

North Dakota P&A cost data is bad news for the taxpayers in oil-producing states

Summary

As the Colorado Oil and Gas Conservation Commission's (COGCC) seeks to fulfill its statutory mandate to "require every operator to provide assurance that it is financially capable of fulfilling every obligation imposed" by the state's rules and regulations,¹ it needs to figure out how much it will really cost to plug and abandon its wells. For evidence, it should look to North Dakota, where last year's CARES Act well plugging program has yielded actual receipts for 251 well plugs and 128 site reclamations.

Key takeaways from our analysis of North Dakota data:

- Plugging alone has averaged over \$130,000 per well. Reclamation costs roughly double that total, bringing per-well retirement costs to over \$250,000 on average. With around 50,000 wells in Colorado,¹ that would come to \$12.5 billion.
- The relatively high frequency of very-high-cost plug and reclamation projects suggest that states should consider implementing a risk-sharing system (e.g., a severance tax-funded stop-loss insurance program) to supplement surety bonds and improve incentives for timely well plugging by responsible parties.

Plugging Costs

Plugging a well entails cementing the borehole to ensure the isolation of the various subsurface strata—particularly hydrocarbon-bearing layers and water-bearing layers—to prevent communication between them and/or pollution at the surface. Plugging invoices from North Dakota's CARES Act plugging program, retrieved through a Freedom of Information Act (FOIA) request, shed light on the cost of this routine operation. As is shown in Table 1 below, we calculated the average per-well plugging cost for the 251 well invoices to be over \$130,000.

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¹ COGCC, *Daily Activity Dashboard*, page 2 of 9, 'Active Well Status Breakdown'. Accessible at: <https://cogcc.state.co.us/DAD.html>

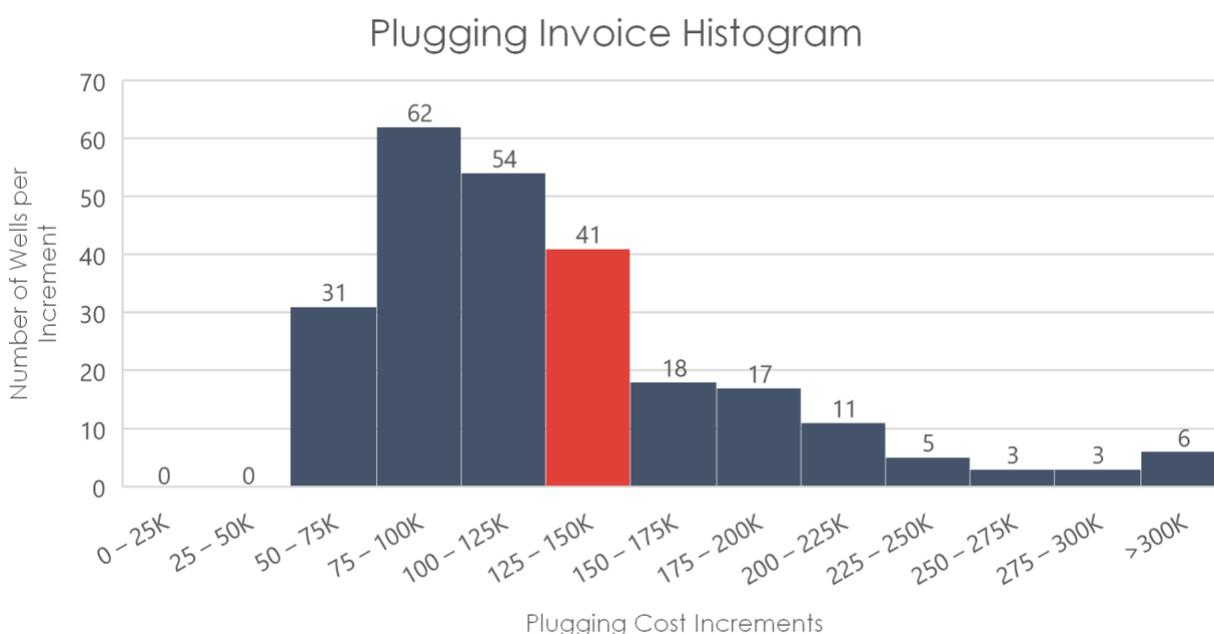
TABLE 1 - DESCRIPTIVE STATISTICS FOR NORTH DAKOTA CARES ACT WELL PLUG DATA FROM FOIA REQUEST, 251 RECORDS.

