

## Anadarko Petroleum

### Day 3 of Anadarko Week; DJ Basin Delivering Elusive Combination of High Growth and Significant FCF

**JPM View:** On Day 3 of Anadarko week, we perform a deep dive on APC's DJ Basin asset, which is a key anchor of the company's oil growth and FCF profiles that are enabling meaningful cash return to shareholders. Despite world-class resources and stacked pay potential at Wattenberg, the DJ Basin has generally played second fiddle to other U.S. resource plays such as the Permian given midstream and above the ground regulatory challenges as well as concerns on oil mix that have plagued the basin over the past few years. In 2016 and 2017, DJ Basin focused producers underperformed the XOP Index by 13% and 10%, respectively. Despite the maturity of this play, our analysis confirms meaningful well productivity gains from APC's enhanced completion design that was tested in 2017 on the bulk of the company's short and mid-lateral length wells. For select advantaged producers such as APC, we believe the value creation potential from this play is often overlooked. One of the key surprises from our analysis was the magnitude of FCF generation in the 2018 to 2021 period given the high level of production growth. This combination (high production growth and FCF generation) has proven elusive for U.S. shale producers and reflects APC's unique combination of quality rocks in the core, midstream integration, and minerals ownership. While regulatory concerns could be heightened given the looming election cycle, we continue to see an attractive risk-reward in APC shares. We reiterate our OW rating and \$72 per share price target.

- **DJ Basin is core "franchise asset" for APC:** One of the most important characteristics of a successful E&P company is the ownership of core franchise assets that provide an inventory of low-cost and low-risk development drilling opportunities. APC holds interests in 335K acres in the DJ Basin. APC estimates 4,000 undrilled locations in the DJ Basin, including 3,100 locations in the contiguous core. Based on the company's new completion design, we see 89% wellhead IRRs for the company's acreage in the core.
- **Elusive combination of high oil growth and FCF generation supports cash return strategy:** One of the key findings in our analysis is the magnitude of growth and FCF generation the company should be able to generate from its DJ Basin franchise asset. In 2018, we forecast \$1.6 billion in FCF, rising to \$1.8 billion in 2019 and 2020 at the strip. In 2021, we expect APC's DJ Basin asset to contribute more than \$2.0 billion in asset level FCF. The strong FCF generation profile is especially impressive given our expectation of 18% per annum oil growth from 2018 through 2020. We see 10% oil growth in 2021.

#### Anadarko Petroleum Corporation (APC;APC US)

| FYE Dec               | 2015A  | 2016A  | 2017A  | 2018E | 2019E |
|-----------------------|--------|--------|--------|-------|-------|
| Adjusted EPS (\$)     |        |        |        |       |       |
| Q1 (Mar)              | (0.72) | (1.12) | (0.60) | 0.32  | 0.67  |
| Q2 (Jun)              | 0.01   | (0.60) | (0.77) | 0.46  | 0.49  |
| Q3 (Sep)              | (0.70) | (0.89) | (0.77) | 0.53  | 0.44  |
| Q4 (Dec)              | (2.46) | (0.49) | 0.20   | 0.63  | 0.55  |
| FY                    | (3.88) | (3.07) | (1.96) | 1.93  | 2.14  |
| Bloomberg EPS FY (\$) | -2.49  | -3.05  | -2.04  | 1.64  | 1.76  |

Source: Company data, Bloomberg, J.P. Morgan estimates.

## Overweight

APC, APC US

Price: \$64.06

Price Target: \$72.00

### Large Cap Oil & Gas Exploration & Production

Arun Jayaram <sup>AC</sup>

(1-212) 622-8541

arun.jayaram@jpmorgan.com

Bloomberg JPMA JAYARAM <GO>

Ashish Rath

(1-212) 834-7587

ashish.rath@jpmorgan.com

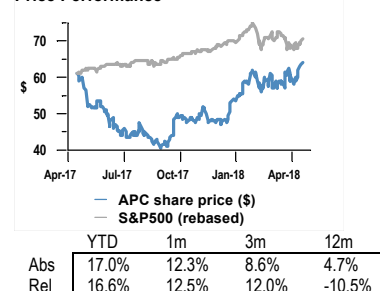
Sachin Sharma

(1-212) 622-1304

sachin.1.sharma@jpmorgan.com

J.P. Morgan Securities LLC

#### Price Performance



#### Company Data

|                       |             |
|-----------------------|-------------|
| Price (\$)            | 64.06       |
| Date Of Price         | 17 Apr 18   |
| 52-week Range (\$)    | 64.37-39.96 |
| Market Cap (\$ mn)    | 33,011.91   |
| Fiscal Year End       | Dec         |
| Shares O/S (mn)       | 515         |
| Price Target (\$)     | 72.00       |
| Price Target End Date | 31-Dec-18   |

#### See page 31 for analyst certification and important disclosures.

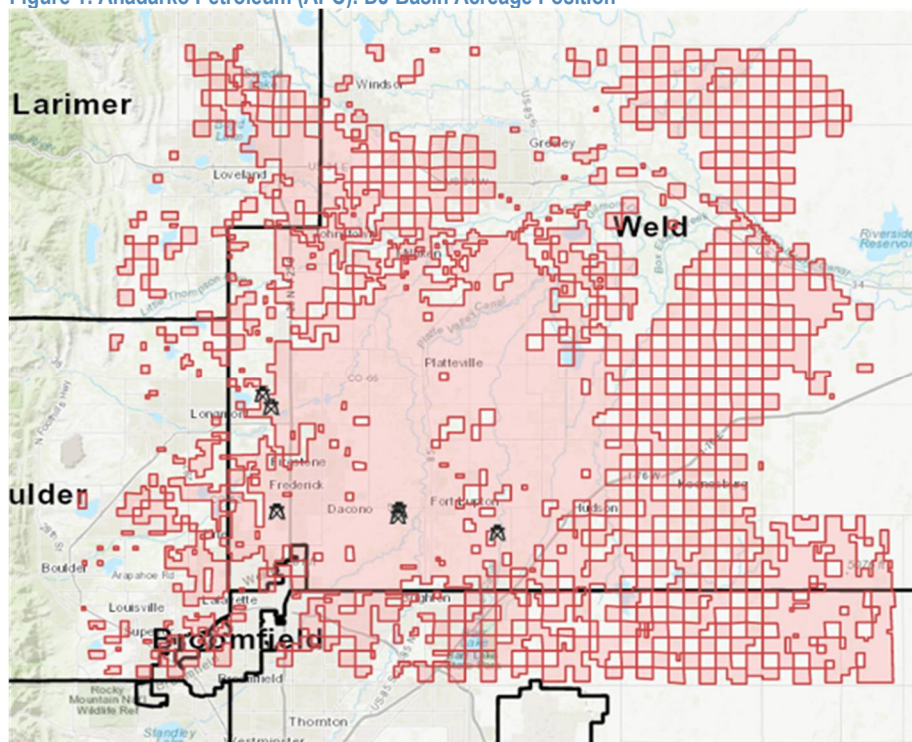
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- **Optimized completions in the DJ Basin should support more capital efficient growth.** In 2017, the bulk of APC's shorter and mid-lateral length wells utilized a new completion design. In Figure 19, we plot cumulative production from APC's DJ Basin completions online since January 2017. As a whole, the company's program on a lateral length adjusted basis is trending consistent with the company's 690 MBoe type curve. That said, note the number of completions with limited production history (i.e., less than 4 months) that are substantially outpacing the company's 690 MBoe type curve. In 2018, we expect APC to apply its new completion design to extended reach laterals, which could provide upside if successful as the company's DJ Basin production forecast only bakes in historical performance for extended reach laterals.
- **Midstream integration is benefitting APC's upstream:** Anadarko's upstream integration with Western Gas has helped provide timely well connections as well as the lowest line pressures in the basin. As shown in Figure 41, APC's oil takeaway capacity in DJ is forecasted to grow to 150 MBo/d by year-end 2019, which is in-line with our estimated production growth rate. Gas processing capacity is expected to grow from 1.1 Bcf/d today to 1.6 Bcf/d by year end 2019. We believe this midstream alignment should help to de-risk the company's lofty growth outlook.

## DJ Basin Deep Dive

Since 2017, a common characteristic of upstream winners have been companies that have successfully transitioned to FCF stories or executed balanced capital allocation programs. We continue to believe this theme has legs and could continue to differentiate the stocks, particularly the large caps. APC's reshaped asset base through active portfolio management has an optimal mix of stable conventional production (low sustaining capex and high margins) and unconventional (high growth rates from DJ and Delaware Basins) to deliver attractive debt adjusted growth and significant free cash flow. Figure 1 illustrates the company's DJ Basin acreage position.

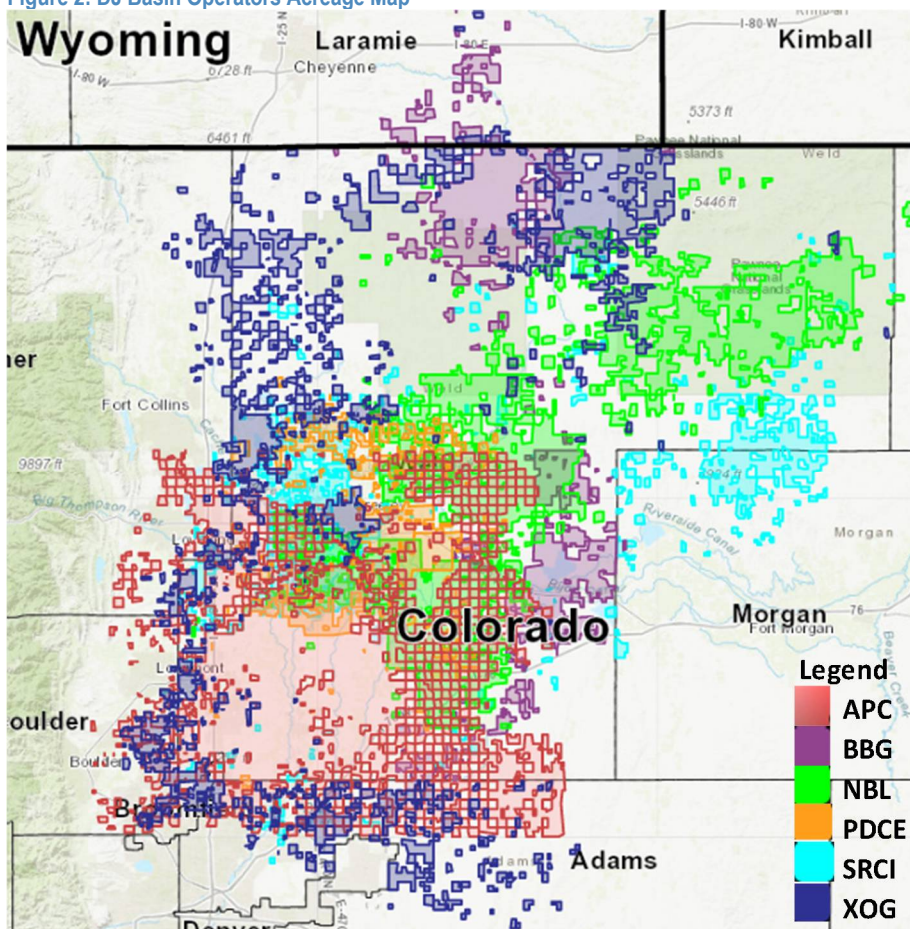
Figure 1: Anadarko Petroleum (APC): DJ Basin Acreage Position



Source: Drilling Info.

The acreage map in Figure 2 highlights APC's acreage position in the DJ Basin relative to the peer group. The core of APC's position is in the southwest portion of Weld County. APC's position is south of PDCE, SRCI, and XOG, while NBL is situated to the northeast of Anadarko.

Figure 2: DJ Basin Operators Acreage Map



Source: Drilling Info. Note: APC – Red, BBG – Violet, NBL – Green, PDCE – Yellow, SRCI – Light Blue, XOG – Dark Blue.

**Minerals ownership supports up to 40% uplift to per well NPVs on sections on the Land Grant**

Figure 3 depicts Anadarko's Land Grant position in the Rockies. Through its 2000 merger with Union Pacific Resources (UPR), APC obtained mineral rights across its Land Grant, which encompasses 8 million acres across Colorado, Wyoming, and Utah. APC's Land Grant traverses several giant U.S. onshore fields, including Wattenberg, the emerging Niobrara play in Laramie County, Wyoming, world class Soda Ash, and Coal deposits. In 2018, Anadarko guided its total Minerals and other revenue at \$190 MM - \$230 MM.



Figure 3: Anadarko's Land Grant



Source: Company reports.

### APC's DJ Basin Acreage in "Core of the Core" of Basin:

Given the impact of decline on growth rates and cash flows, one of the most important characteristics of a successful E&P company is the ownership of core franchise assets that provide an inventory of low-cost and low-risk development drilling opportunities. We utilize several criteria to identify franchise assets:

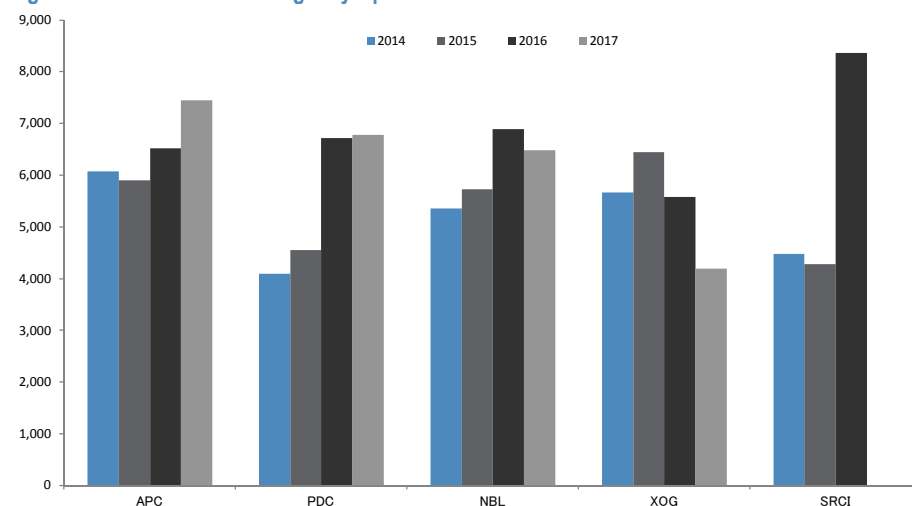
- *Attractive drilling economics:* E&P is a capital-intensive sector where the cash flow from drilling operations fund the next well in inventory. As such, plays with high investment returns above a company's cost of capital are more likely to be considered franchise assets. However, it takes more than just high single-well economics to meet the criteria of a franchise asset.
- *Significant inventories that provide long-run growth visibility:* Franchise assets should provide an abundant inventory of development drilling opportunities.
- *Repeatable set of development opportunities:* Franchise assets should provide a plethora of development drilling opportunities that provide line of sight for growth. As such, plays with limited running room do not qualify.
- *Significant resources in place:* Another positive characteristic of a franchise asset is significant hydrocarbons in place that provide opportunities to increase recovery factors through downspacing or stacked pay development.

