ARTICLE

DRILLING TO THE BOTTOM OF THE ORPHAN WELL PROBLEM: SUGGESTIONS FOR A BETTER REGULATORY FRAMEWORK FOR PREVENTING AND REMEDIATING ORPHANED OIL WELLS IN BRITISH COLUMBIA

Holly Stewart *

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ABSTRACT

When an oil firm goes bankrupt, its non-productive oil wells are classified as "orphans" and must be plugged and remediated by provincial regulatory bodies. The number of orphan oil wells has increased significantly in the western oil-producing provinces in the past several years. This paper examines the scope of the orphan well problem in British Columbia, policy tools used to address orphan wells in other jurisdictions, and shortcomings of British Columbia's current regulatory framework. It considers the intersection of bankruptcy law and orphan well remediation recently addressed by the Supreme Court of Canada in *Orphan Well Association v Grant Thornton Ltd*, 2019 SCC 5, and makes the argument for upfront environmental bonds despite the strong environmental stance taken in that decision.

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INTRODUCTION

Legacy pollution from defunct natural resource infrastructure and industrial facilities presents a vexing and pervasive environmental problem. Improperly closed mines, for example, can threaten human health and cause environmental damage long after production has shut down, and they are costly for taxpayers to clean up and remediate.[1] The saying that an ounce of prevention is worth a pound of cure is particularly apt when it comes to legacy pollution from natural resource industries. The best way to deal with legacy pollution is to ensure that it is cleaned up earlier, rather than later, thus preventing it from becoming a problem for future taxpayers.

The growth in oil and gas activities across Canada has resulted in tens of thousands of oil wells, mostly spread across the western provinces, a substantial number of which are now in need of decommissioning and restoration. The rest will eventually need sealing and reclamation once they are no longer productive. Oil wells that are not properly sealed, decontaminated, and reclaimed can threaten human and environmental health by leaking contaminants, including methane and brine, into groundwater, and they can release methane into the atmosphere where it contributes to climate change.[2] Legislation in most oil and gas producing jurisdictions requires oil and gas producers to seal a well and reclaim the site once the well is no longer productive.[3] When oil and gas producers go bankrupt before doing so, their oil wells become classified as orphans, meaning there is no legal owner who could be held responsible for sealing and reclamation.[4] These orphan oil wells are financial liabilities, requiring remediation and having no monetary value, and they must be cleaned up by provincial governments. They present a significant risk of becoming a taxpayer burden.

The problem of orphaned oil wells in Alberta received significant media and academic attention after a 2014 downturn in oil and gas prices resulted in thousands of oil wells being added to the list of orphan sites.[5] Remediation of these orphan wells will cost tens of

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1 See e.g. University of Victoria Environmental Law Centre, "BC Mining Law Reform: A Plan of Action for Change" (Victoria: University of Victoria Environmental Law Centre, 5 November 2019) online (pdf): <elc.uvic.ca/wordpress/wp-content/uploads/2019/11/BCMLR-Briefs-print-lowres.pdf>[https://perma.cc/Z2EV-2QPZ].

2 See Vanessa Alboiu & Tony R Walker, "Pollution, management, and mitigation of idle and orphaned oil and gas wells in Alberta, Canada" (2019) 191:611 Environmental Monitoring & Assessment at 4–8.

3 See e.g. *Drilling and Production Regulation*, BC Reg 282/2010, Part 5 [DPR]. See also *Oil and Gas Conservation Act*, RSA 2000, c O-6, s 27. See also *The Oil and Gas Conservation Regulations, 2012*, RRS c O-2, Reg 6.

4 Most jurisdictions set out the power to classify an oil well or other site or facility as an orphan in legislation. See e.g. *Oil and Gas Activities Act*, SBC 2008, s 45(2) [*OGAA*].

5 See e.g. Tracy Johnson, "Alberta attempts to tackle its abandoned well problem", *Canadian Broadcasting Corporation* (10 May 2017). See also Tony Seskus, "Orphan well clean-up costs could sting Alberta taxpayers if regulator loses court battle", *Canadian Broadcasting Corporation* (21 February 2018). See also Lucija Muehlenbachs, "80,000 Inactive Oil Wells: A Blessing or a Curse?" (2017) 10:3 U Calgary School Public Policy Publications.

millions of dollars.[6] Taxpayer money, in the form of government grants and loans, now funds much of that remediation work.[7] Less attention has focused on British Columbia, where the booming oil and gas sector and its concomitant price volatilities have also caused an increase in the number of orphaned oil wells.[8] Oil and gas production in that province, mostly in the northwestern region, has nearly doubled in the past 10 years.[9] It has been a welcome source of economic growth, contributing $498 million in government royalties and land sales in fiscal 2018.[10] That economic prosperity obscures some of the hidden financial and environmental costs of oil and gas production. These costs include an exponential increase in the number of orphaned oil wells in British Columbia over that same period, mostly due to a 2016/2017 downturn in the industry.

One of the purposes of oil and gas regulation is to ensure that oil and gas producers, and not taxpayers, pay for any pollution associated with oil and gas production. This paper considers how oil and gas regulations in British Columbia could be improved in order to ensure that taxpayers are not liable for current and future orphan oil well remediation costs. Part I addresses the number of orphan oil wells in British Columbia, the recent history of oil company bankruptcies, and the meagre security collected by the provincial regulatory body to seal and reclaim the orphan wells of bankrupt companies. Part II discusses policy tools used in other jurisdictions to address the problem of orphan wells. It introduces the concept of an environmental bond, which is a deposit that an oil well permit holder leaves with a regulatory body as security against the remediation obligations associated with that permit. Part III describes the two orphan well regulatory tools used in British Columbia. One is aimed at funding remediation for the current inventory of orphan wells. The other is similar to, but is not quite, an environmental bond; it is meant to assess the financial riskiness of an oil well permit holder and requires security from that permit holder based on its ratio

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6 The exact cost of remediating Alberta's current inventory of orphan oil wells is hard to estimate with precision because costs vary by site. The 2019 Annual Report from Alberta's Orphan Well Association gives an average reclamation cost of $25,000 per well, with costs ranging from $5,000 to $45,000 per site. Given the 2019 inventory of 3,319 orphan sites in Alberta, total reclamation costs should be around $83 million. See Orphan Well Association, *Annual Report 2019* (Calgary: Orphan Well Association, June 2020) at 10 [*OWA 2019 Annual Report*].

7 See Government of Alberta, "Cleanup boost for old oil and gas sites to create jobs" (18 May 2017), online: *Government of Alberta* <www.alberta.ca/release.cfm?xID=4694019572224-D73F-7246-523724CDE750729C> [https://perma.cc/9PRW-Z3P6]. See also *OWA 2019 Annual Report*, *supra* note 6 at 3. The *OWA 2019 Annual Report* notes two provincial loans to the Orphan Well Association, a $235 million loan in 2017 with interest on this loan covered by a $30 million federal grant, at 8, and repayment set to occur from 2021–2027, at 23; and a $100 million loan in 2020 at 0% interest, with repayment beginning in 2028, at 25. It also notes a $200 million interest-free loan commitment by the federal government in 2020 as part of a COVID-19 stimulus plan with terms yet to be finalized, at 25.

8 Part I of this paper discusses the number of orphan wells in British Columbia in more detail.

9 See British Columbia Oil and Gas Commission, *British Columbia's Oil and Gas Reserves and Production Report* (Victoria: British Columbia Oil and Gas Commission, 2019).

10 See Office of the Auditor General of British Columbia, *The BC Oil and Gas Commission's Management of Non-operating Oil and Gas Sites* (Victoria: Office of the Auditor General of British Columbia, 2019) at 15 [*Management of Non-Operating Sites*].

of productive oil wells to non-productive, liability-laden wells. In theory, both tools are economically efficient. In practice, they tend to be ineffective. Part IV considers the provincial regulator's ability to recover the orphan well remediation costs from a bankrupt permit holder. The regulator's ability to recover in bankruptcy proceedings depends on where it ranks among the other creditors, which in turn requires considering how a recent Supreme Court of Canada decision, *Orphan Well Association v Grant Thornton Ltd* [*Redwater*], might apply in British Columbia.[11] It is not yet clear how that decision will apply in British Columbia and, as a result, it is not apparent whether the regulator will recover ahead of, or behind, the bankrupt permit holder's other creditors. Part V puts forward the argument that, given the weaknesses in the current regulatory framework and the uncertainty when it comes to the provincial regulator recovering costs in bankruptcy proceedings, a framework that incorporates upfront environmental bonds would be preferable to the current one.

I. THE SCOPE OF THE ORPHAN WELL PROBLEM IN BRITISH COLUMBIA

A. How Oil Wells Become Orphans

Once an oil well is no longer productive, it must be sealed and plugged with concrete to avoid contamination of ground and surface water and to prevent methane from leaking from the well.[12] This process is often termed plugging, decommissioning, or abandonment.[13] Surface structures must be removed and the site returned to its original condition, with any contaminants cleaned up.[14] This process is referred to as restoration or reclamation.[15] The terms used to describe these processes vary between jurisdictions. For simplicity, this paper will refer to both processes collectively as remediation. An orphan well is one that is no longer productive and requires remediation but has no legal or financial owner who could be held accountable for those remediation obligations, typically because the permit holder is insolvent or cannot be located.[16] The distinction between an "orphan well" and an "abandoned well" is key, despite the similarity in how those terms are used colloquially. An "abandoned" well is one that has been plugged and remediated and has no pending regulatory obligations

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11 2019 SCC 5 [*Redwater*].

