



The Institutional Context of Reclamation: Changing Landscapes of Energy



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Introduction

Between the year 2000 and 2014, U.S. energy production increased by 22.5% (U.S. EIA 2015). The rapid rise in domestic production is the result of natural gas and crude oil extraction which have increased 35% and 49% respectively during this timeframe (U.S. EIA 2015). The rapid pace and scale of the expansion of development has widespread implications for host communities and landscapes. Since the year 2000, an average estimated 50,000 oil and gas wells have been drilled in North America each year (Allred et al. 2015). The proliferation of oil and gas wells brings attention to the topic of reclamation and restoration of oil and gas production sites. Ecological restoration is beneficial for nature and society as projects increase the supply and quality of ecosystem services, improve hydrology, reduce soil erosion, encourage the presence of native species, and aid in carbon sequestration (Aronson et al. 2010). In order to conduct environmentally and financially responsible restoration, the criteria to gauge project success must be explicit. If evaluative criteria are disregarded, project duration, budget, effectiveness, and utility can suffer.

Therefore, it is germane to ask, *do policies enacted at different scales (federal and state) operate using the same criteria for reclamation success?*

Criteria to Judge Reclamation Success

Federal	State of Montana	State of Wyoming
<ul style="list-style-type: none"> Self-sustaining, diverse, native plant community Plant density sufficient to control erosion, non-native plant invasion, and to re-establish wildlife habitat Be free of state- or county-listed noxious weeds, oil field debris, contaminated soil, and equipment (BLM Gold Book, 43-44). 	<ul style="list-style-type: none"> Must restore the surface of the location to its previous grade and productive capability Take necessary measures to prevent adverse hydrological effects (ARM 36.22.1307) 	<ul style="list-style-type: none"> Restore the surface directly affected by oil and gas operations, as closely as reasonably practicable, to the condition that existed prior to oil and gas operations (WY Statute 30-5-401).

Hypothetical Bonding Scenarios

Location	Number of wells/well depth	Bond collected	Estimated reclamation cost*	Estimated landowner/taxpayer liability
MT Private	21 wells	\$50,000	\$285,264	\$235,264
MT Private	1 well, 3,750 feet	\$10,000	\$13,584	\$3,584
MT Public	13 wells	\$25,000	\$176,592	\$151,592
WY Private	21 wells	\$100,000	\$285,264	\$185,264
WY Private	1 well, 3,750 feet	\$37,500	\$13,584	+\$23,916
WY Public	18 wells	\$25,000	\$244,512	\$219,512

* Estimated reclamation cost per well (\$13,584) from Andersen et al. (2009)

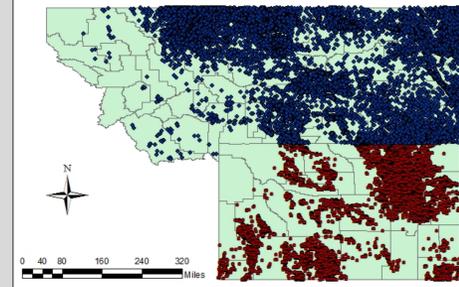
Preliminary Findings

Bonding regimes, and criteria to gauge reclamation success, enacted at different scales are inconsistent. The discrepancy in bond amounts between Montana and Wyoming illustrates that the State of Montana is more vulnerable to relying on taxpayer dollars to fund reclamation efforts. Blanket bond amounts are insufficient to complete timely and effective reclamation, again increasing the likelihood of utilizing tax dollars. Overall, reclamation policy must be improved by increasing bond amounts to avoid landowner/taxpayer liability.

About Reclamation Policy

- The backbone of federal and state reclamation policy is **environmental assurance bonding**. Prior to drilling, operators must pay a bond to ensure that reclamation will be completed after extraction.
- If an operator is drilling multiple wells within one state, they are eligible to pay a higher **blanket bond** amount covering all wells.
- Bond types differ based on well location as federal leases allow for bonds in the form of cash, a letter of credit on operations, or a lien on equipment or surety bond. Wells on state or privately owned land require cash or surety bonds (Igarashi et al. 2014). A surety bond company is a third party lender that will pay to guarantee that the reclamation will be completed by the oil and gas company (Andersen et al. 2009).
- Despite the prevalence of environmental bonding regimes to ensure reclamation, flaws have been identified regarding their requirements and implementation.
- The greatest flaw is that the bond amount is not linked to production. Companies can decide to forfeit the bond if the cost of reclamation is higher than the bond posted, which it often is, and instead walk away.

Oil and Gas Wells in MT and WY: Current and Historic



Reclamation in the News

Wyo Supreme Court awards Arvada rancher \$1.1 million for CBM cleanup 3/23/16

On abandoned CBM wells, Wyoming makes progress but challenges remain 12/13/15

Scars of a boom: The lingering impact of coal-bed methane 11/22/15

Reclamation Bonding Structure

FEDERAL Bond Type	Bond Amount
Individual lease bond	\$10,000
Statewide bond	\$25,000
Nationwide bond	\$150,000

WYOMING Bond Type	Bond Amount
Individual well	\$10 per foot of depth
Multiple wells (blanket bond)	\$100,000

MONTANA Bond Type	Bond Amount
Individual well, depth of 2,000ft or less	\$1,500
Individual well, depth between 2,000-3,501ft	\$5,000
Individual well, depth of 3,501ft or more	\$10,000
Multiple wells (blanket bond)	\$50,000



Unreclaimed CBM compressor station in Sheridan County, Wyoming



Reservoir for water disposal from CBM operations in Sheridan County, Wyoming

References: Allred et al. 2015. Ecosystem services lost to oil and gas in North America. *Science*; Andersen et al. 2009. Reclamation costs and regulation of oil and gas development with application to Wyoming. *Western Economics Forum*; Aronson et al. 2010. Are Socioeconomic Benefits of Restoration Adequately Quantified? A Meta-analysis of Recent Papers (2000–2008) in Restoration Ecology and 12 Other Scientific Journals. *Restoration Ecology*; Igarashi et al. 2014. *Economics of oil and gas development in the presence of reclamation and bonding requirements*. Paper presented at the 2014 Annual Meeting of the Agricultural & Applied Economics Association; U.S. Energy Information Administration (2015). *Monthly Energy Review October 2015*. Washington, D.C.



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