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Assessing the Performance of Voluntary Environmental Programs

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ASSESSING THE PERFORMANCE OF VOLUNTARY ENVIRONMENTAL PROGRAMS

Luis Inaraja Vera*

Abstract

In recent years, government agencies have increasingly relied on voluntary programs to achieve a variety of goals, from improving worker safety to creating healthier living conditions in urban areas. This type of government initiative is based on a bargain between the agency and private citizens: the government provides certain incentives—economic or otherwise—and private actors voluntarily adopt behaviors that benefit the public. One example is cleaning up a contaminated site and building an affordable housing project.

While agencies have made substantial progress since the creation of the first voluntary programs, much work remains. To move forward in this area, and especially with voluntary environmental programs, two critical questions must be answered: First, how should we evaluate the performance of voluntary environmental programs? And second, how do we determine the appropriate level of government—federal, state, or local—that should be in charge of implementing them? These two questions have not been satisfactorily addressed to date.

This Article addresses these lingering questions by evaluating the performance of a sophisticated local voluntary cleanup program. The resulting analysis uncovers some of the shortcomings in how agencies and scholars have previously assessed voluntary programs, yielding four contributions to the literature. First, the Article offers a deeper understanding of how data can and should affect the design and improvement of regulatory programs. Second, the examination of a local voluntary cleanup program provides much-needed empirical support for

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a common argument raised in the environmental federalism literature: that the need to tailor programs to local conditions can justify a strong municipal role. The need for a strong local government is especially important where state legislation creates what this Article refers to as “local regulatory gaps.” Third, while efficiency is a desirable feature of any government initiative, it becomes a necessity in the context of voluntary programs. Delays and other inefficiencies in the operation of a voluntary program can deter potential enrollees from participating in it. Without enrollees, voluntary cleanup programs simply cannot operate. Lastly, injecting unnecessary complexity into the design of voluntary programs by trying to address too many policy challenges at once can be counterproductive.

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INTRODUCTION

Environmental law at the federal and state levels is becoming increasingly sophisticated, as the growing popularity of voluntary or incentives programs suggests.¹ Consider hazardous substance contamination, one of the most important environmental problems of our time.² Both legislatures and agencies have adopted

¹ See Xiang Bi & Madhu Khanna, *Reassessment of the Impact of the EPA's Voluntary 33/50 Program on Toxic Releases*, 88 LAND ECON. 341, 341 (2012) (pointing out that, starting in the 1990s, voluntary programs have gained traction compared to more traditional command-and-control regulation); *infra* Section I.A (explaining the evolution of environmental regulatory tools and the emergence of voluntary programs).

² Contaminated sites can cause a variety of problems ranging from urban sprawl to serious public health concerns. See William W. Buzbee, *Urban Sprawl, Federalism, and the Problem of Institutional Complexity*, 68 FORDHAM L. REV. 57, 59 (1999) (noting that avoiding brownfields leads to sprawl). Communities in areas with a higher density of contaminated properties experience higher mortality rates resulting from the increased likelihood of suffering different types of health problems. See, e.g., Jill S. Litt et al., *Examining Urban Brownfields Through the Public Health "Macroscopic,"* 110.2 ENVTL. HEALTH PERSP. 183, 189 (2002); see also *infra* notes 22 and 23 and accompanying text (addressing the magnitude of this problem).

groundbreaking tools to tackle this environmental challenge. The main federal statute designed to address existing hazardous substance contamination, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or the Superfund Law),³ has been described by scholars as the “most far-reaching of all the environmental statutes” and one that “transformed environmental law.”⁴ CERCLA’s significance is all the more remarkable when considering that the statute was enacted in 1980, whereas the European Union did not enact a similar framework until 2004.⁵

At the state and local levels, legislatures and agencies have developed a suite of sophisticated instruments to deal with both hazardous substance contamination and other complex environmental problems, such as programs that rely on voluntary behavior by private actors to achieve a particular policy goal.⁶ One of the federal predecessors of these state initiatives is the Occupational Safety and Health Administration’s (OSHA) Voluntary Protection Program, which removed certain facilities from the agency’s routine inspection list as long as the sites’ operators implemented a health and safety management system, agreed to improve workplace safety, and passed an initial inspection.⁷

State voluntary programs typically follow the same core principle adopted by the OSHA Voluntary Protection Program: if the agency provides the right incentives, the private sector will adopt behaviors that are beneficial to the public.⁸ Voluntary Cleanup Programs (“VCPs”), the quintessential environmental state voluntary initiative, address the two main hurdles that real estate developers who wish to purchase a site that may be contaminated face. First, taking title to the property can often make the buyer automatically liable for the contamination.⁹ Second, cleanup costs can be very high—easily in the hundreds of thousands or millions of dollars—and also relatively complicated to estimate with precision

³ Comprehensive Environmental Response, Compensation, and Liability Act, Pub. L. No. 96-510, 94 Stat. 2767 (1980) (codified as amended at 42 U.S.C. §§ 9601–9675 (2018)).

⁴ Richard J. Lazarus, *The Greening of America and the Graying of United States Environmental Law: Reflections on Environmental Law’s First Three Decades in the United States*, 20 VA. ENVTL. L.J. 75, 85 (2001); Justin R. Pidot & Dale Ratliff, *The Common Law of Liable Party CERCLA Claims*, 70 STAN. L. REV. 191, 194 (2018).

⁵ See Directive 2004/35, of the European Parliament and of the Council of 21 April 2004 on Environmental Liability with Regard to the Prevention and Remedying of Environmental Damage, 2004 O.J. (L 143) 56.

⁶ See *infra* Section II.A.3 (discussing voluntary cleanup programs at a state and local level).

⁷ See Cary Coglianese & Jennifer Nash, *Performance Track’s Postmortem: Lessons from the Rise and Fall of EPA’s “Flagship” Voluntary Program*, 38 HARV. ENVTL. L. REV. 1, 15 (2014).

⁸ See *infra* Section II.A.3 (discussing how voluntary state programs typically follow the OSHA principle).

⁹ See *infra* Section II.A (discussing this type of liability and cases where the purchaser did not contribute to contamination at the site or migration of contaminants to other properties).

before the remediation starts, which typically happens after the developer has already acquired the property.¹⁰ As a prominent scholar put it, this framework “makes it an act of heroism to purchase a [contaminated] site.”¹¹ VCPs typically seek to incentivize prospective buyers of contaminated properties to purchase them, clean them up, and put them to use. To such end, these programs provide liability protections to those who agree to remediate the site under the supervision of the state environmental agency, and they also offer financial assistance for the cleanup, generally in the form of grants or tax incentives.¹² The state, on the other hand, “receives the increased tax revenue from the redevelopment [and] improved environmental quality for its citizens, and conserves state enforcement resources.”¹³ The way this process operates in practice is: the developer buys the land, applies to enroll the site in the program, and, if the application is successful, the state will oversee the cleanup until it is complete.¹⁴

Despite the proliferation of complex regulatory tools such as voluntary programs, there still remains a lot of work to be done. According to recent estimates, there are in excess of half a million contaminated sites in the United States,¹⁵ covering approximately 23 million acres of land—an area comparable to that of the State of Indiana.¹⁶ To address these issues effectively, however, legislators and agencies need more specific answers to two critical questions that the literature has largely ignored: (i) How can we improve voluntary programs?; and (ii) What is the appropriate level of government to implement them?

To answer the first question, agencies must first evaluate their programs to identify potential areas of improvement. The practical problem that program assessment poses in the context of voluntary programs, however, is that evaluating these particularly complex government initiatives has proved very challenging.¹⁷

¹⁰ See *infra* Section II.B (addressing the significant barriers to brownfield redevelopment).

¹¹ RICHARD A. EPSTEIN, *SIMPLE RULES FOR A COMPLEX WORLD* 296 (1997).

