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CLEARING THE AIR? INFORMATION DISCLOSURE, SYSTEMS OF POWER, AND THE NATIONAL POLLUTION RELEASE INVENTORY

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The establishment of the National Pollutant Release Inventory (NPRI) in 1992 marked the emergence of a new approach to the regulation of industrial pollution in Canada. In contradistinction to the traditional permit-based model of regulation, the NPRI sets no mandatory discharge limits, instead requiring facilities to track their releases of pollutants and report them to a publically-accessible national database. Through its grounding of regulation in the interplay of social actors interacting across the public/private divide, the NPRI exemplifies a *new governance* technique of environmental regulation, a characterization I examine through a series of analytical lenses. The mining industry offers an informative narrative, and I contend that the relationship between mining activity and the NPRI illustrates well the risks of failing to attend to the extant distribution of power within the social dynamic that informational regulatory mechanisms seek to harness. I end by offering some recommendations for how the NPRI might be improved in light of these considerations.

La création de l'Inventaire national des rejets de polluants (INRP) en 1992 a marqué le début d'une nouvelle approche par rapport à la réglementation de la pollution industrielle au Canada. Contrairement au modèle traditionnel basé sur l'octroi de permis, l'INRP n'établit pas de quantités maximales autorisées pour le rejet de polluants; il requiert plutôt que les installations assujetties suivent l'évolution de leurs rejets et produisent une déclaration à cet effet dans une base de données nationale accessible au public. En s'arrimant aux interactions entre les acteurs sociaux des secteurs privé et public, l'INRP s'inscrit dans une « nouvelle gouvernance » de la réglementation de l'environnement, une approche que nous examinons ici sous différents angles analytiques. L'industrie minière offre un exemple instructif et nous estimons que la relation entre cette indusrie et l'INRP met en lumière les risques encourus lorsque la distribution des pouvoirs au sein de la dynamique sociale que l'INRP vise à encadrer n'est pas prise en compte. À la lumière de ces enseignements, nous offrons quelques recommandations visant à améliorer l'INRP.

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Introduction

The establishment of the National Pollutant Release Inventory (NPRI) in 1992 marked the emergence of a new approach to the regulation of industrial toxic pollution in Canada. Whereas in the traditional permit-based model of regulation, the regulator imposes specific restrictions on the pollutant discharges of the regulatee, the NPRI sets no mandatory discharge limits, instead requiring facilities merely to track their releases of certain pollutants and report them to a publically accessible national database. In this way, it enhances the public's capacity to scrutinize polluters and pollution levels and to influence, both formally and informally, the behaviour of polluting actors and official regulators. Through the NPRI, a wide range of stakeholders (potentially extending to local residents, community groups, public interest advocates, employees, investors, customers, and competitors) can enter the regulatory arena—and do so, in principle, armed with information about who is polluting and what they are discharging. In appealing to the interplay of social actors and social processes, the NPRI seeks to move beyond the binary of regulator and regulatee and to breach the public/private divide. As such, it can be considered as exemplifying a *new governance* technique of environmental regulation.[1]

My focus here is on the NPRI as regulatory policy and, more generally, on the information disclosure approach to environmental performance viewed in light of economic, institutional, and political power relations within society.[2] While I review the current evidence on the pollution inventory and reductions in emissions, my aim is not to advance a totalizing narrative on the effectiveness, or lack thereof, of the NPRI, something that likely varies widely and non-linearly in response to a complex and hyper-interactive set of variables.[3] Rather, it is to begin to consider the

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1 The rubric of *new governance* embraces a range of approaches to the formation, operation, and enforcement of laws, regulations, standards, and norms: democratic experimentalism, reflexive law, collaborative governance, soft law, responsive regulation, and sundry other related regulatory appellations. Common to each is an eschewing of the traditional regulatory approach—cast as the hierarchical command-and-control enforcement of fixed rules and prescriptions—in favour of the co-optation of a range of social actors (including the regulatee) and the broader social dynamic into the governance process.

2 In the course of this investigation, links are made to the American precursor of the NPRI, the Toxics Release Inventory (TRI). While there are relevant differences between the two, the TRI represents the model on which the NPRI is based, and much that can be said of that scheme applies equally to the NPRI. Given the TRI's longer history and location within the much larger jurisdiction of the United States, it has also been subject to more extensive study, some of which will inform this analysis.

3 For an extensive and nuanced, though still incomplete, analysis of the mechanisms by which information disclosure affects decision-making within corporations, communities,

heretofore largely neglected theoretical issue of the play of power dynamics underlying the inventory's operation. After briefly describing the development and history of the NPRI and outlining the mechanism of its operation, I go on to examine the pollution inventory approach in theory and in practice, applying a series of analytical lenses. The new governance philosophy is premised on establishing a social dynamic in which a plurality of actors variously connected to the regulated entity seeks to influence its behaviour; hence, I offer an overview of existing analyses of how these various stakeholders have engaged with (or not engaged with) pollution inventories. In this light, the experience of mining and the NPRI presents an informative case study. I contend that the relationship between mining activity and the NPRI illustrates well the risks of failing to attend to the extant configuration of power relations within the very social interactions that informational regulatory mechanisms seek to harness. The historic failure of the NPRI to fully include in its domain the harmful effects of mining is indicative of the need to carefully consider the influence of the socio-economic landscape when designing a pollution inventory model.[4] This analysis then leads to a more general examination of the ideological and structural precepts of regulation-by-information. In light of these considerations, I end by offering some recommendations for how the NPRI might be improved with an eye to increasing its capacity to foster a positive informational dynamic of better and more accessible information, leading to greater public involvement and improved regulatory action across a multi-faceted regulatory regime.

I. The Establishment and Operation of the NPRI

The creation of the NPRI followed on the heels of its American cousin, the Toxics Release Inventory (TRI); each was a product of mounting public concern over the accumulation of industrial toxins in the environment. In both countries, numerous high-profile issues and events of the 1970s and 1980s—the impact of chlorofluorocarbons (CFCs) on the ozone layer, the "toxic blob" found in the St. Clair River, the leakage from the Love Canal disposal site by Niagara Falls—raised the profile of industrial chemical contamination and spurred a growing "right-to-know" community movement. And in both instances, government action was catalyzed by

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and regulatory agencies, see Michael E Kraft, Mark Stephan & Troy D Abel, *Coming Clean: Information Disclosure and Environmental Performance* (Cambridge, Mass: MIT Press, 2011) [Kraft et al].

4 That is to say that the example of mining and the NPRI is offered for consideration not because the particulars of how a powerful industry was able to avoid the reach of the NPRI are necessarily reproduced in other sectors, but because it offers a salient illustration of how power imbalances within the interplay of actors may lead to undesirable regulatory outcomes.

the devastating Bhopal chemical plant disaster.[5] In the United States, this tragedy provoked the (hurried) creation of the TRI under the *Emergency Planning and Community Right to Know Act* (*EPCRA*).[6] In Canada, the NPRI was established under the rubric of the *Canadian Environmental Protection Act* (*CEPA*).[7]

Originally proclaimed into force in 1988, the intent of *CEPA* was to move away from a piecemeal approach to toxic pollution, whereby substances could fall under the domain of any (or none) of a number of unconnected legislative regimes,[8] to a more integrative and holistic system that deals with toxic industrial chemicals "from cradle to grave."[9] In the words of Environment Canada, *CEPA* is intended as "a framework for the management and control of toxic substances at each stage of their life cycle, from development and manufacturer/importation through to transportation, distribution, use, storage and ultimate disposal as waste."[10] The result is a multifaceted and complex piece of legislation that employs a range of regulatory devices—permitting, environmental quality objectives, guidelines, and codes of practice—and crosses departmental and even ministerial divisions.[11] Established under the authority of subsection

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5 See James T Hamilton, *Regulation through Revelation: The Origin, Politics, and Impacts of the Toxics Release Inventory Program* (New York: Cambridge University Press, 2005) at 10; John Jackson, *A Citizen's Guide to the National Pollutant Release Inventory* (Toronto: Canadian Institute for Environmental Law and Policy, 2000) at 3.

6 See *Emergency Planning and Community Right to Know Act*, Pub L No 99–499, 100 Stat 1741, § 313 (codified at 42 USC § 11023) [*EPCRA*]. The *EPCRA* was itself hastily added to the *Superfund Amendments and Reauthorization Act* of 1986, Pub L 99–499 as the freestanding Title III.

7 *Canadian Environmental Protection Act*, SC 1999, c 33 [*CEPA*]. The central sections authorizing the inventory and defining the general parameters of its operation are ss 44, 46, and 48–55.

8 The perverse result of this approach was often that a substance would be shuffled to the regime that offered the least actual regulation. See Barry G Rabe, "The Politics of Sustainable Development: Impediments to Pollution Prevention and Policy Integration in Canada" (1997) 40:3 Canadian Public Administration 415 at 418.

9 "CEPA Environmental Registry: General Information – The history of CEPA" (11 January 2007), online: Environment Canada <www.ec.gc.ca> [*CEPA* General Information].

10 *Ibid*.

11 The envisaged scope of *CEPA* is truly profound. As outlined in *CEPA*, the federal government's duties include, *inter alia*: applying the precautionary principle to enact preventive measures in the face of scientific uncertainty; incorporating environmental protection into social and economic decisions; assessing the toxicity and risk of new and existing characters;

> implement[ing] an ecosystem approach; ... establish[ing] nationally consistent standards of environmental quality; [providing] information to the people of Canada on the state of the Canadian environment; apply[ing] knowledge, including traditional aboriginal knowledge, science and technolo-

46(1) of *CEPA*, which gives the Minister of the Environment broad powers to require reporting of information regarding pollution and toxic substances, the NPRI is one component of this mosaic.[12] Section 48 then requires the use of this information to establish a "national inventory of releases of pollutants."[13] Failure to comply with the submission requirements of the NPRI is a hybrid offence under *CEPA* and carries the maximum penalty of a fine of $1,000,000 and imprisonment for a term of up to three years.[14]

The listing of substances on which reporting is required appears in the "Notice with respect to substances in the National Pollutant Release Inventory", published annually in the Canada Gazette, Part 1.[15] Facilities meeting the minimum threshold criteria[16] are required to track the "releases, disposals and transfers for recycling" of substances listed in the Schedule 1 to the Notice and report their results to Environment Canada.[17] The number of substances on which facilities are required to report is relatively small: the most recent notice lists 366 substances.[18] Compare this to the more than twenty-three thousand chemicals appearing on the

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> gy, to identify and resolve environmental problems; [and] protect[ing] the environment, including its biological diversity, and human health, from the ... use and release of toxic substances, pollutants and wastes (*supra* note 7, s 2).

CEPA offers much grist for the analytic mill: it integrates various regulatory techniques in the service of high-level goals, including both command-and-control and compliance measures, and exhibits in its operation elements of a regulatory pyramid (see Ian Ayres & John Braithwaite, *Responsive Regulation: Transcending the Deregulation Debate* (New York: Oxford University Press, 1992)). Here, however, the primary subject of analysis is the one component of *CEPA* that is the NPRI.

12 *CEPA* (*supra* note 7, s 46(1)) allows for the mandating of reporting on a wide range of substances that raise potential environmental or health concerns, including those that are listed as Priority Substances under the *Act*, those that "may contribute significantly to air pollution," those that may damage "fish or ... their habitat," and various other heads.

13 *Ibid*, s 48.

14 *Ibid*, s 272.

15 See e.g. Notice (Department of the Environment), (2011) C Gaz I, 3816 [Notice 2011].

16 Reporting thresholds are listed in Schedule 3, s 6 of the Notice 2011 (*ibid*). For most substances, the threshold is ten tonnes of the substance manufactured, processed, or otherwise used in at least 1 per cent concentration.

17 "3. General Information and Reporting Requirements", online: Environment Canada <www.ec.gc.ca/inrp-npri>.

18 *Ibid*.

