

Fully funded for 2020 Beetaloo drilling

Empire Energy Group Limited (EEG.ASX) is a junior oil and gas producer and explorer with onshore unconventional oil & gas shale reservoir assets. EEG holds the largest acreage position in the highly prospective, potentially global-scale, long-life, northern Australian McArthur-Beetaloo basins, with the Beetaloo alone forecast to contain shale dry gas volumes of over 100 Tcf. EEG has a number of event drivers over the coming 12-months, aimed at transforming the company into a strategically-important, long-life Australian onshore energy cash generator. EEG ended 2019 with gross cash of US\$9.9m, fully-funded for its 2020 drill program (Carpentaria-1) in the Beetaloo, set for mid-year. The well will target the Velkerri & Kyalla shales to confirm the above-expected results of recent 2D seismics. The Basin is fast developing as a gas-rich (and potentially liquids-rich) answer to east coast Australia's future energy self-sufficiency and expansion gas for existing LNG projects located in Darwin NT, with strong policy support from both the Northern Territory (NT) and Federal governments. Crystallising Empire's inherent value potential is dependent on successful drilling outcomes and securing strategic funding to commercialise its acreage.

Business model

Empire Energy Group (EEG) is a junior oil & gas producer/exploration company, focusing on maturing its portfolio of onshore, long-life oil and gas fields. The company holds substantial exploration acreage in Australia's Northern Territory McArthur-Beetaloo basins. Although EEG's NT assets are at an early exploration stage, given the high prospectivity of the region, success from the company's 2Q 2020 drilling programme could see cashflows generated within 24-36 months, assuming links and upgrades to existing pipeline infrastructure are undertaken in time. Empire's NT assets could benefit from look-through revaluations should Santos (ASX: STO) and Origin Energy (ASX: ORG) report drilling success from their adjacent acreage over their 2020 work programmes.

Q419 takeaways

EEG's 4Q19 quarterly update came in line with our expectations. Gross positive cash of about A\$15m leaves EEG fully-funded to support its 2020 NT work program aims in line with the strategic pivot from the US to the McArthur-Beetaloo. While risks exist switching from producer to explorer/appraiser, we believe the quality of assets in focus justifies the decision. EEG's Appalachia business is running on lean, with Henry Hub prices hitting 20-yr lows of \$1.89/Mbtu in January, due to benign US winter conditions. Further restructuring is expected in 2020. We chiefly await NT drilling approvals, drier conditions and a rig supply contract to begin this year's Carpentaria-1 well evaluation and appraisal process.

Valuation

As we highlighted in our December 23 scoping report, [Forging New Frontiers](#), we assign a base valuation of \$160m (\$0.61/share) to EEG on the current share count of 262.5m. On a fully diluted (in-the-money options) basis, the valuation is \$0.56/share. We observe a number of event drivers lining up for EEG's portfolio over the coming 6-12 months which have the potential to generate a sizeable uplift in NAV.

Historical earnings and RaaS Advisory estimates

Year end	Revenue (US\$m)	Gross Profit (US\$m)	NPAT reported (US\$m)	OCFPS (AUD cps)	EPS Adj (AUD cps)	Price/Book (x)
12/18a	14.3	5.0	(15.9)	(0.15)	(1.41)	31.5
12/19e	6.7	1.7	(7.4)	(9.87)	(6.13)	4.0
12/20e	4.4	1.2	(3.0)	0.64	(1.47)	4.9
12/21e	4.5	1.2	(3.0)	2.06	(1.40)	5.2

Source: Company data, RaaS Advisory Estimates for FY19e, FY20e and FY21e

Energy exploration & production

6 February 2020

Share details

ASX Code	EEG
Share price (4-Feb)	\$0.39
Market Capitalisation	\$103.6M
Shares on issue	262.5M
Net cash	~US\$2.4M
Gross cash	~US\$9.9M

Share performance (12 months)



Upside Case

- Velkerri/Kyalla drilling success generates significant commercial outcomes for EEG's EP187
- Drilling success generates high-value LT strategic partnership & funding options
- Drilling success is achieved on other EEG permits, including within McArthur Barney Creek formation

Downside Case

- McArthur-Beetaloo Basin EP 187 2Q 2020 drilling is unsuccessful, negatively impacting value of remaining NT permits (EP180-188)
- Continuing financing through equity issues highly dilutive to future capital growth
- Fracking success in NT/Qld pushes onshore energy prices to sub-economic levels.