12 See Alboiu & Walker, *supra* note 2 at 4–8.

13 See *DPR*, *supra* note 3, Part 5, which refers to "abandoning, plugging and restoring wells". See also Jacqueline Ho et al, "Managing Environmental Liability: An Evaluation of Bonding Requirements for Oil and Gas Wells in the United States" (2018) 52:7 Environmental Science & Technology 3908 [Ho et al, "Evaluation of Bonding Requirements"], discussing regulations in American states that require plugging and abandonment, and the environmental risks associated with improperly plugged wells, at 3908. See also *OWA 2019 Annual Report*, *supra* note 6 at 8, explaining that the Orphan Well Association uses the term "decommission" to refer to the "responsible abandonment of energy infrastructure".

14 See *DPR*, *supra* note 3, s 28. See also Ho et al "Evaluation of Bonding Requirements", *supra* note 13 at 3908, discussing well site reclamation in American states.

15 *DPR, supra* note 3, s 28.

16 See Benjamin Dachis, Blake Shaffer & Vincent Thivierge, "All's Well that Ends Well: Addressing End-of-Life Liabilities for Oil and Gas Wells" (2017) 492 CD Howe Institute Commentary at 5 for a succinct description of the term orphan well.

attached to it, whereas an "orphan well" is one that needs to be abandoned but has no legal or financial owner.[17] The term "orphan well" is used nearly uniformly across jurisdictions in Canada and the United States.[18]

Legislation in Alberta and British Columbia allows the provincial regulatory body to designate a non-productive oil well requiring remediation as an orphan if the permit holder or licensee goes bankrupt.[19] The British Columbia Oil and Gas Commission ("Commission")—the regulatory body for oil and gas within that province—may designate an oil well, facility, pipeline, or oil and gas road as an "orphan site" if the permit holder is insolvent or if the Commission cannot identify or locate the permit holder.[20] The Commission has statutory authority to remediate sites designated as orphans.[21] The vast majority of orphan sites in British Columbia are orphan wells.[22] For that reason, this paper will use the term orphan well.

B. The Scale of the Orphan Well Problem in British Columbia

Most jurisdictions aim to prevent orphan sites from becoming taxpayer liabilities, but weak regulations create the risk that provincial or federal governments will ultimately pay for orphan site remediation. Understanding the scope of the potential financial risk facing taxpayers requires consideration of recent surveys of the number of orphan sites in British Columbia and what it will cost to remediate them.

The number of orphan sites in British Columbia has grown exponentially in recent years. There are currently 770 orphan sites in the province, roughly a seventeen-fold increase over the last five years, and the Commission has remediated 56 of those sites.[23] A recent list of those orphan sites, dated 24 June 2020, shows the vast majority of those 770 are orphan wells.[24] In 2010, there were only 38 orphan sites in British Columbia, all "historical sites with no identifiable owner".[25] That number remained fairly steady for five years, and in the 2015/2016 fiscal year there were only 45 orphan sites.[26] In the 2017/2018 fiscal year, the inventory jumped to 307 due to the economic downturn in the oil industry.[27]

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17 See Dachis, *supra* note 16 at 4 for a discussion of the distinction between these terms.

18 See Ho et al, "Evaluation of Bonding Requirements", *supra* note 13 at 3908.

19 See *OGAA supra* note 4, s 45(2). See also *OGAA Act*, *supra* note 3, s 70(2).

20 *Ibid.*

21 *Ibid,* s 45(1).

22 See British Columbia Oil and Gas Commission, *List of Current Orphans (v2)* (Victoria: British Columbia Oil and Gas Commission, 24 June 2020), online (pdf): <www.bcogc.ca/files/resources/Current-Orphans.pdf> [https://perma.cc/S9PN-NSFH].

23 See British Columbia Oil and Gas Commission, "Former Ranch Energy Assets Declared Orphan Sites (IB 2020-05)" (17 June 2020), online: *Government of British Columbia* <www.bcogc.ca/news/former-ranch-energy-assets-declared-orphan-sites-ib-2020-05/> [https://perma.cc/3LTC-3NA6] [Ranch Energy]. All 401 orphan sites added to the orphan site inventory were oil wells.

24 See *List of Current Orphans (v2)*, *supra* note 22. Less than 15 orphan sites are facilities, and the rest are oil wells.

25 See Office of the Auditor General of British Columbia, *Oil and Gas Sites Contamination Risk: Improved Oversight Needed* (Victoria: Office of the Auditor General, 2010) at 10.

26 See Office of the Auditor General of British Columbia, *Management of Non-Operating Sites*, *supra* note 10 at 44.

27 *Ibid*.

The number of orphan sites doubled in June 2020 when the bankruptcy of Ranch Energy Corporation added 401 oil wells to the list of orphan sites.[28]

Based on existing estimates from the Office of the Auditor General of British Columbia ("Auditor General") and the Commission, the total cost for remediating existing orphan sites in British Columbia lies between $77 million and $100 million. The Commission estimates abandonment costs at $130,000 for an average site around Fort St. John, but costs per site could be as low as $30,000 and as high as $250,000 depending on site and well characteristics.[29] In 2019, the Auditor General estimated remediation costs for the then-current 307 orphan sites at $33 million, which calculates to roughly $107,000 per site.[30] The Commission estimates that the 401 orphan wells resulting from the Ranch Energy bankruptcy add up to a liability of $40 million to $50 million.[31] These sources show that remediation costs per orphan site range from $100,000 to $130,000. Multiplying those averages by the current inventory of 770 orphan sites in British Columbia gives an estimate of $77 million to $100 million in total orphan well liabilities.[32]

It is difficult to predict whether this strong uptick in the number of orphan wells will continue. Low oil prices and economic fallout due to the COVID-19 pandemic may cause more bankruptcies and more orphaned sites in the near future.[33] The Auditor General notes that total restoration costs for all the non-operating well sites in British Columbia in 2019 add up to roughly $3 billion.[34] That number suggests that if the number of orphan wells continues to increase, then there will be cause for taxpayer concern.

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28 See British Columbia Oil and Gas Commission, "Ranch Energy", *supra* note 23.

29 See British Columbia Oil and Gas Commission, *2018/19 Annual Service Plan Report* (Victoria: BC Oil and Gas Commission, July 2019) at 11 [*2018/19 Service Plan*].

30 See Office of the Auditor General of British Columbia, *Management of Non-Operating Sites*, *supra* note 10 at 44. The Auditor General's report also estimates total restoration costs (to abandon the sites and completely restore them to their original condition) for the then-inventory of 307 sites at $73 million to $103 million.

31 See Betsy Trumpener, "Collapsed Alberta energy company leaves behind 401 'orphan' wells in BC, more than doubling total" *Canadian Broadcasting Corporation* (19 June 2020). See also British Columbia Oil and Gas Commission, *2020/2021–2022/2023 Annual Service Plan Report* (Victoria: BC Oil and Gas Commission, February 2020) at 15, estimating $50 million in additional orphan well remediation costs due to "receivership of major well operator".

32 See British Columbia, Legislative Assembly, Committee, "Bill 15 – Energy, Mines and Petroleum Resources Statutes Amendment Act, 2018", 41-3, No 125 (25 April 2018) [Hansard]. In 2018, Honourable Michelle Mungall estimated it would cost $62 million to clean up 307 sites, suggesting that the range of $77 million to $100 million errs on the low end. The sources relied on in making these calculations are not always clear on whether those costs would include just plugging and abandonment (i.e. sealing the well with concrete) or assessment, removing existing structures, and site restoration, which all significantly add to the costs. Again, this suggests that these calculations might underestimate total costs.

33 See Kyle Bakx, "More Canadian oilpatch companies seek CCAA protection to restructure", *Canadian Broadcasting Corporation* (30 June 2020).

34 See Office of the Auditor General, *Management of Non-operating Sites*, *supra* note 10 at 20. In May 2018, there were 27,526 oil and gas wells in British Columbia. Of these, 7,474 were inactive wells that had not been decommissioned (i.e. plugged or sealed), and 3,198 had been decommissioned but the sites not fully restored, for a total of 10,672 non-operating well sites that need some form of remediation work.

Governments have already started providing some funding for orphan well remediation in the form of grants and loans. For instance, the federal government recently announced $1.7 billion to clean up orphan sites in British Columbia, Alberta, and Saskatchewan.[35] Orphan well remediation in Alberta is increasingly funded through grants and government loans.[36] Public funding suggests orphan wells are increasingly becoming a taxpayer problem.

II. SOME POLICY TOOLS FOR ADDRESSING THE PROBLEM OF ORPHAN WELLS

A. Environmental Bonds: Security Deposits Against Future Environmental Liabilities

Financial assurance mechanisms are common tools for addressing unpredictable future risks and anticipated future financial obligations across a range of hazardous activities. A classic example is car insurance, which assures other road users that the driver can pay for any accidents caused by their driving.[37] In the natural resources context, these financial assurance mechanisms can protect against unforeseen hazards—oil spills, for instance—and can ensure that operators pay for predictable environmental obligations that will only arise far in the future—for example, reclaiming non-productive mines.[38] More specifically, when it comes to oil wells, financial assurance mechanisms can be used to ensure that oil producers pay for their remediation obligations that will only arise once the well is no longer productive and has no economic value.

