so that the GIP per section results using these data well represent the entire interval thickness of 243.77 m for the middle Velkerri penetrated by the Sever 1 well. However, there were no other independent data to compare and assess the accuracy of these results against.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
Estimated Cracked Gas	Bscf	Sever 1	167.91	796.75	3780.57
37% Retained Gas	Bscf	Sever 1	62.13	294.80	1398.81

Table 4. Summary of the gas-in-place 90, 50, and 10% probability values based upon geochemical hydrocarbon yield calculations for the middle Velkerri Formation core data penetrated by the Sever 1 well located in the Gorrie Sub-basin, Northern Territory, Australia.

Tarlee S3 Well

Table 5 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 14 middle Velkerri core samples from the Tarlee S3 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 385.97 m (1266.31 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.97. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 0.81 MMbbl, a 50% probability of 2.38 MMbbl, and a 10% probability of 7.02 MMbbl.

Also summarized in Table 3 are the SRP-based STOIIP 90, 50, and 10% probability values calculated based upon six middle Velkerri core samples from the Tarlee S3 well. These data are reported in units of million stock tank barrels of oil per section. The SRP STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.94. Converting the probability values to a SRP STOIIP per section resulted in a 90% probability of 2.33 MMbbl, a 50% probability of 5.24 MMbbl, and a 10% probability of 11.80 MMbbl.

Another approach shown in Table 5 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the middle Velkerri STOIIP per section resulted in a 90% probability of 0.00 MMbbl, a 50% probability of 0.32 MMbbl, and a 10% probability of 1.53 MMbbl. A negative 90% probability value was actually calculated for this distribution because 12 samples had an in-situ resource potential of 0 bbl/acre-ft (estimated to have 100% oil cracking). While this was statistically correct, in a physical sense this simply means that the 90% probability value equates to zero (i.e. no oil-in-place).

Confidence in these data was moderate. The S1 values used in these calculations were very low with an average value of 0.17 mg HC/g rock. The average SRP oil saturation of 2% of the pore volume was also very low. Using data with very low oil content potentially increased the degree of error in the calculated results. However, in a qualitative sense these rocks were simply oil lean and the data support that interpretation. S1-based STOIIP per section probability values were slightly lower than SRP-based STOIIP per section probability values suggesting that the oil content determined from SRP analysis was slightly greater than that determined from the S1 peak. A possible explanation for this was that the S1 STOIIP per section values represent mobile oil present in the rocks while the SRP STOIIP per section values include both mobile and immobile hydrocarbons. The assumed 37% retention factor may have been too low in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were lower relative to the S1 STOIIP per section values, which was primarily a consequence of elevated thermal maturity and an average 99.7% oil cracking. The distribution of S1 and hydrocarbon yield data spanned the entire interval thickness of 385.97 m for the middle Velkerri penetrated by the Tarlee S3 well. However, only 14 samples having an average spacing close to 30 m were analyzed. These data may or may not accurately represent the overall reservoir properties of the middle Velkerri penetrated by the Tarlee S3 well. Similarly, the SRP data distribution covered the entire middle Velkerri source rock interval, but only six samples were analyzed having an average spacing of 76

m. Thus, STOIIP per section data using SRP results may not represent the average reservoir properties of the middle Velkerri in the Tarlee S3 well.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
S1 STOIIP	MMbbl	Tarlee S3	0.81	2.38	7.02
SRP STOIIP	MMbbl	Tarlee S3	2.33	5.24	11.80
Estimated Oil	MMbbl	Tarlee S3	0.00 (-2.39)	0.87	4.13
37% Retained Oil	MMbbl	Tarlee S3	0.00 (-0.88)	0.32	1.53

Table 5. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the middle Velkerri Formation core data penetrated by the Tarlee S3 well located in the Gorrie Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Adsorption isotherm data were available for two core samples in the middle Velkerri penetrated by the Tarlee S3 well. Adsorption isotherm results were determined using a pressure gradient of 0.53 psi/ft as provided by NTGS and a salinity to match that used in the reported SRP data for those same core samples. The methane adsorption gas storage capacity results from isotherm analysis were used in combination with total organic carbon and bulk density, porosity, and fluid saturations from shale rock properties analyses to calculate total gas storage capacity values on a sample by sample basis as described in the Methodology section of this report. These data were converted to a gas-in-place (GIP) per volume in which the average of the two results was converted to a GIP per section value reported in units of billion standard cubic feet of gas per section, Bscf, as summarized in Table 6. The isotherm-based GIP per section for the middle Velkerri samples in the Tarlee S3 well was 151.95 Bscf. Gas composition results were not available at the time of preparing this report; therefore, the calculated GIP per section for the middle Velkerri core samples in the Tarlee S3 well could be different if the gas was not predominately composed of methane. The average isotherm-based GIP per section for the middle Velkerri in the Tarlee S3 well was in line with reported Barnett Shale gas-in-place data of 150 to 200 Bscf (Jarvie, 2012). Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. Based on these core analyses, the shale gas potential in the middle Velkerri penetrated by the Tarlee S3 well was excellent. Further evaluation of the present day gas potential of the middle Velkerri penetrated in the Tarlee S3 well is recommended.

Another approach shown in Table 6 to estimate GIP 90, 50, and 10% probability values uses the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Estimated GIP 90, 50, and 10% probability values were calculated based upon 14 middle Velkerri core samples from the Tarlee S3 well and are summarized in Table 6. These data were reported in units of billion standard cubic feet of gas per section, Bscf. The interval thickness provided by NTGS was 385.97 m (1266.31 ft). The in-situ resource potential (37% retained gas) per volume data were log-normally distributed and had a squared correlation coefficient of 0.84. Converting these values to an in-situ resource potential per section resulted in a 90% probability of 300.69 Bscf, a 50% probability of 731.26 Bscf, and a 10% probability of 1778.38 Bscf.

Confidence in these data was moderate to low. Only two core samples from the lower half of the middle Velkerri had adsorption isotherm data. These data likely do not represent the overall reservoir properties for the entire interval of 385.97 m. As with the oil data discussed above, the distribution of hydrocarbon yield data were sufficient, but the quantity may or may not have been enough to represent the average reservoir properties of the middle Velkerri penetrated by the Tarlee S3 well. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were much higher relative to the isotherm-based GIP per section values. However, one must also consider that the isotherm-based GIP could be different if gases other than methane are present as 100% methane composition was assumed.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
Isotherm based GIP	Bscf	Tarlee S3		*151.95*	
Estimated Cracked Gas	Bscf	Tarlee S3	812.68	1976.38	4806.43
37% Retained Gas	Bscf	Tarlee S3	300.69	731.26	1778.38

Italicized values indicate statistical distribution analysis could not be performed due to an insufficient number of samples. Average values, or actual value if only one sample, were used instead.

Table 6. Summary of the gas-in-place 90, 50, and 10% probability values based upon geochemical hydrocarbon yield calculations for the middle Velkerri Formation core data penetrated by the Tarlee S3 well located in the Gorrie Sub-basin, Northern Territory, Australia.

BEETALOO SUB-BASIN

Core data from the Kyalla and middle Velkerri Formations from the Altree 2, Balmain 1, Chanin 1, Elliot 1, Jamison 1, McManus 1, Ronald 1, Shenandoah 1/1A, and Walton 2 wells in the Beetaloo Sub-basin were analyzed for potential hydrocarbon resources. As explained previously, Kyalla and middle Velkerri stock tank oil-in-place and gas-in-place per volume data were log-normally or normally distributed using a cumulative probability function. Using the 90, 50, and 10% probability results, reservoir thicknesses as supplied by NTGS, and an assumed area of 640 acres, the stock tank oil-in-place and gas-in-place per section values were determined. All the calculated results used to derive the data reported in this section of the report are provided in Appendix II.

Some samples in this study were analyzed from core that was not preserved and has been exposed to atmospheric conditions over an extended period. This likely resulted in a change of the fluid saturations as compared with the in-situ state of the rocks. If a change did occur, the rate and degree of change would be dependent on the permeability of the rock, the time the core was exposed to atmospheric conditions, the fluid composition, and several other factors. It is important to understand this when reviewing hydrocarbon-in-place results from core data such as these as it could adversely affect the results from programmed pyrolysis, shale rock properties, and adsorption isotherms, which are the main data sets used in this study.

Throughout the following discussion comments were provided regarding the confidence WFT Labs had in the data reported. A variety of factors can influence data quality. Confidence in the analytical results depends on adherence to sample collection, preservation, and processing protocols as well as reliability of client provided information, such as reservoir pressure. Further confidence when these data are applied to an entire depth interval depend on the quantity and distribution of the data within the interval being evaluated as well as the reliability of client provided interval thickness information used in the calculations. Relative confidence levels assigned to the data discussed in this report are defined as the following:

- Low confidence — Data should not be considered representative of reservoir properties and conditions.
- Moderate confidence — Data are suspect but may be useful in conjunction with other information to describe reservoir properties and conditions.
- High confidence — Data are believed to represent reservoir properties and conditions (assuming data accurately describe initial reservoir conditions).

KYALLA FORMATION

Balmain 1 Well

Table 7 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 19 Kyalla core samples from the Balmain 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 111.5 m (365.81 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.92. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 2.26 MMbbl, a 50% probability of 4.99 MMbbl, and a 10% probability of 11.05 MMbbl.

Another approach shown in Table 7 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation.

Using this method, the in-situ resource potential for the Kyalla STOIIP per section resulted in a 90% probability of 2.60 MMbbl, a 50% probability of 5.44 MMbbl, and a 10% probability of 11.40 MMbbl.

Confidence in these data was moderate. The assumed 37% retention factor may have been correct in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were in line with the S1 STOIIP per section values. The thickness of the analyzed interval of approximately 65 m was less than the total thickness used in the calculations. Therefore these data, which were from the middle section of the Kyalla, were assumed to represent the reservoir properties of the entire thickness of 111.5 m for the Kyalla penetrated by the Balmain 1 well.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
S1 STOIIP	MMbbl	Balmain 1	2.26	4.99	11.05
Estimated Oil	MMbbl	Balmain 1	7.03	14.72	30.80
37% Retained Oil	MMbbl	Balmain 1	2.60	5.44	11.40

Table 7. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 data for the Kyalla Formation core data penetrated by the Balmain 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Chanin 1 Well

Table 8 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 21 Kyalla core samples from the Chanin 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 380 m (1246.72 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.96. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 1.04 MMbbl, a 50% probability of 5.00 MMbbl, and a 10% probability of 23.97 MMbbl.

Another approach shown in Table 8 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the Kyalla STOIIP per section resulted in a 90% probability of 9.77 MMbbl, a 50% probability of 23.40 MMbbl, and a 10% probability of 56.01 MMbbl.

Confidence in these results was moderate. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values. The thickness of the analyzed interval of approximately 351 m was slightly less than the total thickness used in the calculations of 380 m. The quantity and distribution of S1 and hydrocarbon yield data were likely sufficient enough so that the STOIIP per section results using these data represented the overall reservoir properties of the Kyalla penetrated by the Chanin 1 well.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
S1 STOIIP	MMbbl	Chanin 1	1.04	5.00	23.97
Estimated Oil	MMbbl	Chanin 1	26.42	63.23	151.38
37% Retained Oil	MMbbl	Chanin 1	9.77	23.40	56.01

Table 8. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 data for the Kyalla Formation core data penetrated by the Chanin 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Adsorption isotherm data were not available for the Chanin 1 well. In lieu of isotherm data the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale) were used to estimate gas-in-place (GIP) per section in the Kyalla source rock interval. As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Estimated GIP 90, 50, and 10% probability values were calculated based upon 21 Kyalla core samples from the Chanin 1 well and are summarized in Table 9. These data were reported in units of billion standard cubic feet of gas per section, Bscf. The interval thickness provided by NTGS was 380 m (1246.72 ft). The in-situ resource potential (37% retained gas) per volume data were normally distributed and had a squared correlation coefficient of 0.92. A negative 90% probability value was calculated for this distribution because one sample had an in-situ resource potential of 0 Mscf/acre-ft (this sample was estimated to have 0% oil cracking). While this was statistically correct, in a physical sense this means that the 90% probability value equates to zero (i.e. no gas-in-place). Converting these distribution values to an in-situ resource potential per section resulted in a 90% probability of 0.00 Bscf, a 50% probability of 25.35 Bscf, and a 10% probability of 53.83 Bscf.

While not knowing the actual present day gas retention, the 50% in-situ resource potential probability value was much less than reported Barnett Shale gas-in-place data of 150 to 200 Bscf by Jarvie, 2012. Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. If estimated cracked gas values based upon hydrocarbon yield calculations were correct, then the GIP per section of the Kyalla source rock interval penetrated by the Chanin 1 well was low. Further data are needed to confirm the in-situ gas resource potential in this well.

Confidence in these data was moderate. As with the oil data discussed above, the quantity and distribution of hydrocarbon yield data were likely sufficient enough so that the GIP per section results using these data represented the overall reservoir properties of the Kyalla penetrated by the Chanin 1 well. However, there were no other independent data to compare and assess the accuracy of these results against.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
Estimated Cracked Gas	Bscf	Chanin 1	0.00 (-8.46)	68.52	145.49
37% Retained Gas	Bscf	Chanin 1	0.00 (-3.13)	25.35	53.83

Table 9. Summary of the gas-in-place 90, 50, and 10% probability values based upon geochemical hydrocarbon yield calculations for the Kyalla Formation core data penetrated by the Chanin 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia.

Elliot 1 Well

Table 10 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 59 Kyalla core samples from the Elliot 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 657.55 m (2157.32 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.97. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 2.13 MMbbl, a 50% probability of 10.36 MMbbl, and a 10% probability of 50.30 MMbbl.

Also summarized in Table 10 is the SRP-based STOIIP per section value of 3.24 MMbbl calculated based upon one Kyalla core sample from the Elliot 1 well. This data is reported in units of million stock tank barrels of oil per section.

Another approach shown in Table 10 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the Kyalla STOIIP per section resulted in a 90% probability of 14.47 MMbbl, a 50% probability of 35.59 MMbbl, and a 10% probability of 87.51 MMbbl.

Confidence in these results was low to high. The S1-based STOIIP per section 50% probability value was higher than the SRP-based STOIIP per section value suggesting that the oil content determined from S1 analysis was greater than that determined from the SRP oil saturation, S_o. A possible explanation for this is that the SRP data available from the one depth analyzed may not represent the average properties of the interval, but rather the low end or less favorable properties of the Kyalla. The reported SRP oil saturation from this one sample was 0.9% of the pore volume, which was very low. Confidence in the S1-based and hydrocarbon yield based STOIIP per section 50% probability values was relatively higher than the SRP-based STOIIP per section data since the sample population was much greater. The quantity and distribution of S1 and hydrocarbon yield data were sufficient so that the STOIIP per section results using these data well represent the entire interval thickness of 657.55 m for the Kyalla penetrated by the Elliot 1 well. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
S1 STOIIP	MMbbl	Elliot 1	2.13	10.36	50.30
SRP STOIIP	MMbbl	Elliot 1		*3.24*	
Estimated Oil	MMbbl	Elliot 1	74.61	129.69	225.44
37% Retained Oil	MMbbl	Elliot 1	14.47	35.59	87.51

Italicized values indicate statistical distribution analysis could not be performed due to an insufficient number of samples. Average values, or actual value if only one sample, were used instead.

Table 10. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the Kyalla Formation core data penetrated by the Elliot 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Adsorption isotherm data were not available for the Elliot 1 well. In lieu of isotherm data the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale) were used to estimate gas-in-place (GIP) per section in the Kyalla source rock interval. As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Estimated GIP 90, 50, and 10% probability values were calculated based upon 51 Kyalla core samples from the Elliot 1 well and are summarized in Table 11. These data were reported in units of billion standard cubic feet of gas per section, Bscf. The interval thickness provided by NTGS was 657.55 m (2157.32 ft). The in-situ resource potential (37% retained gas) per volume data were normally distributed and had a squared correlation coefficient of 0.28. A negative 90% probability value was calculated for this distribution because 43 samples had an in-situ resource potential of 0 Mscf/acre-ft (estimated 0% oil cracking). While this was statistically correct, in a physical sense this means that the 90% probability value equates to zero (i.e. no gas-in-place). Converting these distribution values to an in-situ resource potential per section resulted in a 90% probability of 0.00 Bscf, a 50% probability of 2.38 Bscf, and a 10% probability of 12.69 Bscf.

While not knowing the actual present day gas retention, the 50% in-situ resource potential probability value was much less than reported Barnett Shale gas-in-place data of 150 to 200 Bscf by Jarvie, 2012. Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. If estimated cracked gas values based upon hydrocarbon yield calculations were correct, then the GIP per section of the Kyalla source rock interval penetrated by the Elliot 1 well was low. Further data are needed to confirm the in-situ gas resource potential in this well.

Confidence in these data was moderate. As with the oil data discussed above, the quantity and distribution of hydrocarbon yield data were sufficient so that the GIP per section results using these data well represent the entire interval thickness of 657.55 m for the Kyalla penetrated by the Elliot 1 well. However, there were no other independent data to compare and assess the accuracy of these results against.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
Estimated Cracked Gas	Bscf	Elliot 1	0.00 (-21.45)	6.43	34.31
37% Retained Gas	Bscf	Elliot 1	0.00 (-7.94)	2.38	12.69

Table 11. Summary of the gas-in-place 90, 50, and 10% probability values based upon geochemical hydrocarbon yield calculations for the Kyalla Formation core data penetrated by the Elliot 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia.

Jamison 1 Well

Table 12 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 115 Kyalla core samples from the Jamison 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 745.52 m (2445.93 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.97. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 3.46 MMbbl, a 50% probability of 15.34 MMbbl, and a 10% probability of 68.01 MMbbl.

Also summarized in Table 12 are the SRP-based STOIIP 90, 50, and 10% probability values calculated based upon five Kyalla samples from the Jamison 1 well. These data are reported in units of million stock tank barrels of oil per section. The SRP STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.84. Converting the probability values to a SRP STOIIP per section resulted in a 90% probability of 11.78 MMbbl, a 50% probability of 46.41 MMbbl, and a 10% probability of 182.88 MMbbl.

Another approach shown in Table 12 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the Kyalla STOIIP per section resulted in a 90% probability of 0.00 MMbbl, a 50% probability of 89.05 MMbbl, and a 10% probability of 191.01 MMbbl. A negative 90% probability value was actually calculated for this distribution because two samples had an in-situ resource potential of 0 bbl/acre-ft (estimated 100% oil cracking). While this was statistically correct, in a physical sense this simply means that the 90% probability value equates to zero (i.e. no oil-in-place).

Confidence in these data was moderate to high. S1-based STOIIP per section probability values were lower than SRP-based STOIIP per section probability values suggesting that the oil content determined from SRP analysis was greater than that determined from the S1 peak. A possible explanation for this was that the S1 STOIIP per section values represent mobile oil present in the rocks while the SRP STOIIP per section values include both mobile and immobile hydrocarbons. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1-based and SRP-based STOIIP per section values. The quantity and distribution of S1 and hydrocarbon yield data were sufficient so that the STOIIP per section results using these data well represent the entire interval thickness of 745.52 m for the Kyalla penetrated by the Jamison 1 well. However, only five SRP samples, spaced approximately 100 to 265 m apart, were analyzed throughout from the Kyalla source rock interval. Thus, STOIIP per section data using SRP results may not represent the entire interval thickness of 745.52 m for the Kyalla in the Jamison 1 well.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
S1 STOIIP	MMbbl	Jamison 1	3.46	15.34	68.01
SRP STOIIP	MMbbl	Jamison 1	11.78	46.41	182.88
Estimated Oil	MMbbl	Jamison 1	0.00 (-34.91)	240.66	516.24
37% Retained Oil	MMbbl	Jamison 1	0.00 (-12.92)	89.05	191.01

Table 12. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the Kyalla Formation core data penetrated by the Jamison 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Adsorption isotherm data were not available for the Jamison 1 well. In lieu of isotherm data the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale) were used to estimate gas-in-place (GIP) per section in the Kyalla source rock interval. As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Estimated GIP 90, 50, and 10% probability values were calculated based upon 115 Kyalla core samples from the Jamison 1 well and are summarized in Table 13. These data were reported in units of billion standard cubic feet of gas per section, Bscf. The interval thickness provided by NTGS was 745.52 m (2445.93 ft). The in-situ resource potential (37% retained gas) per volume data were normally distributed and had a squared correlation coefficient of 0.74. A negative 90% probability value was calculated for this distribution because 37 samples had an in-situ resource potential of 0 Mscf/acre-ft (estimated 0% oil cracking). While this was statistically correct, in a physical sense this simply means that the 90% probability value equates to zero (i.e. no gas-in-place). Converting these distribution values to an in-situ resource potential per section resulted in a 90% probability of 0.00 Bscf, a 50% probability of 107.01 Bscf, and a 10% probability of 340.86 Bscf.

While not knowing the actual present day gas retention, the 50% in-situ resource potential probability value was slightly less than reported Barnett Shale gas-in-place data of 150 to 200 Bscf by Jarvie, 2012. Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. The 50% in-situ resource potential probability value of 107.01 Bscf per section was just above this threshold. Estimated in-situ resource potential using hydrocarbon yield data were encouraging and further evaluation of the present day gas potential of the Kyalla penetrated in the Jamison 1 well is recommended.

Confidence in these data was moderate. As with the oil data discussed above, the quantity and distribution of hydrocarbon yield data were sufficient so that the GIP per section results using these data well represent the entire interval thickness of 745.52 m for the Kyalla penetrated by the Jamison 1 well. However, there were no other independent data to compare and assess the accuracy of these results against.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
Estimated Cracked Gas	Bscf	Jamison 1	0.00 (-536.60)	452.74	1442.09
37% Retained Gas	Bscf	Jamison 1	0.00 (-126.83)	107.01	340.86

Table 13. Summary of the gas-in-place 90, 50, and 10% probability values based upon geochemical hydrocarbon yield calculations for the Kyalla Formation core data penetrated by the Jamison 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia.

McManus 1 Well

Table 14 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon three Kyalla core samples from the McManus 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 115.1 m (377.62 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.84. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 0.20 MMbbl, a 50% probability of 0.63 MMbbl, and a 10% probability of 2.01 MMbbl.

Another approach shown in Table 14 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the Kyalla STOIIP per section resulted in a 90% probability of 3.41 MMbbl, a 50% probability of 3.60 MMbbl, and a 10% probability of 3.81 MMbbl.

Confidence in these data was low. The S1 values used in these calculations were very low with an average value of 0.15 mg HC/g rock. Using data with very low oil content potentially increased the degree of error in the calculated results. However, in a qualitative sense these rocks were simply oil lean and the data support that interpretation. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values. Both the quantity and distribution of S1 and hydrocarbon yield data were insufficient so that the STOIIP per section results using these data may not represent the entire interval thickness of 115.1 m for the Kyalla penetrated by the McManus 1 well. The analyzed interval spanned only approximately 51 m with a total of three samples.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
S1 STOIIP	MMbbl	McManus 1	0.20	0.63	2.01
Estimated Oil	MMbbl	McManus 1	9.22	9.74	10.29
37% Retained Oil	MMbbl	McManus 1	3.41	3.60	3.81

Table 14. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 data for the Kyalla Formation core data penetrated by the McManus 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Ronald 1 Well

Table 15 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 13 Kyalla core samples from the Ronald 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 170.3 m (558.73 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.97. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 1.27 MMbbl, a 50% probability of 2.74 MMbbl, and a 10% probability of 5.89 MMbbl.

Another approach shown in Table 15 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the Kyalla STOIIP per section resulted in a 90% probability of 5.36 MMbbl, a 50% probability of 9.32 MMbbl, and a 10% probability of 16.21 MMbbl.

Confidence in these data was moderate to high. The S1 values used in these calculations were low with an average value of 0.39 mg HC/g rock. Using data with very low oil content potentially increased the degree of error in the calculated results. However, in a qualitative sense these rocks were simply oil lean and the data support that interpretation. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values. The distribution of S1 and hydrocarbon yield data spanned the entire interval thickness of 170.3 m for the Kyalla penetrated by the Ronald 1 well. However, only 13 samples having an average spacing close to 9 m were analyzed. These data may or may not accurately represent the overall reservoir properties of the Kyalla penetrated by the Ronald 1 well.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
S1 STOIIP	MMbbl	Ronald 1	1.27	2.74	5.89
Estimated Oil	MMbbl	Ronald 1	14.49	25.19	43.80
37% Retained Oil	MMbbl	Ronald 1	5.36	9.32	16.21

Table 15. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 data for the Kyalla Formation core data penetrated by the Ronald 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Adsorption isotherm data were not available for the Ronald 1 well. In lieu of isotherm data the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale) were used to estimate gas-in-place (GIP) per section in the Kyalla source rock interval. As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Estimated GIP 90, 50, and 10% probability values were calculated based upon 13 Kyalla core samples from the Ronald 1 well and are summarized in Table 16. These data were reported in units of billion standard cubic feet of gas per section, Bscf. The interval thickness provided by NTGS was 170.3 m (558.73 ft). The in-situ resource potential (37% retained gas) per volume data were normally distributed and had a squared correlation coefficient of 0.89. A negative 90% probability value was calculated for this distribution because five samples had an in-situ resource potential of 0 Mscf/acre-ft (estimated 0% oil cracking). While this was statistically correct, in a physical sense this simply means that the 90% probability value equates to zero (i.e. no gas-in-place). Converting these distribution values to an in-situ resource potential per section resulted in a 90% probability of 0.00 Bscf, a 50% probability of 1.15 Bscf, and a 10% probability of 2.80 Bscf.

While not knowing the actual present day gas retention, the 50% in-situ resource potential probability value was much less than reported Barnett Shale gas-in-place data of 150 to 200 Bscf by Jarvie, 2012. Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. If estimated cracked gas values based upon hydrocarbon yield calculations were correct, then the GIP per section of the Kyalla source rock interval penetrated by the Ronald 1 well was low. Further data are needed to confirm the in-situ gas resource potential in this well.

Confidence in these data was moderate. As with the oil data discussed above, the distribution of hydrocarbon yield data were sufficient, but the quantity of data may or may not represent the overall reservoir properties of the entire interval thickness of 170.3 m for the Kyalla penetrated by the Ronald 1 well. There were also no other independent data to compare and assess the accuracy of these results against.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
Estimated Cracked Gas	Bscf	Ronald 1	0.00 (-1.37)	3.10	7.57
37% Retained Gas	Bscf	Ronald 1	0.00 (-0.51)	1.15	2.80

Table 16. Summary of the gas-in-place 90, 50, and 10% probability values based upon geochemical hydrocarbon yield calculations for the Kyalla Formation core data penetrated by the Ronald 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia.

Shenandoah 1/1A Well

Shenandoah 1/1A core analysis data performed for Falcon Oil & Gas (Falcon) have recently become available to the public per the Petroleum Act, 2016, and these data were incorporated into the original study dataset so that they would be utilized for the resource assessment. Upon review of Falcon's data and newly analyzed data, there were discrepancies in the interpreted thermal maturity and generated hydrocarbons of the Kyalla interval. There were notable gas volumes reported from Falcon's data and the gas compositions from core suggested wet gas was present in these source rocks. The original interpretation suggested oil was the main product. Equivalent vitrinite reflectance values from high reflecting solid bitumen using Jacob's conversion equation (Jacob, 1985) resulted in an average of 1.58% Eq. R_o. This value was higher than 0.93% Calc. R_o determined using select T_{max} data. Estimated cracked gas values from the original interpretation were also much lower than the computed gas-in-place using methane only adsorption isotherm, porosity, fluid saturation, and bulk density data available from Falcon's dataset. As a result, there was enough evidence to warrant reevaluation of the thermal maturity in the

Kyalla source rock interval penetrated by the Shenandoah 1/1A well. Updated hydrocarbon yields were used instead of previously reported values for the current resource assessment.

Table 17 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 28 Kyalla core samples from the Shenandoah 1/1A well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 776.8 m (2548.56 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.99. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 9.26 MMbbl, a 50% probability of 17.74 MMbbl, and a 10% probability of 33.99 MMbbl.

Also summarized in Table 17 are the SRP-based STOIIP 90, 50, and 10% probability values calculated based upon eight Kyalla core samples from the Shenandoah 1/1A well. These data are reported in units of million stock tank barrels of oil per section. The SRP STOIIP per volume data were normally distributed and had a squared correlation coefficient of 0.87. A negative 90% probability value was actually calculated for this distribution because two samples had SRP STOIIP per volume values of 0 bbl/acre-ft. While this was statistically correct, in a physical sense this simply means that the 90% probability value equates to zero (i.e. no oil-in-place). Converting the probability values to a SRP STOIIP per section resulted in a 90% probability of 0.00 MMbbl, a 50% probability of 14.18 MMbbl, and a 10% probability of 34.44 MMbbl.

Another approach shown in Table 17 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the Kyalla STOIIP per section resulted in a 90% probability of 14.74 MMbbl, a 50% probability of 21.82 MMbbl, and a 10% probability of 32.80 MMbbl.

Confidence in these results was moderate to low. The S1-based STOIIP per section 50% probability value was higher than the SRP-based STOIIP per section 50% probability value suggesting that the oil content determined from S1 analysis was greater than that determined from the SRP oil saturations. A possible explanation for this is that the SRP data available from the eight depths analyzed may not represent the average properties of the interval, but rather the low end or less favorable properties of the Kyalla. The average reported SRP oil saturation was 1.6% of the pore volume, which was very low. Confidence in the S1 and hydrocarbon yield based STOIIP per section 50% probability values was relatively higher since the sample population was much greater. The thickness of the analyzed interval of 147 m was significantly less than the total thickness used in the calculations. The quantity and distribution of S1 and hydrocarbon yield data were insufficient so that the STOIIP per section results using these data may not represent the entire interval thickness of 776.8 m for the Kyalla penetrated by the Shenandoah 1/1A well. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
S1 STOIIP	MMbbl	Shenandoah 1/1A	9.26	17.74	33.99
SRP STOIIP	MMbbl	Shenandoah 1/1A	0.00 (-6.07)	14.18	34.44
Estimated Oil	MMbbl	Shenandoah 1/1A	39.85	58.98	87.30
37% Retained Oil	MMbbl	Shenandoah 1/1A	14.74	21.82	32.30

Table 17. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the Kyalla Formation core data penetrated by the Shenandoah 1/1A well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations data are also provided for comparison.

Adsorption isotherm data were available for four core samples in the Kyalla penetrated by the Shenandoah 1/1A well. Adsorption isotherm results were determined using a pressure gradient of 0.53 psi/ft as provided by NTGS and a salinity to match that used in the reported SRP data for those same core samples. The methane adsorption gas storage capacity results from isotherm analysis were used in combination with total organic carbon and bulk density, porosity, and fluid saturations from shale rock properties analyses to calculate total gas storage capacity values on a sample by sample basis as described in the Methodology section of this report. These data were converted to a gas-in-place (GIP) per section that resulted in a 90% probability of 198.94 Bscf, a 50% probability of 289.86 Bscf, and a 10% probability of 422.32 Bscf. Gas composition results from gas samples collected from two of the four tested core samples indicated hydrocarbon gases heavier than methane were present in notable quantities. This suggests the isotherm-based GIP per section could potentially be higher than the methane only value reported (Wang, 2010). The 50% probability isotherm-based GIP per section for the Kyalla in the Shenandoah 1/1A well was greater than reported Barnett Shale gas-in-place data of 150 to 200 Bscf (Jarvie, 2012). Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. Based on these core analyses, the shale gas potential in the Kyalla penetrated by the Shenandoah 1/1A well was excellent. Further evaluation of the present day gas potential of the Kyalla penetrated in the Shenandoah 1/1A well is recommended.

Another approach shown in Table 18 to estimate GIP 90, 50, and 10% probability values uses the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Using this method, the in-situ resource potential for the Kyalla GIP per section resulted in a 90% probability of 328.17 Bscf, a 50% probability of 485.71 Bscf, and a 10% probability of 718.89 Bscf.

Confidence in these data was moderate to low. Isotherm based GIP per section may be underestimated since only methane isotherm data were available for the calculations even though hydrocarbons heavier than methane were present in the Kyalla source rocks penetrated by the Shenandoah 1/1A well. Only two core samples from the middle section of the Kyalla had adsorption isotherm data. These data likely do not represent the overall reservoir properties for the entire interval of 776.8 m. The quantity and distribution of isotherm, SRP, S1, and hydrocarbon yield data were insufficient so that the GIP per section results using these data may not represent the entire interval thickness of 776.8 m for the Kyalla penetrated by the Shenandoah 1/1A well. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the isotherm-based GIP per section values.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
Isotherm based GIP	Bscf	Shenandoah 1/1A	198.94	289.86	422.32
Estimated Cracked Gas	Bscf	Shenandoah 1/1A	886.94	1312.74	1942.96
37% Retained Gas	Bscf	Shenandoah 1/1A	328.17	485.71	718.89

Table 18. Summary of the gas-in-place 90, 50, and 10% probability values based upon total organic carbon, adsorption isotherm, and shale rock properties data for the Kyalla Formation core data penetrated by the Shenandoah 1/1A well located in the Beetaloo Sub-basin, Northern Territory, Australia. Updated estimated total cracked gas and 37% retained gas based on geochemical hydrocarbon yield calculations are also provided for comparison.

MIDDLE VELKERRI FORMATION

Altree 2 Well

Table 19 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 75 middle Velkerri core samples from the Altree 2 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 275.25 m (906.33 ft). The S1 STOIIP per volume data were normally distributed and had a squared correlation coefficient of 0.95. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 20.86 MMbbl, a 50% probability of 34.17 MMbbl, and a 10% probability of 47.48 MMbbl.

Also summarized in Table 19 are the SRP-based STOIIP 90, 50, and 10% probability values calculated based upon four middle Velkerri core samples from the Altree 2 well. These data were reported in units of million stock tank barrels of oil per section. The SRP STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.74. The small sample population likely had an effect on the squared correlation coefficient. Converting the probability values to a SRP STOIIP per section resulted in a 90% probability of 5.52 MMbbl, a 50% probability of 27.71 MMbbl, and a 10% probability of 139.13 MMbbl.

Another approach shown in Table 19 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the middle Velkerri STOIIP per section resulted in a 90% probability of 23.77 MMbbl, a 50% probability of 45.99 MMbbl, and a 10% probability of 88.97 MMbbl.

Confidence in these data was moderate to high. The S1-based STOIIP per section 50% probability value was higher than SRP-based STOIIP per section value suggesting that the oil content determined from S1 analysis was greater than that determined from the SRP oil saturations. A possible explanation for this is that the SRP data available from the four depths analyzed may not represent the average properties of the interval, but rather biased toward the low end or less favorable properties of the middle Velkerri. Confidence in the S1 and hydrocarbon yield based STOIIP per section 50% probability values was relatively higher since the sample population was much greater. The quantity and distribution of S1 and hydrocarbon yield data were sufficient so that the STOIIP per section results using these data well represent the entire interval thickness of 275.25 m for the middle Velkerri penetrated by the Altree 2 well. However, only four SRP samples collected from the middle Velkerri spanning a thickness of 162 m were available. Thus, STOIIP per section data using SRP results likely do represent the entire interval thickness of 275.25 m for the middle Velkerri in the Altree 2 well. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
S1 STOIIP	MMbbl	Altree 2	20.86	34.17	47.48
SRP STOIIP	MMbbl	Altree 2	5.52	27.71	139.13
Estimated Oil	MMbbl	Altree 2	65.20	125.31	240.81
37% Retained Oil	MMbbl	Altree 2	23.77	45.99	88.97

Table 19. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the middle Velkerri Formation core data penetrated by the Altree 2 well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

McManus 1 Well

Table 20 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 66 middle Velkerri core samples from the McManus 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 350.7 m (1150.59 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.89. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 12.06 MMbbl, a 50% probability of 31.46 MMbbl, and a 10% probability of 82.08 MMbbl.

Also summarized in Table 20 are the SRP-based STOIIP 90, 50, and 10% probability values calculated based upon five middle Velkerri core samples from the McManus 1 well. These data are reported in units of million stock tank barrels of oil per section. The SRP STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.65. Converting the probability values to a SRP STOIIP per section resulted in a 90% probability of 21.81 MMbbl, a 50% probability of 38.05 MMbbl, and a 10% probability of 66.38 MMbbl.

Another approach shown in Table 20 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the middle Velkerri STOIIP per section resulted in a 90% probability of 27.75 MMbbl, a 50% probability of 118.50 MMbbl, and a 10% probability of 209.25 MMbbl.

Confidence in these data was moderate to high. The S1-based STOIIP per section 50% probability value was slightly lower than the SRP-based STOIIP per section 50% probability value suggesting that the oil content determined from SRP analysis was slightly greater than that determined from the S1 peak. A possible explanation for this was that the S1 STOIIP per section values represent mobile oil present in the rocks while the SRP STOIIP per section values include both mobile and immobile hydrocarbons. The quantity and distribution of S1 and hydrocarbon yield data were sufficient so that the STOIIP per section results using these data well represent the entire interval thickness of 350.7 m for the middle Velkerri penetrated by the McManus 1 well. However, only five SRP samples collected from the middle Velkerri spanning a depth range of roughly 306 m were available. Thus, STOIIP per section data using SRP results may not represent the entire interval thickness of 350.7 m for the middle Velkerri in the McManus 1 well. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
S1 STOIIP	MMbbl	McManus 1	12.06	31.46	82.08
SRP STOIIP	MMbbl	McManus 1	21.81	38.05	66.38
Estimated Oil	MMbbl	McManus 1	75.01	320.28	565.54
37% Retained Oil	MMbbl	McManus 1	27.75	118.50	209.25

Table 20. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the middle Velkerri Formation core data penetrated by the McManus 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Adsorption isotherm data were not available for the McManus 1 well. In lieu of isotherm data the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale) were used to estimate gas-in-place (GIP) per section in the middle Velkerri source rock interval. As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Estimated GIP 90, 50, and 10% probability values were calculated based upon 53 middle Velkerri core samples from the McManus 1 well and are summarized in Table 21. These data were reported in units of billion standard cubic feet of gas per section, Bscf. The interval thickness provided by NTGS was 350.7 m (1150.59 ft). The in-situ resource potential (37% retained gas) per volume data were normally distributed and had a squared correlation coefficient of 0.42. A negative 90% probability value was calculated for this distribution because 37 samples had an in-situ resource potential of 0 Mscf/acre-ft (estimated 0% oil cracking). While this was statistically correct, in a physical sense this simply means that the 90% probability value equates to zero (i.e. no gas-in-place). Converting these distribution values to an in-situ resource potential per section resulted in a 90% probability of 0.00 Bscf, a 50% probability of 29.11 Bscf, and a 10% probability of 142.20 Bscf.

While not knowing the actual present day gas retention, the 50% in-situ resource potential probability value was less than reported Barnett Shale gas-in-place data of 150 to 200 Bscf by Jarvie, 2012. Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. If estimated cracked gas values based upon hydrocarbon yield data were correct, then the GIP per section of the middle Velkerri source rock interval penetrated by the McManus 1 well was low. Further data are needed to confirm the in-situ gas resource potential in this well.

Confidence in these data was moderate. As with the oil data discussed above, the quantity and distribution of hydrocarbon yield data were likely sufficient enough so that the GIP per section results using these data represented the overall reservoir properties of the middle Velkerri penetrated by the McManus 1 well. There were also no other independent data to compare and assess the accuracy of these results against.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
Estimated Cracked Gas	Bscf	McManus 1	0.00 (-227.00)	78.66	384.33
37% Retained Gas	Bscf	McManus 1	0.00 (-83.99)	29.11	142.20

Table 21. Summary of the gas-in-place 90, 50, and 10% probability values based upon geochemical hydrocarbon yield calculations for the middle Velkerri Formation core data penetrated by the McManus 1 well located in the Beetaloo Sub-basin, Northern Territory, Australia.

Shenandoah 1/1A Well

Table 22 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 39 middle Velkerri core samples from the Shenandoah 1/1A well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 263.5 m (864.50 ft) based on modern interpretation of the middle Velkerri penetrated by the Shenandoah 1/1A by Hoffman, 2015. The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.93. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 0.37 MMbbl, a 50% probability of 1.18 MMbbl, and a 10% probability of 3.70 MMbbl.

Also summarized in Table 22 are the SRP-based STOIIP 90, 50, and 10% probability values calculated based upon eight middle Velkerri core samples from the Shenandoah 1/1A well. These data are reported in units of million stock tank barrels of oil per section. The SRP STOIIP per volume data were normally distributed and had a squared correlation coefficient of 0.80. A negative 90% probability value was actually calculated for this distribution because three samples had SRP STOIIP per volume values of 0 bbl/acre-ft. While this was statistically correct, in a physical sense this simply means that the 90% probability value equates to zero (i.e. no oil-in-place). Converting the probability values to a SRP STOIIP per section resulted in a 90% probability of 0.00 MMbbl, a 50% probability of 1.48 MMbbl, and a 10% probability of 3.13 MMbbl.

Total estimated oil generation from hydrocarbon yield calculations were 0 bbl/acre-ft for all samples (Table 22) and as a consequence no statistical evaluations were performed. For the middle Velkerri interval penetrated by the Shenandoah 1/1A well, the total estimated oil yields were zero as a consequence of complete (100%) oil to gas cracking based upon the R_o algorithm.

Confidence in these data was moderate to low. The S1 values used in these calculations were very low with an average value of 0.15 mg HC/g rock. The average SRP oil saturation of 0.8% of the pore volume was also very low. Using data with very low oil content potentially increased the degree of error in the calculated results. However, in a qualitative sense these rocks were simply oil lean and the data support that interpretation. The S1-based STOIIP per section 50% probability value was slightly lower than the SRP-based STOIIP per section 50% probability value suggesting that the oil content determined from SRP analysis was slightly greater than that determined from the S1 peak. A possible explanation for this was that the S1 STOIIP per section 50% probability value represents mobile oil present in the rocks while the SRP STOIIP per section 50% probability value includes both mobile and immobile hydrocarbons. The quantity and distribution of S1 and hydrocarbon yield data were sufficient so that the STOIIP per section results using these data well represent the entire interval thickness of 263.5 m for the middle Velkerri penetrated by the Shenandoah 1 well. However, only eight SRP samples collected from the middle section of the middle Velkerri spanning an analyzed interval thickness of 6.17 m were available. Thus, STOIIP per section data using SRP results likely do not represent the entire interval thickness of 263.5 m for the middle Velkerri in the Shenandoah 1/1A well.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
S1 STOIIP	MMbbl	Shenandoah 1/1A	0.37	1.18	3.70
SRP STOIIP	MMbbl	Shenandoah 1/1A	0.00 (-0.17)	1.48	3.13
Estimated Oil	MMbbl	Shenandoah 1/1A		0.00	

Table 22. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the middle Velkerri Formation core data penetrated by the Shenandoah 1/1A well located in the Beetaloo Sub-basin, Northern Territory, Australia. The total estimated oil yields based upon geochemical hydrocarbon yield calculations was zero for all analyzed samples due to complete (100%) oil to gas cracking based upon the R_o algorithm.

Adsorption isotherm data were available for four core samples in the middle Velkerri penetrated by the Shenandoah 1/1A well. Adsorption isotherm results were determined using a pressure gradient of 0.53 psi/ft as provided by NTGS and a salinity to match that used in the reported SRP data for those same core samples. The methane adsorption gas storage capacity results from isotherm analysis were used in combination with total organic carbon and bulk density, porosity, and fluid saturations from shale rock properties analyses to calculate total gas storage capacity values on a sample by sample basis as described in the Methodology section of this report. These data were converted to a gas-in-place (GIP) per section that resulted in a 90% probability of 106.89 Bscf, a 50% probability of 178.17 Bscf, and a 10% probability of 249.45 Bscf. The 50% probability isotherm-based GIP per section for the middle Velkerri in the Shenandoah 1/1A well was in line with reported Barnett Shale gas-in-place data of 150 to 200 Bscf by Jarvie, 2012. Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. Based on these core analyses, the shale gas potential in the middle Velkerri penetrated by the Shenandoah 1/1A well was excellent. Further evaluation of the present day gas potential of the middle Velkerri penetrated in the Shenandoah 1/1A well is recommended.

Another approach shown in Table 23 to estimate GIP 90, 50, and 10% probability values uses the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Using this method, the in-situ resource potential for the middle Velkerri GIP per section resulted in a 90% probability of 103.34 Bscf, a 50% probability of 191.86 Bscf, and a 10% probability of 356.18 Bscf.

Confidence in these data was moderate. Four core samples, spaced less than 3 m apart, from the middle section of the middle Velkerri penetrated by the Shenandoah 1/1A well had adsorption isotherm data. These data likely do not represent the overall reservoir properties for the entire interval of 263.5 m. As with the oil data discussed above, the quantity and distribution of hydrocarbon yield data were sufficient so that the GIP per section results using these data well represent the entire interval thickness of 263.5 m for the middle Velkerri penetrated by the Shenandoah 1/1A well. The assumed 37% retention factor may have been correct in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were somewhat in line with with the isotherm-based GIP per section values.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
Isotherm based GIP	Bscf	Shenandoah 1/1A	108.89	178.17	249.45
Estimated Cracked Gas	Bscf	Shenandoah 1/1A	279.30	518.53	962.65
37% Retained Gas	Bscf	Shenandoah 1/1A	103.34	191.86	356.18

Table 23. Summary of the gas-in-place 90, 50, and 10% probability values based upon total organic carbon, adsorption isotherm and shale rock properties data for the middle Velkerri Formation core data penetrated by the Shenandoah 1/1A well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total cracked gas and 37% retained gas based on geochemical hydrocarbon yield calculations are also provided for comparison.

Walton 2 Well

Table 24 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 67 middle Velkerri core samples from the Walton 2 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 295.9 m (970.80 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.99. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 21.04 MMbbl, a 50% probability of 37.32 MMbbl, and a 10% probability of 66.23 MMbbl.

Also summarized in Table 24 are the SRP-based STOIIP 90, 50, and 10% probability values calculated based upon four middle Velkerri core samples from the Walton 2 well. These data are reported in units of million stock tank barrels of oil per section. The SRP STOIIP per volume data were normally distributed and had a squared correlation coefficient of 0.89. Converting the probability values to a SRP STOIIP per section resulted in a 90% probability of 34.98 MMbbl, a 50% probability of 47.32 MMbbl, and a 10% probability of 59.67 MMbbl.

Another approach shown in Table 24 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation. Using this method, the in-situ resource potential for the middle Velkerri STOIIP per section resulted in a 90% probability of 22.50 MMbbl, a 50% probability of 51.02 MMbbl, and a 10% probability of 115.70 MMbbl.

Confidence in these data was moderate to high. The S1-based STOIIP per section 50% probability value was lower than the SRP-based STOIIP per section 50% probability value suggesting that the oil content determined from SRP analysis was slightly greater than that determined from the S1 peak. A possible explanation for this was that the S1 STOIIP per section values represent mobile oil present in the rocks while the SRP STOIIP per section values include both mobile and immobile hydrocarbons. The quantity and distribution of S1 and hydrocarbon yield data were sufficient so that the STOIIP per section results using these data well represent the entire interval thickness of 295.9 m for the middle Velkerri penetrated by the Walton 2 well. However, only four SRP samples collected from the middle Velkerri spanning a thickness of 138.62 m were available. Thus, STOIIP per section data using SRP results may not represent the entire interval thickness of 295.9 m for the middle Velkerri in the Walton 2 well. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
S1 STOIIP	MMbbl	Walton 2	21.04	37.32	66.23
SRP STOIIP	MMbbl	Walton 2	34.98	47.32	59.67
Estimated Oil	MMbbl	Walton 2	60.80	137.88	312.69
37% Retained Oil	MMbbl	Walton 2	22.50	51.02	115.70

Table 24. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the middle Velkerri Formation core data penetrated by the Walton 2 well located in the Beetaloo Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

OT DOWNS SUB-BASIN

Core data from the Kyalla and middle Velkerri Formations from the Burdo 1 and Tanumbirini 1 wells in the OT Downs Sub-basin were analyzed for potential hydrocarbon resources. As explained in the previous section, Kyalla and middle Velkerri stock tank oil-in-place and gas-in-place per volume data were log-normally or normally distributed using a cumulative probability function. Using the 90, 50, and 10% probability results, reservoir thicknesses as supplied by NTGS, and an assumed area of 640 acres, the stock tank oil-in-place and gas-in-place per section values were determined. All the calculated results used to derive the data reported in this section of the report are provided in Appendix III.

Some samples in this study were analyzed from core that was not preserved and has been exposed to atmospheric conditions over an extended period. This likely resulted in a change of the fluid saturations as compared with the in-situ state of the rocks. If a change did occur, the rate and degree of change would be dependent on the permeability of the rock, the time the core was exposed to atmospheric conditions, the fluid composition, and several other factors. It is important to understand this when reviewing hydrocarbon-in-place results from core data such as these as it could adversely affect the results from programmed pyrolysis, shale rock properties, and adsorption isotherms, which are the main data sets used in this study.

Throughout the following discussion comments were provided regarding the confidence WFT Labs had in the data reported. A variety of factors can influence data quality. Confidence in the analytical results depends on adherence to sample collection, preservation, and processing protocols as well as reliability of client provided information, such as reservoir pressure. Further confidence when these data are applied to an entire depth interval depend on the quantity and distribution of the data within the interval being evaluated as well as the reliability of client provided interval thickness information used in the calculations. Relative confidence levels assigned to the data discussed in this report are defined as the following:

- Low confidence — Data should not be considered representative of reservoir properties and conditions.
- Moderate confidence — Data are suspect but may be useful in conjunction with other information to describe reservoir properties and conditions.
- High confidence — Data are believed to represent reservoir properties and conditions (assuming data accurately describe initial reservoir conditions).

KYALLA FORMATION

Burdo 1 Well

Table 25 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 52 Kyalla core samples from the Burdo 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 395.2 m (1296.59 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.96. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 0.94 MMbbl, a 50% probability of 3.14 MMbbl, and a 10% probability of 10.48 MMbbl.

Another approach shown in Table 25 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation.

Using this method, the in-situ resource potential for the Kyalla STOIIP per section resulted in a 90% probability of 12.87 MMbbl, a 50% probability of 26.97 MMbbl, and a 10% probability of 41.06 MMbbl.

Confidence in these data was moderate. The S1 values used in these calculations were low with an average value of 0.24 mg HC/g rock. Using data with very low oil content potentially increased the degree of error in the calculated results. However, in a qualitative sense these rock are simply oil lean and the data support that interpretation. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values. The quantity and distribution of S1 and hydrocarbon yield data were sufficient so that the STOIIP per section results using these data well represent the entire interval thickness of 395.2 m for the Kyalla penetrated by the Burdo 1 well.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
S1 STOIIP	MMbbl	Burdo 1	0.94	3.14	10.48
Estimated Oil	MMbbl	Burdo 1	34.79	72.88	110.98
37% Retained Oil	MMbbl	Burdo 1	12.87	26.97	41.06

Table 25. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 data for the Kyalla Formation core data penetrated by the Burdo 1 well located in the OT Downs Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

Adsorption isotherm data were not available for the Burdo 1 well. In lieu of isotherm data the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale) were used to estimate gas-in-place (GIP) per section in the Kyalla source rock interval. As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Estimated GIP 90, 50, and 10% probability values were calculated based upon 49 Kyalla core samples from the Burdo 1 well and are summarized in Table 26. These data were reported in units of billion standard cubic feet of gas per section, Bscf. The interval thickness provided by NTGS was 395.2 m (1296.59 ft). The in-situ resource potential (37% retained gas) per volume data were normally distributed and had a squared correlation coefficient of 0.40. A negative 90% probability value was calculated for this distribution because there were 37 samples that had an in-situ resource potential of 0 Mscf/acre-ft (estimated 0% oil cracking). While this was statistically correct, in a physical sense this means that the 90% probability value equates to zero (i.e. no gas-in-place). Converting these distribution values to an in-situ resource potential per section resulted in a 90% probability of 0.00 Bscf, a 50% probability of 2.45 Bscf, and a 10% probability of 11.04 Bscf.

While not knowing the actual present day gas retention, the 50% in-situ resource potential probability value was much less than reported Barnett Shale gas-in-place data of 150 to 200 Bscf by Jarvie, 2012. Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. If estimated cracked gas values based upon hydrocarbon yield calculations were correct, then the GIP per section of the Kyalla source rock interval penetrated by the Burdo 1 well was low. Further data are needed to confirm the in-situ gas resource potential in this well.

Confidence in these data was moderate. As with the oil data discussed above, the quantity and distribution of hydrocarbon yield data were sufficient so that the GIP per section results using these data well represent the entire interval thickness of 395.2 m for the Kyalla penetrated by the Burdo 1 well. However, there were no other independent data to compare and assess the accuracy of these results against.

Parameter	Unit	Well	90%	50%	10%
Kyalla					
Estimated Cracked Gas	Bscf	Burdo 1	0.00 (-15.90)	7.47	30.85
37% Retained Gas	Bscf	Burdo 1	0.00 (-6.13)	2.45	11.04

Table 26. Summary of the gas-in-place 90, 50, and 10% probability values based upon geochemical hydrocarbon yield calculations for the Kyalla Formation core data penetrated by the Burdo 1 well located in the OT Downs Sub-basin, Northern Territory, Australia.

MIDDLE VELKERRI FORMATION

Tanumbirini 1 Well

Table 27 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon five middle Velkerri core samples from the Tanumbirini 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 503 m (1650.26 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.85. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 2.58 MMbbl, a 50% probability of 3.05 MMbbl, and a 10% probability of 3.60 MMbbl.

Also summarized in Table 27 are the SRP-based STOIIP 90, 50, and 10% probability values calculated based upon five middle Velkerri core samples from the Tanumbirini 1 well. These data are reported in units of million stock tank barrels of oil per section. The SRP STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.78. Converting the probability values to a SRP STOIIP per section resulted in a 90% probability of 1.02 MMbbl, a 50% probability of 2.27 MMbbl, and a 10% probability of 5.05 MMbbl.

Total estimated oil generation from hydrocarbon yield calculations were 0 bbl/acre-ft for all samples (Table 27) and as a consequence no statistical evaluations were performed. For the middle Velkerri interval penetrated by the Tanumbirini 1 well, the total estimated oil yields were zero as a consequence of complete (100%) oil to gas cracking based upon the R_o algorithm.

Confidence in these results was moderate to low. The S1 values used in these calculations were very low with an average value of 0.12 mg HC/g rock. The average SRP oil saturation of 0.5% of the pore volume was also very low. Using data with very low oil content potentially increased the degree of error in the calculated results. However, in a qualitative sense these rocks were simply oil lean and the data support that interpretation. The S1-based STOIIP per section 50% probability value was higher than the SRP-based STOIIP per section 50% probability value suggesting that the oil content determined from S1 analysis was greater than that determined from the SRP oil saturations. The thickness of the analyzed interval of 74.15 m was significantly less than the total thickness used in the calculations. The quantity and distribution of S1, hydrocarbon yield, and shale rock properties data were insufficient so that the STOIIP per section results using these data may not represent the entire interval thickness of 503 m for the middle Velkerri penetrated by the Tanumbirini 1 well.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
S1 STOIIP	MMbbl	Tanumbirini 1	2.58	3.05	3.60
SRP STOIIP	MMbbl	Tanumbirini 1	1.02	2.27	5.05
Estimated Oil	MMbbl	Tanumbirini 1		0.00	

Table 27. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 and shale rock properties (SRP) data for the middle Velkerri Formation core data penetrated by the Tanumbirini 1 well located in the OT Downs Sub-basin, Northern Territory, Australia. The total estimated oil yields based upon geochemical hydrocarbon yield calculations was zero for all analyzed samples due to complete (100%) oil to gas cracking based upon the R_o algorithm.

Adsorption isotherm data were available for two core samples in the middle Velkerri penetrated by the Tanumbirini 1 well. Adsorption isotherm results were determined using a pressure gradient of 0.53 psi/ft as provided by NTGS and a salinity to match that used in the reported SRP data for those same core samples. The methane adsorption gas storage capacity results from isotherm analysis were used in combination with total organic carbon and bulk density, porosity, and fluid saturations from shale rock properties analyses to calculate total gas storage capacity values on a sample by sample basis as described in the Methodology section of this report. These data were converted to a gas-in-place (GIP) per volume in which the average of the two results was converted to a GIP per section value reported in units of billion standard cubic feet of gas per section, Bscf, as summarized in Table 28. The isotherm-based GIP per section for the middle Velkerri samples in the Tanumbirini 1 well was 292.04 Bscf. Gas composition results were not available at the time of preparing this report; therefore, the calculated GIP per section for the middle Velkerri core samples in the Tanumbirini 1 well could be different if the gas was not predominately composed of methane. The average isotherm-based GIP per section for the middle Velkerri in the Tarlee S3 well was greater than reported Barnett Shale gas-in-place data of 150 to 200 Bscf (Jarvie, 2012). Sondergeld et al, 2010 have suggested an original gas-in-place greater than 100 Bscf/section as desirable in shale gas plays. Based on these core analyses, the shale gas potential in the middle Velkerri penetrated by the Tanumbirini 1 well was excellent. Further evaluation of the present day gas potential of the middle Velkerri penetrated in the Tanumbirini 1 well is recommended.

Another approach shown in Table 28 to estimate GIP 90, 50, and 10% probability values uses the total estimated secondary cracked gas from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). As noted previously, this approach based upon carbon mass balance calculations was likely to be a less conservative and more poorly constrained figure. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of secondary cracked gas generation and any oil-associated gas was not factored into the determination. Estimated GIP 90, 50, and 10% probability values were calculated based upon five middle Velkerri core samples from the Tanumbirini well and are summarized in Table 28. These data were reported in units of billion standard cubic feet of gas per section, Bscf. The interval thickness provided by NTGS was 503 m (1650.26 ft). The in-situ resource potential (37% retained gas) per volume data were normally distributed and had a squared correlation coefficient of 0.81. Converting these values to an in-situ resource potential per section resulted in a 90% probability of 471.54 Bscf, a 50% probability of 1023.60 Bscf, and a 10% probability of 1575.66 Bscf.

Confidence in these data was moderate to low. Only two core samples from the entire interval had adsorption isotherm data. These data likely do not represent the overall reservoir properties of the entire interval of 503 m. As with the oil data discussed above, the quantity and distribution of hydrocarbon yield data were insufficient so that the GIP per section results using these data may not represent the entire interval thickness of 503 m for the middle Velkerri penetrated by the Tanumbirini 1 well. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were much higher relative to the isotherm-based GIP per section values. However, one must also consider that the isotherm-based GIP could be different if gases other than methane are present as 100% methane composition was assumed.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
Isotherm based GIP	Bscf	Tanumbirini 1		*292.04*	
Estimated Cracked Gas	Bscf	Tanumbirini 1	1090.47	2449.60	5502.71
37% Retained Gas	Bscf	Tanumbirini 1	471.54	1023.60	1575.66

Italicized values indicate statistical distribution analysis could not be performed due to an insufficient number of samples. Average values, or actual value if only one sample, were used instead.

Table 28. Summary of the gas-in-place 90, 50, and 10% probability values based upon geochemical hydrocarbon yield calculations for the middle Velkerri Formation core data penetrated by the Tanumbirini 1 well located in the OT Downs Sub-basin, Northern Territory, Australia.

BROADMERE SUB-BASIN

Core data from the middle Velkerri Formations from the Broadmere 1 well in the Broadmere Sub-basin were analyzed for potential hydrocarbon resources. As explained previously, middle Velkerri stock tank oil-in-place per volume data were log-normally or normally distributed using a cumulative probability function. Using the 90, 50, and 10% probability results, reservoir thicknesses as supplied by NTGS, and an assumed area of 640 acres, the stock tank oil-in-place per section values were determined. All the calculated results used to derive the data reported in this section of the report are provided in Appendix IV.

Some samples in this study were analyzed from core that was not preserved and has been exposed to atmospheric conditions over an extended period. This likely resulted in a change of the fluid saturations as compared with the in-situ state of the rocks. If a change did occur, the rate and degree of change would be dependent on the permeability of the rock, the time the core was exposed to atmospheric conditions, the fluid composition, and several other factors. It is important to understand this when reviewing hydrocarbon-in-place results from core data such as these as it could adversely affect the results from programmed pyrolysis, shale rock properties, and adsorption isotherms, which are the main data sets used in this study.

Throughout the following discussion comments were provided regarding the confidence WFT Labs had in the data reported. A variety of factors can influence data quality. Confidence in the analytical results depends on adherence to sample collection, preservation, and processing protocols as well as reliability of client provided information, such as reservoir pressure. Further confidence when these data are applied to an entire depth interval depend on the quantity and distribution of the data within the interval being evaluated as well as the reliability of client provided interval thickness information used in the calculations. Relative confidence levels assigned to the data discussed in this report are defined as the following:

- Low confidence — Data should not be considered representative of reservoir properties and conditions.
- Moderate confidence — Data are suspect but may be useful in conjunction with other information to describe reservoir properties and conditions.
- High confidence — Data are believed to represent reservoir properties and conditions (assuming data accurately describe initial reservoir conditions).

MIDDLE VELKERRI FORMATION

Broadmere 1 Well

Table 29 summarizes the S1-based STOIIP 90, 50, and 10% probability values calculated based upon 50 middle Velkerri core samples from the Broadmere 1 well. These data were reported in units of million stock tank barrels of oil per section, MMbbl. The interval thickness provided by NTGS was 161.54 m (529.99 ft). The S1 STOIIP per volume data were log-normally distributed and had a squared correlation coefficient of 0.91. Converting these values to a S1 STOIIP per section resulted in a 90% probability of 2.52 MMbbl, a 50% probability of 7.85 MMbbl, and a 10% probability of 24.46 MMbbl.

Another approach shown in Table 29 to estimate STOIIP 90, 50, and 10% probability values uses the total estimated oil generation from hydrocarbon yield calculations (Ruble et al., 2016) and an assumed retention efficiency (default of 37% based upon work done in the Barnett Shale). This approach was likely to be a less conservative (and less constrained) figure, since yields were based on carbon mass balance calculations and were likely to be overestimations. This method also uses a proprietary algorithm for oil to gas cracking to quantify the amounts of estimated oil generation and secondary cracked gas generation.

Using this method, the in-situ resource potential for the middle Velkerri STOIIP per section resulted in a 90% probability of 6.27 MMbbl, a 50% probability of 14.61 MMbbl, and a 10% probability of 34.07 MMbbl.

Confidence in these data was high. The quantity and distribution of S1 and hydrocarbon yield data were sufficient so that the STOIIP per section results using these data well represent the entire interval thickness of 161.54 m for the middle Velkerri penetrated by the Broadmere 1 well. The assumed 37% retention factor may have been too high in this instance because the estimated in-situ resource potential using hydrocarbon yield calculations gave results that were higher relative to the S1 STOIIP per section values.

Parameter	Unit	Well	90%	50%	10%
middle Velkerri					
S1 STOIIP	MMbbl	Broadmere 1	2.52	7.85	24.46
Estimated Oil	MMbbl	Broadmere 1	16.94	39.49	92.09
37% Retained Oil	MMbbl	Broadmere 1	6.27	14.61	34.07

Table 29. Summary of the stock tank oil-in-place 90, 50, and 10% probability values based upon programmed pyrolysis S1 data for the middle Velkerri Formation core data penetrated by the Broadmere 1 well located in the Broadmere Sub-basin, Northern Territory, Australia. Estimated total oil and 37% retained oil based on geochemical hydrocarbon yield calculations are also provided for comparison.

MAP-BASED VOLUMETRIC CALCULATION

A 3D regional geologic model covering the entire McArthur basin (Figure 2) was constructed for the estimation of original hydrocarbon initially in-place (OHIP) for the each intervals of interest.