Board of Directors

Alex Underwood	Managing Director/CEO
Paul Espie AO	Non-Executive Chairman
John Gerahty	Non-Executive Director
Dr John Warburton	Non-Executive Director

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Empire Energy Group Limited – drilling towards rewards

EEG concluded 2019 with a successful December quarter, meeting its strategic aims to pivot the company from a focus on US gas production to a focus on exploring the oil and gas potential of its huge tenement position in the NT's highly prospective McArthur- Beetaloo, the largest acreage held by any company in the region and the only independent ASX-listed junior explorer in the region.

After finalising the sale of its Kansas assets on 30 September 2019 for c.US\$19.25m, receiving ongoing in-the-money option exercise flows at \$0.30 per share and concluding an over-subscribed \$12m 30m share placement in late-November at \$A0.40 per share (with directors purchasing 2.64m shares in the \$A\$0.40 share placement, lifting their total holdings to 19m shares), the company achieved a gross cash position (US\$9.9m/A\$14.8m) as at 31 December 2019, for the first time since 2010, placing EEG on excellent footing to fully-fund its 2020 strategic work program aims for its planned Carpentaria-1 well.

Although the intangible value of becoming “net cash” is hard to quantify, we also believe EEG management has gained significant additional negotiating flexibility now in dealing with potential farm-in suitors. We also anticipate that current in-the-money options (~52.8M) may be exercised in FY20 and FY21, delivering an additional US\$11m in equity capital. We still expect the possibility of additional capital being raised in FY21 to further improve NT acreage value, ahead of a farm-in, or other commercial, arrangement.

The company also completed better-than-expected 231-km 2D seismics on its 100%-owned EP187 permit in the NT's Beetaloo sub-basin, giving confidence that its acreage holds sizeable gas and even liquids potential. EEG also beefed up its senior management team, with the appointment of industry veteran David Evans as COO, together with Ben Johnston to fill the BD role.

Meanwhile, following the Kansas asset sale, EEG's US business is being restructured to reduce overheads and remain as lean as possible while gas prices hover at two-decade lows. The restructuring costs incurred, together with lower realised gas prices, resulted in an EBITDA loss for the December quarter of -US\$0.3m, compared to +US\$0.7m in the September quarter. Gas production for the quarter amounted to 4,836mcf/d from its remaining Appalachian assets.

Beetaloo EP187 next steps

EEG is now focusing its 2020 work program on progressing its first well in the Beetaloo sub-basin, Carpentaria-1. Vertical drilling to a depth of 2,500m-2,800m, evaluating the gas and liquids potential of both the Kyalla and Velkerri shales within EEG's EP187 tenement, is expected to commence during the dry season, ideally by mid-year. Follow-up vertical fracture stimulation is planned by the fourth quarter, with horizontal drilling including a multi staged fracture stimulation expected to take place during 1H 2021.

Drill rig discussions and environmental regulatory approvals are both well-advanced for the Carpentaria-1 well. EEG awaits an Aboriginal Areas Protection Authority certificate, ahead of submitting its final application to the Northern Territory Minister for Primary Industry and Resources for approval.

EEG's recently-finalised 2D seismic interpretations contain a number of significant strategic highlights, serving to underpin our existing net equity valuation metrics:

- a) Confirmation the Beetaloo sub-basin shale formations extend into EP187;
- b) The south-western flank of EP187 likely contains at least one area covering 160sq km if not a second covering a similar area, containing large shale formations of interest without faulting interference. This lack of faulting also significantly de-risks the prospective site chosen for the proposed, mid-2020 2,500-2,800m vertical drill hole;
- c) The Middle Velkerri shale can be confidently mapped into EP187 with continuous thickness (up to 500m gross (270m net) over the A,B,C shales), similar to those noted in the Tanumbirini-1 well, some 76km to the north-west. We note Tanumbirini-1 flowed 1.2MMcfd of gas on test;
- d) The seismic data suggests the presence of Kyalla shale over the western flank of EP187 down to a depth of c.1,200m, with a gross thickness of 100m. This is encouraging as the Kyalla was considered to be a higher risk