¹² See *infra* Section II.A.3 (discussing state and local cleanup programs and their use of financial assistance through tax incentives).

¹³ See Matthew D. Fortney, Comment, *Devolving Control over Mildly Contaminated Property: The Local Cleanup Program*, 100 NW. U.L. REV. 1863, 1873 (2006).

¹⁴ See, e.g., Section IV. A (discussing New York City’s voluntary cleanup program).

¹⁵ See U.S. ENVTL. PROT. AGENCY, *PROTECTING & RESTORING LAND: MAKING A VISIBLE DIFFERENCE IN COMMUNITIES* 3 (2013) [hereinafter U.S. ENVTL. PROT. AGENCY, *PROTECTING & RESTORING LAND*]; see also Robert A. Simmons, *How Many Urban Brownfields Are Out There? An Economic Base Contraction Analysis of 31 U.S. Cities*, 2 PUB. WORKS MGMT. & POL’Y 267, 273 (1998) (estimating, many years earlier, that the number of brownfields in the United States ranged from 500,000 to 600,000, or more).

¹⁶ See U.S. ENVTL. PROT. AGENCY, *PROTECTING & RESTORING LAND*, *supra* note 15, at 3.

¹⁷ See Anna Alberini & Kathleen Segerson, *Assessing Voluntary Programs to Improve Environmental Quality*, 22 ENVTL. & RESOURCE ECON. 157, 160 (2002) (highlighting how lack of baselines can complicate these assessments); Jonathan C. Borck & Cary Coglianese, *Voluntary Environmental Programs: Assessing Their Effectiveness*, 34 ANN. REV. ENV’T

VCPs, for example, often have a wide variety of goals, but the available data on their operation are typically insufficient to assess their overall success.¹⁸

The Article's central claim is that, as a result, scholars have tried to reach conclusions on VCPs' overall performance by focusing not on the programs' core objectives, but instead on subsidiary goals that are easier to evaluate.¹⁹ Without an adequate answer to the question of how to evaluate and improve these programs, it is extremely difficult to determine which level of government, or combination thereof, is in the best position to address the soil contamination problem. This uncertainty may help explain why debates about federalism in the environmental law literature have thus far been mostly theoretical.²⁰

This Article addresses these shortcomings in the literature by examining a real-world example of a VCP: New York City's Voluntary Cleanup Program ("NYC VCP"). VCPs provide for interesting case studies because, although they are complex and sophisticated, they remain untested in a meaningful way. The NYC VCP was chosen for this analysis for different reasons. It is of recent adoption, widely used, and operates in a geographic area where data on soil contamination is plentiful. This made it possible to evaluate whether the program was meeting its central goal, that is, spurring the redevelopment of contaminated sites.²¹ Moreover,

RESOURCES 305, 315 (2009) (noting that the literature evaluating the effect of voluntary environmental programs beyond questions relating to participation is scarce).

¹⁸ See *infra* Sections III.A and III.B; Richard C. Hula & Rebecca Bromley-Trujillo, *Cleaning Up the Mess: Redevelopment of Urban Brownfields*, 24 *ECON. DEV. Q.* 276, 279 (2010) (noting that "the literature has yet to determine whether [brownfield redevelopment] initiatives lead to improvements in brownfields over time"); see also Joel B. Eisen, *"Brownfields of Dreams?": Challenges and Limits of Voluntary Cleanup Programs and Incentives*, 1996 *U. ILL. L. REV.* 883, 990 (noting that state voluntary cleanup statutes are "too new for their effectiveness to be measured accurately").

¹⁹ See *infra* Section III.A.

²⁰ See, e.g., Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Environmental Regulatory Authority*, 14 *YALE L. & POL'Y REV.* 23, 25 (1996) ("The Matching Principle suggests that, in general, the size of the geographic area affected by a specific pollution source should determine the appropriate governmental level for responding to the pollution."); Nestor M. Davidson, *Cooperative Localism: Federal-Local Collaboration in an Era of State Sovereignty*, 93 *VA. L. REV.* 959, 1034 n.47 (2007) ("[E]nvironmental protection is increasingly a local government issue."); Fortney, *supra* note 13, at 1890–96 (laying out the arguments in support of local cleanup programs); Jared Snyder & Jonathan Binder, *The Changing Climate of Cooperative Federalism: The Dynamic Role of the States in a National Strategy to Combat Climate Change*, 27 *UCLA J. ENVTL. L. & POL'Y* 231, 247 (2009) ("While the climate change crisis may differ from other environmental problems in many ways, it is similar in that the best approach to mitigate and adapt to the problem requires a comprehensive approach involving multiple levels of government.").

²¹ See LUIS INARAJA VERA, N.Y.U. FURMAN CTR., *MAKING DIRTY LAND CLEAN: AN ANALYSIS OF NEW YORK CITY'S VOLUNTARY CLEANUP PROGRAM* 3 (2018) [hereinafter

the NYC VCP is the first and only VCP run by a local government agency, which allows this Article to shed some light on the role that local governments can play in this domain.²²

The analysis in this Article yields four contributions to the literature. First, it provides a deeper understanding of how data can and should affect the design of voluntary environmental programs.²³ Of course, in the context of VCPs, knowing more about the location of environmental hazards from these additional data can definitely help citizens reduce their exposure to dangerous pollutants. Less obviously, having more comprehensive and accurate environmental data has the additional benefit of allowing for more thorough assessments of the performance of government programs.²⁴ Improved assessments, in turn, make it easier for agencies to modify their programs and make them more effective.

Second, the study of the first local VCP offers important lessons on how to best structure collaboration between the various levels of government that participate in the implementation of voluntary programs. Specifically, this analysis provides direct support for a common argument raised in the federalism literature: that the need to tailor programs to local conditions justifies a strong local government role.²⁵ With VCPs, state legislation can create a local regulatory gap that affects specific municipalities; for instance, by making sites located in a particular city ineligible to join a state cleanup program.²⁶ When this occurs, it becomes crucial for state legislatures to give municipal governments enough authority to allow them to create local programs that address environmental cleanup issues effectively.²⁷

INARAJA VERA, N.Y.U. FURMAN CTR]; *see also infra* Section IV.A (analyzing New York City's VCP in detail).

²² *See* INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 14; *see also infra* Section IV.A (explaining the basic features of New York City's VCP).

²³ *See infra* Section V.A; *see also* Emily A. Green, *The Rustbelt and the Revitalization of Detroit: A Commentary and Criticism of Michigan Brownfield Legislation*, 5 J.L. SOC'Y 571, 605–14 (2004).

²⁴ *See infra* Section V.A; *see also* Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130, 168 (2005) (“The lack of data can inhibit sound policy formation at all levels of government.”).

²⁵ *See, e.g.,* Adler, *supra* note 24, at 137 (2005) (“A more decentralized system is better able to overcome this ‘knowledge problem,’ and ensure that regulatory measures take account of local conditions.”); John R. Nolon, *In Praise of Parochialism: The Advent of Local Environmental Law*, 26 HARV. ENVTL. L. REV. 365, 415 (2002) (“The diversity of local conditions . . . suggests that centralized approaches to environmental protection are not necessarily desirable when dealing with environmental problems.”).

²⁶ For an example of this problem, *see infra* Section IV.A.

²⁷ In the VCP context, this often requires allowing enrollees in a local program to have the same liability protections that those in a state-level VCP would enjoy. *See infra* Section V.B.