Environmental bonds are one form of financial assurance mechanism.[39] The term "environmental bond" describes some form of security deposit given to a regulator against a company's future remediation obligations. The security deposit is returned to the company once it performs those obligations, or it is used by the regulator if the company does not perform those obligations.[40] Environmental bonds are common policy tools in jurisdictions that produce oil and gas.[41]

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35 See Kathleen Harris, "Trudeau announces aid for struggling energy sector, including $1.7B to clean up orphan wells", *Canadian Broadcasting Corporation* (17 April 2020).

36 See Government of Alberta, "Cleanup boost for old oil and gas sites to create jobs", *supra* note 7. See also *OWA 2019 Annual Report*, *supra* note 6 at 10 and 25.

37 See Zachary CM Arnold, "Preventing Industrial Disasters in a Time of Climate Change: A Call for Financial Assurance Mandates" (2017) 41:1 Harv Envtl L Rev 243 at 263.

38 *Ibid* at 270 and 273.

39 See Colin Mackie & Laurel Besco, "Rethinking the Function of Financial Assurance for End-of-life Obligations" (2020) 50 Environmental L Reporter at 10573. FARs include surety bonds, letters of credit, bank guarantees, self-bonds, and cash deposits. See also Arnold, *supra* note 37, on requiring participants to carry insurance as a form of financial assurance mechanism. See Dachis, *supra* note 16 at 8.

40 See Dachis, *supra* note 16 at 8, offering a succinct definition. Most authors use the term "environmental bond" without defining it.

41 See Judson Boomhower, "Drilling Like There's No Tomorrow: Bankruptcy, Insurance, and Environmental Risk" (2019) 109:2 American Economics Rev 391 at 396, discussing environmental bonds used in Texas. See also Ho et al, "Evaluation of Bonding Requirements", *supra* note 13, surveying bonding requirements in 13 states. See also Christopher S Kulander, "Surface Damages, Site-Remediation and Well Bonding in Wyoming – Results and Analysis of Recent Regulations" (2009) 9:2 Wyo L Rev 413 at 440.

Environmental bonds are particularly useful for protecting against what Judson Boomhower, Assistant Professor in the Department of Economics at the University of California San Diego, describes as the "judgment-proof problem" of oil well environmental liabilities.[42] Bankruptcy protection allows companies to take risks knowing that, in the worst-case scenario, their liabilities are discharged in bankruptcy.[43] The judgment-proof problem arises when firms take on liabilities, specifically environmental or public health risks, that exceed the value of their assets, making them effectively judgment-proof.[44] Taking on such risks may give a firm an advantage over competitors.[45] Boomhower notes that oil well remediation obligations can present a judgment-proof problem because, without policy interventions in the oil industry, firms have few incentives to remediate non-productive oil wells or to ensure that the costs of their remediation obligations do not exceed the value of their assets.[46] Bankruptcy protection also creates the risk that a debtor will avoid or delay performing regulatory obligations if those obligations can be discharged in bankruptcy.[47]

Small differences in environmental bonding requirements for oil wells can lead to large differences in effectiveness, as noted in a report by Jacqueline Ho, Alan Krupnick, Katrina McLaughlin, Clayton Munnings, and Jhih-Shyang Shih, researchers at the American non-profit research organization, Resources For The Future.[48] Bond amount is the major policy choice differentiating one regulatory framework from another, and there is significant academic and policy debate on setting optimum bond amounts.[49] Bond amounts fixed at or near actual remediation costs, characteristic of strong regulatory systems, ensure that the regulator can access sufficient funds to carry out remediation work.[50] Factors like well depth, location, and well type all influence remediation costs, so bond amounts set near remediation costs should vary with those factors.[51] Conversely, since environmental bonds tie up capital for long periods of time and increase the costs of entering the industry for new firms, some

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42 Boomhower, *supra* note 41 at 396.

43 *Ibid* at 391.

44 *Ibid*.

45 *Ibid* at 392–393.

46 *Ibid*.

47 See Anna J Lund, "Lousy Dentists, Bad Drivers, and Abandoned Oil Wells: A New Approach to Reconciling Provincial Regulatory Regimes with Federal Insolvency Law" (2017) 80:1 Sask L Rev 157 at 166. Lund calls this a "moral hazard".

48 See Jacqueline Ho et al, "Plugging the Gaps in Inactive Well Policy" (Washington, D.C.: Resources for the Future, May 2016), online: <www.rff.org/publications/reports/plugging-the-gaps-in-inactive-well-policy/> [https://perma.cc/BD68-N48Z] [Ho et al, "Plugging the Gaps"]. The authors survey inactive well regulations in a number of American states and make policy recommendations, at 16–50.

49 See e.g. Ho et al, "Evaluation of Bonding Requirements", *supra* note 13 at 3914, discussing some of the considerations that factor into setting bond amounts. See also Dachis, *supra* note 16 at 17, noting that the "[t]he optimal bonding amount is less than the full environmental liability due to the economic distortion created by the bond requirement [reference omitted]."

50 See Ho et al, "Plugging the Gaps", *supra* note 48 at 16 and 21. The authors add at 45 that "[s]tates should require an amount of financial assurance that reflects real world plugging costs."

51 *Ibid* at 23.

commentators argue for bond amounts set at less than actual remediation costs in order to encourage resource development.[52] Empirical evidence shows that bond amounts in most jurisdictions are set substantially lower than actual remediation costs, leading to shortfalls in funding for orphan site remediation.[53] For that reason, most commentary calls for more stringent bond requirements, but ones that still account for industry "liquidity constraints."[54]

Texas provides an example of stringent oil well bonding requirements.[55] As of 2001, all oil well permit holders in Texas must post a bond of two dollars per foot of well depth, with the option of providing a "blanket bond" for a large number of wells.[56] Oil companies can either post cash or assets with the regulator themselves, or they can purchase a "surety bond" from a third-party insurer.[57] Third-party insurers charge a premium on the bond amount based on the financial riskiness (or strength) of that particular company.[58] If the company goes bankrupt, the insurer pays the bond amount to the regulator and then attempts to recover from the bankrupt company's estate.[59] Creating a market for third-party insurance transfers the burden of monitoring the financial health and risk levels of oil companies from the regulator to the third-party insurance providers.[60] It avoids creating liquidity problems or tying up capital for long periods of time, a common critique levelled at environmental bonds.[61] It also ensures that the regulator can access the funds to clean up orphan wells; if a company goes bankrupt, the regulator can use the posted cash or assets, or the insurer will pay out the bond amount. One drawback is that insurers might charge high premiums and transaction costs, driving up costs for producers.[62] Another risk is that insurers will underestimate oil company risk levels and set premiums too low.

Boomhower's Texas case study shows how introducing bonding requirements for oil wells can reduce the number of orphaned oil wells but also change industry composition. Following the introduction of bonding requirements in 2001, the number of firms leaving orphan wells behind when they exited the industry decreased from seven percent to three percent.[63]

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52 Dachis, *supra* note 16 at 17. The authors suggest setting low bonding amounts initially with gradual increases.

53 See Ho et al, "Evaluation of Bonding Requirements", *supra* note 13 at 3913. The authors found that plugging and abandonment expenditures exceeded bond amounts in 11 of 13 states.

54 *Ibid* at 3914.

55 Boomhower, s*upra* note 41 at 396, noting that bonding requirements in Texas are among the most strict.

56 *Ibid* at 404. For example, 100 wells or more can be covered with a $250,000 blanket bond.

57 *Ibid* at 403. Boomhower notes that 97% of producers purchase third-party surety bonds.

58 *Ibid* at 396.

59 *Ibid*.

60 *Ibid* at 393. In Texas, "[f]irms were required to purchase an insurance product from private insurers that was specifically designed to address bankruptcy concerns," and insurers charge a premium based on perceived risk.

61 Dachis, *supra* note 16 at 8.

62 Boomhower, *supra* note 41 at 423. Boomhower notes several dozen firms offer insurance in Texas, suggesting pricing is competitive.

63 *Ibid* at 416–417. Boomhower took averages for the two years before and after the introduction of bonding requirements. The bond requirements decreased the "industry-wide orphan well rate by 65 percent", at 421.