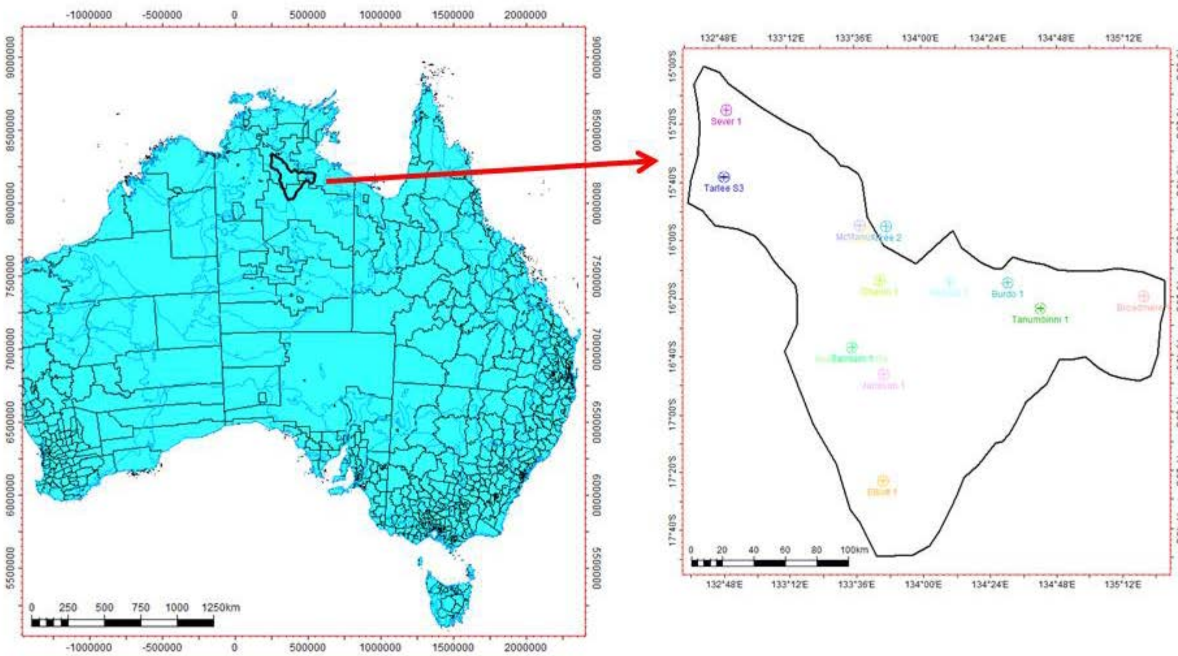

Figure 2. Area of interest within McArthur Basin.

A "Map-Based Volume Calculation" approach was used to calculate the OHIP for both the Kyalla and middle Velkerri intervals. This approach utilizes regional geology and property maps (depth structure, isopach, porosity, water saturation, and net-to-gross maps) to estimate OHIP using the following equations:

$$NetVolume = BulkVolume * NTG \tag{12}$$

$$PoreVolume = NetVolume * Porosity \tag{13}$$

$$HydrocarbonPoreVolume = NetVolume * Porosity \tag{14}$$

$$OHIP = \frac{HydrocarbonPoreVolume}{FormationVolumeFactor * SolutionGas - OilRatio} \tag{15}$$

The net volume was calculated using top and base structural maps for both Kyalla and middle Velkerri separately. Figure 3 and Figure 4 show the top structure map of the Kyalla and mid Velkerri respectively. Figure 5 and Figure 6 show the isopach maps for the Kyalla and mid Velkerri intervals. These maps were generated using both seismic horizons and well formation top data (Table 1). Net-to-gross values of 0.5 and 0.33 were used for Kyalla and middle Velkerri, respectively. Both porosity and water saturation maps (Figure 7, Figure 8, Figure 9, and Figure 10) were created for both intervals using core measurements data (Table 30). Using cumulative probability functions, 90, 50 and 10% probability values (i.e. P90, P50, and P10 values) were determined from the core data. Each interval then was evaluated separately using these values for porosity and water saturation.

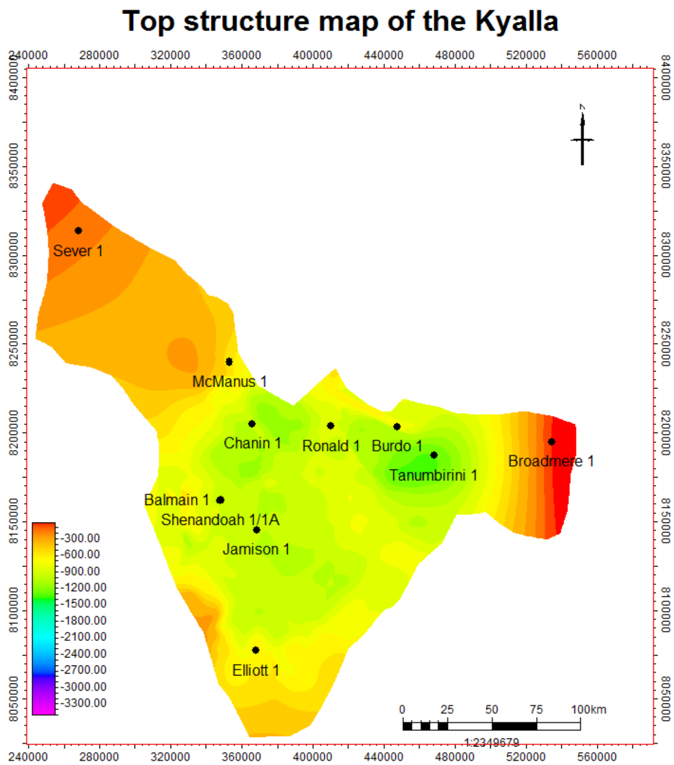

Figure 3. Top structure map of the Kyalla interval.

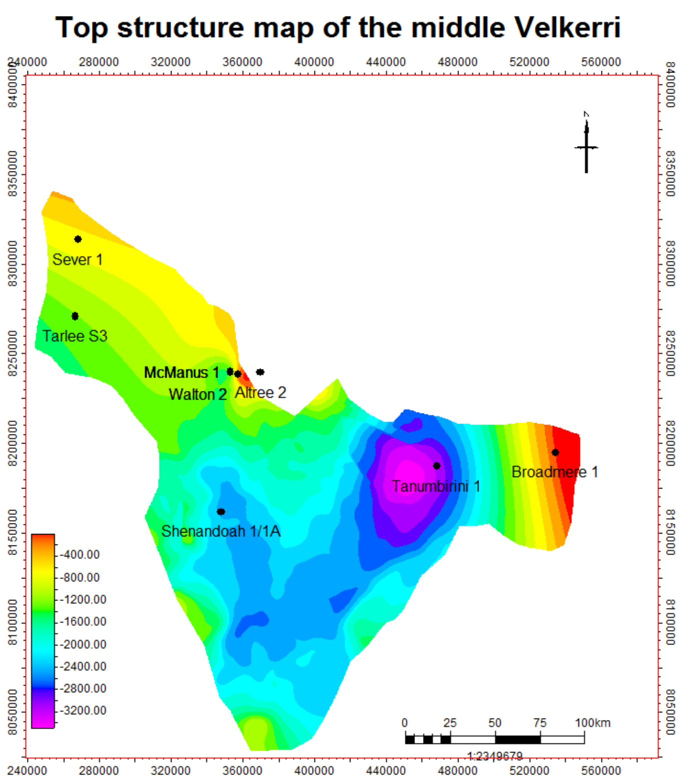

Figure 4. Top structure map of middle Velkerri interval.

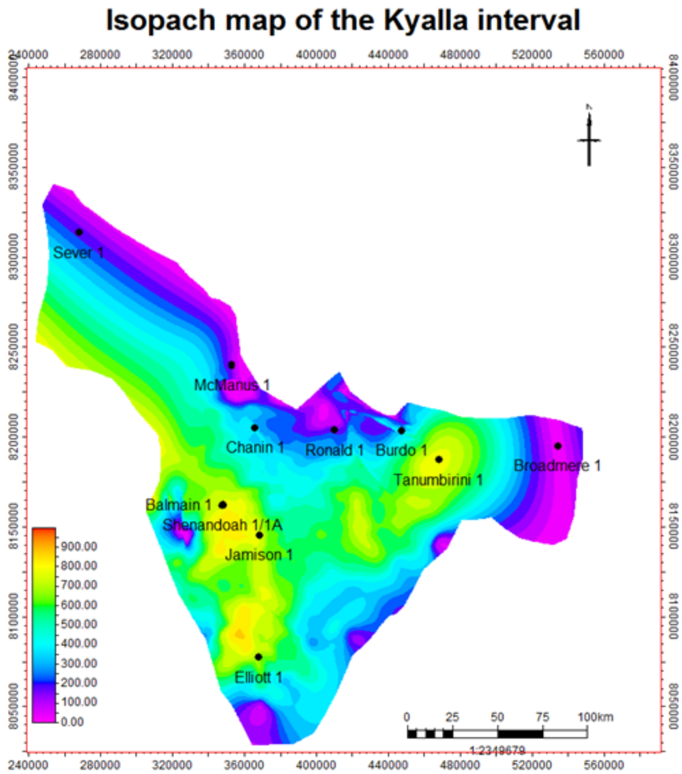

Figure 5. Isopach map of the Kyalla interval.

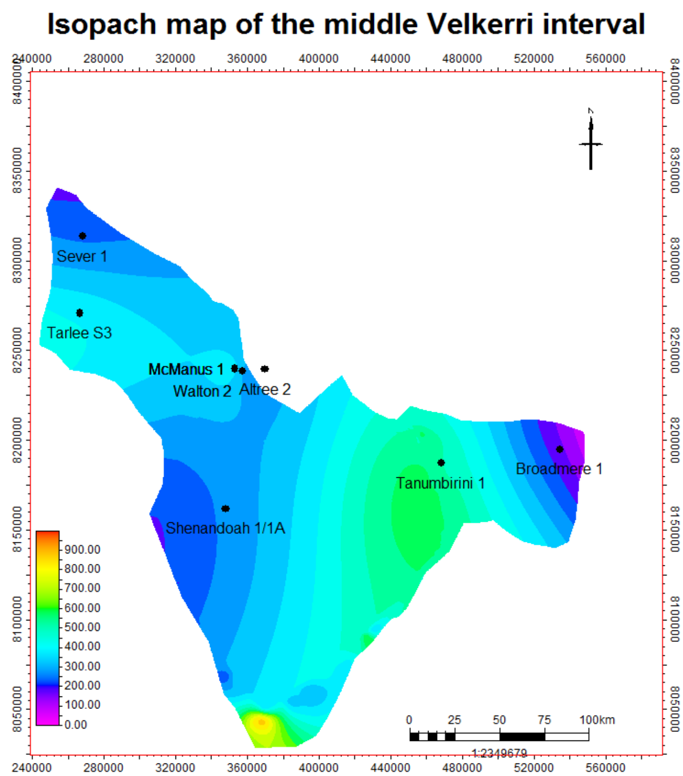

Figure 6. Isopach map of the middle Velkerri interval.

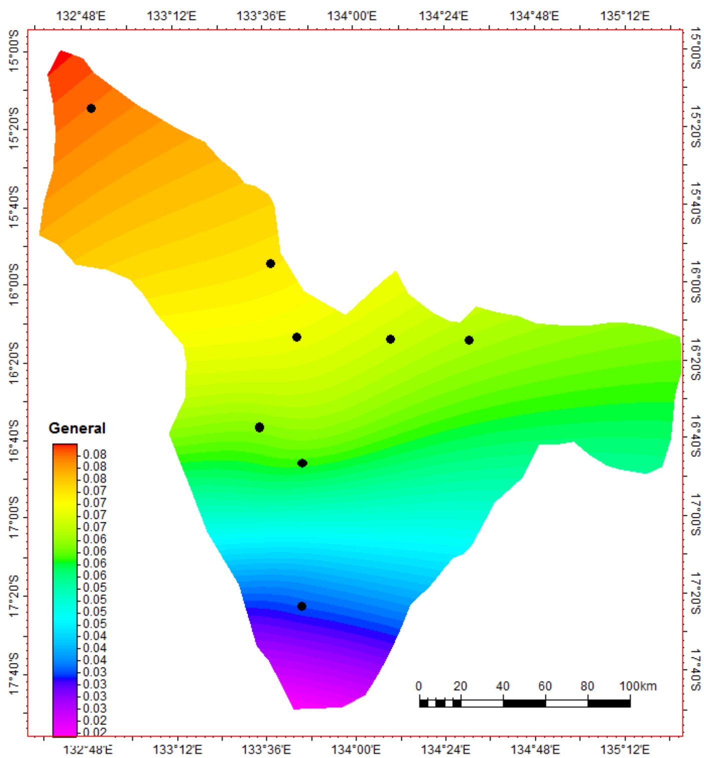

Figure 7. Porosity (P50) map of Kyalla interval.

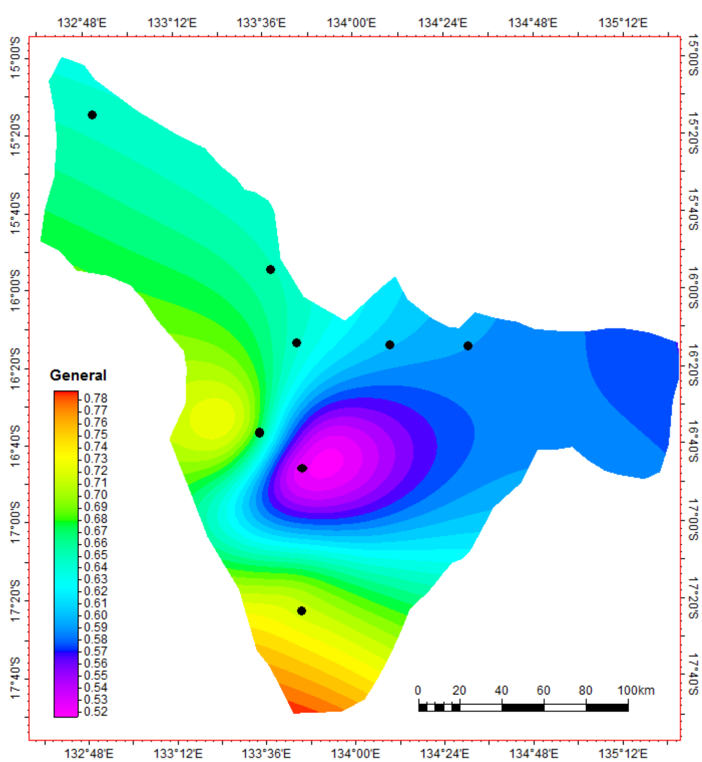

Figure 8. Water saturation (P50) map of Kyalla interval.

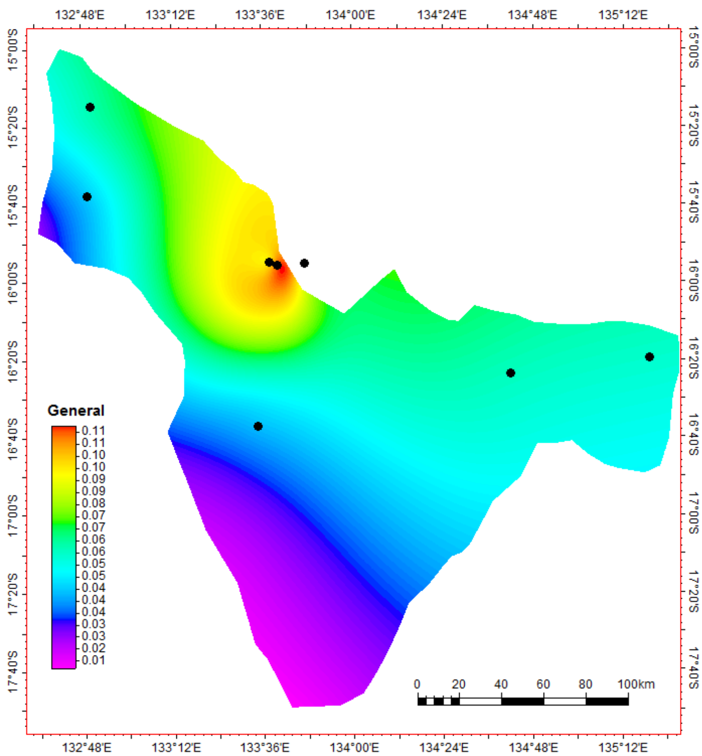

Figure 9. Porosity (P50) of middle Velkerri interval.

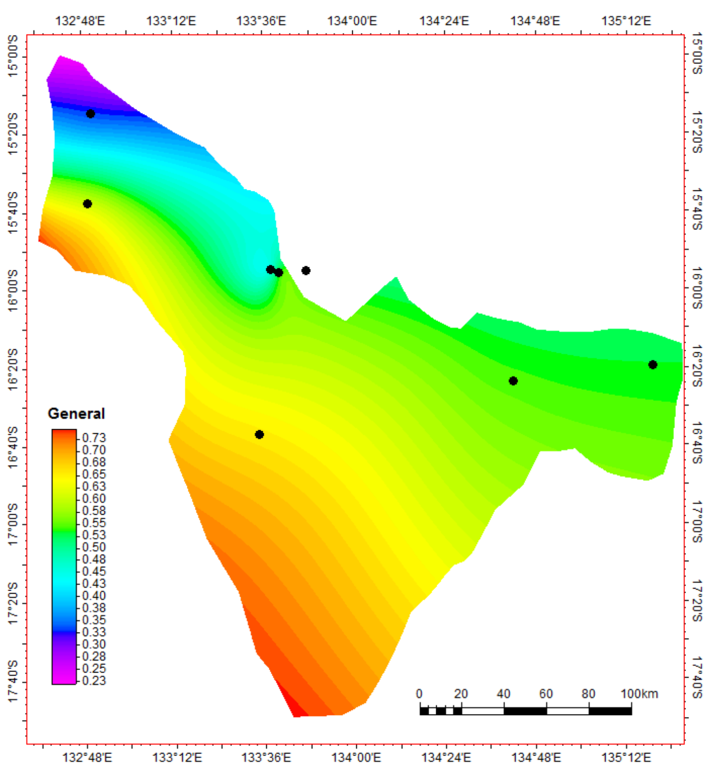

Figure 10. Water saturation (P50) of middle Velkerri interval.

Well Name	Interpreted Formation	90% phi (frac of BV)	90% Sw (frac of PV)	50% phi (frac of BV)	50% Sw (frac of PV)	10% phi (frac of BV)	10% Sw (frac of PV)
Altree 2	middle Velkerri	0.05	0.38	0.08	0.51	0.10	0.63
Elliott 1	Kyalla	0.03	0.71	0.03	0.71	0.03	0.71
Jamison 1	Kyalla	0.04	0.51	0.06	0.52	0.07	0.63
McManus 1	middle Velkerri	0.09	0.40	0.10	0.46	0.10	0.54
Sever 1	middle Velkerri	0.06	0.23	0.06	0.33	0.07	0.46
Shenandoah 1/1A	Kyalla	0.04	0.56	0.06	0.66	0.08	0.77
Shenandoah 1/1A	middle Velkerri	0.03	0.49	0.04	0.65	0.05	0.81
Tanumbirini 1	middle Velkerri	0.06	0.50	0.06	0.54	0.07	0.65
Tarlee S3	middle Velkerri	0.03	0.50	0.04	0.60	0.08	0.67
Walton 2	middle Velkerri	0.09	0.43	0.11	0.53	0.13	0.56

Table 30. Porosity and water saturation values from core measurements.

Hydrocarbon types (e.g. oil or gas) were determined using the measured vitrinite reflectance (R_o) data from core. R_o maps were generated for both intervals (Figure 11 and Figure 12). Figure 11 shows that the Kyalla interval was in oil window; therefore, the hydrocarbon type was assumed to be 100% oil for the Kyalla interval. However, Figure 12 shows that the middle Velkerri was in the dry gas window in the southern region of the study area, whereas it was still in oil window in the northern region of the study area. Therefore, the model was run separately for the oil and gas window. The formation volume factor and gas-oil-ratio for both dry gas and oil were calculated and the results are summarized in Table 31. Due to an inherent in-source trapping mechanism found in shale reservoirs, free water levels could not be determined from petrophysical logs. Therefore, for the volumetric calculations, the structural base of the prospective interval was used as the contact between oil/gas and water.

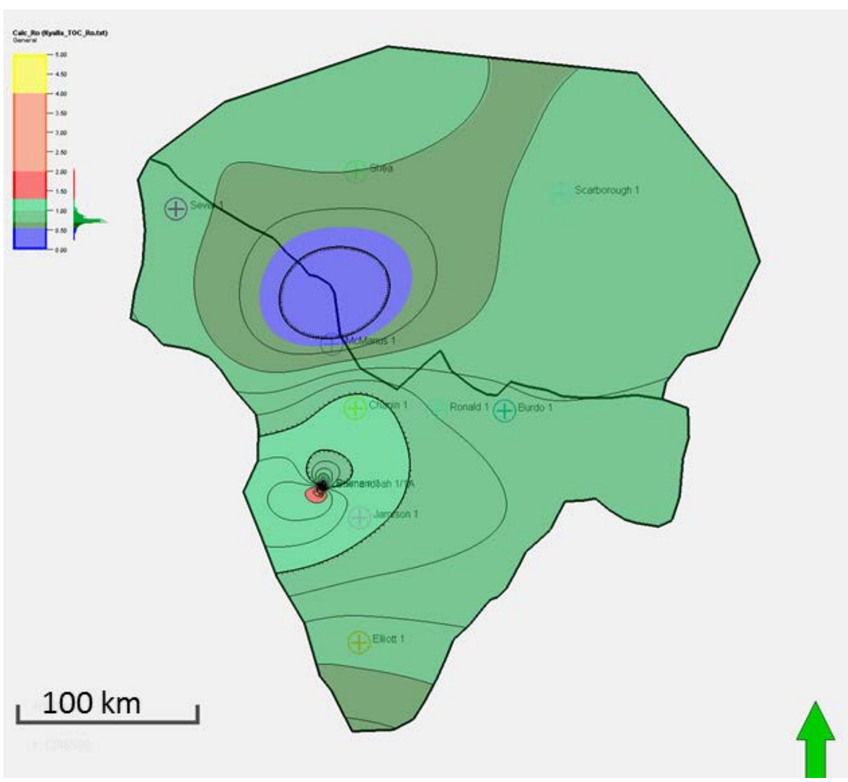

Figure 11. Ro map of Kyalla interval.

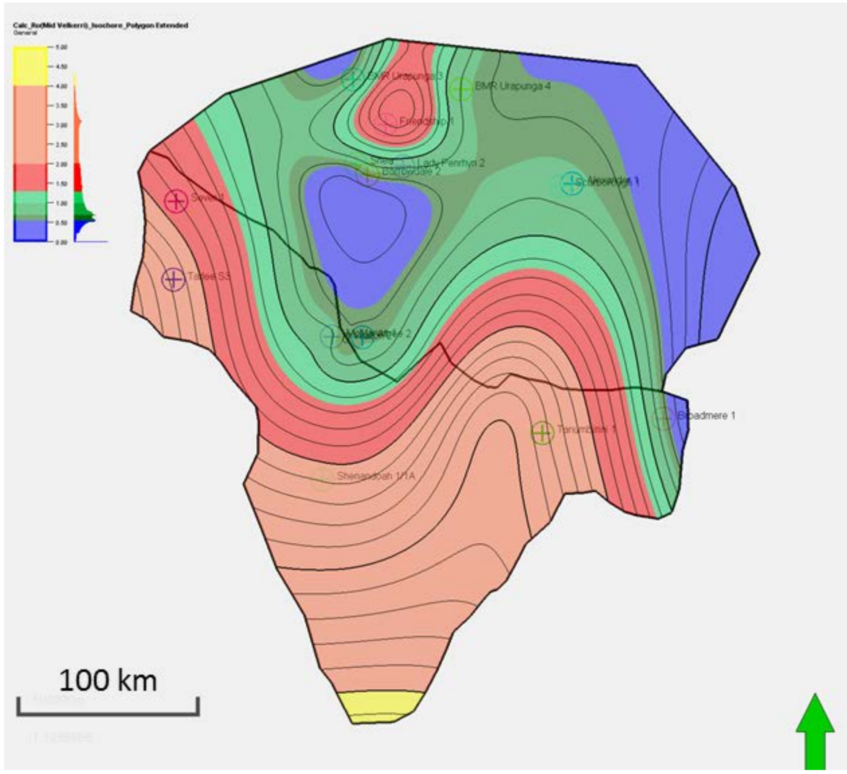

Figure 12. Ro map of middle Velkerri interval.

Hydrocarbon Type	GOR	Formation Volume Factor
Oil	119	1.4
Dry Gas	0	0.013

Table 31. GOR and formation volume factor for dry gas and oil scenario.

The volumetric results from the modeling are shown in Table 32. The Total OHIP (oil) values for Kyalla ranged from 1164 (P10) to 414 (P90) MMbbl with a P50 value of 772 MMbbl over an area of 36,600 km^2 (Figure 13). For the middle Velkerri, the gas and oil volume are estimated to be 202 Tcf (P50) and 96 MMbbl (P50), respectively (Figure 14, Figure 15, and Figure 16). The oil window is distributed in two areas within the middle Velkerri interval and referred to as oil-zone 1 and zone 2 located in the west and eastern part of the mapped area. The calculated OHIP (gas) probability values for the middle Velkerri were compared with OHIP (gas) values reported for a number of US shale plays and summarized in Table 33.

Interpreted Formation	Hydrocarbon Type (unit)	90%	50%	10%
Kyalla	Oil (MMbbl)	414	772	1164
middle Velkerri	Oil, Zone 1 (MMbbl)	62	83	113
	Oil, Zone 2 (MMbbl)	10	13	15
	Dry Gas (Tcf)	118	202	293

Table 32. Estimated OHIP values from Map-Based Volumetric approach.

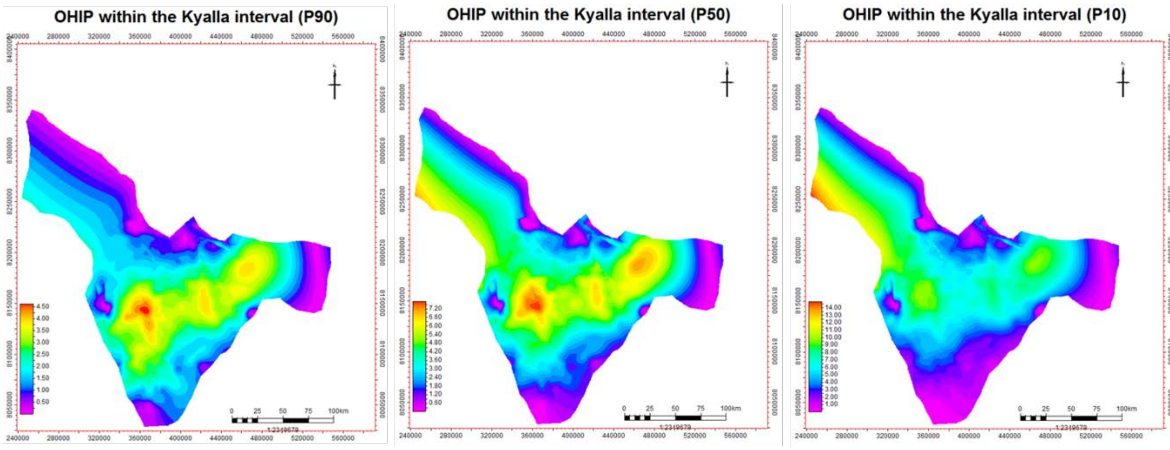

Figure 13. OHIP maps of Kyalla interval; P90 (left), P50 (middle) and P10 (right).

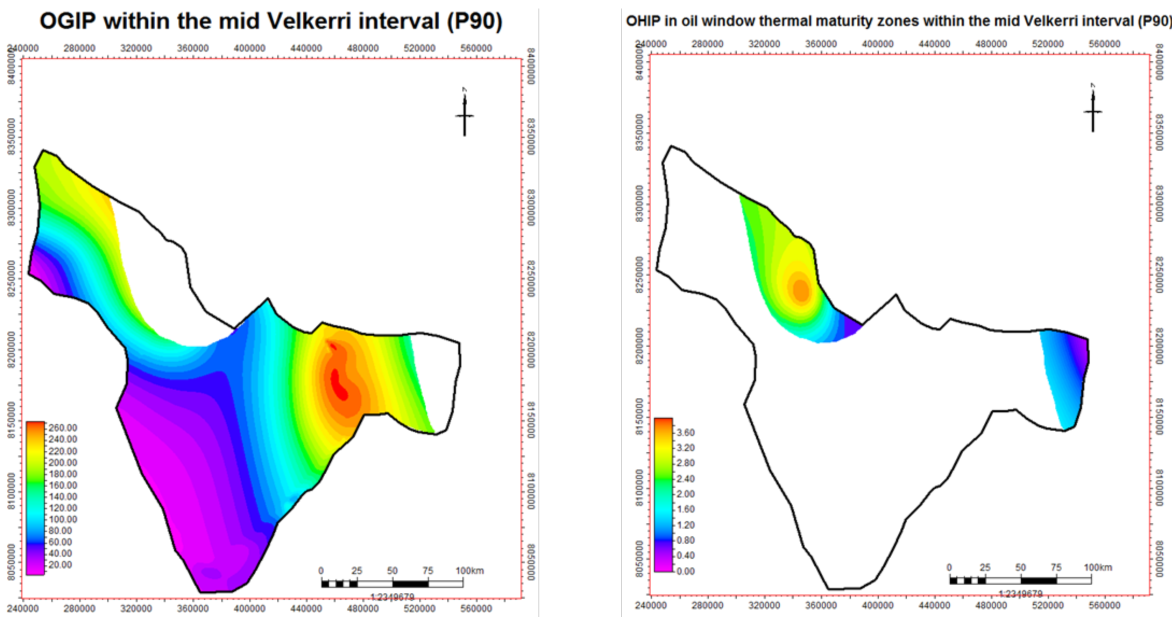

Figure 14. OHIP map (P90) of middle Velkerri; dry gas (left) and oil (right).

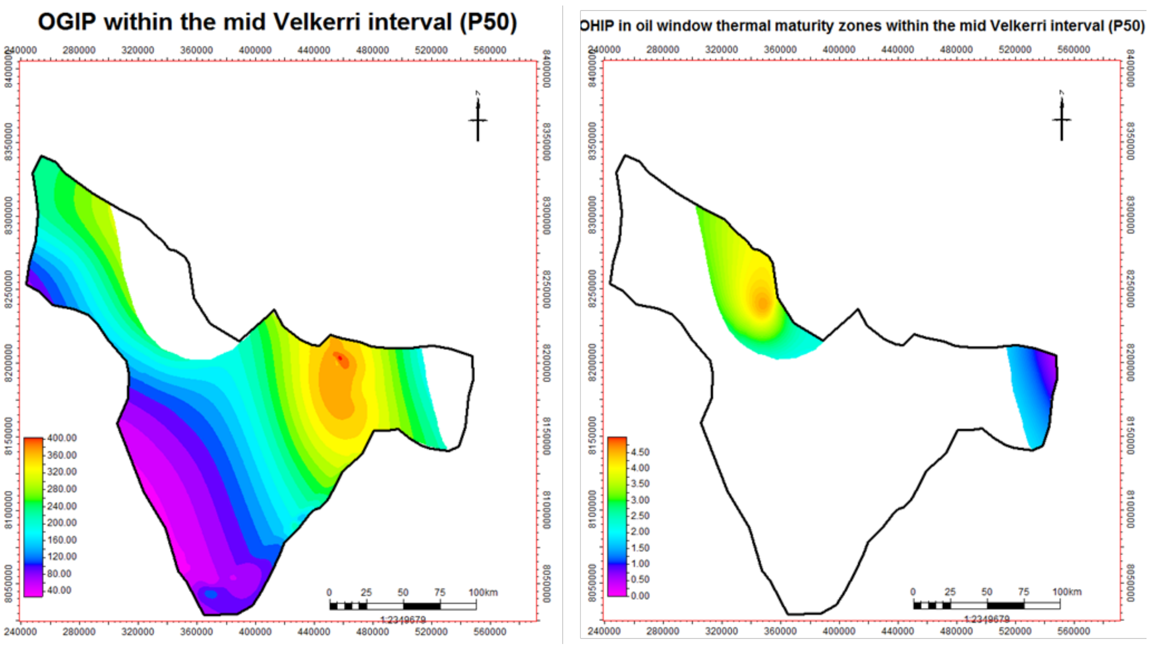

Figure 15. OHIP map (P50) of middle Velkerri; dry gas (left) and oil (right).

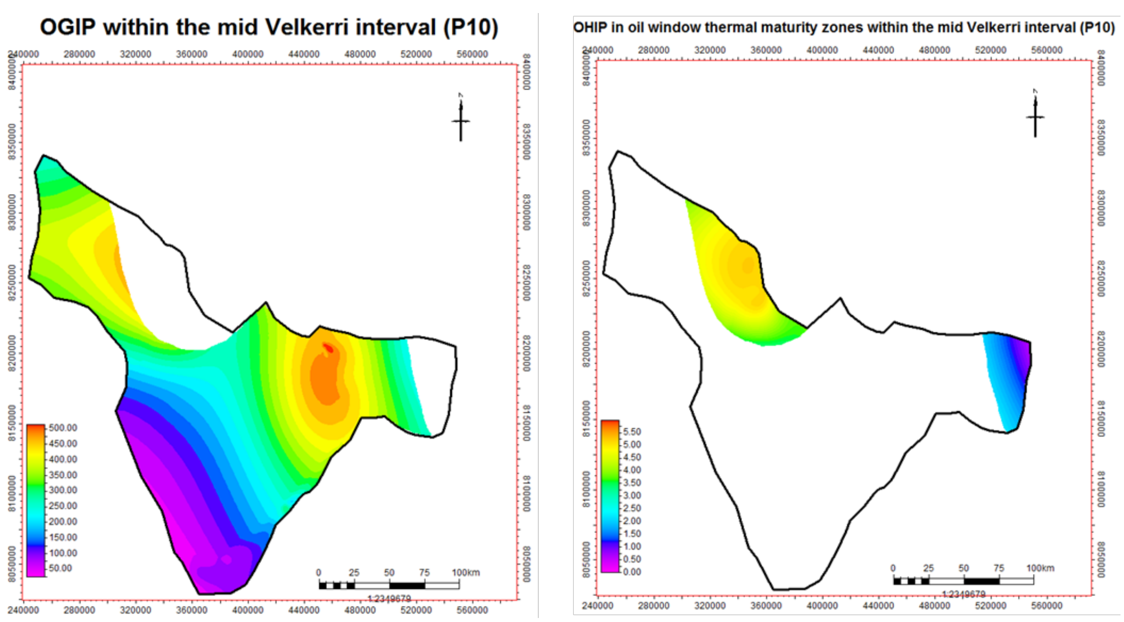

Figure 16. OHIP map (P90) of middle Velkerri; dry gas (left) and oil (right).

Formation	Basin Area (m^2)	GIP (Tcf)
Marcellus	160000	225-248
Antrim	122000	35-76
New Albany	53000	86-160
Barnett	4200	3-30
Lewis	1100	96.8
middle Velkerri	11914	118-293

Table 33. Comparison of OHIP (gas) values between middle Velkerri and North American Shale Plays (Jarvie, 2012).

Amount of adsorbed gas is estimated for the gas window present within the middle Velkerri Formation using the following equation (Figure 17):

$$Adsorbed\ gas = 21.67 * TOC$$

Adsorbed gas = scf/ton

TOC = wt. %

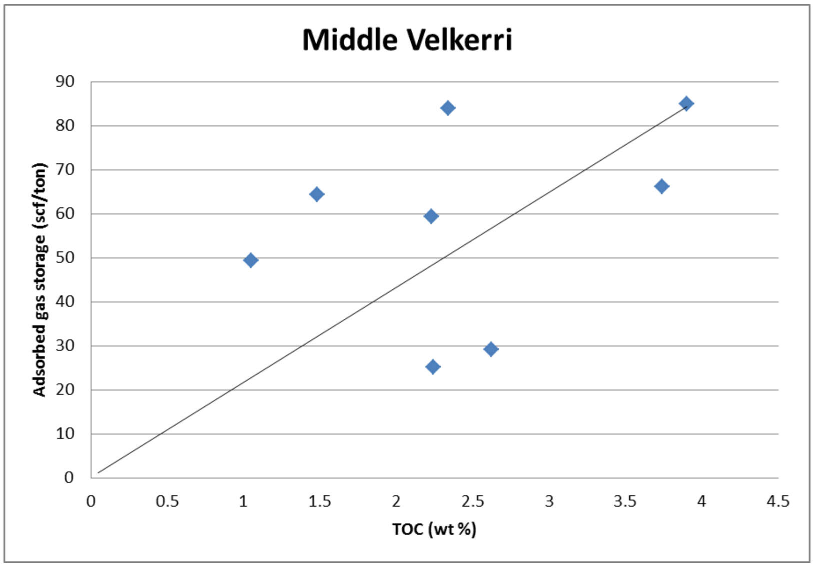

Figure 17. Crossplot of TOC and adsorbed gas is used to establish a regression between the two.

Figure 18 shows the distribution of adsorbed gas within the middle Velkerri Formation. Total estimated adsorbed gas is 10 Tcf. Due to limited dataset for the adsorbed gas (3 data point only) further analysis could not be performed.

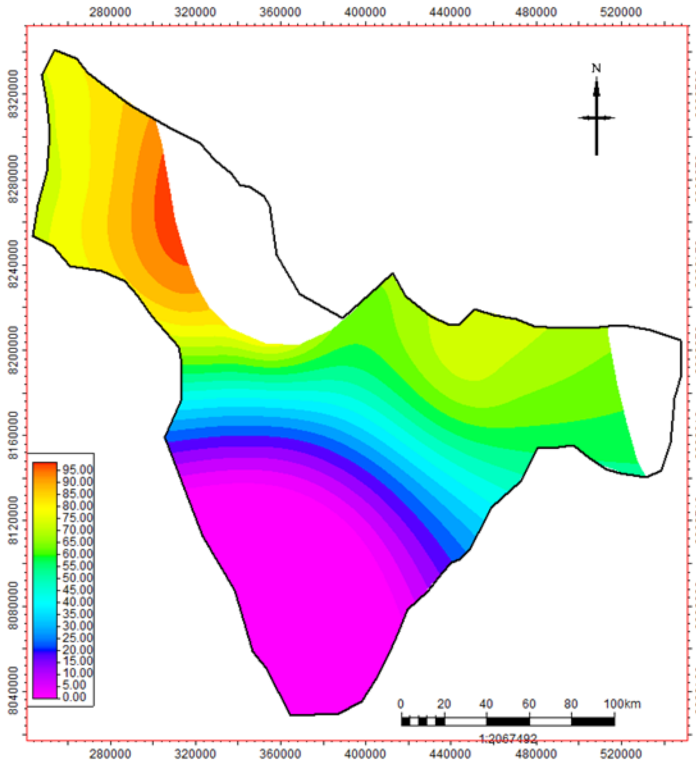

Figure 18. Distribution of adsorbed gas for the Gas window within the middle Velkerri Formation.

OHIP COMPARISON BETWEEN DIFFERENT METHODS

OHIP estimates using the conventional modeling approach described above was compared with the OHIP estimated using S1 data, SRP, and hydrocarbon yield data. The following equations were used for such comparison of OHIP:

$$TotalOHIP_{s1} = NetVolume * \frac{OHIP}{volume_{s1}} \tag{16}$$

$$TotalOHIP_{SRP} = NetVolume * \frac{OHIP}{volume_{SRP}} \tag{17}$$

$$TotalOHIP_{HCYield} = NetVolume * \frac{OHIP}{volume_{HCYield}} \tag{18}$$

Table 34 shows the comparison between OHIP values estimated using different methods. For most of the scenarios except for estimated gas in the middle Velkerri, the map-based volumetric value was much larger than the SRP, S1, and hydrocarbon (HC) yield-based volumetric values as each method has its own limitation.

Interpreted Formation	Method Type	90% Oil (MMbbl)	50% Oil (MMbbl)	10% Oil (MMbbl)
Kyalla	Map-based Volumetric	414	772	1164
	SRP-based Volumetric		143	
	S1-based Volumetric		94	
	HC Yield-based Volumetric		293	
Interpreted Formation	**Method Type**	**90% Oil, Zone 1 (MMbbl)**	**50% Oil, Zone 1 (MMbbl)**	**10% Oil, Zone 1 (MMbbl)**
middle Velkerri	Map-based Volumetric	62	83	113
	SRP-based Volumetric		9	
	S1-based Volumetric		13	
	HC Yield-based Volumetric		24	
	Method Type	**90% Oil, Zone 2 (MMbbl)**	**50% Oil, Zone 2 (MMbbl)**	**10% Oil, Zone 2 (MMbbl)**
	Map-based Volumetric	10	13	15
	SRP-based Volumetric		0.7	
	S1-based Volumetric		1	
	HC Yield-based Volumetric		1.8	
	Method Type	**90% Gas (Tcf)**	**50% Gas (Tcf)**	**10% Gas (Tcf)**
	Map-based Volumetric	118	202	293
	S1-based Volumetric		752	

Table 34. OHIP comparisons between different methods.

UNCERTAINTY

The OHIP calculated using the map-based volumetric approach provides only a rough estimate due to lack of data. When more data become available, for example well logs, the technical assessment study can become more refined with reduced uncertainty.

Rock properties (porosity and permeability) measured in limited core data were used to generate a spatial distribution in the entire McArthur Basin using a mapping algorithm. These maps may lead to inaccurate and biased results, especially where the cores were preferentially targeted for the best rock types. Therefore, this process might overestimate the OHIP calculation.

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Appendix I

Kyalla and middle Velkerri Resource Assessment Data
Gorrie Sub-basin

McArthur Basin Study, 2016

Northern Territory Geological Survey - Australia

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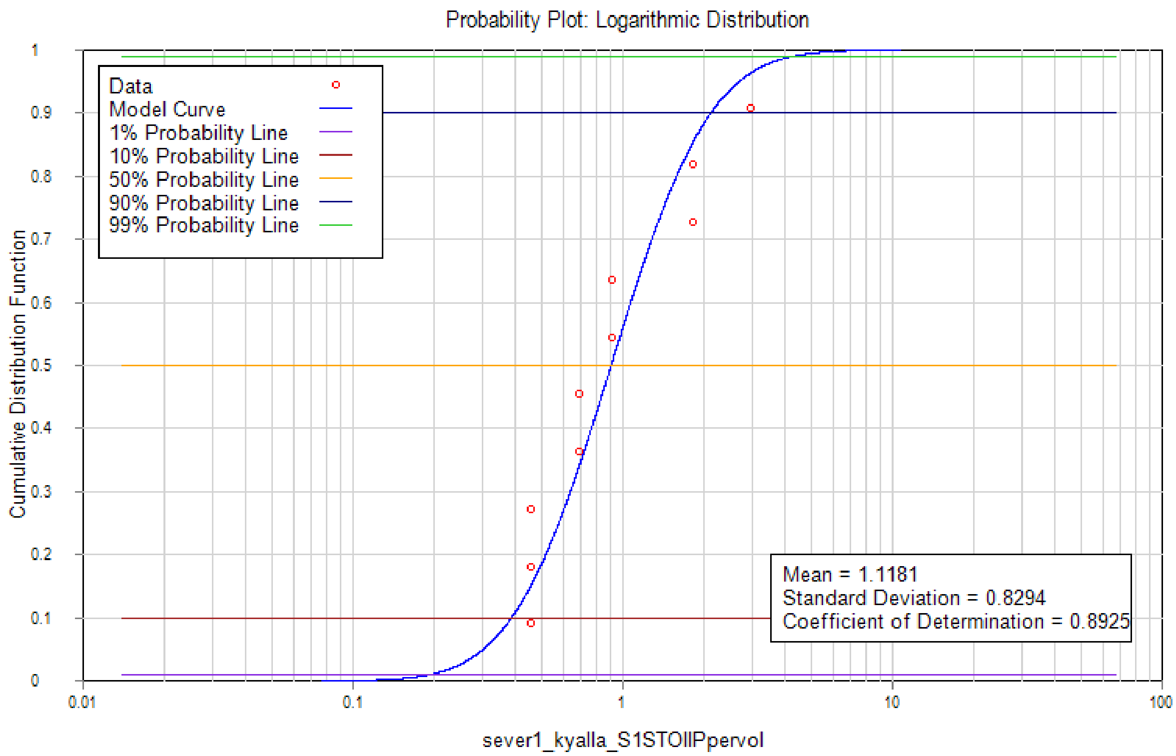
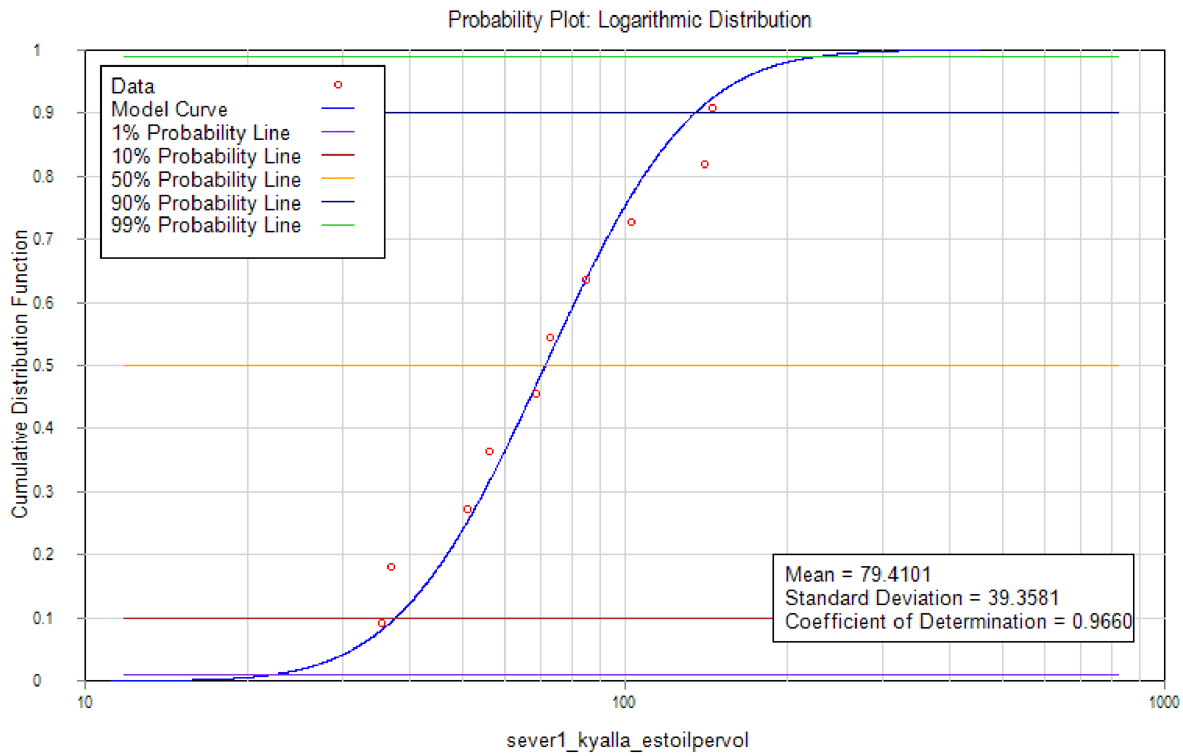
WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Sever 1	Kyalla	281.9	924.8688	0.03	2.5	0.85	0.684564706									5.704705882	90.16039359	84.45568771	0	31.24860445	0
Sever 1	Kyalla	289.42	949.5407	0.04	2.5	0.85	0.912752941									24.18795294	75.36238911	51.17443617	0	18.93454138	0
Sever 1	Kyalla	295.12	968.2415	0.02	2.5	0.85	0.456376471									3.651011765	76.42778942	72.77677766	0	26.92740773	0
Sever 1	Kyalla	301.97	990.7152	0.03	2.5	0.85	0.684564706									7.073835294	63.11778622	56.04395092	0	20.73626184	0
Sever 1	Kyalla	307.4	1008.53	0.13	2.5	0.85	2.966447059									29.20809412	65.94404071	36.73594659	0	13.59230024	0
Sever 1	Kyalla	315.75	1035.925	0.08	2.5	0.85	1.825505882									26.69802353	62.20181059	35.50378706	0	13.13640121	0
Sever 1	Kyalla	316.37	1037.959	0.02	2.5	0.85	0.456376471									5.932894118	108.8740714	102.9411773	0	38.0882356	0
Sever 1	Kyalla	320.55	1051.673	0.08	2.5	0.85	1.825505882									38.33562353	106.7470687	68.4114452	0	25.31223472	0
Sever 1	Kyalla	326.1	1069.882	0.02	2.5	0.85	0.456376471									9.583905882	154.9193043	145.3353984	0	53.77409742	0
Sever 1	Kyalla	330.68	1084.908	0.04	2.5	0.85	0.912752941									10.04028235	150.7623818	140.7220995	0	52.06717681	0
Sever 1	middle Velkerri	677.3	2222.113	0.09	2.5	0.85	2.053694118									1.140941176	219.473817	114.4822997	623.1034568	42.35845089	230.548279
Sever 1	middle Velkerri	679.5	2229.331	0.04	2.5	0.85	0.912752941									2.738258824	65.42473925	1.223925046	368.7753323	0.452852267	136.4468729
Sever 1	middle Velkerri	686.78	2253.215	0.12	2.5	0.85	2.738258824									0.228188235	237.5599623	4.633795045	1396.187874	1.714504167	516.5895135
Sever 1	middle Velkerri	687.44	2255.381	0.12	2.5	0.85	2.738258824									3.194635294	13.59583121	0	62.40717548	0	23.09065493
Sever 1	middle Velkerri	687.7	2256.234		2.5	0.85															
Sever 1	middle Velkerri	687.75	2256.398	0.17	2.5	0.85	3.8792									6.161082353	247.4159169	4.710391019	1419.266661	1.742844677	525.1286647
Sever 1	middle Velkerri	690.27	2264.665	0.12	2.5	0.85	2.738258824									2.966447059	12.25071142	0	55.70558618	0	20.61106689
Sever 1	middle Velkerri	694	2276.903	0.06	2.5	0.85	1.369129412									0.456376471	106.791798	2.076150787	625.5556246	0.768175791	231.4555811
Sever 1	middle Velkerri	699.57	2295.177	0.07	2.5	0.85	1.597317647									0	152.8670729	2.984660135	899.2944765	1.10432425	332.7389563
Sever 1	middle Velkerri	700.45	2298.064	0.06	2.5	0.85	1.369129412									12.77854118	86.99814015	1.449103944	436.6229701	0.536168459	161.550499
Sever 1	middle Velkerri	704	2309.711	0.03	2.5	0.85	0.684564706									1.369129412	37.74174012	0.710158696	213.9747121	0.262758718	79.17064347
Sever 1	middle Velkerri	711.8	2335.302	0.04	2.5	0.85	0.912752941									2.053694118	44.59293673	0.830559382	250.2520994	0.307306971	92.59327676
Sever 1	middle Velkerri	715	2345.801	0.02	2.5	0.85	0.456376471									0.456376471	91.52838727	1.778139628	535.7632271	0.657911662	198.232394
Sever 1	middle Velkerri	719.7	2361.22	0.91	2.5	0.85	20.76512941									11.86578824	569.3975141	10.88555361	3279.877034	4.027654834	1213.554503
Sever 1	middle Velkerri	725.01	2378.642	0.37	2.5	0.85	8.442964706									7.986588235	414.954332	7.945860271	2394.131301	2.9399683	885.8285814
Sever 1	middle Velkerri	730.3	2395.997	1.02	2.5	0.85	23.2752									18.02687059	1342.152951	25.85296003	7789.638721	9.565595213	2882.166327
Sever 1	middle Velkerri	730.5	2396.654		2.5	0.85															
Sever 1	middle Velkerri	735.08	2411.68	0.61	2.5	0.85	13.91948235									9.127529412	878.252923	16.96927838	5112.936691	6.278633	1891.786576
Sever 1	middle Velkerri	740	2427.822		2.5	0.85															
Sever 1	middle Velkerri	740.21	2428.51	0.93	2.5	0.85	21.22150588									21.22150588	1998.367095	38.60286921	11631.25632	14.28306161	4303.564838
Sever 1	middle Velkerri	744.99	2444.193	0.26	2.5	0.85	5.932894118									1.140941176	714.3456087	13.92499705	4195.678023	5.15224891	1552.400868
Sever 1	middle Velkerri	749.3	2458.333	0.31	2.5	0.85	7.073835294									0	3128.417516	61.08093044	18404.01951	22.59994426	6809.487219
Sever 1	middle Velkerri	751.37	2465.125	0.31	2.5	0.85	7.073835294									20.76512941	975.7891762	18.64641055	5618.265818	6.899171904	2078.758352
Sever 1	middle Velkerri	753.4	2471.785	0.13	2.5	0.85	2.966447059									15.28861176	433.2439283	8.160387637	2458.769574	3.019343426	909.7447422
Sever 1	middle Velkerri	756.54	2482.087	0.15	2.5	0.85	3.422823529									11.86578824	337.6266456	6.360332714	1916.403148	2.353323104	709.0691647
Sever 1	middle Velkerri	756.56	2482.152		2.511	0.85		0.073714	0.006204	3.548034675											
Sever 1	middle Velkerri	756.59	2482.251	0.04	2.5	0.85	0.912752941									1.825505882	446.9181259	8.690231156	2618.414333	3.215385528	968.8133033
Sever 1	middle Velkerri	840.24	2756.693	0.36	2.5	0.85	8.214776471									28.52352941	933.4019263	17.66733952	5323.266344	6.536915624	1969.608547
Sever 1	middle Velkerri	842.59	2764.403	0.06	2.5	0.85	1.369129412									1.140941176	554.333732	10.80083787	3254.351718	3.996310012	1204.110136
Sever 1	middle Velkerri	845.19	2772.933	0.29	2.5	0.85	6.617458824									18.48324706	668.8170224	12.69747145	3825.817823	4.698064437	1415.552595
Sever 1	middle Velkerri	850.28	2789.633	0.25	2.5	0.85	5.704705882									12.55035294	152.731587	2.736974896	824.6655549	1.012680712	305.1262553
Sever 1	middle Velkerri	855.15	2805.61	0.22	2.5	0.85	5.020141176									14.37585882	249.0781829	4.58245623	1380.719207	1.695508805	510.8661067
Sever 1	middle Velkerri	860.16	2822.047	0.22	2.5	0.85	5.020141176									12.77854118	203.9343234	3.732229786	1124.541314	1.380925021	416.0802863
Sever 1	middle Velkerri	863.5	2833.005	0.11	2.513	0.85	2.523122955	0.06161	0.046635	22.290248						5.734370353	218.0960085	4.146264489	1249.292242	1.534117861	462.2381296
Sever 1	middle Velkerri	863.55	2833.169	0.05	2.5	0.85	1.140941176									36.28192941	254.6330873	155.960035	374.3467372	57.70521296	138.5082928
Sever 1	middle Velkerri	865.27	2838.812	0.13	2.5	0.85	2.966447059									10.26847059	456.7524393	8.717396607	2626.599433	3.225436745	971.8417901
Sever 1	middle Velkerri	870.15	2854.823	0.02	2.5	0.85	0.456376471									13.69129412	283.6044826	5.269932356	1587.859537	1.949874972	587.5080285
Sever 1	middle Velkerri	875	2870.735		2.5	0.85															
Sever 1	middle Velkerri	875.5	2872.375	0.24	2.5	0.85	5.476517647									12.55035294	626.3855993	11.98485426	3611.102353	4.434396076	1336.107871
Sever 1	middle Velkerri	880.29	2888.091	0.16	2.5	0.85	3.651011765									11.40941176	445.6899463	8.4791301	2554.808427	3.137278137	945.2791178
Sever 1	middle Velkerri	882.5	2895.341	0.14	2.528	0.85	3.230415209	0.062162	0.007338	3.538564546						5.768598588	382.072938	7.347171235	2213.743009	2.718453357	819.0849134
Sever 1	middle Velkerri	882.55	2895.505	0.15	2.5	0.85	3.422823529									26.01345882	1380.612102	26.44792297	7968.904319	9.785731499	2948.494598
Sever 1	middle Velkerri	885.27	2904.429	0.16	2.5	0.85	3.651011765									5.248329412	323.4137027	6.212034338	1871.720033	2.298452705	692.5364124
Sever 1	middle Velkerri	890	2919.948		2.5	0.85															
Sever 1	middle Velkerri	890.06	2920.144	0.18	2.5	0.85	4.107388235									1.140941176	633.1124891	12.3389573	3717.795543	4.565414203	1375.584351
Sever 1	middle Velkerri	895.05	2936.516	0.14	2.5	0.85	3.194635294									1.140941176	403.6669304	7.859137033	2368.001113	2.907880702	876.1604119
Sever 1	middle Velkerri	900.15	2953.248	0.18	2.5	0.85	4.107388235									2.281882353	428.0557132	8.313040576	2504.764742	3.075825013	926.7629544
Sever 1	middle Velkerri	905.97	2972.343	0.14	2.5	0.85	3.194635294									0.684564706	309.2549698	6.024696946	1815.274249	2.22913787	671.6514722
Sever 1	middle Velkerri	910.19	2986.188	0.09	2.5	0.85	2.053694118									0.912752941	218.1260843	4.240991594	1277.834039	1.56916689	472.7985944
Sever 1	middle Velkerri	911.07	2989.075	0.1	2.564	0.85	2.340298541	0.062683	0.034172	16.61736536						3.97850752	146.101636	2.774889503	836.0894339	1.026709116	309.3530905
Sever 1	middle Velkerri	915.07	3002.198	0.06	2.5	0.85	1.369129412									1.140941176	162.4826129	3.150122826	949.1492931	1.165545446	351.1852384



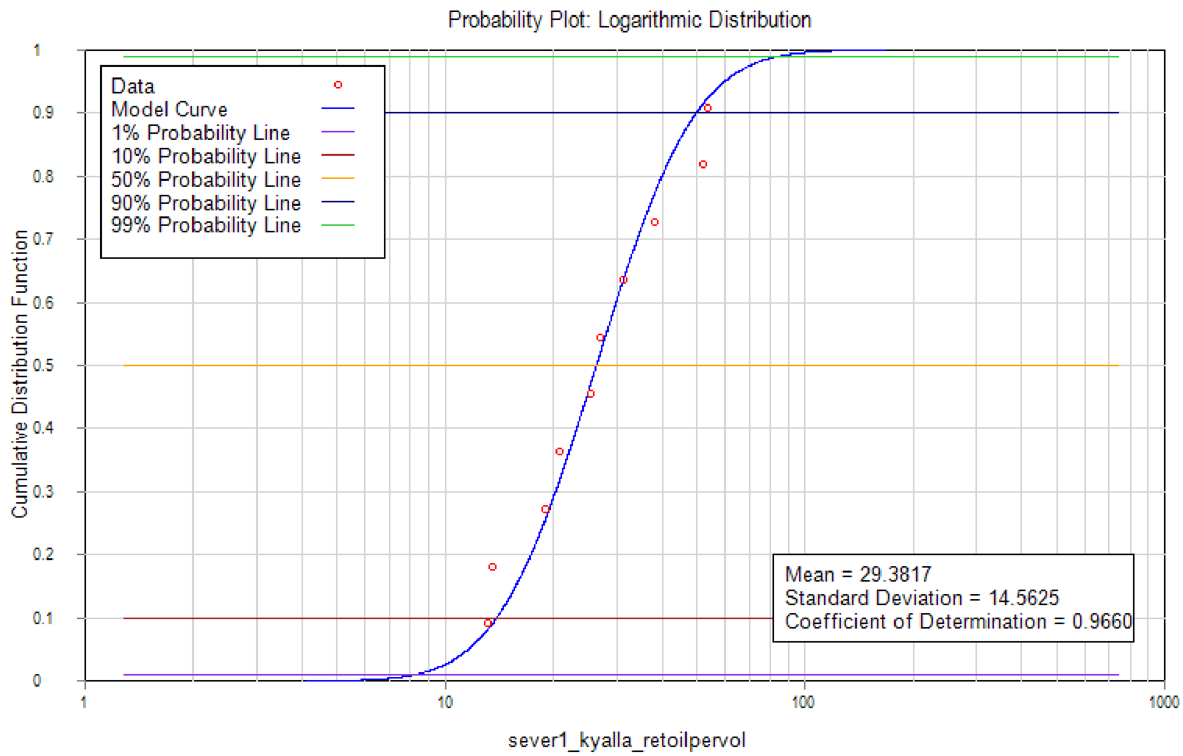
Distribution Report

Log-Normal Distribution Report	
Parameter	sever1_kyalla_S1STOIIPpervol
Description	Sever 1 Kyalla S1 STOIIP per Volume
Number of Positive Points	10
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.89250
Data Range	
Minimum Value	0.4564
Average Value	1.1181
Maximum Value	2.9664
Standard Deviation	0.829398
Distribution	
99% Value	0.1935
90% Value	0.3868
50% Value	0.9046
10% Value	2.1157
1% Value	4.2296
Average Value Probability	0.6254



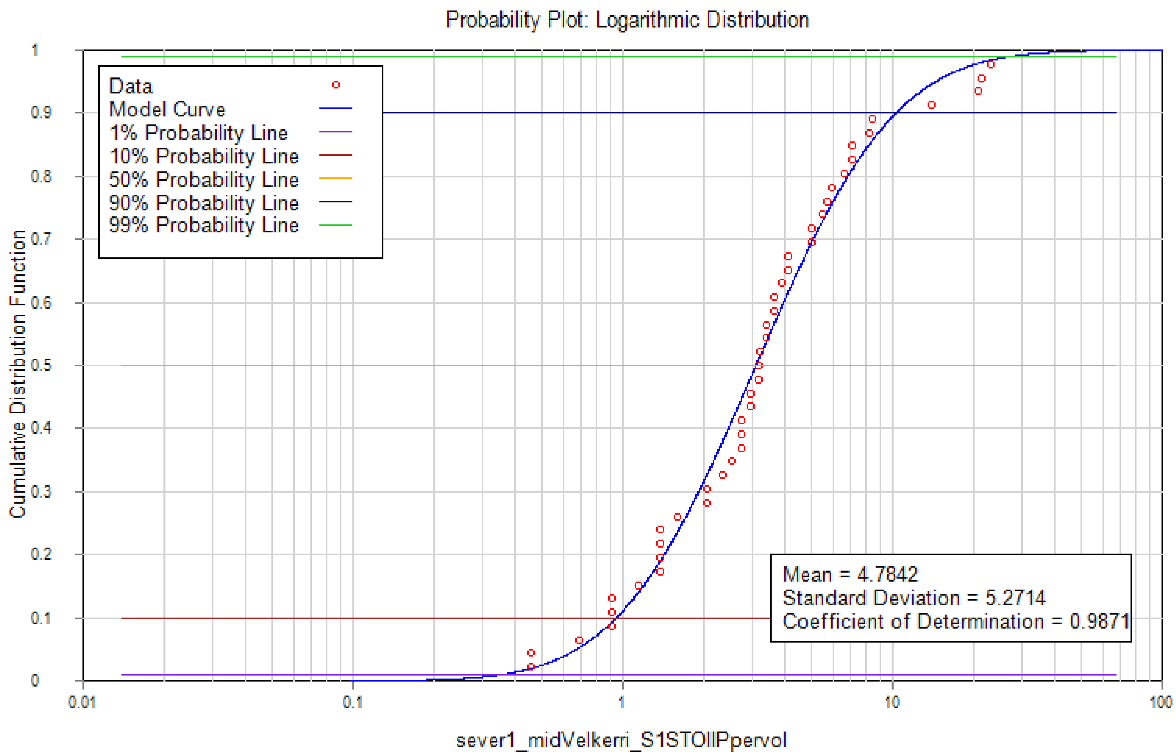
Distribution Report

Log-Normal Distribution Report	
Parameter	sever1_kyalla_estoilpervol
Description	Sever 1 Kyalla Estimated Oil per Volume
Number of Positive Points	10
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96599
Data Range	
Minimum Value	35.5038
Average Value	79.4101
Maximum Value	145.3354
Standard Deviation	39.3581
Distribution	
99% Value	22.3468
90% Value	37.5858
50% Value	71.1217
10% Value	134.5799
1% Value	226.3545
Average Value Probability	0.5877