We think the DJ Basin fits our "textbook" definition of a U.S. shale franchise asset. Anadarko holds interest in over 400K net acres in its core position in the DJ Basin operates over 4,600 vertical wells and 1,400 horizontal wells. Among all DJ Basin operators, Anadarko has the largest DJ Basin acreage position followed by Noble Energy (NBL) at 335K net acres. Anadarko's DJ Basin position is prospective for the Niobrara and Codell formations, which are naturally fractured formations that hold both liquids and natural gas. APC estimates 4,000 undrilled locations, 2+ BBoe of

net resource potential, and 10+ years of inventory. In sections located on the Land Grant, APC enjoys a ~40% uplift in per well NPVs given its ownership of significant mineral interests.

In Figure 4, we highlight average lateral lengths by DJ Basin operators since January 2017. Based on state data available for 2017, the bulk of the DJ Basin operators are completing wells with average lateral lengths at approximately 6,000 ft. On average, APC drilled the longest laterals in the basin last year at 7,400 ft.

Figure 4: DJ Basin Lateral Length by Operator

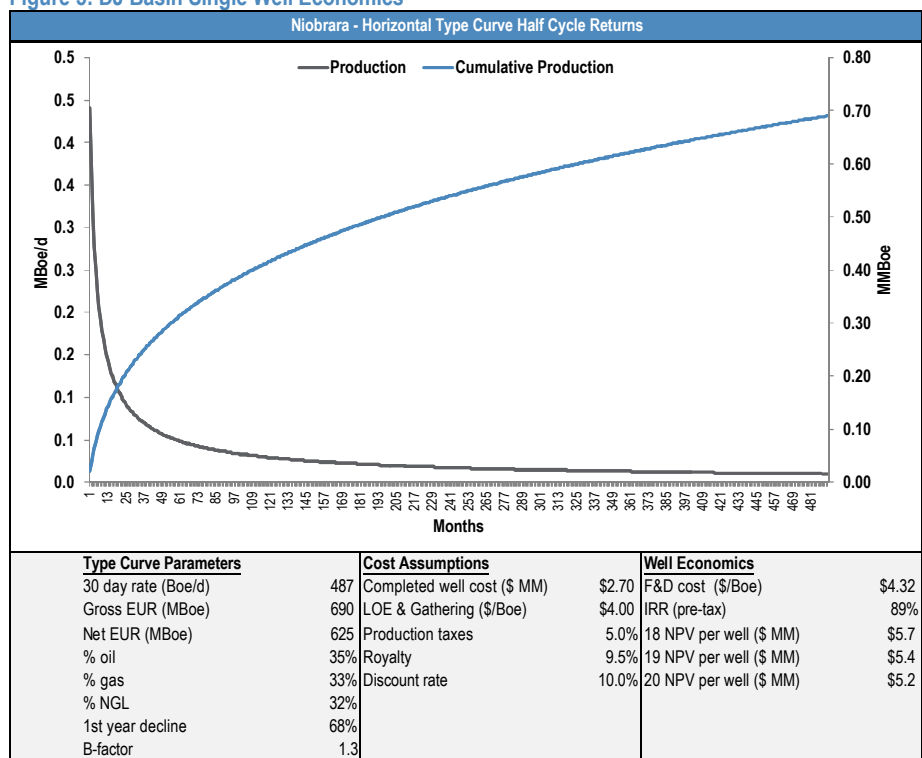


Source: Drilling Info.

#### Attractive single well economics in the contiguous core

In Figure 5, we highlight our estimates for the single well economics in APC's contiguous core acreage. We estimate type well IRRs of 89% assuming 690 MBoe EURs, which we corroborated with our analysis of production data from optimized wells in 2017 standardized by lateral lengths as shown in Figure 19 (APC's type curve is based on average lateral lengths of 6,700 ft.). APC estimates 3,100 undrilled locations in the contiguous core and 900 locations in the extended development area, which supports lower average EURs of 380 MBoe.

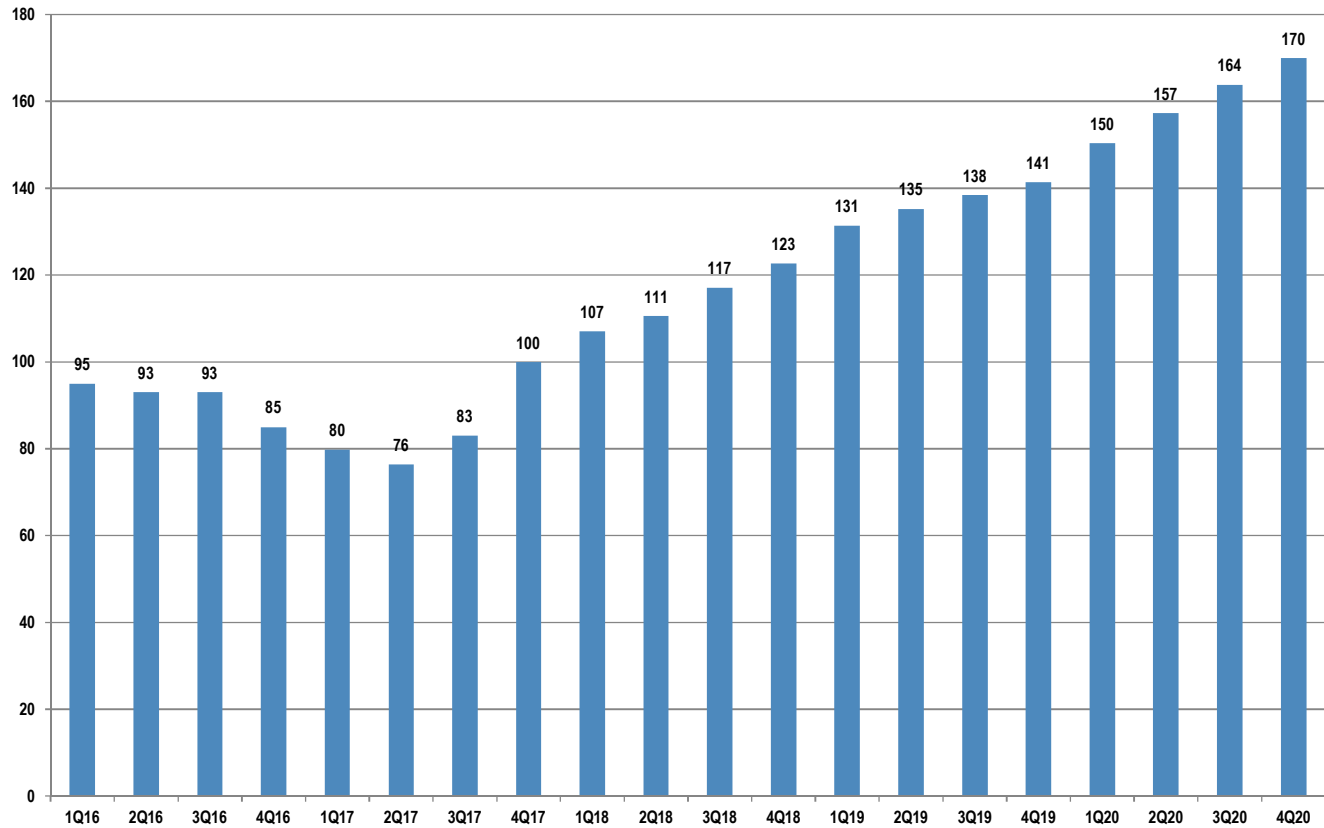
Figure 5: DJ Basin Single Well Economics



Source: J.P. Morgan estimates, Company data.

In the DJ Basin, we expect Anadarko to drill and turn online 300 operated wells in 2018. As a result of which, we expect DJ oil production to grow from 100 MBo/d in 4Q17 to 126 MBo/d in 4Q18, representing 26% YoY growth (see Figure 6). Longer term, we are forecasting an 18% oil growth CAGR in the DJ Basin between 2018 and 2020. Our total production growth estimates on a per boe basis are shown in Figure 7. We are modeling slightly higher capex of \$992 MM in 2018, which is 4% above guidance given higher than anticipated cost inflation.

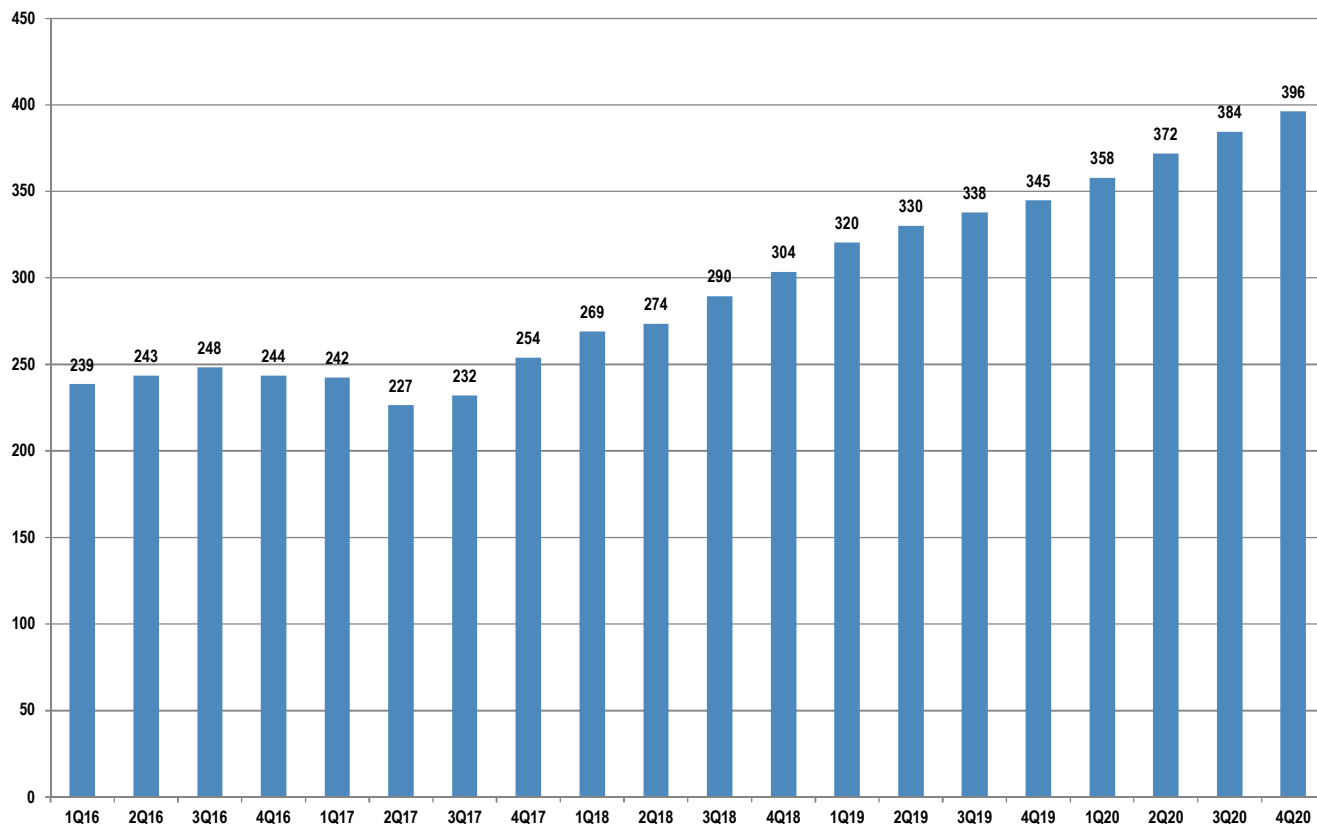
Figure 6: APC - DJ Basin Oil Volume Forecast (MBo/d)



Source: J.P. Morgan estimates.



Figure 7: APC - DJ Basin Total Volume Forecast (MBoe/d)



Source: J.P. Morgan estimates.

Figure 8 illustrates our DJ Basin segment model, which illustrates our revenue, cost, production, and price realization expectations. One of the key findings in our analysis is the magnitude of growth and FCF generation the company should be able to generate from its DJ Basin franchise asset.