Bonding requirements also caused small oil firms to go out of business: a total of five percent of oil producers exited the industry in the 12 months after bonding requirements were introduced.[64] All were small firms who also represent the biggest polluters, as 100 percent of orphan wells in Texas were associated with the 20 percent of production that came from the smallest firms.[65]

It is not entirely clear why small oil firms are disproportionately responsible for orphaned wells and other forms of pollution. Nor is it clear if the same phenomenon exists in British Columbia. Boomhower explains this phenomenon with the theory that small firms may take on excessive environmental risks in order to remain competitive against larger firms.[66] Anthropologist Caura Wood's work offers a more structural explanation, albeit one based on qualitative and anecdotal research.[67] Junior energy companies compete to "amass an inventory of hydrocarbon reserves in a short period of market time" with the anticipated reward of being purchased by a large oil producer, suggesting that industry structure and market forces concentrate high risk (and high reward) in smaller companies.[68] The buy-and-sell nature of the oil industry might also encourage aggregation of risk among small producers. Christopher S Kulander, Professor at the South Texas College of Law Houston, writing in 2009, described the phenomenon in Texas of selling wells with "dwindling production … down the company 'food chain' so that wells circling the drain of economic viability are common in the portfolio of financially unstable corporations."[69] When those companies inevitably go out of business, they end up "orphaning a large group of wells in one fell swoop."[70] Wood's ethnographic account of a small Alberta oil company in the mid-2010s, and the liability-ridden assets it accepted as part of a deal to stave off bankruptcy, suggests this practice existed in Alberta at the time of the 2014 downturn in oil.[71]

One reason why Texas's bonding requirements are so effective is that Texas requires an upfront bond from oil producers against their remediation obligations or a surety bond purchased

64 *Ibid* at 393.

65 *Ibid* at 406. Data collected was from March 1996 to February of 2002. "One hundred percent of orphan wells, 98 percent of field rules violations, and 41 percent of blowouts are associated with the 20 percent of production that comes from the smallest firms."

66 *Ibid* at 392. Research for this paper did not come across any studies indicating whether environmental risk also concentrates among small producers in the oil and gas industry in British Columbia.

67 See Caura Wood, "Inside the Halo Zone: Geology, finance and the corporate performance of profit in a deep tight oil formation" (2016) 3:1 Economic Anthropology 43.

68 *Ibid* at 44.

69 See Kulander, *supra* note 41 at 440. Kulander describes Alberta's "regulatory experiences with orphaned wells [as] much less problematic" at 442, though his comments were written in 2009, prior to the downturn in 2014.

70 *Ibid*.

71 See Caura Wood, "Orphaned wells, oil assets, and debt: the competing ethics of value creation and care within petrocapitalist projects of return" (2019) 25:S1 J Royal Anthropological Institute 67. Facing severe financial distress, a junior oil company accepted 1,000 wellbores, over half of which needed abandonment or had environmental liabilities attached, used those wells to secure a new loan, then immediately commenced bundling them to pass them off to other distressed firms, at 80–83.

from a third party.[72] Cash deposited upfront with a regulator guarantees the regulator can use those funds for remediation activities, whereas weaker forms of financial assurance—such as liens or proof of financial statements—are less likely to ensure that the regulator can access sufficient funds for remediation.[73] Other policy choices related to environmental bonding for oil wells include the lowest possible bond amount, whether to allow blanket bonds (a discount on the bond amount for a larger number of wells), and whether to link bond amounts to a permit holder's previous compliance history.[74]

Aside from whether and how to rely on environmental bonding, another major policy decision is how to fund remediation for existing orphan wells. Evidence suggests that bond amounts in most oil and gas jurisdictions are nearly always insufficient to cover the actual costs of orphan well remediation, so governments must find other funding sources.[75] This typically involves deciding whether taxpayers, remaining industry participants, or new entrants should fund remediation and how to apportion those costs appropriately.[76] For instance, if current industry participants are funding remediation of orphan sites left by now-bankrupt oil firms, should their contributions be based on their ability to pay or based on their respective risks of going bankrupt and creating more orphaned oil wells? As a final note, policy tools exist aside from environmental bonding, such as direct regulation, relying on the tort system, mandatory insurance, environmental risk-premiums, and minimum asset requirements.[77]

B. Recovery During Bankruptcy Proceedings: Uniquely Canadian Challenges

The regulator's ability to recover its costs is an important piece of the regulatory framework. Depending on applicable laws, it may be easy or difficult for a regulator to recover costs during bankruptcy proceedings. Ho et al, in their report for Resources For The Future, postulate that if recovery of remediation costs is difficult, costly, and litigious, regulators

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72 See Boomhower, *supra* note 41 at 403.

73 See Ho et al, "Plugging the Gaps", *supra* note 48. At 21–22 and at 45, the authors note that cash, guarantees by third parties like surety bonds, letters of credit, and trust accounts are described as 'strong' forms of financial assurance. Liens and financial statements are 'weak forms'. Annual fees are typically set so low that they are ineffective.

74 *Ibid*. Minimum bond amounts varied from $5,000 per well in Kansas to $200,000 in California, at 25. The authors recommend against blanket bonds, at 27, or at least only allowing them with caution, since blanket bond amounts tend to be significantly less than actual remediation costs. They discuss linking bond amounts with previous compliance history at 21–22.

75 See Ho et al, "Evaluation of Bonding Requirements", *supra* note 13 at 3913.

76 See Ho et al, "Plugging the Gaps", *supra* note 48 at 48. The authors recommend that states "develop more sustainable means of funding their orphaned well plugging programs."

77 See Dachis, *supra* note 16 at 8 (on the first four options); see also Boomhower, *supra* note 41 at 423 (on the last).

and governments are less likely to have funds available to perform remediation work.[78] However, granting significant powers to a regulator to recover costs, both before and during bankruptcy proceedings, is not as simple a policy choice as it may first appear.

Anna Lund, Assistant Professor in the Faculty of Law at the University of Alberta, points out that in Canada, the ease with which a provincial regulator can recover remediation costs during bankruptcy proceedings is complicated by the federal power over bankruptcy, which, due to federal paramountcy, will supersede any conflicting provincial environmental legislation.[79] This is further complicated by the legal test applied by courts for determining when a particular claim is a "provable claim", a concept that is "central to insolvency law".[80] Provable claims are automatically stayed in bankruptcy and are subject to specific ordering set out in the *Bankruptcy and Insolvency Act* ("*BIA*").[81] Non-provable claims are not stayed and can continue to be enforced "notwithstanding the insolvency proceedings."[82] Thus, if a regulator advances a claim against an oil producer or its trustee once insolvency proceedings are initiated—for example, in the form of an order that the oil producer or its trustee abandon and reclaim its non-productive oil wells—and that order is considered a provable claim, it is subject to the ordering in the *BIA*, usually landing the regulator amongst the unsecured creditors.[83] If the regulator's claim is not provable in bankruptcy, then it is not stayed and can be enforced regardless of bankruptcy proceedings, allowing the regulator to recover during and after those proceedings.[84]

This paper will later return to the leading case on whether a regulator's remediation order is a claim provable in bankruptcy, *Redwater*, and discuss its potential application in British Columbia.[85] For now, in order to illustrate the particular challenges in designing a regulatory system where a regulator can recover most or all of the oil well remediation costs in bankruptcy proceedings, this section will describe the legal test developed in cases prior to *Redwater* and the criticisms of that test as summarized by Lund. Lund's work shows that the more power a regulator has to recover remediation costs in bankruptcy proceedings and the more steps it takes towards enforcing remediation obligations, the more likely it is that the regulator's claim will end up among the unsecured creditors.[86] Conversely, the less power the regulator

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78 See Ho et al, "Evaluation of Bonding Requirements", *supra* note 13 at 22. The authors make this comment with respect to the different types of financial assurance that can be required under an environmental bonding system. They note liens and other forms where "collection requires legal operation" are "weaker" forms, meaning it is less likely that the regulator will be able to recover their costs. This paper assumes that, similarly, the likelihood of a regulator recovering remediation costs from a bankrupt firm, and the process required for it to do so, will influence whether or not the regulator has sufficient costs for well remediation. The problem of whether or not the bankrupt firm's estate has enough value to cover remediation costs is a separate issue.

79 See Lund, *supra* note 47 at 170.

80 *Ibid* at 159.

81 *Bankruptcy and Insolvency Act*, RSC 1985, c B-3, ss 2, 69.3, 121, and 124. See Lund, *ibid*.

82 See Lund, *ibid*.

83 *Ibid* at 167–168.

84 *Ibid* at 159.

85 *Redwater*, *supra* note 11.

86 See Lund, *supra* note 47 at 166–168.

has and the fewer steps it takes, the more likely its claim will not be stayed when the debtor enters bankruptcy, thus allowing the regulator to effectively recover ahead of creditors.[87]

The test for a claim provable in bankruptcy has three requirements, as set out in *Newfoundland and Labrador v AbitibiBowater Inc* [*AbitibiBowater*]:[88]

> First, there must be a debt, a liability or an obligation to a *creditor*. Second, the debt, liability or obligation must be incurred *before the debtor becomes bankrupt*. Third, it must be possible to attach a *monetary value* to the debt, liability or obligation.