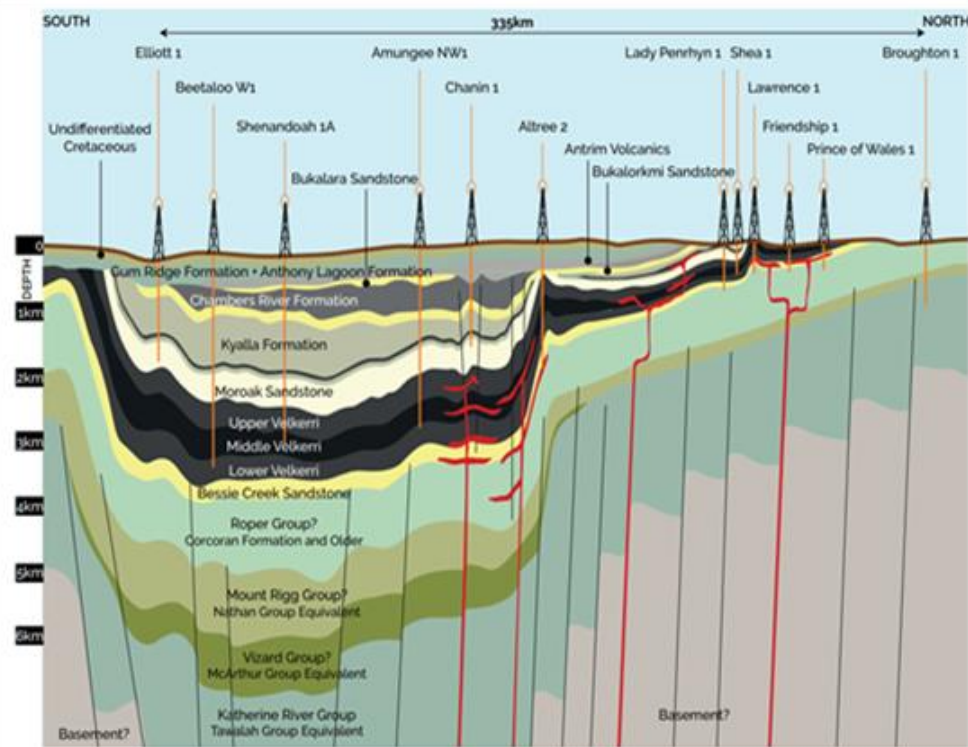
opportunity, getting thinner and shallower towards the east. It should also be noted that the Kyalla could be a relatively liquids rich target in the EEG areas. The upcoming well could confirm considerable upside;

e) Both the Kyalla and Velkerri shale formations lie some 1,000m shallower through EP187, compared to the adjoining Santos/Origin permits, increasing the potential for both dry and wet gas flows, while decreasing total appraisal costs.

These seismic results now need to be confirmed during the EEG's 2020/21 vertical/horizontal well drilling program. Appraisal drilling results by near-neighbours, Origin/Falcon and Santos/Tamboran Resources, in the Beetaloo, will also help expand understanding of the basin's gas & oil economic potential to improve Australia's energy self-sufficiency and streamline EEG's future exploration and development plans.

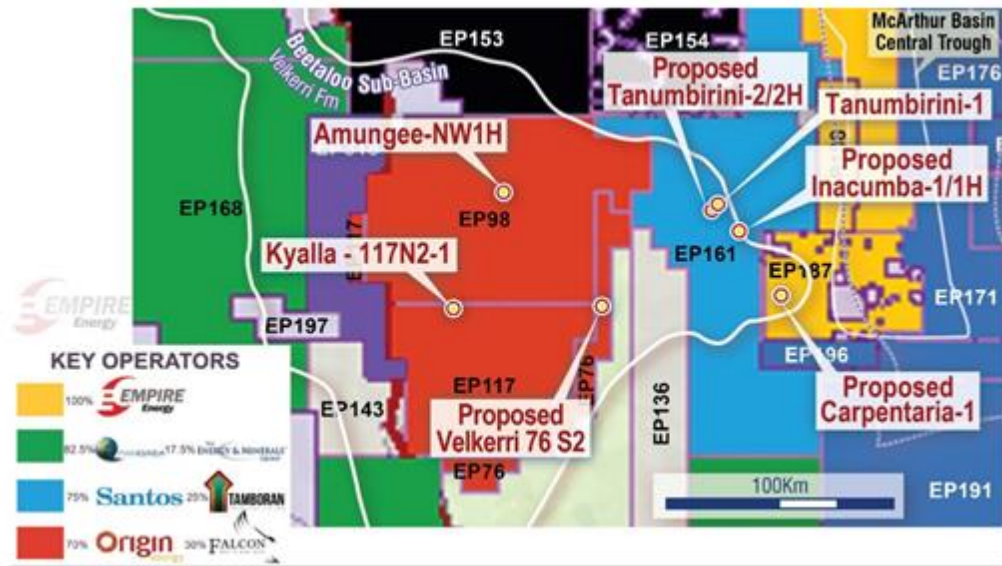
Positive results from 2020 drilling could evolve EEG's current Prospective (P50) of 1.85bln Boe (11 Tcfe) to a Contingent resource (2C). This would place the company in an even stronger strategic position to negotiate with potential future funding partners.

