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# Hardrock Homesteads: Free Access and the General Mining Law of 1872

By Andrew P Morriss, Roger E Meiners  
and Andrew Dorchak\*

*Most discussions of the US General Mining Law of 1872 begin with the premise that the statute is an outdated relic of 19th-century attitudes towards resources and should be replaced with a modern system of royalties, permits and concessions. In contrast, this article argues that the statute provides institutional mechanisms that resolve incentive problems created by government ownership of mineral resources. Instead of calling for radical change in US mining laws, the authors hold up the free access principle of the General Mining Law of 1872 as a model for privatisation of assets whose value is unknown.*

The private appropriation of mineral resources from public land in the United States today is governed by the General Mining Law of 1872. From the discovery of gold in California in 1848 until 1866, the federal government made virtually no attempt to regulate access to minerals on federal land, leaving them open to appropriation by individuals at their own initiative.

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When Congress finally passed its first post-Gold Rush mineral rights legislation in 1866, the well-established practice of private appropriation left it little choice but to ratify the miners' practices. All three of the 19th-century federal mining statutes, the Lode Law of 1866,<sup>1</sup> the 1870 Placer Act<sup>2</sup> and the General Mining Law of 1872<sup>3</sup> ('the Mining Law'), recognised claims based on individuals' self-directed appropriation of minerals found on federal lands, which the authors term the 'free access principle'.

Since 1872 the free access principle's scope has narrowed slightly, with the removal of petroleum and 'common' resources such as gravel and removal of some public lands from the statute's coverage. However, despite repeated attacks as everything from 'an anachronism'<sup>4</sup> to a 'gargantuan prehistoric firebreathing dragon'<sup>5</sup> by critics including academics, environmentalists and politicians, the basic approach remains intact for hardrock minerals. The Mining Law presents an easy target for populist appeals. Its critics tar it as privileging an environmentally risky activity conducted by a small number of companies, many foreign-owned, over recreation, preservation and other interests popular with many American voters. Even worse, they note that the statute 'gives away' valuable resources on public land to mining companies and the law is routinely 'abused' to acquire land for non-mining purposes. Despite the appeal of such arguments, Mining Law critics have failed to persuade Congress to change any of the basic principles articulated in the 1872 law with respect to hardrock minerals.<sup>6</sup>

The Mining Law's critics are wrong about the structure and impact of the Mining Law. Their criticisms ignore how the free access principle solves important information and incentive problems inherent in public ownership of resources. This article does not argue that the authors of the Mining Law consciously designed it to accomplish those ends; its argument is that they, to some degree by accident, developed institutional arrangements that do and are therefore worth preserving. Rather than needing wholesale revision, the Mining Law can serve as a model for privatisation of such resources both in the United States and abroad.

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1 Lode Law of 1855, 14 Stat 251 (repealed 1872).

2 16 Stat 217 (1870).

3 30 USC §22 *et seq.*

4 James F Cress and Cecilia G Dalupan, 'Sustainable Development and Mining Law: Is a "Mine Veto" Needed?' (2003) 17 *Nat Res & Env't* 164, 164.

5 United States, House of Representatives, Committee on Interior and Insular Affairs, *Reform of the Mining Law* 224 (1977) (statement of Wilderness Society representative).

6 See Robert J Uram, 'Prospects for Mining Law Reform' (1998) 12 *Nat Res & Env't* 191, 192-95; John D Leshy, *The Mining Law: A Study in Perpetual Motion* (1987), pp 287-312.

The first part of this article describes the structure of the Mining Law. The second puts the Mining Law in historical context, addressing the charge that it represents a giveaway of the public's assets, and explains the political vulnerability of the mining industry to expropriation. Next the article examines the incentive and information problems mining laws must solve and shows how the Mining Law addresses each. It concludes with a discussion of the future of the Mining Law in the light of the insights provided by the article.

### **Structure of the Mining Law**

The General Mining Law of 1872 has a rich legal history, which includes a number of complex subsidiary doctrines, many of which have their roots in earlier, limited understandings of geology. The authors do not defend these 'encrustations'<sup>7</sup> on the statute, but instead focus on two central points about its structure. First, property rights *must* be issued under the statute to anyone who completes the relatively minor steps necessary to receive the rights, leaving no discretion for the government officials administering the statute. Secondly, issuance of the property rights does not require the payment of more than nominal amounts to the government. Together, these two features of the Mining Law provide free access to minerals, and the accompanying surface estate, on public land to anyone willing to search for them. The article limits its attention to these points to focus on the principle, separating the critique of free access from the criticism of its imperfect implementation in the Mining Law.<sup>8</sup>

### ***Staking a claim***

The operation of the Mining Law is conceptually simple: select a parcel of eligible federal land and then attempt to locate a valuable mineral deposit on the parcel. Once exploration begins, the prospector may locate a claim to an area he believes contains a valuable mineral covered by the Mining Law. After payment of minor fees (US\$100/year<sup>9</sup> and a US\$25 claim location fee for the initial location),<sup>10</sup> the claim is protected against rivals. Claim holders may make multiple claims and need not ever produce minerals;

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7 Doctrines that have grown up over time on the basic principle of free access.

8 See Richard Gordon and Peter VanDoren, *Two Cheers for the 1872 Mining Law*, Cato Policy Analysis No 300 (1998) at \*4, available at [www.cato.org/pubs/pas/pa-300.html](http://www.cato.org/pubs/pas/pa-300.html) for a detailed critique of the Mining Law on market principles.

9 30 USC 28f(a).

10 30 USC 28g.

even when mining occurs, no royalties need be paid to the federal government.

Once a claimant has performed at least US\$500 of development work and determined that his claims are of an economically viable mineral deposit, he may file a patent application to receive fee simple title to both mineral and surface rights, or just the mineral rights at the claimant's option, paying an additional US\$250 fee per application, plus a separate US\$50 per claim fee.<sup>11</sup> Once the patent application is granted, the applicant must pay US\$2.50 per acre for placer claims<sup>12</sup> and US\$5 per acre for lode claims.<sup>13</sup> Claims are limited to around 20 acres.<sup>14</sup>

The rest of the patent process is also straightforward, requiring only a survey by an approved surveyor,<sup>15</sup> notice of the claim by a posted copy of the plat on the claim and a notice at the BLM state office, and publication of a notice in a local newspaper for at least 60 days.<sup>16</sup> (The applicant must also prove that he has complied with the location requirements described above.) Once the government verifies the discovery, it issues title to both the surface and mineral estates. In short, discovery of a resource can lead, with only *de minimis* payment, to full title.<sup>17</sup>

### *Consequences*

There are three important consequences of this structure. First, the claim is readily transformed into private property with fee simple title, which 'removes any opportunity the federal government has to collect revenues on the minerals extracted, because the government no longer has title to either the minerals or the land'.<sup>18</sup> Of course, the government may still collect real estate taxes on the property in the same fashion it does all other property, collect income taxes on income earned from economic activity on the property, or apply other generally applicable taxes to economic activity on the property. What it cannot do is apply special rules to raise revenue from the mineral resources.