Figure 8: APC -DJ Basin Segment Model

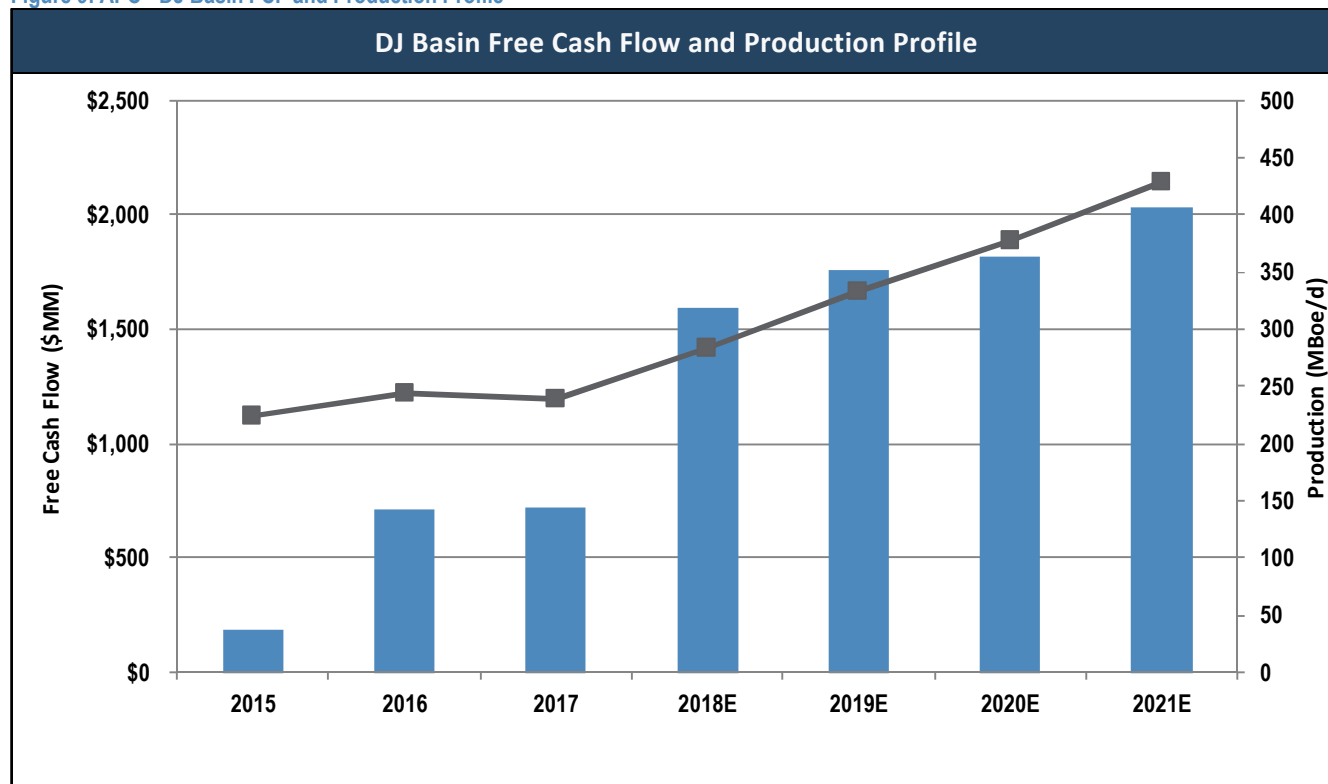
| DJ Basin Summary (Anadarko Petroleum)          | 2015           | 2016           | 2017           | 2018E          | 2019E          | 2020E          | 2021E          |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| JP Morgan Research Estimates                   | Year           | Year           | Year           | Year           | Year           | Year           | Year           |
| <b>Summary Income Statement</b>                |                |                |                |                |                |                |                |
| Oil revenues (\$MM)                            | \$1,590        | \$1,296        | \$1,537        | \$2,567        | \$2,890        | \$3,189        | \$3,490        |
| NGL revenues (\$MM)                            | \$286          | \$389          | \$621          | \$742          | \$780          | \$831          | \$942          |
| Gas revenues (\$MM)                            | \$413          | \$445          | \$586          | \$570          | \$641          | \$696          | \$851          |
| <b>Total DJ Basin revenues (\$MM)</b>          | <b>\$2,289</b> | <b>\$2,130</b> | <b>\$2,744</b> | <b>\$3,879</b> | <b>\$4,311</b> | <b>\$4,716</b> | <b>\$5,283</b> |
| <b>Operating Expenses</b>                      |                |                |                |                |                |                |                |
| Production costs                               | \$670          | \$748          | \$890          | \$1,047        | \$1,229        | \$1,396        | \$1,582        |
| Depreciation, Depletion, and Amortization      | \$1,225        | \$1,334        | \$1,305        | \$1,555        | \$1,825        | \$2,073        | \$2,350        |
| Ad Valorem and Severance Taxes                 | \$153          | \$160          | \$178          | \$242          | \$269          | \$295          | \$330          |
| <b>Total</b>                                   | <b>\$2,049</b> | <b>\$2,241</b> | <b>\$2,374</b> | <b>\$2,844</b> | <b>\$3,323</b> | <b>\$3,764</b> | <b>\$4,262</b> |
| Pre-Tax Income                                 | \$240          | -\$111         | \$370          | \$1,034        | \$989          | \$952          | \$1,021        |
| Less: Income taxes                             | \$0            | \$0            | \$0            | \$0            | \$0            | \$0            | \$0            |
| <b>Net Income</b>                              | <b>\$240</b>   | <b>-\$111</b>  | <b>\$370</b>   | <b>\$1,034</b> | <b>\$989</b>   | <b>\$952</b>   | <b>\$1,021</b> |
| <b>Summary Cash Flow Statement</b>             |                |                |                |                |                |                |                |
| Discretionary Cash Flow                        |                |                |                |                |                |                |                |
| Adjusted Net Income                            | \$240          | -\$111         | \$370          | \$1,034        | \$989          | \$952          | \$1,021        |
| DD&A   | \$1,225        | \$1,334        | \$1,305        | \$1,555        | \$1,825        | \$2,073        | \$2,350        |
| <b>Discretionary Cash Flow from Operations</b> | <b>\$1,465</b> | <b>\$1,222</b> | <b>\$1,675</b> | <b>\$2,589</b> | <b>\$2,813</b> | <b>\$3,025</b> | <b>\$3,371</b> |
| <b>CAPEX</b>                                   | <b>\$1,282</b> | <b>\$511</b>   | <b>\$955</b>   | <b>\$992</b>   | <b>\$1,052</b> | <b>\$1,208</b> | <b>\$1,341</b> |
| <b>Free Cash Flow</b>                          | <b>\$183</b>   | <b>\$711</b>   | <b>\$720</b>   | <b>\$1,598</b> | <b>\$1,762</b> | <b>\$1,817</b> | <b>\$2,030</b> |
| <b>Operating Summary</b>                       |                |                |                |                |                |                |                |
| Realized Prices                                |                |                |                |                |                |                |                |
| Oil realization (\$/Bbl)                       | \$45.00        | \$39.06        | \$49.63        | \$61.49        | \$57.94        | \$54.35        | \$54.36        |
| NGL realization (\$/Bbl)                       | \$17.03        | \$19.33        | \$29.21        | \$32.54        | \$29.17        | \$27.33        | \$27.32        |
| Gas realization (\$/Mcfe)                      | \$2.36         | \$2.04         | \$2.82         | \$2.43         | \$2.38         | \$2.36         | \$2.45         |
| Daily Production                               |                |                |                |                |                |                |                |
| Oil production (Mbb/d)                         | 97             | 92             | 85             | 114            | 137            | 160            | 176            |
| NGL production (Mbb/d)                         | 46             | 55             | 58             | 62             | 73             | 83             | 94             |
| Gas production (MMcfe/d)                       | 486            | 585            | 576            | 643            | 740            | 805            | 952            |
| <b>Total Production (MBoe/d)</b>               | <b>224</b>     | <b>244</b>     | <b>238</b>     | <b>284</b>     | <b>333</b>     | <b>378</b>     | <b>429</b>     |
| % Growth (YoY)                                 |                | 8.9%           | -2.1%          | 19.1%          | 17.4%          | 13.3%          | 13.6%          |
| % Oil Growth (YoY)                             |                | -5.4%          | -7.7%          | 35.3%          | 19.5%          | 17.4%          | 9.7%           |
| Production Summary                             |                |                |                |                |                |                |                |
| Oil production (MMBo)                          | 35             | 33             | 31             | 42             | 50             | 59             | 64             |
| NGL production (MMBo)                          | 17             | 20             | 21             | 23             | 27             | 30             | 34             |
| Gas production (Bcf)                           | 177            | 214            | 210            | 235            | 270            | 295            | 348            |
| <b>Total production (MMBoe)</b>                | <b>82</b>      | <b>89</b>      | <b>87</b>      | <b>104</b>     | <b>122</b>     | <b>138</b>     | <b>157</b>     |
| % Oil  | 43%            | 38%            | 35%            | 40%            | 41%            | 42%            | 41%            |
| % NGL  | 21%            | 22%            | 24%            | 22%            | 22%            | 22%            | 22%            |
| % Gas  | 36%            | 40%            | 40%            | 38%            | 37%            | 36%            | 37%            |

Source: J.P. Morgan estimates, Company data.

In 2018, we are forecasting \$1.6 billion in cash flow, rising to \$1.8 billion in 2019 and 2020 at the strip. In 2021, we expect APC's DJ Basin asset to contribute more than \$2.0 billion in asset level FCF. The strong FCF generation profile is especially

impressive given the magnitude of our oil growth production forecasts of 35%, 20%, and 17% in 2018, 2019, and 2020, respectively.

Figure 9: APC - DJ Basin FCF and Production Profile

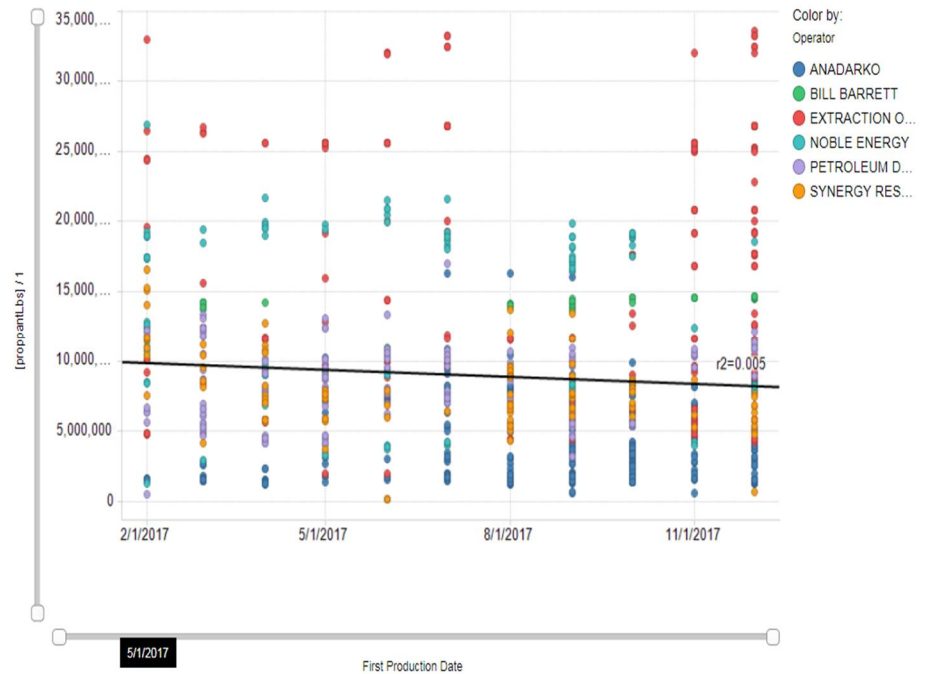


Source: J.P. Morgan estimates, Company data.

## Well Productivity Analysis

In Figure 10, we highlight average proppant intensity by operator. On a historical basis, APC's proppant intensity has lagged other DJ Basin operators as APC has been solving for the optimal combination of cost vs. completion design that would maximize the highest NPV per section. While larger jobs could contribute to higher initial production rates, this would be offset by higher costs and potentially fewer wells per section. In 2017, Anadarko successfully changed its completion design on Niobrara short and medium laterals with encouraging results. The new design involves higher fracture stimulation intensity driven by increased fluid volumes and tighter stage spacing. In 2017, the bulk of APC's shorter and mid-lateral length wells utilized a new completion design.

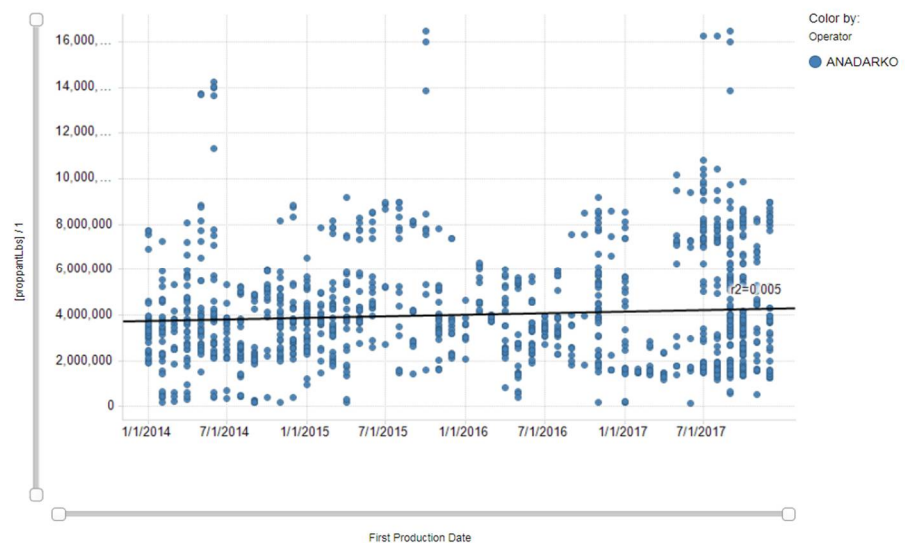
Figure 10: Proppant Intensity by DJ Basin Operator



Source: Drilling Info.

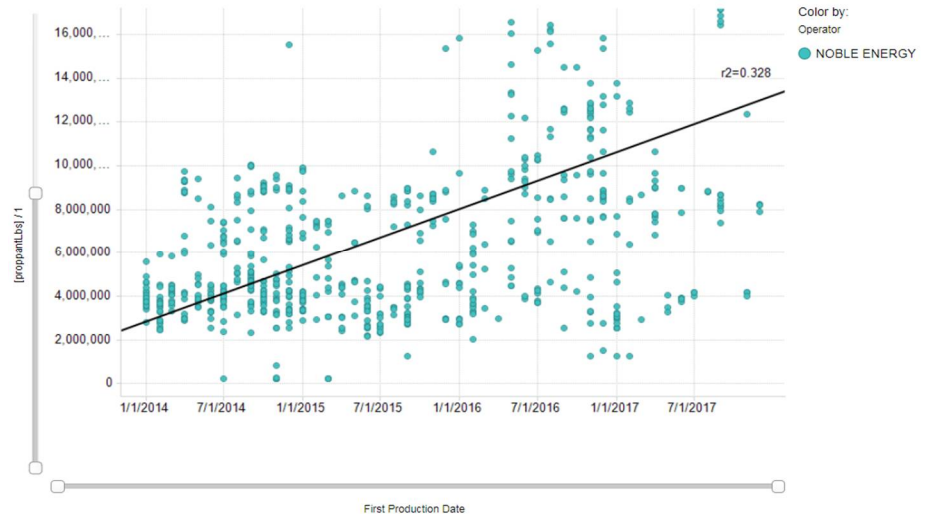
In Figure 11, we show the trajectory of Anadarko's proppant intensity by year. Anadarko's proppant intensity was flattish from 2014 to 2016 before increasing in 2017 in conjunction with the company's new completion design. That said, proppant intensity still lags offset operators such as NBL and XOG (see Figure 12 and Figure 13).