If any of the three prongs of the *AbitibiBowater* test are not met, then the claim is not a claim provable in bankruptcy and, therefore, not stayed.[89] The first and third prongs of the test are the most applicable where a regulator is advancing a remediation claim or making a remediation order against a bankrupt firm or its trustee. The test is highly fact-specific, and thus it is hard to predict whether a regulator's remediation order will be considered a claim provable in bankruptcy in any particular set of circumstances.[90]

Lund points out that the nature of the test and its application by courts create "perverse incentives" for all parties involved: creditors, regulators, and legislators.[91] Regulators have an incentive to show that their claims are not provable in bankruptcy.[92] The actions taken by the regulator in issuing a remediation order can influence whether the order is considered a claim provable in bankruptcy.[93] The third prong of the test, as it applies to regulators, asks whether it is "sufficiently certain" that the regulator will perform the work and assert a monetary claim.[94] Lund gives two examples of how the *AbitibiBowater* test has been applied to illustrate this point. In *Nortel Networks Corporation (Re)* [*Nortel Networks*], decided after *AbitibiBowater*, it was not sufficiently certain that the regulator would carry out the remediation work and assert a claim for reimbursement because the orders were made against current and former owners of the properties, who might instead carry out the work.[95] The regulator was not considered a creditor.[96] In *Northstar Aerospace Inc (Re)* [*NorthStar Aerospace*], the regulator had already started the remediation work, so it was sufficiently certain the regulator would undertake the remediation work and advance a claim for reimbursement; thus, the regulator

87 *Ibid*.
88 2012 SCC 67 at para 26 [emphasis in original] [*AbitibiBowater*].
89 *Ibid* at paras 22–26.
90 See Lund, *supra* note 47 at 165.
91 *Ibid* at 166–168.
92 *Ibid*.
93 *Ibid* at 167.
94 *Ibid*. Lund explains how this step was applied at 160–161. See also *AbitibiBowater*, *supra* note 88 at para 37. This step is variously described as whether the regulator will liquidate the obligation, assert a claim for reimbursement, or recover a debt.
95 *Ibid* at 161–162; see 2013 ONCA 599 [*Nortel Networks*].
96 *Ibid*.

was considered a creditor.[97] These cases show that the more steps the regulator takes to enforce the remediation order or assert a claim as the debtor approaches or enters bankruptcy, the more likely the regulator will be considered a creditor, thus discouraging the regulator from taking those steps.[98] Lund also speculates that this test encourages subterfuge, whereby the regulator disguises its efforts, in order to avoid being considered a creditor.[99]

Perverse incentives as described by Lund extend to legislators as well, who grant the regulator its powers to compel compliance with environmental regulators and demand repayment for work done by the regulator.[100] The more power the regulator has to "liquidate instances of non-compliance and collect the resulting debt", the more likely it will be considered a creditor.[101] Legislators may not want to create "rigorous regulatory schemes".[102] However, Lund points out that "these debt-creating provisions are desirable because they enable regulators to collect from noncompliant parties" and reduce taxpayer burdens, making them an important part of the compliance and enforcement toolkit.[103]

Finally, as Lund also notes, debtors have no incentive to perform environmental obligations prior to insolvency if they think they can discharge those obligations in bankruptcy.[104] Creditors might choose to "push a debtor to liquidate, instead of restructuring, to increase the likelihood of a regulatory obligation being deemed a provable claim."[105]

The point made by Ho et al, that strong regulatory systems feature regulators that can easily access remediation costs, should be considered in light of Lund's work.[106] Legislators cannot easily draft recovery powers for a regulator, nor is doing so necessarily effective. The legal uncertainty surrounding recovery in bankruptcy proceedings hinders legislators from ensuring that a regulator can recover remediation costs in bankruptcy proceedings. This uncertainty also makes it difficult for legislators to decide whether to grant those powers to the regulator and to determine whether the debtor's assets will cover the remediation costs. Such challenges demonstrate the sub-optimal nature of a system that relies on recovery in bankruptcy proceedings to fund orphan well remediation.

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97 *Ibid*. 2013 ONCA 600 [*NorthStar Aerospace*]. In *AbitibiBowater*, the fact that the debtor company did not have sufficient funds to do the work, that the timelines for remediation were unrealistically short, and that the government had already expropriated some of the lands at issue allowed the Court to conclude it was "sufficiently certain" the regulator would do the work and advance a claim for reimbursement.

98 *Ibid*.

99 *Ibid* at 167.

100 *Ibid* at 168.

101 *Ibid.*

102 *Ibid*.

103 *Ibid*.

104 *Ibid* at 166. See also Boomhower, *supra* note 41, referring to the "judgment-proof problem".

105 *Ibid* at 167.

106 See Ho et al, "Evaluation of Bonding Requirements", *supra* note 13 at 22.

III. BRITISH COLUMBIA'S REGULATORY FRAMEWORK: PREVENTING AND REMEDIATING ORPHAN SITES

The previous sections discussed the scope of the orphan well problem in British Columbia, introduced the concept of environmental bonds for oil well remediation obligations, and described some uniquely Canadian problems with relying on regulators to recover orphan well remediation costs during bankruptcy proceedings. This part of the paper describes two policy tools used in British Columbia to address the problem of orphaned oil wells and considers their effectiveness. The first, the Liability Management Rating program ("LMR") aims to collect financial assurance from oil companies against their future oil well remediation obligations based on their perceived financial riskiness. The LMR program is meant to prevent those remediation costs from becoming taxpayer liabilities and encourage firms to perform their own remediation work. The second, the Orphan Site Reclamation Fund ("OSRF"), is an industry-wide levy to fund remediation of the current inventory of orphaned wells and sites. Both programs are operated by the provincial regulator, the British Columbia Oil and Gas Commission. This section puts forward the argument that these policy tools are ineffective, that they will force the regulator to seek to recover costs in bankruptcy proceedings, and that upfront environmental bonding requirements would be more effective.

A. The Liability Management Rating program

The Liability Management Rating program is based on a series of policies created by the Commission pursuant to its statutory power to collect financial security from oil and gas producers.[107] In theory, the LMR program allows the Commission to monitor the financial health of oil companies. Oil well permit holders are required to post security against their site remediation obligations only if the ratio of their assets to liabilities falls below 1.0.[108] The LMR rating is based on "deemed" assets and "deemed" liabilities as defined in the Commission's policies, not on the level of overall debt of the permit holder.[109] Security deposits are returned to permit holders if their financial situation improves, through increased asset values or decreased liabilities, or if they remediate their sites.[110] The deposit is used to perform remediation work if the permit holder goes bankrupt.[111] The formula is expressed in Commission policy documents as:[112]

$$\text{LMR (1.0)} = \frac{\text{Deemed Assets + Security Deposit}}{\text{Deemed Liabilities}}$$

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107 See *OGAA*, *supra* note 4, s 30.

108 See British Columbia Oil and Gas Commission, *Liability Management Rating Program Manual Version 3.0* (Victoria: BC Oil and Gas Commission, 2020) at 8 [*LMR Program Manual 3.0*].

109 *Ibid* at ch 3 and ch 4.

110 *Ibid* at 18. See also *Fee, Levy and Security Regulation,* BC Reg 8/2014, s 25(4).

111 See British Columbia Oil and Gas Commission, *2018/19 Service Plan, supra* note 29 at 32. Any security deposits not returned are paid into the Orphan Site Reclamation Fund, discussed in more detail below.

112 See *LMR Program Manual 3.0*, *supra* note 108 at 8.

Although the LMR program requires financial security from permit holders, it is atypical in comparison to environmental bond requirements in other oil and gas producing jurisdictions, aside from Alberta.[113] The differences between the LMR and a more conventional environmental bonding system, such as the one used in Texas, illustrate the LMR's shortcomings. In Texas, as noted earlier, a cash deposit or a third-party surety bond based on well depth is required and only returned once remediation work is performed, regardless of the oil firm's perceived riskiness. Unlike a true environmental bonding system, with the LMR program, a company could hold several permits without being required to post any security against its environmental obligations, as long as it maintains the required ratio of deemed assets to deemed liabilities.[114] The amount of the security deposit required under the LMR is not linked to actual costs of remediation obligations. Instead, it is linked to valuations of assets and liabilities and returned if that ratio improves. None of the policy considerations discussed in Part II of this paper are evident in the LMR program. In particular, no link exists between the security required by the LMR and actual variations in remediation costs based on site characteristics. One positive attribute of the LMR program is that it requires what are considered "strong" forms of financial assurance: either cash or an irrevocable letter of credit.[115]

British Columbia's Auditor General issued a 2019 report excoriating the LMR program following a series of oil company bankruptcies in 2016 and 2017.[116] According to the Auditor General, the fundamental problem with the LMR program is that security deposits collected by the Commission are far less than the costs of restoring orphan sites.[117] For instance, before going bankrupt, Quattro Exploration and Production Ltd posted $0 in security against its $18.955 million in environmental liabilities, and Terra Energy Corp posted $952,000 against $54.702 million in liabilities.[118] The LMR program requires such low security deposits because the deposits are not linked to actual site remediation costs. Instead, the security deposit is an attempt to assess the company's financial well-being, based on valuation methods that are unable to keep up with rapid fluctuations in oil prices and do not account for its overall debt levels. Lucija Muehlenbachs, Associate Professor in the Department of Economics at the University of Calgary, points out that systems like the LMR program work well during an economic boom but fail to prevent orphan wells from becoming taxpayer liabilities during a downturn.[119]

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113 See Muehlenbachs, *supra* note 5 at 4, describing the Alberta liability management program as "atypical".

114 *Ibid.* Muehlenbachs makes this point in the context of Alberta, but it is equally relevant in British Columbia, given the similarities between the two regulatory regimes which is discussed in more detail in Parts IV and V.

115 See *Fee, Levy and Security Regulation*, *supra* note 110, s 25.

116 See Office of the Auditor General, *Management of Non-Operating Sites*, *supra* note 10.

117 *Ibid* at 41.