Third, efficiency is a critical feature of voluntary programs.²⁸ While having government initiatives that are efficient is generally desirable, in the context of voluntary programs it is a necessity.²⁹ As this Article shows, perceived inefficiencies and delays in the operation of a voluntary program can deter potential enrollees from participating in it.³⁰ Without enrollees, a voluntary program cannot operate. Interviews with actors who have repeatedly used VCPs strongly suggest that the predictability of the program and the general swiftness with which the agency responds to requests and keeps the process moving forward can dramatically affect the willingness of enrollees to use the program in the future.³¹

Lastly, injecting more complexity into the design of voluntary programs can be counterproductive. As Professor Richard Epstein noted in his seminal book “Simple Rules for a Complex World,” overly complicated rules can have a negative impact on “the productive efficiency of the society they regulate.”³² Given that there is no shortage of environmental problems, it can be tempting to try to address multiple issues at once in the same program. VCPs are perceived as a tool that could potentially be used to incentivize the development of solar installations on contaminated sites and help combat climate change.³³ This Article cautions against blindly favoring this type of redevelopment at the expense of other beneficial uses, such as housing and recreational uses. The technical literature makes it clear that there is no obvious comparative advantage to using contaminated sites for solar energy generation.³⁴ Moreover, including provisions in a VCP that promote this particular activity can upset the fragile balance of incentives that the various levels

²⁸ Alberini & Segerson, *supra* note 17, at 173–74 (addressing the key role of efficiency in the context of environmental voluntary programs); Green, *supra* note 23, at 605 (explaining that voluntary programs in Ohio and Michigan would benefit from specific measures that would increase their efficiency).

²⁹ See Alberini & Segerson, *supra* note 17, at 173–74; Green, *supra* note 23, at 596–97; see also *infra* Section V.C.

³⁰ See Tracy A. Hudak, Addressing Barriers to Brownfield Redevelopment: An Analysis of CERCLA and the Voluntary Cleanup Programs of Ohio, Pennsylvania, and Michigan 23 (Apr. 19, 2002) (major paper for the degree of Master of Urban and Regional Planning, Virginia Polytechnic Institute and State University) (on file with the Utah Law Review); see also *infra* Section V.C.

³¹ See INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 1, 5.

³² EPSTEIN, *supra* note 11, at 307.

³³ See Silvio Marcacci, *Solar Brightfields: Gigawatts of Clean Energy Potential on America’s Landfills and Brownfields*, FORBES (Aug. 10, 2017, 08:55 AM), <https://www.forbes.com/sites/energyinnovation/2017/08/10/solar-brightfields-gigawatts-of-clean-energy-potential-on-americas-landfills-and-brownfields/#45f10b4b6f54> [<https://perma.cc/LE5G-49ZV>]; Robert B. Warren, *The Benefits of Brightfields Developments for Municipalities*, WEIRFOULDS LLP NEWSLETTER (WeirFoulds LLP, Toronto, ON, Canada), June 2016, <https://www.weirfoulds.com/the-benefits-of-brightfields-developments-for-municipalities> [<https://perma.cc/ZB6R-DYXV>].

³⁴ See *infra* Section V.D.

of government—federal, state, and local—have crafted for all the different land uses.³⁵

This Article's contributions have implications for a number of different fields. Agencies have set up voluntary programs not only to incentivize the cleanup and redevelopment of contaminated sites but also to promote land conservation, reduce the impacts of farming activities, and to improve the safety of workers, to name a few.³⁶ Moreover, the control of hazardous substance contamination is also tied to other key environmental problems of our time, such as climate change. Climate-related risks associated with contaminated properties are especially apparent with sites located in flood zones, which are becoming an increasing source of concern as these low-lying areas flood more and more frequently.³⁷ Further, as noted above, policymakers are currently evaluating the extent to which it is advisable to promote the use of contaminated properties to host renewable energy installations and ultimately reduce the generation of greenhouse gases.³⁸

Implementing the principles outlined in this Article has become particularly urgent. In the current political environment, it is unlikely that the federal government will take the lead in creating new innovative and far-reaching regulatory programs or that it will dedicate more resources to environmental enforcement.³⁹ Therefore, voluntary programs are a critical piece in the puzzle to provide a more viable

³⁵ See *infra* Section V.D.

³⁶ See, e.g., Coglianesi & Nash, *supra* note 7, at 15 (describing OSHA's voluntary program to increase worker safety); Sherry A. Enzler, *EPA-Minnesota AG Certainty Program—Is It Up to the Task of Cleaning Our Waters?*, 39 WM. MITCHELL L. REV. 959, 959–61 (2013) (explaining how agencies use voluntary programs to reduce agricultural pollution); Stephanie Stern, *Encouraging Conservation on Private Lands: A Behavioral Analysis of Financial Incentives*, 48 ARIZ. L. REV. 541, 542–43 (2006) (noting how financial incentives—a tool designed to elicit voluntary action—are used in the land conservation context).

³⁷ See generally U.S. ENVTL. PROT. AGENCY, BROWNFIELD REVITALIZATION IN CLIMATE-VULNERABLE AREAS: COMMUNITY-BASED EXAMPLES FOR IMPROVING ORDINANCE REGULATIONS, DEVELOPMENT INCENTIVES, PROGRAMS, AND PROJECTS (2016) (addressing the challenges of redeveloping contaminated sites in areas subject to flooding), https://www.epa.gov/sites/production/files/2016-01/documents/bf_revitalization_climate_vulnerable_areas_012616_508_v2_web.pdf [<https://perma.cc/2VWL-EWWW>]. These initiatives, however, may be encouraging investment in areas where redevelopment is undesirable given their risk of flooding. See Katrina M. Wyman & Nicholas R. Williams, *Migrating Boundaries*, 65 FLA. L. REV. 1957, 1991 (2013) (noting the dangers of incentivizing overinvestment in areas prone to flooding).

³⁸ See, e.g., *Parking Lot Solar Canopy Installation*, EMPIRE RENEWABLE ENERGY, LLC, <http://solarbyempire.com/why-solar/solar-options/118-parking-lot-canopies> [<https://perma.cc/9DWL-N8E4>] (last visited Jan. 5, 2020).

³⁹ See Joel A. Mintz, *It's Official: Trump's Policies Deter EPA Staff from Enforcing the Law*, THE HILL (Feb. 16, 2019, 03:00 PM EST), <https://thehill.com/opinion/energy-environment/430326-its-official-trumps-policies-deter-epa-staff-from-enforcing-the> [<https://perma.cc/XF4Q-5F2D>].

alternative to mandatory regulation. Moreover, it is essential to structure collaborations among various levels of government so that states and cities can adopt a leading role in addressing a variety of environmental problems.⁴⁰

This Article proceeds in five parts. Part I situates the emergence of voluntary programs within the history and evolution of environmental law. Part II examines the different approaches to dealing with third-generation environmental problems, such as the recalcitrant presence of contaminated sites in many communities. It then explores how Congress amended federal legislation in 2018 to tackle some of these issues and how state agencies have opted for the alternative approach of creating voluntary programs. Part III identifies the practical challenges that agencies and academics face when attempting to evaluate the success of voluntary programs and uncovers critical gaps in the literature. Part IV proposes a new analytical framework to determine whether voluntary programs are meeting their most important goal— incentivizing private actors’ actions—and puts it to the test with the most sophisticated municipal VCP in the nation. Finally, Part V lays out a set of recommendations that policymakers can use to make voluntary programs more effective and efficient. It also provides guidance on how to better structure collaboration between different levels of government in a way that maximizes these programs’ success.

I. THE GROWING COMPLEXITY AND SOPHISTICATION OF ENVIRONMENTAL LAW

A. *The First and Second Generations of Environmental Law*

Scholars often use the term “generations” to refer to the different historical stages of environmental regulation.⁴¹ For example, federal statutes such as the Clean Air Act are typically viewed as part of the first generation of environmental law, whereas state programs adopting flexible market-oriented approaches are more aligned with what scholars regard as the second generation.⁴² It is worth noting, however, that different scholars may include the same statute or regulatory tool in a different category, depending on the main feature they use to distinguish between these two generations.⁴³ In some cases, scholars will base this determination on the level of government that is primarily tasked with implementing the statute (i.e., federal for first generation or state for second generation) and, in others, on the

⁴⁰ See *supra* note 28 and accompanying text (highlighting some of the literature supporting a stronger role of local governments in addressing environmental problems).