Figure 11: Anadarko's Proppant Intensity by Year



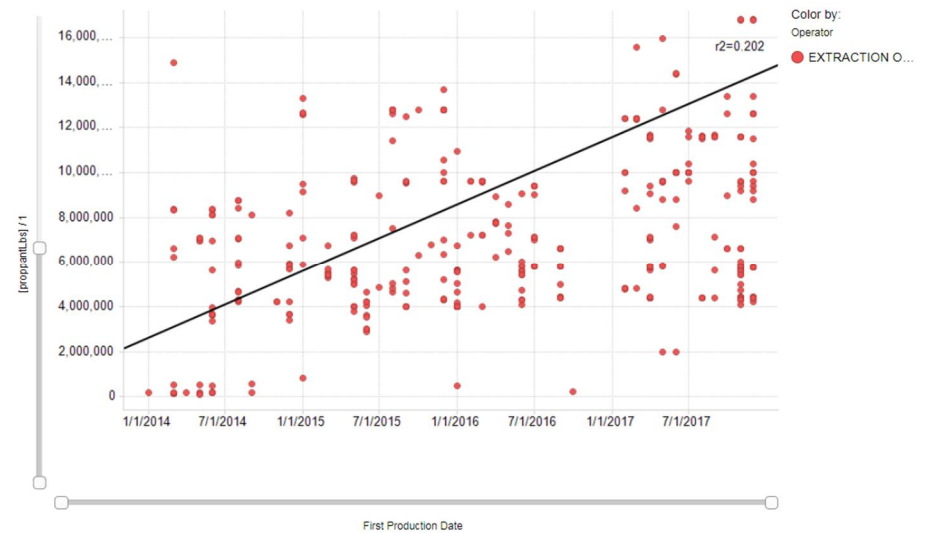
Source: Drilling Info.

Figure 12: Noble Energy's Proppant Intensity by Year



Source: Drilling Info.

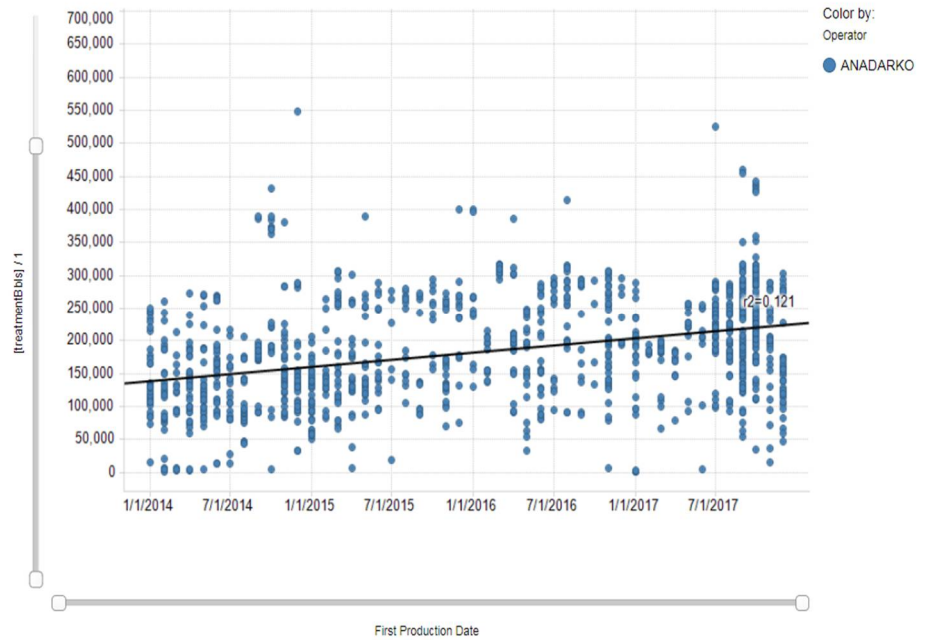
Figure 13: Extraction's Proppant Intensity by Year



Source: Drilling Info.

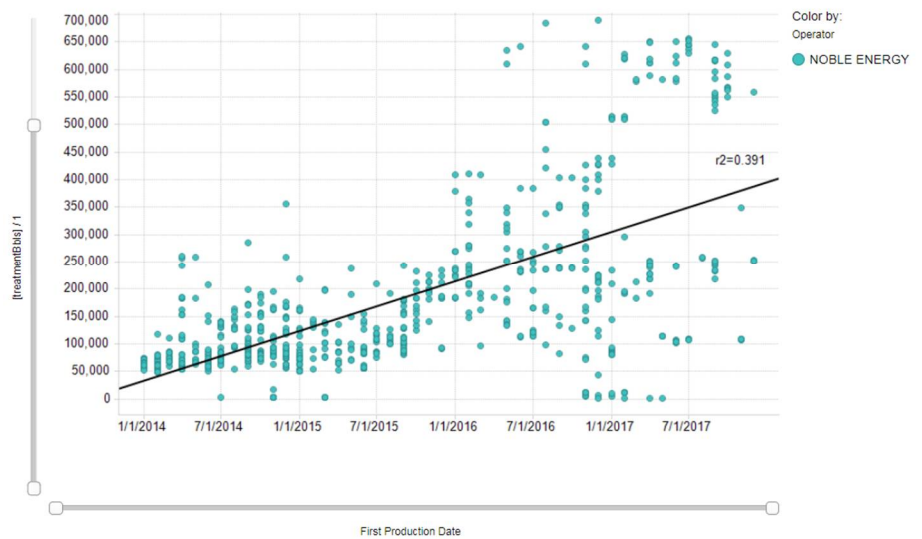
In Figure 14, we highlight the trajectory of Anadarko's fluid intensity by year. APC's fluid intensity was also relatively flat through 2016 before increasing in 2017, although still below NBL and XOG (see Figure 15 and Figure 16).

Figure 14: Anadarko's Fluid Intensity by Year



Source: Drilling Info.

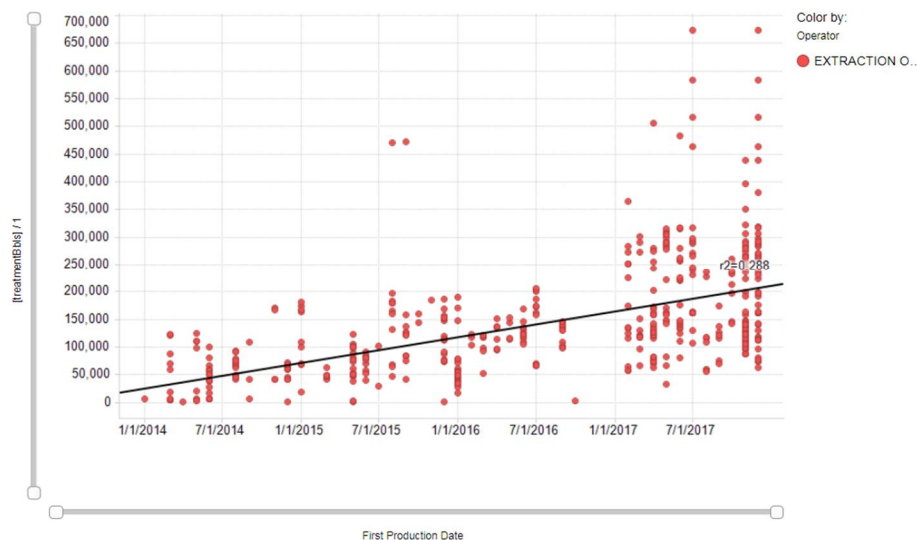
Figure 15: Noble Energy's Fluid Intensity by Year



Source: Drilling Info.



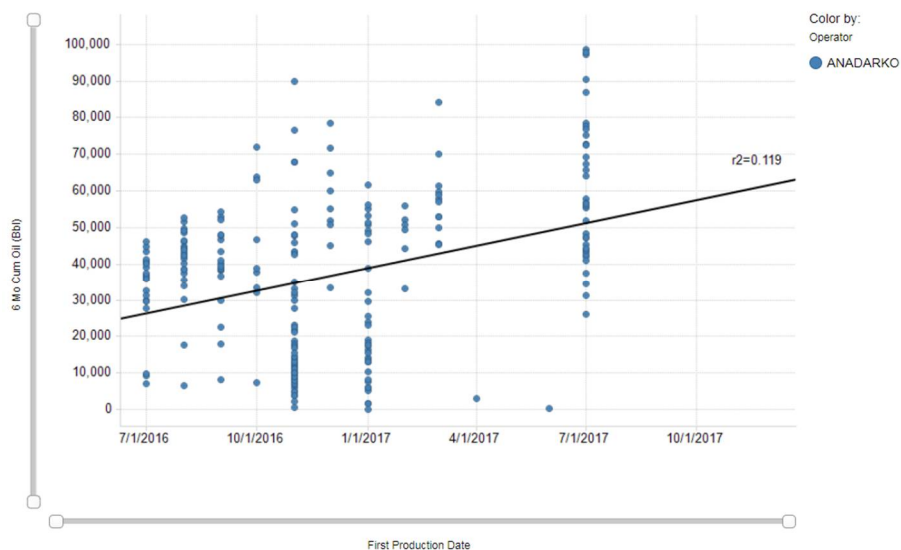
Figure 16: Extraction Oil & Gas Fluid Intensity by Year



Source: Drilling Info.

In Figure 17, we plot 6 month cumulative oil production for Anadarko's DJ Basin program. Note the substantial increase in 6-month oil production that coincides with the implementation of the company's new completion design.

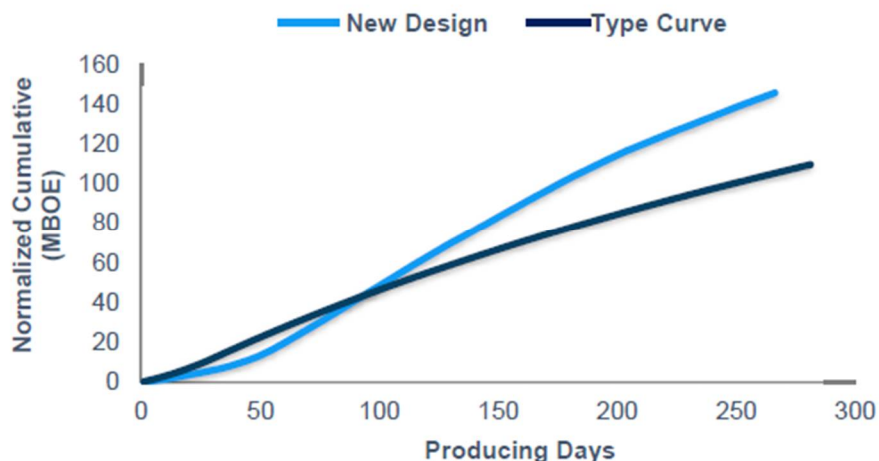
Figure 17: Anadarko 6-month Cumulative Oil Production by Year



Source: Drilling Info.

This is consistent with APC's 3Q17 update, which highlighted a 40% uplift in cumulative oil production as shown in Figure 18.

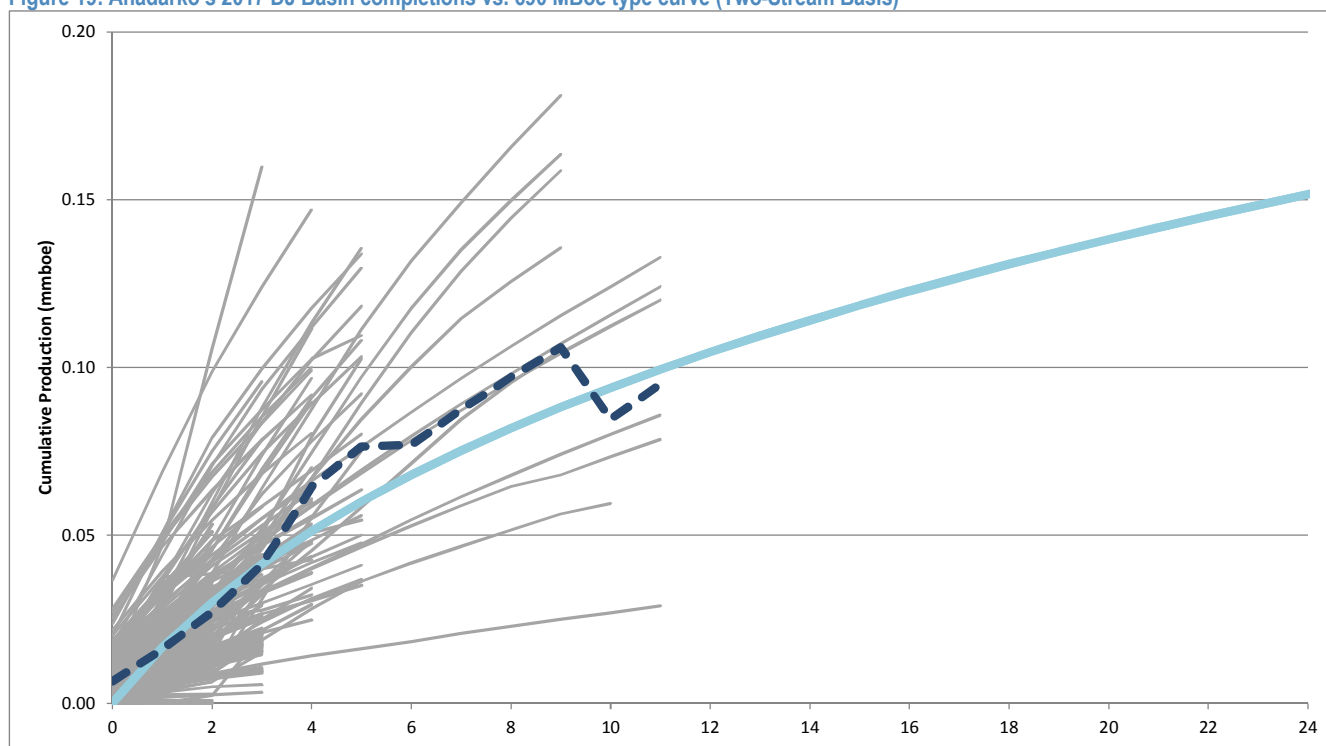
Figure 18: Anadarko's New DJ Basin Design vs. Three-Stream Type Curve



Source: Company reports.

In Figure 19, we plot cumulative production of DJ Basin completions online since January 2017. As a reminder, APC adopted a new completion design for the bulk of its short and mid-lateral length wells in 2017. As a whole, the company's program on a lateral length adjusted basis is trending consistent with the company's type curve. That said, note the number of completions with limited production history (i.e., less than 4 months) that are substantially outpacing the company's 690 MBoe type curve at average lateral lengths of 6,700 ft. In 2018, we expect APC to apply its new completion design to extended reach laterals. We see potential upside to the company's DJ Basin production forecast that only bakes in historical performance for extended reach laterals.