118 *Ibid* at 42. TransEuro Beaver River Inc posted $2.069 million against $10.258 million in liabilities, and Calver Resources Inc posted $108,000 against $1.142 million in liabilities. In total, five bankruptcies in 2016 and 2017 resulted in 262 orphan sites. Note that the liability estimates in the report likely include assessment, equipment removal, and site restoration costs, and not just plugging and abandonment costs.

119 See Muehlenbachs, *supra* note 5 at 5, referring to Alberta's regime, but relevant as the two liability management programs are nearly identical.

Recent adjustments to the LMR program's policies resulted in only slight improvements. For example, the Commission collected $15.6 million as a security deposit prior to the Ranch Energy Corporation bankruptcy, leaving a shortfall of only $25 million to $35 million in site remediation costs.[120] According to its 2019/2020 Annual Report, the Commission holds $144 million in security deposits.[121] The Auditor General estimated in 2019 that total remediation costs for all oil and gas sites in British Columbia was around $3 billion.[122] The disparity between those two figures suggests the security collected by the LMR program is nowhere close to the potential orphan well liabilities.

The LMR program also contains several other flaws that contribute to insufficient collection of security deposits. The program lags behind the rapidly deteriorating financial health of oil companies.[123] According to the Auditor General, by the time the Commission requested a deposit from companies that were close to bankruptcy in 2016 and 2017, "some operators could not pay the required security because of their poor financial status, and became non-compliant."[124] Caura Wood's description of the industry practice of bundling non-productive, liability-ridden oil wells with other more lucrative assets in order to pass them off to financially distressed companies illustrates how quickly regulators must react to changing balance sheets.[125] The Commission's monthly LMR reassessments are not frequent enough to keep up.[126] Nor do the deemed assets and deemed liabilities paint an accurate or holistic picture of a permit holder's financial health: this point was made in the context of Alberta's nearly-identical regulations by Colin Mackie, Lecturer at the School of Law at the University of Leeds, and Laurel Besco, Assistant Professor at the Institute for Management and Innovation and in the Geography Department at the University of Toronto-Mississauga.[127] The "deemed liabilities" are defined by the Commission and include the cost of remediating the permit holder's oil wells, but do not account for the permit holder's overall debt load.[128]

The LMR program overvalues assets, and the risk of low commodity prices leading to bankruptcies in the short-term is not captured in the valuation of those assets. Asset values are calculated by multiplying a fixed five-year average netback (essentially gross profits), based on data from 2008–2013, by expected production of that asset.[129]

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120 Email from Communication Specialist, British Columbia Oil and Gas Commission (14 July 2020), regarding $15.6 million collected from Ranch Energy Corporation.

121 See British Columbia Oil and Gas Commission, *2018/19 Service Plan, supra* note 29 at 28.

122 See Office of the Auditor General, *Management of Non-Operating Sites, supra* note 10 at 20. In 2018, there were 27,526 oil and gas wells in British Columbia. Of these, 7,474 were inactive wells that had not been decommissioned (i.e. plugged or sealed), and 3,198 had been decommissioned but the sites not fully restored, for a total of 10,672 non-operating well sites that need some form of remediation work.

123 See *LMR Program Manual 3.0*, *supra* note 108 at 17.

124 See Office of the Auditor General, *Management of Non-Operating Sites*, *supra* note 10 at 43.

125 See C Wood, *supra* note 71.

126 See *LMR Program Manual 3.0*, *supra* note 108 at 17.

127 See Mackie & Besco, *supra* note 39.

128 See *LMR Program Manual 3.0*, *supra* note 108 at 13.

129 See *LMR Program Manual 3.0*, *supra* note 108 at 10. This interpretation of netback in the *LMR Program Manual 3.0* was confirmed by email with Manager, Financial Risk and Liability, British Columbia Oil and Gas Commission (30 July 2020).

This valuation method "does not do an adequate job of reflecting changing asset values" as it does not capture the risk of short-term low commodity prices leading to bankruptcy.[130] In the context of Alberta, which applies a very similar formula for valuing assets, Mackie and Besco point out that the netback valuation method does not account for variability in value and production between individual sites.[131]

A final weakness of the LMR program is that it is premised on the assumption that the Commission can access a company's assets during bankruptcy proceedings and use those funds to remediate any orphan sites left by that company.[132] Any posted security deposit will always be less than the actual remediation costs; this was shown in the 2016/2017 bankruptcies.[133] More fundamentally, based on the LMR formula, the only situation in which a permit holder would have to post their full remediation costs as security would be if their deemed assets were worth nothing, or only a fraction of their deemed liabilities. Presumably, the difference between the posted security and the actual remediation costs is intended to come from the value of the company's assets. Even if the Commission ranks ahead of creditors (this is discussed in more detail later), there is no guarantee that the remaining assets will cover the company's remediation obligations. Finally, accessing remediation funds during the bankruptcy process is slow, cumbersome, uncertain, and could involve significant transaction costs.

B. The Orphan Site Reclamation Fund

The Commission uses the industry-funded Orphan Site Reclamation Fund to clean up existing orphan sites.[134] Unlike funds paid into the LMR program, funds paid into the OSRF are not returned to oil and gas producers. Prior to 2019, an industry-wide tax based on the cubic metres of oil or petroleum produced by an operator funded the OSRF.[135] In order to fund the increasing number of orphan sites, Bill 15 changed the tax to a levy in 2019, and it delegated power to the Commission to determine the amount collected annually under that levy.[136] The difference is "more than semantic": a tax must be set out in legislation whereas a levy can be amended by the Commission itself through amendments to the *Fee, Levy and Security Regulation*.[137] The Commission decides on the amount to be collected each year, and each producer then pays in proportion to their liabilities as a ratio of total industry liabilities. As noted above, security deposits of bankrupt oil companies are also paid into the OSRF once the firm is insolvent and are earmarked for that firm's orphan sites.[138]

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130 See Dachis, *supra* note 16 at 9, critiquing Alberta's LLR, which also uses a fixed netback valuation method.

131 See Mackie & Besco, *supra* note 39 at 10580–10581.

132 See Dachis, *supra* note 16, making this same point in the context of Alberta's regulatory regime.

133 See Office of the Auditor General, *Management of Non-Operating Sites*, *supra* note 10.

134 See *OGAA*, *supra* note 4, s 45(3).

135 *Ibid*, s 47, as it appeared on 16 May 2018.

136 See "Bill 15 – Energy, Mines and Petroleum Resources Statutes Amendment Act", 2nd reading, British Columbia, *Legislative Assembly Debates*, 41-3, Issue No 123 (24 April 2018), cl 12, effective April 2019.

137 See Hansard, *supra* note 32. Honourable Michelle Mungall discussed the difference between a tax and a levy. See also *Fee, Levy and Security Regulation*, *supra* note 110, Part 4.1.

138 See British Columbia Oil and Gas Commission, *2018/19 Service Plan, supra* note 29 at 32.

The former tax was premised on an "ability-to-pay" model, since it was based on the volume of petroleum products produced.[139] The new levy is more liability-based, in that permit holders who hold a greater portion of the industry's total liabilities pay more in levies.[140] However, permit holders are paying to clean up the orphan sites left by exiting firms in proportion to their current liabilities, which brings up the questions of whether this is truly a polluter-pays model and whether it represents a fair distribution of liabilities across the industry. From an industry perspective, one concern is that the Commission has complete discretion in determining the amount to be raised each year and the number of levies imposed annually, allowing for flexibility but creating unpredictability for oil companies.[141]

The new levy system that funds the OSRF risks breaking down if the number of orphan sites increases and the number of industry participants decreases, as it focuses the increasing remediation costs on a decreasing number of producers.[142] Recent events suggest that this focusing effect is already happening; as noted earlier, the number of orphan wells doubled in June 2020, and presumably the amount collected by the levy will also need to double.[143] The levy itself risks causing more bankruptcies in the industry, though this flaw is not unique to the levy, and any effort to draw funds out of the industry for orphan site remediation may cause more bankruptcies.[144] According to the Honorable Minister Mungall, the Commission will only increase the levy gradually each year, in order to prevent insolvencies and bankruptcies.[145] While gradual increases will allow companies to plan ahead financially, it is unclear how the gradual approach will prevent bankruptcies, since the annual increases are tied to the number of orphan sites the Commission plans to remediate that year and are not tied to fluctuations in oil prices, a more immediate cause of bankruptcies.[146]

IV. ALBERTA'S REGULATORY FRAMEWORK

Alberta provides a helpful point of comparison as it is by far Canada's largest producer of oil and gas, and because its regulatory framework is very similar to, though predates, that

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139 See Hansard, *supra* note 32, where Honourable Michelle Mungall noted that the former tax was based on ability to pay.

140 *Ibid*.

141 *Ibid*. Honourable Sonia Fursteneau pointed out that the new section 47(2) does not state how the Commission will determine the amount to raise under the levy. See also *Fee, Levy and Security Regulation*, *supra* note 110, s 24.3, setting out the amounts to be raised under the levy annually until 2021.

142 See Dachis, *supra* note 16 at 9, critiquing the Alberta system, but the same comments are relevant in British Columbia.