⁴¹ See, e.g., Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570, 600, 605 (1996) (using the first- and second- generation terminology with regard to environmental law); Lazarus, *supra* note 4, at 75, 77, 87 (alluding to first and second generations of environmental laws).

⁴² See *infra* Section I.A.2.

⁴³ See Sarah E. Light, *The Law of the Corporation as Environmental Law*, 71 STAN. L. REV. 137, 150–51 (2019).

specific type of instrument on which the program relies (e.g., command-and-control regulation as first generation or market-based tools as second generation).⁴⁴

1. *The Pre-Generational Era*

Societies have been working to address environmental problems for a very long time. In Ancient Greece, for example, certain ordinances tried to reduce noise pollution by requiring that roosters and tinsmiths be located outside the city limits.⁴⁵ More recently, and until the 1970s, tort actions were the main avenue to address environmental issues.⁴⁶ Some have gone so far as to claim that, prior to 1970, “environmental protection law in the United States was essentially nonexistent.”⁴⁷ This is in part because there was no agency tasked with environmental protection at the federal level at the time, but also because tort causes of action had not been effective in dealing with a variety of environmental problems; for example, those in which “private parties [were] incapable of paying for the full magnitude of the harm” they caused.⁴⁸

The issue of soil contamination, due to its magnitude and economic impact, was one of the triggers of more comprehensive federal regulation. Soil polluting activities (e.g., manufacturing, waste disposal, illegal dumping, and accidental spills⁴⁹) are ubiquitous. There are in excess of 530,000 contaminated sites in the United States⁵⁰ covering approximately 23 million acres of land—an area

⁴⁴ Compare Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U.L. REV. 21, 21 (2001) (basing that distinction on the type of instrument used), with Esty, *supra* note 41, at 600–12 (defining the two generations based on whether environmental regulation was more or less centralized); see also *infra* Section I.A.2.

⁴⁵ Luis Inaraja Vera, *How Science Can Improve Regulation: Noise Control in Urban Areas*, 53 TULSA L. REV. 33, 36 (2017).

⁴⁶ See, e.g., Esty, *supra* note 41, at 600 (discussing the difficulty in relying on tort remedies as a pollution control strategy).

⁴⁷ Lazarus, *supra* note 4, at 76. It is worth noting, however, that states and cities started enacting statutes and ordinances to address certain environmental issues in their jurisdictions long before 1970. See Katrina M. Wyman & Danielle Spiegel-Feld, *The Urban Environmental Renaissance*, 108 CALIF. L. REV. (forthcoming 2020) (NYU School of Law, Public Law Research Paper No. 19-08) (manuscript at 10–18), <https://ssrn.com/abstract=3360548> [<https://perma.cc/GRF2-3E43>] (showing that Congress passed a series of landmark environmental statutes in the 1970s).

⁴⁸ See Steven Shavell, *Liability for Harm Versus Regulation of Safety*, 13 J. LEGAL STUD. 357, 360 (1984); Wyman & Spiegel-Feld, *supra* note 47.

⁴⁹ *Report on the Environment: Contaminated Land: What Are the Trends in Contaminated Land and Their Effects on Human Health and the Environment?*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/report-environment/contaminated-land> [<https://perma.cc/94DE-Z6X7>] (last visited Aug. 19, 2019).

⁵⁰ See U.S. ENVTL. PROT. AGENCY, PROTECTING & RESTORING LAND, *supra* note 15, at 3; see also Simmons, *supra* note 15, at 273 (estimating, many years earlier, that the number of brownfields in the United States ranged from 500,000 to 600,000, or more).

comparable to that of the State of Indiana.⁵¹ Thus, it is not surprising that the failure of the existing legal framework—mostly tort law—to adequately deal with the effects of soil contamination became a catalyst for change.

During the Love Canal disaster in the 1970s, the inadequacy of tort-based solutions became evident. This incident, which has been described as “one of the most appalling environmental tragedies in American history,” showed the world why the combination of insufficient regulation, residential uses, and unaddressed soil contamination could lead to catastrophic results.⁵² William Love, an entrepreneur who arrived in the Niagara Falls area in the 1890s, had the ambitious idea to construct a several-mile-long navigable canal in the Niagara River to generate power for local industry.⁵³ After the excavation of a considerable amount of soil, the project was halted, which left an empty 16-acre canal that Hooker Electrochemical Company (“Hooker”) and other local industries later used to dispose of their chemical waste.⁵⁴ Hooker then capped the site and sold it to the Niagara County Board of Education.⁵⁵ During the next few years, a school and approximately one hundred residences were built in the surrounding area.⁵⁶

While the presence of homes in an area adjacent to an uncontrolled chemical waste dumpsite was enough cause for concern, certain developments made this situation even worse. In the 1970s, heavy rainfall increased the groundwater level and mobilized the hazardous substances located in the canal, which, in some cases, ended up in the basements of nearby residences in the form of “oily sludge.”⁵⁷ Many residents became exposed to hazardous chemicals in the sludge and experienced a myriad of health problems, including miscarriages, birth defects, and cancer.⁵⁸ To address the public health crisis, the State of New York bought 734 residences and, along with the federal government, spent more than \$250 million on relocation and cleanup.⁵⁹ Love Canal made clear that a more effective approach was needed to address untreated hazardous waste dumps and other environmental problems.

⁵¹ See U.S. ENVTL. PROT. AGENCY, PROTECTING & RESTORING LAND, *supra* note 15, at 3.

⁵² Eckardt C. Beck, *The Love Canal Tragedy*, 5 ENVTL. PROT. AGENCY J. 17, 17 (1979).

⁵³ Theodore Baurer, *Love Canal: Common Law Approaches to a Modern Tragedy*, 11 ENVTL. L. 133, 135 (1980).

⁵⁴ See Barbara Ann White, *Economizing on the Sins of Our Past: Cleaning Up Our Hazardous Wastes*, 25 HOUS. L. REV. 899, 923–24 (1988) (citing ADELINE GORDON LEVINE, LOVE CANAL: SCIENCE, POLITICS, AND PEOPLE 9–12 (1982)).

⁵⁵ LOIS MARIE GIBBS, LOVE CANAL: THE STORY CONTINUES 21 (1998).

⁵⁶ Eric R. Pogue, *The Catastrophe Model of Risk Regulation and the Regulatory Legacy of Three Mile Island and Love Canal*, 15 PENN ST. ENVTL. L. REV. 463, 473 (2007).

⁵⁷ Lori A. Kosakowski, *The Inclusion of Passive Migration Under CERCLA Liability: When Is Disposal Truly Disposal*, 37 VAL. U.L. REV. 293, 296 (2002).

⁵⁸ DAN FAGIN, TOMS RIVER: A STORY OF SCIENCE AND SALVATION 129 (2013).

⁵⁹ Lynn E. Richter, *AM International v. International Forging Equipment: Does CERCLA Allow Private Parties to Contractually Allocate Liability for Cleaning Up Contaminated Sites*, 22 U. TOL. L. REV. 1065, 1069–70 (1991).