"Domestic Substances List" and deemed as requiring evaluation under *CEPA*.[19]

A permanent substance review process is used to add substances to the reportable list. Whereas relatively minor changes can be implemented via paper consultation (or other less formal mechanisms), for "multiple, complex or controversial"[20] candidate substances, a multi-stakeholder working group (MSWG) comprising representatives from government, industry, environmental groups, and First Nations is struck to develop recommendations. The MSWG assesses candidate substances and makes recommendations to Environment Canada. Environment Canada then reviews these recommendations and publishes a formal response.[21]

Environment Canada has made the NPRI widely accessible via an online database that allows for searches by facility, substance, location, or type of industry.[22] In its public proclamations, the federal government claims to consider the NPRI a foundation for a range of pollution prevention initiatives and approaches. Environment Canada states that the NPRI is a major starting point for "identifying and monitoring sources of pollution in Canada as well as for developing indicators for the quality of our air, water, and land."[23] The registry is seen as advancing the right to know, and Environment Canada makes "improving public understanding" an explicit aim.[24] Public access to information is also viewed as linking to the further goal of encouraging voluntary action on the part of industry: "Public access to the NPRI motivates industry to prevent and reduce pol-

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19 The list was first published in 1994. See "Domestic Substances List", online: Environment Canada <www.ec.gc.ca/lcpe-cepa>.

20 Lynne Robinson-Lewis, *Modifying the National Pollutant Release Inventory: A Guide to the Procedures to Follow When Submitting Proposals and a Description of the Stakeholder Consultation Process*, online: Environment Canada <www.ec.gc.ca/inrp-npri>.

21 *Ibid*.

22 See "National Pollutant Release Inventory: Tracking Pollution in Canada", online: Environment Canada <www.ec.gc.ca/inrp-npri> [NPRI database]. The database incorporates map layers for use with Google Earth, including criteria air contaminant (CAC) emission density maps and the NPRI facility locations.

23 "Frequently Asked Questions about the National Pollutant Release Inventory (NPRI)", online: Environment Canada <www.ec.gc.ca/inrp-npri> [Environment Canada, "FAQ"].

Stated objectives relating to improved government management of substances of concern include: "identify pollution prevention priorities; support assessment and risk management of chemicals, and air quality modeling; and help develop targeted regulations for reducing releases of toxic substances" (*CEPA* General Information, *supra* note 9).

24 NPRI database, *supra* note 22.

lutant releases."[25] Supporting "international reporting commitments" is also a stated policy intent.[26]

II. Mining and the NPRI

Placing the NPRI in context with regard to mining first requires some consideration of the environmental effects of mineral extraction. The excavation and processing of metals and minerals significantly impact land, water, and air.[27] While the intense localized impact of a mining operation on the area of the mine is by and large readily apparent, the environmental effects can extend much more broadly over the hydrology of a wide area. This is the result of chemical changes that the often-vast amount of material unearthed through the mining process undergoes.[28]

Critical to the release of toxic pollution is a process of oxidization to which much waste rock and tailings (the waste produced in the process of refining ore—a mixture of fine rock particles and extraction chemicals) are subject. Most ore and waste rock contain sulphides, chemicals formed in the absence of oxygen deep below the earth. Once exposed to the air through mining, these minerals begin to oxidize, and in the process they produce sulphuric acid, which proceeds to dissolve the metals, including heavy metals, in the surrounding material. The resulting "acid mine draining" (AMD) poses some of the most serious environmental threats from mining, not least because once established, the process can continue for hundreds or even thousands of years.

Many of the chemicals used in the refining of ore and the heavy metals, such as lead and mercury, appear in the NPRI listing of reportable substances. However, prior to 2007, mining was exempt from the report-

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25 Environment Canada, "FAQ", *supra* note 23.

26 "Report of the National Pollutant Release Inventory Multi-Stakeholder Work Group on Substances" (12 February 2009), online: Environment Canada <www.ec.gc.ca/inrp-npri>.

27 I am referring here, and throughout this paper, to hard rock mining, which makes up the bulk of mining activity. While aggregate mines, or quarries, can have notable environmental impacts (silting of waterways, for example), they are typically not of the same nature or extent as hard rock mines. Acid mine drainage, for example, is not a concern in aggregate mining.

28 The minerals or metals that are the final product of mining represent a tiny portion of the total material removed. Most of this volume is waste rock, but even the smaller quantity of material that is the ore (rock that is economical to refine) must be refined to a very small portion of its original volume to obtain the desired mineral or metal. For example, Canada's largest copper mine, Highland Valley (located near Kamloops, British Columbia) has an average ore grade of 0.43 per cent, meaning that 99.57 per cent of the ore mined is eventually discarded ("Highland Valley", online: Mining Technology <www.mining-technology.com>).

ing requirements of the NPRI, although the further processing of mined materials was not. According to Environment Canada, tailings were always regarded as being generated through such further processing, but only material leaving the tailings impoundment areas was considered subject to reporting.[29] Waste rock was considered as included in the mining exemption.[30] In practice, tailings and waste rock disposed of on-site (effectively, all tailings and waste rock) were excluded from reporting requirements.[31]

Environmentalists had long maintained that the exclusion of tailings and waste rock was unjustified. Despite being a significant source of *CEPA* pollutants,[32] mining remained the only industrial sector not required to report on-site disposals of these pollutants to the NPRI.[33] It was argued that, beyond denying the public information to which it was entitled, the result was the creation of a distorted and potentially misleading image of the reality of pollution in Canada.[34] These efforts met with apparent success when in 2006 the exemption for mining processes that take place prior to milling was removed.[35] As well, the 2006 *Guide for Report-*

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29 See email from François Lavallée, Environment Canada (3 March 2009). See also "Discussion Paper on Pollutant Release Reporting Requirements as It Relates to Mining Facilities", online: Environment Canada <www.ec.gc.ca/inrp-npri>.

30 *Ibid*.

31 See Matt Thorpe, "The Decision in *Great Lakes United v. Canada (Minister of Environment)*: The Federal Government's Responsibility to Report on Pollution from the Mining Sector, and Beyond?", online: (2009) 24:2 Environmental Law Centre <www.elc.ab.ca>.

32 To get a sense of the significance of exempting mining, both in terms of local impact and international consistency, consider that in 2005, tailings and waste rock pollution accounted for more than 97 per cent of the total pollutants reported by the mining industry in the United States. Although in the same year, mining operations in the United States made up less than one-half of one per cent of all industries reporting to the TRI, they accounted for 27 per cent of all pollutants released, or more than 530 million kilograms of toxic substances (EcoJustice & Great Lakes United, "Lawsuit exposes Canada's toxic tailings secret: Groups say feds flouting law, hiding mining pollution from public" (7 November 2007), online: Mining Watch Canada <www.miningwatch.ca>). In the United States, mining was initially exempt from reporting to the TRI, but as a result of efforts by environmentalists was made reportable in 1998.

33 Facilities used exclusively for oil and gas exploration or for the drilling of oil and gas wells are also exempt from reporting requirements. All other types of oil and gas facilities are required to report (see Environment Canada, *Guide for Reporting to the National Pollutant Release Inventory (NPRI) 2011*, online: <www.ec.gc.ca/inrp-npri> at 3.7.1 [2011 *Guide for Reporting*]).

34 See "Get Mining Included in the National Pollutant Release Inventory!" (30 November 2002), online: Mining Watch Canada <www.miningwatch.ca>.

35 See Notice (Department of the Environment) (2006) C Gaz I, 364. In prior notices (see e.g. Notice (Department of the Environment) (2003) C Gaz I, 8), the following appeared:

ing, issued under section 47 of *CEPA*, did not include the statement used in previous years that "[l]isted substances in tailings are not reported unless they left the tailings impoundment or other forms of on-site containment."[36] Despite these changes, the Minister of the Environment continued to exercise a purported discretion not to require reporting of on-site movements of tailings and waste rock—a practice that was subsequently successfully challenged in federal court.[37] Furthermore, Environment Canada appears to have continued to construe the meanings of a "release" and a "disposal" per the Gazette requirements to exclude reporting.[38] Tailings were still only considered to be released into the environment should they exit the tailings impoundment area. For waste rock, instructions given to mining companies were that releases of NPRI substances from waste rock must be reported to the NPRI, but the substances in the rock itself need not be.[39] In effect, such an interpretation accorded with the position of the mining industry that toxins in waste rock and tailings occur naturally in low concentrations and are therefore not "releases to the en-

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> 3 (1) A substance listed in Schedule 1 shall not be included in calculating its prescribed mass reporting threshold if the substance is manufactured, processed or otherwise used in an activity listed below:
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> ...
>
> (h) mining, except processing or otherwise using mined materials

The 2006 and subsequent notices list no such exemption.

36 Environment Canada, *Guide for Reporting to the National Pollutant Release Inventory (NPRI) 2006*, online: <www.ec.gc.ca/inrp-npri>. The statement *was* previously used in Environment Canada, *Guide for Reporting to the National Pollutant Release Inventory (NPRI) 2005*, online: <www.ec.gc.ca/inrp-npri> at 71.

37 See *Great Lakes United v Canada (Minister of the Environment)*, 2009 FC 408, [2010] 2 FCR 515 [*Great Lakes*]. The court found that the Minister of the Environment was in error in interpreting *CEPA* as allowing him the discretion in 2006 and subsequent years to exempt from publication in the NPRI releases and transfers to tailings and waste rock disposal areas by mining facilities. The court made an order in mandamus directing the publication of such information (*ibid* at para 241). The Minster did not seek leave to appeal this decision (see "Federal Court Ruling to Stand: Mine Waste Toxins to Be Reported" (25 May 2009), online: Mining Watch Canada <www.miningwatch.ca>).

38 See Lavallée, *supra* note 29.

39 *Ibid*. The record suggests that mining companies concurred with this interpretation: prior to the court decision, there were at least eighty facilities across the country not reporting their tailings and waste rock pollution to the NPRI (see Environmental News Service, "Toxic Wastes from Canadian Mines Evading Scrutiny, Claim Groups" (26 January 2009), online: MAC: Mines and Communities <www.minesandcommunities.org> [Environmental News Service]).

vironment".[40] In light of the professed intent of the NPRI, these interpretations have certain practical implications, which I now take up.

By far the most common means of tailings disposal is simply to dump the slurry directly into "tailings ponds", artificial ponds that often more closely resemble lakes in their size.[41] Typically, these are straightforward and unsophisticated in their engineering design. Material, normally earth or rock, is simply piled into embankments surrounding an area of natural ground, thus creating an impoundment area into which the tailings can be deposited. Given their size and construction, limiting the leeching of tailings material from the pond into the surrounding environment and groundwater can be a difficult if not impossible undertaking.[42] As well, acid-generating waste rock is often used to construct the tailings ponds, with the result that, ironically, the ponds themselves become a source of AMD.[43]

In fact, the mining industry now claims that the safest means of disposal for tailings is their direct deposition into lakes. Elizabeth Gardiner, vice-president for technical affairs for the Mining Association of Canada, contends that "[l]akes are often the best way for mine tailings to be contained" and that "in the end it's really the safest option for human health and for the environment."[44] As of the time of writing, nineteen Canadian

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40 See "National Pollutant Release Inventory: Overview" (4 June 2009), online: Mining Watch Canada <www.miningwatch.ca>.

41 The tailings area at the Highland Valley copper mine, for example, is two kilometers wide by ten kilometers long (11,000 hectares). It is one of the larger compacted, earth-filled tailings dam structures in Canada (Jane Werniuk, "Huge B.C. Mine Has Own Style" (01 June 2013), online: Canadian Mining Journal <www.canadianminingjournal.com>).

42 For example, studies by Fisheries and Oceans Canada of mine tailings near the abandoned Little Bay copper mine in north-central Newfoundland "show that wild mussels from this site have some of the highest copper concentrations ever reported" (Environmental News Service, *supra* note 39).

43 See Sierra Legal Defence Fund, *Digging Up Trouble: The Legacy of Mining in British Columbia* (Vancouver: Sierra Legal Defence Fund, 1998) at 11.