143 See Hansard, *supra* note 32, comments by Honourable Michelle Mungall.

144 *Ibid*. Honourable Michelle Mungall noted, "We don't want to be responsible for triggering more bankruptcies that result in more orphaned wells."

145 *Ibid*. Honourable Michelle Mungall noted that the Commission has the power to implement a second levy in any given year if it determines that the work is more expensive than anticipated, or it can do more than originally planned.

146 *Ibid*. Honourable Michelle Mungall noted that the Commission will base levy amounts on the work it wants to perform.

of British Columbia. Alberta produces 82 percent of Canada's crude oil.[147] Revenues from non-renewable resources in Alberta amounted to $5.9 billion in the 2019/2020 fiscal year.[148] The scale of oil and gas extraction in British Columbia, as well as the scale of the orphan well problem, is modest in comparison to Alberta. The most recent update to Alberta's orphan well inventory indicates that 2,983 orphan wells need abandonment and 3,284 sites need reclamation.[149] Recent financial statements from 2019 indicate each orphan well costs on average $29,000 to decommission and $25,000 to reclaim.[150] At least one news agency has reported on internal documents suggesting that it will cost roughly $100 billion to remediate all the oil wells currently in existence in Alberta.[151]

The Alberta Energy Regulator ("AER") is a statutorily-created corporation charged with overseeing the development of energy resources in Alberta, including the granting of licenses for resource development and regulating the abandonment and closure of wells, pipelines, and other facilities.[152] It does not perform abandonment or reclamation work. Once wells are classified as orphans, they are abandoned and reclaimed by the Orphan Well Association ("OWA"), an independent, non-profit entity that operates under powers delegated by the AER.[153] The OWA is funded in nearly equal parts by an industry-wide levy, titled the Orphan Fund, and government funding, the latter being mostly in the form of federal and provincial loans.[154]

The levy for the Orphan Fund is raised by the AER and transferred to the OWA's operating budget.[155] Similar to British Columbia, the levy is based on the permit holder's liabilities as a ratio of the total industry-wide outstanding liabilities.[156] In other words, an oil producer

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147 See Government of Alberta, "Provincial and Territorial Energy Profiles – Alberta" (29 September 2020), online: *Government of Alberta* <www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-alberta.html#:~:text=In%202018%2C%20Alberta%20produced%203.91,over%2082%25%20of%20total%20production> [https://perma.cc/JQY7-CEEN].

148 See Government of Alberta, *Energy Annual Report 2019–2020* (Edmonton: Energy Communications, Government of Alberta, July 2020). Bitumen accounts for 69 percent of those revenues, conventional oil counts for 20 percent, natural gas and by-products 6 percent, and land sales, rentals and fees, and coal accounting for the remainder.

149 See Government of Alberta, "Oil and gas liabilities management" (Government of Alberta, 2020), online: *Government of Alberta* <www.alberta.ca/oil-and-gas-liabilities-management.aspx> [https://perma.cc/EMG9-FA9F].

150 See *OWA 2019 Annual Report*, *supra* note 6. The average remediation costs per site are notably lower in Alberta, perhaps because unconventional wells make up a larger portion of British Columbia's oil wells.

151 See Mike De Souza et al, "Cleaning up Alberta's oilpatch could cost $260 billion, internal documents warn", *Global News* (1 November 2018).

152 See *Responsible Energy Development Act*, SA 2012, c R-17.3, Division 1.

153 See *Orphan Fund Delegated Administration Regulation*, Alta Reg 45/2001.

154 See *OWA 2019 Annual Report*, *supra* note 6 at 8.

155 See Alberta Energy Regulator "Orphan Well Association: Project Closure" (*Alberta Energy Regulator*, 2021), online: *Alberta Energy Regulator* <www.aer.ca/regulating-development/project-closure/liability-management-programs-and-processes/orphan-well-association> [https://perma.cc/BU8Q-A6BJ].

156 See Alberta Energy Regulator, *Bulletin 2020-19: 2020/2021 Orphan Fund Levy* (Calgary: Alberta Energy Regulator, 10 September 2020).

who holds more oil wells that need abandonment and reclamation, as a ratio of the total oil wells it holds, will pay more into the fund than one who holds mostly wells that do not need abandonment and reclamation.[157]

Alberta uses a liability management rating ("Alberta LMR") to assess the financial riskiness of an oil producer and to require a security deposit from that producer against its abandonment and reclamation obligations, if the producer is deemed financially risky.[158] This is also similar to the program used in British Columbia. The Alberta LMR is part of the Licensee Liability Rating program ("LLR") and is set out in a policy document issued by the AER.[159] The purpose of the LLR is to "to prevent the costs to suspend, abandon, remediate, and reclaim a well, facility, or pipeline in the LLR program from being borne by Albertans should a licensee become defunct, and to minimize the risk to the Orphan Fund posed by the unfunded liability of licences in the program."[160] The Alberta LMR is a ratio of the licensee's deemed assets to deemed liabilities.[161] Details of how these assets and liabilities are calculated are set out in directives from the AER, but they include using a three-year industry netback.[162] The Alberta LMR is calculated monthly, and if it drops below 1.0, the licensee is required to post a security deposit with the AER sufficient to bring its LMR back up to 1.0.[163] A licensee's LMR also affects its ability to transfer, or receive, licenses from other operators—as of 2016, in order to transfer a license, both the transferor and transferee must have an LMR of 2.0 after the transfer is completed, or the AER will not approve the transfer.[164]

The similarities between the regulatory frameworks in Alberta and British Columbia are apparent, and British Columbia's framework is quite possibly based on Alberta's, given the proximity of the two provinces and their economic interconnectedness. For that reason, many drawbacks of Alberta's regulatory framework are also relevant to British Columbia.

V. THE COMMISSION'S ABILITY TO RECOVER COSTS DURING BANKRUPTCY PROCEEDINGS AND THE SUPREME COURT OF CANADA DECISION IN *REDWATER*

As noted in Part II of this paper, a regulator's ability to recover remediation costs from an oil firm in bankruptcy proceedings has implications for designing the most appropriate orphan well regulatory framework in that jurisdiction. This section considers the 2019 Supreme

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157 *Ibid*.

158 See Alberta Energy Regulator, *Directive 006: Licensee Liability Rating (LLR) Program and Licence Transfer Process* (Calgary: Alberta Energy Regulator, 12 March 2013).

159 *Ibid.* Alberta uses the term "licensee" whereas British Columbia uses "permit holder".

160 *Ibid.*

161 *Ibid* at 4.

162 *Ibid* at 4, referring to other directives that are used to calculate the assets and liabilities, and at 17, referring to three-year industry netback.

163 *Ibid* at 4.

164 See Alberta Energy Regulator, *Bulletin 2016-21: Revision and Clarification on Alberta Energy Regulator's Measures to Limit Environmental Impacts Pending Regulatory Changes to Address the Redwater Decision* (Calgary: Alberta Energy Regulator, 8 July 2016).

Court of Canada decision in *Redwater*.[165] The Court considered the *AbitibiBowater* test for when a regulator's enforcement of an environmental regulation is considered a provable claim in bankruptcy. This test was discussed in Part II, and Part V picks up that discussion.

The Court's conclusion in *Redwater* suggests that most environmental remediation orders issued by a regulatory body are not stayed during bankruptcy proceedings and remain enforceable, thus allowing the regulator to continue enforcing the debt regardless of bankruptcy proceedings and effectively giving it priority over the debtor's creditors.[166] The facts of the case involved Redwater, an oil and gas company holding mostly non-productive and liability-laden oil wells, with only a few productive wells, that experienced financial distress in mid-2014. The Alberta Energy Regulator, Alberta's oil and gas regulator, told Redwater's receiver that the AER would not approve the transfer of any of Redwater's licenses unless the receiver fulfilled Redwater's outstanding remediation obligations. The liabilities of the non-productive wells exceeded the value of Redwater's few productive assets, so the receiver disclaimed the non-productive assets and refused to take possession of them. The AER ordered the receiver to remediate the non-productive assets. The AER and the Orphan Well Association sought a court order declaring the receiver's renunciation of the assets void, and the receiver countered by seeking approval for a sale of Redwater's productive assets.

Chief Justice Wagner, for the majority, applied the three-part test from *AbitibiBowater*.[167] He held that the remediation order issued by the AER was not a claim provable in bankruptcy.[168] The result was that the entire value of the company's assets (some $4 million) went towards its oil well remediation obligations, and its creditors received nothing.[169] A strong dissent, penned by Justice Côté, with Justice Moldaver concurring, argued the majority's decision displaces the polluter-pays model with a lender-pays model.[170]

Roderick Wood, Professor in the Faculty of Law at the University of Alberta, noted that some of the facts emphasized in Chief Justice Wagner's analysis might provide a basis for differentiating *Redwater* from other provincial regulatory regimes.[171] Only the first and third prongs of the *AbitibiBowater* test were at issue in *Redwater*.[172] Under the first part of the test (whether the regulator is a creditor), Chief Justice Wagner noted that the regulator had not yet done any remediation work itself.[173] He implied that if the regulator had done some of the remediation work, then it might be considered a creditor, leaving "such situations to be addressed in future cases in which there are full factual records."[174] Considering both *AbitibiBowater* and *Redwater*, Wood also noted that a regulator might be a creditor if it has

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165 *Redwater, supra* note 11.