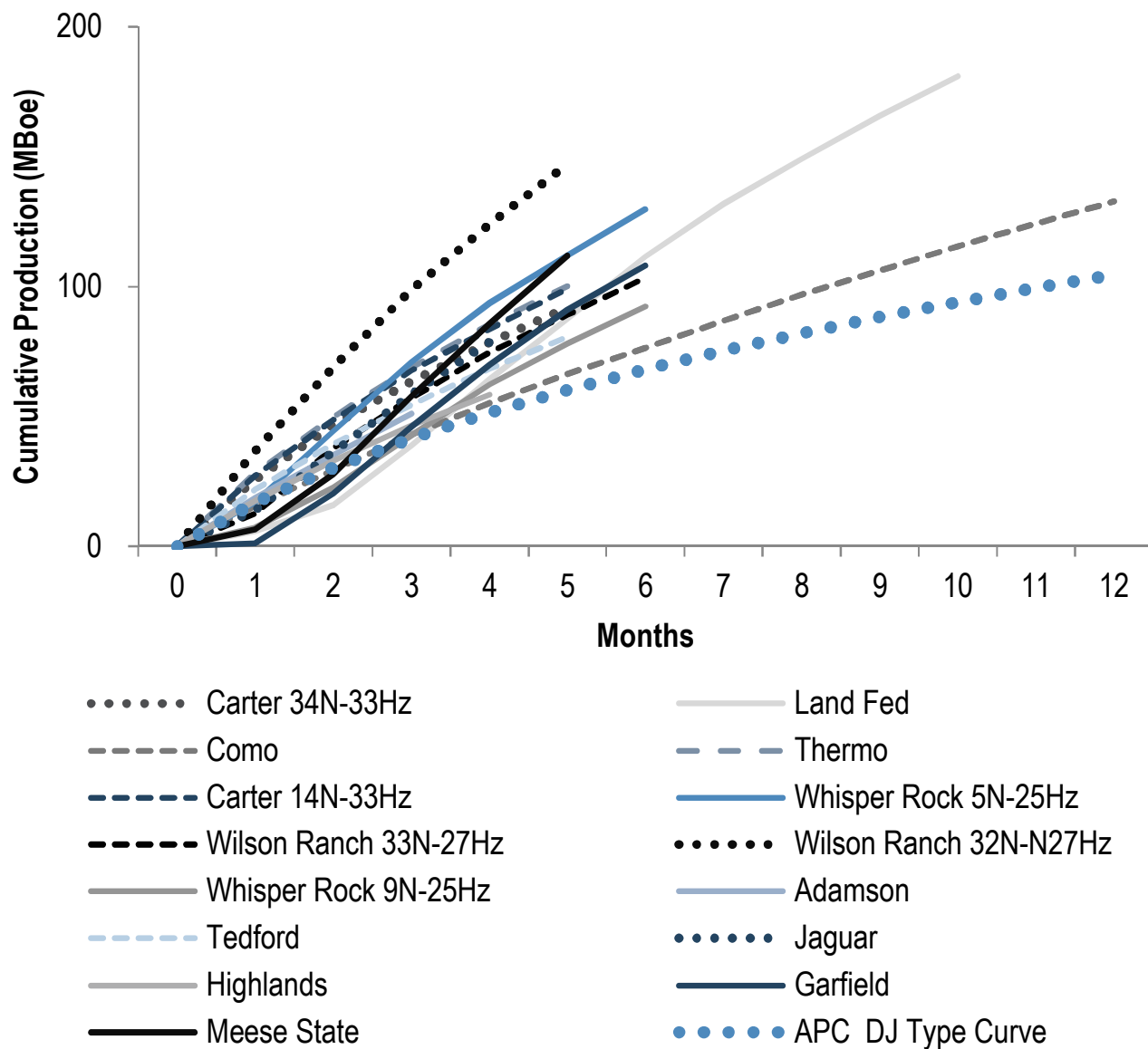
Figure 19: Anadarko's 2017 DJ Basin completions vs. 690 MBoe type curve (Two-Stream Basis)



Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

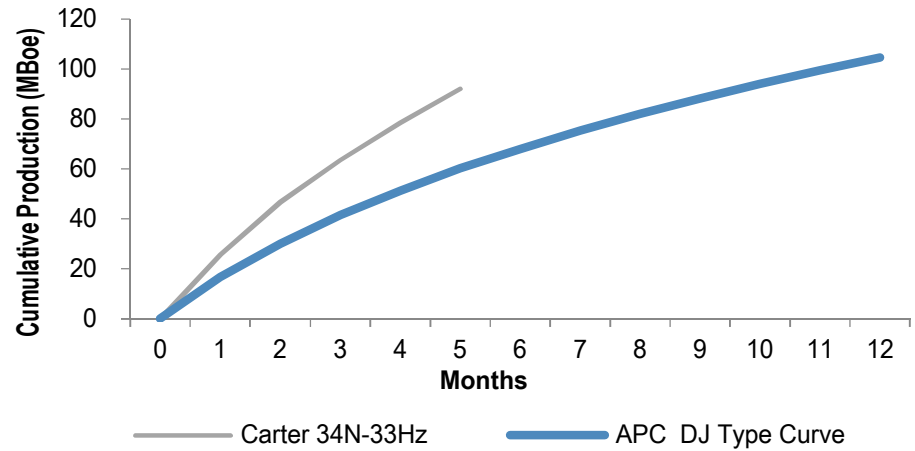
In Figure 20, we highlight results from 15 DJ Basin wells that were completed using the company's enhanced completion design. These include Carter 34N-33Hz, Land Fed, Como, Thermo, Carter 14N-33Hz, Whisper Rock 5N-25Hz, Wilson Ranch 33N-27Hz, Wilson Ranch 32N-N27Hz, Whisper Rock 9N-25Hz, Adamson, Tedford, Jaguar, Highlands, Garfield and Meese State. The individual wells relative to APC's type curve are highlighted in Figure 21 to Figure 35. The wells are meaningfully outperforming the company's type curve.

Figure 20: Anadarko's DJ Basin Optimized Completions vs. Type Curve



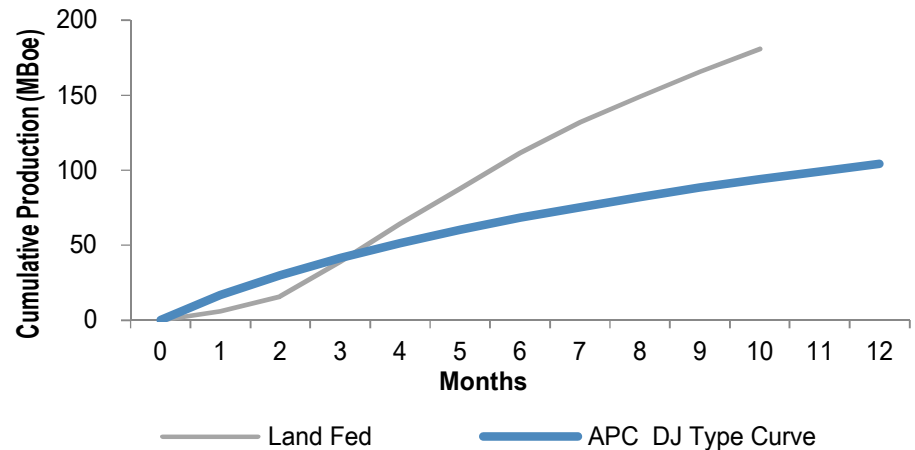
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 21: Carter 34N-33Hz vs APC DJ Basin Type Curve



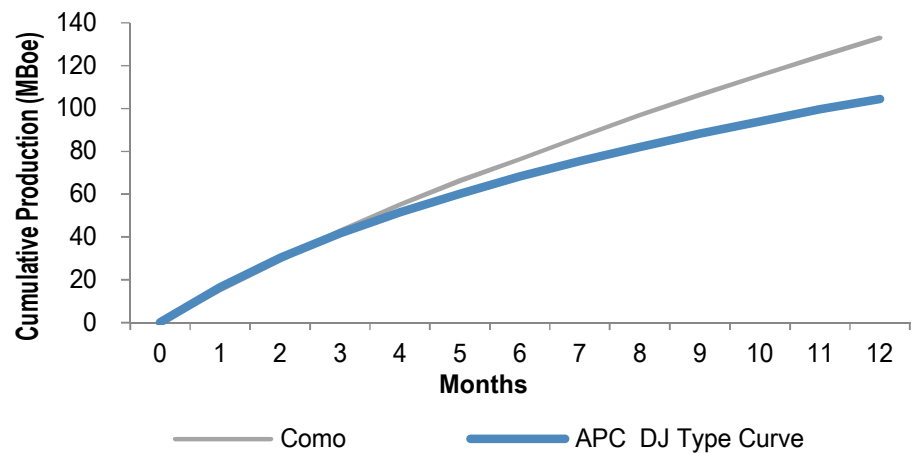
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 22: Land Fed vs APC DJ Basin Type Curve



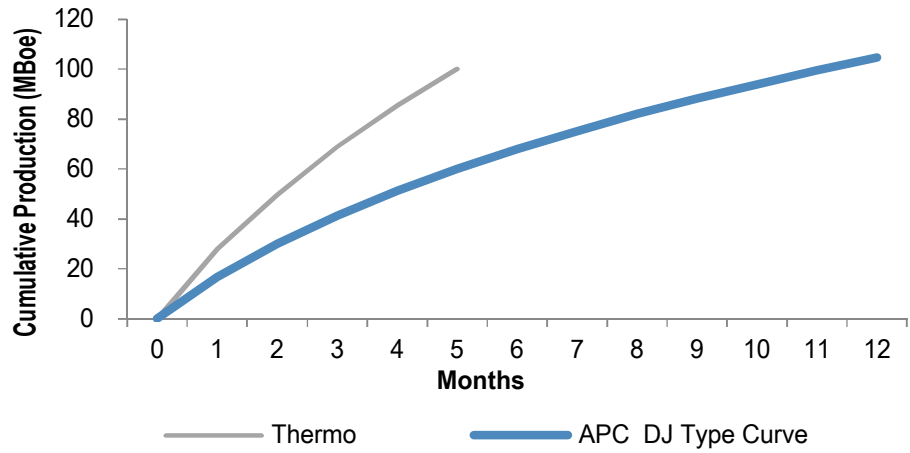
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 23: Como vs APC DJ Basin Type Curve



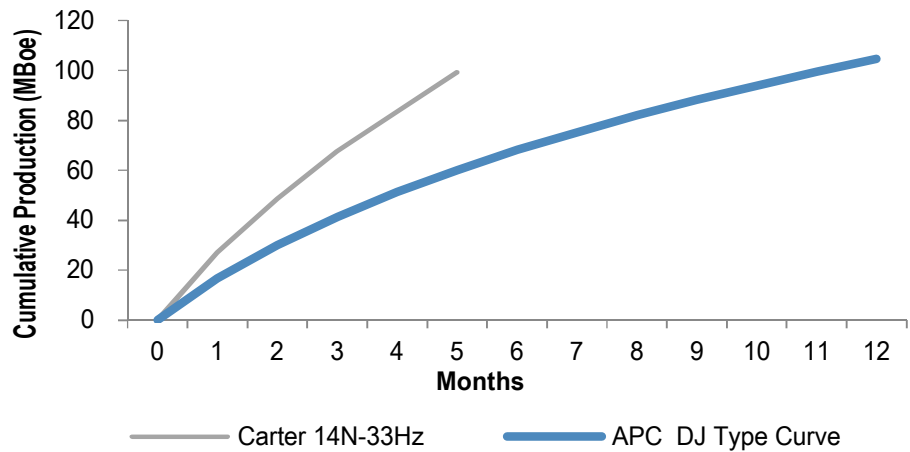
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 24: Thermo vs APC DJ Basin Type Curve



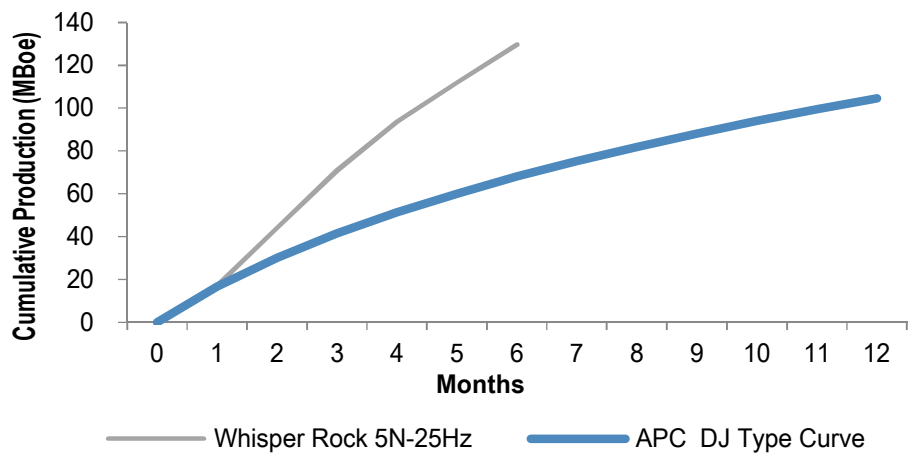
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 25: Carter 14N-33Hz vs APC DJ Basin Type Curve



Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

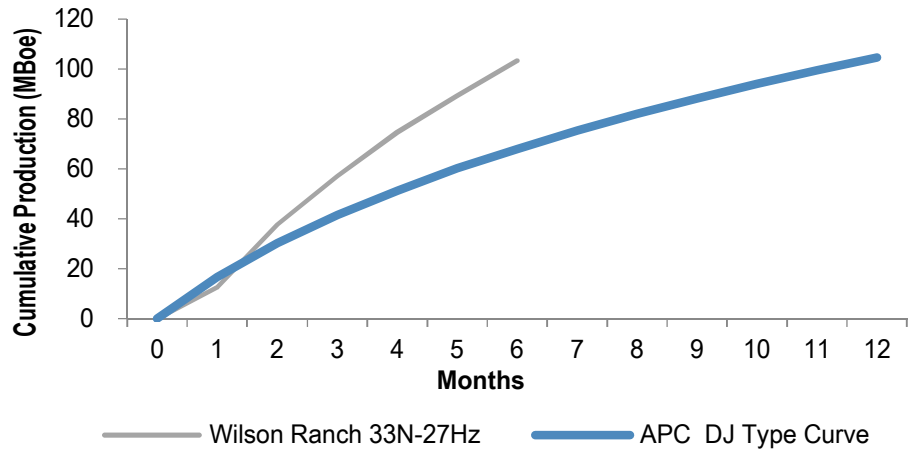
Figure 26: Whisper Rock 5N-25Hz vs APC DJ Basin Type Curve



Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

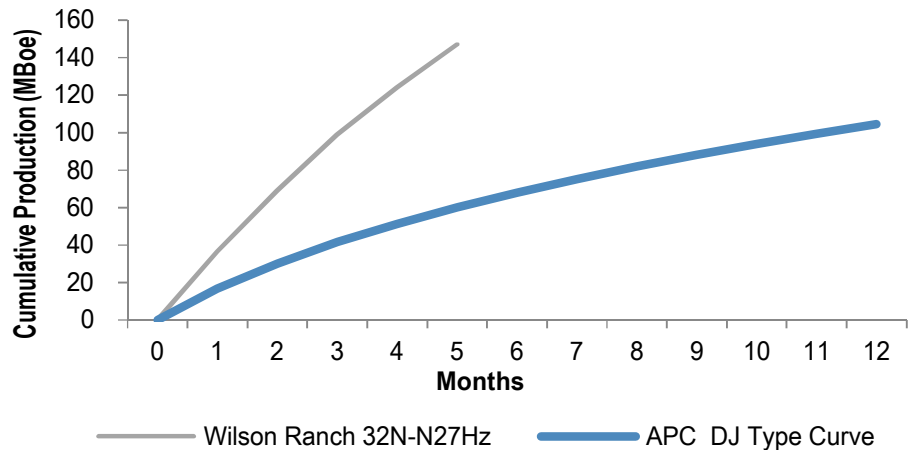


Figure 27: Wilson Ranch 33N-27Hz vs APC DJ Basin Type Curve



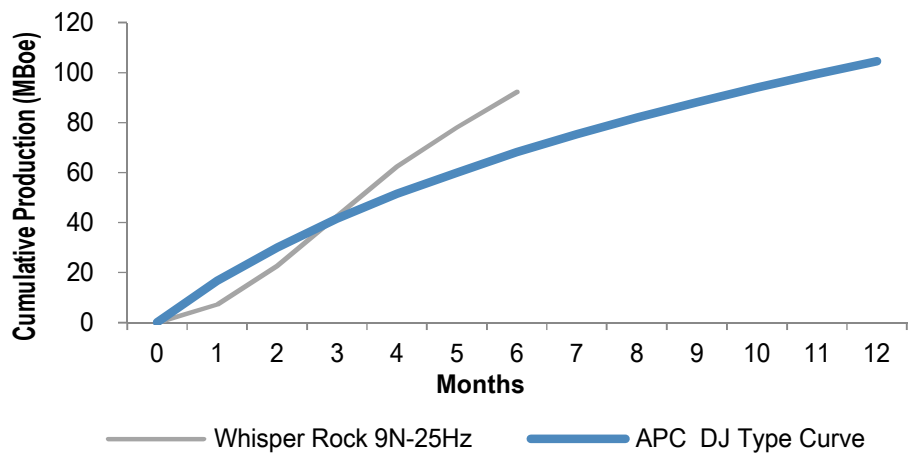
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 28: Wilson Ranch 32N-N27Hz vs APC DJ Basin Type Curve



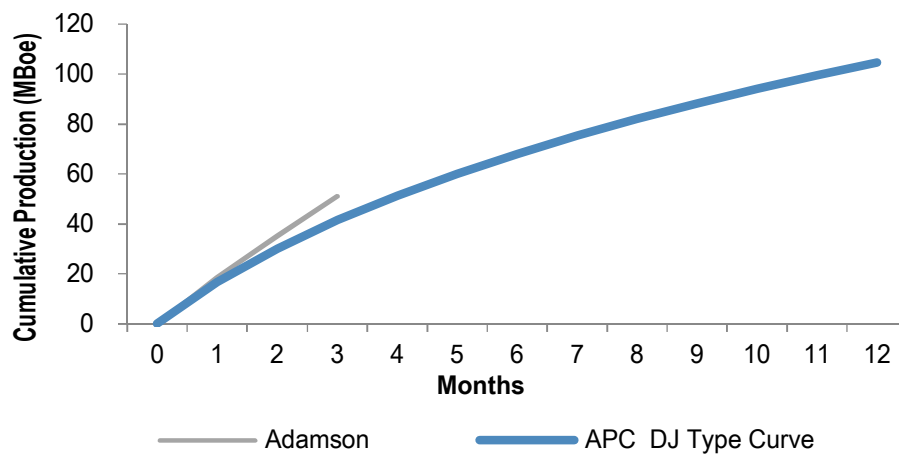
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 29: Whisper Rock 9N-25Hz vs APC DJ Basin Type Curve



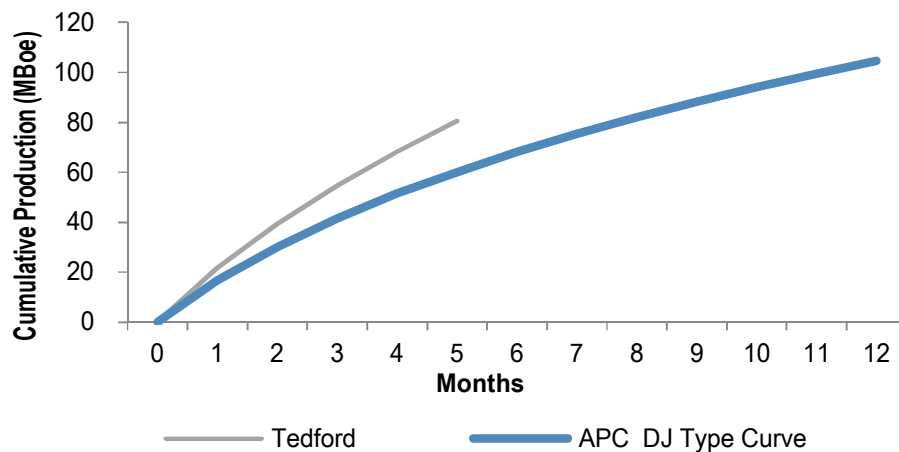
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 30: Adamson vs APC DJ Basin Type Curve



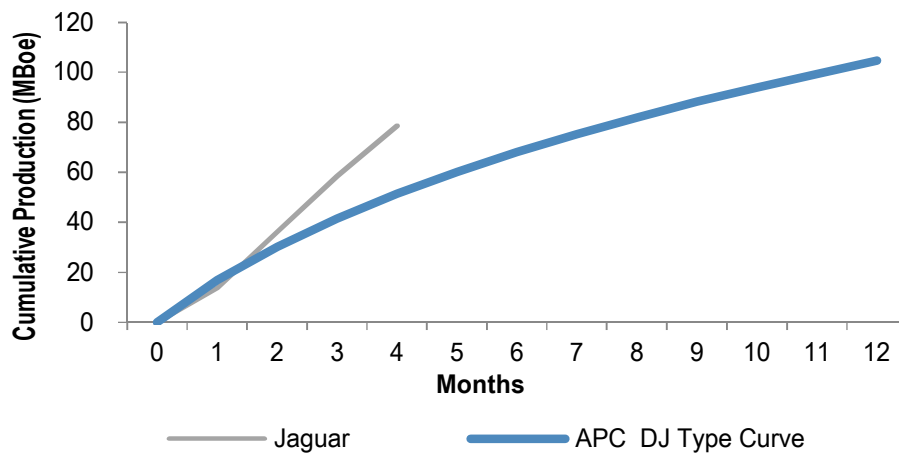
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 31: Tedford vs APC DJ Basin Type Curve



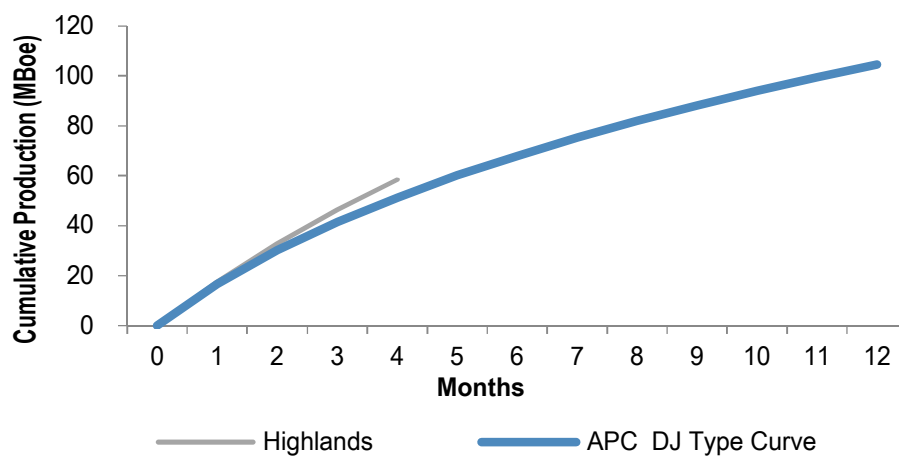
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 32: Jaguar vs APC DJ Basin Type Curve



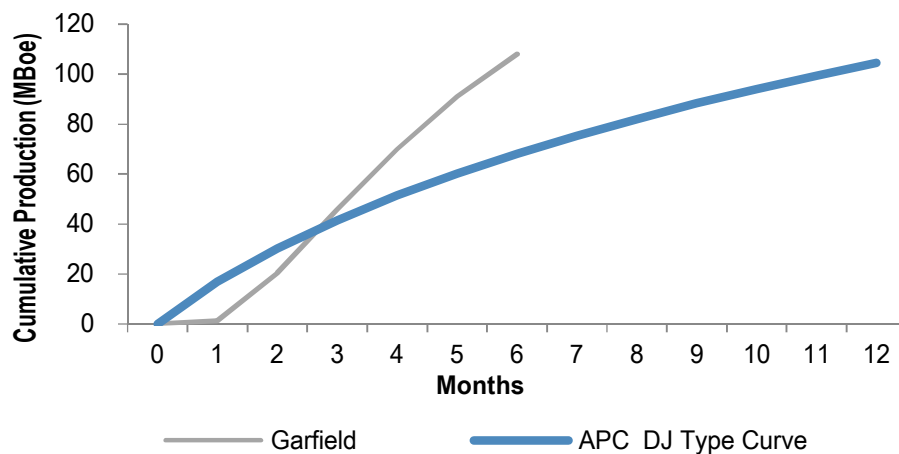
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 33: Highlands vs APC DJ Basin Type Curve



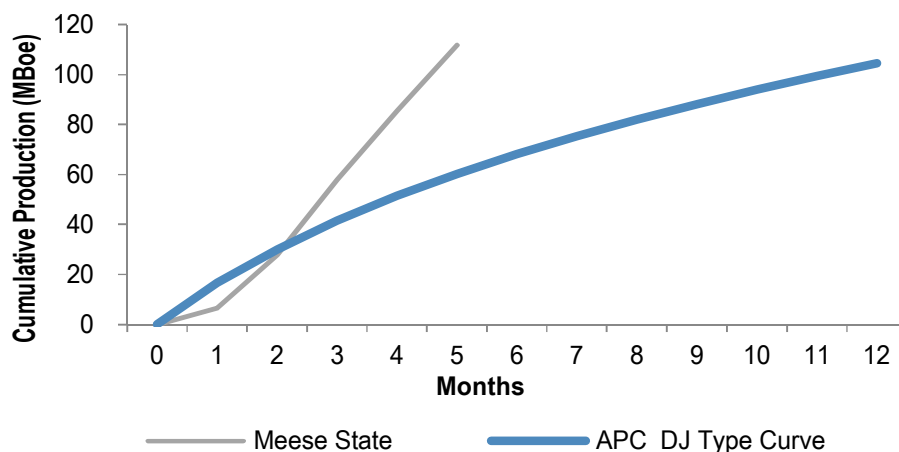
Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

Figure 34: Garfield vs APC DJ Basin Type Curve



Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

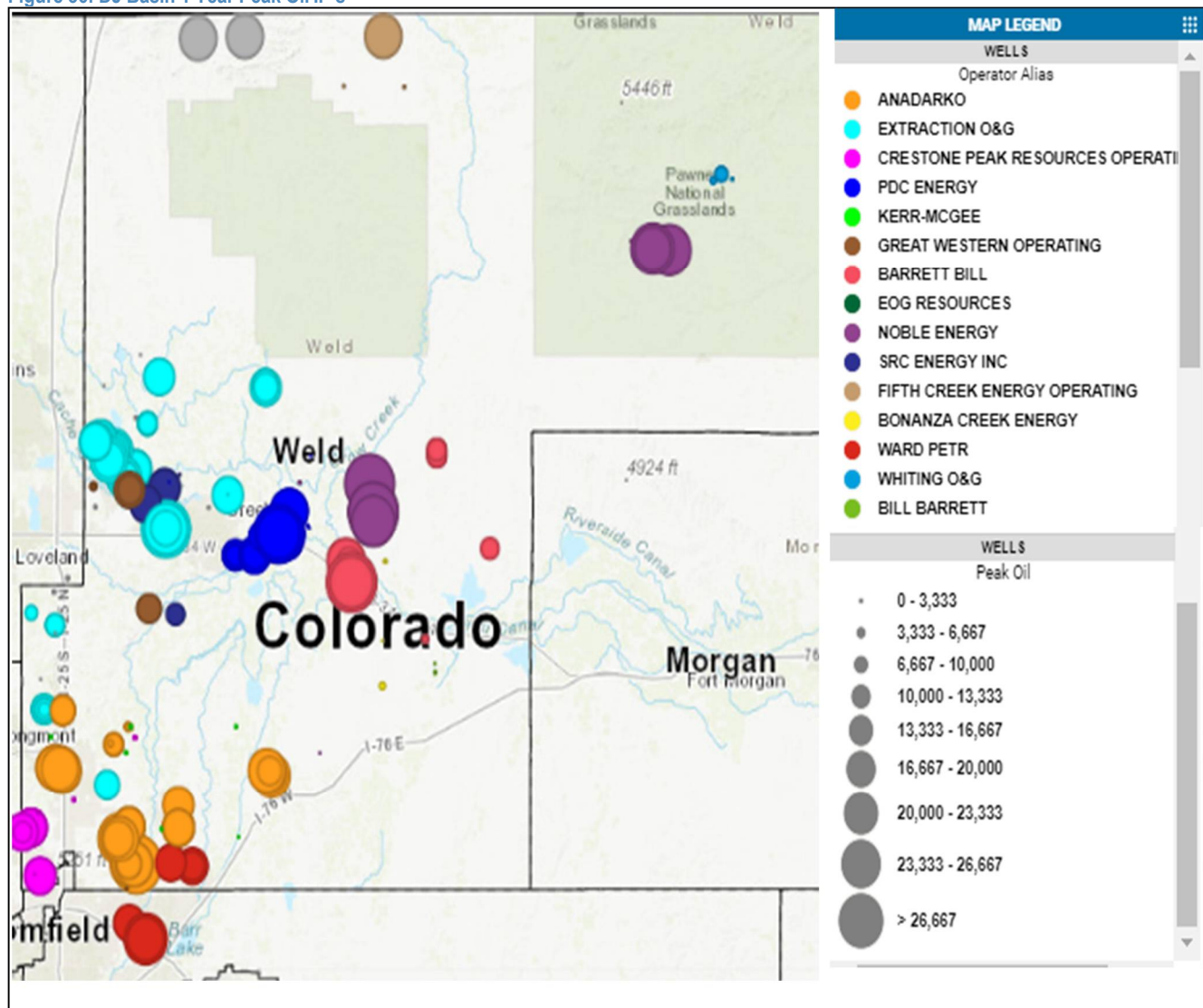
Figure 35: Meese State vs APC DJ Basin Type Curve



Source: J.P. Morgan research, Drilling Info. Note: analysis is based on a two-stream basis (unprocessed DJ Basin type curve)

We plot one-year DJ Basin peak oil IP's in Figure 36. As illustrated in the map, APC is more focused towards the southern and eastern regions of the DJ Basin. Notable operators in the central and eastern parts of the county are NBL, PDC and XOG.