Well Plugging Cost (thousands of \$) – Descriptive Statistics	
Total plugging cost in FOIA (A)	\$ 32,787.1
Count of plugged wells in FOIA (B)	251
Mean plugging cost (A / B)	\$ 130.6
Median plugging cost	\$ 113.7
Max cost	\$ 523.4
Min cost	\$ 51.2

Source: Well plugging invoices for ND CARES Act plugs, NDIC

Plug costs ranged widely, from a low of about \$50,000 to over \$500,000. The histogram in Figure 1 below shows the distribution of North Dakota plugging costs in \$25,000 increments, with the number of wells in each increment at the top.

FIGURE 1. DISTRIBUTION OF WELL PLUGGING INVOICES, \$25,000 INCREMENTS. THE MEAN PLUGGING COST LIES WITHIN THE RED BAR



Data: CARES Act plugging and reclamation program FOIA request

This distribution shows a long right tail, i.e., the plugging costs in this dataset are very skewed to the right, indicating a much larger range of costs above the median than below it. When it comes to well plugging, this makes perfect sense; there is a base price for labor and materials and anything more adds to the cost—unexpected downhole junk, well casing issues, surface or groundwater contamination, etc. These surprises can up the price to extravagant levels.

Reclamation Costs Are Even More Skewed

Reclamation is an additional legal requirement for final well abandonment. Though there can be local intricacies and exceptions, reclamation generally means resetting the landscape to its pre-drilling condition, i.e., recontouring the land, removing access roads, and replanting native species or replacing topsoil for return to agricultural use. Remediation for previously unknown or undisclosed spills is also generally required where contamination is discovered. Reclamation costs are distributed a bit differently from plugs, but are similar in magnitude to plugging costs. Table 2 shows key facts for 128 sites, with an average reclamation cost of \$123,869 per wellsite.²

TABLE 2. DESCRIPTIVE STATISTICS FOR NORTH DAKOTA CARES ACT WELL RECLAMATION DATA FROM FOIA REQUEST, 128 RECORDS.

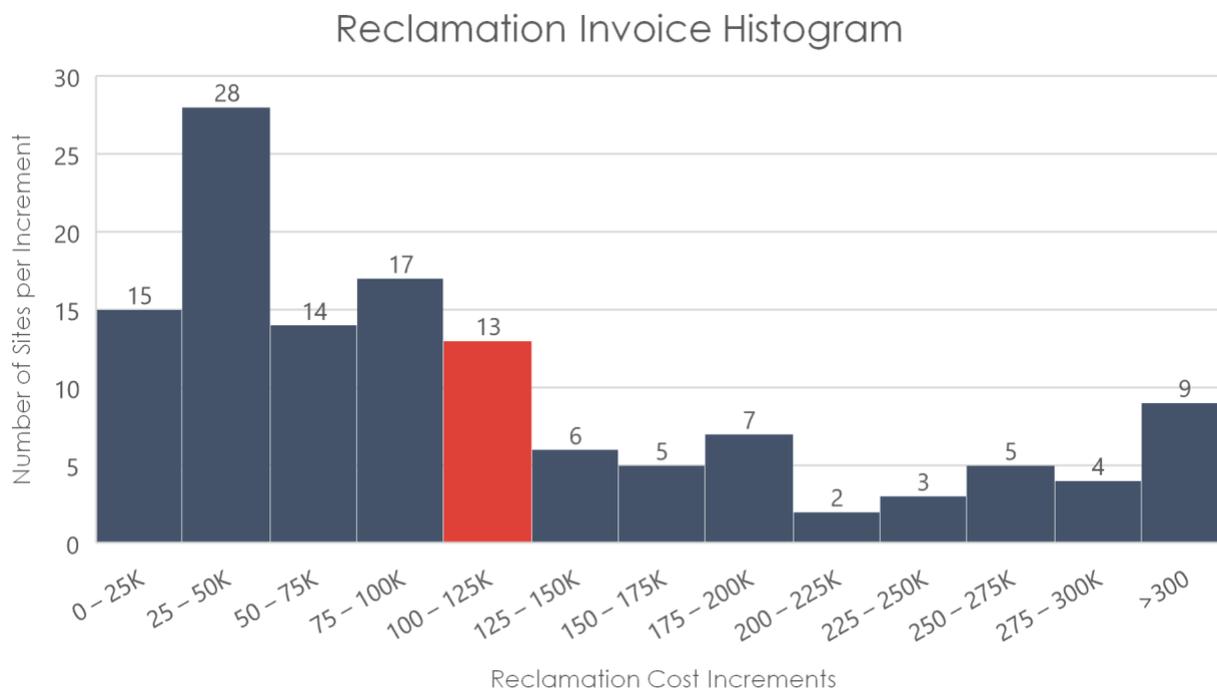
Reclamation Cost (thousands of \$) – Descriptive Statistics		
Total reclamation cost (A)	\$	15,855.2
Count of sites reclaimed in FOIA (B)		128
Mean reclamation cost (A / B)	\$	123.9
Median reclamation cost	\$	86.6
Max cost	\$	782.5
Min cost	\$	1.4

Source: Site reclamation invoices, NDIC, Freedom of Information Act request.