2. *The First Generation of Environmental Law*

Starting in the early 1970s, the legal landscape changed dramatically with the enactment of a variety of federal statutes aimed at protecting the environment and human health, including the National Environmental Policy Act, the Clean Air Act, the Clean Water Act, and the Endangered Species Act.⁶⁰ This “first generation” of environmental law had two distinctive features. First, it relied on so-called command-and-control regulation,⁶¹ which imposes both the goals that the regulated parties must achieve—e.g., ensuring that the emissions of a particular pollutant stay below the specified standard—and the means they must employ to attain them—e.g., using a particular technology.⁶² Second, first-generation environmental statutes adopted a centralized approach; that is, they assigned a prominent role to the federal government in setting the different regulatory standards.⁶³ Scholars have provided multiple justifications for federally oriented environmental regulation, including the desirability of taking advantage of national economies of scale and the need to avoid the effect of “spillover impacts of decisions in one jurisdiction on well-being in other jurisdictions.”⁶⁴

Returning to the soil contamination example, the Love Canal catastrophe and similar incidents led Congress in 1980 to enact what one of the nation’s leading environmental law scholars calls “the most far reaching of all the environmental statutes”: the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”).⁶⁵ Interestingly, whether this statute is part of the first or

⁶⁰ Pub. L. No. 91-190, 83 Stat. 852 (1969) (codified as amended at 42 U.S.C. §§ 4321–4370m-12 (2018)); Pub. L. No. 91-604, 84 Stat 1676 (1970) (codified as amended at 42 U.S.C. §§ 7401–7671q); Pub. L. No. 92-500, 86 Stat 816 (1972) (codified as amended at 33 U.S.C. §§ 1251–1388); Pub. L. No. 93-205, 87 Stat 884 (1973) (codified as amended at 16 U.S.C. §§ 1531–1544); *see also* Lazarus, *supra* note 4, at 77–78.

⁶¹ Incentive-based regulation, on the other hand, is often tied to a “second generation” of environmental law. *See, e.g.,* Craig Anthony Arnold, *Environmental Law, Episode IV: A New Hope? Can Environmental Law Adapt for Resilient Communities and Ecosystems?*, 21 J. ENVTL. & SUSTAINABILITY L. 1, 8 (2015).

⁶² *See* Daniel H. Cole, *Explaining the Persistence of “Command-and-Control” in US Environmental Law*, in POLICY INSTRUMENTS IN ENVIRONMENTAL LAW (Kenneth R. Richards & Josephine van Zeben eds., forthcoming 2020) (manuscript at 2–3), <https://ssrn.com/abstract=3024177> [<https://perma.cc/UVT9-SZLY>].

⁶³ *See* Esty, *supra* note 41, at 601–02; Stewart, *supra* note 44, at 21.

⁶⁴ *See* Richard B. Stewart, *Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L.J. 1196, 1211, 1215 (1977).

⁶⁵ The other examples mentioned by Congress were “the Valley of the Drums, Occidental Chemical Company’s pesticide formulation site in Lathrop, California, and the Chemical Control site in Elizabeth, New Jersey.” Tom Kuhnle, *The Rebirth of Common Law Actions for Addressing Hazardous Waste Contamination*, 15 STAN. ENVTL. L.J. 187, 189 (1996). Congress’s concern about the Love Canal incident is apparent in the Act itself, which

second generation of environmental law is a disputed question. Professor Richard Lazarus considers it part of a second wave of environmental regulation because, unlike the Clean Air Act or Clean Water Act, which target pollution on a particular medium (i.e., air and water), statutes such as CERCLA focus, instead, on specific types of pollutants (i.e., hazardous substances).⁶⁶ Professors Richard Stewart and Daniel Esty, on the other hand, consider CERCLA to be a first generation statute because it adopts a centralized approach to regulation by giving broad power to the federal government as opposed to reserving it for the states, which, according to their framework, is a distinctive feature of second generation statutes.⁶⁷

The dispute over its generational classification aside, CERCLA's far-reaching reputation is owed in part to its adoption of a broad liability framework that does not incorporate a causation requirement.⁶⁸ Section 107 of CERCLA and its implementing regulations promote this expansive approach to liability by adopting a broad and all-encompassing definition of "potentially responsible party."⁶⁹ Those who owned or operated an activity on a property at the time when hazardous substances were released may, not surprisingly, be deemed liable for the release.⁷⁰ However, Section 107 includes a variety of additional potentially responsible parties.⁷¹ The most relevant, for the purposes of the discussion in this Section, are current owners of the property, *even if* they acquired the property after the contamination was already in place and did not contribute to its release or spread in any way.⁷²

The absence of a causation requirement for potentially responsible parties was confirmed in *New York v. Shore Realty Corp.*,⁷³ where the U.S. Court of Appeals for

contains a provision specifically devoted to the "Love Canal property acquisition." *See* 42 U.S.C. § 9661 (2018).

⁶⁶ Lazarus, *supra* note 4, at 83.

⁶⁷ Esty, *supra* note 41, at 602; Stewart, *supra* note 44, at 21–23, 23 n.2.

⁶⁸ Amy Luria, *CERCLA Contribution: An Inquiry into What Constitutes an Administrative Settlement*, 84 N.D. L. REV. 333, 333–34 (2008).

⁶⁹ 40 C.F.R. § 304.12(m) (2018); *see* 42 U.S.C. § 9607(a).

⁷⁰ 42 U.S.C. § 9607(a)(2); *see* 40 C.F.R. § 304.12(m) (potentially responsible parties include "any person who may be liable pursuant to section 107(a) of CERCLA, 42 U.S.C. 9607(a)").

⁷¹ 42 U.S.C. § 9607(a). These provisions are typically broader and, in addition to current owners and operators, also include "(2) any person who *at the time of disposal* of any hazardous substance *owned or operated any facility* at which such hazardous substances were disposed of, (3) any person who by contract, agreement, or otherwise *arranged for disposal or treatment*, or arranged with a transporter for transport for disposal or treatment, of hazardous substances . . . and (4) any person who *accepts or accepted* any hazardous substances *for transport* to disposal or treatment facilities, incineration vessels or sites selected by such person." *Id.* (emphasis added).

⁷² Unless the current owner can claim one of the statutory defenses, such as the innocent landowner defense recognized in Sections 107(b)(3) and 101(35). *See* 42 U.S.C. §§ 9601(35), 9607(b)(3).

⁷³ 759 F.2d 1032 (2d Cir. 1985).

the Second Circuit pointed out that the statute does not require a plaintiff to prove that the defendant caused the contamination.⁷⁴ Shore Realty Corp. (“Shore”) purchased a 3.2-acre site heavily contaminated with hazardous substances, intending to use it as a condominium development.⁷⁵ The State of New York incurred a series of costs in connection with the cleanup of the contaminated property and then sought to recover them from Shore, the current owner, under Section 107 of CERCLA.⁷⁶ Shore argued that it was not liable because it did not own the site at the time when the release of hazardous substances occurred.⁷⁷ The court disagreed and held that CERCLA “unequivocally imposes strict liability on the *current owner* of a facility from which there [was] a release or threat of release [of hazardous substances], without regard to causation.”⁷⁸

The Second Circuit’s interpretation that CERCLA imposes strict liability, which was later partially endorsed by the U.S. Supreme Court,⁷⁹ gave the federal government, states, and private parties a very powerful tool to overcome some of the existing obstacles to recovering cleanup costs.⁸⁰ The first obstacle that agencies face is determining with certainty which of the past owners of a piece of land contributed to its contamination, which can be challenging. To make matters worse, some of these entities may no longer exist or may be insolvent. The statute addresses these issues by allowing plaintiffs to require the current owner to pay these cleanup costs.⁸¹

3. *The Decentralization Era and the Environmental Federalism Debate*

One of the reactions to the federal environmental regulation model adopted in the 1970s and 1980s was a subsequent movement towards a more decentralized, second-generation approach, in which states could play a more prominent role.⁸² Advocates of this position responded to the concerns that had initially justified the centralized approach of the first generation. One of these justifications was based on

⁷⁴ *Id.* at 1044–45.

⁷⁵ *Id.* at 1038.

⁷⁶ *Id.* at 1032–43.

⁷⁷ *Id.* at 1043.

⁷⁸ *Id.* at 1044 (emphasis added).