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11 30 USC 29. See also 43 CFR 3830.21 (listing fees required).

12 30 USC 37; 43 CFR 3863.1.

13 30 USC 37; 43 CFR 3862.1-2.

14 Placer claims cannot be larger than 20 acres. 43 CFR 3832.22. Lode claims may be slightly larger. *Id* (limiting lode claims to 1,500 x 600 feet).

15 30 USC 29; 43 CFR 3861.5.

16 43 CFR 3862.4-1.

17 For a discussion of the changes in the 1990s, see Patrick Garver and Mark Squillace, 'Mining Law Reform – Administrative Style' in *Proceedings of the Rocky Mountain Mineral Law Forty-Fifth Annual Institute* (1999), 14-1, 14-40.

18 General Accounting Office, *Federal Land Management: The Mining Law of 1872 Needs Revision* (GAO/RCED-89-72) (1989), 11.

Secondly, there is no room for discretion on the part of any government actors. The only discretionary steps in the process are taken by the claimant (eg selecting the land to explore, deciding how to explore for mineral resources, deciding whether to apply for a patent). Once someone has satisfied the simple requirements of the law to receive the rights, the property rights *must* issue without a significant payment. This is a key difference from the primary alternatives (leases, licences and auctions), since allocation under a free access regime is on the willingness to invest in discovering resources rather than payments to the government. Moreover, the alternatives also generally give government officials discretion in choosing which resources to offer for sale or lease and require payment in exchange for the property rights. Free access regimes do neither.

Thirdly, the claimant need not pay more than a nominal amount for the title, with one crucial exception: the cost of finding the resources. Locating new deposits is a lengthy and costly process, one which typically costs US\$150,000-250,000, with another US\$500,000-US\$1,000,000 necessary to determine whether to proceed with the site.<sup>19</sup> Because the cost of the site is almost entirely the cost of discovery, those seeking title to resources compete on the ability to find resources, rather than on the ability to pay the government (or bribe government officials) for access to the resources. As the article discusses below, this has important incentive effects, for it rewards those who invest in discovering resources with title to the resources.

### **Context for the Mining Law**

The structure of the Mining Law is related to the context in which it arose and its persistence is connected to the position of the mining industry in America today.

#### ***Nineteenth-century privatisation statutes***

The Mining Law was just one of the 19th-century laws that transferred publicly held resources to private ownership through free access. These included the homestead laws (which led to the privatisation of almost 214 million acres) and railroad grants (including approximately 129 million acres). The existence of these laws raises a question that is important for understanding the Mining Law: why did the federal government choose to give away public

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19 Willard Lacy, *An Introduction to Geology and Hard Rock Mining, Rocky Mountain Mineral Law Foundation, Science and Technology Series No 1*, 49 (1998), available at [www.rmmlf.org/SciTech/Lacy/lacy.htm](http://www.rmmlf.org/SciTech/Lacy/lacy.htm). These costs are caused by the rarity of viable deposits. See National Research Council, *Hardrock Mining on Federal Lands* (1999), 23.

resources rather than selling the land and mineral resources to increase federal revenue?

The failure to auction off these resources is not because the idea of selling the resources had not occurred to federal officials. The original federal land disposal policy emphasised revenue generation as the primary goal.<sup>20</sup> Prominent federal officials, from Albert Gallatin, who served as Thomas Jefferson's Secretary of the Treasury during the Louisiana Purchase, to George Washington favoured the sale of federal lands to raise revenue.<sup>21</sup> As a result, early federal land legislation emphasised auctions of public lands as a revenue measure and Congress regularly took vigorous measures to discourage squatters from occupying federal lands.<sup>22</sup> As Professor Douglas Allen notes, what is puzzling is that 'the federal government *began* disposing public land through auctions and other price mechanisms *before* it established the practice of homesteading,'<sup>23</sup> since the later practice of giving away federal property meant the government had to forego revenues.

Yet between 1830 and 1862, Congress resorted more and more to land 'giveaways' until by 1862 virtually all federal land disposal was done through grants rather than sales; these grants ultimately disposed of more than twice as much land as was sold under the prior policy.<sup>24</sup> As a result, the federal government gave up 'billions of dollars, even at 1870 price levels'.<sup>25</sup> Why did the federal government give up such large amounts of revenue and turn to measures other than price to privatise federal resources?

The widespread use of free access methods for privatising assets *after* the federal government had had extensive experience with revenue-generating methods of privatisation suggests that non-price allocation of resources cannot be dismissed as merely a bad idea from the past. Free access methods of allocation of public resources were an innovation. In other words, free access allocation of federal land was an attempt to deliver something that auctions and other forms of sale did not provide. Critics of the Mining Law contend that it provided a 'giveaway' of public resources to favoured interests. We must therefore ask whether free access is simply a means of looting government assets.

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20 Douglas W Allen, 'Homesteading and Property Rights; Or, "How the West Was Really Won"' (1991) 34 *JL & Econ* 1, 7.

21 Both quoted in Mark T Kanazawa, 'Possession is Nine Points of the Law: The Political Economy of Early Public Land Disposal' (1996) 33 *Explorations in Economic History* 227, 236.

22 Kanazawa, n 20 above, at 237.

23 Allen, n 19 above, at 2.

24 Kanazawa, n 20 above, at 241; Allen, n 19 above, at 8; Gary M Anderson and Dolores T Martin, 'The Public Domain and Nineteenth Century Transfer Policy' (1987) 6 *Cato Journal* 905 at 908.