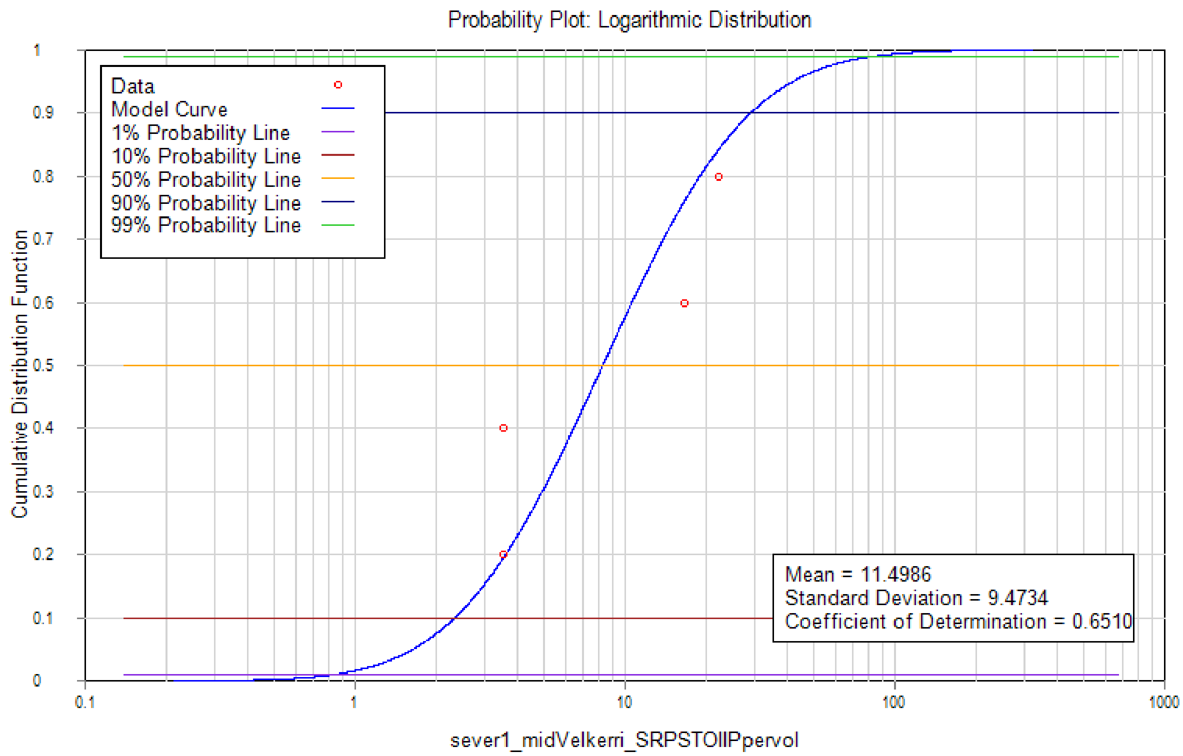
Distribution Report

Log-Normal Distribution Report	
Parameter	sever1_kyalla_retoilpervol
Description	Sever 1 Kyalla Retained Oil per Volume
Number of Positive Points	10
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96599
Data Range	
Minimum Value	13.1364
Average Value	29.3817
Maximum Value	53.7741
Standard Deviation	14.5625
Distribution	
99% Value	8.2683
90% Value	13.9067
50% Value	26.3150
10% Value	49.7946
1% Value	83.7512
Average Value Probability	0.5877



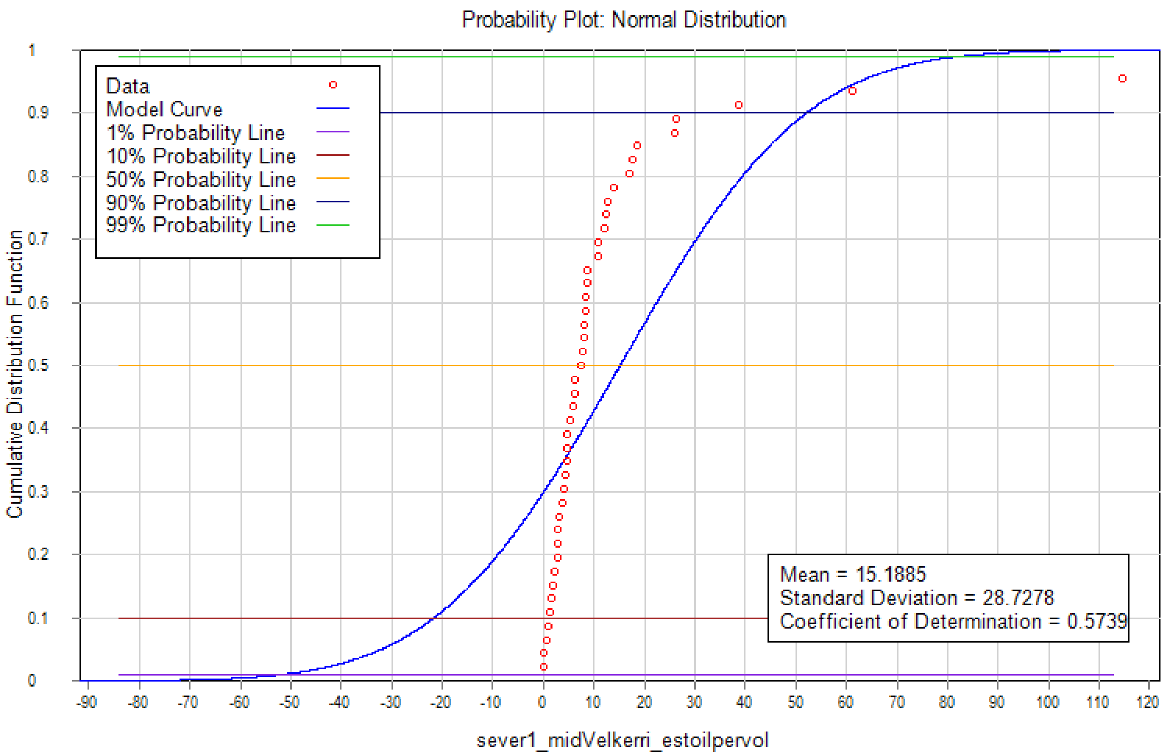
Distribution Report

Log-Normal Distribution Report	
Parameter	sever1_midVelkerri_S1STOIIPpervol
Description	Sever 1 Middle Velkerri S1 STOIIP per Volume
Number of Positive Points	45
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98705
Data Range	
Minimum Value	0.4564
Average Value	4.7842
Maximum Value	23.2752
Standard Deviation	5.27140
Distribution	
99% Value	0.3573
90% Value	0.9450
50% Value	3.1153
10% Value	10.2696
1% Value	27.1584
Average Value Probability	0.6776



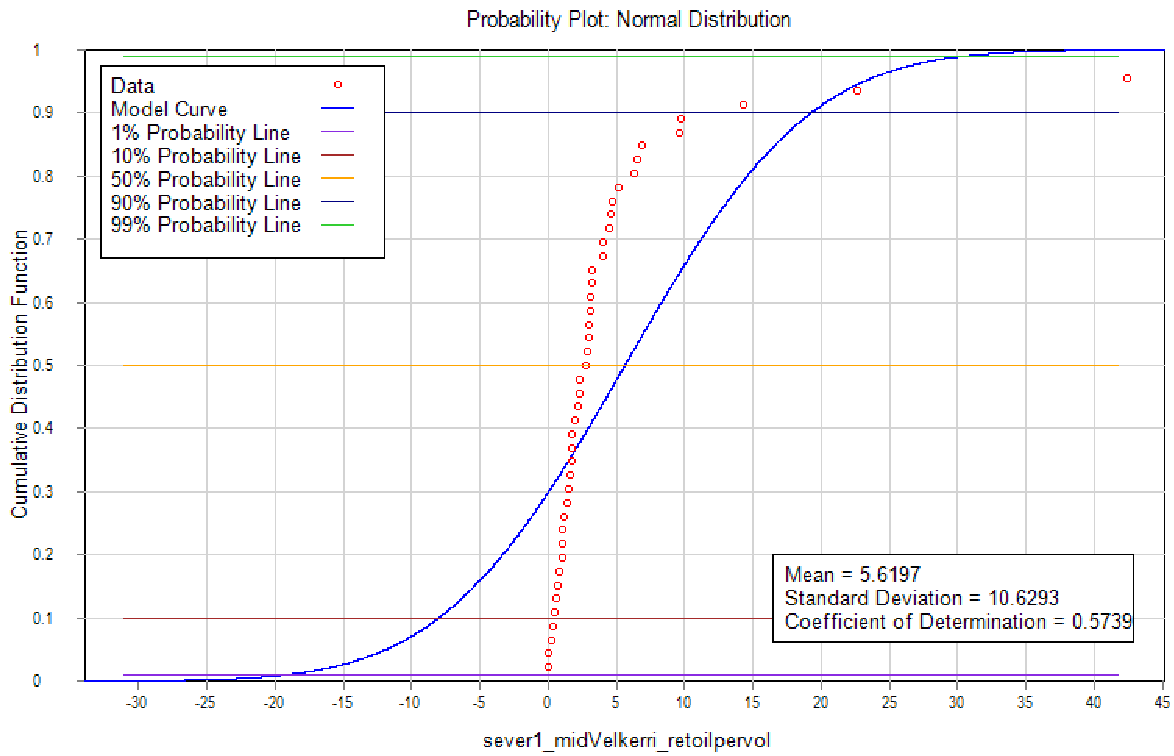
Distribution Report

Log-Normal Distribution Report	
Parameter	sever1_midVelkerri_SRPSTOIIPpervol
Description	Sever 1 middle Velkerri SRP STOIIP per Volume
Number of Positive Points	4
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.65104
Data Range	
Minimum Value	3.5386
Average Value	11.4986
Maximum Value	22.2902
Standard Deviation	9.47339
Distribution	
99% Value	0.8363
90% Value	2.3389
50% Value	8.2580
10% Value	29.1562
1% Value	81.5414
Average Value Probability	0.6317



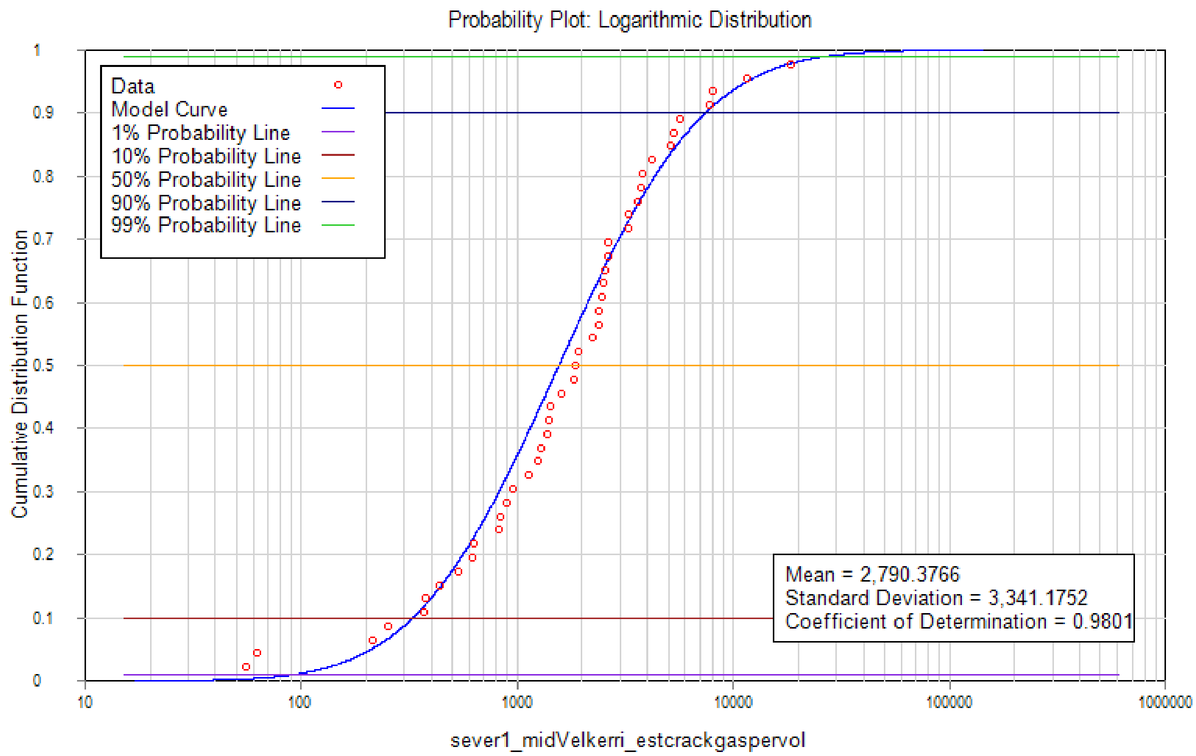
Distribution Report

Normal Distribution Report	
Parameter	sever1_midVelkerri_estoilpervol
Description	Sever 1 middle Velkerri Estimated Oil per Volume
Number of Positive Points	43
Number of Non-Positive Points	2
Number of Null Values	0
Regression Coefficient	0.57391
Data Range	
Minimum Value	0.0000
Average Value	15.1885
Maximum Value	155.9600
Standard Deviation	28.7278
Distribution	
99% Value	-51.6424
90% Value	-21.6277
50% Value	15.1885
10% Value	52.0047
1% Value	82.0194
Average Value Probability	0.5000



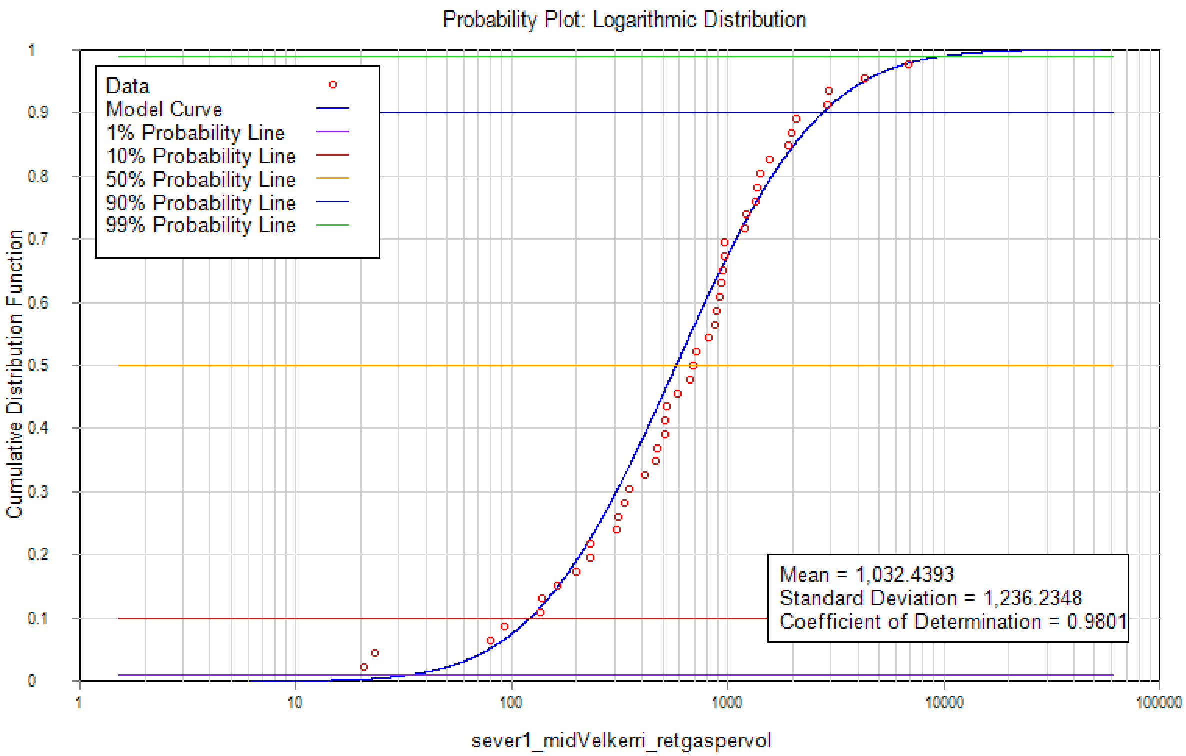
Distribution Report

Normal Distribution Report	
Parameter	sever1_midVelkerri_retoilpervol
Description	Sever 1 Middle Velkerri Retained Oil per Volume
Number of Positive Points	43
Number of Non-Positive Points	2
Number of Null Values	0
Regression Coefficient	0.57391
Data Range	
Minimum Value	0.0000
Average Value	5.6197
Maximum Value	57.7052
Standard Deviation	10.6293
Distribution	
99% Value	-19.1077
90% Value	-8.0022
50% Value	5.6197
10% Value	19.2417
1% Value	30.3472
Average Value Probability	0.5000



Distribution Report

Log-Normal Distribution Report	
Parameter	sever1_midVelkerri_estcrackgaspervol
Description	Sever 1 middle Velkerri Estimated Cracked Gas per Volume
Number of Positive Points	45
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98005
Data Range	
Minimum Value	55.7056
Average Value	2,790.3766
Maximum Value	18,404.0195
Standard Deviation	3341.18
Distribution	
99% Value	92.1788
90% Value	328.0492
50% Value	1,556.5950
10% Value	7,386.0512
1% Value	26,285.7441
Average Value Probability	0.6845

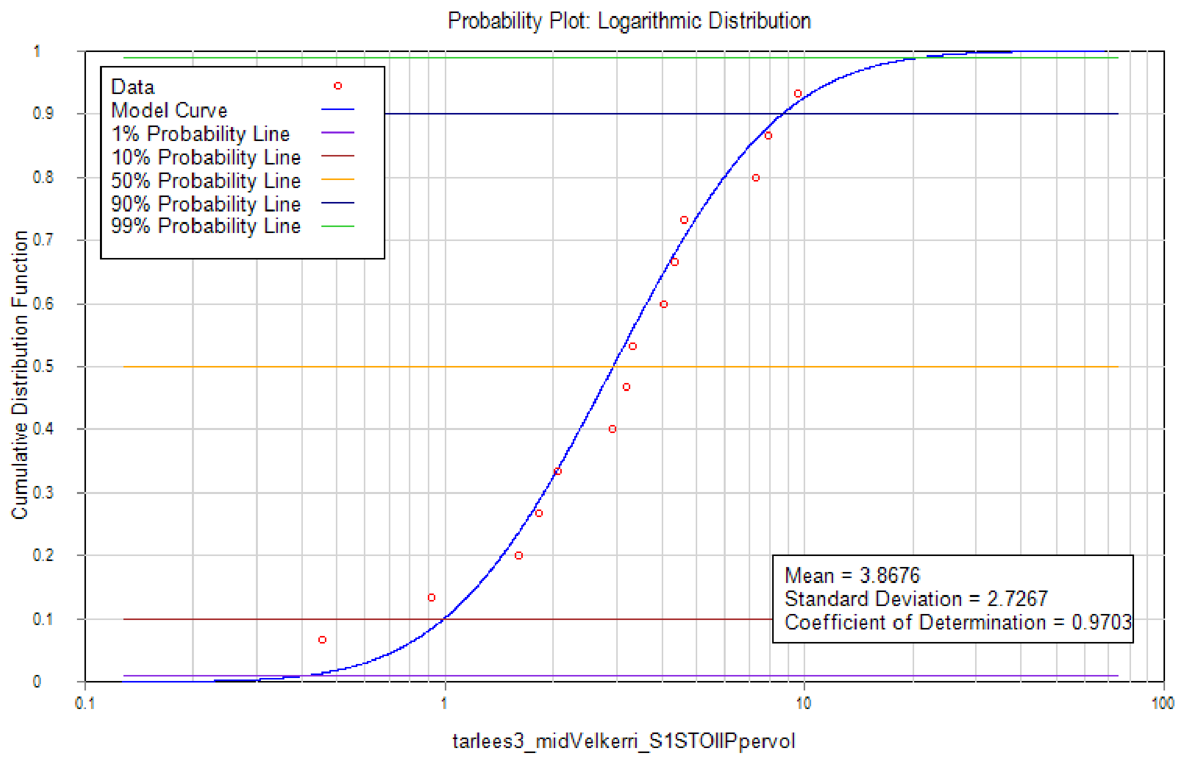


Distribution Report

Log-Normal Distribution Report	
Parameter	sever1_midVelkerri_retgaspervol
Description	Sever 1 middle Velkerri Retained Gas per Volume
Number of Positive Points	45
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98005
Data Range	
Minimum Value	20.6111
Average Value	1,032.4393
Maximum Value	6,809.4872
Standard Deviation	1236.23
Distribution	
99% Value	34.1062
90% Value	121.3782
50% Value	575.9402
10% Value	2,732.8389
1% Value	9,725.7253
Average Value Probability	0.6845

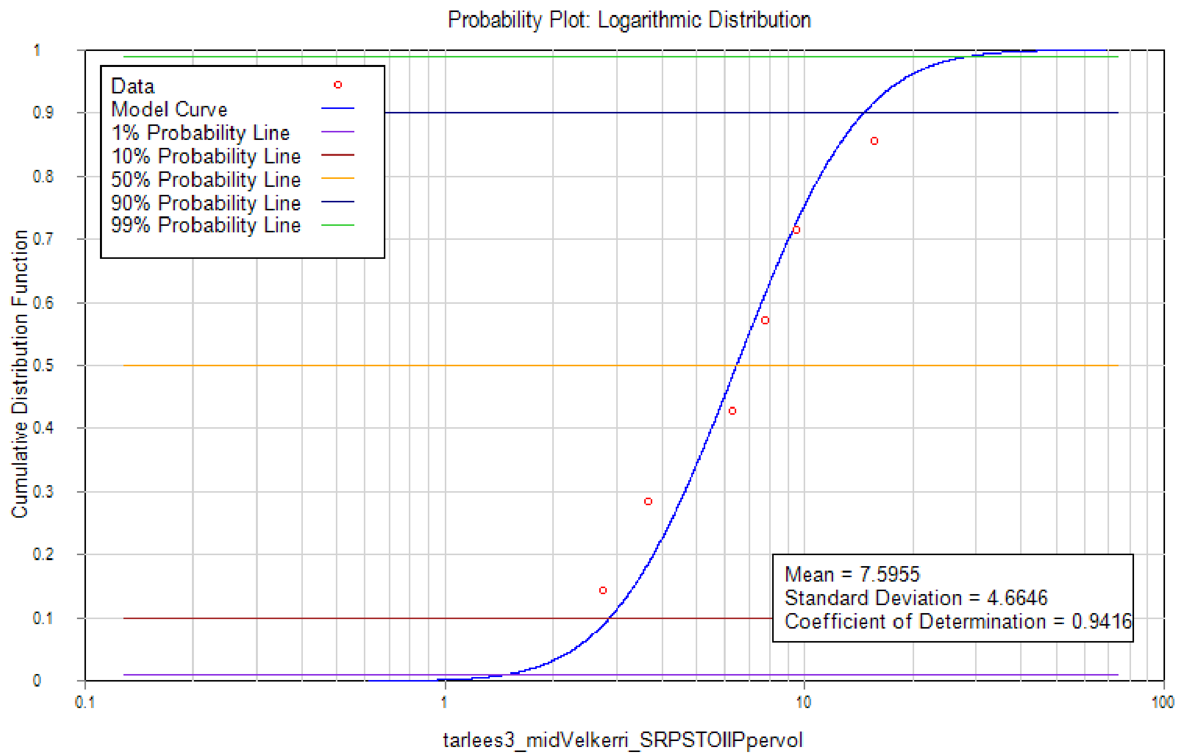
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (bbl/acre-ft)	Retained Gas (Mcf/acre-ft)
Tarlee S3	middle Velkerri	1210.36	3970.997	0.42	2.505	0.85	9.603073694	0.07987	0.015296	9.477877804						10.97494136	450.7347879	0	2638.559079	0	976.2668593
Tarlee S3	middle Velkerri	1255.41	4118.799	0.35	2.481	0.85	7.925890165	0.083825	0.011884	7.728274368						9.737522202	448.6537508	0	2633.497372	0	974.3940275
Tarlee S3	middle Velkerri	1257.42	4125.394	0.32	2.5	0.85	7.302023529									9.812094118	373.3159529	3.635038588	2159.212921	1.344964278	798.9087809
Tarlee S3	middle Velkerri	1300.54	4266.864	0.14	2.5	0.85	3.194635294									5.020141176	282.0406588	0	1662.123106	0	614.9855492
Tarlee S3	middle Velkerri	1343.2	4406.824	0.2	2.538	0.85	4.633133929	0.060953	0.033082	15.64361611						6.949700894	337.7596296	0	1984.859572	0	734.3980417
Tarlee S3	middle Velkerri	1350.93	4432.185	0.19	2.5	0.85	4.335576471									7.073835294	388.6045647	11.44592188	2220.508845	4.234991096	821.5882727
Tarlee S3	middle Velkerri	1399.85	4592.684	0.02	2.5	0.85	0.456376471									0.684564706	65.26183529	0	387.4636235	0	143.3615407
Tarlee S3	middle Velkerri	1449.86	4756.759	0.09	2.5	0.85	2.053694118									1.369129412	381.7589176	0	2282.338729	0	844.4653299
Tarlee S3	middle Velkerri	1459.47	4788.287	0.14	2.59	0.85	3.309642165	0.026051	0.031089	6.283322401	29.09	20.12	0.55	49.76	175.2359605	3.782448188	507.5726194	0	3022.741027	0	1118.41418
Tarlee S3	middle Velkerri	1480.52	4857.349	0.04	2.5	0.85	0.912752941									1.140941176	1603.478729	0	9614.026729	0	3557.18989
Tarlee S3	middle Velkerri	1546.97	5075.361	0.08	2.5	0.85	1.825505882									0.912752941	906.3636706	0	5432.705506	0	2010.101037
Tarlee S3	middle Velkerri	1587.3	5207.677	0.12	2.666	0.85	2.920079209	0.027729	0.012781	2.749434406	25.13	29.17	0.8	55.1	199.735307	3.406759078	358.9706189	0	2133.383159	0	789.3517689
Tarlee S3	middle Velkerri	1589.82	5215.945	0.17	2.627	0.85	4.07626336	0.027867	0.017069	3.69019718						3.596702965	500.4585117	0	2981.170853	0	1103.033215
Tarlee S3	middle Velkerri	1589.9	5216.207	0.07	2.5	0.85	1.597317647									0.684564706	449.9872	0	2695.815812	0	997.4518504



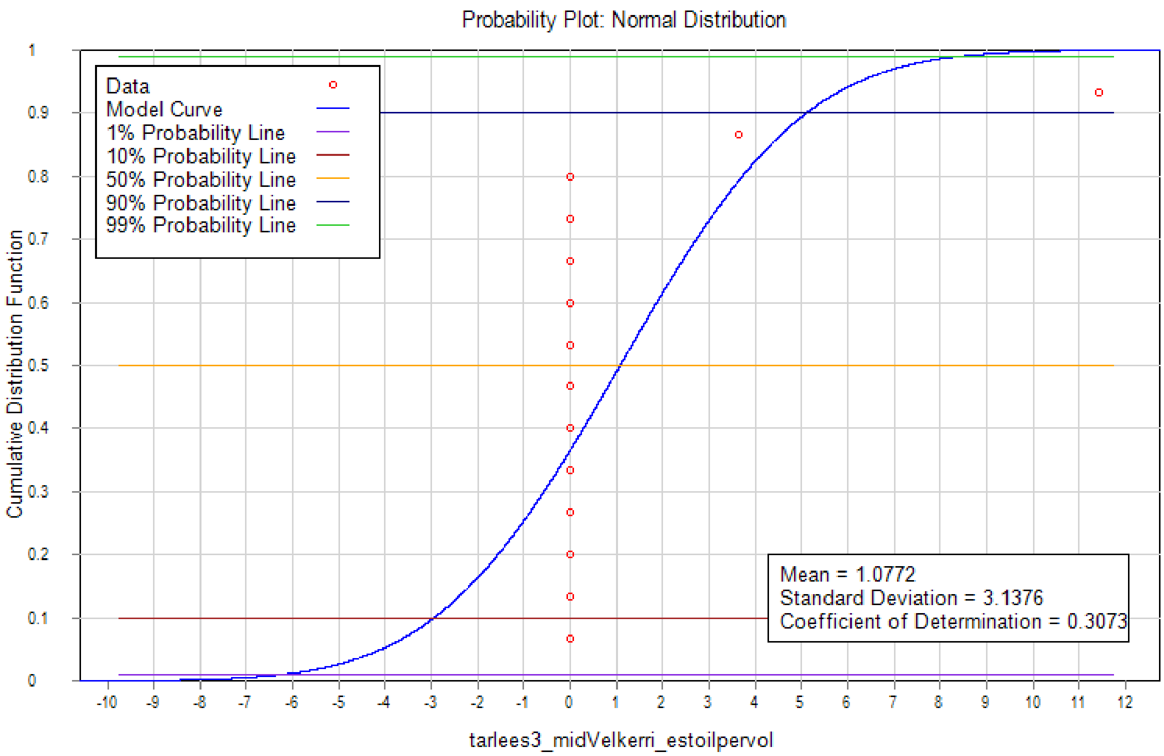
Distribution Report

Log-Normal Distribution Report	
Parameter	tarlees3_midVelkerri_S1STOIIPpervol
Description	Tarlee S3 middle Velkerri S1 STOIIP per Volume
Number of Positive Points	14
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.97033
Data Range	
Minimum Value	0.4564
Average Value	3.8676
Maximum Value	9.6031
Standard Deviation	2.72670
Distribution	
99% Value	0.4117
90% Value	0.9946
50% Value	2.9341
10% Value	8.6560
1% Value	20.9102
Average Value Probability	0.6282



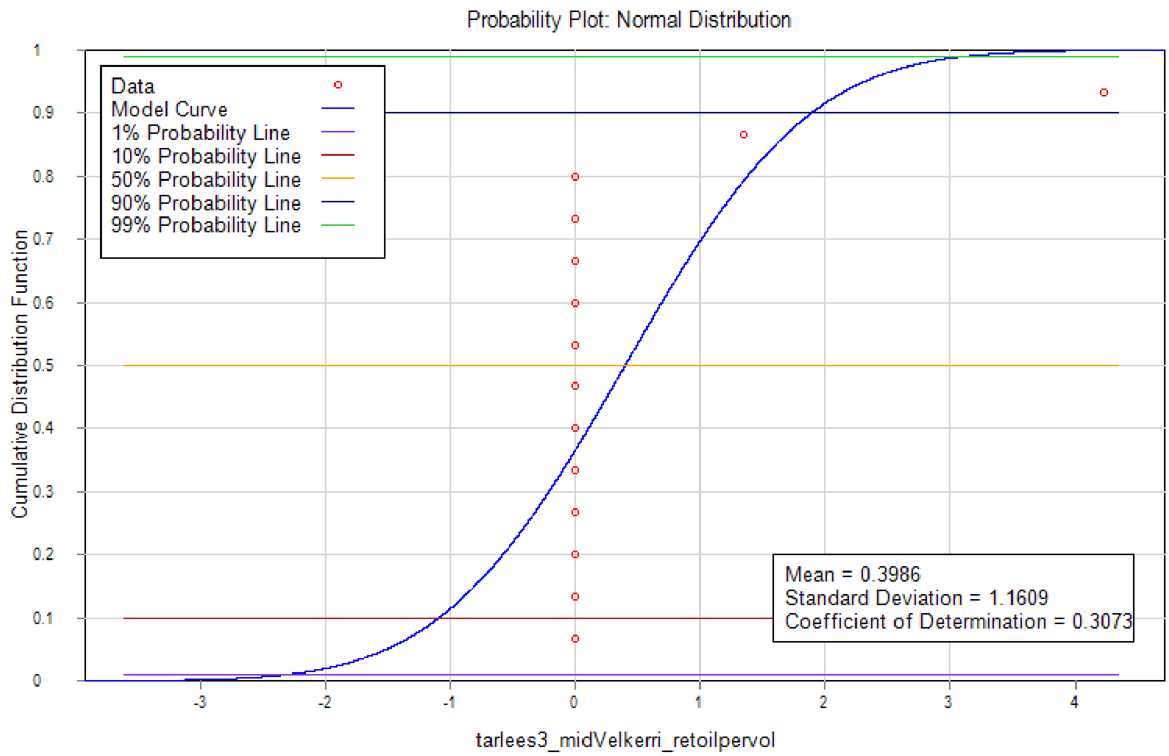
Distribution Report

Log-Normal Distribution Report	
Parameter	tarlees3_midVelkerri_SRPSTOIIPpervol
Description	Tarlee S3 middle Velkerri SRP STOIIP per Volume
Number of Positive Points	6
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.94158
Data Range	
Minimum Value	2.7494
Average Value	7.5955
Maximum Value	15.6436
Standard Deviation	4.66456
Distribution	
99% Value	1.4817
90% Value	2.8716
50% Value	6.4655
10% Value	14.5572
1% Value	28.2120
Average Value Probability	0.6004



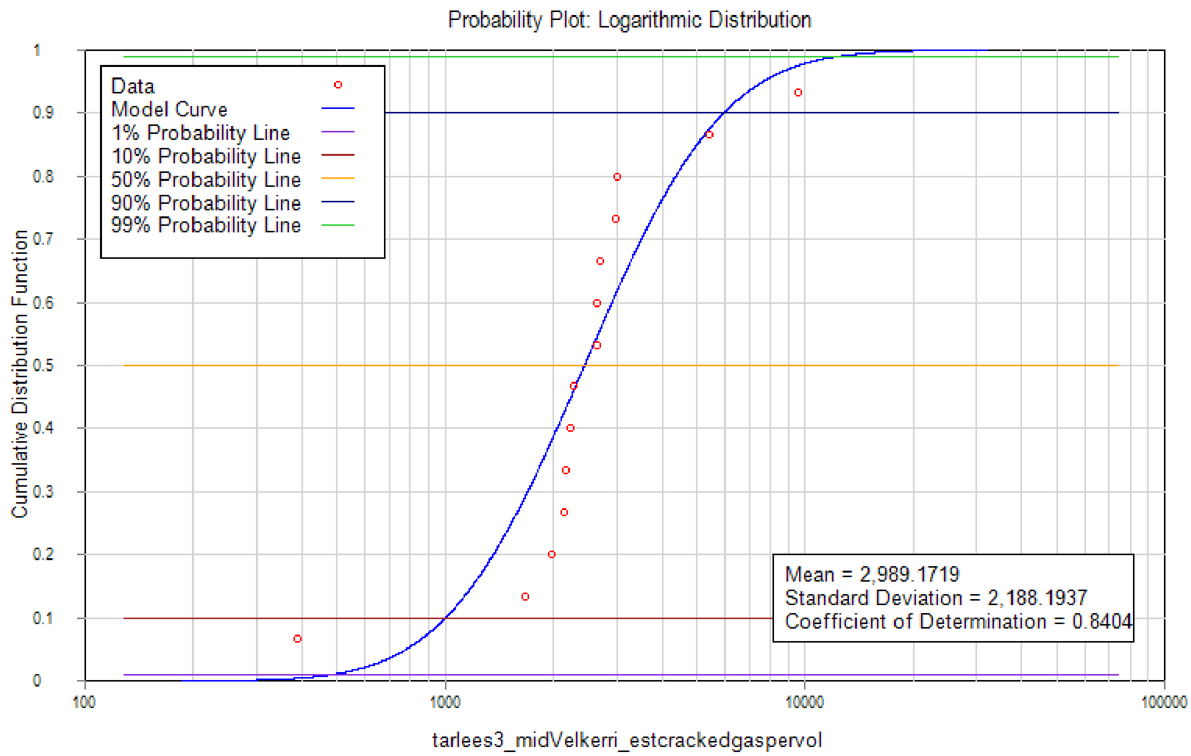
Distribution Report

Normal Distribution Report	
Parameter	tarlees3_midVelkerri_estoilpervol
Description	Tarlee S3 Middle Velkerri Estimated Oil per Volume
Number of Positive Points	2
Number of Non-Positive Points	12
Number of Null Values	0
Regression Coefficient	0.30733
Data Range	
Minimum Value	0.0000
Average Value	1.0772
Maximum Value	11.4459
Standard Deviation	3.13758
Distribution	
99% Value	-6.2219
90% Value	-2.9438
50% Value	1.0772
10% Value	5.0982
1% Value	8.3763
Average Value Probability	0.5000



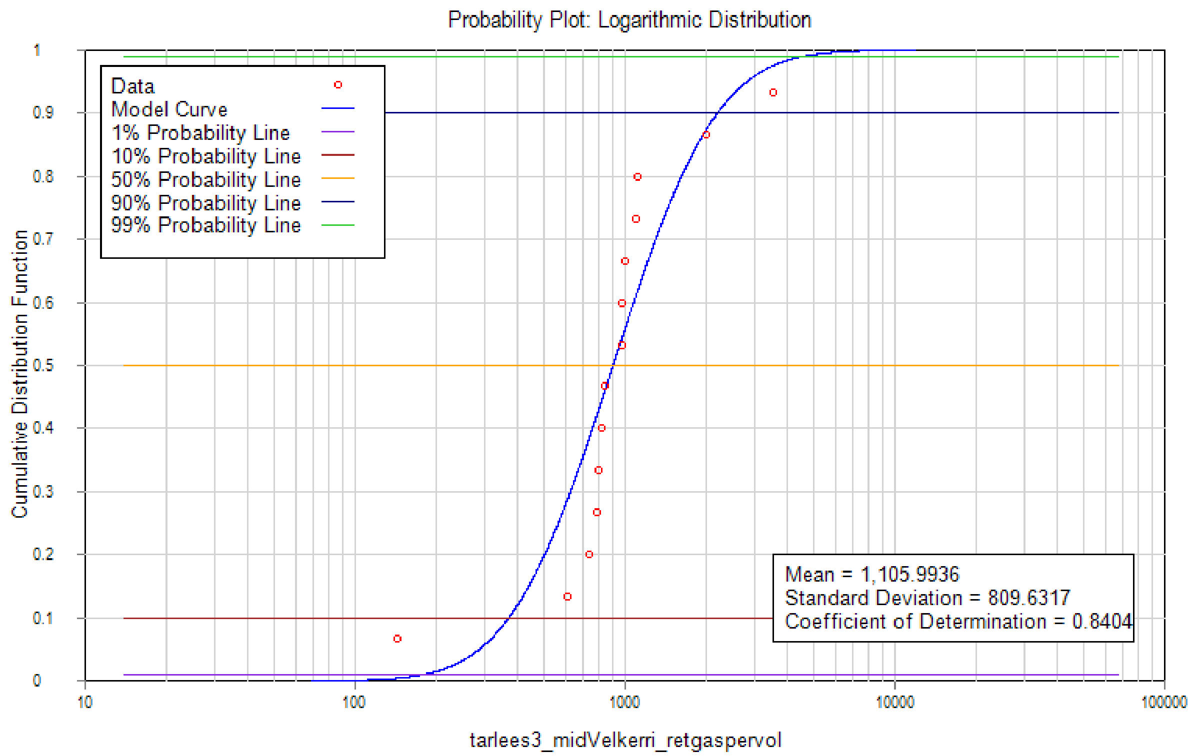
Distribution Report

Normal Distribution Report	
Parameter	tarlees3_midVelkerri_retoilpervol
Description	Tarlee S3 middle Velkerri Retained Oil per Volume
Number of Positive Points	2
Number of Non-Positive Points	12
Number of Null Values	0
Regression Coefficient	0.30733
Data Range	
Minimum Value	0.0000
Average Value	0.3986
Maximum Value	4.2350
Standard Deviation	1.16090
Distribution	
99% Value	-2.3021
90% Value	-1.0892
50% Value	0.3986
10% Value	1.8863
1% Value	3.0992
Average Value Probability	0.5000



Distribution Report

Log-Normal Distribution Report	
Parameter	tarlees3_midVelkerri_estcrackedgaspervol
Description	Tarlee S3 middle Velkerri Estimated Cracked Gas per Volume
Number of Positive Points	14
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.84044
Data Range	
Minimum Value	387.4636
Average Value	2,989.1719
Maximum Value	9,614.0267
Standard Deviation	2,188.19
Distribution	
99% Value	485.9040
90% Value	1,002.7680
50% Value	2,438.6610
10% Value	5,930.6515
1% Value	12,239.1811
Average Value Probability	0.6154



Distribution Report

Log-Normal Distribution Report	
Parameter	tarlees3_midVelkerri_retgaspervol
Description	Tarlee S3 middle Velkerri Retained Gas per Volume
Number of Positive Points	14
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.84044
Data Range	
Minimum Value	143.3615
Average Value	1,105.9936
Maximum Value	3,557.1899
Standard Deviation	809.632
Distribution	
99% Value	179.7845
90% Value	371.0242
50% Value	902.3046
10% Value	2,194.3410
1% Value	4,528.4970
Average Value Probability	0.6154

Appendix II

Kyalla and middle Velkerri Resource Assessment Data
Beetaloo Sub-basin

McArthur Basin Study, 2016

Northern Territory Geological Survey - Australia

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LABORATORIES

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WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Altree 2	middle Velkerri	672.9	2207.677	2.47	2.5	0.85	56.36249412									514.7926588	619.0746824	104.2820235	0	38.58434871	0
Altree 2	middle Velkerri	673.1	2208.333		2.5	0.85															
Altree 2	middle Velkerri	676.71	2220.177	2.23	2.5	0.85	50.88597647									453.8664	634.3632941	180.4968941	0	66.78385082	0
Altree 2	middle Velkerri	680	2230.971		2.5	0.85															
Altree 2	middle Velkerri	680.1	2231.299	4.59	2.5	0.85	104.7384														
Altree 2	middle Velkerri	680.3	2231.955	3.93	2.5	0.85	89.67797647														
Altree 2	middle Velkerri	680.54	2232.743	2.29	2.5	0.85	52.25510588									460.9402353	605.6115765	144.6713412	0	53.52839624	0
Altree 2	middle Velkerri	682	2237.533	3.649425	2.5	0.85	83.27558506									650.5646588	761.2359529	110.6712941	0	40.94837882	0
Altree 2	middle Velkerri	684.46	2245.604	2.47	2.5	0.85	56.36249412									443.8261176	541.2624941	97.43637647	0	36.05145929	0
Altree 2	middle Velkerri	688	2257.218		2.5	0.85															
Altree 2	middle Velkerri	688	2257.218	2.66	2.298	0.85	55.79366648	0.102397	0.079473	63.13279329						590.6577625	727.7986133	137.1408509	0	50.74211482	0
Altree 2	middle Velkerri	688.13	2257.644	2.29	2.5	0.85	52.25510588									437.6650353	698.9405647	261.2755294	0	96.67194588	0
Altree 2	middle Velkerri	694.82	2279.593	2.27	2.5	0.85	51.79872941									360.5374118	589.8665882	229.3291765	0	84.85179529	0
Altree 2	middle Velkerri	695.35	2281.332		2.5	0.85															
Altree 2	middle Velkerri	696	2283.465		2.5	0.85															
Altree 2	middle Velkerri	698.7	2292.323	2.45	2.5	0.85	55.90611765									461.6248	723.3567059	261.7319059	0	96.84080518	0
Altree 2	middle Velkerri	700.45	2298.064		2.5	0.85															
Altree 2	middle Velkerri	700.5	2298.228	2.33	2.5	0.85	53.16785882									515.4772235	664.7123294	149.2351059	0	55.21698918	0
Altree 2	middle Velkerri	702.5	2304.79	2.15	2.5	0.85	49.06047059									443.8261176	702.5915765	258.7654588	0	95.74321976	0
Altree 2	middle Velkerri	706.3	2317.257	2.19	2.5	0.85	49.97322353									425.1146824	609.7189647	184.6042824	0	68.30358447	0
Altree 2	middle Velkerri	708	2322.835		2.5	0.85															
Altree 2	middle Velkerri	710	2329.396		2.5	0.85															
Altree 2	middle Velkerri	710.15	2329.888	2.44	2.5	0.85	55.67792941									675.4371765	964.7798588	289.3426824	0	107.0567925	0
Altree 2	middle Velkerri	710.3	2330.381	3.27	2.5	0.85	74.61755294														
Altree 2	middle Velkerri	711	2332.677	2.61	2.5	0.85	59.55712941									691.6385412	957.2496471	265.6111059	0	98.27610918	0
Altree 2	middle Velkerri	713.01	2339.272	2.2	2.5	0.85	50.20141176									465.2758118	591.2357176	125.9599059	0	46.60516518	0
Altree 2	middle Velkerri	715	2345.801		2.5	0.85															
Altree 2	middle Velkerri	715.19	2346.424	2.24	2.5	0.85	51.11416471									517.9872941	852.5112471	334.5239529	0	123.7738626	0
Altree 2	middle Velkerri	715.59	2347.736		2.5	0.85															
Altree 2	middle Velkerri	717.78	2354.921	1.98	2.5	0.85	45.18127059									516.8463529	681.3700706	164.5237176	0	60.87377553	0
Altree 2	middle Velkerri	721.57	2367.356	1.73	2.5	0.85	39.47656471									390.8864471	509.3161412	118.4296941	0	43.81898682	0
Altree 2	middle Velkerri	723.9	2375		2.5	0.85															
Altree 2	middle Velkerri	725.42	2379.987	2.07	2.5	0.85	47.23496471									523.0074353	748.4574118	225.4499765	0	83.41649129	0
Altree 2	middle Velkerri	726.8	2384.514	2.45	2.5	0.85	55.90611765									623.4102588	811.6655529	188.2552941	0	69.65445882	0
Altree 2	middle Velkerri	732	2401.575		2.5	0.85															
Altree 2	middle Velkerri	735.8	2414.042		2.5	0.85															
Altree 2	middle Velkerri	738	2421.26		2.5	0.85															
Altree 2	middle Velkerri	742	2434.383		2.5	0.85															
Altree 2	middle Velkerri	744.55	2442.749		2.5	0.85															
Altree 2	middle Velkerri	746.5	2449.147	2.137097	2.5	0.85	48.76603931									372.1750118	686.6184	314.4433882	0	116.3440536	0
Altree 2	middle Velkerri	748.3	2455.052		2.5	0.85															
Altree 2	middle Velkerri	752.02	2467.257		2.5	0.85															
Altree 2	middle Velkerri	755.94	2480.118		2.5	0.85															
Altree 2	middle Velkerri	759.83	2492.881	2.14	2.5	0.85	48.83228235									229.5573647	493.5711529	264.0137882	0	97.68510165	0
Altree 2	middle Velkerri	760.45	2494.915	2.69	2.5	0.85	61.38263529														
Altree 2	middle Velkerri	763.53	2505.02	1.16	2.5	0.85	26.46983529									79.86588235	153.1143059	73.24842353	0	27.10191671	0
Altree 2	middle Velkerri	767.31	2517.421		2.5	0.85															
Altree 2	middle Velkerri	772.87	2535.663		2.5	0.85															
Altree 2	middle Velkerri	776	2545.932		2.5	0.85															
Altree 2	middle Velkerri	776.64	2548.031	1.91	2.5	0.85	43.58395294									203.0875294	338.4031529	135.3156235	0	50.06678071	0
Altree 2	middle Velkerri	780.45	2560.531		2.5	0.85															
Altree 2	middle Velkerri	782	2565.617		2.5	0.85															
Altree 2	middle Velkerri	784.34	2573.294	2.27	2.5	0.85	51.79872941									248.0406118	428.3093176	180.2687059	0	66.69942118	0
Altree 2	middle Velkerri	786	2578.74		2.5	0.85															
Altree 2	middle Velkerri	788.12	2585.696		2.5	0.85															
Altree 2	middle Velkerri	791.9	2598.097	2.04	2.5	0.85	46.5504									277.9332706	518.4436706	240.5104	0	88.988848	0
Altree 2	middle Velkerri	792.45	2599.902	3.8	2.5	0.85	86.71152941														
Altree 2	middle Velkerri	793	2601.706	1.79	2.5	0.85	40.84569412									302.3494118	685.9338353	383.5844235	0	141.9262367	0
Altree 2	middle Velkerri	795.74	2610.696		2.5	0.85															
Altree 2	middle Velkerri	799.53	2623.13	2.48	2.5	0.85	56.59068235									325.3964235	620.672	295.2755765	0	109.2519633	0
Altree 2	middle Velkerri	800.2	2625.328		2.5	0.85															
Altree 2	middle Velkerri	800.2	2625.328	2.23	2.359	0.85	48.0160074	0.082946	0.114738	73.83301659						343.6481964	830.8534373	487.2052409	0	180.2659391	0
Altree 2	middle Velkerri	800.44	2626.115		2.5	0.85															
Altree 2	middle Velkerri	803.3	2635.499		2.5	0.85															
Altree 2	middle Velkerri	806.93	2647.408	2.54	2.5	0.85	57.95981176									397.2757176	711.4909176	314.2152	0	116.259624	0
Altree 2	middle Velkerri	807	2647.638		2.5	0.85															
Altree 2	middle Velkerri	808.8	2653.543		2.5	0.85															
Altree 2	middle Velkerri	810.8	2660.105		2.5	0.85															
Altree 2	middle Velkerri	811.8	2663.386	2.22	2.5	0.85	50.65778824									462.3093647	717.1956235	254.8862588	0	94.30791576	0
Altree 2	middle Velkerri	814.4	2671.916	4.29	2.5	0.85	97.89275294									537.6114824	925.9878588	388.3763765	0	143.6992593	0
Altree 2	middle Velkerri	814.65	2672.736	2.54	2.5	0.85	57.95981176									363.5038588	682.5110118	319.0071529	0	118.0326466	0

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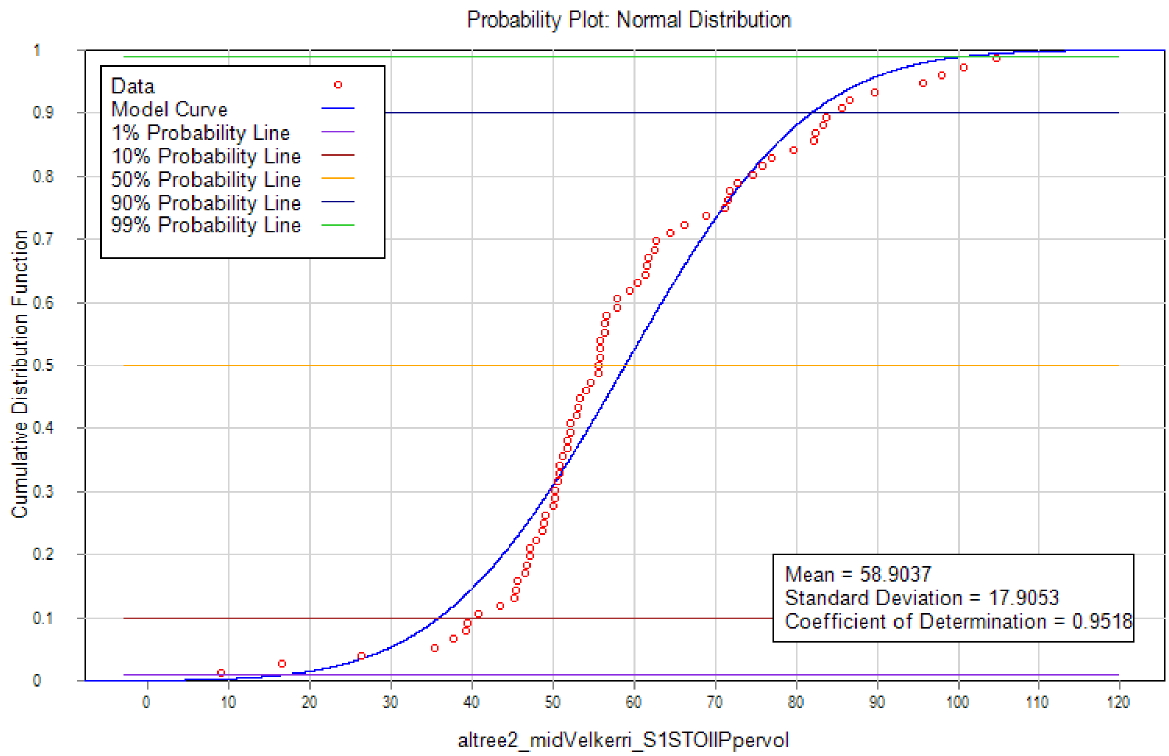
WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Altree 2	middle Velkerri	815.8	2676.509		2.5	0.85															
Altree 2	middle Velkerri	818.5	2685.367		2.5	0.85															
Altree 2	middle Velkerri	819.9	2689.961	2.2	2.5	0.85	50.20141176									463.4503059	700.5378824	237.0875765	0	87.72240329	0
Altree 2	middle Velkerri	820.7	2692.585	3.61	2.5	0.85	82.37595294									418.7254118	764.8869647	346.1615529	0	128.0797746	0
Altree 2	middle Velkerri	821.7	2695.866		2.5	0.85															
Altree 2	middle Velkerri	821.7	2695.866	2.61	2.332	0.85	55.55489032	0.081551	0.226395	143.2337152						350.1448068	736.8498023	386.7049955	0	143.0808483	0
Altree 2	middle Velkerri	822.18	2697.441	4.19	2.5	0.85	95.61087059									306.0004235	625.4639529	319.4635294	0	118.2015059	0
Altree 2	middle Velkerri	823.8	2702.756		2.5	0.85															
Altree 2	middle Velkerri	824.2	2704.068		2.5	0.85															
Altree 2	middle Velkerri	826	2709.974		2.5	0.85															
Altree 2	middle Velkerri	827	2713.255		2.5	0.85															
Altree 2	middle Velkerri	827.9	2716.207	2.32	2.5	0.85	52.93967059									270.6312471	720.6184471	449.9872	0	166.495264	0
Altree 2	middle Velkerri	829.74	2722.244	3.37	2.5	0.85	76.89943529									262.4164706	607.2088941	344.7924235	0	127.5731967	0
Altree 2	middle Velkerri	831.6	2728.346	2.821833	2.5	0.85	64.39090926									159.2753882	465.7321882	306.4568	0	113.389016	0
Altree 2	middle Velkerri	831.9	2729.331		2.5	0.85															
Altree 2	middle Velkerri	833.55	2734.744		2.5	0.85															
Altree 2	middle Velkerri	835	2739.501		2.5	0.85															
Altree 2	middle Velkerri	837.4	2747.375	2.7	2.5	0.85	61.61082353									180.7250824	358.0273412	177.3022588	0	65.60183576	0
Altree 2	middle Velkerri	841.2	2759.843		2.5	0.85															
Altree 2	middle Velkerri	843.35	2766.896		2.5	0.85															
Altree 2	middle Velkerri	845	2772.31	2.37	2.5	0.85	54.08061176									121.3961412	238.0003294	116.6041882	0	43.14354965	0
Altree 2	middle Velkerri	848.83	2784.875		2.5	0.85															
Altree 2	middle Velkerri	850	2788.714	2.22332	2.5	0.85	50.73354673									123.4498353	448.3898824	324.9400471	0	120.2278174	0
Altree 2	middle Velkerri	850	2788.714	0.65	2.792	0.85	16.56464038	0.032238	0.031204	7.804135491						41.79386187	151.1204884	109.3266265	0	40.4508518	0
Altree 2	middle Velkerri	852.52	2796.982	3.6	2.5	0.85	82.14776471									216.3224471	440.6314824	224.3090353	0	82.99434306	0
Altree 2	middle Velkerri	856.37	2809.613		2.5	0.85															
Altree 2	middle Velkerri	860.25	2822.343	3.67	2.5	0.85	83.74508235									198.7519529	473.9469647	275.1950118	0	101.8221544	0
Altree 2	middle Velkerri	863	2831.365	2.74	2.5	0.85	62.52357647									148.7787294	546.9672	398.1884706	0	147.3297341	0
Altree 2	middle Velkerri	863.6	2833.333	3.19	2.5	0.85	72.79204706									189.6244235	376.0542118	186.4297882	0	68.97902165	0
Altree 2	middle Velkerri	864	2834.646		2.5	0.85															
Altree 2	middle Velkerri	868.95	2850.886	2.9	2.5	0.85	66.17458824									149.9196706	314.4433882	164.5237176	0	60.87377553	0
Altree 2	middle Velkerri	870.6	2856.299	3.49	2.5	0.85	79.63769412									115.0068706	261.7319059	146.7250353	0	54.28826306	0
Altree 2	middle Velkerri	872.55	2862.697		2.5	0.85															
Altree 2	middle Velkerri	876.25	2874.836		2.5	0.85															
Altree 2	middle Velkerri	876.42	2875.394	2.71	2.5	0.85	61.83901176									134.4028706	352.5508235	218.1479529	0	80.71474259	0
Altree 2	middle Velkerri	879.9	2886.811	3.120567	2.5	0.85	71.20766768									125.2753412	312.6178824	187.3425412	0	69.31674024	0
Altree 2	middle Velkerri	879.9	2886.811	1.55	2.5	0.85	35.36917647									49.97322353	142.6176471	92.64442353	0	34.27843671	0
Altree 2	middle Velkerri	880.28	2888.058		2.5	0.85															
Altree 2	middle Velkerri	884.08	2900.525	2.4	2.5	0.85	54.76517647									125.5035294	319.4635294	193.96	0	71.7652	0
Altree 2	middle Velkerri	886	2906.824	3.75	2.5	0.85	85.57058824														
Altree 2	middle Velkerri	888	2913.386		2.5	0.85															
Altree 2	middle Velkerri	891.85	2926.017	2	2.5	0.85	45.63764706									112.2686118	273.3695059	161.1008941	0	59.60733082	0
Altree 2	middle Velkerri	895.61	2938.353		2.5	0.85															
Altree 2	middle Velkerri	896.8	2942.257		2.5	0.85															
Altree 2	middle Velkerri	899.43	2950.886	3.02	2.5	0.85	68.91284706									178.8995765	476.6852235	297.7856471	0	110.1806894	0
Altree 2	middle Velkerri	902	2959.318		2.5	0.85															
Altree 2	middle Velkerri	903.25	2963.419		2.5	0.85															
Altree 2	middle Velkerri	905.02	2969.226	1.99211	2.5	0.85	45.45760654									32.17454118	117.5169412	85.3424	0	31.576688	0
Altree 2	middle Velkerri	905.1	2969.488		2.5	0.85															
Altree 2	middle Velkerri	907.02	2975.787	2.75	2.5	0.85	62.75176471									155.168	421.4636706	266.2956706	0	98.52939812	0
Altree 2	middle Velkerri	909	2982.283	4.41	2.5	0.85	100.6310118														
Altree 2	middle Velkerri	909.7	2984.58		2.5	0.85															
Altree 2	middle Velkerri	910.85	2988.353		2.5	0.85															
Altree 2	middle Velkerri	912.1	2992.454		2.5	0.85															
Altree 2	middle Velkerri	914.87	3001.542	2.34	2.5	0.85	53.39604706									116.1478118	225.6781647	109.5303529	0	40.52623059	0
Altree 2	middle Velkerri	916	3005.249	2.05	2.5	0.85	46.77858824									255.5708235	593.5176	337.9467765	0	125.0403073	0
Altree 2	middle Velkerri	918.7	3014.108		2.5	0.85															
Altree 2	middle Velkerri	918.72	3014.173	0.3956479	2.5	0.85	9.02821961									5.704705882	41.98663529	36.28192941	0	13.42431388	0
Altree 2	middle Velkerri	920.2	3019.029	1.72	2.5	0.85	39.24837647									229.5573647	538.9806118	309.4232471	0	114.4866014	0
Altree 2	middle Velkerri	922.59	3026.87	3.32	2.5	0.85	75.75849412									228.8728	651.2492235	422.3764235	0	156.2792767	0
Altree 2	middle Velkerri	924	3031.496		2.5	0.85															
Altree 2	middle Velkerri	924.9	3034.449		2.5	0.85															
Altree 2	middle Velkerri	926.38	3039.304		2.5	0.85															
Altree 2	middle Velkerri	926.5	3039.698	2.069672	2.5	0.85	47.22748013									125.0471529	437.8932235	312.8460706	0	115.7530461	0
Altree 2	middle Velkerri	927.7	3043.635		2.5	0.85															
Altree 2	middle Velkerri	929	3047.9		2.5	0.85															
Altree 2	middle Velkerri	930.15	3051.673	2.65	2.5	0.85	60.46988235									169.7720471	433.7858353	264.0137882	0	97.68510165	0
Altree 2	middle Velkerri	931.3	3055.446		2.5	0.85															
Altree 2	middle Velkerri	933.97	3064.206		2.5	0.85															
Altree 2	middle Velkerri	935	3067.585		2.5	0.85															
Altree 2	middle Velkerri	935.6	3069.554	3.139867	2.5	0.85	71.64807098									133.4901176	503.1550588	369.6649412	0	136.7760282	0

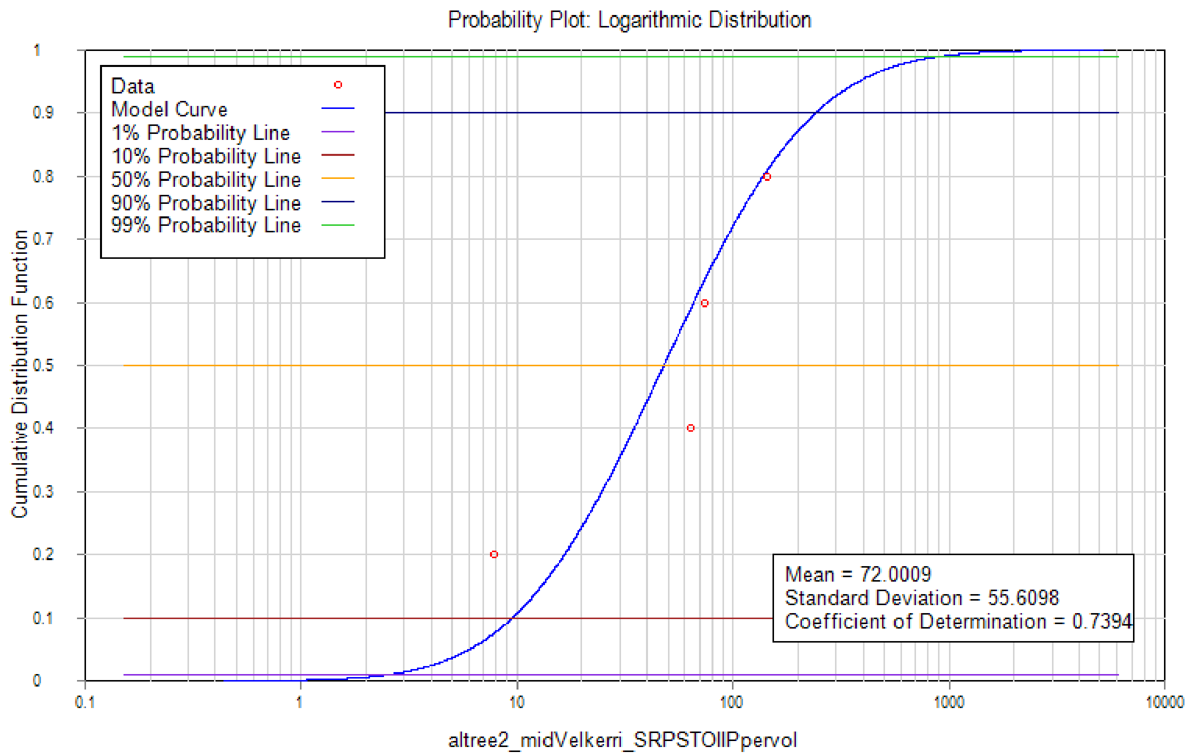
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Altree 2	middle Velkerri	937.84	3076.903	3.15	2.5	0.85	71.87929412									192.3626824	533.9604706	341.5977882	0	126.3911816	0
Altree 2	middle Velkerri	939.1	3081.037		2.5	0.85															
Altree 2	middle Velkerri	941.55	3089.075		2.5	0.85															
Altree 2	middle Velkerri	943	3093.832		2.5	0.85															
Altree 2	middle Velkerri	945.4	3101.706		2.5	0.85															
Altree 2	middle Velkerri	945.5	3102.034	1.652807	2.5	0.85	37.71511126									62.29538824	474.8597176	412.5643294	0	152.6488019	0
Altree 2	middle Velkerri	946.3	3104.659		2.5	0.85															