⁷⁹ See *Babbitt v. Sweet Home Chapter of Cmty. for a Great Oregon*, 515 U.S. 687, 712 (1995) (citing *New York v. Shore Realty Corp.* 759 F.2d 1032, 1044, n.17 (2d Cir. 1985) to support the proposition that “‘traditional tort law has often imposed strict liability while recognizing a causation defense,’ but that, in enacting [CERCLA], Congress ‘specifically rejected including a causation requirement.’”).

⁸⁰ 42 U.S.C. §§ 9607(a)(4)(A), (B) (2018) (listing, as potential plaintiffs, “the United States Government or a State or an Indian tribe . . . [or] any other person.”).

⁸¹ Those intending to recover under this section must have incurred removal, remedial, or response costs. See 42 U.S.C. §§ 9607(a)(4)(A), (B); *United States v. Atlantic Research Corp.*, 551 U.S. 128, 139 (2007).

⁸² See *Esty*, *supra* note 41, at 605.

the fear of a race-to-the-bottom—that is, that the lack of federal regulation would lead smaller units of government, such as states, to adopt lax environmental standards to attract industry and economic activity.⁸³ Those in favor of decentralization responded to this concern by pointing out that states also have an incentive to compete for higher environmental quality with neighboring areas, which would lead them to adopt stringent regulatory standards.⁸⁴

Returning to the context of hazardous substances, CERCLA is a good example of a statute that, while preserving a central role for the federal government, also adopts a relatively decentralized approach. To achieve this goal, CERCLA contains a provision recognizing that the liability for releases of hazardous substances under state law is not affected by the Act.⁸⁵ In addition to not displacing or preempting state law, CERCLA expressly contemplates, and in some cases requires, an important role for the states in implementing the statute.⁸⁶ For example, Section 107 of the act authorizes *states* to recover costs incurred in connection with the cleanup up of a site.⁸⁷

Another reason to view CERCLA as part of the decentralization effort is that it has led to the enactment of state-specific provisions governing liability for releases of hazardous substances.⁸⁸ These statutes generally mirror CERCLA's liability approach, but in some cases they have deviated from the federal standard.⁸⁹ This raises two important questions.

First, the existence of both federal and state liability frameworks can lead to challenging scenarios in which a potentially liable party could be held liable for

⁸³ See Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 605–06 (2001) (explaining the basis for this argument).

⁸⁴ See Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the “Race to the Bottom” Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210, 1233–44 (1992).

⁸⁵ 42 U.S.C. § 9652(d). This savings clause, however, is limited by Section 309, relating to the statute of limitations of claims under state law. *See id.* § 9658; Robin Kundis Craig, *Federalism Challenges to CERCLA: An Overview*, 41 SW. L. REV. 617, 631 (2012). Moreover, there are situations in which courts have found CERCLA to preempt state law claims. *See* Kristi Weiner, *Does CERCLA Preempt New York State Law Claims for Cost Recovery and Contribution?*, 54 N.Y. L. SCH. L. REV. 811, 825–26 (2010); *see also* *PMC, Inc. v. Sherwin-Williams Co.*, 151 F.3d 610, 618 (7th Cir. 1998) (“CERCLA’s savings clause must not be used to gut provisions of CERCLA.”).

⁸⁶ Robert B. McKinstry, Jr., *The Role of State “Little Superfunds” in Allocation and Indemnity Actions under the Comprehensive Environmental Response, Compensation and Liability Act*, 5 VILL. ENVTL. L.J. 83, 89 (1994).

⁸⁷ The statute also recognizes this right to other parties, such as the federal government and private citizens. *See* 42 U.S.C. § 9607(a)(4)(A) (referring to the costs of a removal or remedial action incurred by a State).

⁸⁸ *See* ENVTL. LAW INST., AN ANALYSIS OF STATE SUPERFUND PROGRAMS: 50-STATE STUDY, 2001 UPDATE 13 (2001). New Jersey’s Spill Compensation and Control Act, however, preceded CERCLA. *See* N.J. REV. STAT. § 58:10-23.11 (1976).

⁸⁹ *See, e.g., infra* note 90 and accompanying text.

certain cleanup costs under state law but not federal law. This can happen, for example, when the applicable state statute does not contemplate a defense to liability that CERCLA recognizes.⁹⁰ In these cases, the state agency or another party may be able to recover its cleanup costs even if the potentially liable party would be protected from cost recovery or contribution suits brought under federal law (because, as pointed out above, CERCLA does not preempt state law).⁹¹ Part II explains how most states have tempered this result by creating voluntary cleanup programs.

Second, the role that local-level cleanup initiatives can play in this context is largely unassessed. The literature has pointed to several reasons that, in theory, support increasing the involvement of local governments in cleanup projects. These reasons include the need to consider local factors when designing policies to address land contamination problems, to have administrative action that originates closer to the people, and to experiment with different models in order to determine which ones are the most effective.⁹² The question of whether local programs are desirable, however, can only be definitively answered once policymakers have adequate assessments of the performance of cleanup programs. Part III of this article examines the obstacles that agencies and scholars face when evaluating the success of these types of programs.

B. Third-Generation Environmental Issues: The Brownfield Problem

Some environmental challenges are particularly hard to tackle. Scholars have used the terms “third generation” and “next generation” problems to describe environmental issues that require a more sophisticated approach than those provided by first- and second-generation regulatory tools.⁹³ These types of problems are often

⁹⁰ New York State, for example, does not provide an equivalent to the federal bona fide prospective purchaser protection. *See Developments in Historic Contamination Liability and Cleanup Schemes in the United States*, ENVTL. PRAC. BRIEFING (Shearman & Sterling LLP, New York, N.Y.), Winter 2004, at 3–4, https://www.shearman.com/-/media/Files/NewsInsights/Publications/2004/12/Environmental-Practice-Briefing--Developments-in-_/Files/Download-PDF-Environmental-Practice-Briefing--De_/FileAttachment/Env_0404.pdf?la=en&hash=D5447761577481AE9C19D5FE7588EED5615E935B [<https://perma.cc/EVC5-9GBM>]. Some courts, however, have found some of these claims to be preempted. *See Weiner, supra* note 85, at 825–26.

⁹¹ *See supra* note 85 and accompanying text (explaining the basic features of cost-recovery actions under Section 107 of CERCLA). Contribution actions are governed by 42 U.S.C. § 9613(f).

⁹² *See Fortney, supra* note 13, at 1892–95; James E. Krier, *On the Topology of Uniform Standards in a Federal System—and Why It Matters*, 54 MD. L. REV. 1226, 1228 (1995); Butler & Macey, *supra* note 20, at 53.

⁹³ *See, e.g., Lazarus, supra* note 4, at 91 (noting how scholars have pointed to the necessity of a third generation of environmental law to deal with the environmental problems of the next millennium); Stewart, *supra* note 44, at 21 (pointing out that certain environmental challenges require a third-generation strategy).

caused by many actors and sources; present ecological, economic, and distributional components; and involve contaminants whose cumulative effects are not easy to predict in space or time.⁹⁴ It is important to keep in mind that, in addition to the inherent complexity of third and next generation issues, the regulatory framework designed to address them can also make matters worse. This Section illustrates these challenges by focusing on a category of contaminated sites with which regulators are still contending: brownfields.