44 Terry Milewski, "Lakes Across Canada Face Being Turned into Mine Dump Sites" (16 June 2008), online: CBC News <www.cbc.ca>. To this end, the *Metal Mining Effluent Regulations* (SOR/2002-222, s 1 [*Metal Mining Effluent Regulations*]), created by amendment to the federal *Fisheries Act* (RSC 1985, c F-14), permit the reclassification of lakes and freshwater bodies as "tailings impoundment areas", thereby allowing mining companies to get around the prohibition on the deposition of materials that are deleterious to fish into water frequented by fish. Under s 5(1) of the *Metal Mining Effluent Regulations*, "the owner or operator of a mine may deposit or permit the deposit of waste rock or an effluent that contains any concentration of a deleterious substance and that is of any pH into a tailings impoundment area." This tailings impoundment area may be any "water or place set out in Schedule 2" (*ibid*, s 1(1)). Various lakes, ponds, tributaries, and streams currently appear on Schedule 2. When the amendment was

waterways have been reclassified as "tailings impoundment areas".[45] Exempting reporting for tailings in tailings impoundment areas thus means exempting direct deposition into designated lakes (and if, as the mining industry claims, direct deposition into lakes is the safest means of tailings disposal, then exempting lakes would also follow as a matter of logical necessity from the exemption of tailings ponds, which are by implication less safe). If direct deposition into a completely natural and unrestricted environmental feature is not considered a release into the environment for the purposes of the NPRI, then it is frankly difficult to imagine what would be.[46] By this light, it seems clear that Environment Canada's understanding prior to 2007 of what amounted to a release of tailings was at odds with the most basic stated goals and objectives of the NPRI.

An analogous argument to the treatment of tailings can be made for waste rock. Beneath the earth, the rock is inert, protected from oxidation, and heavy metal toxins are safely ensconced within. It is the mining activity itself that directly exposes the rock to air and initiates the process that results in heavy metals entering the hydrological system and the environment more generally. The degree of containment for waste rock is even less than for tailings: the rock is normally simply deposited in massive piles. Once again, an ordinary understanding of the meaning of the term "release", and one taken in light of the professed intent of the NPRI to track the transfer of pollutants into the environment, would seem to conflict with an interpretation of the Gazette Notice that exempts the toxins in waste rock from reporting. If one purpose of data from the NPRI really is to "[help] the Government of Canada to track progress in pollution prevention, evaluate releases and transfers of substances of concern, identify and take action on environmental priorities, ... and implement policy initiatives and risk management measures,"[47] then it is hard to see why a major source of pollution from one of the most significant polluting industries should be (seemingly arbitrarily) exempted.

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first introduced, the Liberal government of the day assured environmental groups that the intent of the amendment was to grandfather in lakes and rivers that had been used for mining operations. Under the current federal government, reclassifications have pertained to new projects. See "Why is the Canadian Government Letting Mining Companies Turn Lakes into Toxic Dumps?", online: Council of Canadians <www.canadians.org>.

45 *Metal Mining Effluent Regulations*, *supra* note 44.

46 Put another way, what is the material difference between directly depositing tailings into a natural water source as opposed to making an indirect release into one by discharging tailings from a tailings pond, something that all parties (including Environment Canada) agree *is* reportable?

47 Environment Canada, "FAQ", *supra* note 23.

Whereas Environment Canada's interpretation of the requirements of the NPRI accorded with that of the mining industry, it was at odds with those environmental, community, and First Nations groups whose efforts had eventuality led to the removal of the reporting exemption for mining.[48] In 2007, the environmental non-governmental organization (ENGO) members of the NPRI Mining Subgroup reaffirmed this position to Environment Canada.[49] It was only after two ENGOs, Great Lakes United and Mining Watch Canada, successfully sued the Minister of the Environment[50] that Environment Canada changed its practice so as to require mining facilities to report releases or transfers of pollutants to waste rock and tailings ponds.[51] In its judgment, the Federal Court pointed to the breakdown in the consultative process and the lack of consensus on how this information should be reported, which resulted in seventeen years of fruitless negotiation throughout which the unsatisfactory status quo of non-reporting endured.[52] In contrast to the new governance ideal of stakeholder negotiation and collaboration generating mutually acceptable outcomes, a requirement on the part of the Minister for consensus across

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48 See John Jackson, "National Pollutant Release Inventory and Mine Tailings & Waste Rock: The ENGO Perspective" (2007) [unpublished, submission to Environment Canada].

49 *Ibid*.

50 See *Great Lakes*, *supra* note 37.

51 See 2011 *Guide for Reporting*, *supra* note 33, s 3.7.4 (substances contained within inert and uncrushed components of tailings as well as within inert rock or rock with a low acid-generating potential remain non-reportable).

52 In *Great Lakes*, Russell J wrote:

> [I]t is clearly unsatisfactory that such an important part of the pollution picture in Canada is not being reported to the public under the CEPA. The Minister and his predecessors have continued the incremental and consultative process envisaged under the CEPA ... At some point incremental becomes glacial, study becomes stasis, and stasis clearly favours those who are not required to report. The Canadian public is the loser and, without such information being readily accessible, cannot participate in the debate or gauge fully the environmental and health concerns that arise from the pollutants in on-site TIAs and WRSAs. At the time of the hearing of this application, there was no indication of when, or how, this information would be made available (*supra* note 37 at para 145).

The court found that the parties to the Mining Sub-Group were in agreement that the removal of the mining exemption meant that mining activities were reportable. However, while the civil society members took this to mean "reportable to the NPRI", the mining representatives took the position that a separate inventory should be established, a position also adopted by the Minister of the Environment. The court found that the Minister did not have the discretion to exempt the mining sector from reporting to the NPRI (*ibid* at paras 177, 202) and that transfers to tailings ponds and waste rock sites were "releases" of "pollutants" under *CEPA* and hence reportable (*ibid* at paras 184, 188).

stakeholders here served to stymie productive change by effectively giving a veto power to mining representatives. It would seem that the voice of the mining industry sounds much louder in the ears of Environment Canada and the government than do the voices of ENGOs and the range of civil society actors that make up a key part of the corpus upon which a successful new governance model is based. This discrepancy is taken up below, where the praxis of the NPRI is examined through various regulatory analysis perspectives.

III. The NPRI in Theory and Practice

A. The NPRI as New Governance Regulation

I now turn to examine the new governance theory and review the empirical evidence for the success of the NPRI and pollution inventories more generally. In the new governance construal of the pollution inventory approach, the regulator appears as merely one actor in a broader network of social forces, while governance emerges through a heterarchy of diverse stakeholders, both public and private, each of whom participates in distinct but intersecting ways in an ongoing social interaction. At its optimum, the inventory heralds an empowered citizenry, energized civil society, and burgeoning participatory democracy, as increased access to information facilitates individuals, community groups, and ENGOs in exposing and pressuring bad actors while lauding good ones.[53]

For industry, proponents contend that the requirements of the inventory result in *information forcing*—as managers become aware of data that had previously been unrecorded and are required to confront the hard pollution numbers, they begin "to manage what they measure."[54] Having the numbers in front of them leads them to direct their managerial efforts around those numbers. Managers can now set internal standards for production subunits, establishing the necessary transparency and accountability to reach firm-wide objectives.[55] And while opportunities for

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[53] See e.g. Bradley C Karkkainen, "Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?" (2001) 89:2 Geo LJ 257 at 295. See also Archon Fung & Dara O'Rourke, "Reinventing Environmental Regulation from the Grassroots Up: Explaining and Expanding the Success of the Toxics Release Inventory" (2000) 25:2 Environmental Management 115 (the success of TRI is due to its creation of "maxi-min" mechanisms that facilitate blacklisting by bringing maximum attention to bear on the minimum performers).

[54] Louis Lowenstein, "Financial Transparency and Corporate Governance: You Manage What You Measure" (1996) 96:5 Colum L Rev 1335, cited in Karkkainen, *supra* note 53 at 299.

[55] See Karkkainen, *supra* note 53 at 295.

increased efficiency from waste reduction may now function as an internal driver of change, pressure from the community and the media, investor responses and their effect on stock prices, and the threat of potential command-and-control intervention by the regulator all act as external drivers.[56] Standardized data requirements[57] mean that managers and boards can cross-compare their operations with competitors, ideally introducing a norm-based drive to continual improvement, one not restricted by the de facto regulatory ceiling of performance- or technology-based regulatory standards.[58]

A fundamental advantage that the pollution inventory is claimed to proffer to regulators is a means to overcome the ubiquitous informational bottleneck faced by conventional regulations.[59] Under a conventional command-and-control regulatory regime, standards must be set in a legally and scientifically justifiable manner for each chemical in the vast array of substances in industrial usage,[60] a process made all the more challenging by industry's continual innovation and its increasing heterogeneity. Regulatory resources inevitably fall far short of the magnitude of the task at hand. By shifting the information burden to industry and enlisting civil society in the enforcement effort, a self-sustaining virtuous dynamic is set in motion in which benchmarking by multiple actors leads, in theory, to continual improvement.[61]

B. Empirical Analysis of Pollution Inventory Performance

While numerous qualifications apply, the weight of the evidence in the United States suggests that the TRI has had an effect in reducing levels of toxics deposition. Between the start of the inventory's operations in 1988

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56 See e.g. Frances M Lynn & Jack D Kartez, "Environmental Democracy in Action: The Toxics Release Inventory" (1994) 18:4 Environmental Management 511 at 512.

57 However, reporting may not, in reality, be all that standardized. See Alexander Volokh, "The Pitfalls of the Environmental Right-to-Know" (2002) 2002:4 Utah L Rev 805 at 816.

58 See Karkkainen, *supra* note 53 at 295.

59 *Ibid* at 263–83. For discussion of the power of information technology to overcome limits on data accessibility generally, and hence on public engagement, see Glenna Ford, *Using Information Technology to Measure, Monitor and Report on Environmental Performance* (GreenWare Environmental Systems, 1998).

60 According to one recent review, the major environmental legislative regimes of the United States employ 15,000 pages of regulation to detail the process of reporting and compliance. See Daniel J Fiorino, The New Environmental Regulation (Cambridge, Mass: MIT Press, 2006) at 1.

61 *Ibid*.

and 2007, emissions fell by an impressive 61 per cent.[62] Whereas such figures are often cited by disclosure advocates as evidence of the efficacy of the TRI in reducing emissions, correlation, of course, does not imply causation.[63] Various social, legal, political, or economic factors wholly unrelated to the TRI, including broader sectoral shifts and technological changes, may have influenced emissions over this period.[64] At the regulatory level, many reportable chemicals also fall under the rubric of conventional regulation, and the tightening of command-and-control restrictions that took place during this period is likely responsible for some reduction.[65] Alternatively, the TRI may play an etiological role—just not the

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62 The distribution of reductions across industry sectors, states, communities, and facilities has been far from uniform, however, and significant disparities exist between high and low performers. See especially Kraft et al, *supra* note 3. Consider, for example, that between 1991 and 2000, the 5,213 facilities that reduced their emissions did so by an aggregate 66 per cent, while for the 3,176 facilities that increased (or had no change in) emissions, these doubled (*ibid* at 74). The bulk of reductions are attributable to a comparatively small number of large and well-capitalized firms in select industrial sectors (see Karkkainen, *supra* note 53 at 343).

Later comparison periods also indicate a continued, if slowing, decrease in emissions, with rates falling an overall 30 per cent between 2001 and 2010 (Environmental Protection Agency, *Toxics Release Inventory National Analysis Overview* (Washington, DC: Environmental Protection Agency, 2010)). It should be noted that such comparisons are made, by necessity, only for those chemicals reportable since the beginning of the period in question (or often since the establishment of the registry) and do not include the various reportable substances added since.

63 A better sense of the meaningfulness of emission reductions contemporaneous with the operation of the TRI might be achieved if data were available for the period prior to the inventory's establishment. Was the trend in emissions already negative, or was there a discernible shift following the TRI's establishment? The problem, of course, is that the TRI itself is the primary source of data on its own performance—it is simultaneously both a dependent and an independent variable. Nonetheless, comparison of TRI figures with other independent measures of emissions before and after its introduction might prove of value here.

64 Technological improvements often lead to more efficient production, and more efficient production in itself can lessen environmental harm—much pollution is really comprised of wasted resources, after all. It may be that in some instances, decreased emissions are merely a fortunate side effect of technological changes driven by an economic imperative that is unrelated to TRI reporting. Proponents contend that even where economic (as opposed to environmental) performance is the underlying motivator of emissions reduction, the increase in information brought to light through the TRI reporting process can further that end.

