COGCC
Financial Assurance Responses
May 26, 2021

American Petroleum Institute
Colorado

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Question #6
Financial Assurance/Orphan Wells Data Analysis

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Overview of the Data Analysis

- Reviewed well and operator data on all wells ever orphaned in Colorado. This analysis looked for trends to help explain why these wells became orphaned.
- Trends were analyzed in both well characteristics and operator characteristics:

BOTH CHARACTERISTICS ARE IMPORTANT

All source data for this analysis was from COGCC data

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Wells Ever Orphaned in Colorado – Trends Identified

- **Trend #1 – Wells spud prior to 2000 make up a vast majority of wells ever orphaned in Colorado (91%).**

- **Trend #2 – Wells with no production or especially low production (2 BOE a day or less) in recent years (2011-2020) make up most orphaned wells.**

- **Trend #3 – Operator compliance related trends existed for these former operators that had orphaned wells. These operators had a track record of generally being unresponsive to compliance issues. This is especially true for enforcement orders, corrective actions, and outstanding MITs.**

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Wells Ever Orphaned in Colorado
Well Characteristics

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Wells Ever Orphaned in Colorado – Spud Date

- 525 of these 579 (91%) wells ever orphaned were spud prior to 2000.

- 229 of the 263 (87%) subset of wells (more recent orphaned wells) were spud prior to 2000.

- **Trend #1 – Wells spud prior to 2000 make up a vast majority of wells ever orphaned in Colorado (91%).**

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Wells Ever Orphaned in Colorado – Production Data

- All 579 wells ever orphaned in Colorado had either no production since 2011 or had average yearly production from 2011 to 2020 below stripper well status of 5,475 BOE/year (15 BOE/day).
  - More specifically, the average yearly BOE ranged from 0 to 3,457 BOE, never making it close to the higher end of stripper well status.
- Of the wells that had production from 2011 to 2020, the average yearly production for all of these wells was 680 BOE or 2 BOE/day.
- 19 of these 579 wells (3%) had a max BOE production in any one year between 1999 and 2020 above 5,475 BOE. The highest was 17,845 BOE for a well with this occurring in 2008.

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Wells Ever Orphaned in Colorado – Production Data

- Analysis on the 263 subset of wells more recently orphaned show the same trends.
- A note about wells that had no production:
  - 354 of these 579 wells (61%) had no production since 1999. This tells us that several of these wells are those that were orphaned a while ago and most likely several were plugged by COGCC prior to 1999.
  - This is why analysis was conducted separately on the 263 subset of wells more recently orphaned to determine if the same trends existed. The same trends did exist.

- **Trend #2 – Wells with no production or especially low production (2 BOE a day or less) in recent years (2011-2020) make up most orphaned wells.**

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Wells Ever Orphaned in Colorado – Preceding Years

- The status date for these 579 wells is not the date the well went orphaned.

- In many cases, getting the date the well went orphaned is really hard as there is no clear set date for that.

- Even wells with an enforcement order date officially making the wells orphaned may be misleading because the wells may have been essentially orphaned years before without the formality.

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Wells Ever Orphaned in Colorado – Preceding Years

- Analysis was conducted on 186 of these 579 (32%) wells ever orphaned that belonged to six former operators that had more recent formal enforcement orders against them: Red Mesa, Benchmark, Petroshare, CM Production, Monument Global, and Energy Search.
- The year these wells went orphaned is a best guess based on these enforcement orders but may be misleading.
- Of these 186 wells:
  - 121 wells (65%) had no production the three previous years and seemed to mostly be in SI or TA status.
  - 65 wells (35%) had production in at least one of the previous three years and ALL were under stripper well status of 5,475 BOE a year. In fact, this ranged from 0 BOE in a year to 3,037 BOE in a year.