25 Anderson and Martin, n 23 above, at 910.

### *Giveaway claim*

How can the government justify giving away valuable minerals? A critical part of the answer is that property rights to mineral resources are not given away for nothing under the Mining Law – they are awarded based on the claimant’s efforts in locating the minerals. It is important to distinguish between the costs of location, which are an investment in a claim, and the payment of a fee for ownership, which is a pure resource transfer. As the transfers to the government to acquire the resources increase, the buyer has fewer resources available to use to develop the resource. In contrast, as expenditures on location increase, knowledge about the mineral resources on the parcel is increased as well. (We assume that individuals and firms will stop making investments in locating minerals when the cost of the investments exceeds the value of the rights sought.) The critical point is that locating a resource produces something of value: knowledge of the location of the resource. Payment of a fee for title does not, since the payment is unrelated to the goods produced.

A second part of the answer to the question of why governments might give away resources is that the giveaway charge inappropriately rests on *ex post* information on land values, not on *ex ante* estimates.<sup>26</sup> Those who contend that the government is ‘giving away’ resources begin with the value of the resources at the time of the title transfer, when the work of location has already been done. Since potential claims where mineral resources are not located are not the subject of patent applications, the critics are considering only the successful searches rather than the full set of searches. Similar reasoning would suggest that state governments ‘give away’ too much when they ‘sell’ multi-million-dollar lottery jackpots to individuals in exchange for a single US\$1 winning ticket while overcharging for the losing tickets.<sup>27</sup> As a result the total value of the alleged ‘giveaway’ is overstated by many Mining Law critics.

What then are mining claims worth? The authors have some evidence concerning the value of the rights that can be claimed under the Mining Law. The Mining Law originally required US\$100 of annual work on a claim; this was changed to a US\$100 annual fee in 1992.<sup>28</sup> The change brought about a substantial decline in the number of claims, reducing them from 1.2 million to less than 300,000, despite the fee’s low level.<sup>29</sup> The number of

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26 Gordon and VanDoren, n 7 above, at \*5.

27 See Gordon and VanDoren, n 7 above, at \*22.

28 PL 102-381.

29 Marc Humphries and Carol Hardy Vincent, *Mining on Federal Lands* (CRS Issue Brief 89130) (2001).



claims also fluctuates with mineral prices.<sup>30</sup> This suggests that the value of holding a claim is low.

Something besides the claim itself therefore must be necessary to create value. As suggested earlier, that something is knowledge about the value of mineral rights on the claim. A claimant must show 'actual physical disclosure of a valuable mineral resource deposit'<sup>31</sup> and 'it must be shown that the mineral can be "extracted, removed, and marketed at a profit" – the so-called marketability test'.<sup>32</sup> Where that knowledge is missing, the claims have low value. In short, mineral rights on land about which there is not specific knowledge of mineral deposits (as is true of virtually all federal land) are worth relatively little. It is the specific knowledge about the prospects for minerals that is valuable.

### *Vulnerability of mining*

A key characteristic of the modern mining industry is its vulnerability to expropriation. Hardrock mining today is not a hardy prospector with his mule and pan. It is a capital-intensive industry, requiring extraction and processing of large quantities of low-grade ore<sup>33</sup> and dependent on large capital investments in fixed locations.

The combination of capital intensity and fixed location renders mining facilities vulnerable to expropriation, for once a mine is developed it cannot be moved. Secure property rights are thus critical to inducing investment in mines.<sup>34</sup> Although no one thinks it is likely that the US Government will nationalise mines tomorrow, mining in the United States remains vulnerable to partial expropriation through regulatory measures; property owners can lose their property rights through the imposition of severe regulatory burdens as well as outright seizures.

This effect is particularly serious because hardrock mining today is a regional industry, with most activity and claims concentrated in Arizona, California, Montana, Nevada and Wyoming.<sup>35</sup> Since most other states have

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30 Humphries and Vincent, n 28 above.

31 *Lara v Sec of Interior*, 820 F 2d 1535, 1537 (9th Cir 1987).

32 *United States v Coleman*, 390 US 599, 600 (1968).

33 Humphries and Vincent, n 28 above.

34 See Henning Bohn and Robert T Deacon, 'Ownership Risk, Investment, and the Use of Natural Resources' (2000) 90 *Am Econ Rev* 526 (showing that insecure ownership has an adverse impact on mineral exploration and production); James Otto and John Cordes, *The Regulation of Mineral Enterprises: A Global Perspective on Economics, Law and Policy* (2002), 1-51 ('Security of tenure . . . ranks as one of the most important pre-investment criteria mentioned by international mining companies.').

35 Humphries and Vincent, n 28 above.

little or no interest in the mining industry, states without mining interests form a majority coalition in Congress in favour of converting mineral resources on federal lands into a form that potentially benefits non-mining states' citizens at the expense of mining state citizens. Only the protection provided to minority regional interests by the US Senate rules allowing a small minority to block legislation prevents such a resource transfer.<sup>36</sup>

Mining is thus an economically vulnerable activity with little protection from political risks: it generates enormous wealth and so presents an attractive target; it has significant capital at risk, making it vulnerable; and it has only a regional political base, limiting its ability to protect itself in the national legislature.

Further, most of the unclaimed mineral reserves in the United States are located on federal land because of mining's dependence on western locations where a large share of the land is owned by the federal government.<sup>37</sup> The predominant federal ownership of untapped (and unknown) mineral resources makes the government the dominant seller of unmined land suitable for mineral exploration, increasing mining's dependence on the goodwill of the federal government.

### *Explaining the institution*

How can a law that gives *public* resources to *private* interests without the public receiving something in exchange be justified? The standard answer is 'to promote mineral exploration and development on federal lands in the western United States, offer an opportunity to obtain a clear title to mines already being worked, and help settle the West'.<sup>38</sup> This is an important part of the explanation of why Congress adopted the free access approach. Before the gold rushes that began with the California Gold Rush of 1848-49,<sup>39</sup> the federal government lacked a consistent approach to mineral deposits on federal land, following a variety of strategies.<sup>40</sup> The principle of pre-emptive rights can also clearly be traced back to miners' experience in the West, where the widespread practice of simply staking claims made it impossible

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36 See Andrew P Morriss, Roger E Meiners and Andrew Dorchak, 'Between a Hard Rock and a Hard Place: Politics, Midnight Regulations, and Mining' (2003) 55 *Admin L Rev* 551, 567-68.