166 *Ibid*. See also Lund, *supra* note 47 at 159.

167 *Redwater, supra* note 11.

168 *Ibid* at para 159. The AER's order was for the trustee to abandon and reclaim oil wells orphaned by the firm's bankruptcy.

169 *Ibid* at para 49. Redwater held $4.152 million in assets and had $4.7 million in environmental liabilities.

170 *Ibid* at para 291.

171 See Roderick J Wood, "Environmental Obligations in Insolvency Proceedings: *Orphan Well Association v Grant Thornton Ltd*", Case Comment (2019) 62 Can Bus LJ 211 at 222.

172 See *Redwater*, supra note 11 at para 120.

173 *Ibid* at para 135.

174 *Ibid*.

"taken steps that make it impossible for the debtor to carry out the work."[175] However, Chief Justice Wagner emphasized that the regulator was enforcing a public duty, sending a strong signal to lower courts that in most cases a regulatory body enforcing an environmental law is not a creditor.[176]

Under the third part of the test, which asks whether there is sufficient certainty that the environmental obligation will ripen into a claim for reimbursement, Chief Justice Wagner emphasized that the Orphan Well Association, and not the regulator, would perform the remediation work.[177] On that basis, he concluded that it was not sufficiently certain that the regulator would perform the work and advance a claim for reimbursement.[178] In Alberta, the OWA is non-profit, operating at arm's length from government. The AER is a branch of the Alberta government. The fact that the OWA is independent from the AER was crucial to Chief Justice Wagner's analysis. In British Columbia, unlike in Alberta, the Commission does the remediation work itself, providing a clear factual basis on which to differentiate *Redwater*.[179] For that reason, a regulator's claim is more likely a claim provable in bankruptcy if the regulator does the remediation work itself.

Given the public duty aspect emphasized in Chief Justice Wagner's application of the first prong, *Redwater* would most likely apply to the regulatory framework in British Columbia.[180] However, there is some factual basis for differentiating *Redwater*, suggesting uncertainty—and caution—should the Commission attempt to rely on *Redwater* during bankruptcy proceedings.[181]

Roderick Wood's analysis points out that the Court's decision in *Redwater* creates a remediation stand-off between creditors and regulators.[182] If the regulator takes steps to perform remediation work, it risks being characterized as a creditor.[183] The creditor has no incentive to appoint a receiver, since the longer the creditor waits, the more likely it is that the regulator will begin remediation.[184] A firm's environmental liabilities may exceed asset

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175 See R Wood, *supra* note 171 at 225.

176 *Redwater, supra* note 11 at para 135. See also para 123, regarding the *pro forma* application of step one of *AbitibiBowater*. See also *AbitibiBowater*, *supra* note 88 at para 26.

177 *Redwater*, supra note 11 at paras 145–146.

178 *Ibid*. On the basis of this fact, Chief Justice Wagner concluded that there was not sufficient certainty that the environmental obligation would ripen into a debt because it was not certain that the regulator would perform the remediation work and advance a claim for reimbursement, and the OWA would not advance a claim for reimbursement.

179 See *OGAA, supra* note 4, s 45.

180 See *AbitibiBowater*, *supra* note 88 at para 26. See also *Redwater*, *supra* note 11 at para 135, finding that the regulator was not a creditor, and at para 139, where Chief Justice Wagner continued with an analysis of the third prong of the test despite having resolved the issue under the first prong.

181 *Redwater*, *supra* note 11 at para 135.

182 See R Wood, *supra* note 171 at 226. See also Lund, *supra* note 47. See also *Redwater*, *supra* note 11 at para 221, where Justice Côté, in dissent, argues the majority decision will result in an insolvency standoff.

183 See R Wood, *supra* note 171 at 226.

184 *Ibid*.

values. If so, its creditors might never initiate bankruptcy proceedings. From their perspective, the regulator will receive the entire value of the estate, assuming *Redwater* applies. Initiating bankruptcy proceedings will only cost the creditor time and money, with nothing in return.[185] The other impact of *Redwater* on creditors is that they must now monitor the environmental liabilities of companies they loan money to. One can only speculate that *Redwater* has driven up the cost of credit in the oil industry and decreased its availability for oil companies.[186]

VI. ANALYSIS: WHY BRITISH COLUMBIA SHOULD REQUIRE UPFRONT ENVIRONMENTAL BONDS POST-*REDWATER*

This paper has demonstrated that the recent increase in orphan wells in British Columbia and the modest amount of security collected by the Commission to remediate those wells indicates that the current regulatory framework is not effective at preventing oil wells from becoming orphans. Nor is it effective at collecting funds for orphan well remediation from the firms that profited from those wells. There are many problems with the current regulations and policies that have contributed to the orphan well funding gap, including the ways in which those policies value the assets and liabilities of an oil firm. Many of these same problems are apparent in Alberta's orphan well regulatory model, where the scale of the orphan well problem is far greater.

The fundamental problem with the current framework in British Columbia is that it assumes the Commission can recover some, or all, of a bankrupt oil firm's assets to fund remediation of that firm's orphan oil wells. This regulatory design does not account for the legal uncertainty involved where a regulator attempts to enforce an environmental obligation in bankruptcy proceedings. This uncertainty arises because of the fact-specific nature of the legal test applied in assessing whether the regulator is asserting a provable claim when it enforces remediation obligations and from the "perverse incentives" that legal test creates for creditors and regulators alike. The *Redwater* decision sends a clear signal that bankruptcy does not allow a company to ignore environmental obligations, though it is still not certain how a court in British Columbia would treat the Commission's efforts to enforce remediation obligations. Nor did *Redwater* resolve the "perverse incentives" that the *AbitibiBowater* test created. This leaves the Commission, creditors, and oil firms in a place of uncertainty.

An upfront environmental bonding requirement would do away with the need for the Commission to recover in bankruptcy proceedings, or at least lessen that need, depending on the level at which bond amounts are set. It would also require transparent policy discussions on how to set optimum bond amounts and whether to link those amounts to factors like overall debt load and past compliance history. Environmental bonds can be set slightly below actual remediation costs to encourage economic growth and can link with relevant factors like site location, well depth, and type. Upfront environmental bonding would eliminate

185 *Ibid*.

186 See Tony Seskus, "Alberta seeks to lessen financial hit of Supreme Court ruling on orphan wells", *Canadian Broadcasting Corporation* (14 November 2019). See also C Wood, *supra* note 71 at 80, noting that the lower court decisions in *Redwater* changed the credit market in Alberta.

(or reduce) the need for creditors to monitor the environmental liabilities of oil companies, a criticism of the *Redwater* decision, resulting in greater certainty for creditors and companies. *Redwater* made it clear that permit holders or their creditors must pay for site remediation, and that decision might persuade industry participants that environmental bonding is preferable to the post-*Redwater* credit market.[187] Upfront environmental bonding would also be more transparent than the current levy that funds the OSRF and would avoid that levy's unsustainable funding model.[188]

Finally, environmental bonding is the only true polluter-pays model. The OSRF is funded on a surviving-firms-pay model, and critiques of *Redwater* suggest it created a creditor-pays model.[189] Environmental bonds ensure that companies profiting from oil extraction also pay for the environmental obligations associated with their activities.

The drawback of introducing an environmental bonding requirement for oil site permitting in British Columbia is that it risks drawing capital out of the industry, increasing the cost of entry and pushing existing firms into bankruptcy, thus possibly creating more orphan sites. This is not a policy decision to be taken lightly, as bankruptcy for small oil firms has serious personal consequences for shareholders, managers, and employees.[190] However, any policy response to the orphan site problem will have consequences for individual producers. Poor regulatory design during the early years of oil and gas development in British Columbia did not force firms to internalize their environmental hazards, allowing producers to enter the industry at artificially low cost levels. Any regulatory efforts to improve orphan site remediation funding will drive some producers out of the industry. Allowing firms to purchase surety bonds from third parties, similar to Texas, could ease some of the impacts by allowing firms to retain capital and distributing costs and risk across the industry as a whole. Nonetheless, the consequences of small firm bankruptcy need to be weighed against the benefits of upfront environmental bonds.

CONCLUSION

The orphan well problem in British Columbia illustrates some of the issues with regulatory designs that do not account for the boom-and-bust cycle in natural resource industries or for the implications of legal tests applied in bankruptcy proceedings. Regulatory design needs to account for the realistic prospect of bankruptcies among natural resource companies. Legislators and policy makers must consider whether a provincial regulator can actually enforce remediation obligations or recover costs in bankruptcy proceedings. If the regulator's prospects of recovery are uncertain, then a regulatory framework that creates sufficient funding for remediation but does not rely on recovery in bankruptcy proceedings, such as environmental bonding, is more suitable.

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187 See *Redwater*, *supra* note 11. This statement assumes that the *Redwater* decision applies in British Columbia, or at least that creditors perceive its possible application in British Columbia.

188 See *Fee, Levy and Security Regulation*, *supra* note 110.

189 See *Redwater*, *supra* note 11.

190 See C Wood, *supra* note 67. Wood's work illustrates the kinship ties that link employees, managers, and shareholders in small oil and gas companies, and it shows the personal cost of small oil firm bankruptcies.