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Wells Ever Orphaned in Colorado
Operator Characteristics

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Wells Ever Orphaned in Colorado – Operator Compliance

- Operator compliance research was conducted on the 12 former operators with the most orphaned wells in Colorado. These 12 operators made up 265 of the 579 (46%) orphaned wells.
- The following key trends developed:
  - 11 of the 12 had outstanding corrective actions from violations.
  - 9 of the 12 had outstanding MIT issues.
  - At least 6 of the 12 filed for bankruptcy or were otherwise insolvent.
  - 5 of the 12 were not in compliance with COGCC bonding rules. Particularity requirements for excess inactive well bonding.
- **Trend #3 – Operator compliance related trends existed for these former operators that had orphaned wells. These operators had a track record of generally being unresponsive to compliance issues. This is especially true for enforcement orders, corrective actions, and outstanding MITs.**

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Wells Ever Orphaned in Colorado – Conclusions

- **Trend #1 – Wells spud prior to 2000 make up a vast majority of wells ever orphaned in Colorado (91%).**
- **Trend #2 – Wells with no production or especially low production (2 BOE a day or less) in recent years (2011-2020) make up most orphaned wells.**
- **Trend #3 – Operator compliance related trends existed for these former operators that had orphaned wells. These operators had a track record of generally being unresponsive to compliance issues. This is especially true for enforcement orders, corrective actions, and outstanding MITs.**

Spud Date	# of Total Wells Spud	# Of Wells That Have Ever Been Orphaned	% of Wells That Have Ever Been Orphaned
Spud Prior to 2000	39,726	525	1.32%
Spud 2000 to Now	44,768	54	0.12%
TOTAL	**84,494**	**579**	**0.69%**

ADDITIONAL POINT: 84,494 wells ever drilled/permitted in Colorado. There are under 50,000 wells in Colorado now, which means over time operators have plugged almost as many wells as are active today.

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Wells Ever Orphaned in Colorado – Conclusions

- The true risk of becoming an orphan well is not just the well, but more critically if the operator has compliance issues or is unwilling to address well issues.
- As the previous slide shows, there are many Colorado operators that operate older, low producing wells, however the orphan well risk is low due to the operator's compliance and responsible actions.

Question #1 – Reasons for changing well status?

- A well may need to be put into TA or SI status (“idle” is not in the COGCC rules) to perform maintenance or a workover on the well. Once the maintenance or workover is completed, the well can be put back into active status.

- A well may need to be put into TA or SI status because a nearby new well is being hydraulicly fractured. Once that new well finishes being hydraulically fractured, the well can then be put back into active status.

- If there is a drastic decline in oil or gas prices that is expected to be temporary, at times operators will shut the well in for that time period. The well will be brought back to active status when prices rebound.

Question #2 – Budgeting and preparing for plug and reclaim

- Depending on the operator's business practices over the years, some may front end the plug and reclaim costs, while others set aside dollars as the well approaches the end of production.
- As wells begin to produce less, operators will weigh the economic costs, maintenance costs and output to determine when to plug and reclaim.

Question #3 – Reasons an operator would refuse to sell a low yielding well?

- It's difficult to address rare hypotheticals such as this.
- It would depend on the low producing well's operator short- and long-term plans for production and potential new drilling activity to come

Question #4 – Reasons for plugging wells?

- Plugging older wells will allow for a more structured long-term development program, especially horizontal development in the DJ Basin.
- Plugging older wells will reduce and eliminate potential future issues from aging wells and infrastructure.

Question #5 – Projecting production levels?

- After a well is drilled and in production, operators can generally get a sense of yearly production after the first 90 days using similarly situated nearby operations and typically forecast annually after that. They can also use a Decline Curve Analysis.
- This is a continuous exercise. Once a well is in production, operators are consistently reevaluating production levels and future forecasts.
  - Many factors can influence projected production values such as if the well is shut in or temporarily abandoned.
- COGA performed analysis on production levels for all 84,495 current wells from 1999 to 2020. Production averages for the last few years can be calculated with this data and a standard decline curve applied to determine production estimates for the future.

Question #7 – Plug and reclaim cost drivers?

- Vertical well depth is a key driver of initial costs
- Vintage of the well, original well construction, completion intervals and number of formations may require different amounts of work per the rules and regulations
- Reclamation and landscape also impacts costs:
  - Cropland
  - Terrain, soil quality and quantity
  - Landowner needs
- Type of well (oil, gas, coal bed methane, etc.) can also factor into costs

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Question #8 – Determining criteria for well operations?

- Factors or Criteria for plugging and reclaiming a Well
  - The well is no longer economic. Determining when a well is no longer economic is unique for every well and company.
  - The well is aging and maintenance costs and issues will outweigh the benefit of continuing production.
  - The minerals can be more efficiently developed with a newer well.
  - Community engagement/benefits.
- Factors or Criteria for temporarily abondoning a Well
  - A nearby well is being hydraulicly fractured.
  - A maintenance issue is identified with the well and a workover is required.

Thank you for the opportunity to present.

Questions?

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