37 The Bureau of Land Management and US Forest Service manage 43 per cent of Arizona land, 45 per cent of California, 27 per cent of Montana, 80 per cent of Nevada and 50 per cent of Wyoming. National Research Council, n 18 above, Table 1-1 at 18.

38 Humphries and Vincent, n 28 above.

39 See Andrew P Morriss, 'Miners, Vigilantes, & Cattlemen: Overcoming Free Rider Problems in the Private Provision of Law' (1998) 33 *Land & Water L Rev* 581, 620.

40 Leshy, *Mining Law*, n 6 above, at 10-11.

for any other system to be adopted.<sup>41</sup> Although formally the mineral resources on federal land in the West belonged to the federal government,<sup>42</sup> as a practical matter they were an unowned, common pool resource, much as ocean fish in international waters are today.

This is not enough to explain the Mining Law's continued existence, however. If the Mining Law merely reflected the historical accidents that led to its creation, why maintain an ad hoc arrangement designed for conditions that no longer exist? Moreover, the historical origins do not explain another crucial aspect of the Mining Law's persistence. Federal land policy in the 19th century generally aimed to dispose of the public domain (through land grants to railroads, states and private individuals). The Mining Law was simply one of many disposal statutes, but only it persists. Most of the Mining Law's critics conclude this must be because of the power and influence of the recipients of this 'giveaway'.<sup>43</sup>

The historical explanation for the Mining Law is accurate but insufficient. The Mining Law was part of larger set of land disposal statutes and it was intended to (and did in fact) encourage settlement and economic activity in the American West. That is not the entire story, however. Congress considered and rejected asserting federal ownership of the mineral resources in the new land. It chose free access deliberately, on the advice of experts such as Rossiter Raymond, a mining engineer and Commissioner of Mineral Statistics in 1869, who recommended to Congress a system that was 'broad, simple, and, as far as possible, automatic'.<sup>44</sup> Even as staunch an opponent of the Mining Law as John Leshy concludes that the statute 'was fully debated and was clearly the will of Congress'.<sup>45</sup> Could Congress have known what it was doing when it gave away the public claim to mineral rights?<sup>46</sup> We do not argue that Congress understood all the consequences of the adoption of free access. Unintended consequences of institutions are an important feature of the growth of Western legal systems, as Nobel laureate Friedrich Hayek discusses in highlighting the importance of unconscious evolutionary development of legal institutions.<sup>47</sup> (We must avoid circular reasoning that explains all existing institutions as somehow evolved to provide efficiency

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41 Bancroft G Davis, 'Fifty Years of Mining Law' (1937) 50 *Harv L Rev* 897, 897-98.

42 Davis, n 40 above, at 897.

43 See, eg John D Leshy, 'Reforming the Mining Law: Problems and Prospects' (1988) 9 *Public Land L Rev* 1, 3, 17.

44 Quoted in John C Lacy, 'Historical Overview of the Mining Law: The Miners' Law Becomes Law' in *The Mining Law of 1872: A Legal and Historical Analysis* (1989), 39.

45 Lacy, n 43 above, at 17.

46 Of course, purposeful choice by politicians is not evidence of social utility.

47 Friedrich A Hayek, *Law, Legislation, & Liberty: Rules & Order* (1978), pp 85-88.

and efficiency as the set of outcomes provided by existing institutions, but we must also be careful not to assume that all legal institutions are merely what their authors intended them to be.)

We thus have two competing explanations for the Mining Law's survival. In the dominant account, the Mining Law is the relic of a bygone era, persisting through a combination of inertia and special interest lobbying. In the second, the Mining Law is an institutional response to the incentive problems of public ownership of resources and an effective, evolved mechanism for solving the problem of determining how to use those resources. This article now turns to arguing that the latter provides the better explanation of the important features of the Mining Law and accounts for its survival.

### **Solving problems**

Mining laws must address five interrelated but distinct incentive problems. If a mining law does not provide reasonable incentives for appropriate behaviour by those involved in mining in these areas, it will fail, as it will produce an outcome with socially unacceptable results in one or more of these areas. This article argues that the Mining Law's approaches to these incentive problems are the key to understanding its longevity.

The first incentive problem is to induce individuals to locate mineral resources so that the resources can be developed. Mining, as noted earlier, is often a costly endeavour, and so the incentives must be reasonably powerful to induce investment in locating resources, since it is the expected net return on investment that matters to investors. The law must therefore provide a sufficient incentive to look for mineral resources. This may appear to be obvious, but it has not always been recognised by governments in resource rich areas.

The next incentive problem concerns the incentive to develop the resource once it is located. Mineral resource extraction that interferes with surface uses should occur only when there is a net gain from doing so, including the opportunity cost of any foregone surface uses. If there is a more valuable surface use that precludes developing the mineral resource, we want the mineral rights owner to have an incentive to prefer the more valuable use. If developing the mineral resource is more valuable than the alternative surface use, we want the resource owner to proceed with development.

The third incentive problem concerns the impact of the mining law regime on the government implementing it. A successful mining law will guard against the 'resource curse', the endemic corruption that afflicts many nations endowed with rich mineral resources.

Next, the development of mineral resources inevitably produces conflicts over resource use between mineral resource development and other land uses and between long- and short-term management of the resources. A successful mining law must provide a framework for resolving such disputes that gives mineral resource owners and other interested parties clear guidance on how to resolve such conflicts.

Finally, there are inevitably environmental spillovers from mining sites that affect outsiders. The law must provide a means to resolve disputes caused by these spillovers and create incentives to avoid their creation when the spillover effects are costly. In short, we want the mining law to internalise any negative externalities created by mining.

Because these problems differ from one another, the optimal solution for one is unlikely to also be optimal for all the others as well. Only by chance will any particular mining law regime be the best with respect to all of these problems. The challenge is to find the legal regime that offers the best mix of solutions for the entire set. The Mining Law meets that test.

### *Incentives to locate*

Mineral resources are hard to find and require significant investment. We must therefore ask if a mining law rewards the discoverer of mineral resources sufficiently to produce the investment and effort needed to discover new deposits. There can be too much investment in discovery as well as too little, as a slightly silly example illustrates: if those who located minerals on public land received not only the mineral rights and the surface estate but a bonus of US\$10,000, there would likely be 'too much' location activity. (If readers doubt that such a policy is plausible, consider its resemblance to many agricultural subsidy programmes.)