Exhibit 1: Beetaloo South-North schematic cross-section



Source: NT Department of Primary Industry & Resources

Exhibit 2: EEG's EP187 & adjoining lease holder activities in the Beetaloo for 2020



Source: Company data

Exhibit 3: 2020 Beetaloo sub-basin – regional drilling work programs

Companies	Activity scheduled
Origin / Falcon	Kyalla 117 N2 1H shale well: horizontal production flow test results due within 2Q 2020; Velkerri 76 S2 shale well: begin drilling 2Q 2020; flow test results due 4Q 2020 (aiming for liquids-rich gas flows under production test conditions) Stage 3 follow-on: 2Q 2020 begin long-lead preparations for further 2 horizontal wells
EEG	1Q 2020: drill rig & regulatory approvals; 2Q 2020: Carpentaria-1 vertical drilling begins 1H 2020:
Santos / Tamboran Resources	a) EP161 Tanumbirini-1 - extended flow test results b) Inacumba 1/1H- drilling/stimulate/flow test results
Santos / Armour Energy	2020 South Nicholson planning; 2021: 2D seismic & well tests
Hancock Prospecting	2H 2020: 2D seismics & 1-3 well vertical exploration drilling planned
Pangaea Resources	Awaiting NT EMP notification

Source: Company data

US Appalachia

EEG's remaining US conventional gas production assets in the Appalachian are listed on its balance sheet at a recoverable value of US\$12.7m (A\$18.5m). These are represented by a 13.7mm boe 2P reserve holding in New York and Pennsylvania. The Company sells its gas products primarily to owners of domestic pipelines and refiners located in Pennsylvania and New York state. Unfortunately, none of its NY assets, totalling 262,260 acres, can be fracture stimulated, due to the State's hydraulic fracking moratorium, which has been in place since 2010. We believe these assets may still hold some future residual option value.

In the December 2019 quarter, the first full quarter since EEG's Kansas assets were sold, the company's gas production totalled 4,836mcf/d. This fell from 6,189mcf/d in 3Q19, which had included output contributions from its now-sold Kansas holdings during July and August.

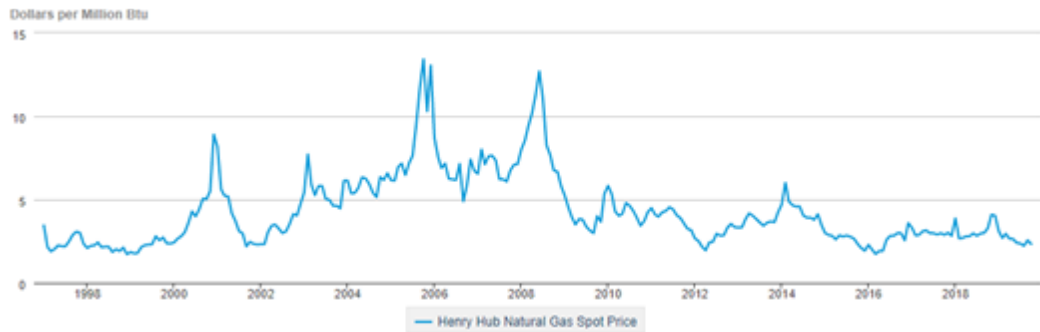
Meanwhile EEG's net realised sales price, post-hedging, amounted to US\$2.60/mcf in the December quarter, compared to US\$2.71/mcf in 3Q19. EEG's gas hedging program combines fixed price gas offtakes and put options covering 120,000 mmBtu/month across the 2020 calendar year, at an average strike price of US\$2.50/mmBtu.