65 Fung & O'Rourke (*supra* note 53 at 116–17) note, however, that during a period of large TRI chemical reductions, emissions under the United States' *Clean Air Act* (42 USC §§ 7401ff [*Clean Air Act*]) and *Clean Water Act* (33 USC §§1251ff [*Clean Water Act*]) remained essentially flat, but also point out that the comparison with the TRI is not entirely fair, as these regimes include substances that are more inherent to combustion and other basic industrial processes and hence less easily replaced with alternatives.

one inferred by disclosure advocates. A key finding of Kraft, Stephan, and Abel's mixed methods analysis of the TRI is that in areas where emission improvements have occurred, the "backdrop" of conventional regulation proved critical. The TRI thus appears to facilitate compliance with and enforcement of conventional regulation—the proximate driver of reductions—rather than to change behavior directly.[66]

Moreover, the interpretation of reported reductions is open to debate. The figures that firms report are often based on estimates of questionable methodology and subject to inconsistencies across companies.[67] Some reported decreases may merely reflect "paper changes" in reporting procedures, something that is particularly pertinent to the initial large drop in emissions following implementation of the TRI.[68] As both the TRI and the NPRI exempt entities if they manufacture, process, or use a chemical below a threshold level, a facility that reduces emissions to below this cut-off appears, for reporting purposes, to reduce them to zero. This effect could significantly exaggerate the extent of reductions.[69] As well, the verification of industry self-reporting is minimal,[70] and there is evidence of dis-

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In the particular case of petroleum refineries, analysis by Bui revealed that legislative regimes such as the *Clean Air Act* and *Clean Water Act* affect TRI releases both directly and indirectly. The direct impact results from simultaneous regulation under these (and other) programs; the indirect effect occurs via their regulation of production inputs, leading to changes in the releases of substances reportable to the TRI but not regulated under these programs (see Linda TM Bui, "What We Know About What We Know About Toxic Polluter Behavior from the TRI: Evidence from (almost) Twenty Years of TRI Data in the Petroleum Refining Industry," (May 2012) [unpublished]).

66 Kraft et al, *supra* note 3 at 195.

67 See David J Abell, "Emergency Planning and Community Right to Know: The Toxics Release Inventory" (1994) 47:3 SMU L Rev 581 at 591, n 88. One study suggested that for some facilities, reported release data may overestimate or underestimate actual amounts by a factor of two (Rosemary O'Leary et al, *Managing for the Environment: Understanding the Legal, Organizational, and Policy Challenges* (San Francisco: Jossey-Bass, 1999) at 329).

68 See e.g. Volokh, *supra* note 57 at 817 (describing how the change, between 1988 and 1990, from reporting ammonium-sulfate to reporting ammonia pushed the numbers down while actual usage likely increased); Thomas E Natan, Jr & Catherine G Miller, "Are Toxic Release Inventory Reductions Real?" (1998) 32:15 Environmental Science & Technology 368A at 368A–74A (finding that more than half of reported reductions of production-related waste were "phantom reductions" of this kind).

69 Using data from the *Massachusetts Toxics Use Reduction Act*, Bennear estimates that errors in inference introduced by reporting thresholds may account for up to 40 per cent of the observed decline in reported toxic releases in Massachusetts (Lori S Bennear, "What Do We Really Know? The Effect of Reporting Thresholds on Inferences Using Environmental Tight-to-Know Data" (2008) 2:3 Regulation & Governance 293).

70 EPA staff inspects only about 3 per cent of reports received. Environment Canada inspections are also minimal. See Kathryn Harrison & Werner Antweiler, *Environmental Regulation vs. Environmental Information: A View from Canada's National Pollutant*

crepancies between reported and actual emissions.[71] Further, the actual impact of the reductions achieved on environmental and human health is not always clear. The disparity between the vast number of potentially toxic substances and the regulatory resources available means not only that the inventory represents a very small portion of toxic chemicals in use, but also that listing is often driven by convenience and a degree of arbitrariness.[72] The result is that many reportable toxic substances may have a non-reportable replacement that is equally or more harmful. Hence, a chemical substitution that reduces reported figures may not lessen the real environmental hazard. Moreover, facilities report only total amounts of released substances. Such figures do not account for their relative or absolute toxicity (which can vary by many orders of magnitude), leaving a potentially misleading impression of actual risk and relative performance across firms.[73] Different types of exposure and handling (direct release into the atmosphere versus injection deep into the earth, away from human contact, for example) and associated risk to people and communities (such as the degree of cumulative impact from exposure to multiple potentially interactive chemicals) are further factors affecting actual risk. Caution must therefore be exercised in inferring changes to environmental impact from changes to the raw data as reported. The EPA has attempted to address this issue by developing the Risk-Screening Environmental Indicators (RSEI) model, a computer-based screening tool that analyzes factors that may result in chronic human health risks and

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Release Inventory (25 January 2001), online: <strategy.sauder.ubc.ca> [Harrison & Antweiler, *Environmental Regulation*].

71 For example, formaldehyde emissions tests at a Louisiana-Pacific facility in California found that the corporation's true releases were double those reported (Volokh, *supra* note 57 at 815). Koehler and Spengler demonstrate underreporting of polycyclic aromatic hydrocarbons by primary aluminum facilities and dislocation of emissions overseas after a tightening of regulatory requirements (Dinah A Koehler & John D Spengler, "The Toxic Release Inventory: Fact or Fiction? A Case Study of the Primary Aluminum Industry" (2007) 85:2 Journal of Environmental Management 296). Comparing reported air emissions with concentrations detected by EPA monitors, de Marchi and Hamilton found statistical deviations that suggested that firms were not accurately reporting emissions of lead and nitric acid (Scott de Marchi & James T Hamilton, "Assessing the Accuracy of Self-Reported Data: An Evaluation of the Toxics Release Inventory" (2006) 32:1 J Risk Uncertainty 57). On the other hand, Hamilton found that initial non-reporting in Minnesota was by small firms, and that the firms' subsequent compliance did not significantly increase total reported releases (*supra* note 5 at 81–95). The EPA itself reports generally good agreement between facility reporting and its own (minimal) surveillance (see "TRI Data Quality Information" (11 September 2012), online: Environmental Protection Agency <www.epa.gov>).

72 See Volokh, *supra* note 57 at 837–38.

73 *Ibid* at 820–27.

thereby facilitates the identification of releases that pose the highest potential risk.[74] No such model has been developed for the NPRI.[75]

Analysis of NPRI figures has been much more limited. While Harrison and Antweiler found a 27 per cent reduction in releases between 1993 and 1999, they see the inventory as unlikely to have contributed significantly to this decline.[76] This is in part because of the greater concentration of releases within a smaller number of facilities, a handful of which were responsible for the bulk of reductions. Harrison and Antweiler argue that these particular improvements can be traced to specific command-and-control enforcement measures and increases in conventional regulatory standards.[77]

Despite these significant caveats, praise for the TRI and the NPRI has come from across an array of interested stakeholders, including environmentalists, industry, government officials, and regulators.[78] In the United States, these accolades are in accord with various empirical analyses which provide support for the contention that the TRI enlists forces beyond the state to influence firm behaviour. For example, a study by Hamilton found that firms that reported higher levels of pollution received greater negative news coverage, which led to significantly reduced share prices.[79] Follow-up work by Konar and Cohen demonstrated a positive correlation between levels of pollution reported to the TRI and declines in

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74 See Environmental Protection Agency, *Risk-Screening Environmental Indicators (RSEI)*, online: <www.epa.gov>. Making comparisons of 199 petroleum refineries over five years, Bui (*supra* note 65) showed that, while RSEI toxicity weighted and unweighted aggregate releases both experienced large declines, the patterns of releases were substantially different, suggesting that inferences regarding the impact of the TRI will be highly sensitive to the measure of releases (weighted or unweighted) adopted.

75 However, using a model that combines toxicity, chemical fate properties, and NPRI release data, Environment Canada has developed a relative risk ranking for a subset of NPRI substances. See Allison M Dunn, "A Relative Risk Ranking of Selected Substances on Canada's National Pollutant Release Inventory" (2009) 15:3 Human and Ecological Risk Assessment 579.

76 Kathryn Harrison & Werner Antweiler, "Incentives for Pollution Abatement: Regulation, Regulatory Threats, and Non-Governmental Pressures" (2003) 22:3 Journal of Policy Analysis and Management 361 at 368.

77 Harrison & Antweiler, *Environmental Regulation*, *supra* note 70 at 18.

78 See e.g. Fung & O'Rourke, *supra* note 53 at 116. See also Karkkainen, *supra* note 53 at 287.

79 James T Hamilton, "Pollution as News: Media and Stock Market Reactions to the Toxics Release Inventory Data" (1995) 28:1 Journal of Environmental Economics and Management 98.

share value.[80] However, the highest-polluting firms did not demonstrate the greatest increases in environmental performance following this negative publicity, likely because these results were expected by investors. Khanna, Quimio, and Bojilova then found that the ongoing publication of TRI data allowed investors to benchmark firm performance, penalizing those firms whose performance declined over time and rewarding those which made progress.[81] However, while uncontrolled discharges were reduced, releases and transfers for off-site disposal were not, suggesting that the abnormal losses experienced by firms caused them to substitute off-site transfers for on-site discharges.[82] As well, while not necessarily drawing a causal connection between the two, numerous studies have utilized TRI data to examine how investors or other market actors value environmental performance.[83]

Beyond its effect on market actors, there is evidence that the presence of the TRI has some impacts on the decisions of ordinary citizens and of civil society. In a study of house prices in Nebraska, Decker, Nielsen, and Sindt found the residential housing market to be significantly more sensi-

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80 Shameek Konar & Mark A Cohen, "Information as Regulation: The Effect of Community Right to Know Laws on Toxic Emissions" (1997) 32:1 Journal of Environmental Economics and Management 109.

81 Madu Khanna, Wilma Rose H Quimio & Dora Bojilova, "Toxics Release Information: A Policy Tool for Environmental Protection" (1998) 36:3 Journal of Environmental Economics and Management 243.

82 *Ibid* at 265.

83 Konar and Cohen scrutinized the effect of poor environmental performance on a firm's intangible asset value, calculating that for the firms they examined, every 10 per cent reduction in the toxic emission results in a $34 million increase in goodwill and/or brand name value (Shameek Konar & Mark A Cohen, "Does the Market Value Environmental Performance?" (2001) 83:2 Review of Economics and Statistics 281 at 288). Schneider found that environmental performance was a significant determinant of firms' bond pricing, but one that fades substantially as a firm's credit quality increases (Thomas E Schneider, "Is Environmental Performance a Determinant of Bond Pricing? Evidence from the U.S. Pulp and Paper and Chemical Industries" (2011) 28:5 Contemporary Accounting Research 1537 at 1552–57). Bosworth and Clemens demonstrate a significant relationship between firms' environmental performance and their market value (William Bosworth & Bruce Clemens, "Does It Pay to Be Environmentally Responsible? Toxic Releases and Financial Performance" (2011) 7:2 Journal of Strategic Innovation and Sustainability 115). Longitudinal analysis by Clarkson et al of TRI data for the pulp and paper, chemical, oil and gas, and metals and mining industries indicates that going "green" is associated with improved financial performance, although such a strategy cannot be easily replicated by all firms (Peter M Clarkson et al, "Does It Really Pay to Be Green? Determinants and Consequences of Proactive Environmental Strategies" (2011) 30:2 Journal of Accounting and Public Policy 122). Antweiler and Harrison employed Canada's NPRI figures as an indirect measure of green consumerism, which they find has a significant presence but a small economic impact (Werner Antweiler & Kathryn Harrison, "Toxic Release Inventories and Green Consumerism: Empirical Evidence from Canada" (2003) 36:2 Canadian Journal of Economics 495).

tive to TRI releases than to regulated pollutant releases.[84] Oberholzer-Gee and Mitsunari discovered that release of TRI data did affect risk perceptions and hence housing prices, though only for those properties located close to reporting facilities.[85] Econometric analysis by Hanna also revealed an inverse relation between house price and distance to reporting facility.[86] On the other hand, a study by Bui and Mayer revealed no relationship between TRI information releases and house prices, neither initially or over time; nor did they find a relationship between declines in toxic releases and any evidenced public activism.[87]

Research by Kraft, Stephan, and Abel found that states with a higher conservation group membership per one thousand residents had a greater net number of facilities that reduced emissions.[88] Voter turnout, studied as a proxy for citizen engagement with civic issues generally, has also been correlated positively with reductions in releases.[89] In one study in which causality seems more definite, the "information shock" resulting from the 1998 addition of coal and oil plants to those industries required to report to the TRI was found to have led to a large increase in the amount of toxins reported by households and to a decrease in median house prices.[90] Yet while evidence indicates that environmental and public interest groups make significant use of TRI data to pressure facilities, in-

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84 Christopher S Decker, Donald A Nielsen & Roger P Sindt, "Residential Property Values and Community Right-to-Know Laws: Has the Toxics Release Inventory Had an Impact?" (2005) 36:1 Growth and Change 113.