While it is impossible to determine the exact amount of a resource that should optimally be produced, several generalisations are possible. First, taxing resource production or otherwise increasing production costs will reduce the amount produced. The larger the tax (or subsidy), the more likely it is to substantially distort investment decisions in a way that is costly for society. Therefore, at a minimum we know that if the locator of mineral resources receives all the rewards of her activity, she will invest more in locating minerals than if she must pay a tax or royalty. One important determinant of a mineral law system's impact on investment is thus the extent to which taxes, royalties and other government-imposed regulatory costs reduce investors' returns.

What is the incentive effect of the Mining Law on location activity? The Mining Law transfers title for a nominal fee, making the title transfer available

only to those who have produced knowledge about the location of a valuable deposit. Indeed, the production of knowledge about the deposit is what creates the value of the claimed rights – there is only speculative value without investment in creating knowledge. The award of title can thus best be characterised as payment for the production of knowledge.

There is another problem for those considering investing in mining. Investors must consider not only the current royalty, tax and other expense rates but also whether those rates are likely to change in the future. A similar issue has been considered in tax law and the conclusion applies with equal force to the incentives for potential mining investors. To the extent these laws are stable and certain, entrepreneurs can make useful predictions concerning the impact of taxation, royalties, etc, on their production plans. However, when laws are changed frequently, the changes add uncertainty to the planning process. Frequent change in these laws increases entrepreneurial uncertainty and, as a result, makes it more difficult for entrepreneurs to formulate plans and develop strategies.<sup>48</sup>

Governments cannot solve this problem as private land owners do, through binding contracts with mineral locators before the investment is made. Although they can write and pledge to honour contracts, governments cannot make credible commitments for the future about critical variables such as tax rates and regulatory costs because today's government cannot bind future governments.<sup>49</sup>

To see why, consider a private landowner contracting with a mining company to survey her property for gold. The landowner and the mining company agree before the survey on the terms and memorialise their agreement in a contract. A landowner who attempted to demand additional compensation after the discovery could be sued for breach of contract. A landowner who demanded a high price for the right to search *ex ante* would suffer in the competition with other landowners to attract mining interests. Market pressures would limit the landowners' ability to extract all the gains from discovery and legal institutions would prevent *ex post* changes in the original contract aimed at opportunistically expropriating value from the mining companies.

A government landowner faced with the same problem can, of course, sign a similar contract, and both reputation effects and constitutional

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48 See Linda A Schwartzstein, 'Smoke and Mirrors: Tax Legislation, Uncertainty, and Entrepreneurship' (1996) 6 *Corn J L & Pub Pol'y* 61, 77.

49 See Klaus M Schmidt, 'The Costs and Benefits of Privatization: An Incomplete Contracts Approach' (1996) 12 *J L Econ & Org* 1, 2; Keith M Hylton, 'Economic Rents and Essential Facilities' (1991) 1991 *BYU L Rev* 1243, 1268-1270; Robert N Fleck, 'When Should Market-Supporting Institutions Be Established?' (2000) 16 *J L Econ & Org* 129, 133-137.

guarantees can safeguard the language of the contract from forced changes. However, even for a government unlikely formally to renege on an explicit contract provision, committing not to use other margins to expropriate is difficult. For example, the government cannot commit that it will not change environmental regulations to reduce the mining company's ability to operate under the terms of its lease. Moreover, as noted earlier, mining interests are particularly attractive targets for resource extraction by governments. Reducing the threat of expropriation is thus an important element in creating an incentive to locate resources. Moreover, the government's market power as the dominant supplier of mineral lands in the United States at least partially insulates it from market pressures to refrain from renegeing on any compact.

The Mining Law offers a straightforward solution to the credible commitment problem. By granting the resource locator full title, the government increases the value of the reputational constraint on its activities. If the government expropriates a vested property right, it must either pay under a takings claim or destroy value in all vested property rights by reducing the general level of security in property rights. The high costs of such an action also provide mining interests with important allies among property owners, since all property owners have an incentive to resist such an action.

Even this enhanced commitment is far from perfect. The government still has margins under which it can harm the mining interest, such as environmental regulations raising the cost of mining activity. Creating a general property interest in land with mineral resources increases the cost to governments of harm to its reputation when it reneges on a commitment not to expropriate directly and indirectly. This commitment in turn increases the value of the incentive to locate, leading to the discovery of more mineral wealth.

### *Incentives to develop*

The ownership structure of mineral rights determines the owners' incentives to invest in extracting the resources, as well as the incentives for capital markets to provide capital for the rights owners to invest. Just as with the incentive to locate, increasing the value of the guarantee against expropriation will increase the incentive to invest. There is an additional issue for production, however, since to achieve the best outcome for society generally producers must consider not only the value of their mineral rights but also the value of any alternative uses of the surface estate which would be precluded by the extractive use. Mineral rights owners' incentives to maximise the sum of the mineral and surface rights also depend on the ownership structure.

Imagine there are only two means of extracting a mineral resource. Method one is quick but environmentally destructive. It yields net returns on the mineral resource of US\$15 and net returns on the surface estate of US\$5. Method two involves additional investments to protect the environment but yields net returns on the mineral resource of US\$10 and net returns on the surface estate of US\$15. If the mineral rights owner owns the surface rights as well, he will maximise his total return by choosing method two (a net return of US\$25) over method one (a net return of US\$20). If the mineral rights owner does not own the surface estate, and does not expect to be made to pay for any damage he causes to it, the choice that maximises his total return is method one (net return to him of US\$15) rather than method two (net return to him of US\$10).

The question for the landowner with secure property rights to both the surface and mineral estates will be which strategy maximises his net return from the land. If there are valued uses of the surface estate, their value may induce him to invest in protecting or restoring the surface estate. If, however, his property rights are not secure or he does not hold surface estate rights, then he cannot benefit from those uses and there will be no incentive to choose extraction methods that protect the surface estate.

This example is oversimplified. It omits consideration of the numerous regulations that attempt to make mineral rights owners pay for damage to surface estates or fund restoration efforts even where the mineral rights owners do not own the surface estate. However, the existence of these regulations proves the point – they would not be necessary if the property rights provided incentives to manage the surface and mineral rights jointly. Moreover, property-rights-based incentives are superior to command-and-control regulations because property owners cannot evade the effects on their wealth of mistakes while they can evade regulations where enforcement is less than perfect.