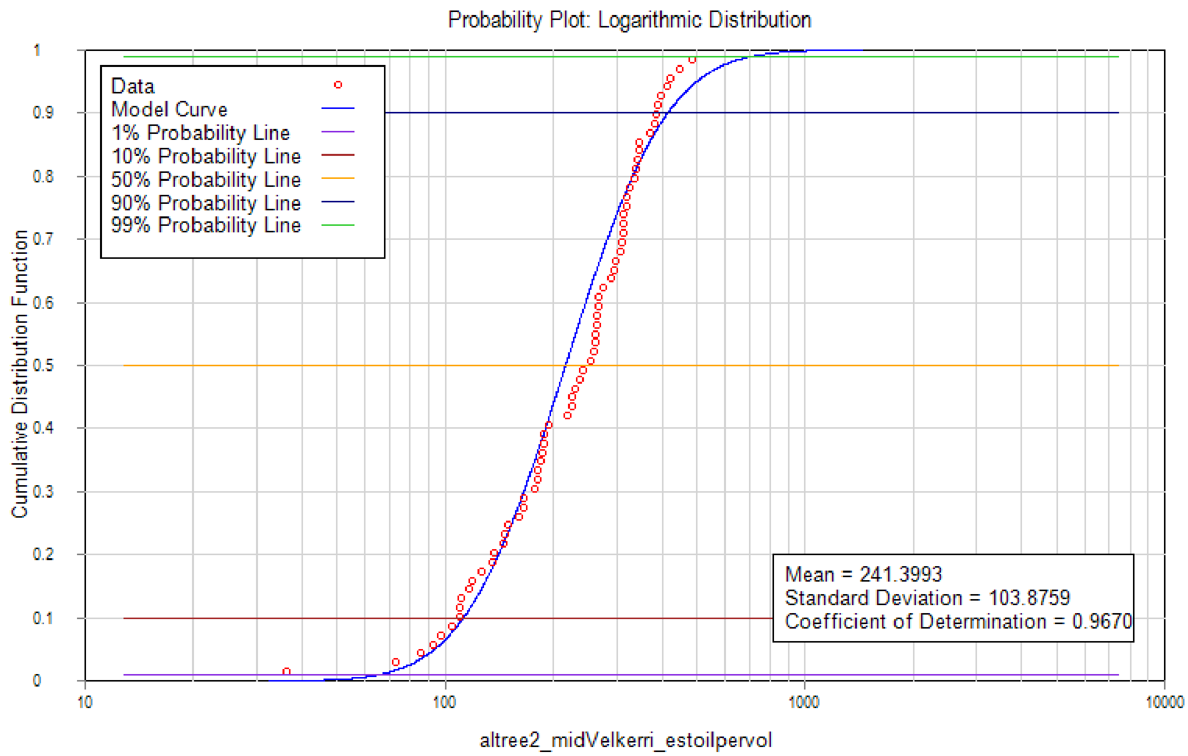
Distribution Report

Normal Distribution Report	
Parameter	altree2_midVelkerri_S1STOIIPpervol
Description	Altree 2 Middle Velkerri S1 STOIIPpervol
Number of Positive Points	75
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.95179
Data Range	
Minimum Value	9.0282
Average Value	58.9037
Maximum Value	104.7384
Standard Deviation	17.9053
Distribution	
99% Value	17.2498
90% Value	35.9571
50% Value	58.9037
10% Value	81.8502
1% Value	100.5575
Average Value Probability	0.5000



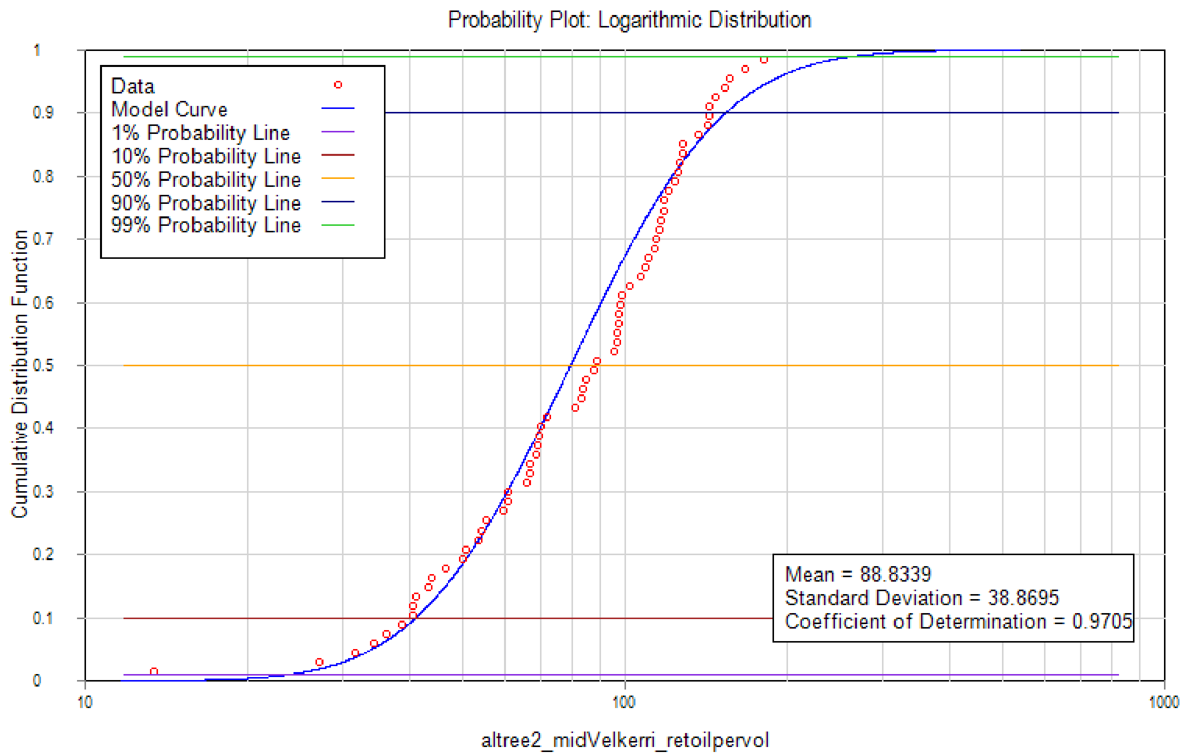
Distribution Report

Log-Normal Distribution Report	
Parameter	altree2_midVelkerri_SRPSTOIIPpervol
Description	Altree 2 Middle Velkerri SRP STOIIP per volume
Number of Positive Points	4
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.73944
Data Range	
Minimum Value	7.8041
Average Value	72.0009
Maximum Value	143.2337
Standard Deviation	55.6098
Distribution	
99% Value	2.5538
90% Value	9.5165
50% Value	47.7770
10% Value	239.8626
1% Value	893.8201
Average Value Probability	0.6277



Distribution Report

Log-Normal Distribution Report	
Parameter	altree2_midVelkerri_estoilpervol
Description	Altree 2 Middle Velkerri Estimated Oil per volume
Number of Positive Points	68
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96699
Data Range	
Minimum Value	36.2819
Average Value	241.3993
Maximum Value	487.2052
Standard Deviation	103.876
Distribution	
99% Value	65.9952
90% Value	112.4097
50% Value	216.0264
10% Value	415.1545
1% Value	707.1330
Average Value Probability	0.5862

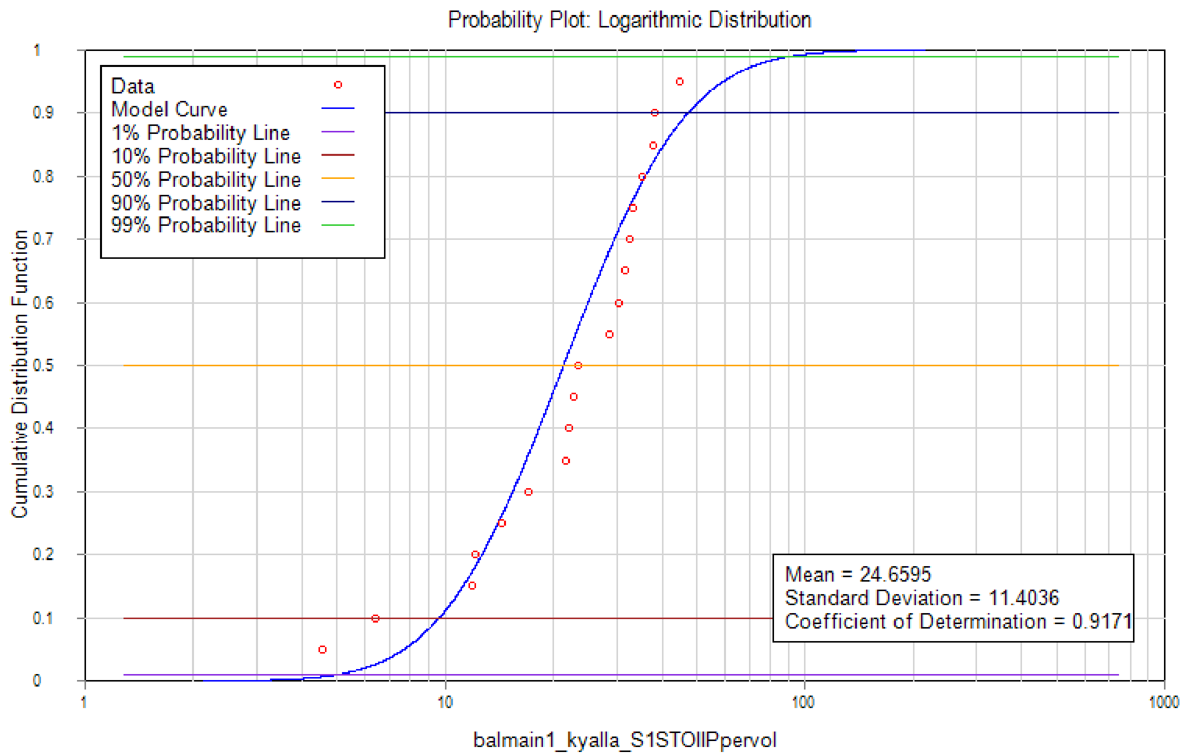


Distribution Report

Log-Normal Distribution Report	
Parameter	altree2_midVelkerri_retoilpervol
Description	Altree 2 Middle Velkerri Retained Oil per Volume
Number of Positive Points	66
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.97054
Data Range	
Minimum Value	13.4243
Average Value	88.8339
Maximum Value	180.2659
Standard Deviation	38.8695
Distribution	
99% Value	23.9271
90% Value	40.9777
50% Value	79.2784
10% Value	153.3774
1% Value	262.6757
Average Value Probability	0.5875

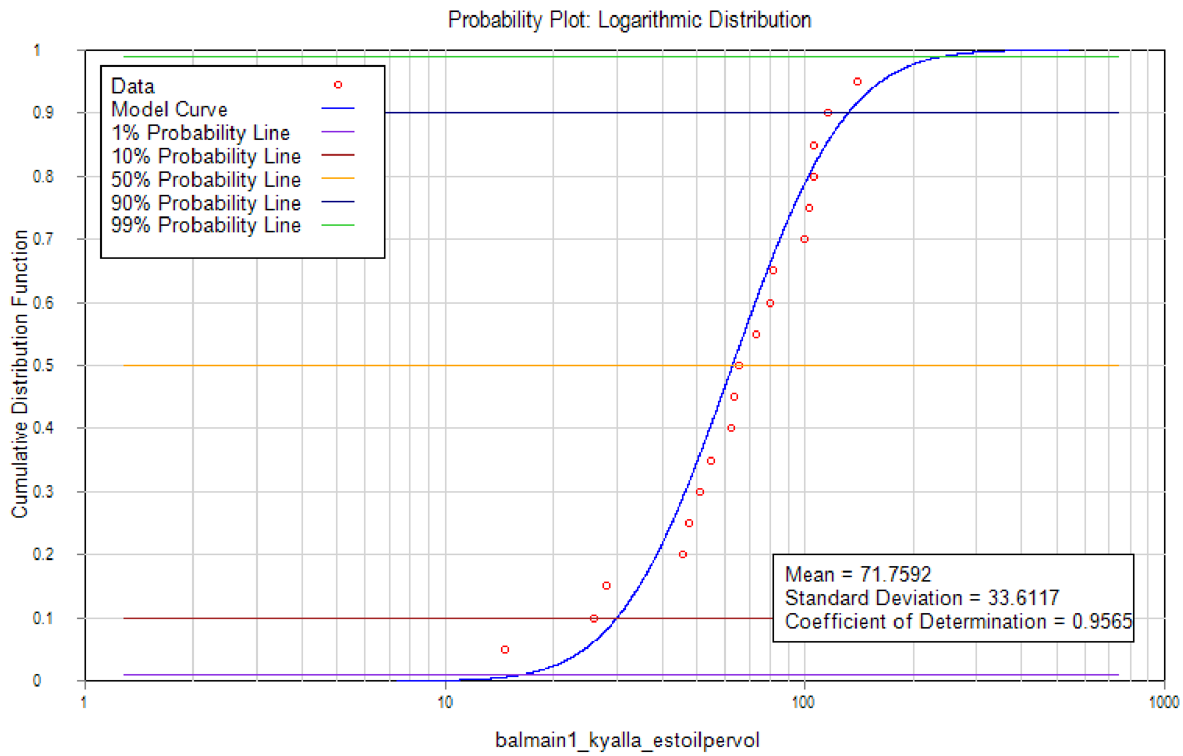
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Balmain 1	Kyalla	941.62	3089.304		2.5	0.85															
Balmain 1	Kyalla	946.56	3105.512		2.5	0.85															
Balmain 1	Kyalla	953.82	3129.331	0.52	2.5	0.85	11.86578824									57.04705882	71.65110588	14.60404706	0	5.403497412	0
Balmain 1	Kyalla	960	3149.606	1.67	2.5	0.85	38.10743529									238.9130824	344.7924235	105.8793412	0	39.17535624	0
Balmain 1	Kyalla	961	3152.887	1.022616	2.5	0.85	23.33489404									225.2217882	327.9064941	102.6847059	0	37.99334118	0
Balmain 1	Kyalla	963.01	3159.482	0.53	2.5	0.85	12.09397647									133.4901176	184.6042824	51.11416471	0	18.91224094	0
Balmain 1	Kyalla	965.6	3167.979	1.33	2.5	0.85	30.34903529									150.8324235	196.4700706	45.63764706	0	16.88592941	0
Balmain 1	Kyalla	972.74	3191.404	0.97	2.5	0.85	22.13425882									142.3894588	205.8257882	63.43632941	0	23.47144188	0
Balmain 1	Kyalla	976.04	3202.231	0.95	2.5	0.85	21.67788235									219.9734588	325.8528	105.8793412	0	39.17535624	0
Balmain 1	Kyalla	980.13	3215.65	1.43	2.5	0.85	32.63091765									334.9803294	434.4704	99.49007059	0	36.81132612	0
Balmain 1	Kyalla	983.94	3228.15	1.26	2.5	0.85	28.75171765									459.1147294	541.0343059	81.91957647	0	30.31024329	0
Balmain 1	Kyalla	985.82	3234.318	1.96	2.5	0.85	44.72489412									353.4635765	468.9268235	115.4632471	0	42.72140141	0
Balmain 1	Kyalla	990.38	3249.278	1.54	2.5	0.85	35.14098824									252.8325647	307.5977412	54.76517647	0	20.26311529	0
Balmain 1	Kyalla	998.26	3275.131	0.75	2.5	0.85	17.11411765									101.3155765	127.1008471	25.78527059	0	9.540550118	0
Balmain 1	Kyalla	999.24	3278.346	0.2	2.5	0.85	4.563764706									33.08729412	80.77863529	47.69134118	0	17.64579624	0
Balmain 1	Kyalla	1002.95	3290.518	0.28	2.5	0.85	6.389270588									19.396	81.69138824	62.29538824	0	23.04929365	0
Balmain 1	Kyalla	1005.86	3300.066	1.38	2.5	0.85	31.48997647									214.2687529	279.5305882	65.26183529	0	24.14687906	0
Balmain 1	Kyalla	1010.64	3315.748	1.45	2.5	0.85	33.08729412									211.0741176	284.0943529	73.02023529	0	27.01748706	0
Balmain 1	Kyalla	1012.6	3322.178	1.66	2.5	0.85	37.87924706									235.7184471	315.5843294	79.86588235	0	29.55037647	0
Balmain 1	Kyalla	1013.37	3324.705	0.63	2.5	0.85	14.37585882									125.2753412	265.8392941	140.5639529	0	52.00866259	0
Balmain 1	Kyalla	1018.7	3342.192	1	2.5	0.85	22.81882353									84.88602353	112.9531765	28.06715294	0	10.38484659	0
Balmain 1	Kyalla	1023.89	3359.219		2.5	0.85															
Balmain 1	Kyalla	1031.93	3385.597		2.5	0.85															
Balmain 1	Kyalla	1038.82	3408.202		2.5	0.85															
Balmain 1	Kyalla	1044.38	3426.444		2.5	0.85															
Balmain 1	Kyalla	1049.27	3442.487		2.5	0.85															



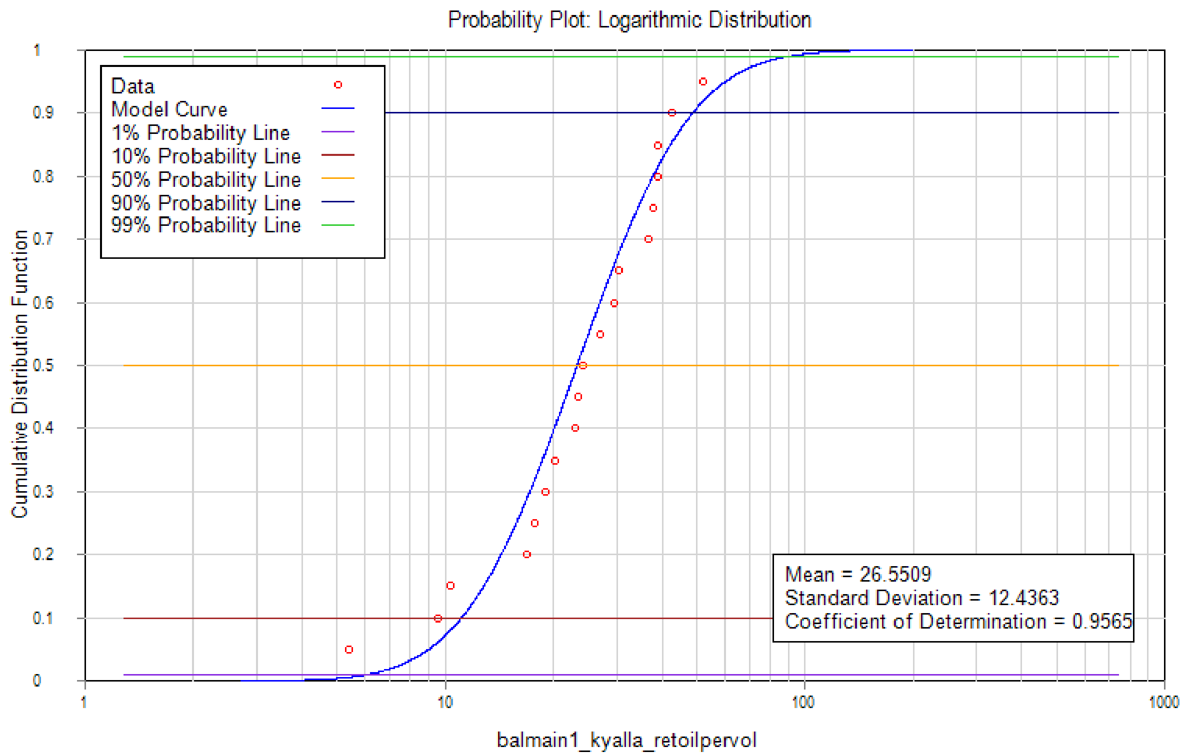
Distribution Report

Log-Normal Distribution Report	
Parameter	balmain1_kyalla_S1STOIIPpervol
Description	Balmain 1 Kyalla S1 STOIIP per volume
Number of Positive Points	19
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.91713
Data Range	
Minimum Value	4.5638
Average Value	24.6595
Maximum Value	44.7249
Standard Deviation	11.4036
Distribution	
99% Value	5.0408
90% Value	9.6339
50% Value	21.3228
10% Value	47.1942
1% Value	90.1961
Average Value Probability	0.5927



Distribution Report

Log-Normal Distribution Report	
Parameter	balmain1_kyalla_estoilpervol
Description	Balmain 1 Kyalla Estimated Oil per volume
Number of Positive Points	19
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.95653
Data Range	
Minimum Value	14.6040
Average Value	71.7592
Maximum Value	140.5640
Standard Deviation	33.6117
Distribution	
99% Value	16.4455
90% Value	30.0310
50% Value	62.8570
10% Value	131.5644
1% Value	240.2487
Average Value Probability	0.5909

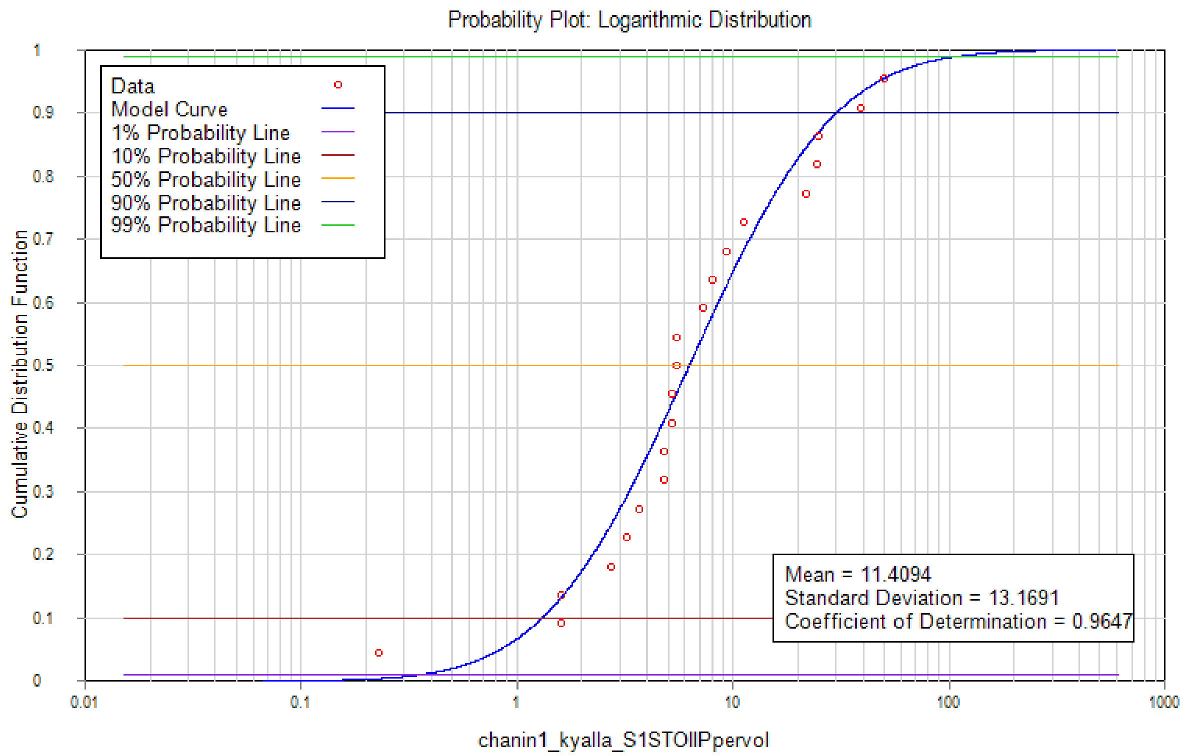


Distribution Report

Log-Normal Distribution Report	
Parameter	balmain1_kyalla_retoilpervol
Description	Balmain 1 Kyalla Retained Oil per volume
Number of Positive Points	19
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.95653
Data Range	
Minimum Value	5.4035
Average Value	26.5509
Maximum Value	52.0087
Standard Deviation	12.4363
Distribution	
99% Value	6.0848
90% Value	11.1115
50% Value	23.2571
10% Value	48.6788
1% Value	88.8920
Average Value Probability	0.5909

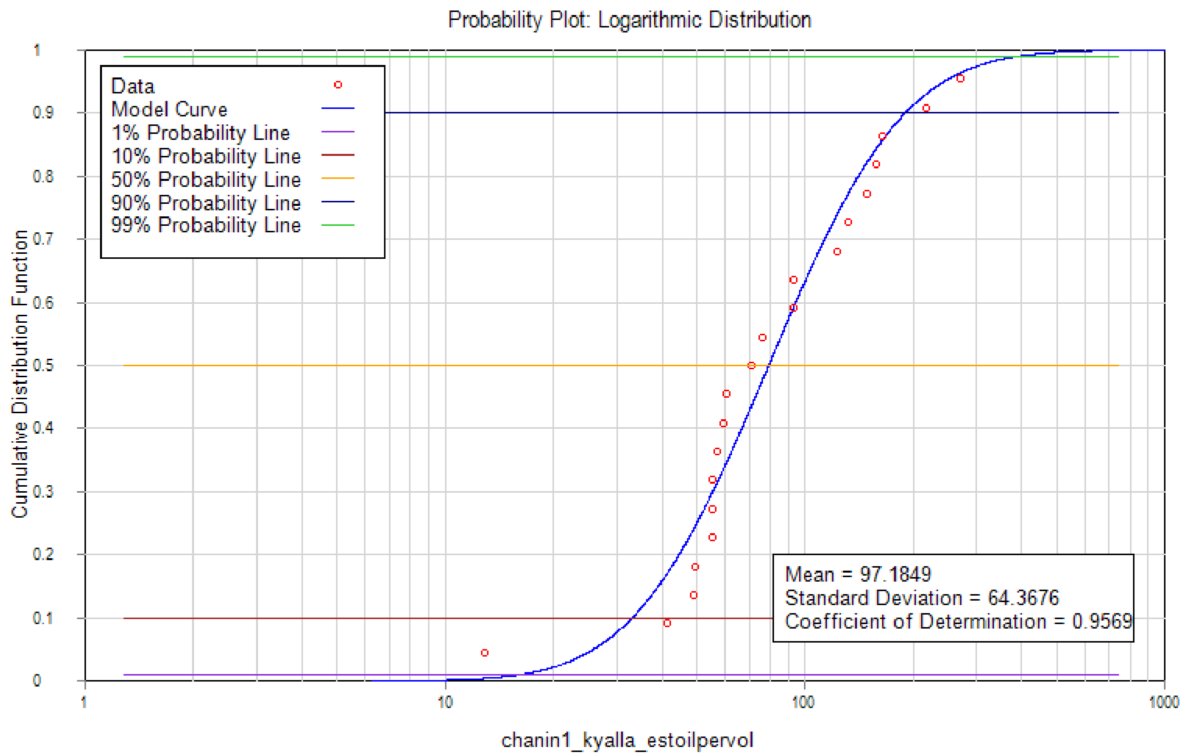
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Chanin 1	Kyalla	972	3188.976	0.16	2.5	0.85	3.651011765									8.214776471	193.96	163.4557967	133.7365609	60.47864478	49.48252755
Chanin 1	Kyalla	1011	3316.929		2.5	0.85															
Chanin 1	Kyalla	1011	3316.929	0.01	2.5	0.85	0.228188235									2.738258824	17.34230588	12.85156141	10.51491388	4.755077722	3.890518136
Chanin 1	Kyalla	1026	3366.142	0.07	2.5	0.85	1.597317647									7.302023529	67.54371765	59.03686024	7.229003294	21.84363829	2.674731219
Chanin 1	Kyalla	1032	3385.827	0.41	2.5	0.85	9.355717647									26.24164706	81.91957647	55.12115012	3.340675765	20.39482554	1.236050033
Chanin 1	Kyalla	1041	3415.354	0.24	2.5	0.85	5.476517647									20.76512941	144.2149647	123.4498353	0	45.67643906	0
Chanin 1	Kyalla	1041	3415.354		2.5	0.85															
Chanin 1	Kyalla	1056	3464.567	0.23	2.5	0.85	5.248329412									23.73157647	81.4632	55.42235859	13.85558965	20.50627268	5.126568169
Chanin 1	Kyalla	1071	3513.78	0.12	2.5	0.85	2.738258824									10.95303529	108.8457882	92.99811529	29.36782588	34.40930266	10.86609558
Chanin 1	Kyalla	1083	3553.15	0.24	2.5	0.85	5.476517647									14.14767059	100.4028235	75.90453459	62.10371012	28.0846778	22.97837274
Chanin 1	Kyalla	1089	3572.835	0.14	2.5	0.85	3.194635294									15.28861176	93.32898824	71.01674259	42.14180329	26.27619476	15.59246722
Chanin 1	Kyalla	1101	3612.205	0.23	2.5	0.85	5.248329412									22.81882353	173.8794353	148.0393995	18.12727341	54.77457783	6.707091162
Chanin 1	Kyalla	1116	3661.417		2.5	0.85															
Chanin 1	Kyalla	1156	3792.651		2.5	0.85															
Chanin 1	Kyalla	1167	3828.74		2.5	0.85															
Chanin 1	Kyalla	1188	3897.638	0.07	2.5	0.85	1.597317647									4.107388235	86.93971765	60.46760047	134.1883736	22.37301217	49.64969825
Chanin 1	Kyalla	1191	3907.48		2.5	0.85															
Chanin 1	Kyalla	1194	3917.323	0.35	2.5	0.85	7.986588235									18.25505882	82.83232941	55.53645271	54.24490729	20.5484875	20.0706157
Chanin 1	Kyalla	1200	3937.008		2.5	0.85															
Chanin 1	Kyalla	1212	3976.378		2.5	0.85															
Chanin 1	Kyalla	1217	3992.782	0.49	2.5	0.85	11.18122353									19.16781176	94.46992941	57.22960941	108.4350494	21.17495548	40.12096828
Chanin 1	Kyalla	1224	4015.748		2.5	0.85															
Chanin 1	Kyalla	1233	4045.276		2.5	0.85															
Chanin 1	Kyalla	1239	4064.961		2.5	0.85															
Chanin 1	Kyalla	1251	4104.331		2.5	0.85															
Chanin 1	Kyalla	1260	4133.858		2.5	0.85															
Chanin 1	Kyalla	1267	4156.824	2.18	2.5	0.85	49.74503529									63.43632941	316.9534588	218.0247313	212.9543887	80.66915058	78.79312382
Chanin 1	Kyalla	1276	4186.352	1.7	2.5	0.85	38.792									41.07388235	314.4433882	270.6358108	16.40217035	100.13525	6.068803031
Chanin 1	Kyalla	1290	4232.283	1.08	2.5	0.85	24.64432941									16.65774118	195.7855059	157.6324329	128.9719906	58.32400019	47.71963652
Chanin 1	Kyalla	1293	4242.126	1.09	2.5	0.85	24.87251765									33.77185882	167.9465412	92.58053082	249.5649092	34.2547964	92.3390164
Chanin 1	Kyalla	1299	4261.811	0.95	2.5	0.85	21.67788235									24.41614118	174.1076235	131.7285045	107.7778673	48.73954665	39.8778109
Chanin 1	Kyalla	1308	4291.339		2.5	0.85															
Chanin 1	Kyalla	1311	4301.181	0.32	2.5	0.85	7.302023529									14.83223529	92.18804706	49.50771953	167.0885534	18.31785623	61.82276476
Chanin 1	Kyalla	1314	4311.024	0.21	2.5	0.85	4.791952941									10.04028235	82.14776471	49.033088	138.4463661	18.14224256	51.22515546
Chanin 1	Kyalla	1314	4311.024		2.5	0.85															
Chanin 1	Kyalla	1317	4320.866		2.5	0.85															
Chanin 1	Kyalla	1323	4340.551	0.21	2.5	0.85	4.791952941									9.355717647	78.04037647	41.21079529	164.8431812	15.24799426	60.99197704
Chanin 1	Kyalla	1326	4350.394		2.5	0.85															



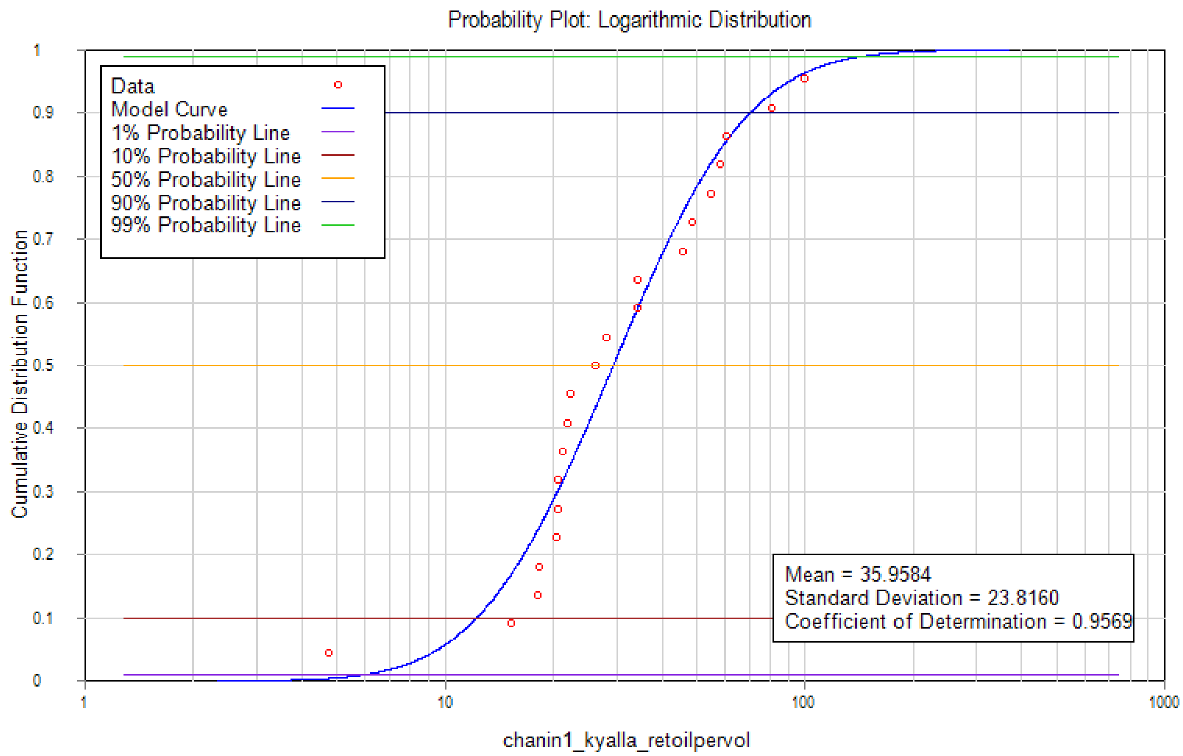
Distribution Report

Log-Normal Distribution Report	
Parameter	chanin1_kyalla_S1STOIIPpervol
Description	Chanin 1 Kyalla S1 STOIIP per Volume
Number of Positive Points	21
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96475
Data Range	
Minimum Value	0.2282
Average Value	11.4094
Maximum Value	49.7450
Standard Deviation	13.1691
Distribution	
99% Value	0.3648
90% Value	1.3085
50% Value	6.2694
10% Value	30.0392
1% Value	107.7557
Average Value Probability	0.6878



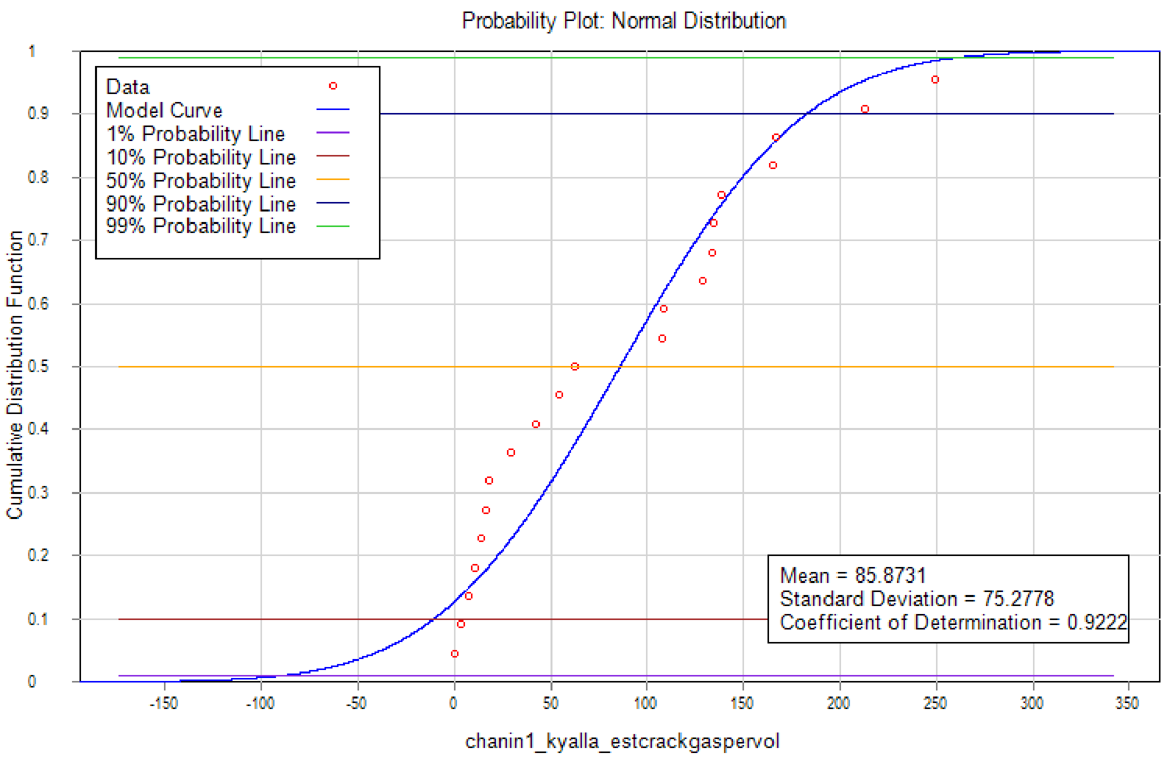
Distribution Report

Log-Normal Distribution Report	
Parameter	chanin1_kyalla_estoilpervol
Description	Chanin 1 Kyalla Estimated Oil per Volume
Number of Positive Points	21
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.95686
Data Range	
Minimum Value	12.8516
Average Value	97.1849
Maximum Value	270.6358
Standard Deviation	64.3676
Distribution	
99% Value	16.2494
90% Value	33.1057
50% Value	79.2509
10% Value	189.7167
1% Value	386.5197
Average Value Probability	0.6177



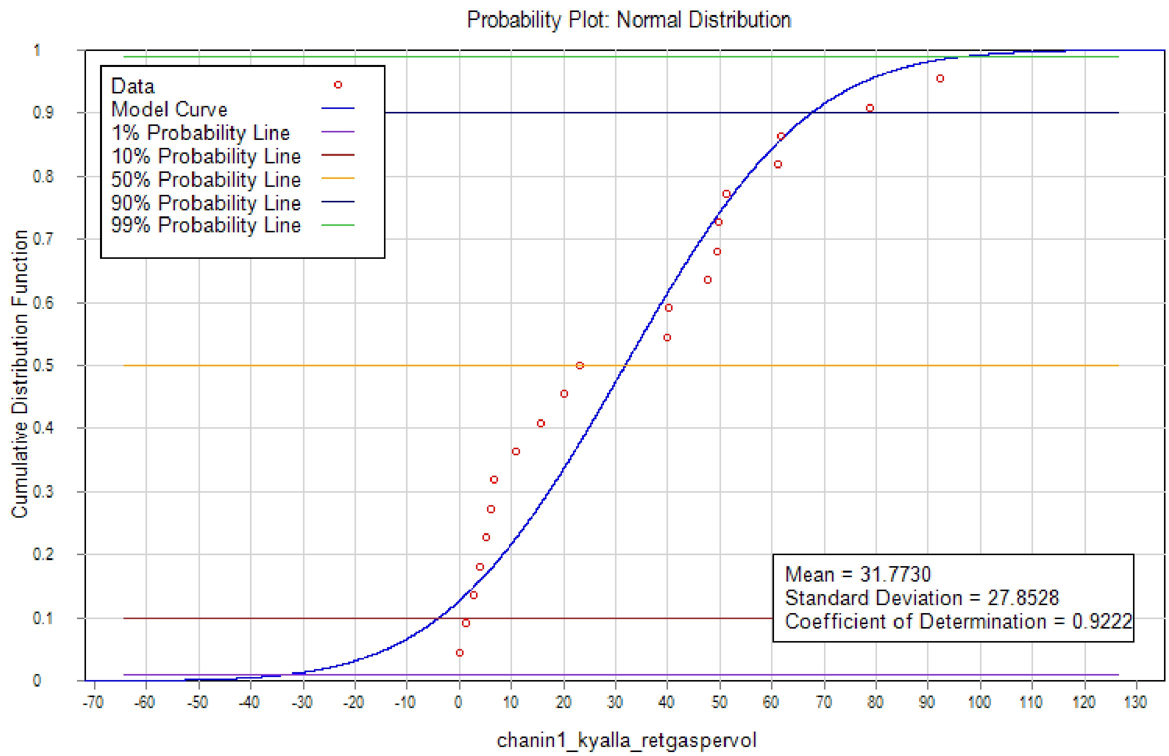
Distribution Report

Log-Normal Distribution Report	
Parameter	chanin1_kyalla_retoilpervol
Description	Chanin 1 Kyalla Retained Oil per Volume
Number of Positive Points	21
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.95686
Data Range	
Minimum Value	4.7551
Average Value	35.9584
Maximum Value	100.1353
Standard Deviation	23.8160
Distribution	
99% Value	6.0123
90% Value	12.2491
50% Value	29.3228
10% Value	70.1952
1% Value	143.0123
Average Value Probability	0.6177



Distribution Report

Normal Distribution Report	
Parameter	chanin1_kyalla_estcrackgaspervol
Description	Chanin 1 Kyalla Estimated Cracked Gas per Volume
Number of Positive Points	20
Number of Non-Positive Points	1
Number of Null Values	0
Regression Coefficient	0.92221
Data Range	
Minimum Value	0.0000
Average Value	85.8731
Maximum Value	249.5649
Standard Deviation	75.2778
Distribution	
99% Value	-89.2492
90% Value	-10.5992
50% Value	85.8731
10% Value	182.3454
1% Value	260.9954
Average Value Probability	0.5000



Distribution Report

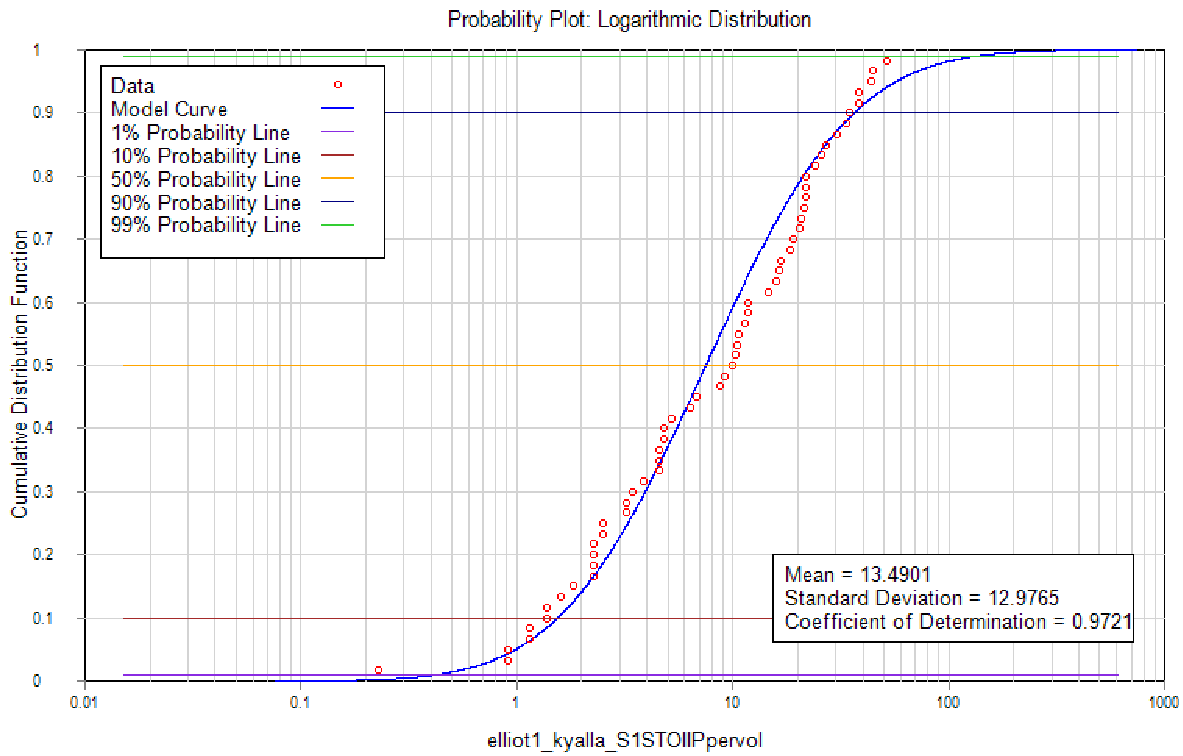
Normal Distribution Report	
Parameter	chanin1_kyalla_retgaspervol
Description	Chanin 1 Kyalla Retained Gas per Volume
Number of Positive Points	20
Number of Non-Positive Points	1
Number of Null Values	0
Regression Coefficient	0.92221
Data Range	
Minimum Value	0.0000
Average Value	31.7730
Maximum Value	92.3390
Standard Deviation	27.8528
Distribution	
99% Value	-33.0222
90% Value	-3.9217
50% Value	31.7730
10% Value	67.4678
1% Value	96.5683
Average Value Probability	0.5000

Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Elliott 1	Kyalla	667.35	2189.469	0.2	2.5	0.85	4.563764706									18.25505882	363.0474824	344.7924235	0	127.5731967	0
Elliott 1	Kyalla	676.93	2220.899	0.1	2.5	0.85	2.281882353									16.20136471	132.1209882	115.9196235	0	42.89026071	0
Elliott 1	Kyalla	677.15	2221.621	0.06	2.5	0.85	1.369129412									5.476517647	75.75849412	70.28197647	0	26.00433129	0
Elliott 1	Kyalla	677.15	2221.621		2.5	0.85															
Elliott 1	Kyalla	688.17	2257.776	0.08	2.5	0.85	1.825505882									30.57722353	115.2350588	84.65783529	0	31.32339906	0
Elliott 1	Kyalla	697.86	2289.567	0.05	2.5	0.85	1.140941176									16.20136471	86.93971765	70.73835294	0	26.17319059	0
Elliott 1	Kyalla	705.3	2313.976	0.04	2.5	0.85	0.912752941									11.40941176	91.50348235	80.09407059	0	29.63480612	0
Elliott 1	Kyalla	710.95	2332.513		2.5	0.85															
Elliott 1	Kyalla	716.05	2349.245	0.04	2.5	0.85	0.912752941									9.127529412	68.68465882	59.55712941	0	22.03613788	0
Elliott 1	Kyalla	725.72	2380.971	0.11	2.5	0.85	2.510070588									18.93962353	85.11421176	66.17458824	0	24.48459765	0
Elliott 1	Kyalla	736.96	2417.848	0.1	2.5	0.85	2.281882353									4.335576471	58.188	53.31389929	3.231145412	19.72614274	1.195523802
Elliott 1	Kyalla	745.22	2444.948		2.5	0.85															
Elliott 1	Kyalla	755.04	2477.165		2.5	0.85															
Elliott 1	Kyalla	764.95	2509.678		2.5	0.85															
Elliott 1	Kyalla	773.86	2538.911	0.11	2.5	0.85	2.510070588									12.77854118	67.77190588	54.99336471	0	20.34754494	0
Elliott 1	Kyalla	785.3	2576.444		2.5	0.85															
Elliott 1	Kyalla	787.6	2583.99	0.01	2.5	0.85	0.228188235														
Elliott 1	Kyalla	794.69	2607.251	0.21	2.5	0.85	4.791952941									39.24837647	96.52362353	57.27524706	0	21.19184141	0
Elliott 1	Kyalla	801.5	2629.593		2.5	0.85															
Elliott 1	Kyalla	805.04	2641.207		2.5	0.85															
Elliott 1	Kyalla	815.93	2676.936		2.5	0.85															
Elliott 1	Kyalla	825.17	2707.251		2.5	0.85															
Elliott 1	Kyalla	837.7	2748.36		2.5	0.85															
Elliott 1	Kyalla	844.12	2769.423	0.06	2.5	0.85	1.369129412									7.302023529	54.08061176	46.77858824	0	17.30807765	0
Elliott 1	Kyalla	856.03	2808.497		2.5	0.85															
Elliott 1	Kyalla	867.11	2844.849		2.5	0.85															
Elliott 1	Kyalla	876.37	2875.23		2.5	0.85															
Elliott 1	Kyalla	885.34	2904.659		2.5	0.85															
Elliott 1	Kyalla	885.8	2906.168	0.1	2.5	0.85	2.281882353														
Elliott 1	Kyalla	894.95	2936.188		2.5	0.85															
Elliott 1	Kyalla	905.11	2969.521		2.5	0.85															
Elliott 1	Kyalla	913.12	2995.801		2.5	0.85															
Elliott 1	Kyalla	920.5	3020.013		2.5	0.85															
Elliott 1	Kyalla	920.5	3020.013		2.5	0.85															
Elliott 1	Kyalla	925	3034.777	0.07	2.5	0.85	1.597317647									9.127529412	68.91284706	59.78531765	0	22.12056753	0
Elliott 1	Kyalla	925.19	3035.4		2.5	0.85															
Elliott 1	Kyalla	935.94	3070.669		2.5	0.85															
Elliott 1	Kyalla	945.83	3103.117		2.5	0.85															
Elliott 1	Kyalla	955.07	3133.432		2.5	0.85															
Elliott 1	Kyalla	964.97	3165.912		2.5	0.85															
Elliott 1	Kyalla	976.5	3203.74	0.2	2.5	0.85	4.563764706									15.06042353	64.80545882	49.74503529	0	18.40566306	0
Elliott 1	Kyalla	984.9	3231.299		2.5	0.85															
Elliott 1	Kyalla	994.92	3264.173		2.5	0.85															
Elliott 1	Kyalla	1003.11	3291.043	0.15	2.5	0.85	3.422823529									12.55035294	57.04705882	44.49670588	0	16.46378118	0
Elliott 1	Kyalla	1010.1	3313.976	0.14	2.5	0.85	3.194635294														
Elliott 1	Kyalla	1010.4	3314.961	0.05	2.5	0.85	1.140941176									5.476517647	72.79204706	67.31552941	0	24.90674588	0
Elliott 1	Kyalla	1010.4	3314.961		2.5	0.85															
Elliott 1	Kyalla	1014.19	3327.395	0.38	2.5	0.85	8.671152941									55.22155294	132.5773647	77.35581176	0	28.62165035	0
Elliott 1	Kyalla	1024.64	3361.68	0.5	2.5	0.85	11.40941176									39.24837647	93.32898824	54.08061176	0	20.00982635	0
Elliott 1	Kyalla	1034.05	3392.552	0.81	2.5	0.85	18.48324706									70.28197647	155.3961882	85.11421176	0	31.49225835	0
Elliott 1	Kyalla	1044.84	3427.953	0.7	2.5	0.85	15.97317647									94.01355294	187.7989176	93.78536471	0	34.70058494	0
Elliott 1	Kyalla	1051.5	3449.803		2.5	0.85															
Elliott 1	Kyalla	1054.37	3459.219	0.95	2.5	0.85	21.67788235									107.4766588	212.6714353	103.0908809	12.62337318	38.14362595	4.670648075
Elliott 1	Kyalla	1063.9	3490.486	1.67	2.5	0.85	38.10743529														
Elliott 1	Kyalla	1064.83	3493.537	1.52	2.5	0.85	34.68461176									159.7317647	253.9735059	93.29932376	5.654504471	34.52074979	2.092166654
Elliott 1	Kyalla	1074.17	3524.18	1.91	2.5	0.85	43.58395294									120.9397647	193.96	73.02023529	0	27.01748706	0
Elliott 1	Kyalla	1083.84	3555.906	1.95	2.5	0.85	44.49670588									161.3290824	291.1681882	129.8391059	0	48.04046918	0
Elliott 1	Kyalla	1093.39	3587.238	0.96	2.5	0.85	21.90607059									66.63096471	143.9867765	77.35581176	0	28.62165035	0
Elliott 1	Kyalla	1102.24	3616.273	1.06	2.5	0.85	24.18795294									81.69138824	208.7922353	119.4747962	45.75630494	44.20567461	16.92983283
Elliott 1	Kyalla	1110.32	3642.782	0.21	2.5	0.85	4.791952941									11.6376	74.61755294	62.97995294	0	23.30258259	0
Elliott 1	Kyalla	1116.1	3661.745	0.83	2.5	0.85	18.93962353														
Elliott 1	Kyalla	1120.05	3674.705	2.26	2.5	0.85	51.57054118									219.2888941	465.2758118	243.5270485	14.75921506	90.10500793	5.460909572
Elliott 1	Kyalla	1128.03	3700.886	0.46	2.5	0.85	10.49665882									47.91952941	140.1075765	92.18804706	0	34.10957741	0
Elliott 1	Kyalla	1141.97	3746.621	0.89	2.5	0.85	20.30875294									93.1008	321.0608471	214.2824442	82.06561694	79.28450437	30.36427827
Elliott 1	Kyalla	1149	3769.685	0.5197505	2.5	0.85	11.86009494									33.08729412	183.4633412	150.3760471	0	55.63913741	0
Elliott 1	Kyalla	1150.77	3775.492	0.72	2.5	0.85	16.42955294									54.76517647	209.0204235	143.4573798	64.78720376	53.07923051	23.97126539
Elliott 1	Kyalla	1160.18	3806.365	0.52	2.5	0.85	11.86578824									42.21482353	128.6981647	86.48334118	0	31.99883624	0
Elliott 1	Kyalla	1171.05	3842.028	0.47	2.5	0.85	10.72484706									23.2752	93.1008	69.8256	0	25.835472	0
Elliott 1	Kyalla	1176.57	3860.138		2.935	0.85		0.034991	0.008648	2.34759819											
Elliott 1	Kyalla	1177.72	3863.911	0.3	2.5	0.85	6.845647059									25.55708235	109.3021647	83.74508235	0	30.98568047	0
Elliott 1	Kyalla	1177.72	3863.911		2.5	0.85															

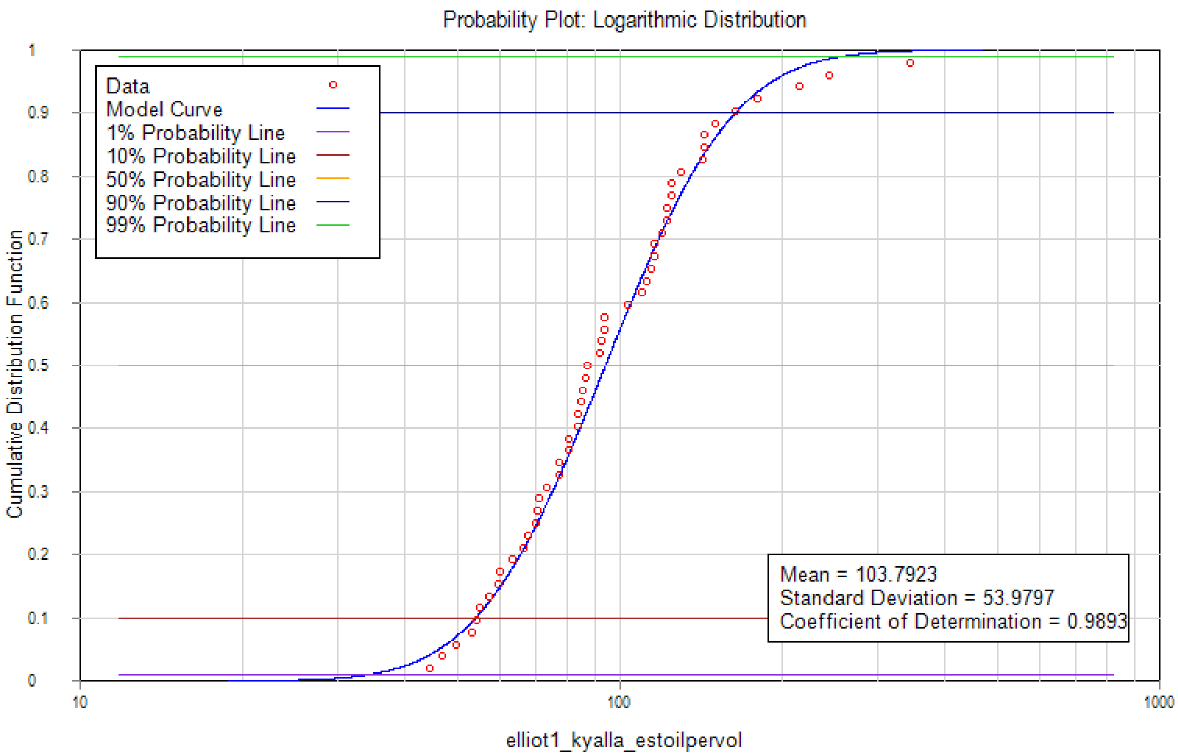
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Elliott 1	Kyalla	1180.12	3871.785	1.13	2.5	0.85	25.78527059									64.57727059	208.1076706	142.095096	8.611824	52.57518552	3.18637488
Elliott 1	Kyalla	1189.44	3902.362	0.64	2.5	0.85	14.60404706									31.48997647	112.0404235	80.55044706	0	29.80366541	0
Elliott 1	Kyalla	1199.7	3936.024	0.91	2.5	0.85	20.76512941									49.28865882	163.3827765	114.0941176	0	42.21482353	0
Elliott 1	Kyalla	1210.13	3970.243	0.73	2.5	0.85	16.65774118									32.63091765	119.3424471	86.71152941	0	32.08326588	0
Elliott 1	Kyalla	1219.95	4002.461	0.94	2.5	0.85	21.44969412									48.83228235	170.6848	121.8525176	0	45.08543153	0
Elliott 1	Kyalla	1221.6	4007.874	0.4	2.5	0.85	9.127529412									17.79868235	109.7585412	91.95985882	0	34.02514776	0
Elliott 1	Kyalla	1228.87	4031.726	0.95	2.5	0.85	21.67788235									41.07388235	124.5907765	83.51689412	0	30.90125082	0
Elliott 1	Kyalla	1230.56	4037.27	0.2	2.5	0.85	4.563764706									6.389270588	118.2015059	111.8122353	0	41.37052706	0
Elliott 1	Kyalla	1230.56	4037.27		2.5	0.85															
Elliott 1	Kyalla	1240.19	4068.865	1.19	2.5	0.85	27.1544									63.66451765	188.0271059	124.3625882	0	46.01415765	0
Elliott 1	Kyalla	1242.2	4075.459	1.69	2.5	0.85	38.56381176														
Elliott 1	Kyalla	1250.04	4101.181	1.34	2.5	0.85	30.57722353									64.34908235	188.7116706	124.3625882	0	46.01415765	0
Elliott 1	Kyalla	1259.12	4130.971	1.48	2.5	0.85	33.77185882									66.40277647	188.7116706	122.3088941	0	45.25429082	0
Elliott 1	Kyalla	1270.04	4166.798	0.45	2.5	0.85	10.26847059									25.55708235	141.0203294	115.4632471	0	42.72140141	0
Elliott 1	Kyalla	1275	4183.071		2.5	0.85															
Elliott 1	Kyalla	1279.06	4196.391	0.44	2.5	0.85	10.04028235									29.66447059	209.0204235	179.3559529	0	66.36170259	0
Elliott 1	Kyalla	1279.95	4199.311	0.17	2.5	0.85	3.8792														
Elliott 1	Kyalla	1291.84	4238.32	0.23	2.5	0.85	5.248329412									14.60404706	157.4498824	142.8458353	0	52.85295906	0
Elliott 1	Kyalla	1299.96	4264.961	0.1	2.5	0.85	2.281882353									7.530211765	117.2887529	109.7585412	0	40.61066024	0
Elliott 1	Kyalla	1310.5	4299.541	0.14	2.5	0.85	3.194635294														
Elliott 1	Kyalla	1310.83	4300.623	0.28	2.5	0.85	6.389270588									15.28861176	178.4432	163.1545882	0	60.36719765	0



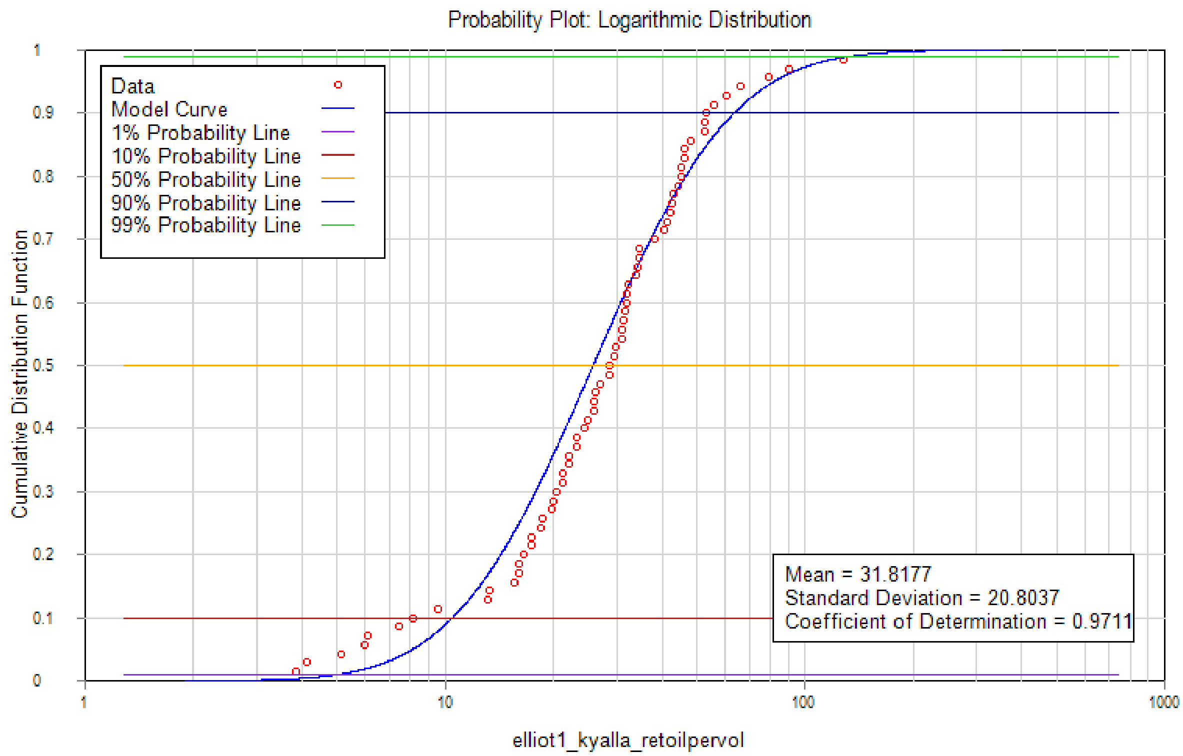
Distribution Report

Log-Normal Distribution Report	
Parameter	elliot1_kyalla_S1STOIIPpervol
Description	Elliot 1 Kyalla S1 STOIIP per volume
Number of Positive Points	59
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.97211
Data Range	
Minimum Value	0.2282
Average Value	13.4901
Maximum Value	51.5705
Standard Deviation	12.9765
Distribution	
99% Value	0.4258
90% Value	1.5445
50% Value	7.5012
10% Value	36.4324
1% Value	132.1435
Average Value Probability	0.6829