85 Felix Oberholzer-Gee & Miki Mitsunari, "Information Regulation: Do the Victims of Externalities Pay Attention?" (2006) 30:2 Journal of Regulatory Economics 141.

86 Bríd Gleeson Hanna, "House Values, Incomes, and Industrial Pollution" (2007) 54:1 Journal of Environmental Economics and Management 100.

87 Linda TM Bui & Christopher J Mayer, "Regulation and Capitalization of Environmental Amenities: Evidence from the Toxic Release Inventory in Massachusetts" (2003) 85:3 The Review of Economics and Statistics 693.

88 Kraft et al, *supra* note 3. Kraft et al consider correlations between multiple resource, political, and policy variables, finding that "[l]iberal states with dense environmental groups, robust regulations, and innovative pollution prevention policies led the way in fostering industrial environmental performance" (*ibid* at 117). The authors posit that environmental group membership is part of a principal-agent path analysis in which the interests of a more liberal state citizenry are pursued by stronger environmental groups and more progressive environmental agencies which together pressure or encourage improved environmental performance by industry (*ibid* at 115). It should be noted, however, that in qualitative analysis by the authors, very few officials reported exerting pressure on businesses to improve performance (*ibid* at 186).

89 Hamilton, *supra* note 5 at 112.

90 Nicholas J Sanders, "Toxic Assets: How the Housing Market Responds to Environmental Information Shocks" (2012) [unpublished]. Because the shock was a discrete event and related only to information, the change was more likely to be independent of other confounding variables related to variation in environmental quality (*ibid* at 3).

form affected residents, and lobby for regulatory changes,[91] among ordinary citizens not already engaged with relevant issues, the TRI appears to figure much less prominently. A survey by Atlas found that very small percentages of respondents knew of the TRI or TRI facilities, and that those who were familiar with relevant information had not come by it as a result of interaction with the inventory. As well, when given TRI information, respondents did little with it and did not take action.[92] If generalizable, these findings would suggest that the TRI is a source that those who are already engaged with environmental issues turn to or discover, rather than a spur to those who are not.

Numerous researchers concerned with issues of environmental equity or environmental racism have employed TRI data to illuminate the geographic relationship between variables such as race or income and pollution levels. Significant correlations between release patterns and race or class have been demonstrated in numerous jurisdictions or geographical regions.[93] Various studies have parsed interactions between environmen-

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91 For an overview of these developments in the United States, see Hamilton, *supra* note 5 at 233–41. For example, the non-profit group Environmental Defense developed a website that allows users to search by zip code to find the largest polluters in their community (US, Environmental Protection Agency, Office of Environmental Information, *How Are the Toxics Release Inventory Data Used?: Government, Business, Academic and Citizen Uses* (Washington, DC: Environmental Protection Agency, 2003) [EPA, *TRI Use*]). In Canada, groups such as the Canadian Institute for Environmental Law and Policy and Great Lakes United have used NPRI data as a key part of broader campaigns on pollution awareness.

92 Mark Atlas, "TRI to Communicate: Public Knowledge of the Federal Toxics Release Inventory" (2007) 88:2 Social Science Quarterly 555.

93 See e.g. Seema Arora & Timothy N Cason, "Do Community Characteristics Influence Environmental Outcomes? Evidence from the Toxics Release Inventory" (1999) 65:4 Southern Economic Journal 691 (southeastern United States); Catherine M Neumann, Debra L Forman & Joan E Rothlein, "Hazard Screening of Chemical Releases and Environmental Equity Analysis of Populations Proximate to Toxic Release Inventory Facilities in Oregon" (1998) 106:4 Environmental Health Perspectives 217 (Oregon); Jeremy L Mennis & Lisa Jordan, "The Distribution of Environmental Equity: Exploring Spatial Nonstationarity in Multivariate Models of Air Toxic Releases" (2005) 95:2 Annals of the Association of American Geographers 249 (New Jersey); Liam Downey, "Environmental Injustice: Is Race or Income a Better Predictor?" (1998) 79:4 Social Science Quarterly 766 (Michigan); Susan A Perlin, Ken Sexton & David WS Wong, "An Examination of Race and Poverty for Populations Living near Industrial Sources of Air Pollution" (1999) 9:1 Journal of Exposure Analysis and Environmental Epidemiology 29 (the West Virginia Kanawha Valley, the Baton Rouge–New Orleans corridor, and the greater Baltimore metropolitan area); Troy D Abel, "Unjust Riskscapes and Skewed Political Landscapes: The Evolving Science of Environmental Injustice" (Paper delivered at the Annual Meetings of the American Political Science Association, 28–31 August 2003), [unpublished] (St Louis and Milwaukee); Eric J Krieg, "Race and Environmental Justice in Buffalo, NY: A ZIP Code and Historical Analysis of Ecological Hazards" (2005) 18:3 Society and Natural Resources 199 (Buffalo, New York); and James L Sadd et al,

tal justice variables[94] or developed more sophisticated measures of risk beyond direct proximity.[95] Using RSEI data (described above), Ash and Boyce combine indicators of corporate environmental performance and environmental justice to develop a measure of corporate environmental justice. Applying this measure to one hundred corporate facilities, they find that, despite a wide variation in the extent of disproportionate exposures, in a majority of cases minorities and the poor bear an excess burden.[96] Campbell, Peck, and Tschudi control for the "chicken-and-egg" issue of whether the people or the pollution came first, concluding that the association is not driven by racial minorities or lower-income individuals moving to higher-pollution neighbourhoods to take advantage of reduced housing costs but, rather more insidiously, by the siting of facilities in already ethnically-characterized areas.[97] Similarly, longitudinal analysis by Morello-Frosch et al. of the increased toxic burden borne by communities

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"'Every Breath You Take...': The Demographics of Toxic Air Releases in Southern California" (1999) 13:2 Economic Development Quarterly 107 (greater Los Angeles). At the county level, see Glynis Daniels & Samantha Friedman, "Spatial Inequality and the Distribution of Industrial Toxic Releases: Evidence from the 1990 TRI" (1999) 80:2 Social Science Quarterly 244 (finding a positive relation between the proportion of the population that is black and the level of toxic releases in the air).

94 See e.g. Susan A Perlin, David Wong & Ken Sexton, "Residential Proximity to Industrial Sources of Air Pollution: Interrelationships among Race, Poverty, and Age" (2001) 51:3 Journal of the Air & Waste Management Association 406.

95 See e.g. Daniel R Faber & Eric J Krieg, "Unequal Exposure to Ecological Hazards: Environmental Injustices in the Commonwealth of Massachusetts" (2002) 110:2 Environmental Health Perspectives Supplements 277 (looking at cumulative exposure); Susan L Cutter, Michael S Scott & Arleen A Hill, "Spatial Variability in Toxicity Indicators Used to Rank Chemical Risks" (2002) 92:3 American Journal Of Public Health 420 (examining the relation between six indices of exposure); Yongwan Chun, Yushim Kim & Heather Campbell, "Using Bayesian Methods to Control for Spatial Autocorrelation in Environmental Justice Research: An Illustration Using Toxics Release Inventory Data for a Sunbelt County" (2012) 34:4 Journal of Urban Affairs 419 (employing Bayesian techniques to account for autocorrelation—the tendency for spatial observations to be related to other observations located closely to them, hence non-independent once these locations are considered—and finding that a relationship between facilities and Asian status observed with regression analysis is explained under Bayesian analysis by the percentage of the population that is American Indian, population density, and the percentage of residents aged 55–74); Marilyn M Williams, "Health Risks from Point Sources of Industrial Air Pollution" in Jayajit Chakraborty & M Martin Bosman, eds, *Spatial and Environmental Injustice in an American Metropolis: A Study of Tampa Bay, Florida* (Amherst, NY: Cambria Press, 2010) 83 (using the RSEI, discussed above, to model risk from industrial exposure in a Tampa Bay neighbourhood).

96 Michael Ash & James K Boyce, "Measuring Corporate Environmental Justice Performance" (2011) 18:2 Corporate Social Responsibility and Environmental Management 61.

97 Heather E Campbell, Laura R Peck & Michael K Tschudi, "Justice for All? A Cross-Time Analysis of Toxics Release Inventory Facility Location" (2010) 27:1 Review of Policy Research 1.

of colour in southern California indicated that facility siting in these communities, and not market-based "minority move-in", underpinned the observed disparity.[98] Using the NPRI to examine the situation in Ontario, Jerrett et al. found that manufacturing employment, urbanization variables, dwelling value, and household income were all significantly related to pollution emissions.[99] Surprisingly, income level was positively correlated with pollution. The authors suggested a development model that accounts for this in which higher wages act as compensation for the social costs of higher pollution. Miranda, Keating, and Edwards considered inequities resulting from changes to the TRI itself and concluded that the decision by the EPA in 2006 to raise the threshold reporting requirements for certain facilities had a disproportionate informational impact on minority and low-income communities.[100] Analysis can also bring to light previously unrecognized or unconfirmed patterns of impact. Work by Hendryx and Fedorko, for example, indicated that increased releases were associated with increased mortality in rural as well as urban populations.[101]

Finally, officials, managers, and academics have utilized TRI and NPRI data to measure, inform, and improve other regulatory, governmental, or managerial efforts. A study by the EPA revealed that federal, state, and local governments use TRI data to prioritize enforcement and allocate resources, while regulators look to the TRI when setting permit limits, assessing compliance, and targeting facilities for enforcement.[102] Environment Canada has made use of the NPRI to identify pollution priorities and develop targeted regulations.[103] Olewiler and Dawson used NPRI data to examine the toxic intensity of various Canadian industries (calculated by normalizing emissions across levels of employment and value of output and weighting by relative toxicity of substance) in order to better

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98 Rachel Morello-Frosch et al, "Environmental Justice and Regional Inequality in Southern California: Implications for Future Research" (2002) 110:2 Environmental Health Perspectives Supplements 149.

99 M Jerrett et al, "Environmental Equity in Canada: An Empirical Investigation into the Income distribution of pollution in Ontario" (1997) 29:10 Environment and Planning A 1777.

100 Marie Lynn Miranda, Martha H Keating & Sharon E Edwards, "Environmental Justice Implications of Reduced Reporting Requirements of the Toxics Release Inventory Burden Reduction Rule" (2008) 42:15 Environmental Science & Technology 5407.

101 Michael Hendryx & Evan Fedorko, "The Relationship between Toxics Release Inventory Discharges and Mortality Rates in Rural and Urban Areas of the United States" (2011) 27:4 The Journal of Rural Health 358.

102 EPA, *TRI Use*, *supra* note 91.

103 NPRI database, s*upra* note 22.

inform regulatory efforts.[104] Kraft, Stephan, and Abel concluded that, while the primary impetus behind chemical management decisions is not community pressure but concern over regulatory compliance and potential financial liability, by increasing industry's awareness of its chemical releases and thus facilitating responses to changing public expectations, the TRI has played a role in industry's efforts to reduce emissions.[105] TRI data has formed the basis for considerable research on the relationship between a range of other firm or facility characteristics and environmental performance (size, ownership structure, profitability, and environmental expertise and commitment, for example).[106] Finally, it should be recognized that a vast body of research has made use of the expansive TRI and NPRI datasets to assay the health and epidemiological impacts of industrial pollution.[107]

C. Freedom of Information, Democracy, and the Political Economy

I now examine the underlying social and institutional forces that shape the NPRI as regulatory policy. Epistemologically, the determina-

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[104] Nancy Olewiler & Kelli Dawson, "Analysis of National Pollutant Release Inventory Data on Toxic Emissions by Industry" (1998) [unpublished, working paper prepared for the Technical Committee on Business Taxation].