We do not suggest that a landowner holding secure rights to both the surface and mineral estate will always choose to preserve the surface estate. Indeed, any system that led to such a result would be flawed, just as a system that produced the opposite result in all cases would be, for sometimes the efficient choice is to sacrifice the surface estate. Our claim is merely that an owner with secure property rights to both will choose environmentally-desirable methods of developing the mineral estate in some instances while an owner without such rights will do so less often. Moreover, as the choice is more often made along a continuum of management choices, internalising the value of both the surface and mineral estates can be a powerful incentive for increasing environmentally sound land management practices on the margin.



The same analysis applies to the duration of the rights. When a resource owner has only a title of limited duration, the artificially shortened time horizon encourages overly rapid exploitation since the resources left at the end of the period will be lost. As the time horizon shortens, the resource extraction problem becomes a commons exploitation problem and a tragedy of the commons result is more likely.<sup>50</sup> Lengthening the time horizon of mineral rights owners is therefore critical to creating incentives to choose environmentally benign strategies.<sup>51</sup> Mineral law regimes that do not provide outright title produce duration-related problems, as the end period will involve attempts by the outgoing resource owner to maximise its wealth at the expense of the residual interest owner.

Clear, easy-to-prove titles are crucial to ensuring appropriate decision-making that takes a long-run view of maximising the asset's value.<sup>52</sup> The Mining Law provides unambiguous title to mineral resources, resolving both of these problems. It is not the only means of doing so, of course, as either an auction or lottery system of fee simple titles to mineral deposits with surface estates would accomplish the same thing. It is clearly superior, however, to the alternatives of leasing or contract exploitation since neither would make the mining company the residual claimant on the resource in the absence of extraordinary contractual provisions designed to mimic ownership.

### *Corruption*

The economic literature on corruption identifies the existence of discretion in allocating valuable rights as critical factors in determining whether or not corruption will occur. For example, a corrupt government may insist that shares in a project be allocated to government officials or their family members as a condition of approval of permits. Because of their long time horizons and capital intensity, mining operations are particularly vulnerable to corruption problems<sup>53</sup> – and corruption is widespread in countries that have pursued state involvement in mineral resource development. One survey, for example, concluded that ‘stunted institutional development – a

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50 David Schmitz, ‘The Institution of Property’ (1994) 11 *Social Philosophy & Policy* 42 reprinted in *Environmental Ethics* (David Schmitz and Elizabeth Willott, eds, 2002), pp 361, 363-364.

51 See Bruce Yandle and Andrew P Morriss, ‘The Technologies of Property Rights: Choice Among Alternative Solutions to Tragedies of the Commons’ (2001) 28 *Ecol L Q* 123.

52 Louis De Alessi, ‘Private Property Rights as the Basis for Free Market Environmentalism’ in *Who Owns the Environment?* (Peter J Hill and Roger E Meinert, eds, 1998), p 29.

53 See Ian E Marshall, *A Survey of Corruption Issues in the Mining & Mineral Sector*, International Institute for Environment and Development (2001), p 37.

catch-all for a range of related pathologies, including corruption, weak governance, rent-seeking, plunder, etc – is a problem intrinsic to countries that own natural resources such as oil and minerals’.<sup>54</sup>

The result of corruption is to change competition for resources from one based on the ability to exploit the resource to one based on the ability to secure favours from corrupt officials. Competing for such favours has three deleterious effects on the mining industry, quite apart from the overall negative impacts on a society of corruption in the public sector. First, the bribes function as an implicit tax, reducing the expected value of deposits, making them less economically viable. Secondly, rewarding the ability to bribe rather than the ability to produce gives firms that are good at corruption an advantage over firms that are good at production likely increasing production costs. Thirdly, allocating valuable rights through discretionary means can create corruption where it did not exist before.

There is some evidence that Congress knew it would avoid corruption problems by giving away mineral resources. Prior land privatisation programmes that included discretionary awards of resources had had serious corruption problems. For example, the lead land leasing programme, which pre-dated the California gold rush, ‘was plagued with fraud by private citizens and General Land Office employees as well as with continual evasion of the terms of the leases, especially payment of rentals and royalties. In the end the government had to give up the scheme as unworkable’.<sup>55</sup>

The Mining Law solved the corruption problem. By minimising the discretion of government officials in allocating the rights, it minimises the opportunities for the officials to demand bribes as a condition of acting. Since there is no significant payment required, the claimant cannot be offered special deals in exchange for bribes. Because the Mining Law privatises resources by allowing private entities to choose which resources are privatised and when they will be privatised, the law avoids incentive problems in allowing public land managers to choose what parcels to privatise at what times, removing an additional element of discretion from the system.

Foregoing all compensation may seem a high price to pay for avoiding corruption, but the price is less than it appears to be. First, the government does not forego all revenue from the mineral resources given away under the Mining Law, only the revenue from the initial distribution. Revenue from the exploitation of the resource may be taxed via income taxes on the mineral rights owners’ profits or on their employees. Even staunch critics such as

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54 Xavier Sala-I-Martin and Arvind Sumramanian, *Addressing the Natural Resource Curse: An Illustration from Nigeria*, NBER Working Paper 9804 (2003), 5.

55 Marion Clawson, *The Bureau of Land Management* (1971), pp 126-127.

Leshy agree that the revenue argument is insufficient as a reason for reform of the Mining Law.<sup>56</sup>

Secondly, corruption has a corrosive effect on the ability of governments to provide services.<sup>57</sup> Existing government institutions often expend considerable resources on corruption avoidance, including creation of inefficient procedures (eg requiring multiple signatures on documents), substituting costly public proceedings for more flexible private proceedings (eg government procurement rules) and staffing internal affairs and audit units to attempt to uncover corruption. Foregoing revenue from mining claim sales means a loss of one source of revenue, but it also produces compensating savings and increased tax revenues from other sources.

### *Resolving conflicts*

There are two classes of conflicts that mining laws must be able to resolve. First, resources can be claimed by more than one party and who owns the mineral rights must be decided. Secondly, even where ownership is clear, a non-owner may seek to restrict the property owner's ability to take particular actions in the name of public values such as environmental protection. Both conflicts may occur in a single case, as where competing claimants have different priorities for mineral resources.