While the market remains in its current gas price slump, below the more comfortable \$3.00/mmBtu required to justify new development drilling, EEG's overarching strategy for its US assets is to conserve both its cash and in-ground resources, rather than pursue higher gas production rates, as well as seeking to innovative ways

to protect margins and move closer to end-customers, where possible. For example, EEG agreed to spend US\$0.02m to construct a pipeline linking directly to a local utility which is expected to add US\$0.16m in sustaining annual revenues. EEG also has the ability to monitor each individual well on a daily basis, to optimise profitability.

During the December quarter, Henry Hub prices continued to drift lower, closing out 2019 at \$2.19/mmBtu. Low prices are considered partly caused by unseasonably-mild temperatures prevailing in the US this winter which is sapping heating demand, as well as strong onshore gas production rates, which are outpacing demand, forcing a lift in onshore storage levels. According to the US EIA, US onshore gas storage peaked in late-October/early-November, while the Baker Hughes weekly drill rig count are already reacting to the tougher economics, showing onshore US rigs are down 255 YoY to 790 rigs. Nonetheless, the US Energy Information Administration (EIA) predicts US gas supplies will continue to rise into 2021, predicting 3% growth in output for 2020 to a fresh record of 94.7bcf/day.

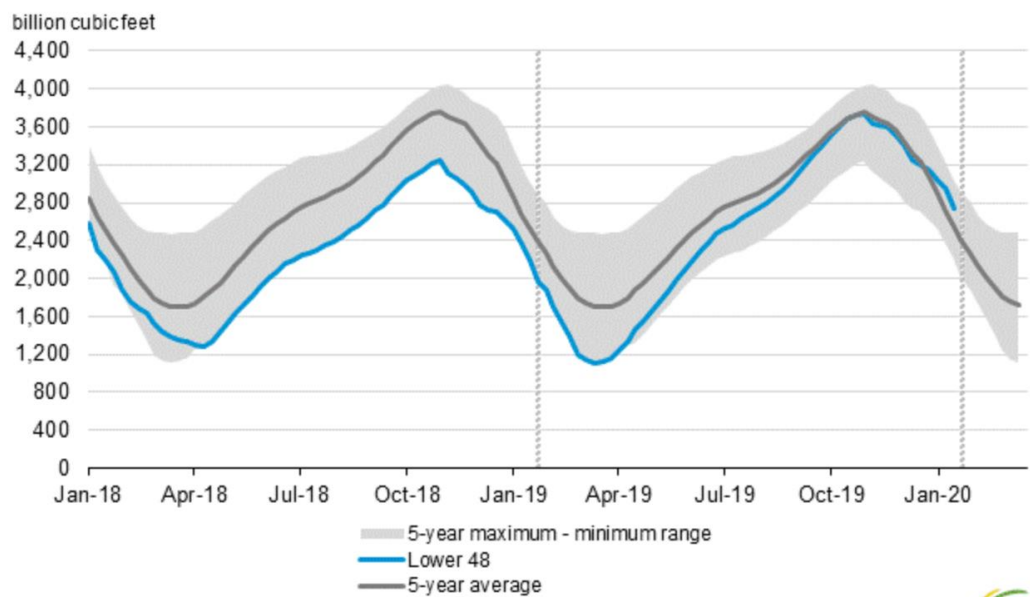
Exhibit 4: Henry Hub gas prices (USD/MBtu)



Source: EIA data

Exhibit 5: US onshore gas storage estimates

Working gas in underground storage compared with the 5-year maximum and minimum



Source: U.S. Energy Information Administration



Source: US EIA data

Financials – December 2019

EEG ended the 2019 year with a positive cash balance of US\$9.9m (A\$14.8m), more than enough to fund the entirety of its 2020 work program plans in the NT's Beetaloo sub-basin. We expect EEG's 2020 drill program to cost around A\$5-\$8m, while its Australian corporate overheads are running in the A\$2.5m per annum range.