Reclamation costs run from as little as a few thousand to over three quarters of a million dollars. This wide range is likely due to a combination of factors including site topography, desired post-retirement surface use, and remediation for previously unreported spills, which can be a particularly impactful driver of reclamation cost.

² According to the data, these sites are billed on a per-well basis. In other words, none of these sites include reclamation on multiple wells, which eliminates the challenge of disaggregating reclamation costs per well.

FIGURE 2. DISTRIBUTION OF RECLAMATION COSTS IN \$25,000 INCREMENTS. THE MEAN RECLAMATION COST LIES WITHIN THE RED BAR.



Data: CARES Act plugging and reclamation program FOIA request

The histogram in Figure 2 above illustrates the long right tail in the reclamation data. Reclamation projects frequently require extensive work above and beyond the basic operations, evidenced by the fact that more than half (55%) of reclamation invoices were over \$75,000, and over one in four (27%) exceeded \$150,000. These costs are in addition to the cost to plug wells. At these frequencies, expensive reclamation projects should not be considered low probability, high-cost events, but rather high probability, high-cost events that require careful consideration when devising a full-cost financial assurance program.

Estimating the Bill at Closing Time

As we discussed extensively in It’s Closing Time, forecasting well closure costs is challenging in large part because good quality, fully disaggregated data is hard to find.³ That said, North Dakota’s CARES Act plugging costs far exceed the financial assurance requirements in most states, including Colorado, and adding on reclamation essentially doubles the price per well. These numbers eclipse the estimates coming out of state orphan well programs, which, for reasons discussed in It’s Closing Time, are not likely to offer an accurate reflection of the full costs.

³ Despite this, the CTI cost model provides an estimate very similar in magnitude to the FOIA data. Applying the CTI cost model to the average adjusted depth of the North Dakota wells in the FOIA data (our model caps price at 10,000 ft TVD), our estimate for the total cost of the 280 North Dakota CARES Act wells is approximately \$39 million, only about \$1.8 million off from the total plugging cost quoted by Oil and Gas Division Director, Lynn Helms.

Implications for Colorado

North Dakota Shows How Little We Know

Are North Dakota costs perfectly representative of Colorado? Probably not. But as states have not opted to collect actual cost data from operators, we're left with guesswork based on models and isolated samples. North Dakota's rare set of competitively-bid project invoices should concern the COGCC, since it shows that the gap between actual costs and current bond requirements is likely worse than expected, and the incentive for industry to delay and avoid payment greater than realized. In order to fill this knowledge gap, Colorado regulators should collect full-cost plugging and reclamation data from operators to build a factual basis for financial assurance rules.

"Fulfilling Every Obligation"

Colorado's statutes require that companies provide assurances that they are financially capable of fulfilling every obligation imposed by the state. In North Dakota plugging plus reclamation costs would put that figure around \$250,000 on average per well, but current proposals aren't even close to that. Someone will pay for the cost of doing business in the oil and gas industry, but without the implementation of a full-cost financial assurance system, it won't be the companies who carry that obligation under law.

Managing High Probability, High-Cost Events

North Dakota's data suggest that high-cost outliers should not be ignored—they are a feature of aging oilfields, in part because technology and regulation have changed dramatically since drilling first began. A full-cost financial assurance system must consider these high-probability, high-cost outcomes in order to protect the public from taking on private decommissioning costs and incentivize operators to plug wells. For many small operators, one very expensive well could be financially crippling, and the risk that any given plugging project could unexpectedly bankrupt the company is a strong disincentive for plugging non-economic wells. Regulators who want to develop a system that maximizes the number of wells plugged by industry and minimizes the cost to the public should be aware of these issues when developing policy. Surety bonds are not well suited to deal with these risk/incentive issues. A better mechanism would be a risk-sharing/insurance policy against high-cost plugging or reclamation costs that would provide protection for both operators in the normal course of well decommissioning and the state in the event an operator defaults.