Figure 36: DJ Basin 1 Year Peak Oil IP's

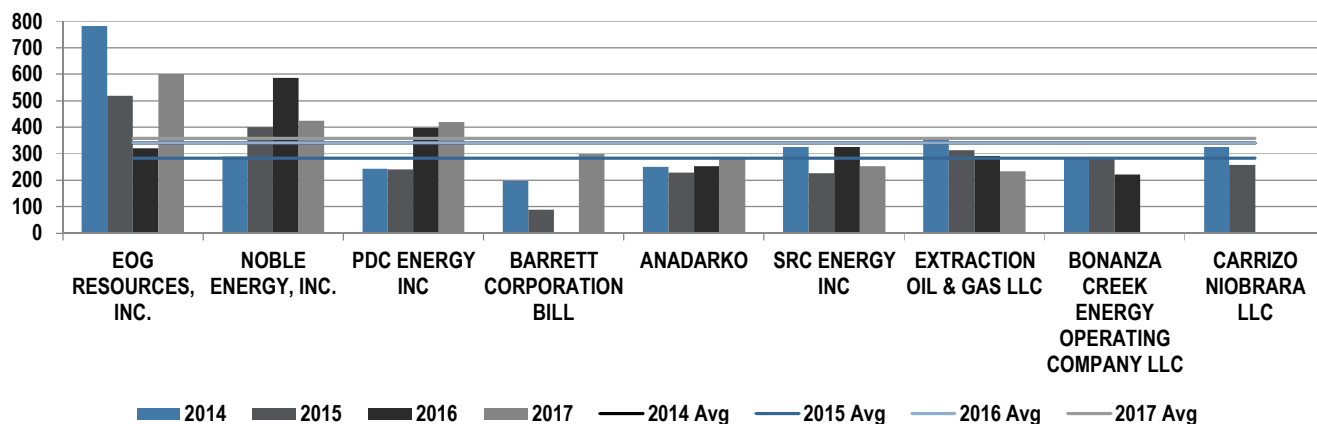


Includes wells from Jan 1st 2017 till date

Source: J.P. Morgan estimates, HPDI.

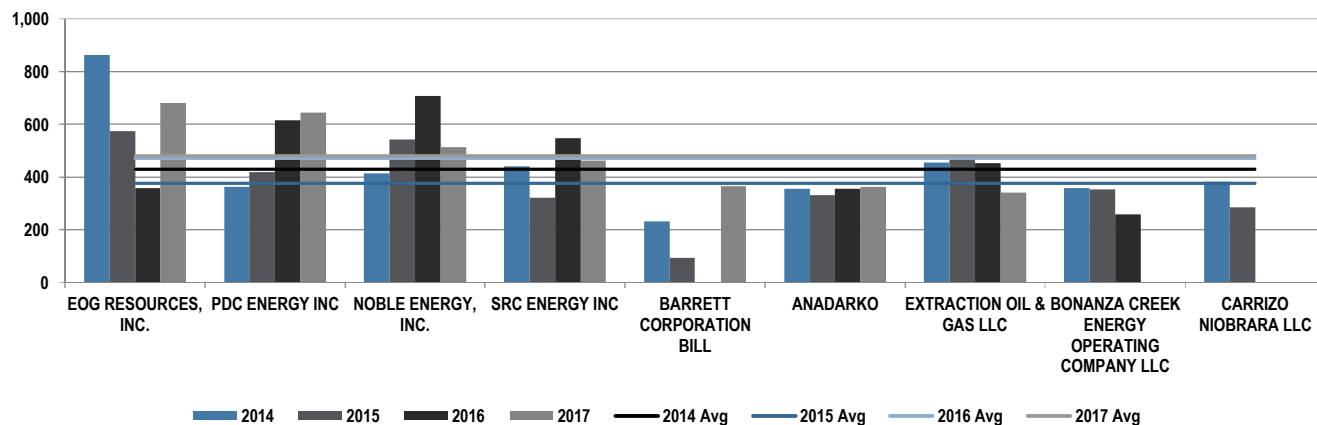
In Figure 37 through Figure 39, we plot initial oil production rates (IP-30s and IP-180s) for DJ Basin operators. In 2017, APC's results are in the middle of the pack relative to its peers given slightly higher GoRs over its acreage position. That said, APC's initial production rates on an IP-30 and IP-180 basis did increase by 11% and 12% above 2016 levels.

Figure 37: DJ Basin: Oil IP-30s (2014 to 2017)



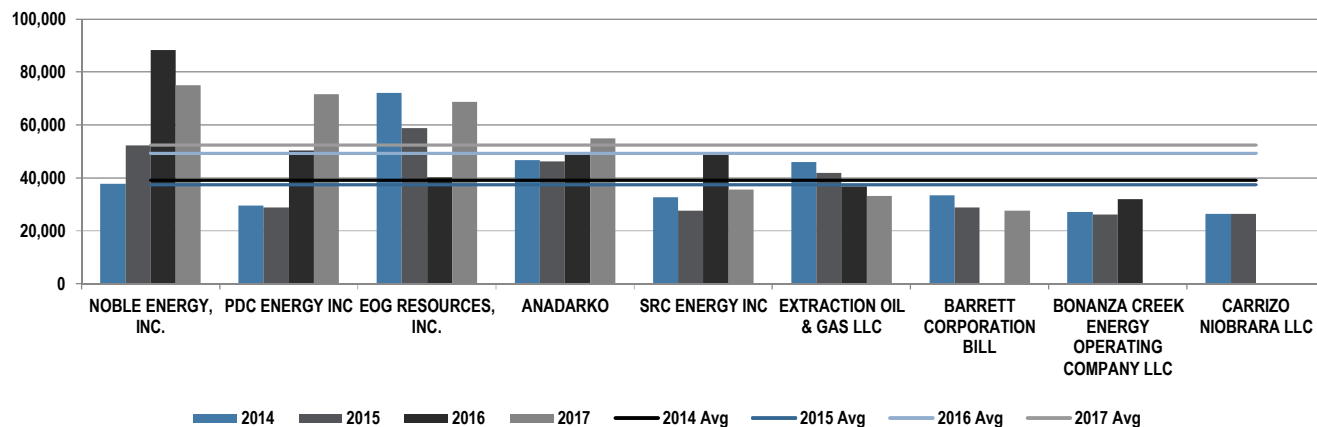
Source: J.P. Morgan estimates, HPDI

Figure 38: DJ Basin: Total IP-30s (2014 to 2017)



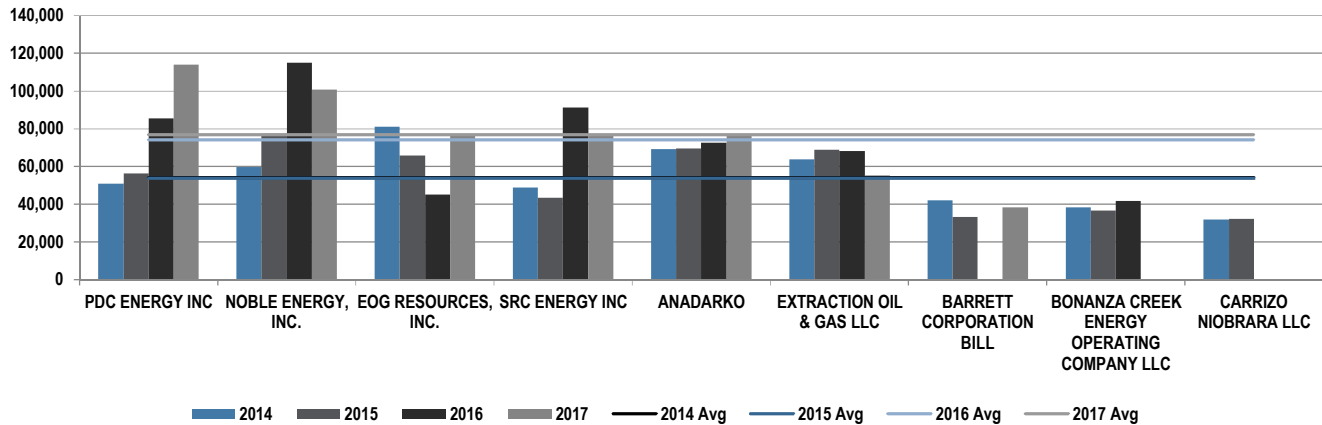
Source: J.P. Morgan estimates, HPDI

Figure 39: DJ Basin: Oil IP-180s (2014 to 2017)



Source: J.P. Morgan estimates, HPDI

Figure 40: DJ Basin: Total IP-180s (2014 to 2017)



Source: J.P. Morgan estimates, HPDI

At a recent competitor conference, Anadarko indicated that the company was moving ~1+ Bcf/d of gas in the DJ Basin at low line pressures. The company sees its integration of its upstream and midstream processes as a key competitive advantage relative to its DJ Basin peers that continue to face line pressure challenges. In certain cases, its peers have been forced to shut-in legacy wells given these chronic line pressure challenges.

In Figure 42, we illustrate how line pressures on the DCP system have remained elevated throughout 2018, with average line pressures of 250 psi in 2017 vs. 130 psi for the APC/WES system. As result, APC's DJ Basin peers are more dependent on DCP's Plant 10 (~200 MMcf/d of capacity) and Plant 11 in mid-2019 to ramp production (see Figure 43). Anadarko's upstream integration with Western Gas has helped provide timely well connections as well as the lowest line pressures in the basin. As shown in Figure 41, APC's oil takeaway capacity in DJ is forecasted to grow to 150 MBo/d by year-end 2019, which is in-line with our estimated growth rate. Gas processing capacity is expected to grow from 1.1 Bcf/d today to 1.6 Bcf/d by year end 2019 (see Figure 41).

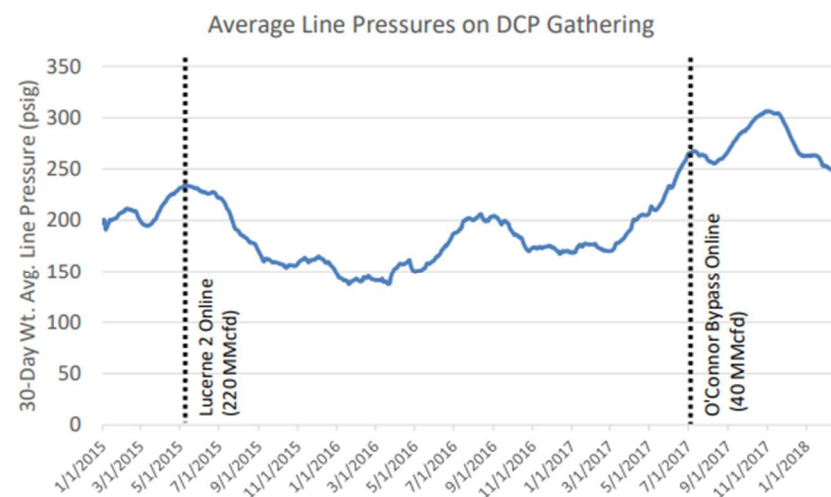


Figure 41: Anadarko DJ Basin Midstream Alignment



Source: Company reports.

Figure 42: DJ Basin Average Line Pressures

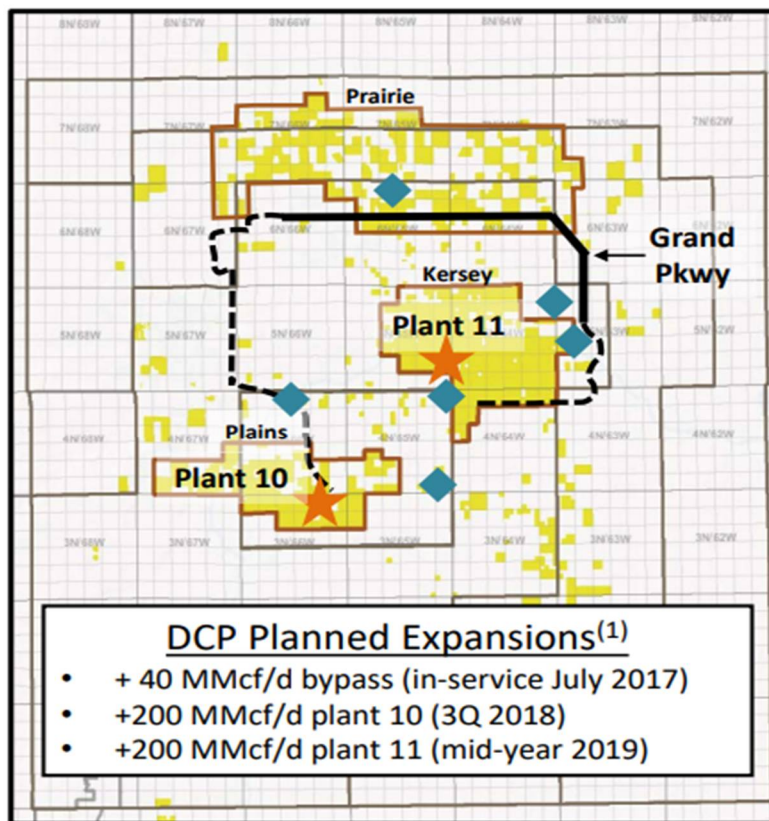


4h 2018

(1) Source: DCP Midstream press release, 11/7/17 and 1/23/18 presentation

Source: DCP Midstream.

Figure 43: DCP Planned Expansions in DJ Basin



◆ Additional Compression      ★ 2018-2019 Processing Capacity Expansions

Source: DCP Midstream.