EEG estimates its 1Q20 cash outgoing will total US\$3m (A\$5m), including \$1m on NT development works in the NT (chiefly seismic evaluation costs); \$0.9m of US production expenses; \$0.8m in office and staff costs across both the US and Australian businesses.

EEG's December quarterly cashflow statement clearly demonstrates the company's dogged debt reduction focus since 2017. The company's drawn debt (with Macquarie Bank, maturing Sept-2024) has reduced by US\$30.4m, from US\$37.9m down to US\$7.5m (incurring annual interest costs of c.US\$0.6m), over the past 2 years.

Going forward, we expect EEG to incur annual interest costs of US\$0.63m (A\$1m) on its Macquarie Appalachian asset-secured 5-yr project finance loan. This should be readily covered by the Appalachian gas production cashflows, net of EBITDA expenses, particularly once EEG's outstanding US business restructuring plans are fully completed, likely by end-1Q20. Notably, EEG's US accounts payable also fell from US\$1.1m at the end of September to US\$0.35m as at 31 December 2019.

For the December quarter, EEG's Appalachian revenues reached US\$1.34m, while total costs from both the US and Australia businesses amounted to US\$2.2m, including interest costs of ~US\$0.16m and a series of one-off expenses totalling US\$0.46m. These included:

- a) \$0.09m redundancy charges;
- b) \$0.11m Southpointe Pennsylvania office closure and relocation costs to Mayville NY;
- c) \$0.067m legal & IT costs;
- d) Kansas royalty buy-out charge to effect asset sale of \$0.12m and
- e) loan re-establishment fees of \$0.076m.

We expect net cashflows from the Appalachia business to be neutral-to-positive during 2020 and expect EEG will look for a positive price rally to fix put options for 2021.

Risk adjusted DCF Valuation at \$0.61/share

We have evaluated EEG's portfolio against a range of risk factors based on our assessment of prevailing operating conditions. These factors include, but are not limited to, commodity prices, location, phase of exploration, timing and scale of work programmes, potential timeline to development, and funding costs.

We value EEG using estimated values for Prospective Resources adjusted for our discretionary probability weighting (1-risk%), to derive a gross portfolio worth. These probability weightings are subject to change as the company delivers its next phase of exploration results.

We believe that the majority of EEG's current market value (~85%) is being derived from its early stage Northern Territory exploration assets. These Prospective Resource estimates could be subject to significant adjustments following the results of planned drilling and well testing, both by EEG and in adjacent tenements.

We note the significant subjectivity inherent in underpinning such valuations. For a full explanation of our valuation considerations, please refer to our December 23 scoping report, [Forging New Frontiers](#).

Exhibit 6: RaaS's Empire Energy Group Valuation Range

In A\$M		Risky Range (A\$M)			Risk Weight	A\$/share			
		Low	Mid	High		Low	Mid	High	
Northern Territory									
Gas	100%	\$72	\$108	\$244	4%	\$0.27	\$0.41	\$0.93	Risking and valuing exploration assets is somewhat arbitrary and down to the discretion of the valuer
Oil	100%	\$23	\$35	\$78	4%	\$0.09	\$0.13	\$0.30	
US Onshore									Key sensitivity here is the assumed gas price – US\$2.40 in FY20 and US\$2.44 in FY21
Appalachian		\$9	\$17	\$26		\$0.03	\$0.06	\$0.10	
Sub total		\$104	\$160	\$347		\$0.40	\$0.61	\$1.32	
Net cash/(debt)		\$5	\$5	\$5					
Corporate costs		(\$5)	(\$5)	(\$5)					
TOTAL		\$104	\$160	\$347		\$0.40	\$0.61	\$1.32	Based on current shares of 262.5m

Source: RaaS analysis; risk-adjusted ranges based on company data; regional farm-in valuations and weighted by applying the RaaS risk overlay
 The Base Case ascribed to the Marcellus assets assumed the continuation of the New York state ban on hydraulic fracturing. The Low Case assumes Pennsylvania introduces new taxes on gas drillers to pay for infrastructure upgrades, rendering some of EEG's wells sub-economic to operate. The High Case assumes New York state lifts the ban on fracking.



FINANCIAL SERVICES GUIDE

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of

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Effective Date: 26th November 2018

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