[105] More accurately, it has played a role in the decisions of some facilities. At the facility level, Kraft et al (*supra* note 3) find a wide range of responsiveness to the TRI, including some counterintuitive results. For instance, high-performing facilities communicate less about their environmental performance with other actors than do low-performing ones (*ibid* at 171). Low performers appear to value the TRI program more and be more committed to improving their environmental record. The researchers suspect that this may be because high performers already made their significant environmental improvements earlier in the operation of the program (*ibid* at 137, 171).

[106] See e.g. Kraft et al, *supra* note 3 at 119–77; Harland Prechel & Lu Zheng, "Corporate Characteristics, Political Embeddedness and Environmental Pollution by Large U.S. Corporations" (2012) 90:3 Social Forces 947; Natalia Ortiz-de-Mandojana et al, "The Effect of Director Interlocks on Firms' Adoption of Proactive Environmental Strategies" (2012) 20:2 Corporate Governance 164; Jeffrey L Decker & Terrance Jalbert, "Financial Performance as It Relates to Pollution Control: An Empirical Analysis" (2010) 3:1 International Business & Economics Research Journal 67; Neil Gunningham, Robert A Kagan & Dorothy Thornton, *Shades of Green: Business, Regulation, and Environment* (Stanford: Stanford University Press, 2003); Magali Delmas, Maria J Montes-Sancho & Jay P Shimshack, "Information Disclosure Policies: Evidence from the Electricity Industry" (2010) 48:2 Economic Inquiry 483; Aseem Prakash, *Greening the Firm: The Politics of Corporate Environmentalism* (Cambridge, UK: Cambridge University Press, 2000); Susan L Santos, Vincent T Covello & David B McCallum, "Industry Response to SARA Title III: Pollution Prevention, Risk Reduction, and Risk Communication" (1996) 16:1 Risk Analysis 57.

[107] Such work in fact makes up the great bulk of the research that utilizes pollution inventory data. Regardless of the ultimate effectiveness of pollution inventories in terms of pollution reduction, their immense value as research tools is beyond doubt.

tions of the regulatory problem and regulatory response are here viewed as constitutive acts in themselves—ones not reducible to a simple task of objectively pointing out a regulatory problem we find lying in our midst and the "natural" solutions that present themselves. Rather, they are part of a process of social construction—of creating meaning—and thereby of constituting a broader social world via the flow of power though systems of discourse (systems of power as expressed through language).[108] Fleshing out an understanding of the interacting, and sometimes clashing, social frames from which the regulatory problem and agenda emerge therefore requires an analysis of the ideological, material, and institutional contexts of the relevant governmental, social, and institutional actors.

1. Democracy and Pollution Inventories in Theory and Practice

The shift in the power relations of governance that lies at the ideological heart of the NPRI may be conceptualized in various ways. On the one hand, freedom and transparency of information ostensibly link to increased accountability within an existing democratic structure: the existence of information coupled with its accessibility serve to rebalance power in favour of citizens and civil society over powerful economic actors and governments. Depending on the extent to which the various interests of the different actors converge, the resulting interplay may be, to differing degrees, cooperative or confrontational. Either way, however, the underlying view of society is that of a pluralist one, in which regulation is served (and to some extent defined) through the interchange of the various forces that together constitute the society as a whole.[109] Government becomes "decentred", removed from prominence, as the regulator, regulatee, and regulatory beneficiary alike become active participants in the regulatory process—the primary role of the regulator now being merely to guarantee the minimum flow of information necessary for local self-governance.[110] However, this construal of new governance regulatory regimens as furthering participatory democracy is in tension with their location within a

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[108] See e.g. Michel Foucault, *Power/Knowledge: Selected Interviews and Other Writings, 1972–1977*, ed by Colin Gordon, translated by Colin Gordon et al (New York: Pantheon Books, 1980), ch 6; Michael Howlett & M Ramesh, *Studying Public Policy: Policy Cycles and Policy Subsystems* (Toronto: Oxford University Press, 1995) at 104–17.

[109] The establishment through the democratic process of the TRI and NPRI as a response to public demand for information also presents itself as a self-referential legitimization of this pluralist view.

[110] See Karkkainen, *supra* note 53 at 295.

socio-economic framework that contains inherent impediments to meaningful democratic engagement.[111]

The more limited role of the state under the NPRI and the transfer of power to the play of market forces are consistent with a neoliberal approach to governance.[112] The conception of the state as a potential locus of collective action furthering the social good—action that may mean directly limiting the socially-detrimental behaviour of powerful private interests—is replaced with a "responsibilized" model in which the individual bears primary responsibility for her own well-being.[113] To the extent that structural relations remain unchanged, inequalities of cultural, material, and political power may actually be exacerbated by this devolution of state power.[114] Rather than enhancing participatory democracy (broadly conceived), the state abdicates its responsibility to continue to be both the instrument and the guarantor of democratic action in light of structural inequality. Similarly, arguments for informational inventories that are couched in economic terms can also reinforce status quo power relationships. Here, inventories are seen as empowering individual stakeholders

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111 To be clear, this is not to paint a deterministic picture in which extant relations of power necessarily overwhelm any and all efforts to resist. Quite to the contrary, the process is in fact an ongoing one of lived experience and dialectical social contestation. The actual capacity for democratic engagement will likely vary considerably by context, and while the potential to enhance that capacity may be structured—or structurated—by social conditions, it is not wholly determined by them. In every case, the particulars matter.

112 The markets envisaged may be the capital markets, where their reactions to pollution information are felt in stock prices, or the influence of the proverbial marketplace of ideas, through which information prompts social action and negotiation around pollutant releases.

113 The responsibilized include not only the traditional beneficiaries of social regulation—the residents of polluted neighbourhoods or the broader public affected by ubiquitous environmental toxins—but also the traditional regulatee. Arguments for benchmarking, against both past performance and against competitors, exhibit this emphasis on the importance of self-initiated improvement.

It might be noted, however, that actually-existing neoliberalism differs notably from its rhetorical construction, typically retaining large-scale direct and indirect state support for market actors (primarily large corporations), usually under the guise of maintaining a business-friendly environment. While those most in need of state support find it now removed, the corporate nanny state tends to endure. See e.g. David Harvey, *A Brief History of Neoliberalism* (Oxford: Oxford University Press, 2005) at 71.

114 Responsibilization and the decentring of governance can produce inequities that run in the other direction. For example, a particular effective community action might disproportionately target a firm that, comparatively speaking, is not a poor performer. Once governance is decentred, a myriad of factors external to the regulatory process come into play which are no longer subject to the standardizing and arbitrating influence of the state (media coverage, visibility of pollution, and the profile of affected residents, among others).

by improving informational efficiency and by reducing the transaction costs of bargaining between stakeholders around pollution-related decisions. Fundamental inequalities of bargaining power and position are taken for granted, however, and may even be deepened as pollution comes to be more "efficiently" located in those areas where residents (sufficiently deprived of social, economic, and political capital) are most willing to accept it.

This same double-edged sword is apparent in the parallel decentring of the role of experts under informational regulation. No longer the exclusive purview of experts, standards come to be determined by what the community will accept. While this can provide for a flexible, localized response that is unbounded by de facto regulatory ceilings, in reality, the level of pollution that people are willing to live with reflects the existing distribution of political, social, and economic power.[115] Achieving a more fundamentally democratic regulatory outcome may therefore involve the reconfiguration of these forces through a form of collective action that goes beyond the kind of localized self-governance that pollutant inventories (at least in the eyes of some advocates) seek to promote. The emancipatory capacity of the pollutant inventory regimen likely depends on the extent it is able to catalyze—rather than usurp—broader-based democratic initiatives, such that a dialectical process is set in motion fomenting the ongoing progressive engagement of citizen, regulator, and regulatee.

The inherent ambiguity of an informational regulatory approach is exemplified in the fact that it is through these inventories that the picture of disparate geographic environmental impact is resolved (literally so, given inventories' incorporation of mapping technology). As discussed above, pollution inventories have been instrumental in the development of the environmental justice movement in the United States and, to a lesser extent, in Canada. While various communities have made use of TRI data when mobilizing against polluters in their midst, research also suggests that residents of wealthier neighbourhoods are able to employ the information more effectively than are inhabitants of poorer locales. For example, Shapiro uses TRI data to calculate risk scores for neighbourhoods across the United States, finding that better-educated neighbourhoods appear to be more able than lesser-educated ones to access and utilize TRI

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[115] Whereas the setting of environmental standards may often be a somewhat arbitrary process subject to political and social influences, some insulation from at least the more overt of such pressures is provided through links to research and the scientific exercise—at least in comparison to the negotiated process under inventory systems of governance. The question then arises: if experts are irrelevant, then why have them at all?

data to pressure for local emissions reductions.[116] The TRI therefore might function to exacerbate environmental disparities, as residents of wealthier neighbourhoods are able to use information to displace pollution to poorer ones. This differential could be intensified by the observed potential effect of TRI data on housing prices, setting up a vicious circle in which further-polluting industries move into already-disadvantaged neighbourhoods to take advantage of diminished financial and social capital. The socioeconomic dynamic established is no doubt complex. Whether the TRI or the NPRI amplifies or reduces environmental disparity likely depends on whether there is an already-established community movement (or the potential for one) and on the degree of existing social solidarity. Where the level of social disorganization is high and mobilization is difficult to achieve, the existence of the inventory may intensify rather than ameliorate disparities.[117] What can be generally concluded, however, is that a view of pollution inventories as inherently enhancing democracy and civic engagement to the end of net social benefit is an idealization that neglects the broader context of the political economy in which these mechanisms are seated.

Locating the democratic operation of the TRI and the NPRI within the reality of the political economy requires considering that, while the inventories' ensuing efficacy in actually reducing emissions has been welcomed by government and regulators, it did not feature prominently in the inventories' founding rationales, which were focused only on the perceived public demand for access to information. In reality, the demand extended beyond a mere desire for access to information regarding discharges of toxins; there was also a demand for the limiting—or eliminating—of those discharges. The focus of public concern was not merely on the right to know *about* exposure, but extended to the right to be *free* from exposure. This is not to say that once enacted, a program remains bound by the parameters of its conceptual genesis, nor that ongoing rolling best practices may not in fact ratchet emissions lower. It is rather to highlight once again the open-ended duality inherent within the new governance approach: while the pollution inventory may be an apparatus with the potential to advance democratic engagement, to the extent that it displaces rather than supplements more conventional regulatory approaches, it

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[116] Marc D Shapiro, "Equity and Information: Information Regulation, Environmental Justice, and Risks from Toxic Chemicals" (2005) 24:2 Journal of Policy Analysis and Management 373.

[117] Direct empirical investigation of this hypothesis is called for here.

may also serve to reinforce the material and economic limitations on the democratic exercise of public will.[118]

The professed efficacy of pollution inventories in light of limited regulatory resources has in fact been advanced as a significant point in their favour.[119] Yet as with conventional regulatory enforcement, a weighing of public benefits against private costs is implicit within the NPRI, which exempts small operations from reporting requirements.[120] The economic burden on smaller facilities is seen as outweighing the public's right to information. This absolute exemption stands at odds with any attempt to seek a "negotiated" level of pollution. The harm from an exempt facility's emissions might be orders of magnitude beyond all the benefits that flow from its operations, yet no facilitated intervention will be forthcoming.[121] In fact, for the very reason that reporting is not required, no such assessment of net social utility can be undertaken.[122]

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[118] Conventional regulation is also grounded in economic reality, of course, but here it arguably seeks to realign forces more directly (if usually only slightly), setting direct limits on emissions concentrations, for example. Informational approaches do not seek such direct intervention, but rather aim to clarify the situation as it is. This may (or may not) catalyze other forces to produce change, but any such process *is* removed from the direct action of the regulatory regime. Of course, to the extent that conventional regulation is inefficacious in the face of power, setting inadequate standards or simply not enforcing what requirements are in place while nonetheless appearing to take action, it can also reinforce existing power imbalances.