The Mining Law provides a reasonably inexpensive means for resolving the first type of conflict; disputes between competing claimants can largely be settled by reference to the objective criteria of which acted first. (There has certainly been considerable litigation under the Mining Law, but it appears to have largely been driven by issues such as the distinction between lode and placer claims rather than by the free access aspects.)

The second type of dispute appears to be more difficult to solve, because it involves competing values. The Mining Law's critics charge that it inappropriately resolves the second type of conflict by giving mining use a priority over non-mining uses. Leshy, for example, claims that 'what is most controversial about the policy of free access is the assumption embedded within it that mineral development is the highest and best use of any land where valuable minerals are found and may be extracted'.<sup>58</sup> There is a kernel of truth to this criticism – since the Mining Law covers only federal land on which a valuable mineral deposit is found, it inevitably privatises more land with mineral deposits than land without.

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<sup>56</sup> Leshy, *Mining Law*, n 6 above, at 366.

<sup>57</sup> World Bank, *Anticorruption*, [www1.worldbank.org/publicsector/anticorrupt/index.cfm](http://www1.worldbank.org/publicsector/anticorrupt/index.cfm).

<sup>58</sup> Leshy, *Mining Law*, n 6 above, at 26.

The general criticism is overbroad, however, because Mining Law critics do not acknowledge the incentives provided by full ownership for consideration of alternative uses. The Mining Law has an absolute preference for *private* rather than *public* ownership of mineral resources and the associated surface estates, but it says nothing about what the private owners must do with the rights after acquiring them. Once title has issued mineral resource owners, like all property owners, are free to not exploit any particular aspect of their property, including its mineral resources. Indeed, the irony of the complaints of a bias towards mining is that when mineral rights owners do make alternative uses of their claims, they are swiftly accused of being ‘speculators’<sup>59</sup> or making an inappropriate use of the mining law to gain rights without guaranteeing the production of minerals.<sup>60</sup>

A similar problem confronted timber companies and their experience shows how private land ownership can influence resource extraction decisions. Timber land is valued for both its timber production and for the wilderness amenities it can provide. In particular, hunting and other recreational leases offer an income stream that often requires sacrificing some timber income to realise.<sup>61</sup> When timber companies learned how to manage their land to maximise the joint revenue stream, they did so.<sup>62</sup> Of course, they do not do so on all land – some plots do not have the potential to generate sufficient alternate revenue streams. But their land management decisions must now consider the potential opportunity costs of harvest methods that reduce the value of alternate uses. Private property rights thus provide property owners with incentives to consider the impact of their choices on alternative uses of a property.

The Mining Law does not simply create property rights in mineral resources, however. Because the key requirement of the Mining Law was discovery of a valuable resource, it also creates an important part of the knowledge necessary to make such choices intelligently. The owner of land privatised under the Mining Law is put in a position to make an informed choice about the appropriate use of the land.

Even more importantly, the Mining Law makes it possible for those whose preferences for wilderness outweigh their preferences for income to gain their objectives by making claims under it. Individuals who object to mining

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59 See, eg, Statement of Sierra Club Legislative Director, in United States, Senate, Committee on Interior and Insular Affairs, *Legislation to Revise the Public Land Laws* (1972) (hereafter 1972 Hearings) at 217.

60 See, eg, GAO 1974, n 58 above, at ii.

61 Holly Lippke Fretwell and Michael J Podolsky, ‘A Strategy for Restoring America’s National Parks’ (2003) 13 *Duke Envtl L & P Forum* 143, 156.

62 Fretwell and Podolsky, n 60 above, at 156-157.

projects are free to acquire mineral resources under the Mining Law, or to purchase them from owners who have already done so, and then not develop the resource. There is an opportunity cost to doing so, and the discovery requirement ensures that resource owners are aware of at least the approximate magnitude of those costs.

Mining opponents' failure to take this step suggests they may not wish to face such choices, for where environmental organisations have faced such choices in the past they have sometimes opted to develop natural resources or land to generate revenue to allow them to preserve alternative habitat. Prominent examples of this are the Audubon Society's oil and gas leasing at its Louisiana bird refuge<sup>63</sup> and the Nature Conservancy's sale and trade of parcels it deems less environmentally significant.<sup>64</sup>

Investing in eliminating the Mining Law's 'giveaway' can be a rational alternative for these groups if their goal is a general attack on mining. If they prevail, they can end mining on far more land than they could ever hope to claim or purchase on their own, and shifts much of the cost to others (mining company shareholders and employees who will lose profits and wages; the general public, who will face higher prices for goods made with mineral resources and who will bear the costs of the reduced economic activity that results) rather than paying the cost themselves. The Mining Law also provides a potent fundraising vehicle for environmental pressure groups.<sup>65</sup> However, if they fail, the pressure groups will leave land unprotected which they could have saved.

### *Spillovers*

Making use of one parcel of land for any particular use can generate spillover effects onto others' property; known in the economics literature as externalities. It is necessary to provide a means for preventing harm to the property of others as well as for compensating those whose property is damaged by mining activity. But tort, property and contract law already provide a means of addressing some harms through generally applicable rules, such as trespass and nuisance.<sup>66</sup> Further, general environmental

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63 See Dwight R Lee, 'To Drill or Not to Drill? Let the Environmentalists Decide' (2001) 6 *The Independent Rev* 217, 218-219.

64 Steven Hayward, *2004 Index of Leading Environmental Indicators* (9th edn, 2004), p 72.

65 See, eg, Earthworks web page, <http://actionnetwork.org/mpc/home.html> (visited 13 March 2004) and Richard and Rhoda Goldman Fund, 2003 Grants, [www.goldmanfund.org/grants/03grants\\_env.php](http://www.goldmanfund.org/grants/03grants_env.php) (visited 13 March 2004) (listing a US\$150,000 grant to the Mineral Policy Center for the 'Campaign for Responsible Gold Mining').

66 See Roger E Meiners and Bruce Yandle, 'Common Law & the Conceit of Modern Environmental Policy' (1999) 7 *Geo Mason U L Rev* 923.

protection laws such as the Clean Air Act and Clean Water Act apply to mining activities, just as they do to other potential polluting activities.<sup>67</sup> These laws form a backdrop to any system of mining law and are available for use by individuals seeking redress for any harms they suffered. Mining law need only address harms unique to mining not capable of being redressed through generally applicable laws.