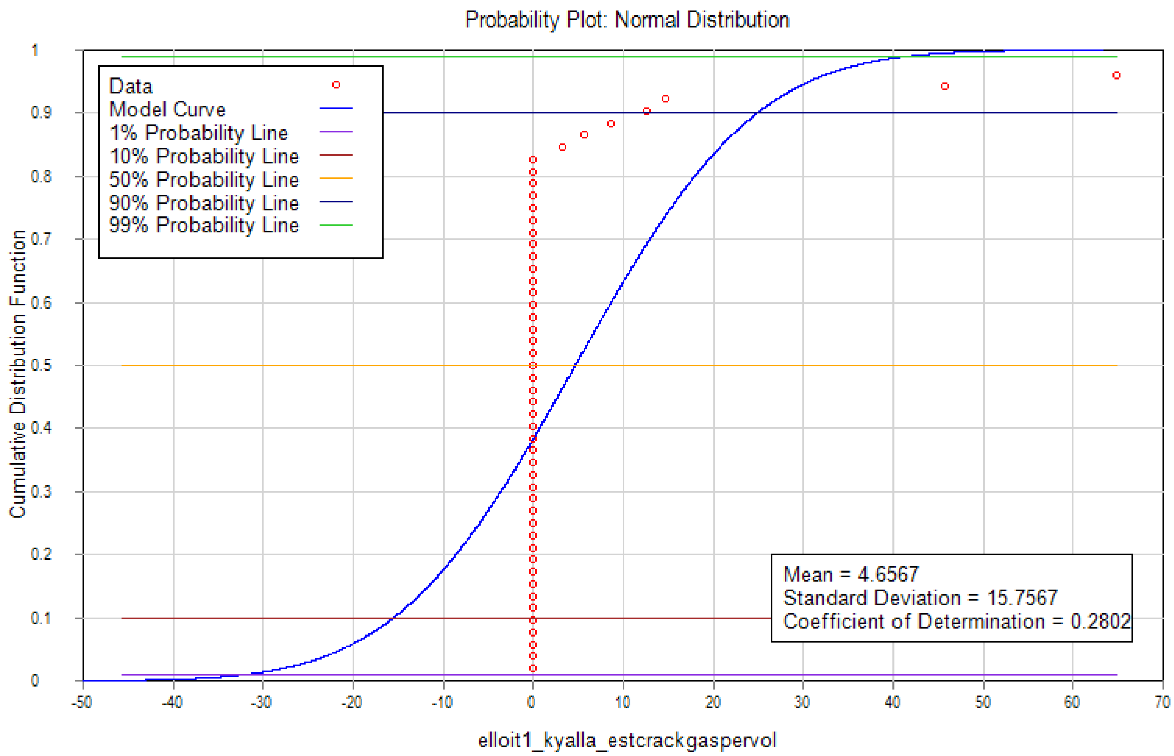
Distribution Report

Log-Normal Distribution Report	
Parameter	elliot1_kyalla_estoilpervol
Description	Elliot 1 Kyalla Estimated Oil per Volume
Number of Positive Points	51
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98927
Data Range	
Minimum Value	44.4967
Average Value	103.7923
Maximum Value	344.7924
Standard Deviation	53.9797
Distribution	
99% Value	34.4273
90% Value	54.0349
50% Value	93.9310
10% Value	163.2838
1% Value	256.2800
Average Value Probability	0.5915



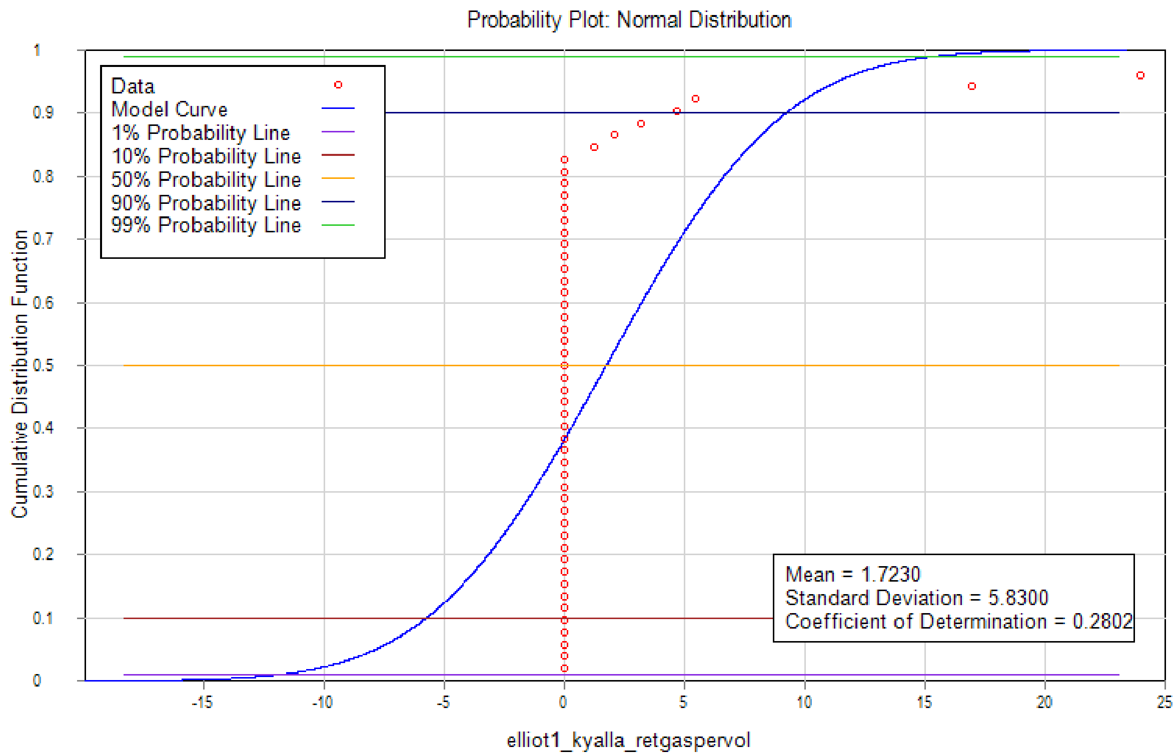
Distribution Report

Log-Normal Distribution Report	
Parameter	elliot1_kyalla_retoilpervol
Description	Elliot 1 Kyalla Retained Oil per Volume
Number of Positive Points	69
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.97111
Data Range	
Minimum Value	3.8449
Average Value	31.8177
Maximum Value	127.5732
Standard Deviation	20.8037
Distribution	
99% Value	5.0338
90% Value	10.4823
50% Value	25.7754
10% Value	63.3804
1% Value	131.9829
Average Value Probability	0.6179



Distribution Report

Normal Distribution Report	
Parameter	elloit1_kyalla_estcrackgaspervol
Description	Elliot 1 Kyalla Estimated Cracked Gas per Volume
Number of Positive Points	8
Number of Non-Positive Points	43
Number of Null Values	0
Regression Coefficient	0.28024
Data Range	
Minimum Value	0.0000
Average Value	4.6567
Maximum Value	82.0656
Standard Deviation	15.7567
Distribution	
99% Value	-31.9989
90% Value	-15.5363
50% Value	4.6567
10% Value	24.8496
1% Value	41.3122
Average Value Probability	0.5000



Distribution Report

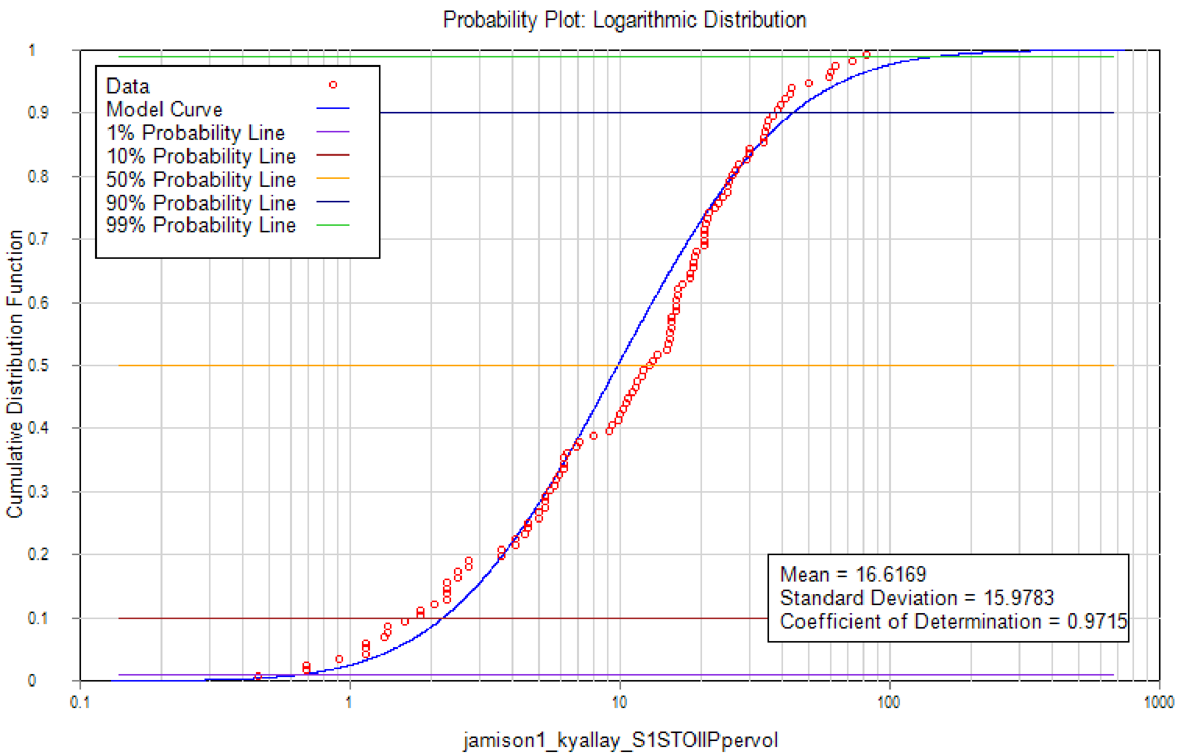
Normal Distribution Report	
Parameter	elliot1_kyalla_retgaspervol
Description	Elliot 1 Kyalla Retained Gas per Volume
Number of Positive Points	8
Number of Non-Positive Points	43
Number of Null Values	0
Regression Coefficient	0.28024
Data Range	
Minimum Value	0.0000
Average Value	1.7230
Maximum Value	30.3643
Standard Deviation	5.82997
Distribution	
99% Value	-11.8396
90% Value	-5.7484
50% Value	1.7230
10% Value	9.1944
1% Value	15.2855
Average Value Probability	0.5000

Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Jamison 1	Kyalla	971.87	3188.55	0.16	2.5	0.85	3.651011765									21.44969412	66.34707344	44.89737933	0	16.61203035	0
Jamison 1	Kyalla	972.03	3189.075		2.5	0.85															
Jamison 1	Kyalla	975	3198.819	0.04	2.5	0.85	0.912752941									5.020141176	88.27031582	83.25017464	0	30.80256462	0
Jamison 1	Kyalla	982.21	3222.474	1.05	2.5	0.85	23.95976471									75.30211765	108.7828061	33.48068844	0	12.38785472	0
Jamison 1	Kyalla	985.24	3232.415	0.08	2.5	0.85	1.825505882									15.5168	144.8490275	129.3322275	0	47.85292417	0
Jamison 1	Kyalla	992	3254.593	1.88	2.5	0.85	42.89938824									267.8929882	329.9244775	62.03148928	0	22.95165103	0
Jamison 1	Kyalla	992.42	3255.971	0.47	2.5	0.85	10.72484706									73.02023529	306.9434502	233.9232149	0	86.55158952	0
Jamison 1	Kyalla	992.42	3255.971	1.1	2.5	0.85	25.10070588									159.7317647	242.4453107	66.23853433	98.85007001	24.5082577	36.5745259
Jamison 1	Kyalla	995	3264.436	0.06	2.5	0.85	1.369129412									5.248329412	402.2530106	397.0046812	0	146.891732	0
Jamison 1	Kyalla	1001.14	3284.58		2.5	0.85															
Jamison 1	Kyalla	1007	3303.806		2.5	0.85															
Jamison 1	Kyalla	1012.18	3320.801	2.64	2.5	0.85	60.24169412									320.1480941	447.2682563	127.1201622	0	47.03446	0
Jamison 1	Kyalla	1018	3339.895	3.2	2.5	0.85	73.02023529									425.7992471	577.9034461	152.104199	0	56.27855363	0
Jamison 1	Kyalla	1018.08	3340.157	3.59	2.5	0.85	81.91957647									411.1952	576.8779215	165.6827215	0	61.30260697	0
Jamison 1	Kyalla	1018.08	3340.157	2.6	2.5	0.85	59.32894118									335.4367059	445.5192262	98.51224952	69.42162486	36.44953232	25.6860012
Jamison 1	Kyalla	1018.17	3340.453	1.34	2.482	0.85	30.35706752	0.05306	0.182759	75.23159279						340.9506464	418.0055329	77.05488645	0	28.51030799	0
Jamison 1	Kyalla	1018.17	3340.453	1.29	2.5	0.85	29.43628235									343.4232941	436.5188351	93.09554102	0	34.44535018	0
Jamison 1	Kyalla	1020.17	3347.014	0.05	2.5	0.85	1.140941176									5.020141176	135.3353389	130.3151977	0	48.21662314	0
Jamison 1	Kyalla	1024.82	3362.27	2.75	2.5	0.85	62.75176471									292.5373176	399.7738988	107.2365812	0	39.67753503	0
Jamison 1	Kyalla	1031.51	3384.219		2.5	0.85															
Jamison 1	Kyalla	1031.65	3384.678	0.05	2.5	0.85	1.140941176									4.107388235	78.31874916	74.21136092	0	27.45820354	0
Jamison 1	Kyalla	1043.99	3425.164	1.89	2.5	0.85	43.12757647									221.3425882	304.3414042	82.99881592	0	30.70956189	0
Jamison 1	Kyalla	1051.45	3449.639	0.9	2.5	0.85	20.53694118									241.8795294	336.9549646	76.13816334	113.6236309	28.17112043	42.04074344
Jamison 1	Kyalla	1054.49	3459.613	0.51	2.5	0.85	11.6376									57.04705882	100.8620232	43.81496435	0	16.21153681	0
Jamison 1	Kyalla	1063	3487.533	0.2538071	2.5	0.85	5.791579425									22.81882353	67.70256287	44.88373934	0	16.60698356	0
Jamison 1	Kyalla	1067.18	3501.247	0.08	2.5	0.85	1.825505882									4.791952941	56.51028479	51.71833185	0	19.13578278	0
Jamison 1	Kyalla	1071.86	3516.601		2.5	0.85															
Jamison 1	Kyalla	1082.5	3551.509		2.5	0.85															
Jamison 1	Kyalla	1091.6	3581.365		2.5	0.85															
Jamison 1	Kyalla	1101.6	3614.173	0.4	2.5	0.85	9.127529412									20.53694118	76.7432148	54.3835566	10.93630215	20.12191594	4.046431794
Jamison 1	Kyalla	1103.68	3620.997		2.5	0.85															
Jamison 1	Kyalla	1119.44	3672.703	0.35	2.5	0.85	7.986588235									27.83896471	79.46369921	51.62473451	0	19.10115177	0
Jamison 1	Kyalla	1130.85	3710.138	0.02	2.5	0.85	0.456376471									2.738258824	231.1489926	228.4107338	0	84.5119715	0
Jamison 1	Kyalla	1142.48	3748.294	0.58	2.5	0.85	13.23491765									43.58395294	102.01026	58.42630704	0	21.61773361	0
Jamison 1	Kyalla	1142.72	3749.081	0.19	2.572	0.85	4.460441073	0.058329	0.059749	27.03721695						28.17120678	96.92524204	68.75403526	0	25.43899305	0
Jamison 1	Kyalla	1142.72	3749.081	0.11	2.5	0.85	2.510070588									18.48324706	74.88988052	56.40663346	0	20.87045438	0
Jamison 1	Kyalla	1142.82	3749.409	0.84	2.5	0.85	19.16781176									75.53030588	123.2607927	47.7304868	0	17.66028012	0
Jamison 1	Kyalla	1142.82	3749.409	0.3	2.5	0.85	6.845647059									20.53694118	94.35372627	59.11384399	88.21764666	21.87212227	32.64052927
Jamison 1	Kyalla	1151.1	3776.575	0.07	2.5	0.85	1.597317647									11.18122353	164.5313909	153.3501673	0	56.73956191	0
Jamison 1	Kyalla	1158.42	3800.591	0.68	2.5	0.85	15.5168									73.02023529	114.5931788	41.57294353	0	15.38198911	0
Jamison 1	Kyalla	1173.75	3850.886	0.16	2.5	0.85	3.651011765									10.26847059	53.64632678	42.46690677	5.465696486	15.71275551	2.0223077
Jamison 1	Kyalla	1180.7	3873.688	0.03	2.5	0.85	0.684564706									1.597317647	97.0350598	85.59223195	59.07306123	31.66912582	21.85703266
Jamison 1	Kyalla	1190.67	3906.398	0.12	2.5	0.85	2.738258824									2.966447059	54.47569898	45.10266767	38.43950553	16.68798704	14.22261704
Jamison 1	Kyalla	1202.1	3943.898		2.5	0.85															
Jamison 1	Kyalla	1208.31	3964.272	0.11	2.5	0.85	2.510070588									4.563764706	59.56202019	48.15771821	41.04322363	17.81835574	15.18599274
Jamison 1	Kyalla	1220.3	4003.609		2.5	0.85															
Jamison 1	Kyalla	1234.2	4049.213	0.43	2.5	0.85	9.812094118									25.55708235	126.956014	99.26952031	12.77646783	36.72972252	4.727293098
Jamison 1	Kyalla	1240	4068.241	0.03	2.5	0.85	0.684564706									1.140941176	61.85565193	53.16317592	45.30920898	19.67037509	16.76440732
Jamison 1	Kyalla	1258.38	4128.543	0.66	2.5	0.85	15.06042353									28.29534118	111.9113861	83.61604489	0	30.93793661	0
Jamison 1	Kyalla	1258.8	4129.921	0.49	2.5	0.85	11.18122353									25.10070588	92.50203558	67.4013297	0	24.93849199	0
Jamison 1	Kyalla	1268.05	4160.269		2.5	0.85															
Jamison 1	Kyalla	1272.02	4173.294	0.23	2.5	0.85	5.248329412									21.90607059	185.4514412	163.5453706	0	60.51178713	0
Jamison 1	Kyalla	1285.38	4217.126	0.71	2.5	0.85	16.20136471									49.51684706	130.1047369	80.58788984	0	29.81751924	0
Jamison 1	Kyalla	1285.38	4217.126	0.6	2.5	0.85	13.69129412									27.38258824	134.2584829	48.2429938	351.7974049	17.84990771	130.1650398
Jamison 1	Kyalla	1295.1	4249.016	0.1	2.5	0.85	2.281882353									8.442964706	244.8687691	232.2683343	24.94482026	85.93928371	9.229583496
Jamison 1	Kyalla	1304.6	4280.184	0.18	2.5	0.85	4.107388235									8.671152941	62.74957628	47.35229235	40.35678592	17.52034817	14.93201079
Jamison 1	Kyalla	1312.9	4307.415	0.1	2.5	0.85	2.281882353									8.671152941	286.1876528	266.943091	63.44045312	98.76894366	23.47296766
Jamison 1	Kyalla	1319.59	4329.364	0.22	2.5	0.85	5.020141176									8.671152941	71.37110859	54.90150132	46.79072597	20.31355549	17.31256861
Jamison 1	Kyalla	1325	4347.113	0.1	2.5	0.85	2.281882353									5.704705882	258.2707698	242.7664762	58.79752609	89.82359619	21.75508465
Jamison 1	Kyalla	1338.45	4391.24	0.22	2.5	0.85	5.020141176									8.442964706	70.04188497	53.9374098	45.96906279	19.95684163	17.00855323
Jamison 1	Kyalla	1348.44	4424.016	0.46	2.5	0.85	10.49665882									25.10070588	106.3259629	71.12267481	60.61549334	26.31538968	22.42773254
Jamison 1	Kyalla	1360.25	4462.762	0.09	2.5	0.85	2.053694118									3.8792	181.2521701	177.3729701	0	65.62799893	0
Jamison 1	Kyalla	1370.35	4495.899	0.82	2.5	0.85	18.71143529									19.62418824	110.954349	87.22408505	24.63645456	32.27291147	9.115488186
Jamison 1	Kyalla	1370.35	4495.899	0.9	2.5	0.85	20.53694118									27.38258824	181.5362075	88.32191533	394.9902233	32.67910867	146.1463826
Jamison 1	Kyalla	1370.55	4496.555	0.72	2.5	0.85	16.42955294									38.792	146.4225279	94.24372804	80.32079902	34.87017938	29.71869564
Jamison 1	Kyalla	1380	4527.559	0.45	2.5	0.85	10.26847059									27.83896471	230.5849335	199.2474236	20.9912712	73.72154673	7.766770345
Jamison 1	Kyalla	1391.99	4566.896	0.82	2.5	0.85	18.71143529									30.57722353	100.7448617	61.44037326	52.36358934	22.73293811	19.37452805
Jamison 1	Kyalla	1399.6	4591.864	0.18	2.5	0.85	4.107388235									11.6376	285.6635897	274.0259897	0	101.3896162	0
Jamison 1	Kyalla	1399.8	4592.52		2.5	0.85															
Jamison 1	Kyalla	1407.1	4616.47	0.9	2.5	0.85	20.53694118									29.66447059	244.6414939	71.56984242	860.4430855	26.48084169	318.3639416
Jamison 1	Kyalla	1407.5	4617.782	0.54	2.62	0.85	12.91362861	0.059116	0.135663	62.21838022						36.82775567	203.2335328	166.4057771	0	61.57013753	0

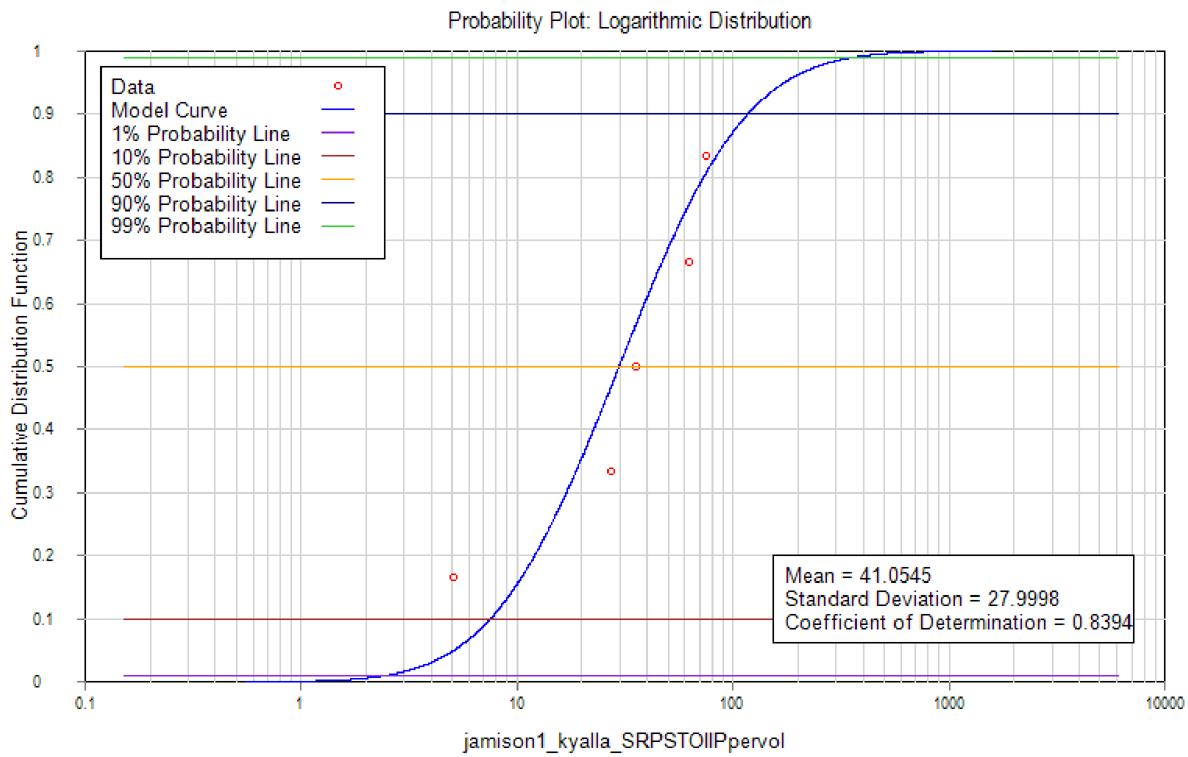
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Jamison 1	Kyalla	1407.5	4617.782	0.65	2.5	0.85	14.83223529									36.28192941	167.7719701	131.4900407	0	48.65131505	0
Jamison 1	Kyalla	1407.55	4617.946	1.12	2.5	0.85	25.55708235									34.22823529	86.8857654	46.10812606	39.29642432	17.06000664	14.539677
Jamison 1	Kyalla	1418.1	4652.559	0.05	2.5	0.85	1.140941176									3.651011765	160.2351933	137.108656	116.8531533	50.73020272	43.23566673
Jamison 1	Kyalla	1427.6	4683.727	0.06	2.5	0.85	1.369129412									1.140941176	88.46470437	76.46266493	65.16658955	28.29118603	24.11163813
Jamison 1	Kyalla	1440.42	4725.787	0.5349794	2.5	0.85	12.20760052									12.77854118	84.35870499	70.8127276	4.604617229	26.20070921	1.703708375
Jamison 1	Kyalla	1451.05	4760.663	0.24	2.5	0.85	5.476517647									10.04028235	90.64585392	70.58006418	60.15304432	26.11462375	22.2566264
Jamison 1	Kyalla	1454.5	4771.982	1.5	2.5	0.85	34.22823529									38.792	318.6038602	224.0785023	334.4001474	82.90904586	123.7280545
Jamison 1	Kyalla	1469.08	4819.816	1.69	2.5	0.85	38.56381176									59.78531765	298.1654096	208.7310078	177.8945048	77.2304729	65.82096677
Jamison 1	Kyalla	1474.54	4837.73	1.01	2.5	0.85	23.04701176									37.87924706	290.9143177	253.0350706	0	93.62297613	0
Jamison 1	Kyalla	1482.07	4862.434	1.8	2.5	0.85	41.07388235									109.5303529	387.1558878	222.3276527	331.7872935	82.26123148	122.7612986
Jamison 1	Kyalla	1483.4	4866.798	2.196079	2.5	0.85	50.11193916									56.81887059	292.5820569	228.1176061	45.87348127	84.40351425	16.97318807
Jamison 1	Kyalla	1490.85	4891.24		2.5	0.85															
Jamison 1	Kyalla	1492.78	4897.572	1.32	2.5	0.85	30.12084706									53.85242353	292.8568986	213.8838065	150.724011	79.13700842	55.76788408
Jamison 1	Kyalla	1495.6	4906.824	0.058651	2.5	0.85	1.338347503									2.510070588	36.79744054	15.47706695	112.861818	5.726514771	41.75887267
Jamison 1	Kyalla	1500	4921.26	0.12	2.5	0.85	2.738258824									6.389270588	151.3354461	122.0852508	137.1655484	45.17154278	50.75125292
Jamison 1	Kyalla	1503.85	4933.891	1.2	2.5	0.85	27.38258824									38.792	219.570941	103.5768242	463.2127006	38.32342495	171.3886992
Jamison 1	Kyalla	1505.48	4939.239	1.559809	2.5	0.85	35.59300631									27.61077647	183.0794494	130.690882	148.6667459	48.35562633	55.00669599
Jamison 1	Kyalla	1505.48	4939.239		2.5	0.85															
Jamison 1	Kyalla	1507.25	4945.046	1.5	2.5	0.85	34.22823529									59.32894118	435.7579072	84.18654479	1753.454527	31.14902157	648.7781751
Jamison 1	Kyalla	1507.3	4945.21	0.7	2.68	0.85	17.12324518	0.039511	0.116521	35.71700627						37.18190381	346.7607124	234.836264	448.4552674	86.88941769	165.9284489
Jamison 1	Kyalla	1507.3	4945.21	0.71	2.5	0.85	16.20136471									34.22823529	316.8009592	220.3993311	373.0403571	81.5477525	138.0249321
Jamison 1	Kyalla	1507.4	4945.538	1.51	2.5	0.85	34.45642353									76.21487059	349.8904837	213.4598174	361.2947741	78.98013246	133.6790664
Jamison 1	Kyalla	1515.08	4970.735	0.67	2.5	0.85	15.28861176									32.17454118	691.8098555	542.080497	705.328904	200.5697839	260.9716945
Jamison 1	Kyalla	1519.7	4985.892	0.26	2.5	0.85	5.932894118									15.74498824	361.6355896	283.1563488	376.4055151	104.7678491	139.2700406
Jamison 1	Kyalla	1525.3	5004.265	0.27	2.5	0.85	6.161082353									18.71143529	300.2869412	251.0231117	183.3143654	92.87855131	67.8263152
Jamison 1	Kyalla	1530.08	5019.948	0.25	2.5	0.85	5.704705882									16.65774118	357.1568576	266.8876156	441.6690052	98.74841777	163.4175319
Jamison 1	Kyalla	1533.25	5030.348		2.5	0.85															
Jamison 1	Kyalla	1542.97	5062.238	0.53	2.5	0.85	12.09397647									23.2752	196.5113025	131.4111883	250.9494852	48.62213966	92.85130954
Jamison 1	Kyalla	1549.9	5084.974	0.31	2.5	0.85	7.073835294									15.06042353	404.4872222	297.6281606	550.7918282	110.1224194	203.7929764
Jamison 1	Kyalla	1557.06	5108.465	0.67	2.5	0.85	15.28861176									21.90607059	192.0060304	125.3036038	268.7781361	46.3623334	99.44791034
Jamison 1	Kyalla	1563.9	5130.906	0.27	2.5	0.85	6.161082353									14.60404706	401.6978096	241.3157769	874.6679137	89.28683747	323.6271281
Jamison 1	Kyalla	1574	5164.042	1.15	2.5	0.85	26.24164706									39.02018824	179.0474023	106.2200218	202.8431532	39.30140807	75.05196669
Jamison 1	Kyalla	1580.3	5184.711	0.99	2.5	0.85	22.59063529									25.78527059	233.6250252	195.6728243	73.00158171	72.398945	27.01058523
Jamison 1	Kyalla	1580.3	5184.711	1.54	2.5	0.85	35.14098824									41.30207059	1195.839523	633.4759544	3126.36899	234.3861031	1156.756526
Jamison 1	Kyalla	1580.3	5184.711	0.9	2.5	0.85	20.53694118									22.81882353	193.9452488	2.093012535	1014.200477	0.774414638	375.2541764
Jamison 1	Kyalla	1585	5200.131	0.41	2.5	0.85	9.355717647									16.65774118	521.1352726	309.4378938	1170.237825	114.4920207	432.9879954
Jamison 1	Kyalla	1590	5216.535	0.44	2.5	0.85	10.04028235									16.65774118	534.7540751	308.3920616	1258.225634	114.1050628	465.5434846
Jamison 1	Kyalla	1600	5249.344	0.23	2.5	0.85	5.248329412									9.127529412	306.0329872	285.4748492	68.58365198	105.6256942	25.37595123
Jamison 1	Kyalla	1603.79	5261.778	0.92	2.5	0.85	20.99331765									25.32889412	339.6075214	251.6801256	375.5910103	93.12164645	138.9686738
Jamison 1	Kyalla	1608.51	5277.264		2.5	0.85															
Jamison 1	Kyalla	1611.6	5287.402	0.83	2.5	0.85	18.93962353									23.04701176	192.2623379	169.2153261	0	62.60967067	0
Jamison 1	Kyalla	1617.58	5307.021		2.5	0.85															
Jamison 1	Kyalla	1622.58	5323.425	1.17	2.5	0.85	26.69802353									30.80541176	316.9611645	170.8605836	691.7710149	63.21841592	255.9552755
Jamison 1	Kyalla	1622.58	5323.425	1.1	2.5	0.85	25.10070588									34.00004706	330.9346133	212.0892135	509.0721162	78.473009	188.356683
Jamison 1	Kyalla	1622.58	5323.425	0.8	2.5	0.85	18.25505882									9.127529412	170.4651853	72.82663282	531.0661385	26.94585414	196.4944713
Jamison 1	Kyalla	1629	5344.488	0.8	2.5	0.85	18.25505882									19.62418824	619.7972659	525.5251407	447.8876216	194.4443021	165.71842
Jamison 1	Kyalla	1637.27	5371.621		2.535	0.85		0.072391	0.009025	5.06851941											
Jamison 1	Kyalla	1637.65	5372.867		2.5	0.85															
Jamison 1	Kyalla	1640.52	5382.283	1.608863	2.5	0.85	36.71236088									31.48997647	294.0678432	199.1829012	380.3697933	73.69767345	140.7368235
Jamison 1	Kyalla	1640.58	5382.48	1.72	2.5	0.85	39.24837647									53.16785882	362.0098763	253.5753236	331.6001633	93.82286973	122.6920604
Jamison 1	Kyalla	1645.05	5397.146	0.93	2.5	0.85	21.22150588									15.74498824	792.2541608	682.8686504	561.8431331	252.6614006	207.8819593
Jamison 1	Kyalla	1649.5	5411.745	0.72	2.5	0.85	16.42955294									13.23491765	1002.494903	779.6830013	1257.461905	288.4827105	465.260905
Jamison 1	Kyalla	1655	5429.79	0.68	2.5	0.85	15.5168									12.55035294	506.8767164	432.8433603	368.8980187	160.1520433	136.4922669
Jamison 1	Kyalla	1657.98	5439.567	0.91	2.5	0.85	20.76512941									19.85237647	228.0354279	201.4318693	40.50709299	74.52979164	14.98762441
Jamison 1	Kyalla	1659.81	5445.571		2.5	0.85															
Jamison 1	Kyalla	1660.15	5446.686	0.68	2.5	0.85	15.5168									17.57049412	243.1823817	161.1461017	386.7947155	59.62405761	143.1140447
Jamison 1	Kyalla	1660.15	5446.686	0.71	2.5	0.85	16.20136471									19.16781176	260.8021365	91.71154354	899.5366872	33.93327111	332.8285742
Jamison 1	Kyalla	1660.15	5446.686	0.5	2.5	0.85	11.40941176									11.40941176	265.0047519	32.8894804	1324.235159	12.16910775	489.9670086
Jamison 1	Kyalla	1665.25	5463.419	0.23	2.5	0.85	5.248329412									6.389270588	617.4539804	198.9029016	2472.97085	73.59407358	914.9992144
Jamison 1	Kyalla	1698.46	5572.375	0.27	2.5	0.85	6.161082353									8.671152941	204.1315205	19.11065214	1058.098292	7.070941293	391.4963682
Jamison 1	Kyalla	1698.99	5574.114	0.28	2.5	0.85	6.389270588									7.530211765	168.3758549	26.546538	805.7946311	9.822219058	298.1440135
Jamison 1	Kyalla	1701.05	5580.873	0.2	2.5	0.85	4.563764706									9.127529412	143.8634966	0	808.415803	0	299.1138471
Jamison 1	Kyalla	1707.3	5601.378	0.2	2.5	0.85	4.563764706									5.704705882	179.7503023	9.952144759	984.5607098	3.682293561	364.2874626
Jamison 1	Kyalla	1708.95	5606.791	0.1	2.5	0.85	2.281882353									4.563764706	108.5694837	0	624.0343138	0	230.8926961



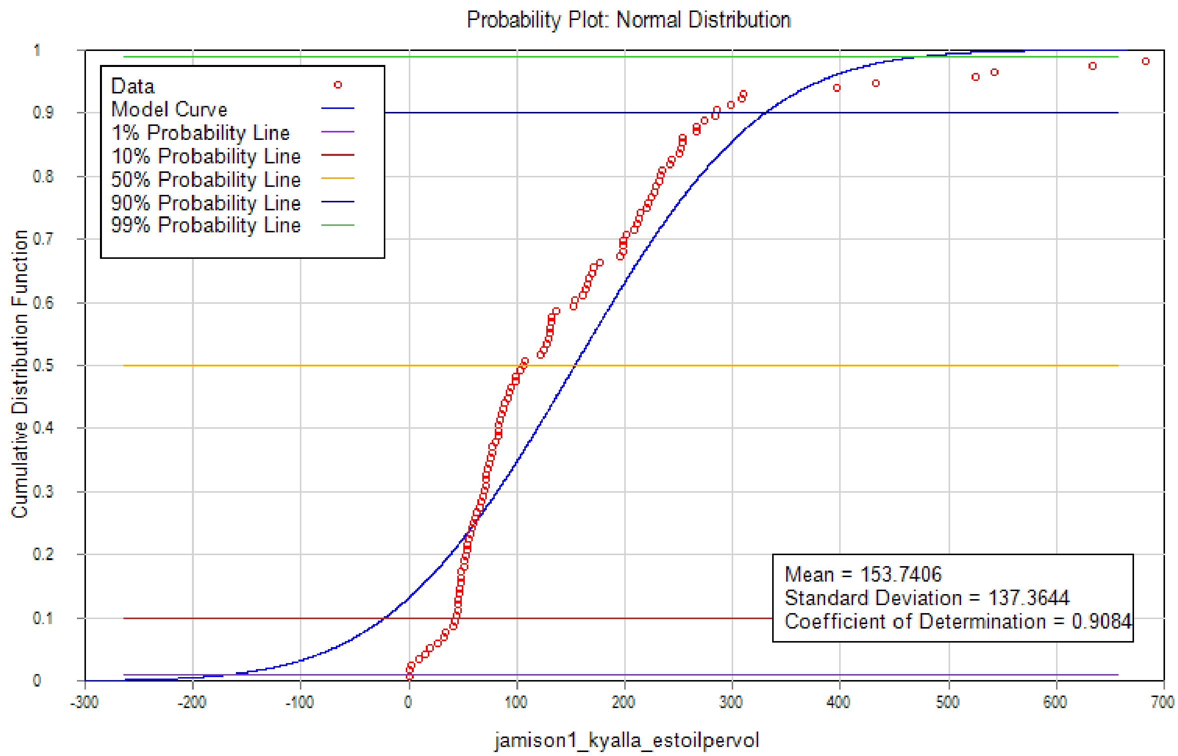
Distribution Report

Log-Normal Distribution Report	
Parameter	jamison1_kyallay_S1STOIIPpervol
Description	Jamison 1 Kyalla S1 STOIIP per Volume
Number of Positive Points	115
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.97153
Data Range	
Minimum Value	0.4564
Average Value	16.6169
Maximum Value	81.9196
Standard Deviation	15.9783
Distribution	
99% Value	0.6562
90% Value	2.2097
50% Value	9.7977
10% Value	43.4428
1% Value	146.2927
Average Value Probability	0.6753



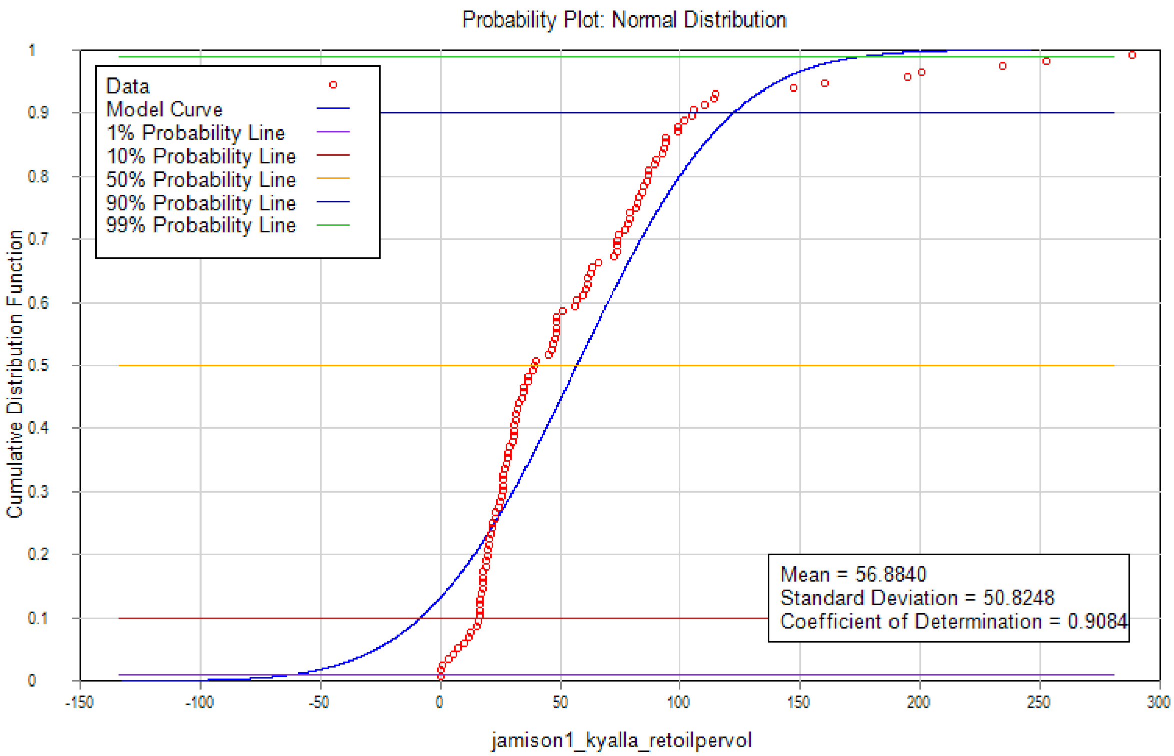
Distribution Report

Log-Normal Distribution Report	
Parameter	jamison1_kyalla_SRPSTOIIPpervol
Description	Jamison 1 Kyalla SRP STOIIP per volume
Number of Positive Points	5
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.83937
Data Range	
Minimum Value	5.0685
Average Value	41.0545
Maximum Value	75.2316
Standard Deviation	27.9998
Distribution	
99% Value	2.4601
90% Value	7.5244
50% Value	29.6488
10% Value	116.8275
1% Value	357.3243
Average Value Probability	0.6195



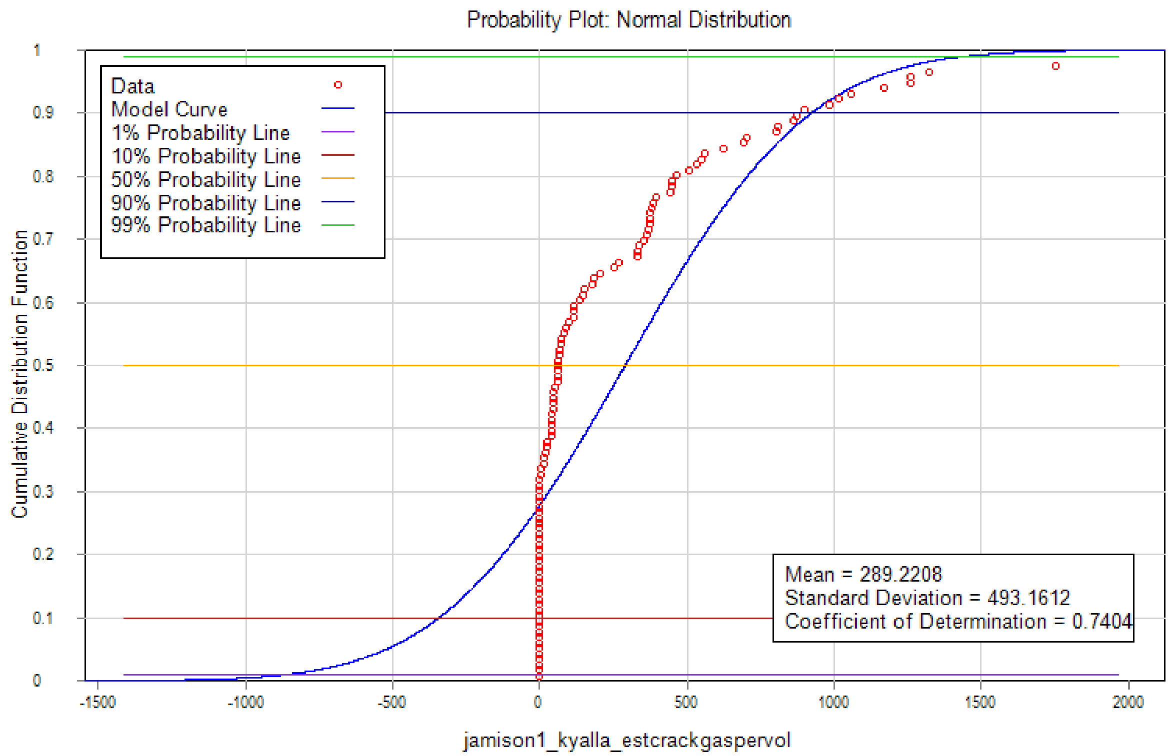
Distribution Report

Normal Distribution Report	
Parameter	jamison1_kyalla_estoilpervol
Description	Jamison 1 Kyalla Estimated Oil per Volume
Number of Positive Points	113
Number of Non-Positive Points	2
Number of Null Values	0
Regression Coefficient	0.90840
Data Range	
Minimum Value	0.0000
Average Value	153.7406
Maximum Value	779.6830
Standard Deviation	137.364
Distribution	
99% Value	-165.8167
90% Value	-22.2989
50% Value	153.7406
10% Value	329.7801
1% Value	473.2979
Average Value Probability	0.5000



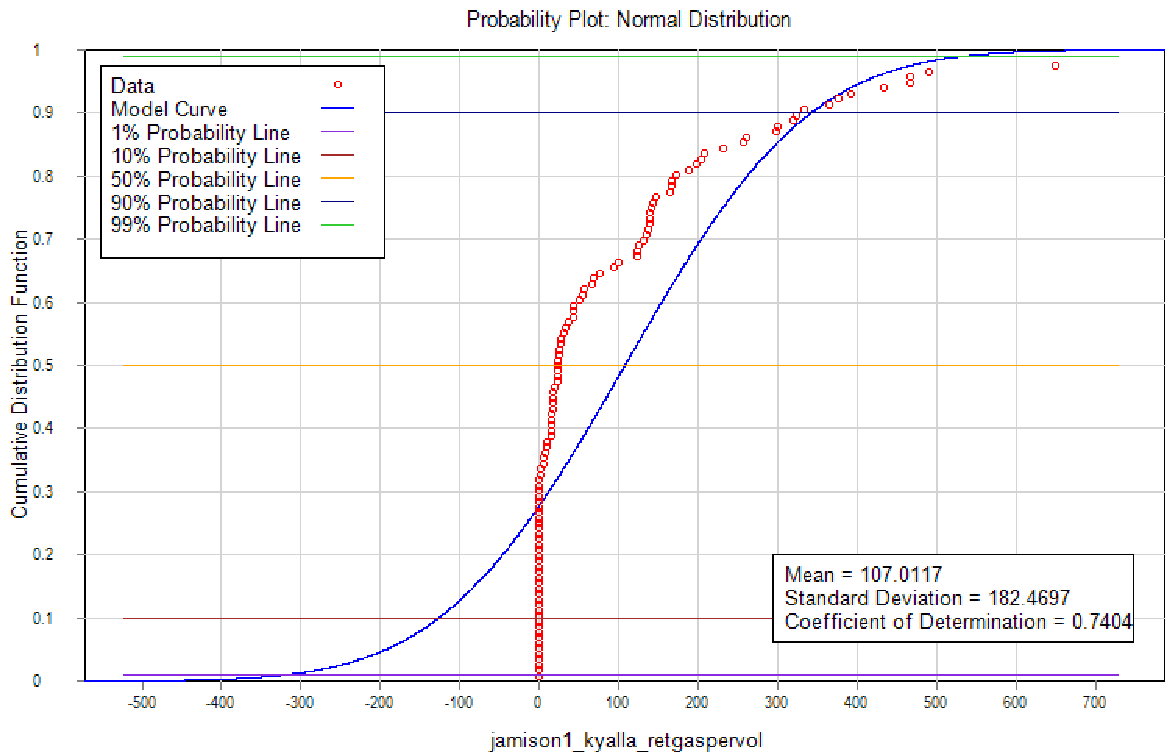
Distribution Report

Normal Distribution Report	
Parameter	jamison1_kyalla_retoilpervol
Description	Jamison 1 Kyalla Retained Oil per Volume
Number of Positive Points	113
Number of Non-Positive Points	2
Number of Null Values	0
Regression Coefficient	0.90840
Data Range	
Minimum Value	0.0000
Average Value	56.8840
Maximum Value	288.4827
Standard Deviation	50.8248
Distribution	
99% Value	-61.3522
90% Value	-8.2506
50% Value	56.8840
10% Value	122.0187
1% Value	175.1202
Average Value Probability	0.5000



Distribution Report

Normal Distribution Report	
Parameter	jamison1_kyalla_estcrackgaspervol
Description	Jamison 1 Kyalla Estimated Cracked Gas per Volume
Number of Positive Points	78
Number of Non-Positive Points	37
Number of Null Values	0
Regression Coefficient	0.74038
Data Range	
Minimum Value	0.0000
Average Value	289.2208
Maximum Value	3,126.3690
Standard Deviation	493.161
Distribution	
99% Value	-858.0438
90% Value	-342.7907
50% Value	289.2208
10% Value	921.2324
1% Value	1,436.4854
Average Value Probability	0.5000



Distribution Report

Normal Distribution Report	
Parameter	jamison1_kyalla_retgaspervol
Description	Jamison 1 Kyalla Retained Gas per Volume
Number of Positive Points	78
Number of Non-Positive Points	37
Number of Null Values	0
Regression Coefficient	0.74038
Data Range	
Minimum Value	0.0000
Average Value	107.0117
Maximum Value	1,156.7565
Standard Deviation	182.470
Distribution	
99% Value	-317.4762
90% Value	-126.8326
50% Value	107.0117
10% Value	340.8560
1% Value	531.4996
Average Value Probability	0.5000

Weatherford LABORATORIES

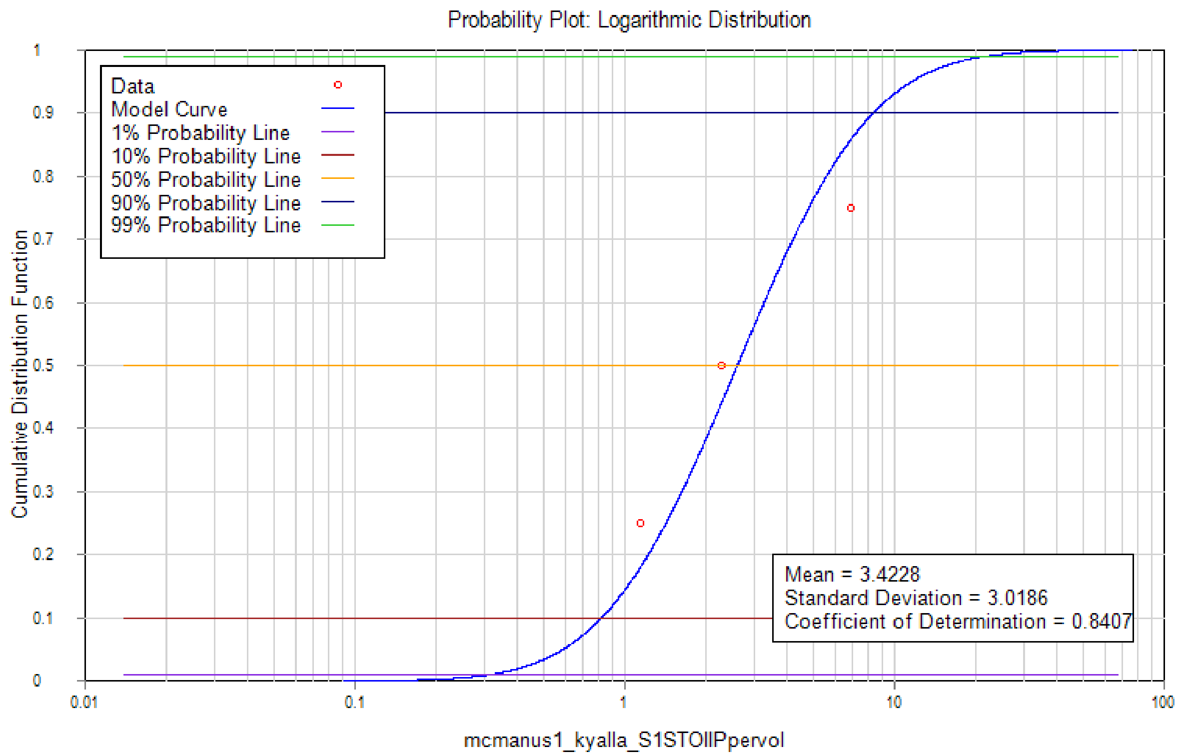
WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
McManus 1	Kyalla	555.5	1822.507		2.5	0.85															
McManus 1	Kyalla	565.3	1854.659		2.5	0.85															
McManus 1	Kyalla	575	1886.483		2.5	0.85															
McManus 1	Kyalla	584.3	1916.995		2.5	0.85															
McManus 1	Kyalla	590.1	1936.024	0.3	2.5	0.85	6.845647059									73.24842353	115.4632471	42.21482353	0	15.61948471	0
McManus 1	Kyalla	592.5	1943.898		2.5	0.85															
McManus 1	Kyalla	593.2	1946.194		2.5	0.85															
McManus 1	Kyalla	594.4	1950.131		2.5	0.85															
McManus 1	Kyalla	602.4	1976.378		2.5	0.85															
McManus 1	Kyalla	604.5	1983.268		2.5	0.85															
McManus 1	Kyalla	612.6	2009.843	0.1	2.5	0.85	2.281882353									32.63091765	71.42291765	38.792	0	14.35304	0
McManus 1	Kyalla	614.5	2016.076		2.5	0.85															
McManus 1	Kyalla	624.4	2048.556		2.5	0.85															
McManus 1	Kyalla	634	2080.052		2.5	0.85															
McManus 1	Kyalla	641.2	2103.675	0.05	2.5	0.85	1.140941176									44.49670588	84.42964706	39.93294118	0	14.77518824	0
McManus 1	Kyalla	644	2112.861		2.5	0.85															
McManus 1	Kyalla	654	2145.669		2.5	0.85															
McManus 1	Kyalla	664	2178.478		2.5	0.85															
McManus 1	middle Velkerri	1200	3937.008	2.46	2.5	0.85	56.13430588									125.9599059	205.1412235	79.18131765	0	29.29708753	0
McManus 1	middle Velkerri	1200.6	3938.976		2.5	0.85															
McManus 1	middle Velkerri	1206.2	3957.349	1.8	2.5	0.85	41.07388235									117.5169412	369.4367529	251.9198118	0	93.21033035	0
McManus 1	middle Velkerri	1206.4	3958.005	3.51	2.5	0.85	80.09407059														
McManus 1	middle Velkerri	1206.9	3959.646		2.5	0.85															
McManus 1	middle Velkerri	1210.4	3971.129	2.93	2.5	0.85	66.85915294									173.4230588	511.8262118	338.4031529	0	125.2091666	0
McManus 1	middle Velkerri	1215.8	3988.845		2.5	0.85															
McManus 1	middle Velkerri	1219.9	4002.297		2.5	0.85															
McManus 1	middle Velkerri	1220	4002.625	2.41	2.5	0.85	54.99336471									159.5035765	334.5239529	175.0203765	0	64.75753929	0
McManus 1	middle Velkerri	1224.92	4018.766	1.97	2.385	0.85	42.88524056	0.102277	0.139179	110.4336527						107.7573304	435.0427165	327.2853861	0	121.0955929	0
McManus 1	middle Velkerri	1226	4022.31		2.5	0.85															
McManus 1	middle Velkerri	1228.7	4031.168		2.5	0.85															
McManus 1	middle Velkerri	1232.2	4042.651		2.5	0.85															
McManus 1	middle Velkerri	1237.2	4059.055		2.5	0.85															
McManus 1	middle Velkerri	1240	4068.241	2.67	2.5	0.85	60.92625882									175.9331294	433.3294588	257.3963294	0	95.23664188	0
McManus 1	middle Velkerri	1240.1	4068.57	4.11	2.5	0.85	93.78536471														
McManus 1	middle Velkerri	1242.8	4077.428		2.5	0.85															
McManus 1	middle Velkerri	1246.3	4088.911	2.22	2.5	0.85	50.65778824									146.9532235	484.9	337.9467765	0	125.0403073	0
McManus 1	middle Velkerri	1249.8	4100.394		2.5	0.85															
McManus 1	middle Velkerri	1252.5	4109.252	1.76	2.5	0.85	40.16112941									131.6646118	682.2828235	550.6182118	0	203.7287384	0
McManus 1	middle Velkerri	1254.7	4116.47	2.95	2.5	0.85	67.31552941									176.8458824	571.6115294	394.7656471	0	146.0632894	0
McManus 1	middle Velkerri	1259.6	4132.546	4.76	2.5	0.85	108.6176														
McManus 1	middle Velkerri	1259.9	4133.53		2.5	0.85															
McManus 1	middle Velkerri	1260	4133.858	3.02	2.5	0.85	68.91284706									179.5841412	731.7996706	552.2155294	0	204.3197459	0
McManus 1	middle Velkerri	1261.635	4139.222	2.8	2.5	0.85	63.89270588									237.7721412	1131.357271	893.5851294	0	330.6264979	0
McManus 1	middle Velkerri	1263	4143.701		2.5	0.85															
McManus 1	middle Velkerri	1268	4160.105		2.5	0.85															
McManus 1	middle Velkerri	1270	4166.667	2.38	2.5	0.85	54.3088									116.6041882	268.5775529	151.9733647	0	56.23014494	0
McManus 1	middle Velkerri	1270.86	4169.488	2.06	2.371	0.85	44.5812268	0.100775	0.063005	49.25793657						194.123109	758.5090626	564.3859537	0	208.8228029	0
McManus 1	middle Velkerri	1270.9	4169.619		2.5	0.85															
McManus 1	middle Velkerri	1273	4176.509		2.5	0.85															
McManus 1	middle Velkerri	1275	4183.071		2.5	0.85															
McManus 1	middle Velkerri	1275.2	4183.727	2.38	2.5	0.85	54.3088									254.8862588	927.1288	672.2425412	0	248.7297402	0
McManus 1	middle Velkerri	1276.6	4188.32		2.5	0.85															
McManus 1	middle Velkerri	1277.5	4191.273	2.4	2.5	0.85	54.76517647														
McManus 1	middle Velkerri	1279.95	4199.311	3.33	2.5	0.85	75.98668235														
McManus 1	middle Velkerri	1280	4199.475	4.16	2.5	0.85	94.92630588									276.5641412	572.5242824	295.9601412	0	109.5052522	0
McManus 1	middle Velkerri	1280	4199.475		2.5	0.85															
McManus 1	middle Velkerri	1282.3	4207.021		2.5	0.85															
McManus 1	middle Velkerri	1284.7	4214.895		2.5	0.85															
McManus 1	middle Velkerri	1286.3	4220.144	2.87	2.5	0.85	65.49002353									149.0069176	717.652	568.6450824	0	210.3986805	0
McManus 1	middle Velkerri	1287.2	4223.097		2.5	0.85															
McManus 1	middle Velkerri	1288.6	4227.69	1.79	2.5	0.85	40.84569412									156.5371294	711.7191059	555.1819765	0	205.4173313	0
McManus 1	middle Velkerri	1290.4	4233.596		2.5	0.85															
McManus 1	middle Velkerri	1293.2	4242.782		2.5	0.85															
McManus 1	middle Velkerri	1294.785	4247.982	1.84	2.5	0.85	41.98663529									142.8458353	1111.504894	968.6590588	0	358.4038518	0
McManus 1	middle Velkerri	1295	4248.688		2.5	0.85															
McManus 1	middle Velkerri	1300	4265.092	0.17	2.5	0.85	3.8792									6.617458824	53.62423529	47.00677647	0	17.39250729	0
McManus 1	middle Velkerri	1300.7	4267.388		2.5	0.85															
McManus 1	middle Velkerri	1306.65	4286.909	0.2	2.5	0.85	4.563764706									5.932894118	126.6444706	115.8831134	28.97077835	42.87675196	10.71918799
McManus 1	middle Velkerri	1312.61	4306.463	0.2	2.5	0.85	4.563764706									10.72484706	219.7452706	209.0204235	0	77.33755671	0
McManus 1	middle Velkerri	1320	4330.709	0.14	2.5	0.85	3.194635294									4.335576471	66.85915294	62.52357647	0	23.13372329	0
McManus 1	middle Velkerri	1331.505	4368.455	1.43	2.5	0.85	32.63091765									109.3021647	1033.008141	923.7059765	0	341.7712113	0

Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
McManus 1	middle Velkerri	1340	4396.325	0.44	2.5	0.85	10.04028235									15.28861176	54.76517647	39.47656471	0	14.60632894	0
McManus 1	middle Velkerri	1340	4396.325		2.5	0.85															
McManus 1	middle Velkerri	1346.2	4416.667		2.5	0.85															
McManus 1	middle Velkerri	1348	4422.572	1.18	2.5	0.85	26.92621176									56.36249412	546.2826353	489.9201412	0	181.2704522	0
McManus 1	middle Velkerri	1352	4435.696		2.5	0.85															
McManus 1	middle Velkerri	1358.4	4456.693		2.5	0.85															
McManus 1	middle Velkerri	1360	4461.942	2.21	2.5	0.85	50.4296														
McManus 1	middle Velkerri	1360	4461.942	2.56	2.5	0.85	58.41618824									193.5036235	688.6720941	440.6999388	326.8111906	163.0589774	120.9201405
McManus 1	middle Velkerri	1362.15	4468.996		2.5	0.85															
McManus 1	middle Velkerri	1365.25	4479.167		2.5	0.85															
McManus 1	middle Velkerri	1370.7	4497.047		2.5	0.85															
McManus 1	middle Velkerri	1374	4507.874		2.5	0.85															
McManus 1	middle Velkerri	1376.3	4515.42		2.5	0.85															
McManus 1	middle Velkerri	1377	4517.717		2.5	0.85															
McManus 1	middle Velkerri	1377.9	4520.669		2.5	0.85															
McManus 1	middle Velkerri	1379.4	4525.591		2.5	0.85															
McManus 1	middle Velkerri	1380	4527.559	1.8	2.5	0.85	41.07388235									83.97327059	296.6447059	210.5447209	12.76028612	77.90154675	4.721305864
McManus 1	middle Velkerri	1381.7	4533.136		2.5	0.85															
McManus 1	middle Velkerri	1382.7	4536.417		2.5	0.85															
McManus 1	middle Velkerri	1384.9	4543.635		2.5	0.85															
McManus 1	middle Velkerri	1386	4547.244	1.17	2.5	0.85	26.69802353									96.06724706	854.3367529	758.2695059	0	280.5597172	0
McManus 1	middle Velkerri	1387	4550.525		2.5	0.85															
McManus 1	middle Velkerri	1390.5	4562.008	1.47	2.5	0.85	33.54367059									94.01355294	733.8533647	633.4414136	38.39038871	234.373323	14.20444382
McManus 1	middle Velkerri	1392.9	4569.882		2.5	0.85															
McManus 1	middle Velkerri	1393.21	4570.899	1.83	2.381	0.85	39.77074498	0.086777	0.058237	39.20582332						105.4033405	581.6000727	476.1967322	0	176.1927909	0
McManus 1	middle Velkerri	1398.6	4588.583		2.5	0.85															
McManus 1	middle Velkerri	1399.9	4592.848	3.42	2.5	0.85	78.04037647														
McManus 1	middle Velkerri	1400	4593.176	3.56	2.5	0.85	81.23501176									170.4566118	657.1821176	467.2564856	116.8141214	172.8848997	43.22122492
McManus 1	middle Velkerri	1400	4593.176		2.5	0.85															
McManus 1	middle Velkerri	1400	4593.176	2.73	2.5	0.85	62.29538824														
McManus 1	middle Velkerri	1405.1	4609.908	3.17	2.5	0.85	72.33567059									126.8726588	717.652	590.7793412	0	218.5883562	0
McManus 1	middle Velkerri	1406.6	4614.829	2.28	2.348	0.85	48.86368105	0.09609	0.058243	43.4180465						136.3039524	610.4456721	465.1703988	53.82792527	172.1130476	19.91633235
McManus 1	middle Velkerri	1407	4616.142		2.5	0.85															
McManus 1	middle Velkerri	1413	4635.827		2.5	0.85															
McManus 1	middle Velkerri	1414.2	4639.764	4.63	2.5	0.85	105.6511529									198.2955765	940.8200941	742.5245176	0	274.7340715	0
McManus 1	middle Velkerri	1419.2	4656.168	3.09	2.5	0.85	70.51016471									125.2753412	672.4707294	547.1953882	0	202.4622936	0
McManus 1	middle Velkerri	1420	4658.793	0.85	2.5	0.85	19.396									61.38263529	219.9734588	147.4894659	66.60814588	54.57110238	24.64501398
McManus 1	middle Velkerri	1428.635	4687.123	2.77	2.5	0.85	63.20814118									233.2083765	1260.283624	1006.533742	123.2490296	372.4174846	45.60214097
McManus 1	middle Velkerri	1429.2	4688.976	3.48	2.5	0.85	79.40950588									153.7988706	665.8532706	512.0544	0	189.460128	0
McManus 1	middle Velkerri	1430	4691.601		2.5	0.85															
McManus 1	middle Velkerri	1437.6	4716.535	1.05	2.5	0.85	23.95976471									48.83228235	675.2089882	626.3767059	0	231.7593812	0
McManus 1	middle Velkerri	1440	4724.409	2.79	2.5	0.85	63.66451765									113.6377412	408.6851294	274.3940711	123.9199031	101.5258063	45.85036413
McManus 1	middle Velkerri	1441.9	4730.643	3.74	2.5	0.85	85.3424									188.2552941	858.4441412	670.1888471	0	247.9698734	0
McManus 1	middle Velkerri	1460	4790.026	1.32	2.5	0.85	30.12084706									33.31548235	85.11421176	51.79872941	0	19.16552988	0
McManus 1	middle Velkerri	1468.8	4818.898	1.27	2.5	0.85	28.97990588									40.38931765	350.2689412	309.8796235	0	114.6554607	0
McManus 1	middle Velkerri	1476.9	4845.472		2.5	0.85															
McManus 1	middle Velkerri	1479.75	4854.823	2.25	2.5	0.85	51.34235294														
McManus 1	middle Velkerri	1480	4855.643	1.74	2.5	0.85	39.70475294									43.58395294	112.9531765	69.36922353	0	25.66661271	0
McManus 1	middle Velkerri	1483.8	4868.11		2.5	0.85															
McManus 1	middle Velkerri	1490	4888.451		2.5	0.85															
McManus 1	middle Velkerri	1496.7	4910.433		2.5	0.85															
McManus 1	middle Velkerri	1500	4921.26	1.16	2.5	0.85	26.46983529									26.24164706	91.95985882	65.71821176	0	24.31573835	0
McManus 1	middle Velkerri	1509	4950.787		2.5	0.85															
McManus 1	middle Velkerri	1513.8	4966.535		2.5	0.85															
McManus 1	middle Velkerri	1519.7	4985.892	2.62	2.5	0.85	59.78531765									60.01350588	613.5981647	548.0488122	33.21507953	202.7780605	12.28957943
McManus 1	middle Velkerri	1519.8	4986.22	1.98	2.5	0.85	45.18127059									72.79204706	709.4372235	534.7819482	611.1793694	197.8693208	226.1363667
McManus 1	middle Velkerri	1520	4986.877	2.74	2.5	0.85	62.52357647														
McManus 1	middle Velkerri	1520	4986.877	3.34	2.5	0.85	76.21487059									142.8458353	521.8664941	333.5381798	272.8948744	123.4091265	100.9711035
McManus 1	middle Velkerri	1520.7	4989.173		2.5	0.85															
McManus 1	middle Velkerri	1522.6	4995.407		2.5	0.85															
McManus 1	middle Velkerri	1524.4	5001.312	2.66	2.5	0.85	60.69807059														
McManus 1	middle Velkerri	1525.45	5004.757		2.5	0.85															
McManus 1	middle Velkerri	1529	5016.404		2.5	0.85															
McManus 1	middle Velkerri	1530.62	5021.719	1.73	2.448	0.85	38.65545216	0.089136	0.057511	39.76935935						70.83108864	531.9706226	366.1642691	569.8515892	135.4807796	210.845088
McManus 1	middle Velkerri	1530.65	5021.818		2.5	0.85															
McManus 1	middle Velkerri	1530.665	5021.867	1.85	2.5	0.85	42.21482353									81.00682353	1423.894588	993.7369459	2094.904913	367.68267	775.1148178
McManus 1	middle Velkerri	1532.2	5026.903		2.5	0.85															
McManus 1	middle Velkerri	1532.5	5027.887	1.18	2.5	0.85	26.92621176														
McManus 1	middle Velkerri	1533.7	5031.824		2.5	0.85															
McManus 1	middle Velkerri	1534.2	5033.465		2.5	0.85															
McManus 1	middle Velkerri	1536.3	5040.354	0.91	2.5	0.85	20.76512941									18.93962353	543.7725647	524.8329412	0	194.1881882	0