WES sanctioned its Latham plant consisting of two cryogenic processing trains (totaling 400 MMcf/d) in Q3, with the plant expected to come online in 2019. In 3Q17, Anadarko executed an agreement for natural gas transportation services from Latham and Lancaster plants on the Cheyenne Connector pipeline, a new pipeline project expected to be in service in late 2019 providing additional takeaway from the DJ Basin to the Cheyenne Hub. With DJ Basin operators ramping production, the ability of producers to source water could become more challenging. Anadarko is well positioned with its own water on demand system delivering a record of more than 51.5 million barrels of water to completions activity in 2017, eliminating an estimated 340K trucks from Colorado roads.

## Investment Thesis, Valuation and Risks

### Anadarko Petroleum (*Overweight; Price Target: \$72.00*)

#### Investment Thesis

We see several emerging positives that could support more upside in the stock (APC trades at a ~13.8% 2020E sustaining FCF yield vs. group average ~9.1%). We believe near-term and long-term oil growth outlooks are largely intact, with the near-term outlook buoyed by surprising strength in the GoM and long-term growth supported by visibility in the Delaware and DJ Basins. Meanwhile, APC's \$4.5+ billion cash hoard provides optionality to support higher levels of cash return to shareholders. APC has one of the highest quality franchise assets at Wattenberg, and its U.S. onshore position is further enhanced by its Delaware Basin position. We believe a key catalyst for the stock is the potential shift into development mode in the Delaware Basin Wolfcamp play, where APC has significant running room in the core. In particular, we believe APC's Delaware Basin volumes could hit a meaningful growth inflection point by mid-year 2018 when it completes its midstream backbone project.

#### Valuation

Using our NAV methodology, we calculate a net asset value of \$72 per share for APC at the strip. We believe an Overweight rating on APC is justified, as the stock is trading at a discount to our NAV. Our Dec-18 price target of \$72 assumes that the stock trades at parity with our NAV estimate. In summary, we value proved developed NAV (net of liabilities) at ~\$30.90 per share and undeveloped/unproven reserves at ~\$40.70 per share to arrive at a total proved developed and undeveloped net asset value of \$72 per share.

#### Risks to Rating and Price Target

- Post the Firestone incident, the regulatory and legal overhang could linger over APC's DJ Basin asset, which represents approximately 20% of our NAV estimate. The DJ Basin has historically had infrastructure issues including delays, high-line pressures, and a lack of natural gas processing capacity, which have all curtailed production at some point over the past several years.
- Post the Freeport-McMoran deepwater purchase, APC has increased its leverage to the U.S. GoM, which could lead to higher volatility in production levels and higher asset concentration risk, particularly at the Lucius development.
- There could be a delay in getting the midstream infrastructure ready, which is the key assumption that underpins our APC growth rates and rate of change in Delaware Basin well productivity.
- Continued oil price volatility could negatively impact play economics and ultimately corporate level cash flow, which could cause the stock to underperform our expectations..

## Anadarko Petroleum: Summary of Financials

| Income Statement - Annual           |         |         |          |         |       | Income Statement - Quarterly  |         |         |         |         |
|-------------------------------------|---------|---------|----------|---------|-------|-------------------------------|---------|---------|---------|---------|
|                                     | FY16A   | FY17A   | FY18E    | FY19E   | FY20E |                               | 1Q18E   | 2Q18E   | 3Q18E   | 4Q18E   |
| Revenue                             | 7,869   | 11,908  | 13,783   | 15,094  | -     | Revenue                       | 3,207   | 3,364   | 3,536   | 3,677   |
| SG&A                                | (1,440) | (1,075) | (990)    | (1,000) | -     | SG&A                          | (245)   | (245)   | (250)   | (250)   |
| Adj. EBITDAX                        | 4,075   | 5,732   | 8,127    | 8,903   | -     | Adj. EBITDAX                  | 1,852   | 1,982   | 2,098   | 2,196   |
| Exploration expense                 | (946)   | (2,541) | (395)    | (557)   | -     | Exploration expense           | (110)   | (96)    | (98)    | (92)    |
| Adj. EBITDA                         | 3,129   | 3,191   | 7,733    | 8,345   | -     | Adj. EBITDA                   | 1,742   | 1,886   | 2,000   | 2,104   |
| D&A                                 | (4,301) | (4,279) | (4,583)  | (5,155) | -     | D&A                           | (1,082) | (1,117) | (1,170) | (1,214) |
| Adj. EBIT                           | (1,172) | (1,088) | 3,150    | 3,190   | -     | Adj. EBIT                     | 660     | 770     | 830     | 890     |
| Net Interest                        | (890)   | (932)   | (951)    | (898)   | -     | Net Interest                  | (239)   | (237)   | (237)   | (237)   |
| PBT                                 | (3,829) | (1,688) | 2,199    | 2,292   | -     | PBT                           | 421     | 532     | 593     | 653     |
| Tax                                 | 1,021   | 1,477   | (879)    | (879)   | -     | Tax                           | (185)   | (216)   | (232)   | (246)   |
| Minority Interest                   | (263)   | (245)   | (330)    | (340)   | -     | Minority Interest             | (70)    | (80)    | (90)    | (90)    |
| Adj. Net Income                     | (1,604) | (1,074) | 990      | 1,073   | -     | Adj. Net Income               | 166     | 237     | 270     | 317     |
| Reported EPS                        | (5.89)  | (0.83)  | 1.93     | 2.14    | -     | Reported EPS                  | 0.32    | 0.46    | 0.53    | 0.63    |
| Adj. EPS                            | (3.07)  | (1.96)  | 1.93     | 2.14    | -     | Adj. EPS                      | 0.32    | 0.46    | 0.53    | 0.63    |
| DPS                                 | -       | -       | -        | -       | -     | DPS                           | -       | -       | -       | -       |
| Payout ratio                        | -       | -       | -        | -       | -     | Payout ratio                  | -       | -       | -       | -       |
| Shares outstanding                  | 522     | 548     | 513      | 502     | -     | Shares outstanding            | 524     | 517     | 509     | 502     |
| Balance Sheet & Cash Flow           |         |         |          |         |       | Ratio Analysis                |         |         |         |         |
|                                     | FY16A   | FY17A   | FY18E    | FY19E   | FY20E |                               | FY16A   | FY17A   | FY18E   | FY19E   |
| Cash and cash equivalents           | 3,184   | 4,553   | 3,349    | 3,540   | -     | ROE                           | (12.8%) | (9.4%)  | 9.7%    | 10.8%   |
| Accounts receivable                 | 1,728   | 1,829   | 1,829    | 1,829   | -     | ROA                           | (3.5%)  | (2.4%)  | 2.4%    | 2.6%    |
| Inventories                         | -       | -       | -        | -       | -     | ROCE                          | (5.3%)  | (7.6%)  | 7.4%    | 7.9%    |
| Other current assets                | 354     | 380     | 380      | 380     | -     | Net debt/equity               | 78.1%   | 79.7%   | 94.6%   | 82.4%   |
| Current assets                      | 5,266   | 6,762   | 5,558    | 5,749   | -     | Interest cover (x)            | 3.5     | 3.4     | 8.1     | 9.3     |
| PP&E                                | 32,168  | 27,451  | 27,897   | 27,845  | -     | P/E (x)                       | NM      | NM      | 33.2    | 30.0    |
| LT investments                      | -       | -       | -        | -       | -     | EV/EBITDA (x)                 | 15.3    | 14.6    | 6.2     | 5.6     |
| Other non current assets            | 8,130   | 7,873   | 7,873    | 7,873   | -     | P/DCF (x)                     | 10.9    | 8.1     | 5.2     | 4.6     |
| Total assets                        | 45,564  | 42,086  | 41,328   | 41,467  | -     | EV/BOE (x)                    | -       | -       | -       | -       |
| Short term borrowings               | -       | -       | -        | -       | -     | EV/EBITDAX (x)                | 11.7    | 8.1     | 5.9     | 5.2     |
| Payables                            | 2,288   | 1,995   | 1,995    | 1,995   | -     | Dividend yield                | -       | -       | -       | -       |
| Other short term liabilities        | 1,040   | 1,911   | 1,911    | 1,911   | -     | Tax rate                      | (26.7%) | (87.5%) | 40.0%   | 38.4%   |
| Current liabilities                 | 3,328   | 3,906   | 3,906    | 3,906   | -     | Sector data                   |         |         |         |         |
| Long-term debt                      | 15,281  | 15,547  | 15,433   | 14,533  | -     |                               | FY16A   | FY17A   | FY18E   | FY19E   |
| Other long term liabilities         | 11,458  | 8,843   | 9,221    | 9,690   | -     | Natural gas price - \$/mcf    | 2.40    | 2.23    | 2.87    | 2.79    |
| Total liabilities                   | 30,067  | 28,296  | 28,560   | 28,129  | -     | Crude oil (WTI) - \$/bbl      | 43.34   | 50.89   | 62.93   | 59.21   |
| Shareholders' equity                | 12,212  | 10,696  | 9,673    | 10,244  | -     | Daily oil production (mbblpd) | 316     | 355     | 388     | 444     |
| Minority interests                  | 3,285   | 3,094   | 3,094    | 3,094   | -     | NGLs Production (MMbbl)       | 46.85   | 36.22   | 37.21   | 41.68   |
| Total liabilities & equity          | 45,564  | 42,086  | 41,328   | 41,467  | -     | Daily gas production (mmcfpd) | 2,093   | 1,312   | 1,103   | 1,230   |
| BVPS                                | 23.41   | 19.52   | 18.86    | 20.42   | -     | Daily production (mboed)      | -       | -       | -       | -       |
| y/y Growth                          | (7.3%)  | (16.6%) | (3.4%)   | 8.3%    | -     | Total Production (mmboe)      | 290     | 245     | 246     | 279     |
| Net debt/(cash)                     | 12,097  | 10,994  | 12,084   | 10,993  | -     | Proved reserves (mmboe)       | -       | -       | -       | -       |
| Cash flow from operating activities | 3,000   | 4,009   | 6,281    | 7,036   | -     | Unit costs per boe            |         |         |         |         |
| o/w Depreciation & amortization     | 4,301   | 4,279   | 4,583    | 5,155   | -     |                               | FY16A   | FY17A   | FY18E   | FY19E   |
| o/w Changes in working capital      | 104     | (306)   | 0        | 0       | -     | Lease operating expense       | -2.79   | -4.07   | -4.69   | -       |
| Cash flow from investing activities | (2,762) | (482)   | (3,799)  | (4,306) | -     | Taxes other than income       | -1.85   | -2.37   | -2.91   | -       |
| o/w Capital expenditure             | (3,505) | (4,344) | (4,399)  | (4,606) | -     | DD&A                          | -14.82  | -17.44  | -18.64  | -       |
| as % of sales                       | 44.5%   | 36.5%   | 31.9%    | 30.5%   | -     | G&A                           | -4.96   | -4.38   | -4.03   | -       |
| Cash flow from financing activities | 2,007   | (1,613) | (2,457)  | (1,742) | -     | Exploration expense           | -3.26   | -10.35  | -1.60   | -       |
| o/w Dividends paid                  | (105)   | (112)   | (513)    | (502)   | -     | Operating margin/boe          | -6.90   | -6.69   | 9.14    | -       |
| o/w Net debt issued/(repaid)        | (790)   | 208     | (114)    | (900)   | -     | Cash margin/boe               | 7.93    | 10.74   | 27.78   | -       |
| Net change in cash                  | 2,245   | 1,914   | 26       | 989     | -     | EBITDAX margin                | 51.8%   | 48.1%   | 59.0%   | 59.0%   |
| Adj. Free cash flow to firm         | (314)   | (1,291) | 653      | 1,633   | -     | Discretionary cash flow       | 3,076   | 4,315   | 6,281   | 7,036   |
| y/y Growth                          | (96.0%) | 311.1%  | (150.6%) | 150.0%  | -     | DCF/share                     | 5.90    | 7.87    | 12.24   | 14.02   |

Source: Company reports and J.P. Morgan estimates.

Note: \$ in millions (except per-share data). Fiscal year ends Dec. o/w - out of which

**Analyst Certification:** The research analyst(s) denoted by an “AC” on the cover of this report certifies (or, where multiple research analysts are primarily responsible for this report, the research analyst denoted by an “AC” on the cover or within the document individually certifies, with respect to each security or issuer that the research analyst covers in this research) that: (1) all of the views expressed in this report accurately reflect his or her personal views about any and all of the subject securities or issuers; and (2) no part of any of the research analyst's compensation was, is, or will be directly or indirectly related to the specific recommendations or views expressed by the research analyst(s) in this report. For all Korea-based research analysts listed on the front cover, they also certify, as per KOFIA requirements, that their analysis was made in good faith and that the views reflect their own opinion, without undue influence or intervention.

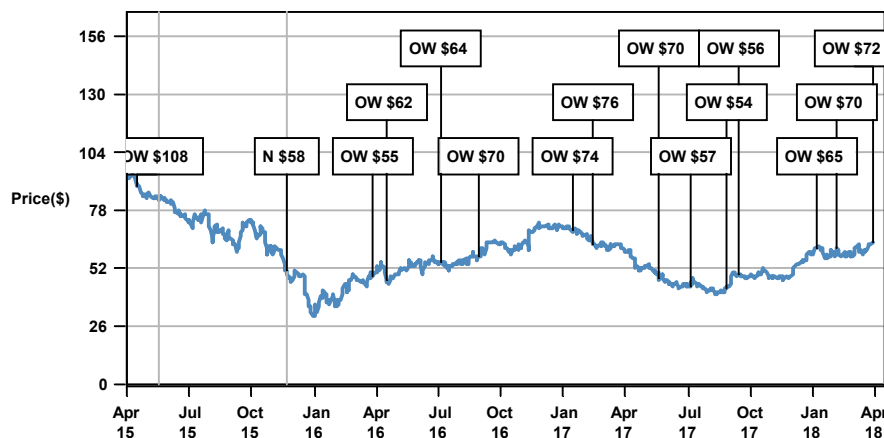
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- **Non-Investment Banking Compensation:** J.P. Morgan has received compensation in the past 12 months for products or services other than investment banking from Anadarko Petroleum.
- **Other Significant Financial Interests:** J.P. Morgan owns a position of 1 million USD or more in the debt securities of Anadarko Petroleum.

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Anadarko Petroleum (APC, APC US) Price Chart



Source: Bloomberg and J.P. Morgan; price data adjusted for stock splits and dividends.  
Initiated coverage May 06, 2002.  
Break in coverage Jun 05, 2015 - Dec 09, 2015.

The chart(s) show J.P. Morgan's continuing coverage of the stocks; the current analysts may or may not have covered it over the entire period.

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