An example of such a circumstance is the problem of oil and gas production by multiple rights holders from the same field. Significant efficiencies are possible in the extraction of oil and natural gas from a common field if the owners of the various property rights in the field coordinate production.<sup>68</sup> Many states provide specialised rules to address 'unitisation' of oil and gas resources to ensure that these efficiencies are realised.<sup>69</sup>

The legal literature identifies only two such potentially unique problems for mining. First is the problem of securing sites against causing environmental damage after they have ceased to operate as mines.<sup>70</sup> The long time lag between income generation and harm makes it less likely that victims will be able to recover from the tortfeasor. The straightforward solution is development of bonding provisions, and American mining law requires bonds in such circumstances.<sup>71</sup>

Secondly, since mining sites are often carved out of federal land, mines are frequently located near other public land which they may harm. This is a distinct problem from causing harm to privately held property because public landowners have unique monitoring problems. Private landowners have a powerful incentive to monitor the condition of their land, since any diminution in their land's value reduces their wealth. The public as owner, however, can act only through its agents, who do not themselves reap the rewards of careful stewardship or bear the costs of neglectful oversight. The possibility of collusion between public agents who lack personal incentives closely to monitor and private entities may require different rules for actions done near public land.

Indeed, well-established rules of property law governing adverse possession recognise this problem. The law generally requires private landowners, but

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67 See Leshy, 'Reforming,' n 42 above, at 14.

68 See Gary D Liebcap and James L Smith, 'The Economic Evolution of Petroleum Property Rights in the United States' (2002) 31 *J Leg Stud* 589, 595-96.

69 See Liebcap and Smith, n 67 above, at 591.

70 See, eg, US General Accounting Office, *Federal Land Management: Limited Action to Reclaim Hardrock Mine Sites*, GAO/RCED-88-21 (1987); US General Accounting Office, *Federal Land Management: An Assessment of Hardrock Mining Damage*, GAO/RCED-88-123BR (1988).

71 See *Mining Claims Under the General Mining Laws; Surface Management*, 62 Fed Reg 9093 (28 February 1997) (to be codified at 43 CFR pt 3800).

usually not government landowners,<sup>72</sup> to monitor their land for unauthorised use, allowing trespassers to gain full legal title if the landowner 'sleeps' on her rights and does not evict them over time.<sup>73</sup> Thus, for example, a private landowner who failed to discover that a neighbouring mine was discharging waste water on to his property would eventually be held to have lost his right to redress for the discharge.<sup>74</sup>

Applying the same rule to a government landowner might not be justified, however, because of the fear that the government land manager would collude with the neighbouring mine owner deliberately to not notice the harm until it was too late to bring a claim in exchange for some private benefit to the manager. Since the manager would not suffer a loss in wealth from the damage to the public resource, there would be little incentive for the manager not to make such a trade. Special rules governing polluting activities that harm public resources might be useful, although there is no reason to limit such rules to mining as the same problem exists with respect to any potentially polluting activity conducted near public resources.

It is easy to hypothesise spillovers from mining activities; it is harder to identify cases where they exist but are not covered by existing, general legal rules. The general framework of property, tort and contract law that governs relations between property owners should be sufficient unless unique circumstances are identified. To the extent unique problems exist in mining, however, the Mining Law's privatisation system does not provide a means of solving such problems and may make them worse by fragmenting property rights and so raising the transactions costs of negotiating a solution.

## Conclusion

The General Mining Law of 1872 handles each of the five problems discussed above reasonably well. It is not the best at handling all, but the sum of incentives it provides is sufficiently better than the alternatives that the law deserves a fresh look as a potential model rather than to be discarded as an anachronism.

The key to its success is the free access approach to allocating mineral rights out of the public domain. By limiting the discretion of government actors, it eliminates the opportunity for corruption. By granting full property rights, including surface rights at the claimant's option, it creates incentives

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72 See Walter Quentin Impert, Comment, 'Whose Land Is It Anyway? It's Time to Reconsider Sovereign Immunity From Adverse Possession' (2001) 49 *UCLA L Rev* 447, 449-450.

73 Jeffrey Evans Stake, 'The Uneasy Case for Adverse Possession' (2001) 89 *Georg L J* 2419, 2434-2435.

74 See, eg, *Hargraves v Wilson*, 382 P 2d 736 (Okla 1963).

for mineral rights holders to consider non-mining uses as well as extractive uses.

In the 19th century, federal land disposal laws, including the Mining Law, were built on a presumption that private ownership was the default approach. The senators and congressmen who passed the various mining laws between 1866 and 1872 may not have had the benefit of modern economic analysis of property rights but their intuition pointed them in the same direction as an incentive-based analysis of the problem of allocating mineral rights does today. The Mining Law begins with a presumption that valuable resources belong in private hands; the critics of the Mining Law begin with the presumption that 'public' resources require 'public' control.

There may be reasons to change various provisions of the Mining Law, but the law's success seems to the authors to put the burden on those advocating such changes to show that their alternative provides solutions to the problems the Mining Law solves that are not significantly worse. The benefits of the Mining Law's approach are tied to its creation of private owners of mineral resources. These resource owners may receive the benefit of the surface estate as well, thus ensuring that they consider the benefits of alternative uses and steps to preserve and enhance environmental amenities on the land. The corrupting effect of mineral deposits, so visible around the world, is avoided by limiting the opportunities for corruption by removing discretion. Far from a wasteful giveaway of public resources, the Mining Law is actually the means of creating incentives for careful stewardship of both land and mineral resources.

The Mining Law has persisted because its strengths outweigh its weaknesses. There is no question that the Mining Law could be improved by removing some of the overly complex, dysfunctional aspects such as the lode-placer distinction. By awarding secure mineral rights based on investment in knowledge about the existence of mineral resources, the Mining Law encourages the creation of more wealth and responsible stewardship of resources.

The free access principle provides an effective tool to privatise assets whose value is unknown but can be learned through investment in knowledge. Since mineral economies today are dominated by efforts to privatise, this is a valuable model. By privatising such assets in response to the creation of knowledge, the free access principle encourages investment in knowledge. By creating residual claimants for the resources, it encourages appropriate decisions about the resources' disposition and resolves conflicts over multiple uses. By removing discretionary decisions from government officials it reduces both the supply of and demand for corruption. Far from an anachronism, the General Mining Law of 1872 is a model for a new century.