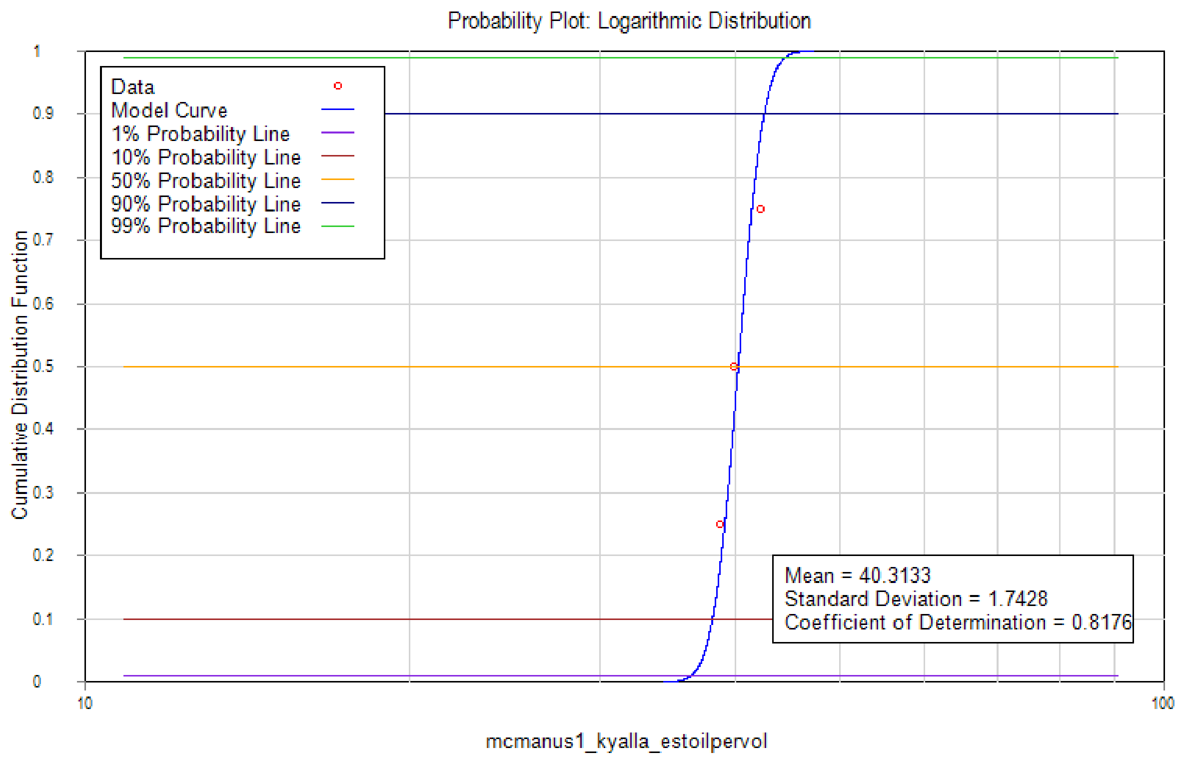
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
McManus 1	middle Velkerri	1537	5042.651		2.5	0.85															
McManus 1	middle Velkerri	1540	5052.493	2.84	2.5	0.85	64.80545882									114.0941176	603.7860706	411.3412405	470.1042748	152.196259	173.9385817
McManus 1	middle Velkerri	1540	5052.493		2.5	0.85															
McManus 1	middle Velkerri	1540.1	5052.822	1.58	2.5	0.85	36.05374118									72.56385882	642.5780706	450.3112273	718.2179068	166.6151541	265.7406255
McManus 1	middle Velkerri	1542.95	5062.172	2.85	2.5	0.85	65.03364706														
McManus 1	middle Velkerri	1544.5	5067.257		2.5	0.85															
McManus 1	middle Velkerri	1546	5072.178		2.5	0.85															
McManus 1	middle Velkerri	1549	5082.021		2.5	0.85															



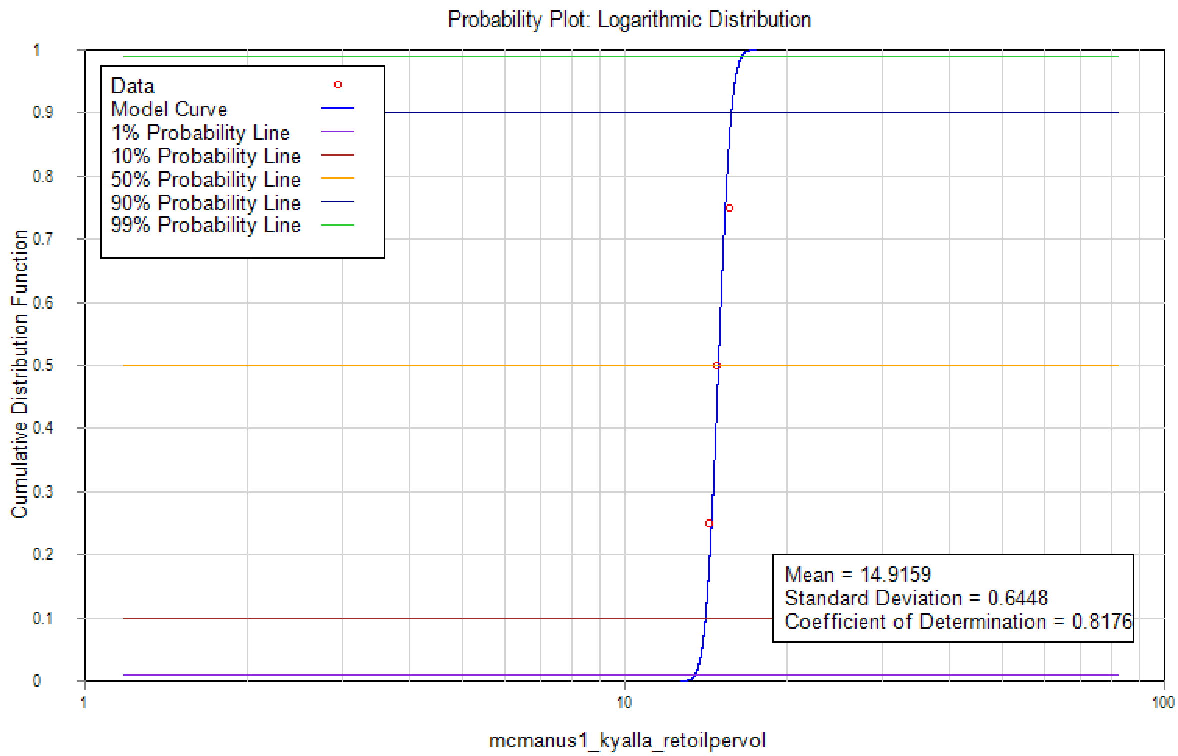
Distribution Report

Log-Normal Distribution Report	
Parameter	mcmanus1_kyalla_S1STOIIPpervol
Description	McManus 1 Kyalla S1 STOIIP per volume
Number of Positive Points	3
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.84073
Data Range	
Minimum Value	1.1409
Average Value	3.4228
Maximum Value	6.8456
Standard Deviation	3.01865
Distribution	
99% Value	0.3193
90% Value	0.8206
50% Value	2.6121
10% Value	8.3147
1% Value	21.3702
Average Value Probability	0.6176



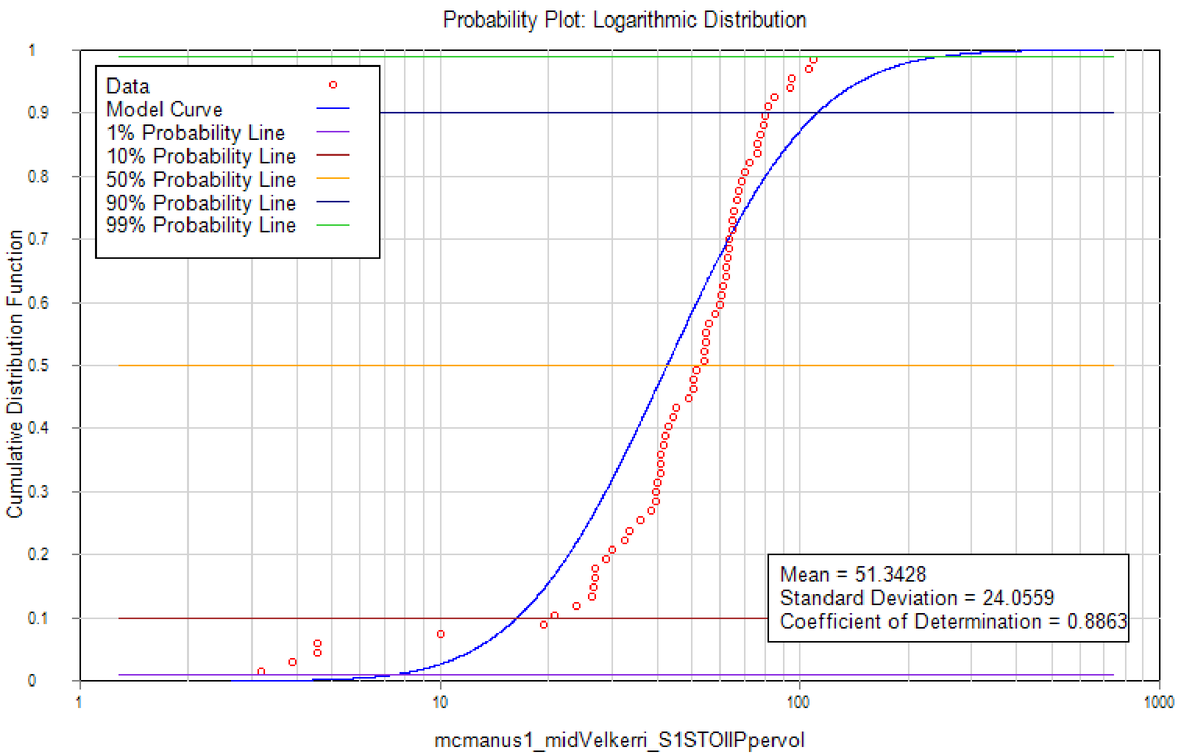
Distribution Report

Log-Normal Distribution Report	
Parameter	mcmanus1_kyalla_estoilpervol
Description	McManus 1 Kyalla Estimated Oil per Volume
Number of Positive Points	3
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.81762
Data Range	
Minimum Value	38.7920
Average Value	40.3133
Maximum Value	42.2148
Standard Deviation	1.74282
Distribution	
99% Value	36.4558
90% Value	38.1297
50% Value	40.2884
10% Value	42.5692
1% Value	44.5238
Average Value Probability	0.5057



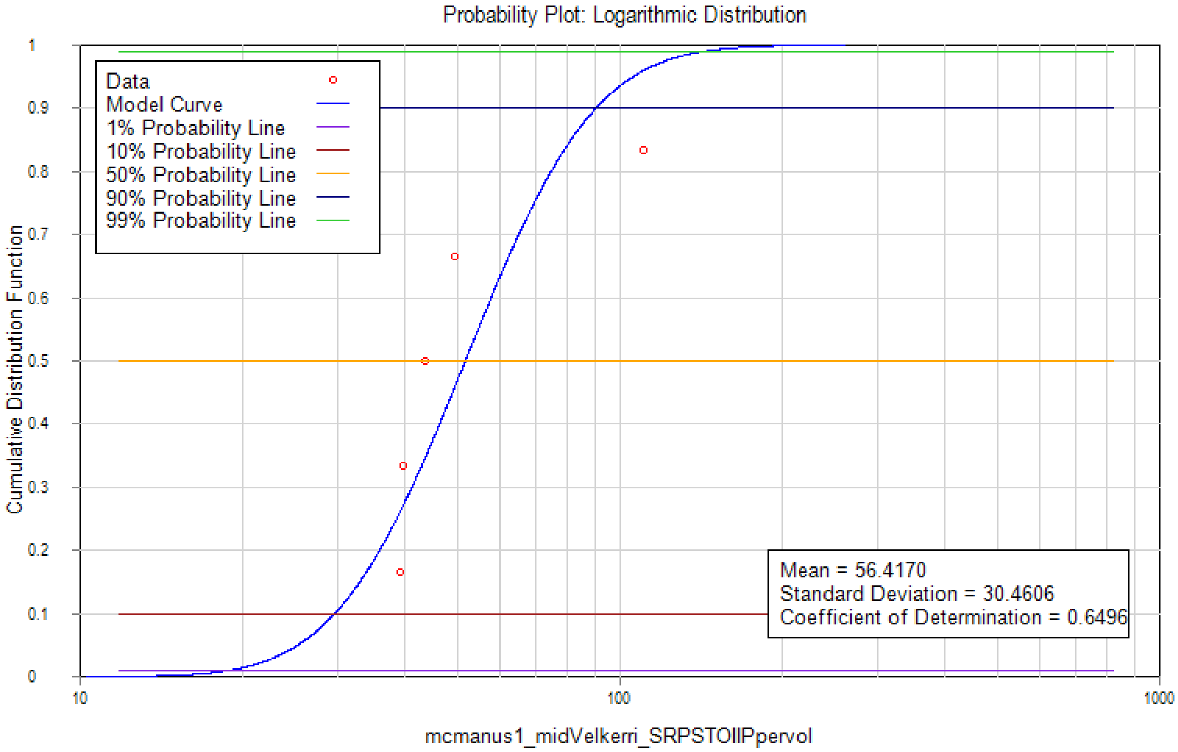
Distribution Report

Log-Normal Distribution Report	
Parameter	mcmanus1_kyalla_retoilpervol
Description	McManus 1 Kyalla Retained Oil per Volume
Number of Positive Points	3
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.81762
Data Range	
Minimum Value	14.3530
Average Value	14.9159
Maximum Value	15.6195
Standard Deviation	0.644842
Distribution	
99% Value	13.4886
90% Value	14.1080
50% Value	14.9067
10% Value	15.7506
1% Value	16.4738
Average Value Probability	0.5057



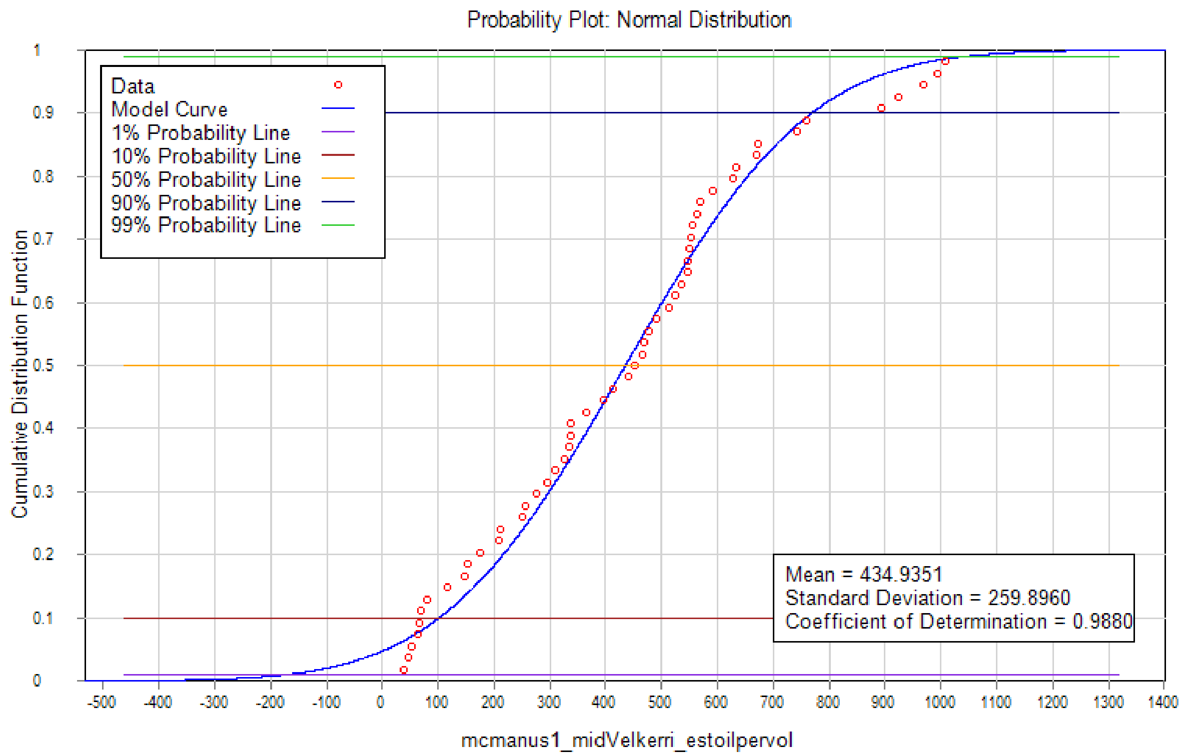
Distribution Report

Log-Normal Distribution Report	
Parameter	mcmanus1_midVelkerri_S1STOIIPpervol
Description	McManus 1 Middle Velkerri S1 STOIIP per Volume
Number of Positive Points	66
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.88625
Data Range	
Minimum Value	3.1946
Average Value	51.3428
Maximum Value	108.6176
Standard Deviation	24.0559
Distribution	
99% Value	7.4930
90% Value	16.3751
50% Value	42.7215
10% Value	111.4578
1% Value	243.5771
Average Value Probability	0.5970



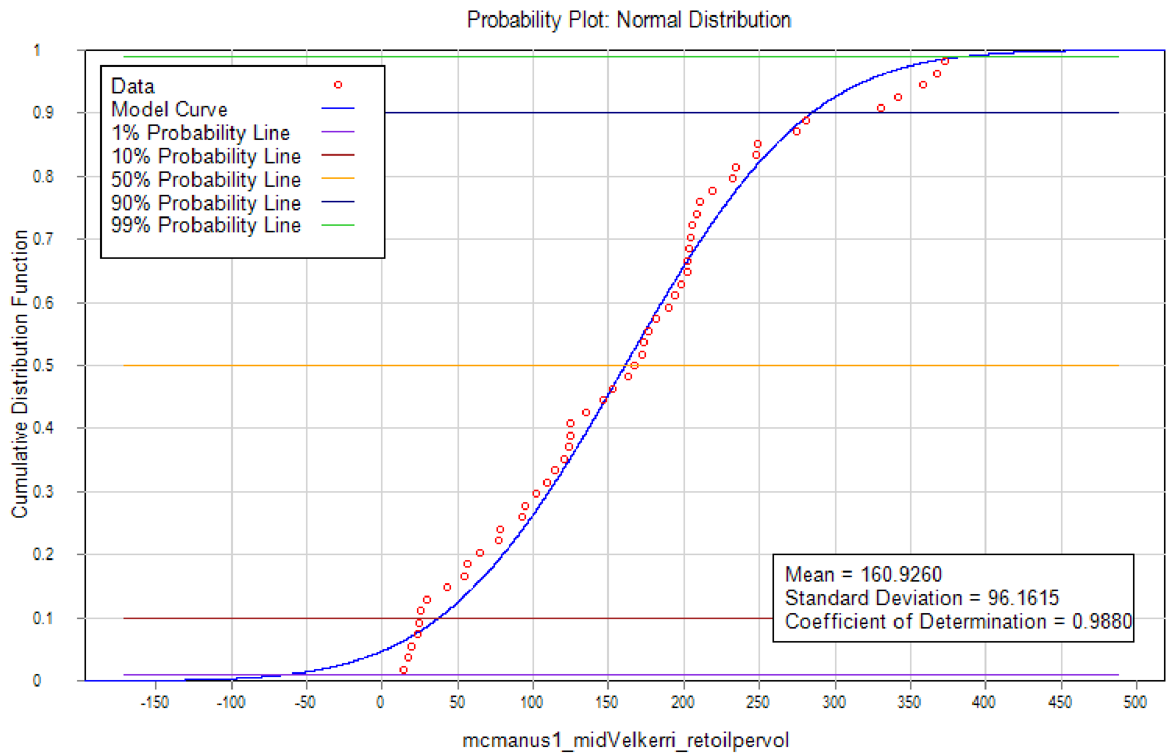
Distribution Report

Log-Normal Distribution Report	
Parameter	mcmanus1_midVelkerri_SRPSTOIIPpervol
Description	McManus 1 Middle Velkerri SRP STOIIP per Volume
Number of Positive Points	5
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.64960
Data Range	
Minimum Value	39.2058
Average Value	56.4170
Maximum Value	110.4337
Standard Deviation	30.4606
Distribution	
99% Value	18.8160
90% Value	29.6179
50% Value	51.6689
10% Value	90.1373
1% Value	141.8836
Average Value Probability	0.5802



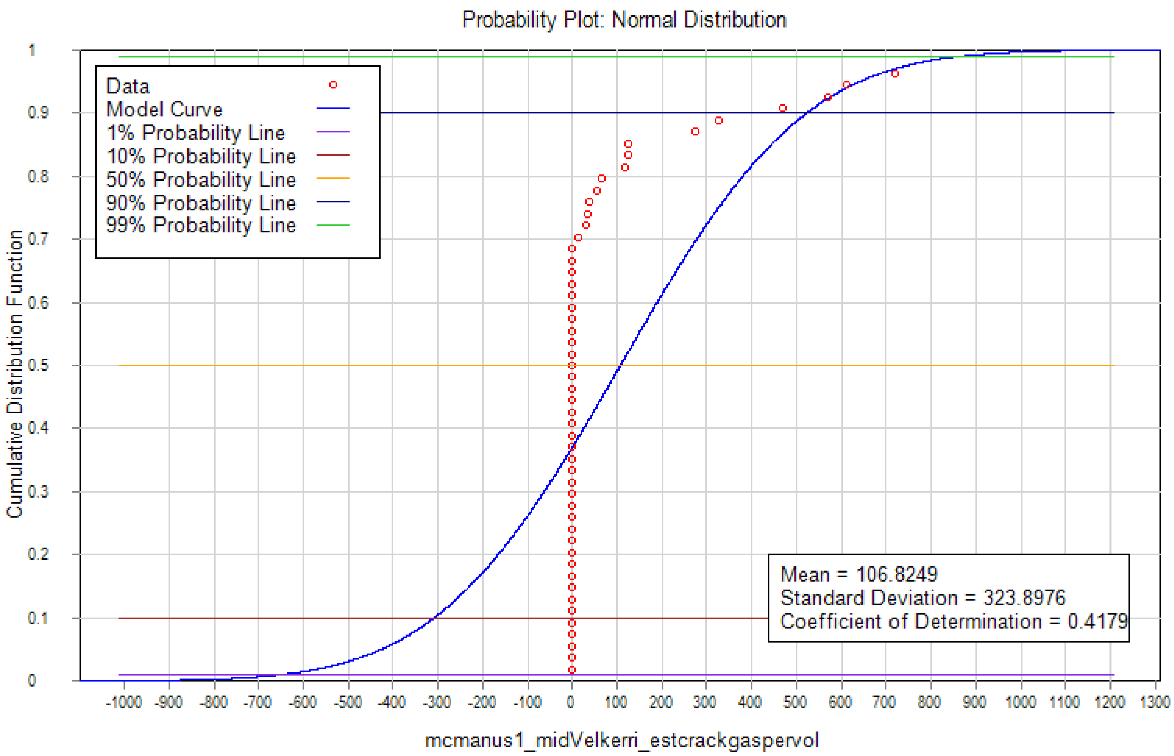
Distribution Report

Normal Distribution Report	
Parameter	mcmanus1_midVelkerri_estoilpervol
Description	McManus 1 Middle Velkerri Estimated Oil per Volume
Number of Positive Points	53
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98800
Data Range	
Minimum Value	39.4766
Average Value	434.9351
Maximum Value	1,006.5337
Standard Deviation	259.896
Distribution	
99% Value	-169.6735
90% Value	101.8649
50% Value	434.9351
10% Value	768.0052
1% Value	1,039.5436
Average Value Probability	0.5000



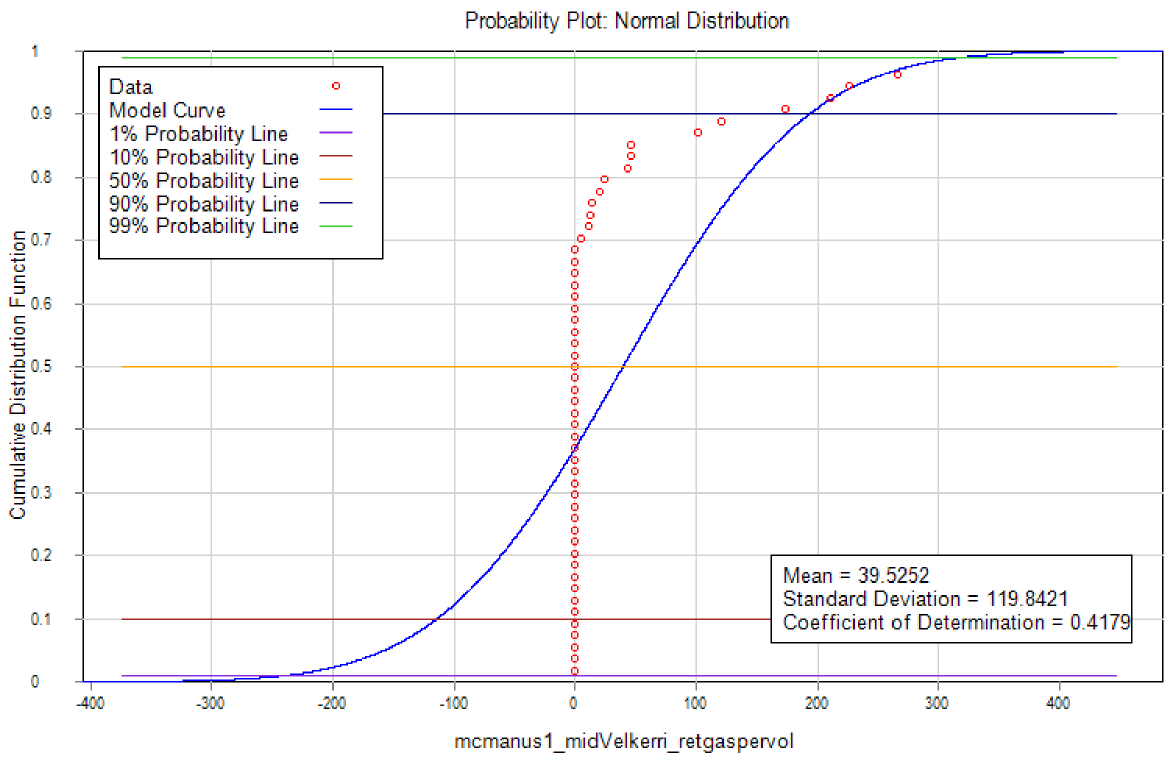
Distribution Report

Normal Distribution Report	
Parameter	mcmanus1_midVelkerri_retoilpervol
Description	McManus 1 Middle Velkerri Retained Oil per Volume
Number of Positive Points	53
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98800
Data Range	
Minimum Value	14.6063
Average Value	160.9260
Maximum Value	372.4175
Standard Deviation	96.1615
Distribution	
99% Value	-62.7792
90% Value	37.6900
50% Value	160.9260
10% Value	284.1619
1% Value	384.6311
Average Value Probability	0.5000



Distribution Report

Normal Distribution Report	
Parameter	mcmanus1_midVelkerri_estcrackgaspervol
Description	McManus 1 Middle Velkerri Estimated Cracked Gas per Volume
Number of Positive Points	16
Number of Non-Positive Points	37
Number of Null Values	0
Regression Coefficient	0.41794
Data Range	
Minimum Value	0.0000
Average Value	106.8249
Maximum Value	2,094.9049
Standard Deviation	323.898
Distribution	
99% Value	-646.6736
90% Value	-308.2666
50% Value	106.8249
10% Value	521.9164
1% Value	860.3234
Average Value Probability	0.5000

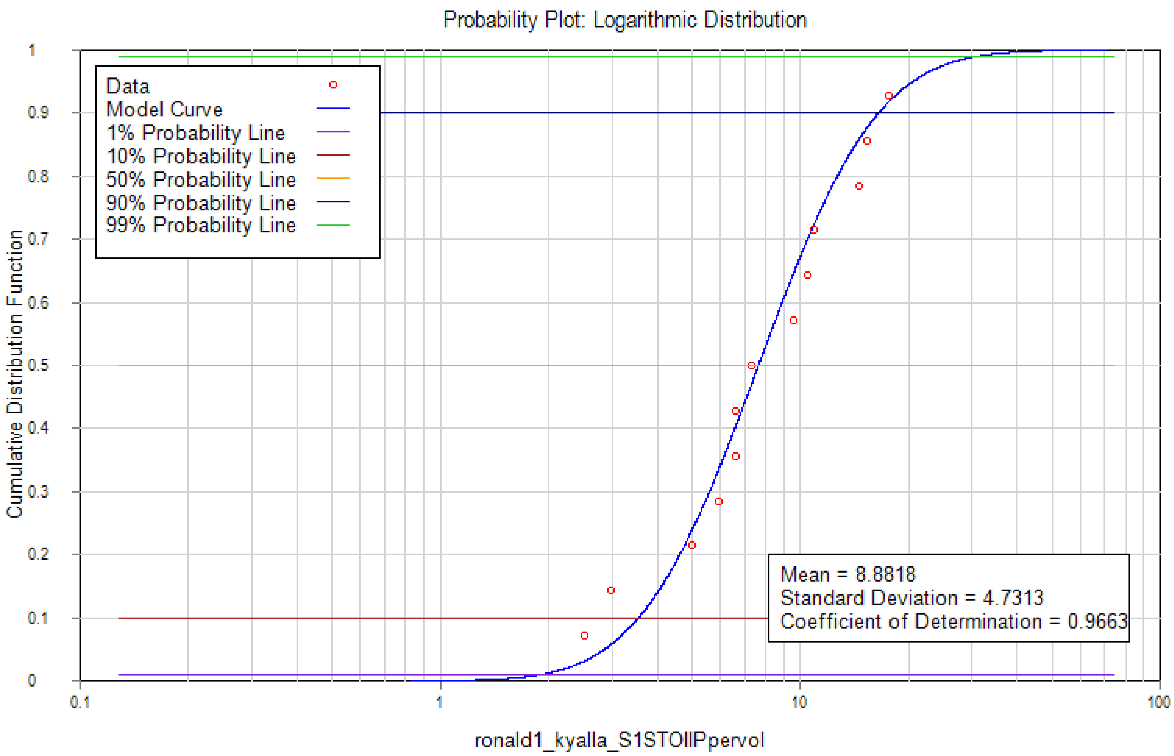


Distribution Report

Normal Distribution Report	
Parameter	mcmanus1_midVelkerri_retgaspervol
Description	McManus 1 Middle Velkerri Retained Gas per Volume
Number of Positive Points	16
Number of Non-Positive Points	37
Number of Null Values	0
Regression Coefficient	0.41794
Data Range	
Minimum Value	0.0000
Average Value	39.5252
Maximum Value	775.1148
Standard Deviation	119.842
Distribution	
99% Value	-239.2692
90% Value	-114.0586
50% Value	39.5252
10% Value	193.1091
1% Value	318.3197
Average Value Probability	0.5000

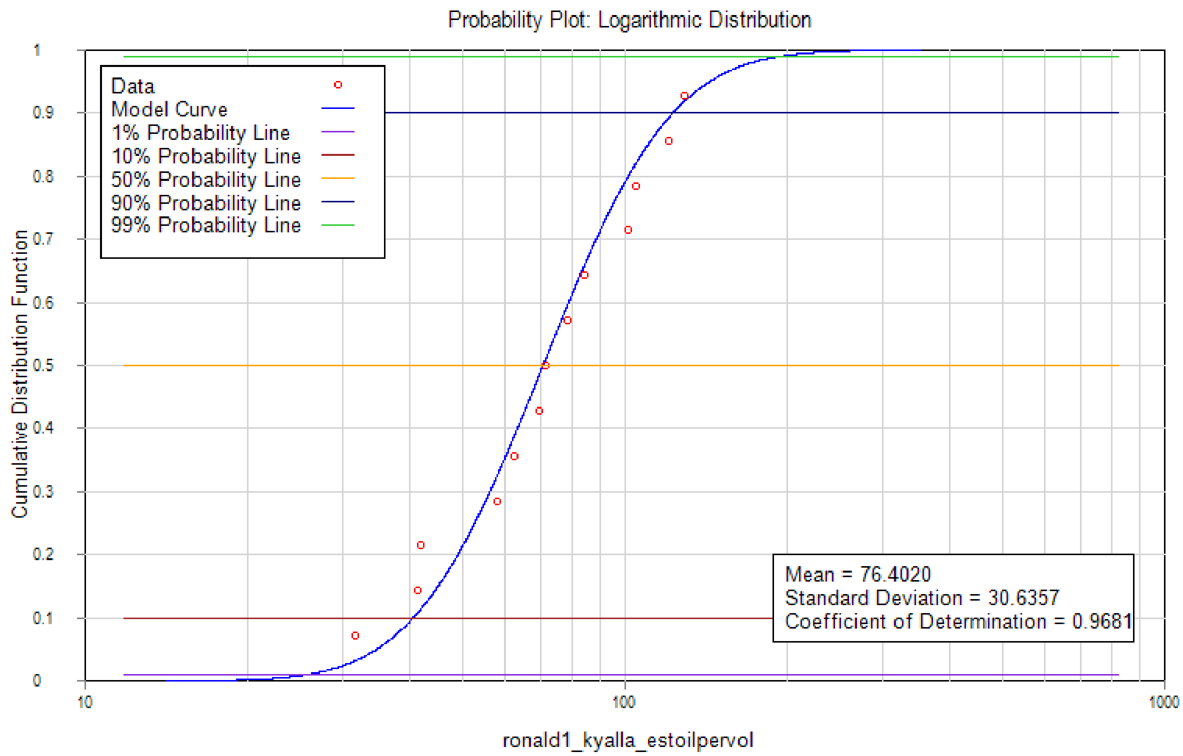
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Ronald 1	Kyalla	873	2864.173	0.32	2.5	0.85	7.302023529									41.30207059	73.02023529	31.71816471	0	11.73572094	0
Ronald 1	Kyalla	888	2913.386	0.46	2.5	0.85	10.49665882									35.59736471	77.35581176	41.75844706	0	15.45062541	0
Ronald 1	Kyalla	900	2952.756	0.13	2.5	0.85	2.966447059									21.22150588	143.0740235	120.6339925	7.311151059	44.63457721	2.705125892
Ronald 1	Kyalla	906	2972.441		2.5	0.85															
Ronald 1	Kyalla	912	2992.126	0.11	2.5	0.85	2.510070588									16.20136471	123.4498353	105.1035012	12.86981647	38.88829544	4.761832094
Ronald 1	Kyalla	912	2992.126		2.5	0.85															
Ronald 1	Kyalla	918	3011.811	0.29	2.5	0.85	6.617458824									28.52352941	70.28197647	41.34086259	2.505506824	15.29611916	0.927037525
Ronald 1	Kyalla	936	3070.866		2.5	0.85															
Ronald 1	Kyalla	948	3110.236	0.26	2.5	0.85	5.932894118									19.85237647	80.32225882	58.05108706	14.51277176	21.47890221	5.369725553
Ronald 1	Kyalla	972	3188.976	0.64	2.5	0.85	14.60404706									35.36917647	110.8994824	70.99848753	27.19091012	26.26944039	10.06063674
Ronald 1	Kyalla	984	3228.346	0.22	2.5	0.85	5.020141176									16.20136471	94.24174118	78.04037647	0	28.87493929	0
Ronald 1	Kyalla	993	3257.874	0.42	2.5	0.85	9.583905882									26.24164706	90.36254118	62.19726729	11.54176094	23.0129889	4.270451548
Ronald 1	Kyalla	1017	3336.614	0.67	2.5	0.85	15.28861176									40.38931765	169.3156706	128.9263529	0	47.70275059	0
Ronald 1	Kyalla	1017	3336.614		2.5	0.85															
Ronald 1	Kyalla	1023	3356.299	0.77	2.5	0.85	17.57049412									39.93294118	125.5035294	83.85917647	10.26847059	31.02789529	3.799334118
Ronald 1	Kyalla	1026	3366.142	0.48	2.5	0.85	10.95303529									28.06715294	129.3827294	101.3155765	0	37.48676329	0
Ronald 1	Kyalla	1026	3366.142		2.5	0.85															
Ronald 1	Kyalla	1032	3385.827	0.29	2.5	0.85	6.617458824									21.44969412	95.15449412	69.282512	26.533728	25.63452944	9.81747936
Ronald 1	Kyalla	1032	3385.827		2.5	0.85															
Ronald 1	Kyalla	1038	3405.512		2.5	0.85															



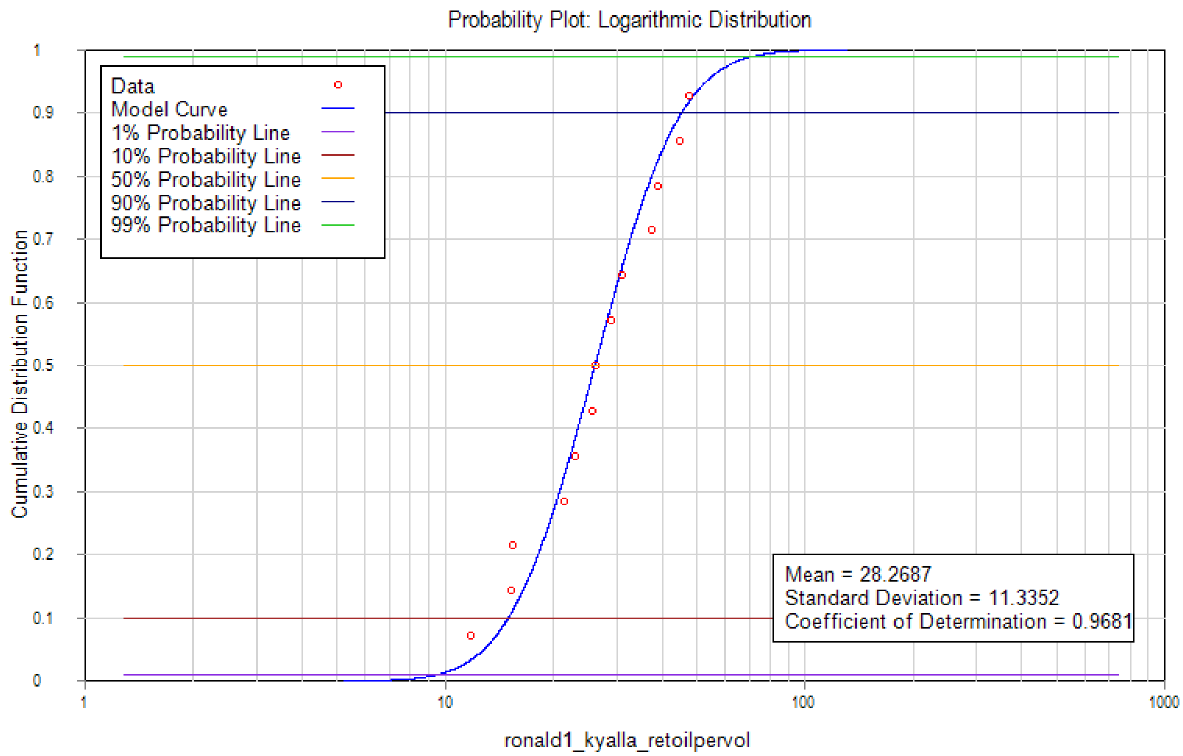
Distribution Report

Log-Normal Distribution Report	
Parameter	ronald1_kyalla_S1STOIIPpervol
Description	Ronald 1 Kyalla S1 STOIIP per Volume
Number of Positive Points	13
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96626
Data Range	
Minimum Value	2.5101
Average Value	8.8818
Maximum Value	17.5705
Standard Deviation	4.73132
Distribution	
99% Value	1.9019
90% Value	3.5533
50% Value	7.6485
10% Value	16.4634
1% Value	30.7579
Average Value Probability	0.5987



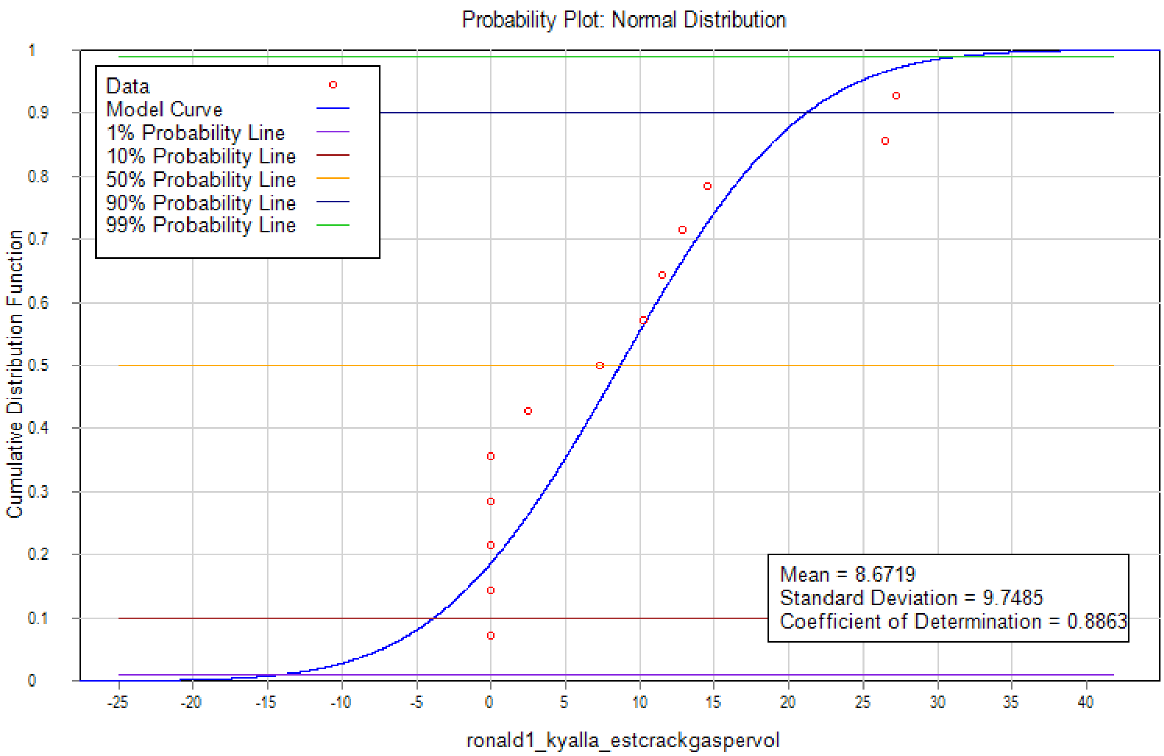
Distribution Report

Log-Normal Distribution Report	
Parameter	ronald1_kyalla_estoilpervol
Description	Ronald 1 Kyalla Estimated Oil per Volume
Number of Positive Points	13
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96813
Data Range	
Minimum Value	31.7182
Average Value	76.4020
Maximum Value	128.9264
Standard Deviation	30.6357
Distribution	
99% Value	25.8148
90% Value	40.5231
50% Value	70.4551
10% Value	122.4961
1% Value	192.2894
Average Value Probability	0.5745



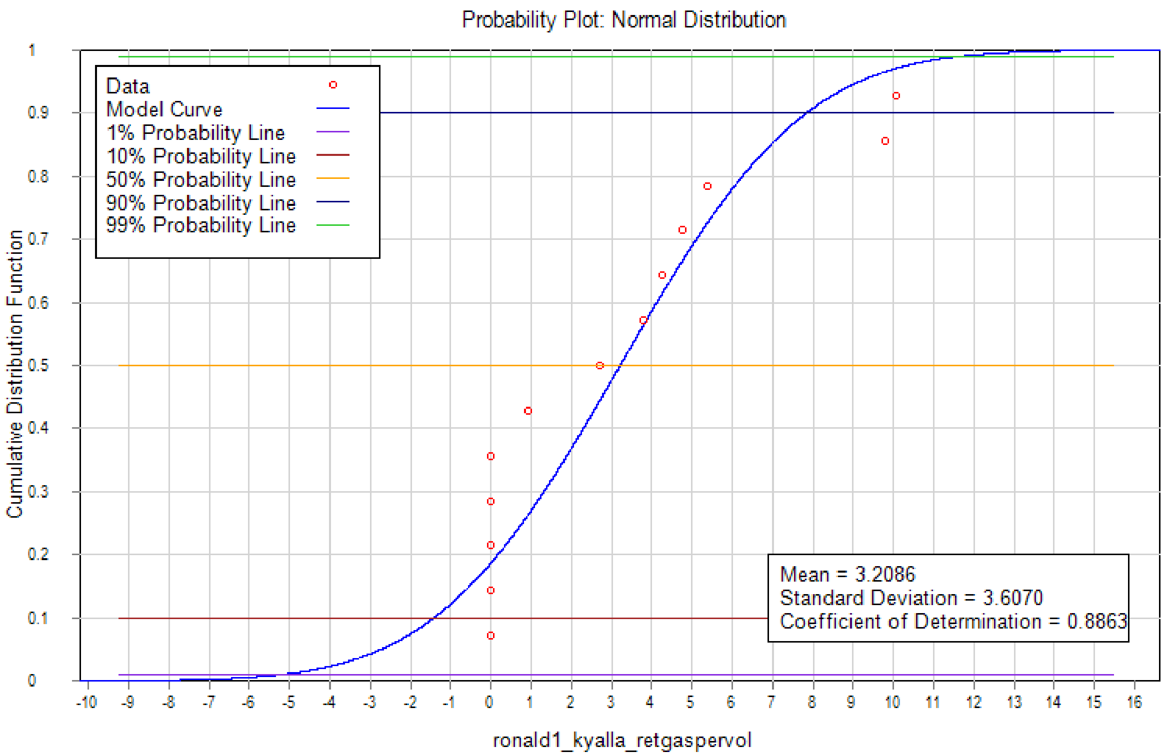
Distribution Report

Log-Normal Distribution Report	
Parameter	ronald1_kyalla_retoilpervol
Description	Ronald 1 Kyalla Retained Oil per Volume
Number of Positive Points	13
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96813
Data Range	
Minimum Value	11.7357
Average Value	28.2687
Maximum Value	47.7028
Standard Deviation	11.3352
Distribution	
99% Value	9.5515
90% Value	14.9935
50% Value	26.0684
10% Value	45.3235
1% Value	71.1471
Average Value Probability	0.5745



Distribution Report

Normal Distribution Report	
Parameter	ronald1_kyalla_estcrackgaspervol
Description	Ronald 1 Kyalla Estimated Cracked Gas per Volume
Number of Positive Points	8
Number of Non-Positive Points	5
Number of Null Values	0
Regression Coefficient	0.88631
Data Range	
Minimum Value	0.0000
Average Value	8.6719
Maximum Value	27.1909
Standard Deviation	9.74854
Distribution	
99% Value	-14.0066
90% Value	-3.8214
50% Value	8.6719
10% Value	21.1651
1% Value	31.3503
Average Value Probability	0.5000



Distribution Report

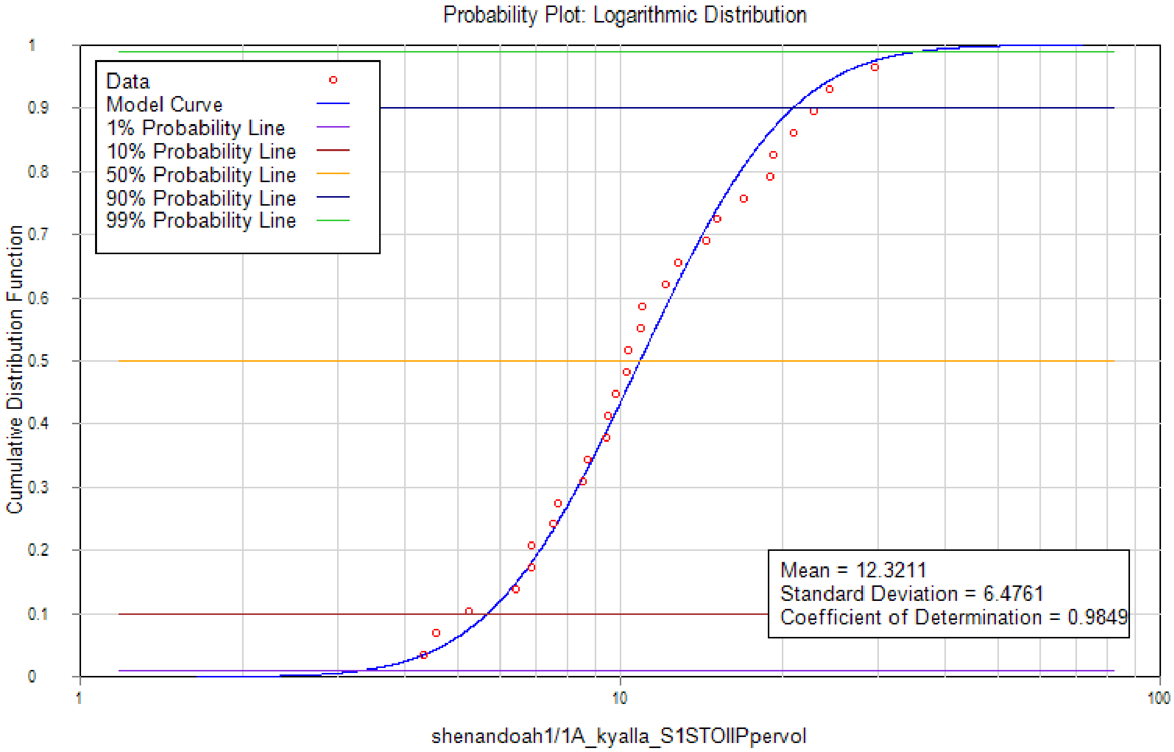
Normal Distribution Report	
Parameter	ronald1_kyalla_retgaspervol
Description	Ronald 1 Kyalla Retained Gas per Volume
Number of Positive Points	8
Number of Non-Positive Points	5
Number of Null Values	0
Regression Coefficient	0.88631
Data Range	
Minimum Value	0.0000
Average Value	3.2086
Maximum Value	10.0606
Standard Deviation	3.60696
Distribution	
99% Value	-5.1825
90% Value	-1.4139
50% Value	3.2086
10% Value	7.8311
1% Value	11.5996
Average Value Probability	0.5000

Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Shenandoah 1/1A	Kyalla	1070	3510.499		2.5	0.85															
Shenandoah 1/1A	Kyalla	1100	3608.924		2.5	0.85															
Shenandoah 1/1A	Kyalla	1200	3937.008		2.5	0.85															
Shenandoah 1/1A	Kyalla	1290	4232.283		2.5	0.85															
Shenandoah 1/1A	Kyalla	1400	4593.176		2.5	0.85															
Shenandoah 1/1A	Kyalla	1540	5052.493		2.5	0.85															
Shenandoah 1/1A	Kyalla	1555	5101.706		2.5	0.85															
Shenandoah 1/1A	Kyalla	1565	5134.514	0.23	2.5	0.85	5.248329412									25.78527059	142.2402132	24.72775724	550.363112	9.149270178	203.6343514
Shenandoah 1/1A	Kyalla	1571	5154.199		2.5	0.85															
Shenandoah 1/1A	Kyalla	1574	5164.042	0.3	2.5	0.85	6.845647059									56.36249412	180.1449648	26.28366661	584.9928246	9.724956647	216.4473451
Shenandoah 1/1A	Kyalla	1578	5177.165	0.32	2.616	0.85	7.640837421	0.056388	0	0						21.96740759	159.8011186	29.26727255	651.3986306	10.82889084	241.0174933
Shenandoah 1/1A	Kyalla	1580	5183.727		2.5	0.85															
Shenandoah 1/1A	Kyalla	1583	5193.57		2.5	0.85															
Shenandoah 1/1A	Kyalla	1585	5200.131	0.4	2.597	0.85	9.481677553	0.060185	0.041706	19.47306139	15.27	28.91	0.46	44.64	157.6301298	14.45955827	210.2168821	41.56663062	925.1441595	15.37965333	342.303339
Shenandoah 1/1A	Kyalla	1585.28	5201.05		2.5	0.85															
Shenandoah 1/1A	Kyalla	1586.7	5205.709		2.5	0.85															
Shenandoah 1/1A	Kyalla	1587.9	5209.646	0.29	2.589	0.85	6.853040358	0.074354	0.044839	25.86483429						8.979845986	149.5401791	29.84623682	664.2845778	11.04310762	245.7852938
Shenandoah 1/1A	Kyalla	1589.7	5215.551		2.5	0.85															
Shenandoah 1/1A	Kyalla	1590.1	5216.864		2.5	0.85															
Shenandoah 1/1A	Kyalla	1590.27	5217.421	0.43	2.628	0.85	10.31447334	0.049377	0	0	9.45	25.67	0.7	35.81	127.9595722	22.78778993	174.4331131	32.19999644	716.6719601	11.91399868	265.1686253
Shenandoah 1/1A	Kyalla	1590.5	5218.176		2.594	13.85		0.06266	0.014107	6.857433468											
Shenandoah 1/1A	Kyalla	1591.3	5220.801	0.4	2.583	0.85	9.430563388	0.068769	0.021703	11.57879416						12.73126057	171.8186723	33.78023131	751.8430827	12.49868559	278.1819406
Shenandoah 1/1A	Kyalla	1592.7	5225.394		2.5	0.85															
Shenandoah 1/1A	Kyalla	1593	5226.378	0.35	2.669	0.85	8.5264816	0.030497	0.000291	0.068907966	11.92	41.5	0.16	53.58	194.4439257	22.16885216	158.7080175	28.99239191	645.2806407	10.72718501	238.7538371
Shenandoah 1/1A	Kyalla	1593.97	5229.56		2.5	0.85															
Shenandoah 1/1A	Kyalla	1595	5232.94	1.3	2.5	0.85	29.66447059														
Shenandoah 1/1A	Kyalla	1595	5232.94		2.5	0.85										165.4364706	328.817113	34.69184539	772.132782	12.83598279	285.6891293
Shenandoah 1/1A	Kyalla	1595.44	5234.383	0.47	2.548	0.85	10.93076412	0.08451	0.00872	5.716966551	17.32	54.95	1.13	73.4	254.295445	15.81472256	242.1959474	48.06923473	1069.87194	17.78561685	395.852618
Shenandoah 1/1A	Kyalla	1598	5242.782	0.84	2.5	0.85	19.16781176									47.23496471	233.1633351	39.47957472	878.6927741	14.60744265	325.1163264
Shenandoah 1/1A	Kyalla	1601	5252.625	0.66	2.5	0.85	15.06042353														
Shenandoah 1/1A	Kyalla	1601	5252.625		2.5	0.85															
Shenandoah 1/1A	Kyalla	1607	5272.31		2.5	0.85															
Shenandoah 1/1A	Kyalla	1610	5282.152	0.53	2.5	0.85	12.09397647									26.24164706	212.183077	39.48234774	878.7544929	14.60846866	325.1391624
Shenandoah 1/1A	Kyalla	1616	5301.837	0.83	2.5	0.85	18.93962353									12.77854118	205.9426908	41.01600236	912.8888837	15.17592087	337.768887
Shenandoah 1/1A	Kyalla	1619	5311.68	0.56	2.5	0.85	12.77854118									29.66447059	256.877006	48.24575318	1073.800693	17.85092868	397.3062564
Shenandoah 1/1A	Kyalla	1628	5341.207	0.74	2.5	0.85	16.88592941									42.21482353	330.8068086	61.27891518	1363.87842	22.67319862	504.6350152
Shenandoah 1/1A	Kyalla	1628	5341.207	1.07	2.5	0.85	24.41614118									25.32889412	268.5411731	51.64309954	1149.415077	19.10794683	425.2835783
Shenandoah 1/1A	Kyalla	1637	5370.735	1	2.5	0.85	22.81882353									26.24164706	297.0251996	57.49751623	1279.716218	21.274081	473.4950005
Shenandoah 1/1A	Kyalla	1643	5390.42	0.92	2.5	0.85	20.99331765									41.30207059	343.034887	64.06920712	1425.981656	23.70560664	527.6132127
Shenandoah 1/1A	Kyalla	1649	5410.105	0.63	2.5	0.85	14.37585882									11.6376	208.558656	41.81373466	930.6439282	15.47108182	344.3382534
Shenandoah 1/1A	Kyalla	1655	5429.79		2.5	0.85															
Shenandoah 1/1A	Kyalla	1655	5429.79	0.48	2.5	0.85	10.95303529														
Shenandoah 1/1A	Kyalla	1655	5429.79	0.38	2.5	0.85	8.671152941									20.76512941	213.2084255	40.86293809	909.4821483	15.11928709	336.5083949
Shenandoah 1/1A	Kyalla	1658	5439.633	0.43	2.5	0.85	9.812094118									8.442964706	167.1721532	33.70416707	750.1501288	12.47054182	277.5555477
Shenandoah 1/1A	Kyalla	1664	5459.318	0.33	2.5	0.85	7.530211765									18.93962353	181.6136035	34.54179442	768.7931133	12.78046394	284.4534519
Shenandoah 1/1A	Kyalla	1670	5479.003		2.5	0.85															
Shenandoah 1/1A	Kyalla	1679	5508.53		2.5	0.85															
Shenandoah 1/1A	Kyalla	1682	5518.373	0.19	2.5	0.85	4.335576471									11.86578824	121.7828397	23.33951745	519.465204	8.635621457	192.2021255
Shenandoah 1/1A	Kyalla	1688	5538.058		2.5	0.85															
Shenandoah 1/1A	Kyalla	1694	5557.743	0.45	2.5	0.85	10.26847059									17.79868235	174.2736246	33.22550594	739.496618	12.2934372	273.6137487
Shenandoah 1/1A	Kyalla	1703	5587.27	0.28	2.5	0.85	6.389270588									13.23491765	128.2468182	24.42134522	543.5433318	9.035897733	201.1110328
Shenandoah 1/1A	Kyalla	1712	5616.798	0.2	2.5	0.85	4.563764706									9.355717647	100.8947901	19.4371824	432.6113401	7.19175749	160.0661958
Shenandoah 1/1A	middle Velkerri	2453	8047.9		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2456	8057.743		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2459	8067.585	0.05	2.5	0.85	1.140941176									2.738258824	138.9666353	0	817.3702588	0	302.4269958
Shenandoah 1/1A	middle Velkerri	2459	8067.585		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2462	8077.428		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2465	8087.27		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2468	8097.113	0.04	2.5	0.85	0.912752941									1.825505882	78.72494118	0	461.3966118	0	170.7167464
Shenandoah 1/1A	middle Velkerri	2468	8097.113		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2471	8106.955		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2474	8116.798		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2474	8116.798		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2474	8116.798		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2477	8126.64		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2480	8136.483	0.05	2.5	0.85	1.140941176									2.053694118	103.1410824	0	606.5243294	0	224.4140019
Shenandoah 1/1A	middle Velkerri	2480	8136.483		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2483	8146.325		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2486	8156.168		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2489	8166.01	0.04	2.5	0.85	0.912752941									2.053694118	89.44978824	0	524.3765647	0	194.0193289
Shenandoah 1/1A	middle Velkerri	2489	8166.01		2.5	0.85															