In reality, the choice between non-regulatory information disclosure policies and conventional regulation is not mutually exclusive. Kraft et al (*supra* note 3 at 196) conclude that the optimum approach is a hybridized one. While this may be true, incorporating an analysis of power into regulatory design and enforcement highlights the need to be continually alive to the possibility that information-based measures will displace conventional ones to the detriment of overall regulation.

[119] See e.g. O'Leary et al, *supra* note 67. Scarcity of government resources has been an ongoing refrain for self-regulation or hybrid regulation models (see e.g. Ayres & Braithwaite, *supra* note 11), something that has opened them to the criticism that they are, to varying extents, accommodations to prevailing ideological and political economic conditions (see e.g. Gary Slapper & Steve Tombs, *Corporate Crime* (Essex: Pearson Education, 1999) at 178).

[120] Facilities with fewer than 20,000 person-hours of staffing do not have to report, regardless of the amount of noxious pollution they release (Notice 2011, *supra* note 15).

[121] This despite the fact that CEPA (*supra* note 7, s 2) indicates that economic considerations are not to be used as a basis for limiting action to protect the environment or human health.

[122] There is evidence that, for a variety of reasons including more marginal profitability, small facilities produce proportionally more pollution than do larger ones. Volokh (*supra* note 57 at 836) advances that for the TRI this problem is worsened by the fact that it is *use* level and not *release* level that determines if a facility meets the reporting threshold.

2. Compliance, Deterrence, and Enforcement

Aside from the rubric of new governance, we can also locate public pollution inventories within related typological schemes. The oft-cited *compliance* versus *deterrence* distinction holds that compliance systems focus on inducing conformity with the law ex ante and without the need to detect and punish, whereas deterrence systems focus ex post on detection and punishment to deter future offences (specifically and generally).[123] To the extent that the NPRI and other pollution inventories strive to encourage voluntary action on the part of industry and rely on the propagation of information as a corrective, they can be viewed as structurally embodying a compliance-based policy approach.[124] Once again, the political economy becomes a salient factor.

Deterrence advocates contend that the rise of compliance-based regimens derives from the economic power of corporations to shape regulation in their own interests. Snider argues that cooperative approaches have become popular in both theory and practice because "they recognize and legitimate the existing relations of power, the status quo under which regulatory forces are outmatched by the powerful corporate sector."[125] This power disparity comes to be enshrined in official policy, a self-defeating acquiescence to the very corporate dominance that creates regulatory ineffectiveness in the first place. Compliance models are a reflection of this power imbalance as "a fundamental and acceptable constraint on the state's ability to regulate corporate crime."[126] In fact, compliance proponents themselves sometimes couch their justifications in terms of the economic role of corporations. Compliance advocates Kagan and Scholz, for example, expound on how "indiscriminate reliance on ... a legalistic enforcement strategy can jeopardize the [regulatory] agency's legal mandate, its funding, and its very existence."[127] Most compliance sup-

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[123] See e.g. Albert J Reiss, Jr, "Selecting Strategies of Social Control over Organizational Life" in Keith Hawkins & John M Thomas, eds, *Enforcing Regulation* (Boston: Kluwer-Nijhoff, 1984) 23. Under *specific deterrence*, the aim of punishment is to prevent the offender in question from reoffending. Under *general deterrence*, the intent is for the punishment to serve as an example to others, so discouraging future offending generally.

[124] And in addressing problems that are often ongoing and predictable, where costs can be externalized, compliance advocates would argue that the NPRI is structurally well-suited to the problem at hand (*ibid* at 25).

[125] Laureen Snider, "Cooperative Models and Corporate Crime: Panacea or Cop-Out?" in Neil Shover & John Paul Wright, eds, *Crimes of Privilege: Readings in White-Collar Crime* (New York: Oxford University Press, 2001) 419 at 420.

[126] *Ibid* at 429.

[127] Robert A Kagan & John T Scholz, "The 'Criminology of the Corporation' and Regulatory Enforcement Strategies" in Keith Hawkins & John Thomas, eds, *Enforcing Regulation* (Boston: Kluwer-Nijhoff, 1984) 67 at 74.

porters, however, do recognize a role for deterrence punishments in the case of intransigence or laggardly behaviour. Indeed, some approaches such as Ayres and Braithwaite's system of "responsive regulation" incorporate a role for serious punishment as a "benign big gun"[128] that sits atop a pyramid of progressively severe regulatory responses. And while proponents advance new governance techniques on the grounds that they improve informational and resource efficiency, new governance theorists also stipulate robust regulatory oversight as a precondition to the regime's effective functioning.[129] Nonetheless, under new governance, power is devolved to the regulatee to determine how to ensure concordance with regulatory objectives. The critical issue is the extent to which this risks the amplification of an already-existing power imbalance between regulator and regulatee. In eschewing set standards altogether, the pollution inventory approach presents a prima facie concern.

Apprehensions around disparities between regulator and regulatee become heightened when we look to the actual enforcement of the reporting requirements, examining the means by which the regulator seeks to ensure that facilities are reporting and otherwise conforming to inventory requirements. Whereas the NPRI represents a compliance approach to regulation, the regulation of the regime itself is grounded in deterrence methods with stipulated hard penalties for non-reporting.[130] Ultimately, then, the system is tied to an enforcement mechanism that does not rely on new governance principles. Enforcement analysis, however, points once again to power dynamics at play. Environment Canada's approach to enforcement appears to be similar to that of the EPA, which for the TRI undertakes only minimal verification of emissions reports (inspecting approximately 3 per cent of firms in a given year). As well, estimates and transfers substitute for actual measurements of emissions, and noncompliance has been widespread (arising in up to one-third of facilities, according to one claim cited by Wolf).[131] Environment Canada's approach

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[128] Ayres & Braithwaite, *supra* note 11 at 40–41.

[129] See e.g. Bradley C Karkkainen, "Adaptive Ecosystem Management and Regulatory Penalty Defaults: Toward a Bounded Pragmatism" (2003) 87:4 Minn L Rev 943; Cristie Ford, "Principles-Based Securities Regulation in the Wake of the Global Financial Crisis" (2010) 55:2 McGill LJ 257.

[130] *CEPA*, *supra* note 7, s 272.

[131] "Small Release Exemption Could Harm Public Health, Witnesses Tell Agency" (1994) 24 Environment Reporter (BNA) 1854, cited in Sidney M Wolf, "Fear and Loathing about the Public Right to Know: The Surprising Success of the Emergency Planning and Community Right-to-Know Act" (1996) 11:2 Journal of Land Use & Environmental Law 217 at 258, n 237.

to the NPRI appears to be similar.[132] Further, no individuals or corporations have ever been prosecuted for failing to report to the NPRI. Thus, it would seem that the risks inherent to new governance regulation are, ironically, intensified by the enforcement failure of a deterrence-based system.

Returning to our consideration of the mining sector, it could be argued that by not requiring mining companies to report at all, Environment Canada had implemented a policy of complete non-enforcement. The adoption of this course despite the clear and unambiguous language of the Gazette requirements and the deliberate removal of the prior exemption for mining suggests that the (non-)enforcement of the NPRI is, in this area at least, heavily influenced by forces at play in the political economy, and that Environment Canada is subject to regulatory capture—beholden to the very interests it is charged with overseeing. Viewed as a policy development, we see a process of outside policy initiation that meets internal resistance.[133] ENGOs and community groups put pressure on the political system for change—first by demanding a reporting mechanism in general and then by advocating for the inclusion of mining activity within it—forcing a response at the political level. But inside the system there is resistance, either politically or bureaucratically or both, leading to the de facto neutralization of the changes—a process of mock change. An elaborate mechanism is in place to increase public visibility of pollution releases, yet a significant proportion of this pollution is exempt. Then, when this exemption is explicitly removed, the actual practice is not to require reporting anyway. Under these circumstances, the NPRI arguably begins to serve a function opposite to its lauded goal, obscuring the true extent of toxin release in Canada while professing to illuminate it. Related to the general pattern of mock change is a process of mock consultation. Environment Canada has taken the position that reporting on a substance will only be made mandatory in practice with the consent of all parties to the working group. Whereas this pays lip service to notions of inclusion and pluralist democracy, in practice it gives a veto power to the regulated industry, whose representatives in the working group obviously have a powerful material interest in not consenting to this requirement.[134]

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[132] For example, while Environment Canada checks firms' reported data for consistency, it does not perform inspections in the field (Harrison & Antweiler, *Environmental Regulation*, *supra* note 70 at 4).

[133] See Howlett & Ramesh, *supra* note 108 at 122–43; Roger Cobb, Jennie-Keith Ross & Marc Howard Ross, "Agenda Building as a Comparative Political Process" (1976) 70:1 American Political Science Review 126 at 127.

[134] In this light, the relationship between mining and the NPRI might be seen as embodying elements of Pierre Bourdieu's concept of symbolic power: "a power of constituting

Conclusion: Reforming the NPRI

The failings of the NPRI should not be taken as an unqualified rejection of the inventory and the approach it exemplifies. The NPRI represents a true regulatory innovation in Canada.[135] It is a shift away from purely command-and-control based models, for which effective regulation means micromanaging precise limits at the end of the pipe, to a more systems-based approach that relies on direct engagement with the issue across a range of otherwise-adversarial groups and interests. Further, positive environmental efforts have come about as a result of the pollution inventory approach, and, while the evidence in Canada is less clear, it seems likely that in the United States the NPRI's counterpart, the TRI, has played a role in the significant reported reduction in toxics releases that has taken place since its establishment.

However, the inadequacies of the NPRI do reveal the failure of a new governance approach rooted in an ideology of the emancipatory power of information to engage structural and institutional obstacles—as is particularly evident in the case of mining. In neglecting an analysis of social relations of power in favour of an idealized pluralism, the new governance perspective tends to an overly optimistic and idealized view of the potential for information—or revelation—to propel change. This position is supported by research indicating that, contrary to the logic of new governance theory, any positive impact from the pollution inventory does not derive primarily from the empowerment of civil society. The analysis of Kraft, Stephan, and Abel—the most comprehensive study to date of the mechanisms by which information disclosure affects decision-making within corporations, communities, and regulatory agencies—suggests that, when effective, inventory reporting impacts corporate and regulatory action directly and not through the mediated action of other stakehold-

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the given through utterances, of making people see and believe, of confirming or transforming the vision of the world and, thereby, ... the world itself. ... [It] is a power that can be exercised only if it is *recognized*, that is, misrecognized as arbitrary" (Pierre Bourdieu, *Language and Symbolic Power*, ed by John B Thompson, translated by Gino Raymond & Matthew Adamson (Cambridge: Polity Press, 1991) at 170). In presenting the comforting—and mollifying—illusion that mining falls under the dominion of the NPRI, industry and government legitimate the destructive components of mining activity. Thus the perceived—or misrecognized—social and economic value of mining, and the legitimacy of Environment Canada as a regulatory agency, enable the NPRI to function as a form of symbolic violence exercised by the actors who stand behind it. However, the subordinated have the ability to withdraw their consent to the NPRI as symbolic violence, appropriating the NPRI to genuinely advance their own interests. See Pierre Bourdieu & Loïc JD Wacquant, *An Invitation to Reflexive Sociology* (Chicago: University of Chicago Press, 1992) at 167.

135 This was true at the time of its enactment and continues to be so today. The NPRI remains the only registry of its kind in Canada.

ers.[136] The researchers find that in the United States in the period studied, public interest in the pollution inventory was low, and that the states that saw the greatest improvements in industrial environmental performance were those that put in place integrated pollution prevention policies, rather than those that prioritized informing the public of emissions levels.[137] Kraft, Stephan, and Abel conclude that the influence of the TRI in lowering emissions likely results from its establishment alongside a framework of traditional command-and-control regulation.[138] Such an assessment dovetails with the analysis of power relations presented here, which would see a tendency for the pollution inventory approach, while cast as an alternative to conventional regulation, to be exploited by capital and industry to the end of weakening enforcement generally and marginalizing those seeking to significantly restrain corporate power. By either analysis, the more robust and well-enforced the accompanying command-and-control regime, the more effective the inventory itself is likely to be.[139]

In seeking to reform the NPRI, we must address the etiology of its institutional failings: the implications of the market assumptions of the NPRI as played out against the neoliberal political economy and the resultant potential for regulatory capture. At the same time, the work of Kraft, Stephan, and Abel sounds a strong note against over-

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136 Kraft et al, *supra* note 3 at 136–45, 175, 185–86.