1. *What Are Brownfields?*

Brownfields are properties where “the presence or potential presence” of contamination may hinder their “expansion, redevelopment, or reuse.”⁹⁵ While there are other similar definitions of brownfield, the unifying theme is that the likely presence of contamination may be impeding the redevelopment of the site.⁹⁶

To fully understand the nature of the problem, which the next section addresses in more detail, it is important to highlight several features of the definition of brownfield used in this Article. First, brownfields need not be vacant.⁹⁷ Sites whose *reuse* may be complicated by the potential presence of hazardous substances are also brownfields. Stated differently, part of the problem with these properties is that their contamination may lock the land into continuing the particular use to which they are currently being put—typically, industrial uses.⁹⁸ This is so because switching to a different use with a more stringent cleanup standard, such as residential or commercial, can entail high remediation costs.⁹⁹ Moreover, the change in use could

⁹⁴ Lazarus, *supra* note 4, at 92; Stewart, *supra* note 44, at 153; J.B. Ruhl & James Salzman, *Climate Change, Dead Zones, and Massive Problems in the Administrative State: A Guide for the Whittling Away*, 98 CALIF. L. REV. 59, 75, 78–79 (2010) (explaining that the existence of multiple sources and of cumulative effects that are not “proportional over time and . . . space” are features of “massive” environmental problems).

⁹⁵ 42 U.S.C. § 9601(39)(A) (defining “brownfield site” as “real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant”).

⁹⁶ For example, the Environmental Protection Agency defines brownfield as “abandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.” *United States Environmental Protection Agency Grants and Fellowship Information*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/grants/united-states-environmental-protection-agency-grants-and-fellowship-information> [<https://perma.cc/MHZ3-XCSP>] (last visited Jan. 12, 2020).

⁹⁷ However, many brownfields are, in practice, vacant. Lincoln L. Davies, Note, *Working Toward a Common Goal? Three Case Studies of Brownfields Redevelopment in Environmental Justice Communities*, 18 STAN. ENVTL. L.J. 285, 292 (1999).

⁹⁸ The term “vacant” is sometimes used to refer to unused land, with or without buildings, and also to land with no structures.

⁹⁹ Different uses often have different cleanup standards. *See, e.g.*, N.Y. COMP. CODES R. & REGS., tit. 6 § 375-6.8(b) (2019) (requiring different contaminant levels for residential,

trigger the involvement of government agencies,¹⁰⁰ which landowners often hope to avoid given that it may increase their risk of being the recipients of an enforcement action.

Second, brownfields typically have mild to moderate levels of contamination.¹⁰¹ Thus, they do not include properties that are heavily polluted, such as Love Canal. While drawing the line that separates brownfields from other more contaminated sites can be complicated, it is safe to say that sites on the National Priorities List (“NPL”), for example, are not brownfields.¹⁰² This list includes sites that the EPA views as presenting the highest “risk or danger to public health or welfare or the environment.”¹⁰³

The distinction between brownfields and other contaminated sites has profound implications. A property’s level of contamination affects the type of incentives its owner or developer may be able to receive. For example, government assistance programs designed to incentivize the redevelopment of brownfields typically exclude highly contaminated sites.¹⁰⁴ Moreover, a site’s contamination levels influence both which agencies—federal or state—may initiate an enforcement action and their likelihood of doing so. EPA, for instance, brings enforcement

restricted-residential, commercial, and industrial uses). Moreover, a change of use may also involve a transfer to a different operator. This may trigger reporting or remediation obligations under some state statutes. *See infra* note 121 and accompanying text.

¹⁰⁰ This results from the fact that the change in use will often entail physical modifications that require building construction or alteration permits.

¹⁰¹ William W. Buzbee, *Brownfields, Environmental Federalism, and Institutional Determinism*, 21 WM. & MARY ENVTL. L. & POL’Y REV. 1, 4 n.1 (1997); James A. Kushner, *Brownfield Redevelopment Strategies in the United States*, 22 GA. ST. U.L. REV. 857, 857 n.1 (2006).

¹⁰² *See* 42 U.S.C. § 9601(39)(B)(ii) (2018) (excluding NPL sites from the definition of brownfield); *see also* Larry Schnapf, *Special Report: State-by-State Survey of Brownfield and Voluntary Cleanup Programs*, 28 ENV’T REP. 2488, 2488 (1998) (explaining that brownfields generally do not present levels of contamination high enough to be included in the NPL or state equivalents).

¹⁰³ 42 U.S.C. § 9605(a)(8)(A) (providing that NPL designation is based on a variety of factors, including “the population at risk, the hazard potential of the hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact, the potential for destruction of sensitive ecosystems, the damage to natural resources which may affect the human food chain and which is associated with any release or threatened release, the contamination or potential contamination of the ambient air which is associated with the release or threatened release, State preparedness to assume State costs and responsibilities, and other appropriate factors”).

¹⁰⁴ *See, e.g.*, 14 R.C.N.Y. § 43-1402(uu)(1)(A) (2020) (limiting the eligibility of sites to join the New York City Voluntary Cleanup Program to properties with “light to moderate levels of contamination”).

actions in connection with brownfields with a lower frequency than it does with respect to more contaminated sites.¹⁰⁵

Last, it is also important to note that, although it may be surprising at first, a brownfield may *not* be contaminated at all. Under Congress's definition, the potential presence of contamination suffices.¹⁰⁶ As the next section explains, uncertainty over the type and extent of the contamination is one of the factors that deter developers from purchasing brownfield sites.¹⁰⁷ Therefore, the mere likelihood of contamination—determined, for example, based on the site's current or former industrial use—can be enough, on its own, to make the site undesirable for redevelopment, and thus a brownfield.

2. *Why Are Brownfields So Problematic?*

There are multiple problems associated with having a large number of contaminated sites across the country. For one thing, brownfields raise a variety of health concerns: their contamination can lead to respiratory, “liver, diabetes, stroke, COPD, [and] heart disease.”¹⁰⁸ For another, brownfields can contribute to urban sprawl, as developers have a tendency to avoid these types of properties—which are often located in more central and high-density parts of towns and cities—and instead target clean land in lower-density and more peripheral areas.¹⁰⁹

In light of the gravity of the brownfield problem, it is reasonable to wonder why first- and second-generation environmental law tools have not effectively addressed it.¹¹⁰ A plausible response is that, given that there are over half a million brownfields in the United States, the process of cleaning them up will necessarily take many decades.¹¹¹ However, this is only part of the problem. Another hurdle is that, as the Supreme Court's opinion in *Burlington Northern & Santa Fe Railway Co. v. United*

¹⁰⁵ See RICHARD L. REVESZ, ENVIRONMENTAL LAW AND POLICY 755–56 (3d ed. 2015) [hereinafter REVESZ, ENVIRONMENTAL LAW AND POLICY] (explaining that contamination levels in brownfields is generally insufficient to attract EPA's attention); Fortney, *supra* note 13, at 1865–66 (noting that, in practice, EPA “addresses only the most contaminated sites,” and that there are contaminated sites that, because they are not reached by state programs either, are still “slipping through the cracks.”).

¹⁰⁶ See *supra* note 95 and accompanying text.

¹⁰⁷ See *infra* Section I.B.2. Certain properties may be viewed as high risk due to the possible activities that the current or former owners carried out to contaminate the soil. For example, using the subsurface of a property to dispose of waste presents a risk that hazardous substances will migrate. See Joseph A. Schremmer, *Getting Past Possession: Subsurface Property Disputes as Nuisances*, 95 WASH. L. REV. 101, 129–30 (2020) (noting the potential impacts associated with the injection of hazardous and non-hazardous fluid wastes).

¹⁰⁸ Litt et al., *supra* note 2, at 189.

¹⁰⁹ See Buzbee, *supra* note 2, at 59 (noting that avoiding brownfields leads to sprawl).

¹¹⁰ See U.S. ENVTL. PROT. AGENCY, PROTECTING & RESTORING LAND, *supra* note 15, at 3; see also Simmons, *supra* note 15, at 273 (estimating, many years earlier, that the number of brownfields in the United States ranged from 500,000 to 600,000, or more).

¹¹¹ See Simmons, *supra* note 15, at 273.