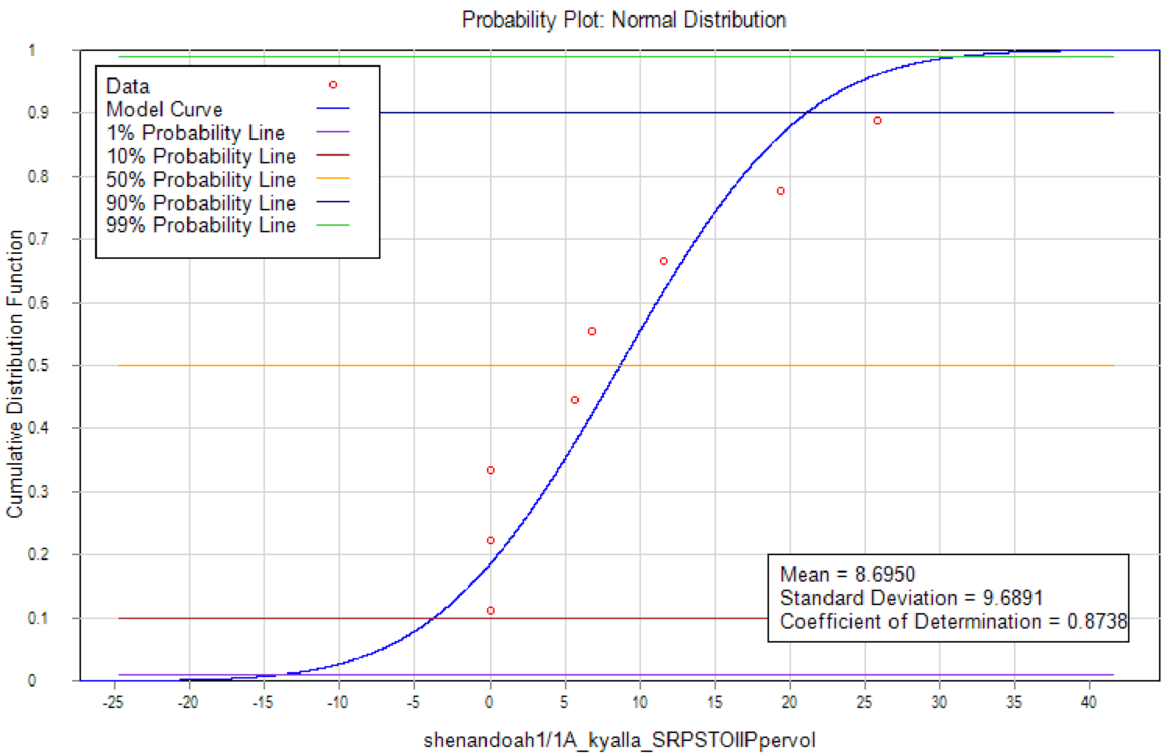
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Shenandoah 1/1A	middle Velkerri	2492	8175.853		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2495	8185.696		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2498	8195.538	0.05	2.5	0.85	1.140941176									2.510070588	102.9128941	0	602.4169412	0	222.8942682
Shenandoah 1/1A	middle Velkerri	2498	8195.538		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2501	8205.381		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2504	8215.223		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2507	8225.066		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2510	8234.908	0.42	2.5	0.85	9.583905882									20.76512941	164.7519059	0	863.9206588	0	319.6506438
Shenandoah 1/1A	middle Velkerri	2510	8234.908		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2511.1	8238.517		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2511.13	8238.615		2.608	14.85		0.048288	0.010292	3.855626954											
Shenandoah 1/1A	middle Velkerri	2511.4	8239.501		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2511.53	8239.928	0.16	2.609	0.85	3.810195878	0.046273	0.012524	4.495894058						4.04833312	329.8906496	0	1955.053899	0	723.3699427
Shenandoah 1/1A	middle Velkerri	2511.7	8240.486	0.37	2.627	0.85	8.871867313	0.034511	0	0	49.33	0.24	0.82	50.4	180.0253678	11.74922968	153.171174	0	848.5316661	0	313.9567165
Shenandoah 1/1A	middle Velkerri	2513	8244.751	0.24	2.5	0.85	5.476517647									8.442964706	188.7116706	0	1081.612235	0	400.1965271
Shenandoah 1/1A	middle Velkerri	2513	8244.751		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2513.4	8246.063		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2513.5	8246.391	0.26	2.591	0.85	6.148851464	0.045415	0.016548	5.830342882	59.39	55.61	1.23	116.23	409.4762792	5.439368602	372.7260633	0	2203.720168	0	815.3764623
Shenandoah 1/1A	middle Velkerri	2513.7	8247.047	0.77	2.59	0.85	18.20303191	0.04239	0	0	84.08	7.85	0.84	92.78	326.7361819	13.71137468	336.0846144	0	1934.239438	0	715.6685921
Shenandoah 1/1A	middle Velkerri	2514.17	8248.589	0.26	2.615	0.85	6.205807247	0.041087	0.011815	3.765900889	64.35	38.62	1.62	104.58	371.846269	4.773697882	277.1629889	0	1634.335746	0	604.7042261
Shenandoah 1/1A	middle Velkerri	2515.4	8252.625		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2515.7	8253.609	0.94	2.639	0.85	22.64229711	0.04307	0	0						15.17515657	304.7956505	0	1737.722964	0	642.9574966
Shenandoah 1/1A	middle Velkerri	2516	8254.593		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2516.15	8255.085		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2517.3	8258.858	0.14	2.635	0.85	3.3671456	0.02967	0.01509	3.473517228						0.9620416	59.21063373	0	349.4915528	0	129.3118745
Shenandoah 1/1A	middle Velkerri	2519	8264.436		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2519	8264.436	0.11	2.5	0.85	2.510070588														
Shenandoah 1/1A	middle Velkerri	2519	8264.436	0.14	2.5	0.85	3.194635294									19.62418824	213.356	0	1162.390871	0	430.0846221
Shenandoah 1/1A	middle Velkerri	2519	8264.436		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2525	8284.121	0.14	2.5	0.85	3.194635294														
Shenandoah 1/1A	middle Velkerri	2528	8293.963	0.07	2.5	0.85	1.597317647									2.510070588	237.0875765	0	1407.465035	0	520.7620631
Shenandoah 1/1A	middle Velkerri	2537	8323.491	0.14	2.5	0.85	3.194635294														
Shenandoah 1/1A	middle Velkerri	2543	8343.176	0.07	2.5	0.85	1.597317647									3.194635294	330.4165647	0	1963.331576	0	726.4326833
Shenandoah 1/1A	middle Velkerri	2549	8362.861	0.18	2.5	0.85	4.107388235														
Shenandoah 1/1A	middle Velkerri	2552	8372.703	0.1	2.5	0.85	2.281882353									4.107388235	398.8730353	0	2368.593882	0	876.3797365
Shenandoah 1/1A	middle Velkerri	2561	8402.231	0.17	2.5	0.85	3.8792														
Shenandoah 1/1A	middle Velkerri	2567	8421.916	0.05	2.5	0.85	1.140941176									2.510070588	163.3827765	0	965.2362353	0	357.1374071
Shenandoah 1/1A	middle Velkerri	2567	8421.916		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2570	8431.759		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2573	8441.601		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2576	8451.444		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2579	8461.286	0.07	2.5	0.85	1.597317647									2.510070588	112.2686118	0	658.5512471	0	243.6639614
Shenandoah 1/1A	middle Velkerri	2579	8461.286		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2588	8490.814	0.05	2.5	0.85	1.140941176									1.825505882	166.3492235	0	987.1423059	0	365.2426532
Shenandoah 1/1A	middle Velkerri	2600	8530.184	0.04	2.5	0.85	0.912752941									2.053694118	117.9733176	0	695.5177412	0	257.3415642
Shenandoah 1/1A	middle Velkerri	2609	8559.711	0.04	2.5	0.85	0.912752941									1.369129412	144.2149647	0	857.0750118	0	317.1177544
Shenandoah 1/1A	middle Velkerri	2618	8589.239	0.04	2.5	0.85	0.912752941									1.597317647	116.6041882	0	690.0412235	0	255.3152527
Shenandoah 1/1A	middle Velkerri	2630	8628.609	0.04	2.5	0.85	0.912752941									1.140941176	121.3961412	0	721.5312	0	266.966544
Shenandoah 1/1A	middle Velkerri	2642	8667.979	0.04	2.5	0.85	0.912752941									1.597317647	108.8457882	0	643.4908235	0	238.0916047
Shenandoah 1/1A	middle Velkerri	2648	8687.664	0.03	2.5	0.85	0.684564706									1.825505882	114.3223059	0	674.9808	0	249.742896
Shenandoah 1/1A	middle Velkerri	2651	8697.507		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2651	8697.507		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2657	8717.192	0.06	2.5	0.85	1.369129412									2.966447059	107.9330353	0	629.7995294	0	233.0258259
Shenandoah 1/1A	middle Velkerri	2672	8766.404	0.03	2.5	0.85	0.684564706									2.281882353	104.9665882	0	616.1082353	0	227.9600471
Shenandoah 1/1A	middle Velkerri	2678	8786.089	0.06	2.5	0.85	1.369129412									1.825505882	136.6847529	0	809.1554824	0	299.3875285
Shenandoah 1/1A	middle Velkerri	2690	8825.459	0.05	2.5	0.85	1.140941176									1.825505882	155.3961882	0	921.4240941	0	340.9269148
Shenandoah 1/1A	middle Velkerri	2702	8864.829	0.07	2.5	0.85	1.597317647									1.825505882	204.0002824	0	1213.048659	0	448.8280038
Shenandoah 1/1A	middle Velkerri	2705	8874.672		2.5	0.85															
Shenandoah 1/1A	middle Velkerri	2705	8874.672	0.1	2.5	0.85	2.281882353														
Shenandoah 1/1A	middle Velkerri	2711	8894.357	0.06	2.5	0.85	1.369129412									3.651011765	195.1009412	0	1148.699576	0	425.0188433



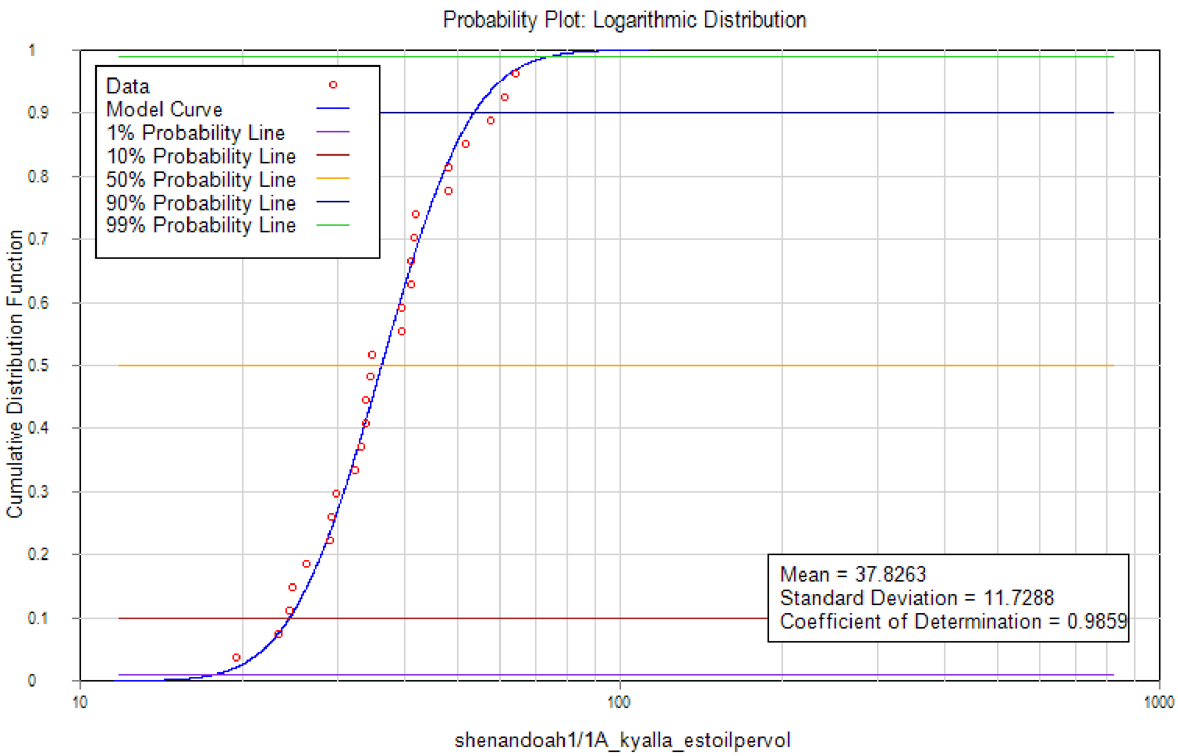
Distribution Report

Log-Normal Distribution Report	
Parameter	shenandoah1/1A_kyalla_S1STOIIPpervol
Description	Shenandoah 1/1A Kyalla S1 STOIIP per Volume
Number of Positive Points	28
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98494
Data Range	
Minimum Value	4.3356
Average Value	12.3211
Maximum Value	29.6645
Standard Deviation	6.47608
Distribution	
99% Value	3.3398
90% Value	5.6754
50% Value	10.8755
10% Value	20.8401
1% Value	35.4136
Average Value Probability	0.5971



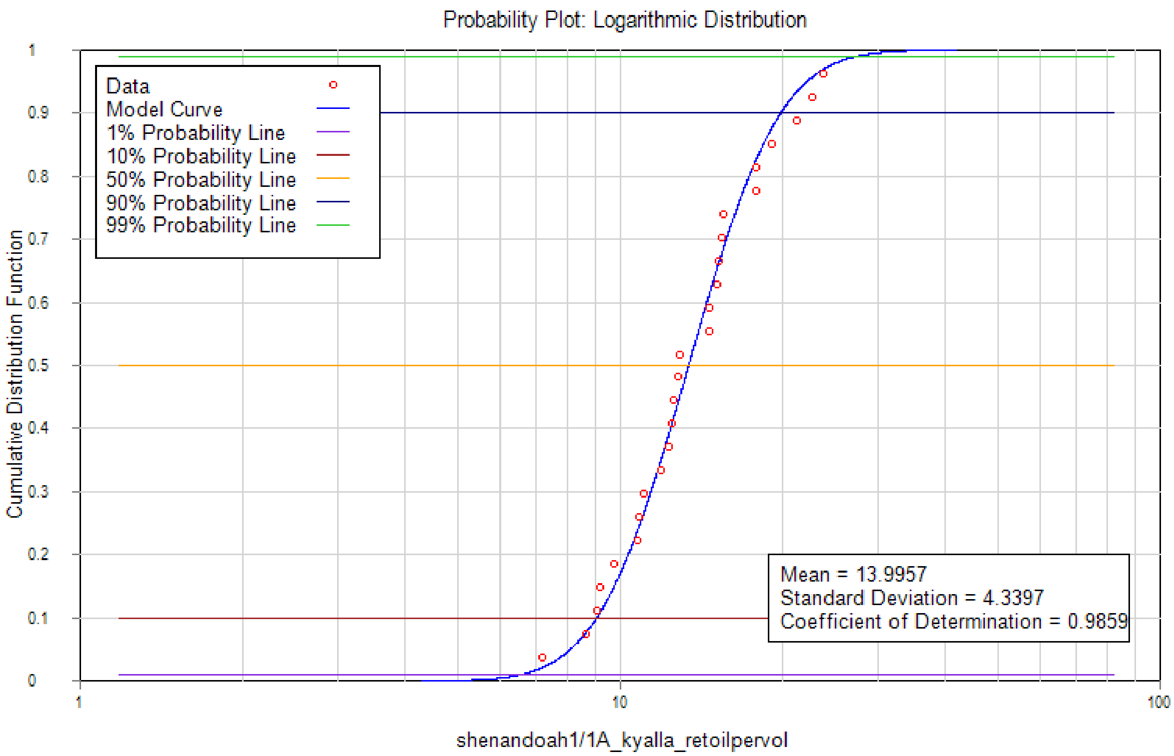
Distribution Report

Normal Distribution Report	
Parameter	shenandoah1/1A_kyalla_SRPSTOIIPpervol
Description	Shenandoah 1/1A Kyalla SRP STOIIP per Volume
Number of Positive Points	6
Number of Non-Positive Points	2
Number of Null Values	0
Regression Coefficient	0.87381
Data Range	
Minimum Value	0.0000
Average Value	8.6950
Maximum Value	25.8648
Standard Deviation	9.68907
Distribution	
99% Value	-13.8452
90% Value	-3.7220
50% Value	8.6950
10% Value	21.1120
1% Value	31.2352
Average Value Probability	0.5000



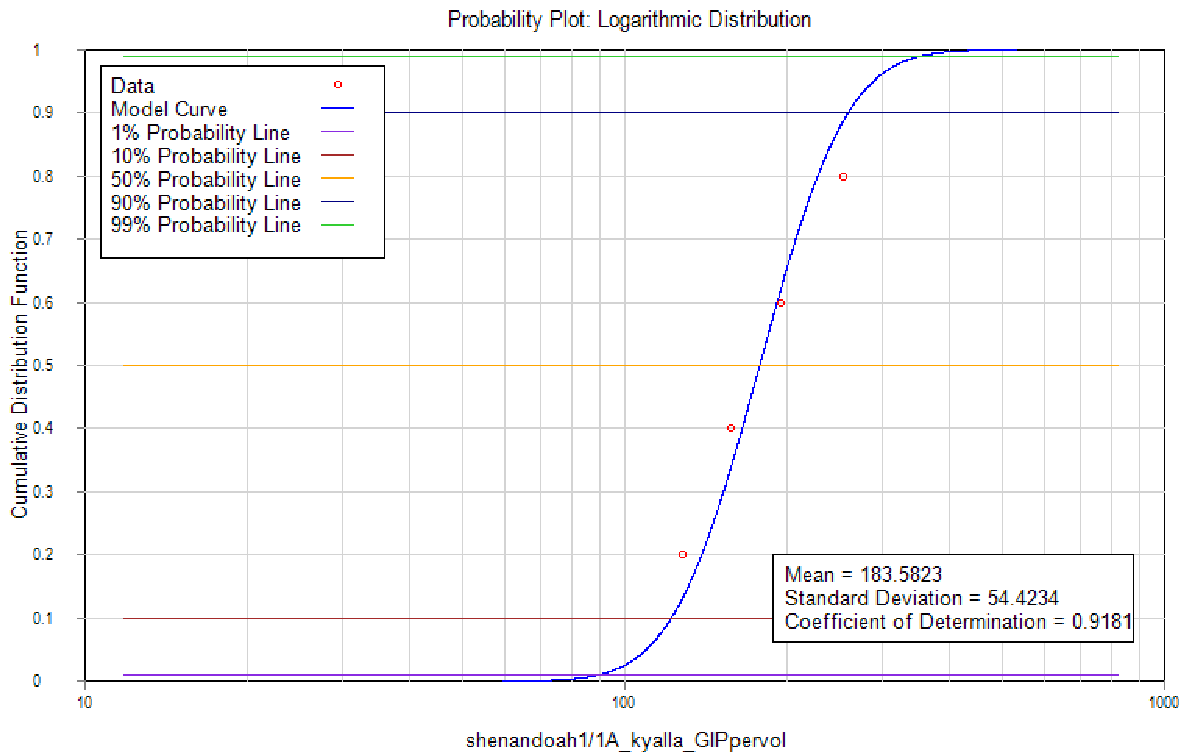
Distribution Report

Log-Normal Distribution Report	
Parameter	shenandoah1/1A_kyalla_estoilpervol
Description	Shenandoah 1/1A Kyalla Estimated Oil per Volume
Number of Positive Points	26
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98591
Data Range	
Minimum Value	19.4372
Average Value	37.8263
Maximum Value	64.0692
Standard Deviation	11.7288
Distribution	
99% Value	17.7472
90% Value	24.4318
50% Value	36.1610
10% Value	53.5210
1% Value	73.6800
Average Value Probability	0.5585



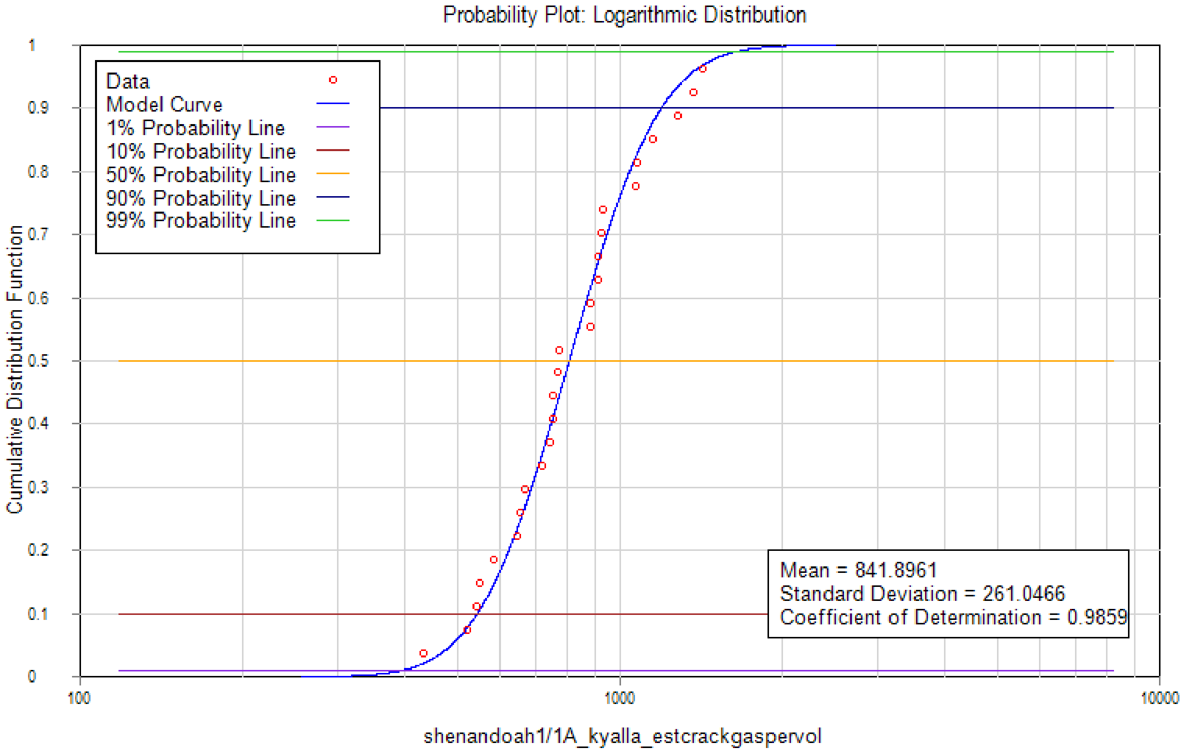
Distribution Report

Log-Normal Distribution Report	
Parameter	shenandoah1/1A_kyalla_retoilpervol
Description	Shenandoah 1/1A Kyalla Retained Oil per Volume
Number of Positive Points	26
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98591
Data Range	
Minimum Value	7.1918
Average Value	13.9957
Maximum Value	23.7056
Standard Deviation	4.33966
Distribution	
99% Value	6.5665
90% Value	9.0398
50% Value	13.3796
10% Value	19.8028
1% Value	27.2616
Average Value Probability	0.5585



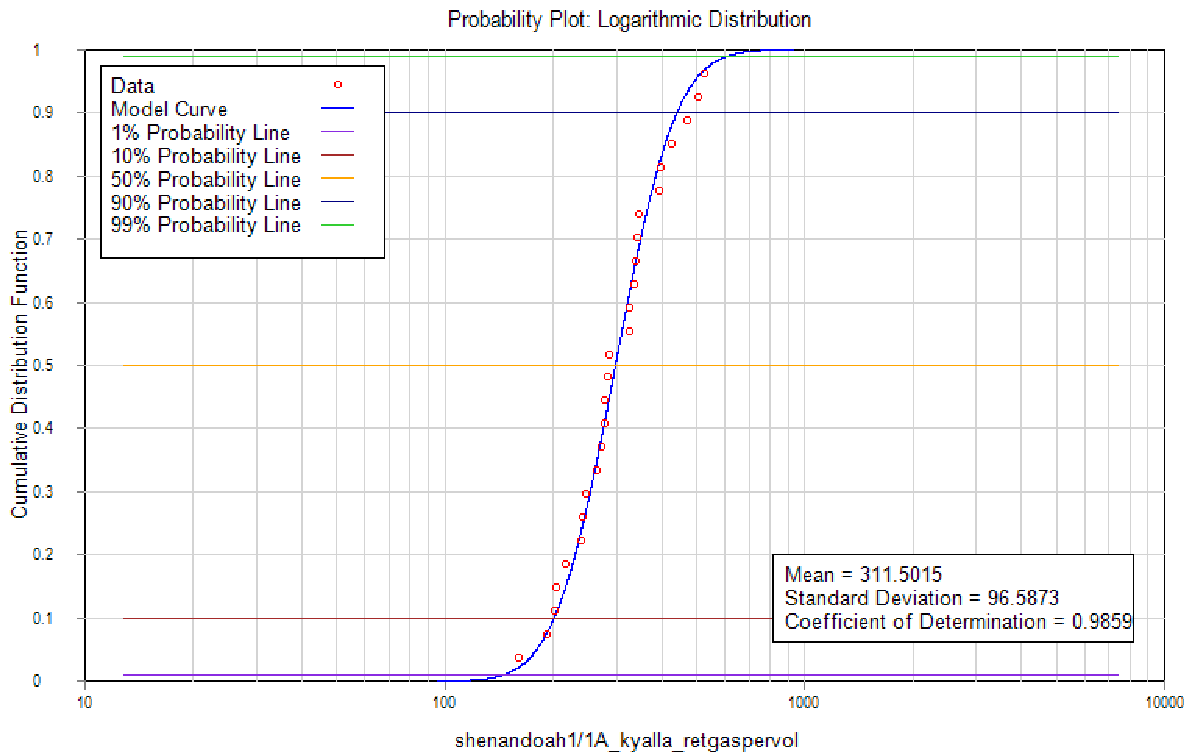
Distribution Report

Log-Normal Distribution Report	
Parameter	shenandoah1/1A_kyalla_GIPpervol
Description	Shenandoah 1/1A Kyalla GIP per Volume
Number of Positive Points	4
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.91810
Data Range	
Minimum Value	127.9596
Average Value	183.5823
Maximum Value	254.2954
Standard Deviation	54.4234
Distribution	
99% Value	89.7414
90% Value	121.9701
50% Value	177.7097
10% Value	258.9221
1% Value	351.9083
Average Value Probability	0.5441



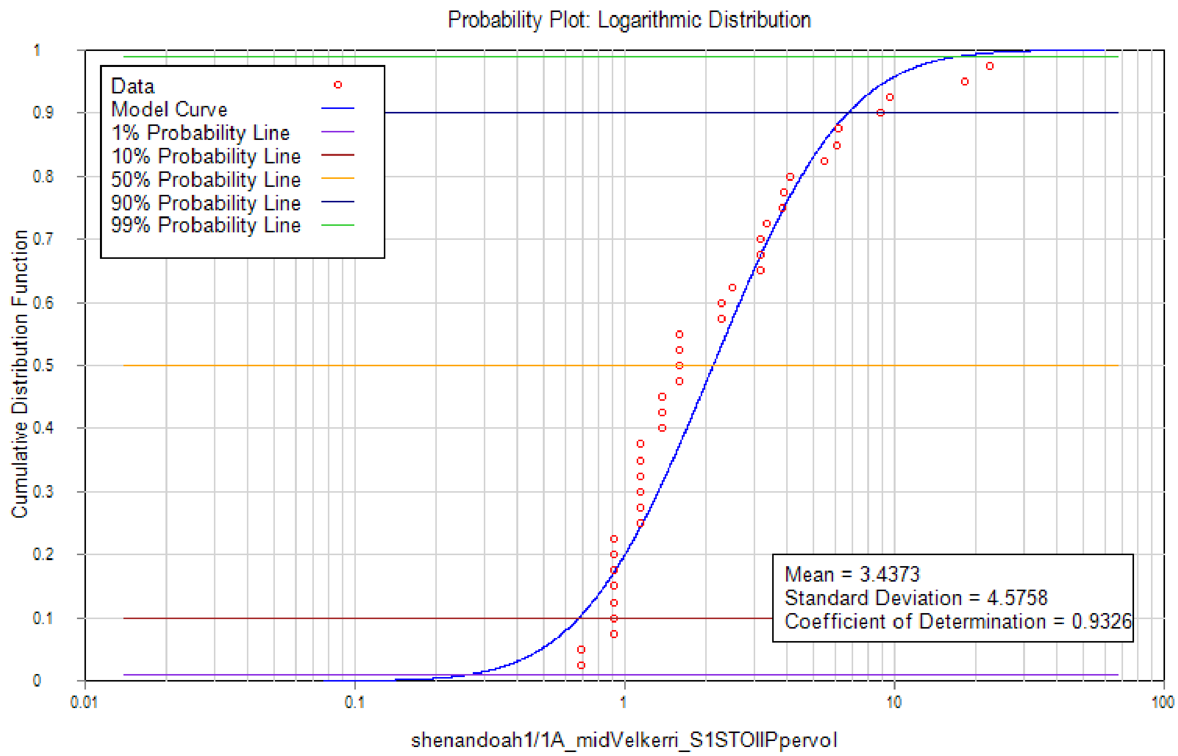
Distribution Report

Log-Normal Distribution Report	
Parameter	shenandoah1/1A_kyalla_estcrackgaspervol
Description	Shenandoah 1/1A Kyalla Estimated Cracked Gas per Volume
Number of Positive Points	26
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98591
Data Range	
Minimum Value	432.6113
Average Value	841.8961
Maximum Value	1,425.9817
Standard Deviation	261.047
Distribution	
99% Value	394.9979
90% Value	543.7765
50% Value	804.8306
10% Value	1,191.2107
1% Value	1,639.8880
Average Value Probability	0.5585



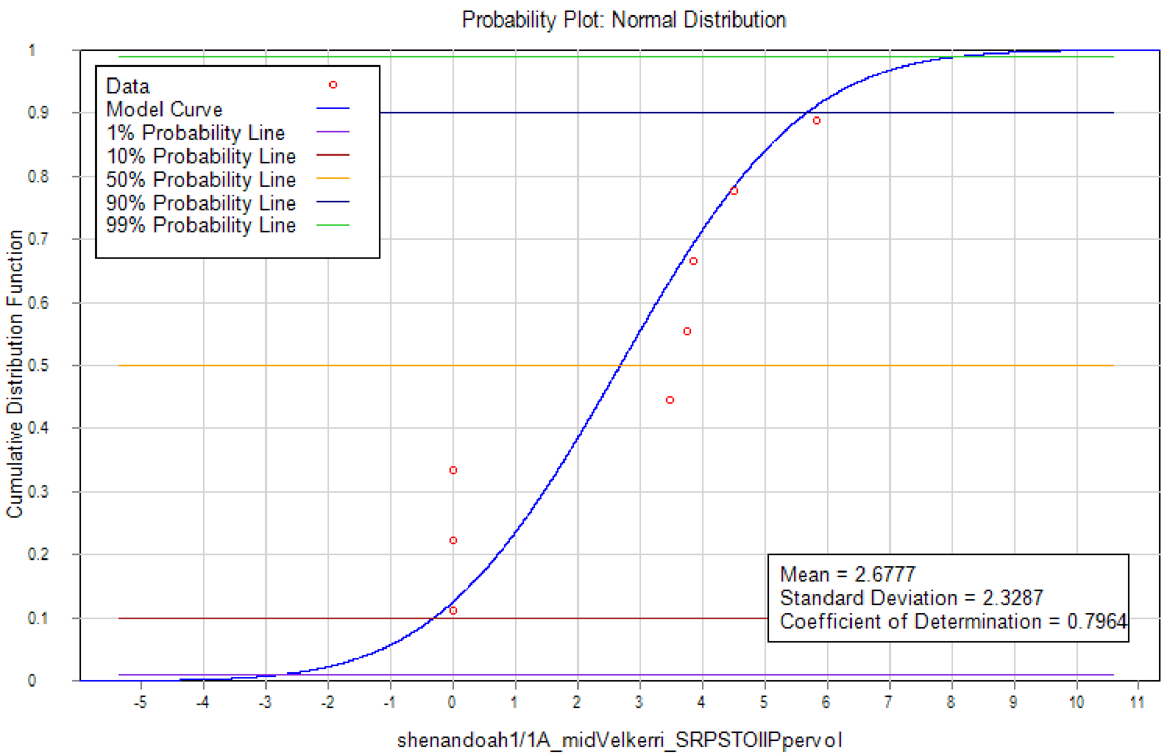
Distribution Report

Log-Normal Distribution Report	
Parameter	shenandoah1/1A_kyalla_retgaspervol
Description	Shenandoah 1/1A Kyalla Retained Gas per Volume
Number of Positive Points	26
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98591
Data Range	
Minimum Value	160.0662
Average Value	311.5015
Maximum Value	527.6132
Standard Deviation	96.5873
Distribution	
99% Value	146.1492
90% Value	201.1973
50% Value	297.7873
10% Value	440.7479
1% Value	606.7586
Average Value Probability	0.5585



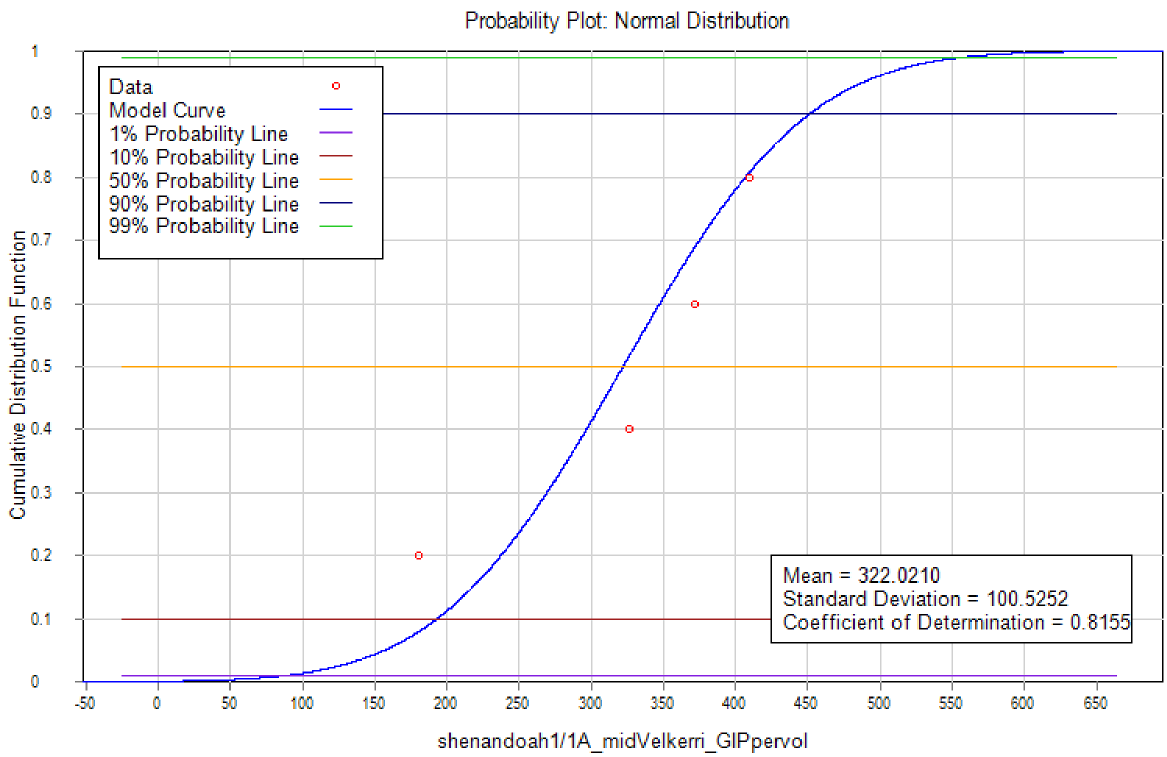
Distribution Report

Log-Normal Distribution Report	
Parameter	shenandoah1/1A_midVelkerri_S1STOIIPpervol
Description	Shenandoah 1/1A middle Velkerri S1 STOIIP per Volume
Number of Positive Points	39
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.93259
Data Range	
Minimum Value	0.6846
Average Value	3.4373
Maximum Value	22.6423
Standard Deviation	4.57576
Distribution	
99% Value	0.2655
90% Value	0.6756
50% Value	2.1247
10% Value	6.6818
1% Value	17.0045
Average Value Probability	0.7047



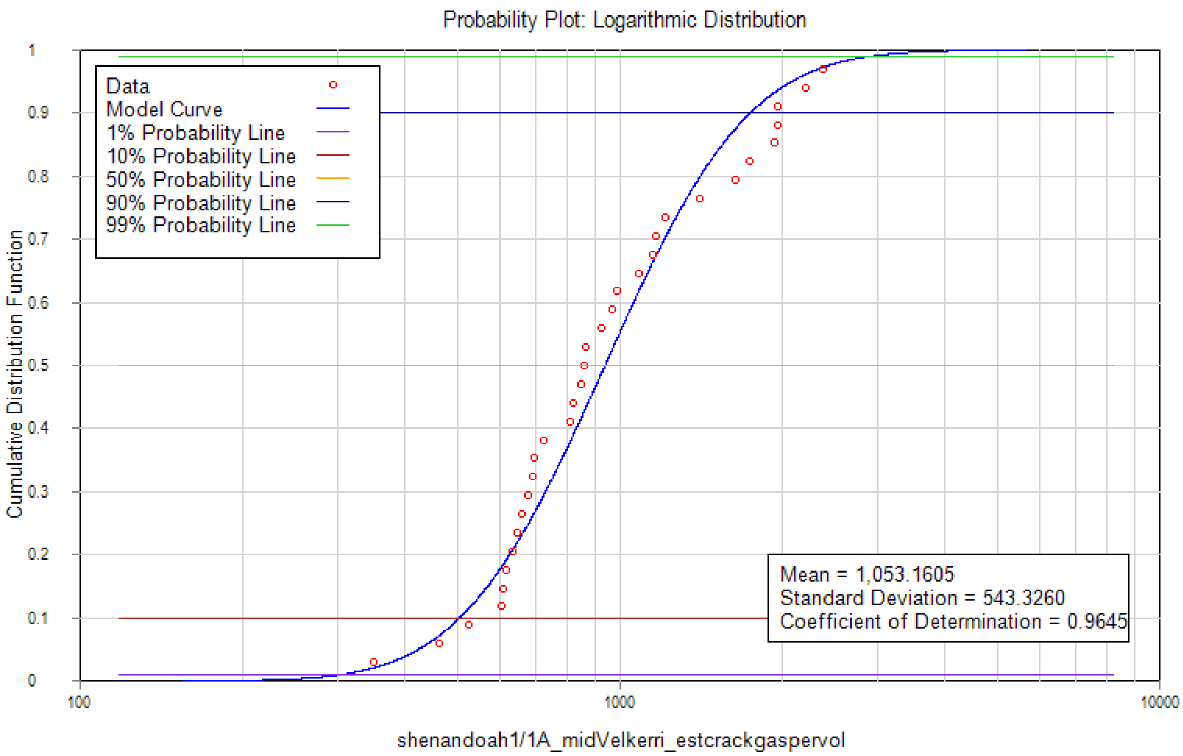
Distribution Report

Normal Distribution Report	
Parameter	shenandoah1/1A_midVelkerri_SRPSTOIIPpervol
Description	Shenandoah 1/1A middle Velkerri SRP STOIIP per Volume
Number of Positive Points	5
Number of Non-Positive Points	3
Number of Null Values	0
Regression Coefficient	0.79643
Data Range	
Minimum Value	0.0000
Average Value	2.6777
Maximum Value	5.8303
Standard Deviation	2.32871
Distribution	
99% Value	-2.7397
90% Value	-0.3067
50% Value	2.6777
10% Value	5.6620
1% Value	8.0951
Average Value Probability	0.5000



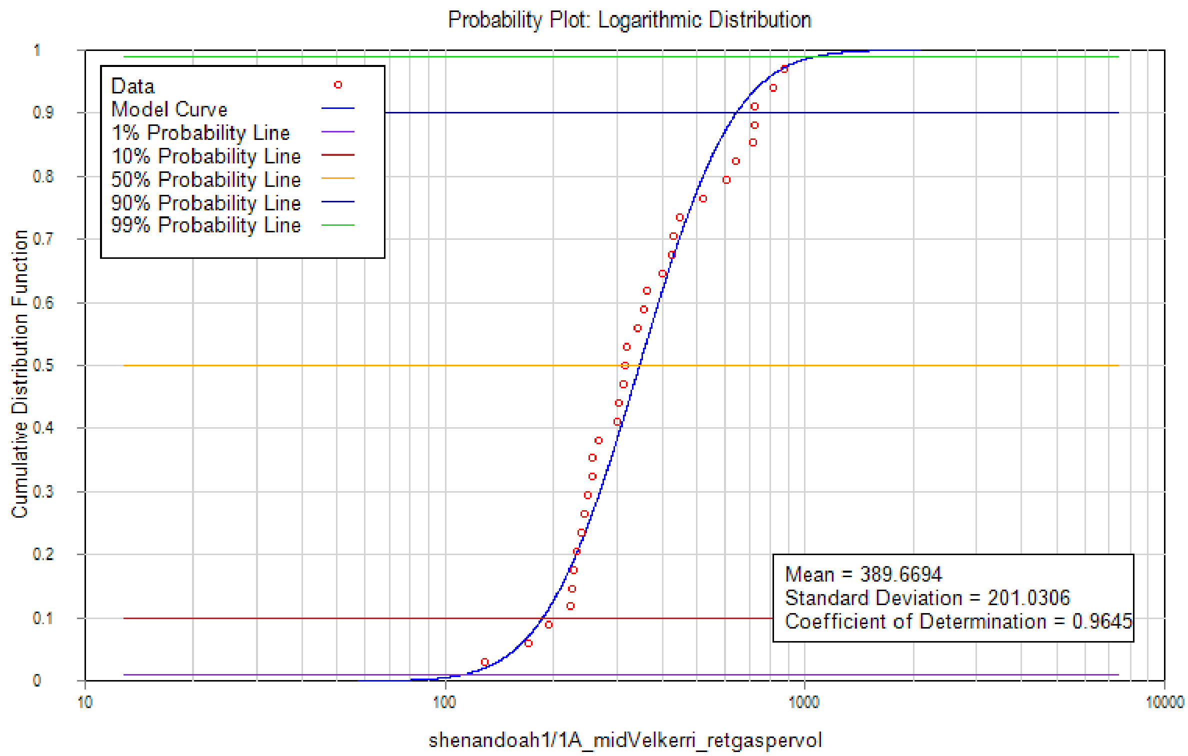
Distribution Report

Normal Distribution Report	
Parameter	shenandoah1/1A_midVelkerri_GIPpervol
Description	Shenandoah 1/1A middle Velkerri GIP per Volume
Number of Positive Points	4
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.81547
Data Range	
Minimum Value	180.0254
Average Value	322.0210
Maximum Value	409.4763
Standard Deviation	100.525
Distribution	
99% Value	88.1643
90% Value	193.1927
50% Value	322.0210
10% Value	450.8493
1% Value	555.8777
Average Value Probability	0.5000



Distribution Report

Log-Normal Distribution Report	
Parameter	shenandoah1/1A_midVelkerri_estcrackgaspervol
Description	Shenandoah 1/1A middle Velkerri Estimated Cracked Gas per Volume
Number of Positive Points	33
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96450
Data Range	
Minimum Value	349.4916
Average Value	1,053.1605
Maximum Value	2,368.5939
Standard Deviation	543.326
Distribution	
99% Value	304.8408
90% Value	504.8127
50% Value	937.1881
10% Value	1,739.8957
1% Value	2,881.2464
Average Value Probability	0.5955



Distribution Report

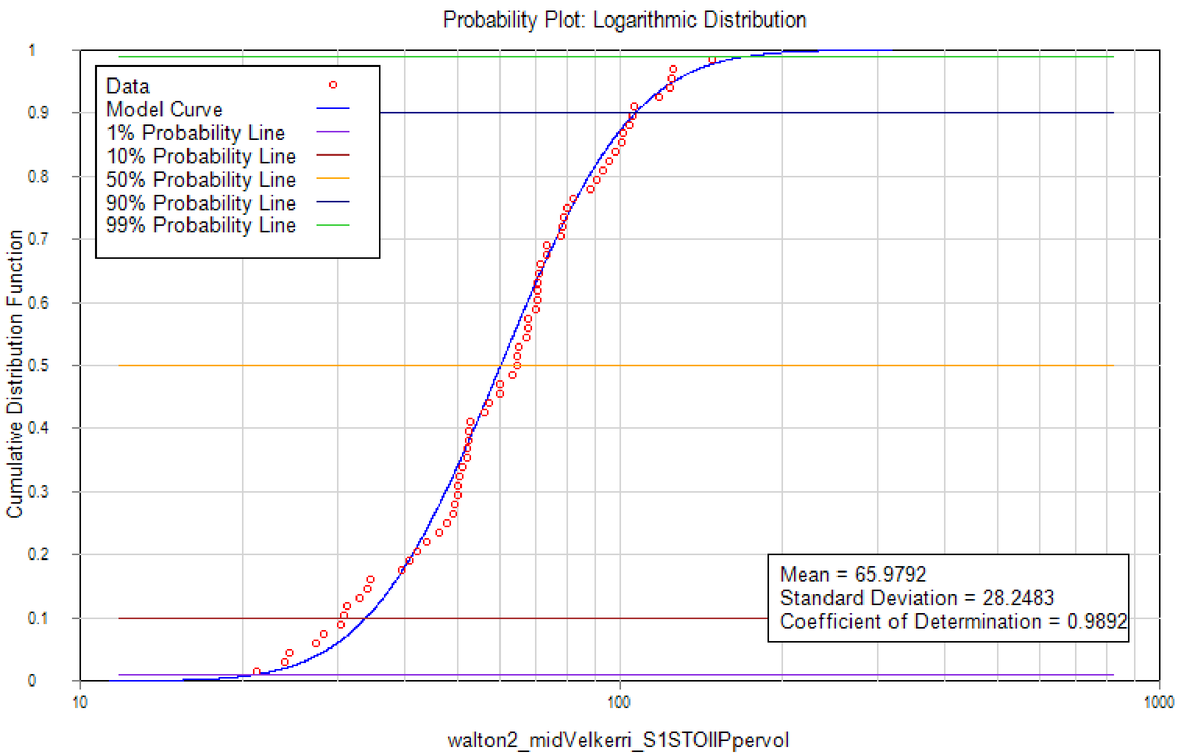
Log-Normal Distribution Report	
Parameter	shenandoah1/1A_midVelkerri_retgaspervol
Description	Shenandoah 1/1A middle Velkerri Retained Gas per Volume
Number of Positive Points	33
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96450
Data Range	
Minimum Value	129.3119
Average Value	389.6694
Maximum Value	876.3797
Standard Deviation	201.031
Distribution	
99% Value	112.7911
90% Value	186.7807
50% Value	346.7596
10% Value	643.7614
1% Value	1,066.0612
Average Value Probability	0.5955

Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Walton 2	middle Velkerri	260.8	855.643	1.51	2.5	0.85	34.45642353									376.7387765	876.0146353	499.2758588	0	184.7320678	0
Walton 2	middle Velkerri	263.68	865.0919		2.5	0.85															
Walton 2	middle Velkerri	263.68	865.0919	0.93	2.5	0.85	21.22150588									208.1076706	627.5176471	419.4099765	0	155.1816913	0
Walton 2	middle Velkerri	263.78	865.4199	3.09	2.5	0.85	70.51016471									292.5373176	533.5040941	240.9667765	0	89.15770729	0
Walton 2	middle Velkerri	264.2	866.7979		2.5	0.85															
Walton 2	middle Velkerri	265	869.4226	3.07	2.5	0.85	70.05378824									574.8061647	1066.551812	491.7456471	0	181.9458894	0
Walton 2	middle Velkerri	265	869.4226	2.93	2.5	0.85	66.85915294														
Walton 2	middle Velkerri	268.96	882.4147	1.05	2.5	0.85	23.95976471									241.6513412	757.5849412	515.9336	0	190.895432	0
Walton 2	middle Velkerri	274.5	900.5906	1.44	2.5	0.85	32.85910588									262.8728471	711.0345412	448.1616941	0	165.8198268	0
Walton 2	middle Velkerri	276.07	905.7415	2.17	2.5	0.85	49.51684706									287.5171765	395.2220235	107.7048471	0	39.85079341	0
Walton 2	middle Velkerri	279.15	915.8465	1.33	2.5	0.85	30.34903529									219.9734588	938.5382118	718.5647529	0	265.8689586	0
Walton 2	middle Velkerri	282.9	928.1496	3.2	2.5	0.85	73.02023529									313.9870118	843.1555294	529.1685176	0	195.7923515	0
Walton 2	middle Velkerri	284.9	934.7113		2.5	0.85															
Walton 2	middle Velkerri	287	941.601		2.5	0.85															
Walton 2	middle Velkerri	288.62	946.916	2.19	2.5	0.85	49.97322353									82.14776471	830.8333647	748.6856	0	277.013672	0
Walton 2	middle Velkerri	304.51	999.0486		2.5	0.85															
Walton 2	middle Velkerri	304.51	999.0486	1.35	2.5	0.85	30.80541176									900.6589647	983.2631059	82.60414118	0	30.56353224	0
Walton 2	middle Velkerri	304.72	999.7375	4.56	2.5	0.85	104.0538353									1417.048941	1712.096329	295.0473882	0	109.1675336	0
Walton 2	middle Velkerri	305	1000.656	3.4	2.5	0.85	77.584									1053.773271	1442.377835	388.6045647	0	143.7836889	0
Walton 2	middle Velkerri	311.8	1022.966	1.24	2.5	0.85	28.29534118														
Walton 2	middle Velkerri	314.67	1032.382	4.31	2.5	0.85	98.34912941									1128.619012	1572.216941	443.5979294	0	164.1312339	0
Walton 2	middle Velkerri	326.6	1071.522	4.08	2.5	0.85	93.1008									1286.297082	1562.404847	276.1077647	0	102.1598729	0
Walton 2	middle Velkerri	336	1102.362	3.45	2.5	0.85	78.72494118									986.9141176	1229.021835	242.1077176	0	89.57985553	0
Walton 2	middle Velkerri	336	1102.362	2.3	2.5	0.85	52.48329412									855.7058824	1131.813647	276.1077647	0	102.1598729	0
Walton 2	middle Velkerri	336.1	1102.69	4.18	2.5	0.85	95.38268235									1612.378071	2165.278165	552.9000941	0	204.5730348	0
Walton 2	middle Velkerri	336.6	1104.331	3.49	2.5	0.85	79.63769412														
Walton 2	middle Velkerri	336.8	1104.987		2.5	0.85															
Walton 2	middle Velkerri	336.8	1104.987	2.14	2.152	0.85	42.03482865	0.133064	0.070819	73.10721105						1065.013275	1463.159079	398.145804	0	147.3139475	0
Walton 2	middle Velkerri	345.36	1133.071	4.65	2.5	0.85	106.1075294									1420.699953	1712.096329	291.3963765	0	107.8166593	0
Walton 2	middle Velkerri	349.9	1147.966		2.5	0.85															
Walton 2	middle Velkerri	349.9	1147.966	1.49	2.5	0.85	34.00004706									905.6791059	1108.994824	203.3157176	0	75.22681553	0
Walton 2	middle Velkerri	355.09	1164.993	2.15	2.5	0.85	49.06047059									603.1015059	710.8063529	107.7048471	0	39.85079341	0
Walton 2	middle Velkerri	360.03	1181.201	2.28	2.5	0.85	52.02691765									713.5446118	837.4508235	123.9062118	0	45.84529835	0
Walton 2	middle Velkerri	365	1197.507	5.41	2.5	0.85	123.4498353														
Walton 2	middle Velkerri	365	1197.507	3.13	2.5	0.85	71.42291765														
Walton 2	middle Velkerri	365	1197.507	2.2	2.5	0.85	50.20141176									791.8131765	1041.451106	249.6379294	0	92.36603388	0
Walton 2	middle Velkerri	365.07	1197.736	4.42	2.5	0.85	100.8592									1213.733224	1553.049129	339.3159059	0	125.5468852	0
Walton 2	middle Velkerri	365.6	1199.475		2.5	0.85															
Walton 2	middle Velkerri	376.78	1236.155	2.45	2.5	0.85	55.90611765									801.1688941	1042.135671	240.9667765	0	89.15770729	0
Walton 2	middle Velkerri	380.7	1249.016	2.95	2.5	0.85	67.31552941									1291.089035	1624.700235	333.6112	0	123.436144	0
Walton 2	middle Velkerri	383.59	1258.497	2.3	2.5	0.85	52.48329412									800.2561412	952.2295059	151.9733647	0	56.23014494	0
Walton 2	middle Velkerri	392.82	1288.78	3.42	2.5	0.85	78.04037647									980.2966588	1126.108941	145.8122824	0	53.95054447	0
Walton 2	middle Velkerri	392.9	1289.042	2.83	2.5	0.85	64.57727059														
Walton 2	middle Velkerri	399.57	1310.925	2.95	2.5	0.85	67.31552941									824.9004706	1005.853741	180.9532706	0	66.95271012	0
Walton 2	middle Velkerri	400	1312.336		2.5	0.85															
Walton 2	middle Velkerri	400	1312.336	3.11	2.285	0.85	64.86341864	0.09749	0.121063	91.5630328						998.1875292	1203.205987	205.0184583	0	75.85682956	0
Walton 2	middle Velkerri	400.1	1312.664	3.11	2.5	0.85	70.96654118									957.2496471	1287.8944	330.6447529	0	122.3385586	0
Walton 2	middle Velkerri	404.43	1326.87	3.96	2.5	0.85	90.36254118									1034.605459	1341.975012	307.3695529	0	113.7267346	0
Walton 2	middle Velkerri	411.67	1350.623	5.18	2.5	0.85	118.2015059									1261.880941	1528.861176	266.9802353	0	98.78268706	0
Walton 2	middle Velkerri	412	1351.706		2.5	0.85															
Walton 2	middle Velkerri	418.6	1373.36	5.47	2.5	0.85	124.8189647									1319.840753	1585.451859	265.6111059	0	98.27610918	0
Walton 2	middle Velkerri	421.2	1381.89	6.47	2.5	0.85	147.6377882									1432.109365	1554.874635	122.7652706	0	45.42315012	0
Walton 2	middle Velkerri	422	1384.514	5.48	2.5	0.85	125.0471529									1366.391153	1721.908424	355.5172706	0	131.5413901	0
Walton 2	middle Velkerri	422.9	1387.467		2.5	0.85															
Walton 2	middle Velkerri	422.9	1387.467	2.44	2.259	0.85	50.31057702	0.088432	0.122616	84.12112204						1023.325384	1341.518043	318.1926592	0	117.7312839	0
Walton 2	middle Velkerri	423	1387.795		2.5	0.85															
Walton 2	middle Velkerri	423.4	1389.108	3.6	2.5	0.85	82.14776471									1121.0888	1325.545459	204.4566588	0	75.64896376	0
Walton 2	middle Velkerri	433.16	1421.129	4.45	2.5	0.85	101.5437647									631.1686588	757.3567529	126.1880941	0	46.68959482	0
Walton 2	middle Velkerri	450	1476.378		2.5	0.85															
Walton 2	middle Velkerri	450	1476.378	1.07	2.5	0.85	24.41614118									248.0406118	395.2220235	147.1814118	0	54.45712235	0
Walton 2	middle Velkerri	454.01	1489.534	3.85	2.5	0.85	87.85247059									365.7857412	459.5711059	93.78536471	0	34.70058494	0
Walton 2	middle Velkerri	454.2	1490.157	3.21	2.5	0.85	73.24842353														
Walton 2	middle Velkerri	462.75	1518.209	2.24	2.5	0.85	51.11416471									394.5374588	527.1148235	132.5773647	0	49.05362494	0
Walton 2	middle Velkerri	465.73	1527.986	4.62	2.5	0.85	105.4229647									205.3694118	318.5507765	113.1813647	0	41.87710494	0
Walton 2	middle Velkerri	474.04	1555.249	3.08	2.5	0.85	70.28197647									398.4166588	504.296	105.8793412	0	39.17535624	0
Walton 2	middle Velkerri	475.45	1559.875	2.07	2.315	0.85	43.73957732	0.121231	0.059415	55.88051835						320.3342957	404.7650813	84.43078558	0	31.23939066	0
Walton 2	middle Velkerri	476.35	1562.828	2.77	2.5	0.85	63.20814118									417.3562824	571.1551529	153.7988706	0	56.90558212	0
Walton 2	middle Velkerri	480.8	1577.428		2.5	0.85															
Walton 2	middle Velkerri	480.8	1577.428	1.2	2.5	0.85	27.38258824									175.4767529	265.3829176	89.90616471	0	33.26528094	0
Walton 2	middle Velkerri	484.6	1589.895	2.62	2.5	0.85	59.78531765														
Walton 2	middle Velkerri	485.16	1591.732	2.03	2.5	0.85	46.32221176									104.9665882	165.6646588	60.69807059	0	22.45828612	0

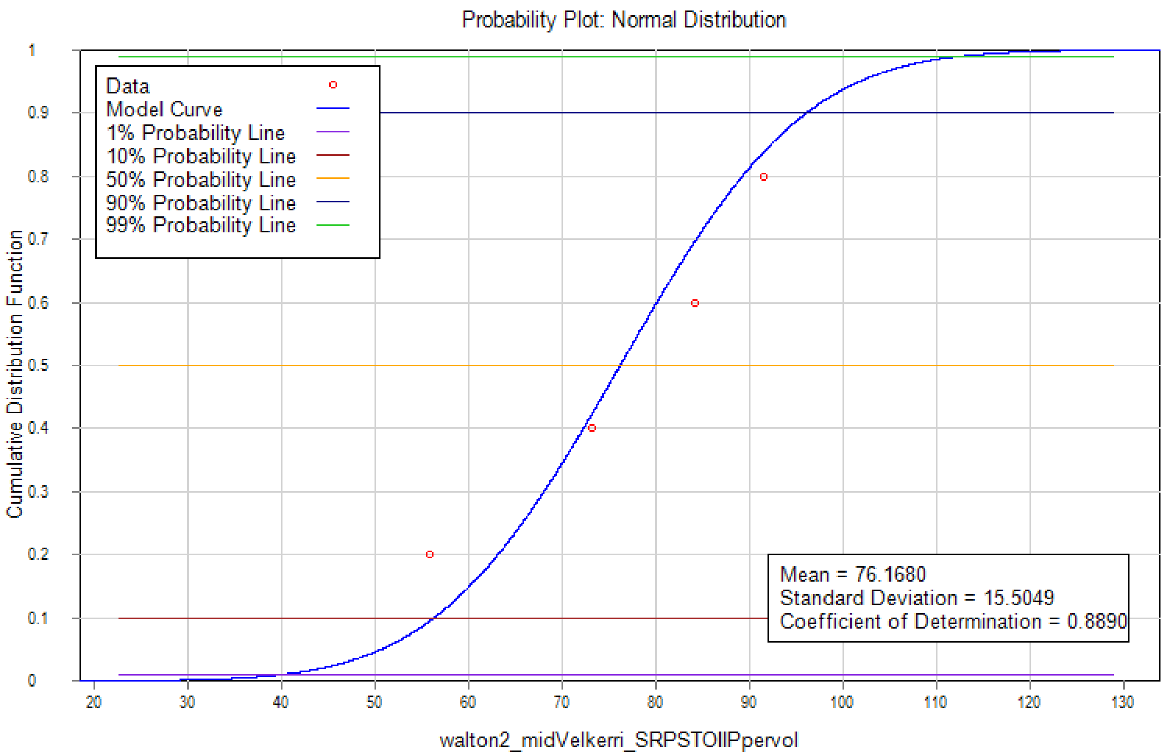
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Walton 2	middle Velkerri	495.02	1624.081	1.73	2.5	0.85	39.47656471									181.6378353	275.1950118	93.55717647	0	34.61615529	0
Walton 2	middle Velkerri	505.2	1657.48	1.78	2.5	0.85	40.61750588									130.9800471	176.1613176	45.18127059	0	16.71707012	0
Walton 2	middle Velkerri	512.8	1682.415		2.5	0.85															
Walton 2	middle Velkerri	515.15	1690.125	2.83	2.5	0.85	64.57727059														
Walton 2	middle Velkerri	515.17	1690.19	2.32	2.5	0.85	52.93967059									222.7117176	356.6582118	133.9464941	0	49.56020282	0
Walton 2	middle Velkerri	521.02	1709.383	3.06	2.5	0.85	69.8256									223.6244706	372.4032	148.7787294	0	55.04812988	0
Walton 2	middle Velkerri	531.65	1744.259	2.51	2.5	0.85	57.27524706									307.3695529	562.2558118	254.8862588	0	94.30791576	0
Walton 2	middle Velkerri	539.5	1770.013	1.37	2.5	0.85	31.26178824									193.7318118	556.7792941	363.0474824	0	134.3275685	0
Walton 2	middle Velkerri	541.3	1775.919	2.63	2.5	0.85	60.01350588									246.4432941	525.2893176	278.8460235	0	103.1730287	0
Walton 2	middle Velkerri	551.5	1809.383	2.09	2.5	0.85	47.69134118									168.6311059	532.5913412	363.9602353	0	134.6652871	0
Walton 2	middle Velkerri	552.5	1812.664	2.29	2.5	0.85	52.25510588									87.39609412	371.9468235	284.5507294	0	105.2837699	0
Walton 2	middle Velkerri	552.7	1813.32		2.5	0.85															



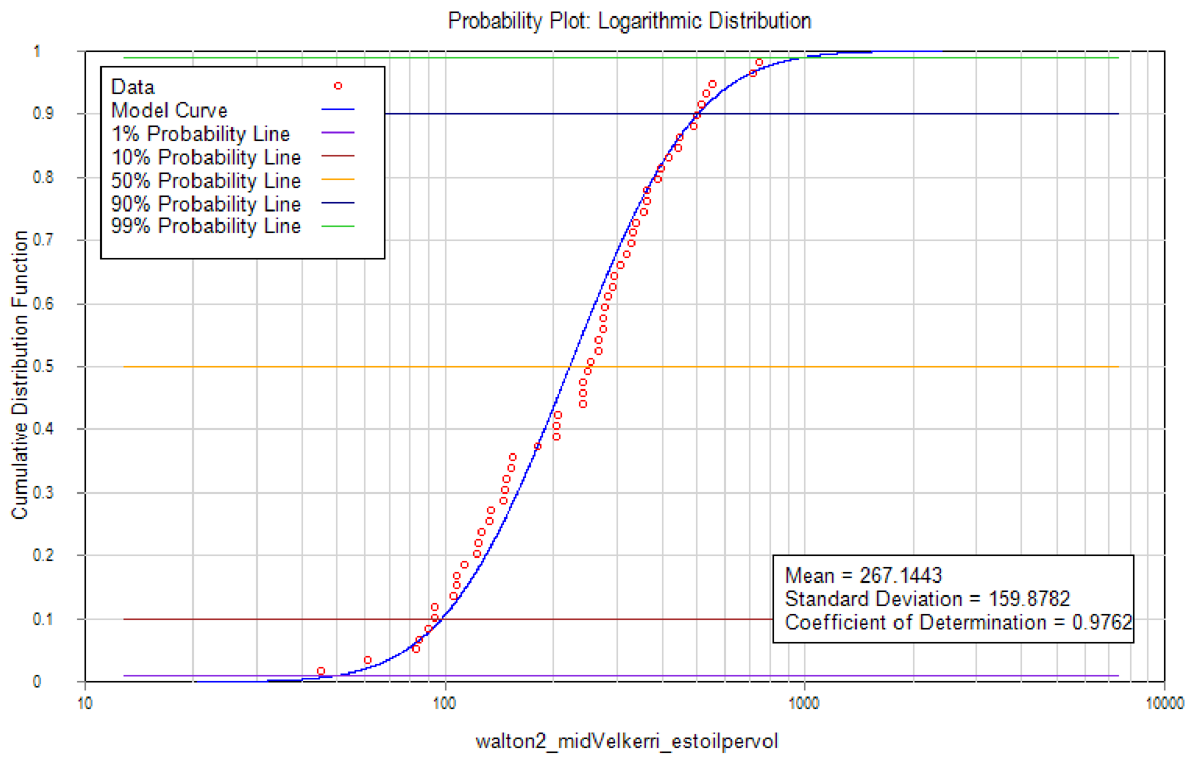
Distribution Report

Log-Normal Distribution Report	
Parameter	walton2_midVelkerri_S1STOIIPpervol
Description	Walton 2 middle Velkerri S1 STOIIP per Volume
Number of Positive Points	67
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.98918
Data Range	
Minimum Value	21.2215
Average Value	65.9792
Maximum Value	147.6378
Standard Deviation	28.2483
Distribution	
99% Value	21.2130
90% Value	33.8561
50% Value	60.0730
10% Value	106.5912
1% Value	170.1200
Average Value Probability	0.5830