137 *Ibid* at 113. See Omri Ben-Shahar & Carl E Schneider, "The Failure of Mandated Disclosure" ((2011) 159:3 U Pa L Rev 647 at 679–729) for an analysis of the many practical issues that inhibit the uptake of mandatorily disclosed information by the public.

138 Kraft et al, *supra* note 3. The availability of TRI data allows regulatory officials to better enforce and make better use of existing conventional regulation by, for example, making comparisons of emissions across similar facilities, checking facility emissions against permit records, learning about local pollution problems, and setting environmental priorities (*ibid* at 135, 185–86). In contrast to a new governance analysis, however, "relatively few [officials] reported exerting pressures on business, assisting citizens in negotiations with facilities, or even contacting businesses or the media" (*ibid* at 186). At the corporate level, liability and regulatory compliance were the primary concerns related to chemical management, although environmental performance was a strong third. Those (few) firms that did utilize the TRI directly were typically the worst performers; high performers had generally made improvements early in the operation of the program (*ibid* at 172–73). Interaction between firms and the community was typically low, respondents were divided over the importance of community relations, and the majority of firms received little media coverage (*ibid* at 136–45, 175). Despite these findings, the researchers believe that there remains considerable potential for the TRI to further community engagement with firms and regulators to the benefit of environmental performance.

139 Shapiro (*supra* note 116 at 391) also observed that reductions in emission following the implementation of the TRI were greater in states that had strong conventional environmental protection laws than in those that did not.

generalization, be it positive or negative, regarding the efficacy of the TRI.[140] The dynamics within and between corporations, regulators, and communities are highly complex and subject to significant variation. Introducing an analysis of power relations likely deepens this complexity further, and an a priori generalization to the effect that the NPRI is wholly enjoined by power in the service of its own ends would be erroneous. Hence, in developing recommendations for the improvement of the NPRI, it is important both to think in terms of the big picture and to look to the particularities of the actual operation of the inventory in a range of contexts—to the dialectical social process as it is instantiated. With this in mind, I offer below some preliminary recommendations for how the NPRI might be made more effective.

One change that could help rebalance forces in favour of active public power and reconstitute the program as a more democratic and effective tool would be the development of mechanisms to actively promote NPRI data. Supporting civil society in its efforts to trumpet the leaders and blacklist the laggards requires the availability of more aggressive publicity measures. In the 1990s, the British Columbia Ministry of Environment instituted a policy of publicly listing firms that repeatedly failed to comply with provincial environmental laws. A study of this program found that it had a greater effect on industry emissions and compliance than did deterrence-based penalties (although the authors also concluded that lax enforcement and mild penalties likely significantly inhibited the effectiveness of the latter).[141] Applying a similar "dirty dozen" approach to the NPRI, in which firms performing significantly outside the industry norm are subject to negative publicity, might engage community opprobrium in its own right as well as facilitate the efforts of groups and organizations already engaged in bringing attention to poor performers. Research that has been undertaken on corporate adverse publicity and shaming holds out positive potential in this area.[142]

Qualification for membership on such a list would have to be carefully determined. Crude measures such as total discharges would be inappropriate given variability in facility size. Instead, a system of standardization of emissions levels per unit of production should be instituted. This

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[140] Kraft et al, *supra* note 3 at 201–02. See also Bui, *supra* note 65 (demonstrating the role of conventional regulation in emissions declines as well as the need for particular and thorough analysis).

[141] Jérôme Foulon, Paul Lanoie & Benoît Laplante, "Incentives for Pollution Control: Regulation and(?) or(?) Information" (Policy Research Working Paper, World Bank, Development Research Group, 1999). This program was abolished in 2001.

[142] See e.g. Brent Fisse & John Braithwaite, *The Impact of Publicity on Corporate Offenders* (Albany: State University of New York Press, 1983).

links to the more general need to improve the depth of information available on the NPRI, as well as to provide contextualization for what it reports as a means of increasing its meaningfulness.[143] A potential downside of increased stigmatization for the worst performers is the possibility that it will reduce their willingness to comply. In light of the evidence that the NPRI is at its most effective when coupled with a conventional regulation, worst offenders should face increased scrutiny under other command-and-control legislation, including under the NPRI reporting enforcement provisions of *CEPA*.

Enhancements to the accessibly and usefulness of the inventory data would likely prove valuable in furthering community engagement. In reference to the TRI, Kraft, Stephan, and Abel recommend that the EPA consider releasing the data in a manner such that trends in facility environmental performance over time are readily apparent.[144] They also advocate for creative thinking on ways to educate citizens about the database and how to use it; they view social networking as holding out particular promise in this regard.[145] Foti and Conlon advocate incorporating environmental justice concerns directly into the various TRI programs, including having an environmental justice point of contact within the Office of Environmental Information and creating a publicly available environmental justice screening tool, both of which would also be valuable additions to the NPRI.[146] On a related note, the development of risk analysis data (analogous to the RSEI) is critical to improving the environmental meaningfulness of NPRI information. Ideally, this information would be integrated with enforcement and compliance figures and made linkable not only to individual facilities but also to the legal entities that own them. The ability to group facilities by corporation would allow users to glean a bigger-picture understanding of the actual organizational actors and their overall environmental impact.

Research by Lynn and Kartez indicates that effective citizen access to information depends in part on the efforts of intermediary public interest groups to bridge individual needs and pollution data.[147] Hence, enhancing the ability of ENGOs and community groups to make use of NPRI data

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[143] See Karkkainen (*supra* note 53 at 361–70) for detailed recommendations for improvements to the quality and scope of data reporting and presentation in the TRI. Similar measures could be taken with regard to the NPRI, likely to significant positive effect.

[144] Kraft et al, *supra* note 3 at 190.

[145] *Ibid* at 191.

[146] Joseph Foti & Lindsay Conlon, "Growing the Grassroots: Integrating Environmental Justice into the Toxics Release Inventory Program" (March 2011), online: Environmental Council of the States at 16–17 <www.ecos.org>.

[147] Lynn & Kartez, *supra* note 56.

may have a multiplier effect on wider civic engagement. Making funding for such groups available as part of the NPRI program could prove fruitful here. Going further, Environment Canada might consider the direct creation of "quasi-ENGOs", independent of government but largely funded by it, whose explicit mandate is to promote NPRI data within the broader community.[148] Kraft, Stephan, and Abel point to the role of community groups under the Superfund program (the U.S. federal government's program to clean up uncontrolled hazardous waste sites) and the evidence of their positive impact on EPA clean-up decisions as a potential model of citizen engagement.[149]

In light of the importance of conventional regulation to information disclosure approaches, as discussed above, expanding the reach of the NPRI and embedding it in other regulatory measures where a synergistic effect can result should be a priority. Looking at the impact of the TRI across American states, Grant finds it to be particularly effective in those states that have right-to-sue laws that allow for citizen action against non-compliant actors.[150] *CEPA* contains right-to-sue provisions as well as other measures designed to enhance public participation, such as the right to request an investigation into an alleged breach of any provision of the *Act*, and the right to bring an environmental protection action in the event that the response to such an investigation is unreasonable.[151] The cogency of such provisions could be enhanced by an effective NPRI. The relevance could go beyond *CEPA* to other legislation, and its data could be used to set limits under the *Fisheries Act*, for example, where applications for effluent release could be required to consider NPRI data for the relevant industry, locality, and broader region. Rather than choose between the mutually independent approaches of permitting versus reporting, the two might be combined, with the NPRI integrated into a regulatory pyramid that becomes more effective as the NPRI enhances both the richness of information available and the number of parties who can engage with

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148 The Langley Environmental Partners Society (LEPS), an organization that works to empower local residents and community groups in watershed stewardship and other local environmental issues, is an example of a public–non-profit partnership that may serve as an analogue here. While the organization is an independent non-profit society (and registered charity), LEPS nonetheless receives significant funding and indirect support from the Township of Langley and is regarded as furthering environmental protection in a manner that the municipality could not achieve directly through governmental action alone. See Langley Environmental Partners Society, online: <www.leps.bc.ca>.

149 Kraft et al, *supra* note 3 at 193.

150 Don Sherman Grant II, "Allowing Citizen Participation in Environmental Regulation: An Empirical Analysis of the Effects of Right-to-Sue and Right-to-Know Provisions on Industry's Toxic Emissions" (1997) 78:4 Social Science Quarterly 859.

151 *CEPA*, *supra* note 7, ss 17–42.

it. The informational imbalance between regulator and regulatee is thus ameliorated. There are also opportunities to combine the benefits of the NPRI with other types of non-conventional regulation. Firms that fall below average performance could be required to implement management-based plans to improve compliance. For ongoing noncompliance or for more egregious laggards, where the willingness to comply (upon which an effective management-based system depends) is likely lacking, strict deterrence-oriented regulation would then be employed.

A further option for reconfiguring power in the NPRI includes adding substance to the role of the precautionary principle, which holds that if a chemical is suspected to be harmful, its use should be prohibited until it is demonstrated to be safe. The principle is featured in the preamble to *CEPA*, yet the operation of the NPRI, which in itself sets no limits on emissions, is arguably at odds with this idea. Giving teeth to the precautionary principle could be accomplished through a reverse onus procedure, whereby industrial chemicals of concern are presumed to be reportable until those producing or releasing them can demonstrate that they are in fact safe.[152] Reporting could also be linked to the mandatory development of a roadmap to eliminating release of the toxin altogether. As well, making the operation of the NPRI consistent with the precautionary principle would require removing thresholds for reporting, making the release of any level of listed toxins reportable.

There is a further need to address the power imbalances within the multi-stakeholder working groups, which lead to industry having a de facto veto power, and which likely explain why only a minuscule portion of the chemicals known or suspected to be harmful are listed for reporting. Whereas the system as currently configured represents a formal egalitarianism, a more substantively democratic approach would recognize this power disparity. One measure would be to increase representation from more neutral scientific parties (for instance, scientists who have no connection to industry, government, or any of the other sectors represented in the working group). Looking to process and group dynamic concerns, breaking up working groups into multiple smaller units containing representatives from distinct interests may prove useful in overcoming deadlock. In this way, the tendency of groups that start from a position of polarization to become more polarized as deliberations commence[153] could be avoided. As well, dividing groups so as initially to separate those who,

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[152] This could be conceptualized as a kind of environmental regulatory penalty default system. See Bradley C Karkkainen, "Information-Forcing Environmental Regulation" (2006) 33:3 Fla St UL Rev 861.

[153] See Cass R Sunstein, "The Law of Group Polarization" (2002) 10:2 The Journal of Political Philosophy 175 at 176.

based on the interests they represent, will have a pre-existing tendency to polarization would allow various representatives to consider matters of particular relevance to them free of opposing dynamics. Making chemicals of concern reportable by default could operate at the working group level: once it can be demonstrated to the satisfaction of the working group that they are safe, a recommendation would be made that the substance be delisted. At present, the level of commitment and expertise required to participate effectively in working groups limits their inclusivity. One possibility is to establish fora where broader community input can be provided to the groups themselves. Expanding the inclusivity and reach of the groups brings the listing process closer to the goal of the iterative feedback process embodied in the new governance philosophy.

There is also a need to bring those smaller firms currently exempt from reporting requirements into the fold. Given that reporting requirements present a proportionately greater burden to smaller facilities, it may be reasonable to combine removing or significantly lowering the exemption for small firms with some level of program support for initial monitoring, such that low-polluting operations are not overly impacted yet high-polluters can be identified. The equity issue arising from the greater ability of large producers to meet reporting requirements could thus be moderated. Combining these measures with a policy of much stricter enforcement of reporting should help identify those producers whose net social utility is significantly negative. Those true laggard firms not able or willing to improve their performance could—and should—be removed from operation through this process. The importance of pollution inventories as nested in interconnected regimes of conventional regulation again comes to the fore here.

Reforms such as these would conserve the advantages of the NPRI while incorporating factors to address features of the structural and institutional environment in which it operates. In this way, we can begin to reconfigure the matrix of forces at work in both the NPRI and the broader social context in which it functions, leading to a more effective and responsive multi-sectoral regulatory regime, catalyzed by the revelatory power of information.