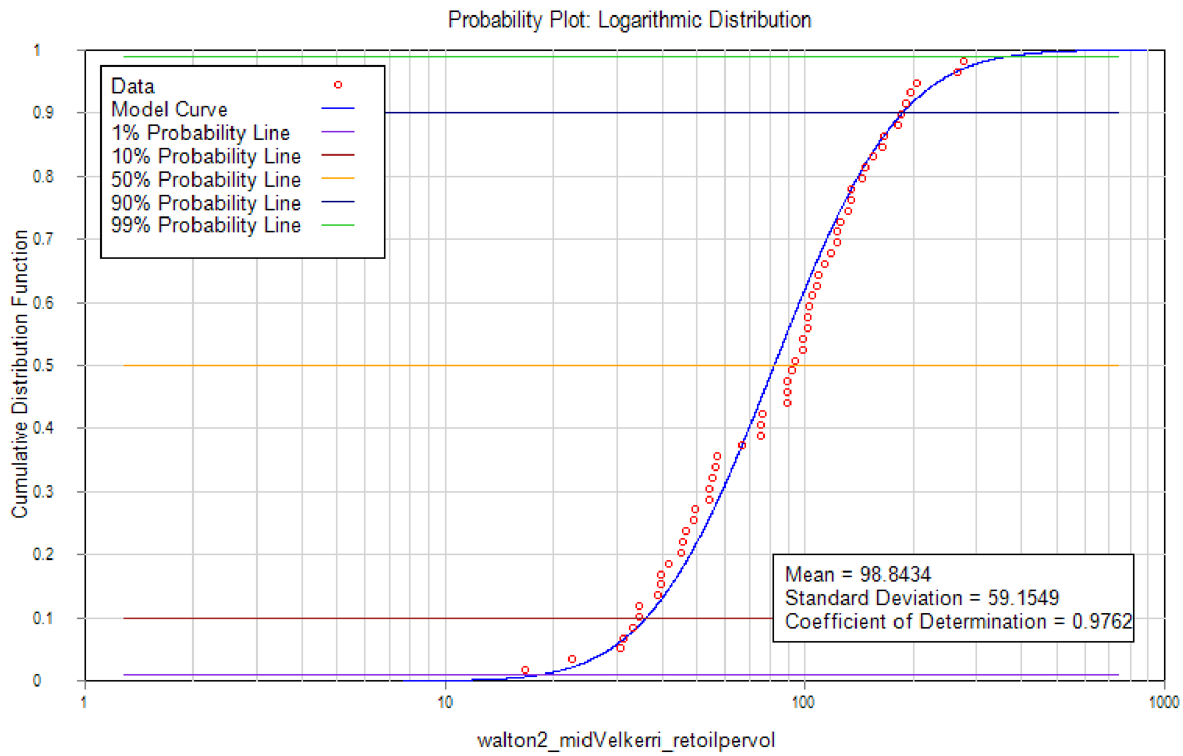
Distribution Report

Normal Distribution Report	
Parameter	walton2_midVelkerri_SRPSTOIIPpervol
Description	Walton 2 middle Velkerri SRP STOIIP per Volume
Number of Positive Points	4
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.88895
Data Range	
Minimum Value	55.8805
Average Value	76.1680
Maximum Value	91.5630
Standard Deviation	15.5049
Distribution	
99% Value	40.0981
90% Value	56.2976
50% Value	76.1680
10% Value	96.0384
1% Value	112.2379
Average Value Probability	0.5000



Distribution Report

Log-Normal Distribution Report	
Parameter	walton2_midVelkerri_estoilpervol
Description	Walton 2 middle Velkerri Estimated Oil per Volume
Number of Positive Points	58
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.97617
Data Range	
Minimum Value	45.1813
Average Value	267.1443
Maximum Value	748.6856
Standard Deviation	159.878
Distribution	
99% Value	50.1962
90% Value	97.8556
50% Value	221.9202
10% Value	503.2778
1% Value	981.1213
Average Value Probability	0.6142



Distribution Report

Log-Normal Distribution Report	
Parameter	walton2_midVelkerri_retoilpervol
Description	Walton 2 middle Velkerri Retained Oil per Volume
Number of Positive Points	58
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.97617
Data Range	
Minimum Value	16.7171
Average Value	98.8434
Maximum Value	277.0137
Standard Deviation	59.1549
Distribution	
99% Value	18.5726
90% Value	36.2066
50% Value	82.1105
10% Value	186.2128
1% Value	363.0149
Average Value Probability	0.6142

Appendix III

Kyalla and middle Velkerri Resource Assessment Data
OT Downs Sub-basin

McArthur Basin Study, 2016

Northern Territory Geological Survey - Australia

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LABORATORIES

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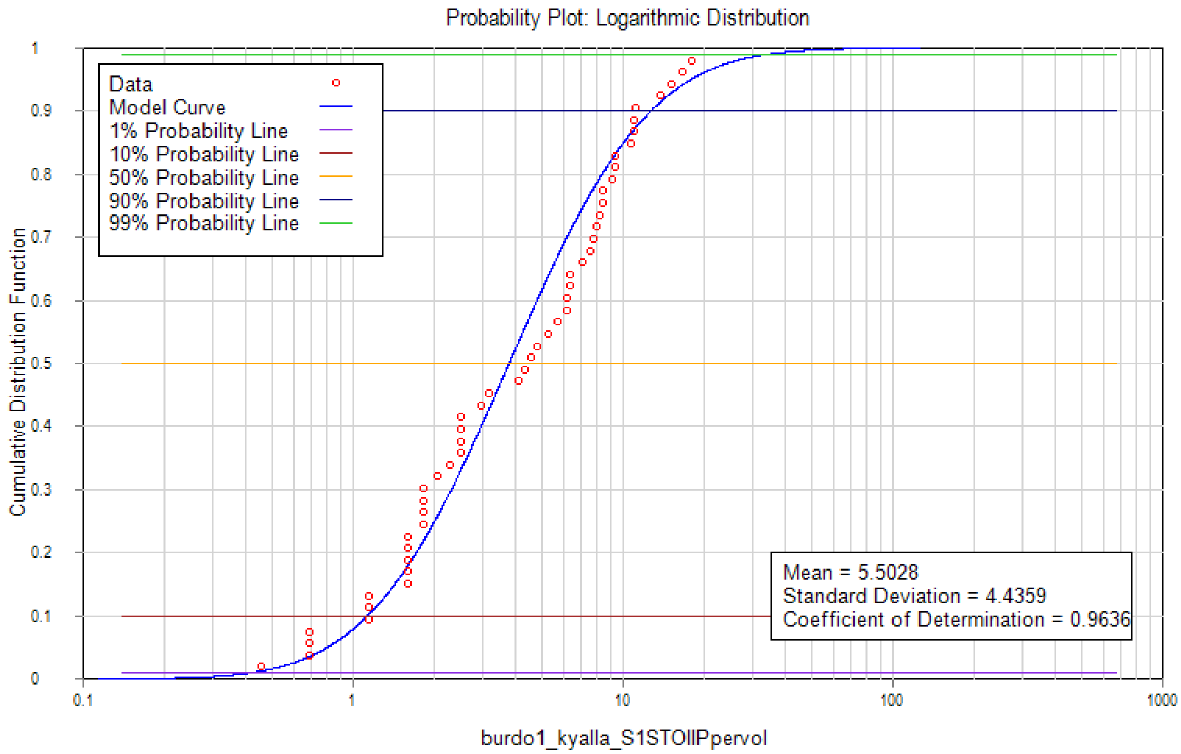
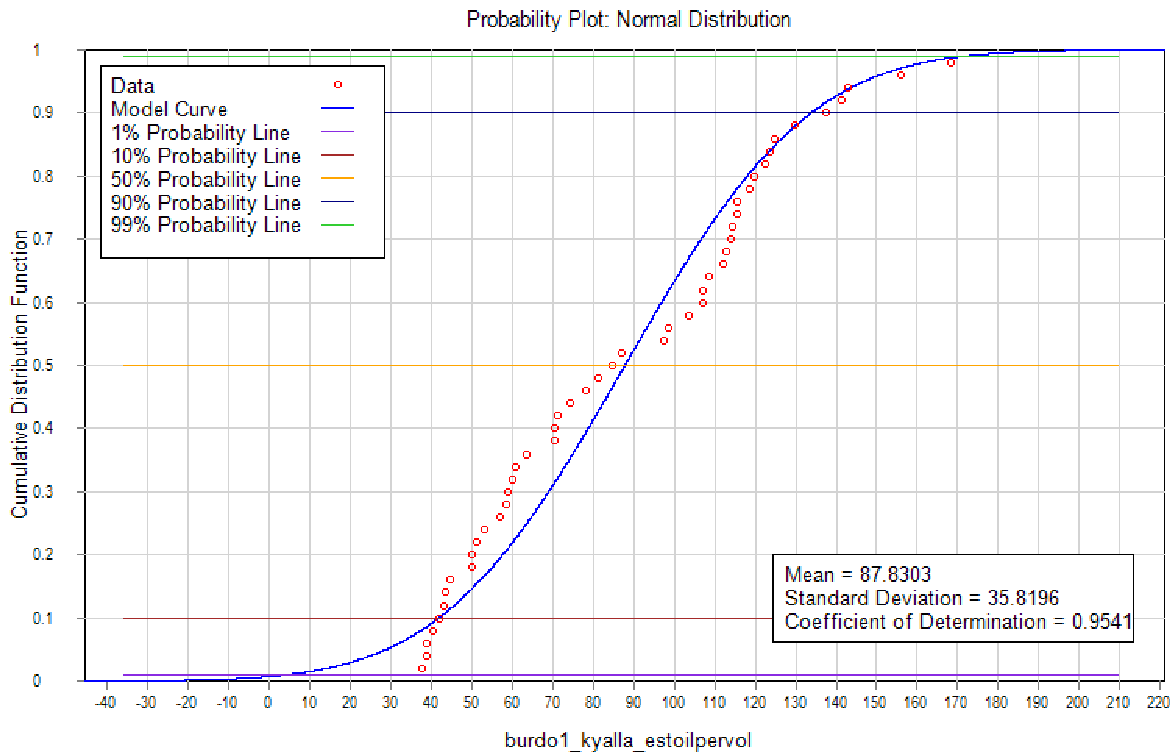
WELL	INTERPRETED FORMATION	Depth From 1 (m)	Depth From 1 (ft)	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Burdo 1	Kyalla	753	2470.472	0.05	2.5	0.85	1.140941176									7.302023529	68.22828235	60.92625882	0	22.54271576	0
Burdo 1	Kyalla	753	2470.472		2.5	0.85															
Burdo 1	Kyalla	768	2519.685	0.19	2.5	0.85	4.335576471									35.14098824	85.3424	50.20141176	0	18.57452235	0
Burdo 1	Kyalla	780	2559.055	0.08	2.5	0.85	1.825505882									13.46310588	129.1545412	115.6914353	0	42.80583106	0
Burdo 1	Kyalla	789	2588.583	0.09	2.5	0.85	2.053694118									18.48324706	138.2820706	119.7988235	0	44.32556471	0
Burdo 1	Kyalla	801	2627.953	0.66	2.5	0.85	15.06042353									117.7451294	156.7653176	39.02018824	0	14.43746965	0
Burdo 1	Kyalla	801	2627.953	0.2	2.5	0.85	4.563764706									35.59736471	94.69811765	59.10075294	0	21.86727859	0
Burdo 1	Kyalla	810	2657.48	0.11	2.5	0.85	2.510070588									16.20136471	103.3692706	87.16790588	0	32.25212518	0
Burdo 1	Kyalla	822	2696.85	0.07	2.5	0.85	1.597317647									15.97317647	56.36249412	40.38931765	0	14.94404753	0
Burdo 1	Kyalla	831	2726.378	0.03	2.5	0.85	0.684564706														
Burdo 1	Kyalla	840	2755.906	0.03	2.5	0.85	0.684564706									8.671152941	47.69134118	39.02018824	0	14.43746965	0
Burdo 1	Kyalla	858	2814.961	0.03	2.5	0.85	0.684564706									4.107388235	55.22155294	51.11416471	0	18.91224094	0
Burdo 1	Kyalla	870	2854.331	0.11	2.5	0.85	2.510070588									21.90607059	65.71821176	43.37401976	2.628728471	16.04838731	0.972629534
Burdo 1	Kyalla	879	2883.858	0.05	2.5	0.85	1.140941176									6.845647059	66.85915294	60.01350588	0	22.20499718	0
Burdo 1	Kyalla	891	2923.228	0.14	2.5	0.85	3.194635294									26.92621176	141.0203294	114.0941176	0	42.21482353	0
Burdo 1	Kyalla	891	2923.228		2.5	0.85															
Burdo 1	Kyalla	897	2942.913	0.28	2.5	0.85	6.389270588									35.82555294	94.24174118	58.41618824	0	21.61398965	0
Burdo 1	Kyalla	909	2982.283	0.08	2.5	0.85	1.825505882									12.32216471	93.55717647	81.23501176	0	30.05695435	0
Burdo 1	Kyalla	924	3031.496	0.37	2.5	0.85	8.442964706									44.26851765	115.4632471	71.19472941	0	26.34204988	0
Burdo 1	Kyalla	930	3051.181	0.11	2.5	0.85	2.510070588									15.74498824	114.3223059	98.57731765	0	36.47360753	0
Burdo 1	Kyalla	939	3080.709	0.11	2.5	0.85	2.510070588									20.99331765	158.3626353	137.3693176	0	50.82664753	0
Burdo 1	Kyalla	948	3110.236	0.23	2.5	0.85	5.248329412									18.02687059	62.52357647	43.16180471	8.009407059	15.96986774	2.963480612
Burdo 1	Kyalla	960	3149.606	0.07	2.5	0.85	1.597317647									10.72484706	125.7317176	112.7067332	13.80082447	41.70149128	5.106305054
Burdo 1	Kyalla	969	3179.134	0.07	2.5	0.85	1.597317647									11.18122353	131.6646118	107.2302155	79.51903624	39.67517975	29.42204341
Burdo 1	Kyalla	981	3218.504	0.07	2.5	0.85	1.597317647									6.389270588	114.5504941	97.34510118	64.89673412	36.01768744	24.01179162
Burdo 1	Kyalla	984	3228.346	0.08	2.5	0.85	1.825505882									3.8792	54.08061176	50.20141176	0	18.57452235	0
Burdo 1	Kyalla	990	3248.031	0.13	2.5	0.85	2.966447059									12.09397647	51.34235294	37.67844141	9.419610353	13.94102332	3.485255831
Burdo 1	Kyalla	996	3267.717	0.07	2.5	0.85	1.597317647									4.791952941	49.51684706	44.72489412	0	16.54821082	0
Burdo 1	Kyalla	999	3277.559	0.05	2.5	0.85	1.140941176									4.563764706	101.3155765	78.36896753	110.2970654	28.99651799	40.8099142
Burdo 1	Kyalla	999	3277.559		2.5	0.85															
Burdo 1	Kyalla	1005	3297.244	0.1	2.5	0.85	2.281882353									6.845647059	60.01350588	53.16785882	0	19.67210776	0
Burdo 1	Kyalla	1011	3316.929	0.48	2.5	0.85	10.95303529									34.9128	157.4498824	122.5370824	0	45.33872047	0
Burdo 1	Kyalla	1020	3346.457	0.18	2.5	0.85	4.107388235									9.812094118	73.47661176	63.66451765	0	23.55587153	0
Burdo 1	Kyalla	1023	3356.299	0.08	2.5	0.85	1.825505882									4.107388235	74.61755294	70.51016471	0	26.08876094	0
Burdo 1	Kyalla	1026	3366.142		2.5	0.85															
Burdo 1	Kyalla	1030.75	3381.726	0.02	2.5	0.85	0.456376471														
Burdo 1	Kyalla	1032.15	3386.319	0.41	2.5	0.85	9.355717647														
Burdo 1	Kyalla	1032.2	3386.483	0.21	2.5	0.85	4.791952941									29.89265882	115.4632471	84.71488235	5.134235294	31.34450647	1.899667059
Burdo 1	Kyalla	1041	3415.354		2.5	0.85															
Burdo 1	Kyalla	1041	3415.354	0.47	2.5	0.85	10.72484706									36.73830588	166.5774118	129.8391059	0	48.04046918	0
Burdo 1	Kyalla	1047	3435.039	0.41	2.5	0.85	9.355717647									32.63091765	139.6512	107.0202824	0	39.59750447	0
Burdo 1	Kyalla	1050	3444.882		2.5	0.85															
Burdo 1	Kyalla	1056	3464.567	0.33	2.5	0.85	7.530211765									29.43628235	141.7048941	112.2686118	0	41.53938635	0
Burdo 1	Kyalla	1059	3474.409	0.28	2.5	0.85	6.389270588									25.55708235	130.0672941	103.4651096	6.270612706	38.28209057	2.320126701
Burdo 1	Kyalla	1062	3484.252		2.5	0.85															
Burdo 1	Kyalla	1065	3494.094	0.37	2.5	0.85	8.442964706									31.0336	159.5035765	124.6158772	23.12459576	46.10787456	8.556100433
Burdo 1	Kyalla	1068	3503.937	0.6	2.5	0.85	13.69129412									34.9128	115.0068706	74.48748565	33.63950965	27.56036969	12.44661857
Burdo 1	Kyalla	1071	3513.78		2.5	0.85															
Burdo 1	Kyalla	1074	3523.622	0.4	2.5	0.85	9.127529412									28.97990588	170.2284235	141.2485176	0	52.26195153	0
Burdo 1	Kyalla	1080	3543.307		2.5	0.85															
Burdo 1	Kyalla	1080	3543.307	0.73	2.5	0.85	16.65774118									42.21482353	150.8324235	108.6176	0	40.188512	0
Burdo 1	Kyalla	1086	3562.992	0.48	2.5	0.85	10.95303529									39.93294118	155.6243765	115.6914353	0	42.80583106	0
Burdo 1	Kyalla	1089	3572.835		2.5	0.85															
Burdo 1	Kyalla	1095	3592.52	0.35	2.5	0.85	7.986588235									27.38258824	170.4566118	143.0740235	0	52.93738871	0
Burdo 1	Kyalla	1095	3592.52		2.5	0.85															
Burdo 1	Kyalla	1098	3602.362	0.79	2.5	0.85	18.02687059									47.00677647	117.5169412	70.51016471	0	26.08876094	0
Burdo 1	Kyalla	1098	3602.362	0.49	2.5	0.85	11.18122353									25.32889412	139.8793882	114.5504941	0	42.38368282	0
Burdo 1	Kyalla	1101	3612.205		2.5	0.85															
Burdo 1	Kyalla	1104	3622.047	0.36	2.5	0.85	8.214776471									26.24164706	182.0942118	155.8525647	0	57.66544894	0
Burdo 1	Kyalla	1110	3641.732		2.5	0.85															
Burdo 1	Kyalla	1116	3661.417	0.27	2.5	0.85	6.161082353									19.62418824	188.0271059	168.4029176	0	62.30907953	0
Burdo 1	Kyalla	1119	3671.26	0.31	2.5	0.85	7.073835294									16.42955294	135.0874353	118.6578824	0	43.90341647	0
Burdo 1	Kyalla	1122	3681.102		2.5	0.85															
Burdo 1	Kyalla	1128	3700.787	0.27	2.5	0.85	6.161082353									21.90607059	145.3559059	123.4498353	0	45.67643906	0
Burdo 1	Kyalla	1131	3710.63		2.5	0.85															
Burdo 1	Kyalla	1137	3730.315	0.34	2.5	0.85	7.7584									25.32889412	73.24842353	42.16918588	34.50206118	15.60259878	12.76576264
Burdo 1	Kyalla	1140	3740.157		2.5	0.85										10.95303529	68.00009412	57.04705882	0	21.10741176	0
Burdo 1	Kyalla	1140	3740.157	0.25	2.5	0.85	5.704705882														
Burdo 1	Kyalla	1143	3750		2.5	0.85															



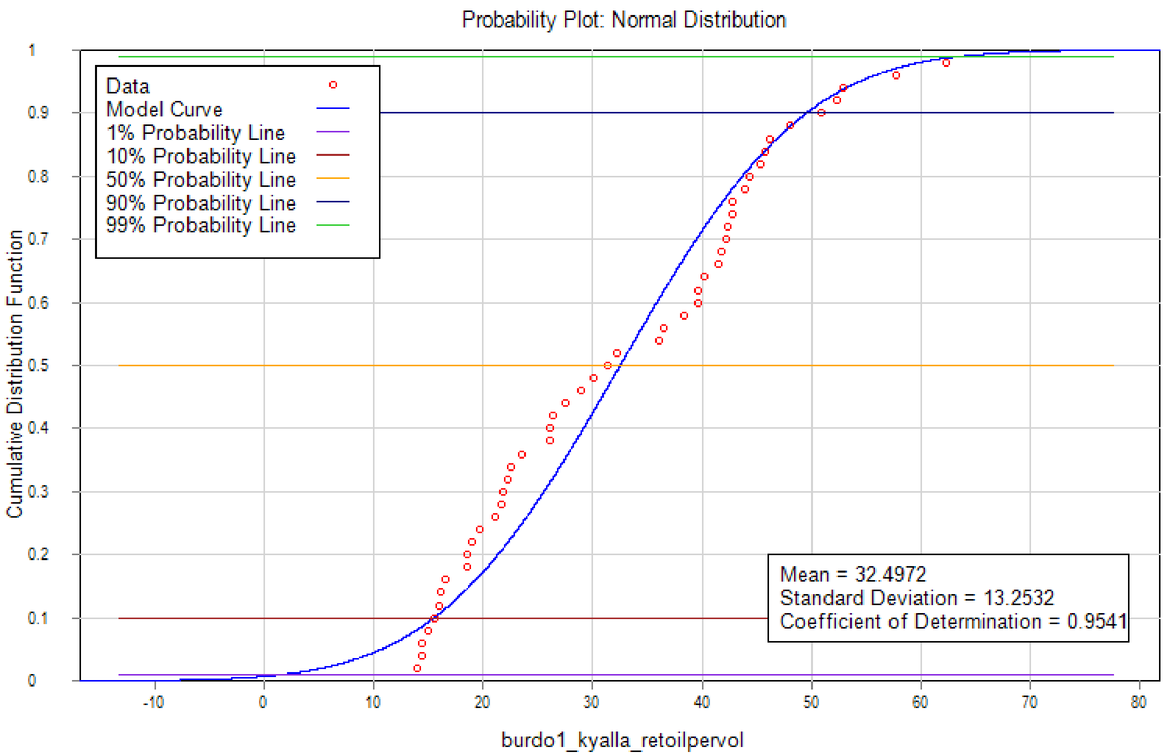
Distribution Report

Log-Normal Distribution Report	
Parameter	burdo1_kyalla_S1STOIIPpervol
Description	Burdo 1 Kyalla S1 STOIIP per volume
Number of Positive Points	52
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.96365
Data Range	
Minimum Value	0.4564
Average Value	5.5028
Maximum Value	18.0269
Standard Deviation	4.43595
Distribution	
99% Value	0.4236
90% Value	1.1323
50% Value	3.7820
10% Value	12.6320
1% Value	33.7650
Average Value Probability	0.6549



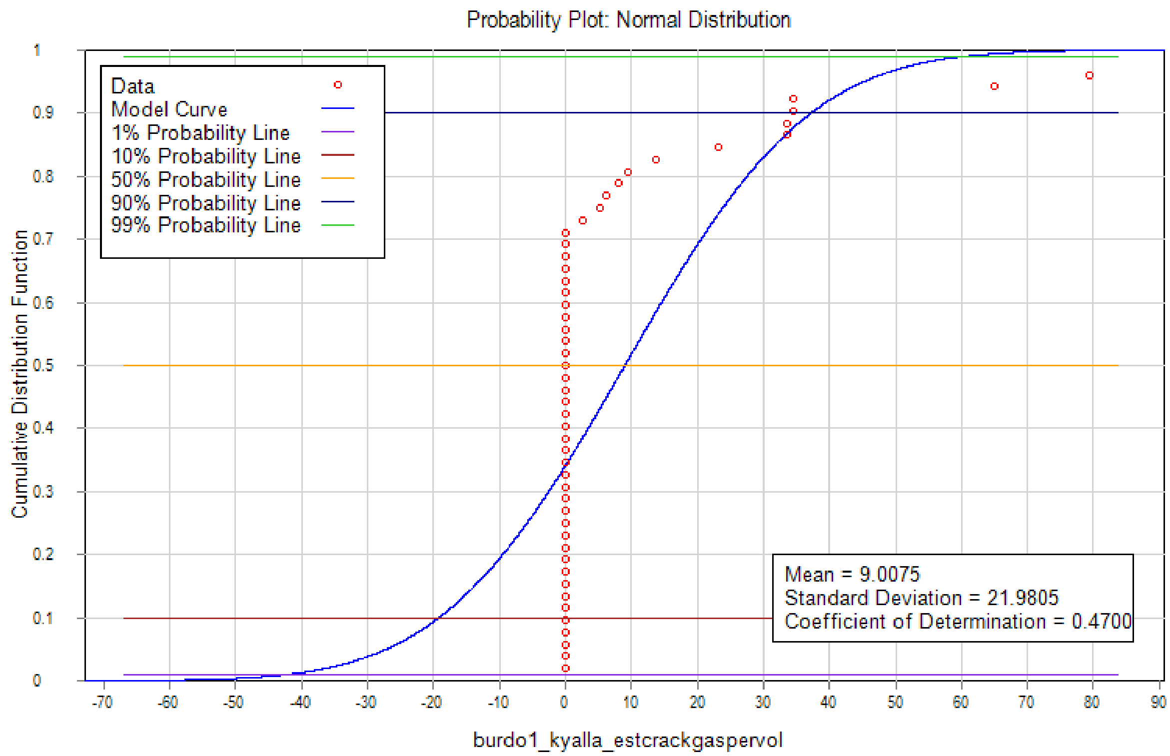
Distribution Report

Normal Distribution Report	
Parameter	burdo1_kyalla_estoilpervol
Description	Burdo 1 Kyalla Estimated Oil per Volume
Number of Positive Points	49
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.95408
Data Range	
Minimum Value	37.6784
Average Value	87.8303
Maximum Value	168.4029
Standard Deviation	35.8196
Distribution	
99% Value	4.5015
90% Value	41.9257
50% Value	87.8303
10% Value	133.7349
1% Value	171.1591
Average Value Probability	0.5000



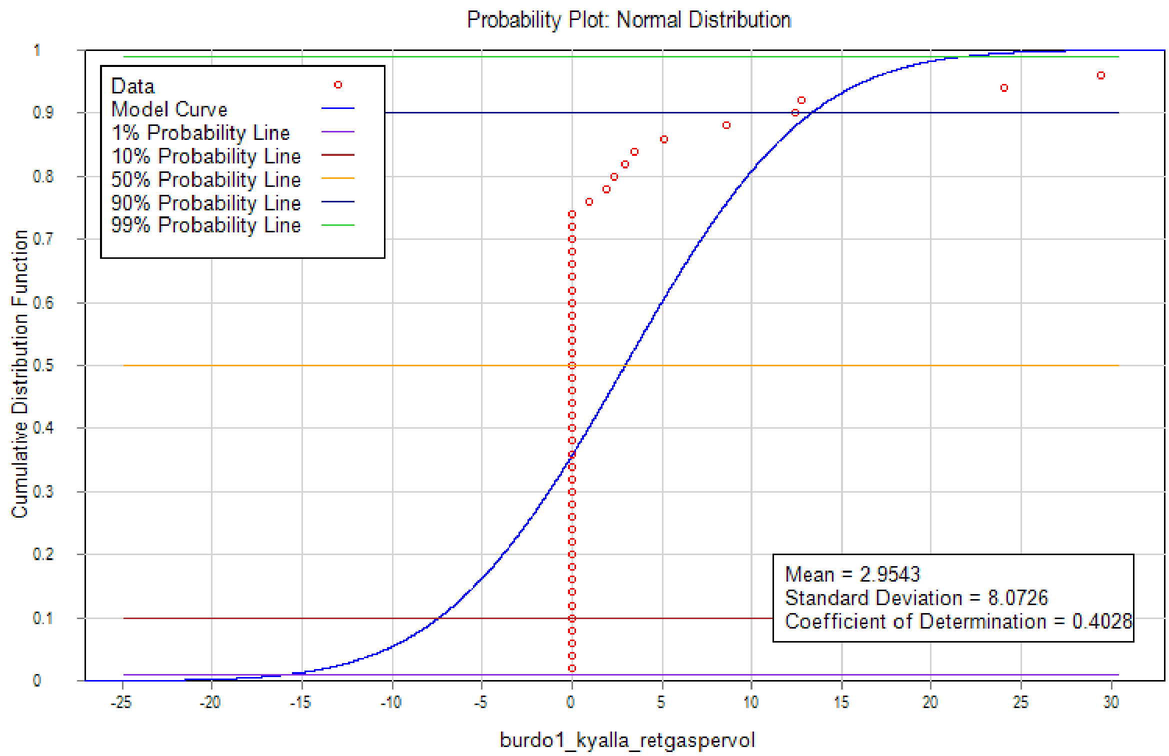
Distribution Report

Normal Distribution Report	
Parameter	burdo1_kyalla_retoilpervol
Description	Burdo 1 Kyalla Retained Oil per Volume
Number of Positive Points	49
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.95408
Data Range	
Minimum Value	13.9410
Average Value	32.4972
Maximum Value	62.3091
Standard Deviation	13.2532
Distribution	
99% Value	1.6656
90% Value	15.5125
50% Value	32.4972
10% Value	49.4819
1% Value	63.3289
Average Value Probability	0.5000



Distribution Report

Normal Distribution Report	
Parameter	burdo1_kyalla_estcrackgaspervol
Description	Burdo 1 Kyalla Estimated Cracked Gas per Volume
Number of Positive Points	14
Number of Non-Positive Points	37
Number of Null Values	0
Regression Coefficient	0.46999
Data Range	
Minimum Value	0.0000
Average Value	9.0075
Maximum Value	110.2971
Standard Deviation	21.9805
Distribution	
99% Value	-42.1267
90% Value	-19.1616
50% Value	9.0075
10% Value	37.1767
1% Value	60.1418
Average Value Probability	0.5000

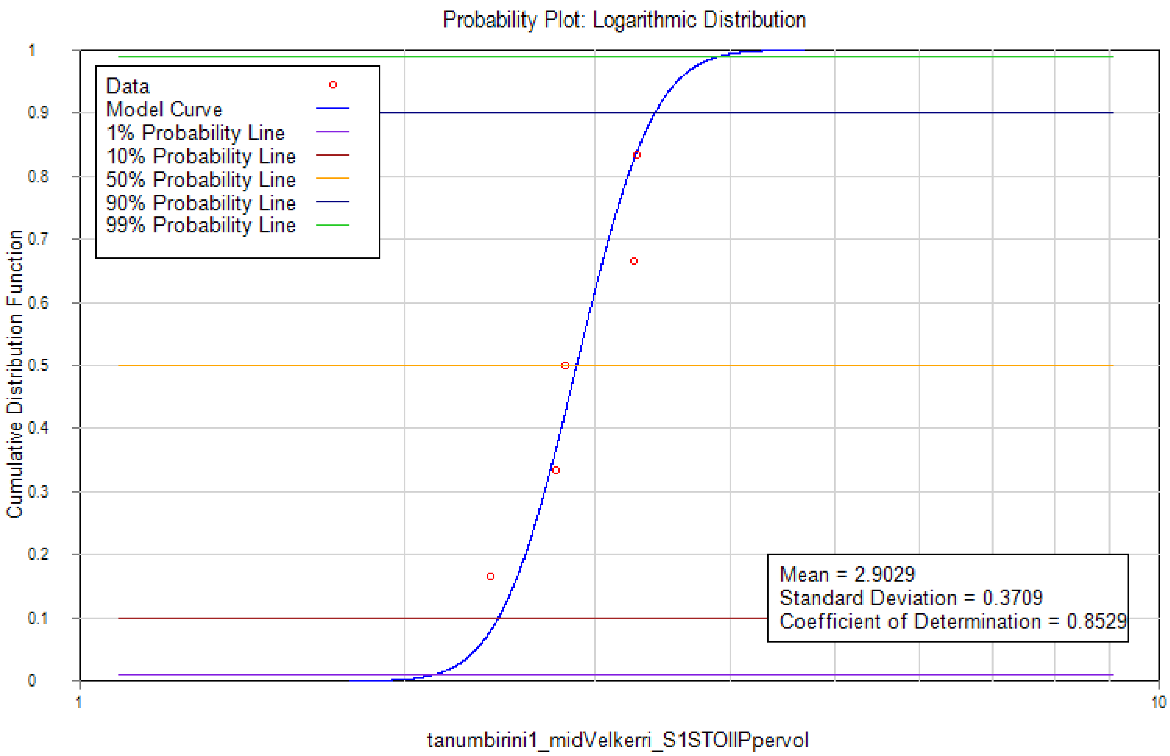


Distribution Report

Normal Distribution Report	
Parameter	burdo1_kyalla_retgaspervol
Description	Burdo 1 Kyalla Retained Gas per Volume
Number of Positive Points	12
Number of Non-Positive Points	37
Number of Null Values	0
Regression Coefficient	0.40276
Data Range	
Minimum Value	0.0000
Average Value	2.9543
Maximum Value	40.8099
Standard Deviation	8.07264
Distribution	
99% Value	-15.8255
90% Value	-7.3912
50% Value	2.9543
10% Value	13.2998
1% Value	21.7341
Average Value Probability	0.5000

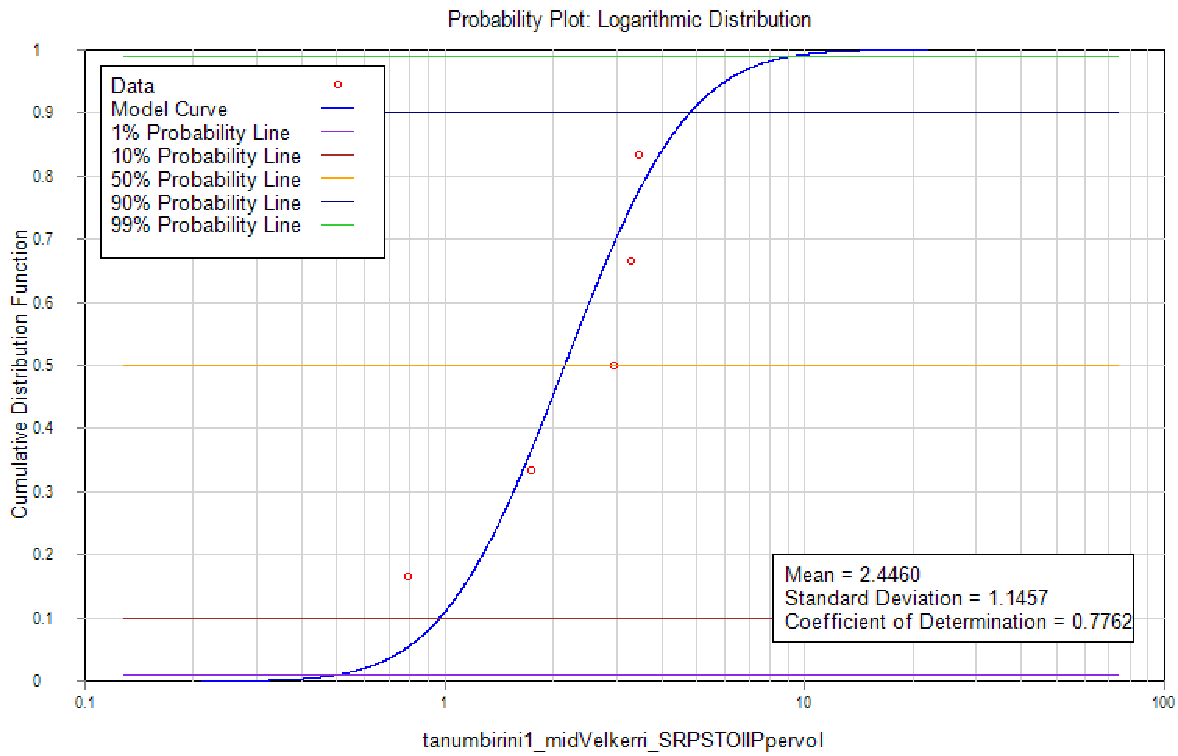
Weatherford LABORATORIES

WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Tanumbirini 1	middle Velkerri	3213.7	10543.64	0.12	2.521	0.85	2.761260198	0.059782	0.007097	3.291613381						3.91178528	483.2711946	0	2876.156456	0	1064.177889
Tanumbirini 1	middle Velkerri	3238.78	10625.92	0.14	2.553	0.85	3.262361562	0.067276	0.006625	3.457884125	85.02	0.33	0.67	86.02	298.6024389	4.660516518	600.4997407	0	3575.035345	0	1322.763078
Tanumbirini 1	middle Velkerri	3259.8	10694.88	0.14	2.565	0.85	3.277695812	0.073658	0.005176	2.957937216	66.22	5.93	0.8	72.95	254.422645	4.448301459	552.2142788	0	3286.595864	0	1216.04047
Tanumbirini 1	middle Velkerri	3271.6	10733.6	0.12	2.568	0.85	2.812739464	0.060723	0.003675	1.731332358						4.453504151	436.6439253	0	2593.142527	0	959.4627349
Tanumbirini 1	middle Velkerri	3287.85	10786.91	0.1	2.63	0.85	2.400540235	0.056484	0.001805	0.791023323						3.840864376	131.4835511	0	765.8561204	0	283.3667645



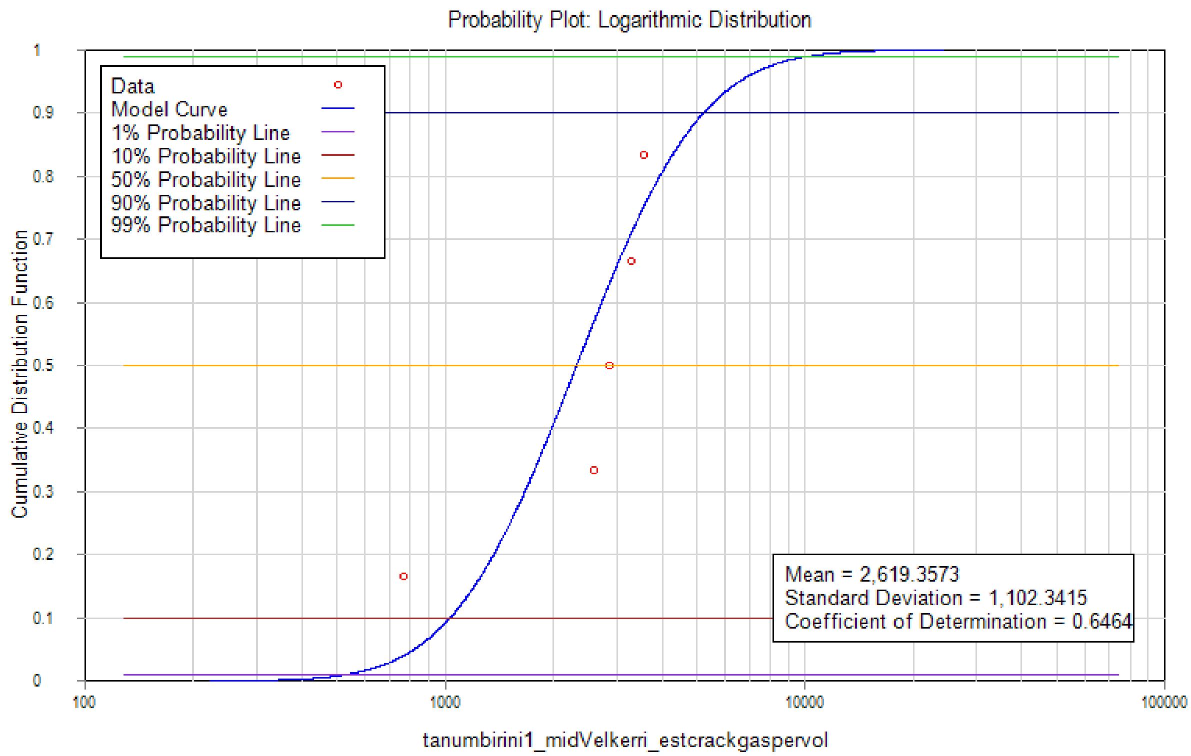
Distribution Report

Log-Normal Distribution Report	
Parameter	tanumbirini1_midVelkerri_S1STOIIPpervol
Description	Tanumbirini 1 middle Velkerri S1 STOIIP per Volume
Number of Positive Points	5
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.85286
Data Range	
Minimum Value	2.4005
Average Value	2.9029
Maximum Value	3.2777
Standard Deviation	0.370891
Distribution	
99% Value	2.1303
90% Value	2.4406
50% Value	2.8836
10% Value	3.4070
1% Value	3.9032
Average Value Probability	0.5205



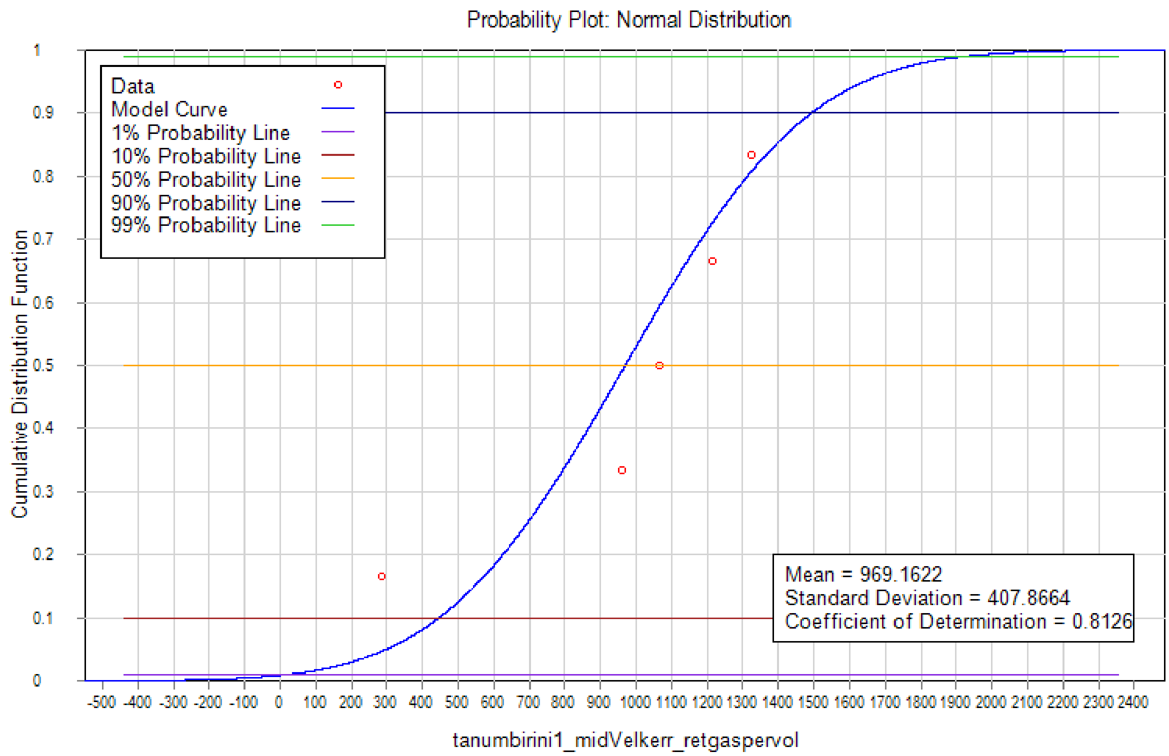
Distribution Report

Log-Normal Distribution Report	
Parameter	tanumbirini1_midVelkerri_SRPSTOIIPpervol
Description	Tanumbirini 1 middle Velkerri SRP STOIIP per Volume
Number of Positive Points	5
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.77618
Data Range	
Minimum Value	0.7910
Average Value	2.4460
Maximum Value	3.4579
Standard Deviation	1.14573
Distribution	
99% Value	0.5043
90% Value	0.9675
50% Value	2.1516
10% Value	4.7847
1% Value	9.1796
Average Value Probability	0.5815



Distribution Report

Log-Normal Distribution Report	
Parameter	tanumbirini1_midVelkerri_estcrackgaspervol
Description	Tanumbirini 1 middle Velkerri Estimated Cracked Gas per Volume
Number of Positive Points	5
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.64644
Data Range	
Minimum Value	765.8561
Average Value	2,619.3573
Maximum Value	3,575.0353
Standard Deviation	1,102.34
Distribution	
99% Value	533.7430
90% Value	1,032.4780
50% Value	2,319.3300
10% Value	5,210.0785
1% Value	10,078.4298
Average Value Probability	0.5764



Distribution Report

Normal Distribution Report	
Parameter	tanumbirini1_midVelkerr_retgaspervol
Description	Tanumbirini 1 middle Velkerri Retained Gas per Volume
Number of Positive Points	5
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.81258
Data Range	
Minimum Value	283.3668
Average Value	969.1622
Maximum Value	1,322.7631
Standard Deviation	407.866
Distribution	
99% Value	20.3231
90% Value	446.4604
50% Value	969.1622
10% Value	1,491.8640
1% Value	1,918.0012
Average Value Probability	0.5000

Appendix IV

Kyalla and middle Velkerri Resource Assessment Data
Broadmere Sub-basin

McArthur Basin Study, 2016

Northern Territory Geological Survey - Australia

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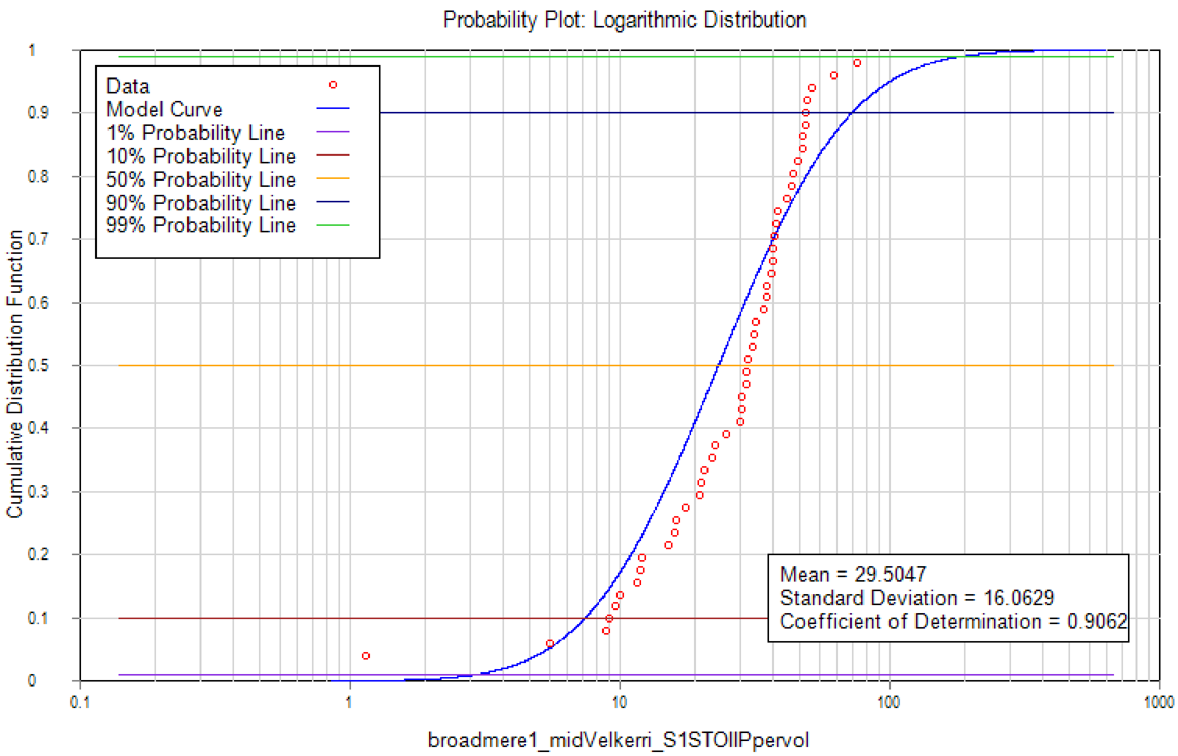
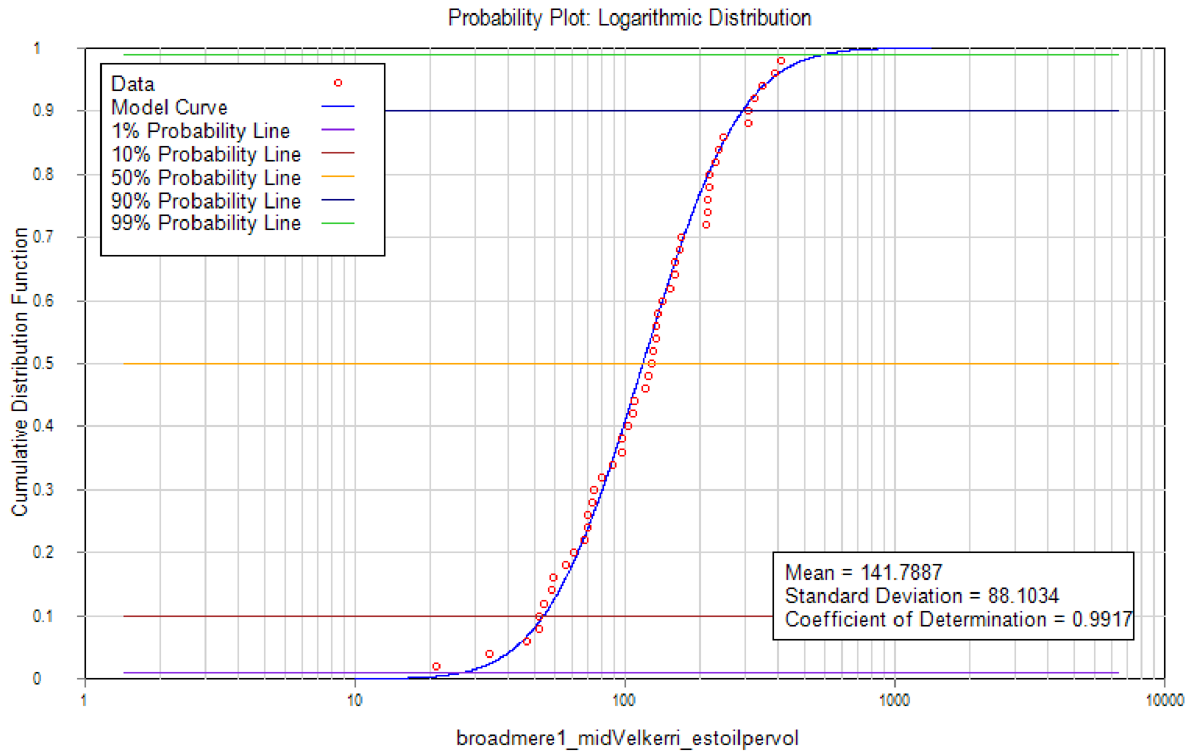
WELL	INTERPRETED FORMATION	**Depth From 1 (m)**	**Depth From 1 (ft)**	S1 (mgHC/g rock)	bden (g/cm3)	oilden (g/cm3)	S1 OIP/volume (bbl/acre-ft)	phi (frac of BV)	So (frac of PV)	SRP STOIIP/volume (bbl/acre-ft)	Adsorbed Gas Storage Capacity (scf/ton)	Free Gas Storage Capacity (scf/ton)	Dissolved Gas-in-Water Storage Capacity (scf/ton)	Total Gas Storage Capacity (scf/ton)	GIP/volume (Mscf/acre-ft)	S2 Remaining (bbl/acre-ft)	S2 Original (bbl/acre-ft)	Estimated Oil (bbl/acre-ft)	Estimated Cracked Gas (Mcf/acre-ft)	Retained Oil (Mcf/acre-ft)	Retained Gas (Mcf/acre-ft)
Broadmere 1	middle Velkerri	18.29	60.00656		2.5	0.85															
Broadmere 1	middle Velkerri	18.3	60.03937	0.05	2.5	0.85	1.140941176									1.140941176	20.99331765	19.85237647	0	7.345379294	0
Broadmere 1	middle Velkerri	27.43	89.99344	1.37	2.5	0.85	31.26178824									217.9197647	278.1614588	60.24169412	0	22.28942682	0
Broadmere 1	middle Velkerri	27.43	89.99344	1.28	2.5	0.85	29.20809412									227.5036706	304.1749176	76.67124706	0	28.36836141	0
Broadmere 1	middle Velkerri	30.48	100	0.9	2.5	0.85	20.53694118									215.1815059	263.3292235	48.14771765	0	17.81465553	0
Broadmere 1	middle Velkerri	36.58	120.0131	1.66	2.5	0.85	37.87924706									277.2487059	400.0139765	122.7652706	0	45.42315012	0
Broadmere 1	middle Velkerri	36.58	120.0131	1.53	2.5	0.85	34.9128									285.6916706	358.4837176	72.79204706	0	26.93305741	0
Broadmere 1	middle Velkerri	45.7	149.9344	0.7	2.5	0.85	15.97317647									140.5639529	292.7655059	152.2015529	0	56.31457459	0
Broadmere 1	middle Velkerri	45.72	150	1.29	2.5	0.85	29.43628235									214.7251294	285.4634824	70.73835294	0	26.17319059	0
Broadmere 1	middle Velkerri	45.72	150	1.39	2.5	0.85	31.71816471									256.2553882	359.6246588	103.3692706	0	38.24663012	0
Broadmere 1	middle Velkerri	45.72	150	0.53	2.5	0.85	12.09397647									147.4096	364.1884235	216.7788235	0	80.20816471	0
Broadmere 1	middle Velkerri	54.86	179.9869	3.32	2.5	0.85	75.75849412									289.5708706	421.9200471	132.3491765	0	48.96919529	0
Broadmere 1	middle Velkerri	54.86	179.9869	2.73	2.5	0.85	62.29538824									311.9333176	409.1415059	97.20818824	0	35.96702965	0
Broadmere 1	middle Velkerri	60.96	200	1.36	2.5	0.85	31.0336									223.3962824	273.3695059	49.97322353	0	18.49009271	0
Broadmere 1	middle Velkerri	64.01	210.0066	2.14	2.5	0.85	48.83228235									213.5841882	322.4299765	108.8457882	0	40.27294165	0
Broadmere 1	middle Velkerri	64.01	210.0066	2.15	2.5	0.85	49.06047059									269.9466824	345.9333647	75.98668235	0	28.11507247	0
Broadmere 1	middle Velkerri	73.15	239.9934	1.89	2.5	0.85	43.12757647									214.7251294	279.3024	64.57727059	0	23.89359012	0
Broadmere 1	middle Velkerri	73.15	239.9934	1.59	2.5	0.85	36.28192941									210.6177412	264.6983529	54.08061176	0	20.00982635	0
Broadmere 1	middle Velkerri	82.3	270.0131	1.91	2.5	0.85	43.58395294									148.0941647	196.0136941	47.91952941	0	17.73022588	0
Broadmere 1	middle Velkerri	82.3	270.0131	1.83	2.5	0.85	41.75844706									164.0673412	246.4432941	82.37595294	0	30.47910259	0
Broadmere 1	middle Velkerri	91.44	300	2.25	2.5	0.85	51.34235294									167.7183529	240.0540235	72.33567059	0	26.76419812	0
Broadmere 1	middle Velkerri	91.44	300	2.09	2.5	0.85	47.69134118									200.1210824	297.5574588	97.43637647	0	36.05145929	0
Broadmere 1	middle Velkerri	91.44	300	1.62	2.5	0.85	36.96649412									286.1480471	393.6247059	107.4766588	0	39.76636376	0
Broadmere 1	middle Velkerri	91.44	300	0.99	2.5	0.85	22.59063529									173.4230588	300.0675294	126.6444706	0	46.85845412	0
Broadmere 1	middle Velkerri	100.58	329.9869	2.17	2.5	0.85	49.51684706									309.1950588	398.8730353	89.67797647	0	33.18085129	0
Broadmere 1	middle Velkerri	100.6	330.0525	0.86	2.5	0.85	19.62418824									208.1076706	261.9600941	53.85242353	0	19.92539671	0
Broadmere 1	middle Velkerri	109.73	360.0066	2.09	2.5	0.85	47.69134118									355.5172706	486.0409412	130.5236706	0	48.29375812	0
Broadmere 1	middle Velkerri	109.73	360.0066	2.01	2.5	0.85	45.86583529									374.2287059	499.2758588	125.0471529	0	46.26744659	0
Broadmere 1	middle Velkerri	112.3	368.4383	0.03	2.5	0.85	0.684564706														
Broadmere 1	middle Velkerri	118.87	389.9934	1.63	2.5	0.85	37.19468235									336.5776471	473.4905882	136.9129412	0	50.65778824	0
Broadmere 1	middle Velkerri	118.87	389.9934	1.67	2.5	0.85	38.10743529									366.0139294	519.3564235	153.3424941	0	56.73672282	0
Broadmere 1	middle Velkerri	121.92	400	0.71	2.5	0.85	16.20136471									241.8795294	273.3695059	31.48997647	0	11.65129129	0
Broadmere 1	middle Velkerri	124.3	407.8084	0.44	2.5	0.85	10.04028235									96.06724706	302.3494118	206.2821647	0	76.32440094	0
Broadmere 1	middle Velkerri	128.02	420.0131	1.54	2.5	0.85	35.14098824									276.5641412	438.5777882	162.0136471	0	59.94504941	0
Broadmere 1	middle Velkerri	128.02	420.0131	1.62	2.5	0.85	36.96649412									315.3561412	434.2422118	118.8860706	0	43.98784612	0
Broadmere 1	middle Velkerri	133.3	437.336	0.87	2.5	0.85	19.85237647									174.3358118	332.9266353	158.5908235	0	58.67860471	0
Broadmere 1	middle Velkerri	136.3	447.1785	0.66	2.5	0.85	15.06042353									203.3157176	334.5239529	131.2082353	0	48.54704706	0
Broadmere 1	middle Velkerri	137.16	450	1.31	2.5	0.85	29.89265882									284.7789176	486.7255059	201.9465882	0	74.72023765	0
Broadmere 1	middle Velkerri	137.16	450	1.49	2.5	0.85	34.00004706									294.5910118	494.4839059	199.8928941	0	73.96037082	0
Broadmere 1	middle Velkerri	142.3	466.8635	0.77	2.5	0.85	17.57049412									280.4433412	567.5041412	287.0608	0	106.212496	0
Broadmere 1	middle Velkerri	146.3	479.9869	0.96	2.5	0.85	21.90607059									211.0741176	442.6851765	231.6110588	0	85.69609176	0
Broadmere 1	middle Velkerri	146.3	479.9869	1.24	2.5	0.85	28.29534118									241.6513412	462.9939294	221.3425882	0	81.89675765	0
Broadmere 1	middle Velkerri	148.3	486.5486	0.4	2.5	0.85	9.127529412									121.3961412	497.9067294	376.5105882	0	139.3089176	0
Broadmere 1	middle Velkerri	152.4	500	0.51	2.5	0.85	11.6376									230.4701176	273.5976941	43.12757647	0	15.95720329	0
Broadmere 1	middle Velkerri	152.46	500.1969	0.42	2.5	0.85	9.583905882									108.8457882	431.9603294	323.1145412	0	119.5523802	0
Broadmere 1	middle Velkerri	154.3	506.2336	0.39	2.5	0.85	8.899341176									124.3625882	483.0744941	358.7119059	0	132.7234052	0
Broadmere 1	middle Velkerri	155.4	509.8425	0.52	2.5	0.85	11.86578824									91.73167059	393.8528941	302.1212235	0	111.7848527	0
Broadmere 1	middle Velkerri	155.45	510.0066	1.22	2.5	0.85	27.83896471									232.0674353	434.9267765	202.8593412	0	75.05795624	0
Broadmere 1	middle Velkerri	155.45	510.0066	1.23	2.5	0.85	28.06715294									242.7922824	448.8462588	206.0539765	0	76.23997129	0
Broadmere 1	middle Velkerri	158.49	519.9803	1.08	2.5	0.85	24.64432941									122.7652706	270.6312471	147.8659765	0	54.71041129	0
Broadmere 1	middle Velkerri	160.3	525.9186	0.24	2.5	0.85	5.476517647									45.86583529	332.6984471	286.8326118	0	106.1280664	0



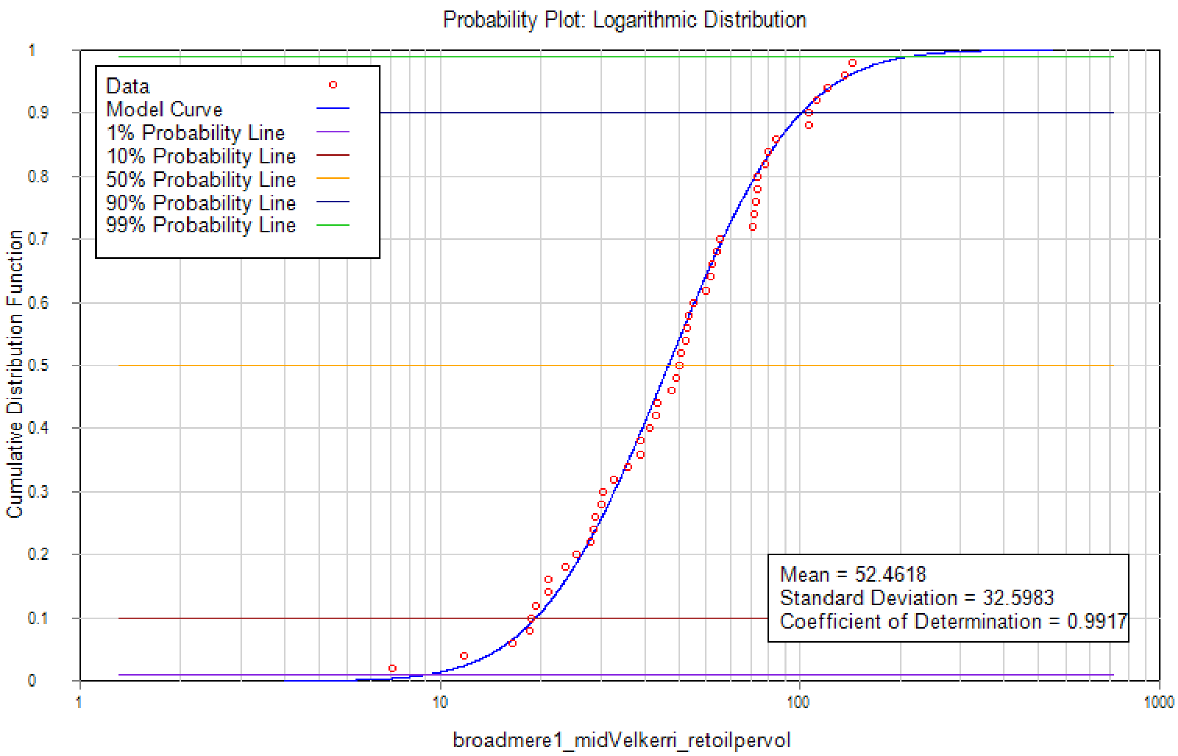
Distribution Report

Log-Normal Distribution Report	
Parameter	broadmere1_midVelkerri_S1STOIIPpervol
Description	Broadmere 1 Middle Velkerri S1 STOIIP per volume
Number of Positive Points	50
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.90623
Data Range	
Minimum Value	0.6846
Average Value	29.5047
Maximum Value	75.7585
Standard Deviation	16.0629
Distribution	
99% Value	2.9443
90% Value	7.4341
50% Value	23.1544
10% Value	72.1173
1% Value	182.0925
Average Value Probability	0.6077



Distribution Report

Log-Normal Distribution Report	
Parameter	broadmere1_midVelkerri_estoilpervol
Description	Broadmere 1 Middle Velkerri Estimated Oil per Volume
Number of Positive Points	49
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.99169
Data Range	
Minimum Value	19.8524
Average Value	141.7887
Maximum Value	376.5106
Standard Deviation	88.1034
Distribution	
99% Value	25.0402
90% Value	49.9332
50% Value	116.4307
10% Value	271.4848
1% Value	541.3750
Average Value Probability	0.6173



Distribution Report

Log-Normal Distribution Report	
Parameter	broadmere1_midVelkerri_retoilpervol
Description	Broadmere 1 Middle Velkerri Retained Oil per volume
Number of Positive Points	49
Number of Non-Positive Points	0
Number of Null Values	0
Regression Coefficient	0.99169
Data Range	
Minimum Value	7.3454
Average Value	52.4618
Maximum Value	139.3089
Standard Deviation	32.5983
Distribution	
99% Value	9.2649
90% Value	18.4753
50% Value	43.0794
10% Value	100.4494
1% Value	200.3088
Average Value Probability	0.6173