States illustrated, equitably allocating liability among the potentially responsible parties is extremely challenging.¹¹² Identifying the source of each contaminant can be complex, as the hazardous substances in question may have been released into a brownfield by different actors over multiple decades.¹¹³ Further, the commingling and migration of contaminants can lead to cumulative effects, which further complicate the apportionment of harms.¹¹⁴

To have a more complete understanding of the brownfield problem, it is important to pay special attention to the specific obstacles that deter their redevelopment; namely, the—sometimes uncertain—economic costs of cleaning up the property and the potential liability associated with purchasing a brownfield.¹¹⁵

(a) *Economic Deterrents to Redevelopment*

Cleaning up a brownfield is generally expensive.¹¹⁶ While the cost obviously varies depending on the specific site considered, experts have estimated remediation costs to be typically in the \$600,000 – \$1,000,000 range.¹¹⁷ In addition, developers are often reluctant to invest in brownfields because hidden cleanup costs may surface

¹¹² *Burlington N. & Santa Fe Ry. Co. v. United States*, 556 U.S. 599, 613–19 (2009) (delving into the difficulties of apportioning cleanup costs in a case with multiple actors and a variety of contaminants released over an extended period of time).

¹¹³ See ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 450 (2018) (introducing *Burlington Northern* by observing that hazardous waste sites can include “a complex mixture of wastes from many sources”—a problem that is often compounded “[w]hen [potentially responsible parties] who would otherwise shoulder significant liability are bankrupt or insolvent”).

¹¹⁴ Karen D. Holl & Richard B. Howarth, *Paying for Restoration*, 8 RESTORATION ECOLOGY 260, 263 (2000) (explaining that “much environmental damage is caused by cumulative effects of many small businesses or individuals”).

¹¹⁵ See Richard C. Hula & Rebecca Bromley-Trujillo, *Cleaning Up the Mess: Redevelopment of Urban Brownfields*, 24 ECON. DEV. Q. 276, 277 (2010) (presenting cleanup costs and potential exposure to liability as two significant barriers that discourage developers from investing in brownfields); Linda McCarthy, *The Brownfield Dual Land-Use Policy Challenge: Reducing Barriers to Private Redevelopment While Connecting Reuse to Broader Community Goals*, 19 LAND USE POL’Y 287, 289 (2002) (noting that liability for contamination is “perhaps the greatest impediment to brownfield reuse” and also listing availability for funding, uncertain cleanup standards, and other regulatory requirements).

¹¹⁶ Zeenat Kotval-K, *Brownfield Redevelopment: Why Public Investments Can Pay Off*, 30 ECON. DEV. Q. 275, 276 (2016).

¹¹⁷ Evans Paull, *The Environmental and Economic Impacts of Brownfields Redevelopment* 10 (NE-Midwest Inst., Working Draft for Distribution, July 2008) (citing other studies that also put the costs of remediation within that same range), <http://www.nemw.org/wp-content/uploads/2015/06/2008-Environ-Econ-Impacts-Brown-field-Redev.pdf> [<https://perma.cc/UCK8-BPZ4>].

at the late stages of the redevelopment process.¹¹⁸ Even when the remediation and construction are complete, the mere fact that the land was formerly a brownfield may complicate the sale of property, as there tends to be a “general market resistance” with respect to these types of sites.¹¹⁹

Moreover, financial institutions may be unwilling to provide financing for development projects on brownfields out of concern that the contamination will be more costly to remediate than anticipated, thereby reducing the site’s collateral value.¹²⁰ In addition, taking title to a brownfield through foreclosure could make private lending institutions liable for cleanup costs.¹²¹ This potential exposure to liability further exacerbates lenders’ reticence to become involved in construction projects on contaminated sites. While this so-called “lender liability” was tempered by the 1996 amendments to CERCLA, it has not been completely eliminated.¹²²

(b) The Unintended Effects of Regulation: How CERCLA’s Liability Provisions Jeopardized Brownfield Redevelopment

Paradoxically, CERCLA liability has been the other factor significantly discouraging the redevelopment of brownfields.¹²³ As noted earlier, this statute—and its state equivalents—treat *current owners* of contaminated properties as potentially liable parties even if they demonstrably did not contribute to the contamination. Because developers often purchase the sites that they intend to

¹¹⁸ Heather Campbell, Hugh Ellis & John Henneberry, *Planning Obligations, Planning Practice, and Land-Use Outcomes*, 27 ENVTL. & PLAN. B: PLAN. & DESIGN 759, 770–71 (2000).

¹¹⁹ See Scott Sherman, *Government Tax and Financial Incentives in Brownfields Redevelopment: Inside the Developer’s Pro Forma*, 11 N.Y.U. ENVTL. L.J. 317, 333 (2003).

¹²⁰ See McCarthy, *supra* note 115, at 291.

¹²¹ For liability triggered by being a current owner or operator, see 42 U.S.C. § 9607(a)(1) (2018).

¹²² Section 101(20)(F)(ii) now provides that:

The term “owner or operator” does not include a person that is a lender that did not participate in management of a vessel or facility prior to foreclosure, notwithstanding that the person—

(I) forecloses on the vessel or facility; and

(II) after foreclosure, sells, re-leases (in the case of a lease finance transaction), or liquidates the vessel or facility, maintains business activities, winds up operations, undertakes a response action [. . .] if the person seeks to sell, re-lease (in the case of a lease finance transaction), or otherwise divest the person of the vessel or facility at the earliest practicable, commercially reasonable time, on commercially reasonable terms, taking into account market conditions and legal and regulatory requirements.

42 U.S.C. § 9601(20)(F)(ii).

¹²³ See *supra* note 115 and accompanying text.

redevelop,¹²⁴ developers can become automatically liable for all the contamination present on the property.¹²⁵ As a result, CERCLA's liability framework, in addition to being a powerful tool to strengthen agencies' authority to require the cleanup of contaminated sites, also had the unintended effect of hindering the cleanup and redevelopment of brownfields.¹²⁶

One could question whether this effectively deters developers from targeting these types of properties. After all, if the developer is going to purchase the site to redevelop it, it will likely buy it at a discounted price to offset the cleanup costs.¹²⁷ Once the developer owns the site, it is likely to clean up the property prior to redeveloping it anyway, so being legally obligated to do so under this expansive liability approach should not, in principle, change the developer's position. This argument, however, overlooks two important complications that result from the often-limited knowledge of the nature and extent of the contamination. First, a developer may find levels of contamination that exceed its predictions, to the point of making the development project inviable economically.¹²⁸ Without landowner liability, the developer would simply be able to leave the lot vacant and, by doing so, cut its losses. Under CERCLA and state equivalent frameworks, however, the developer could be required to clean up the site anyway, which may dissuade the purchase of the brownfield in the first place.¹²⁹

Second, liability is not limited to the contamination present on the property that is being acquired. Developers could also be subject to the costs of cleaning up hazardous substances that originated at the purchased property but then migrated to

¹²⁴ Daniel B. Kohlhepp, *The Real Estate Development Matrix* 11 (Amer. Real Estate Soc'y Annual Meeting, Paper No. 299, 2012), <https://www.ccimef.org/pdf/2012-299.The-Real-Estate-Development-Matrix.4-21-12.pdf> [<https://perma.cc/UCK8-BPZ4>].

¹²⁵ See *supra* Section I.A.2.

¹²⁶ See Jessica Higgins, *Evaluating the Chicago Brownfields Initiative: The Effects of City-Initiated Brownfield Redevelopment on Surrounding Communities*, 3 NW. J.L. & Soc. POL'Y. 240, 242–44 (2008).

¹²⁷ See Hula & Bromley-Trujillo, *supra* note 115, at 277 (noting that developers tend to purchase brownfields at a lower cost).

¹²⁸ The construction of Inter Miami's future soccer stadium in its projected location, for example, became unclear after additional contamination was found on the property. See Joey Flechas, *Report on Beckham Stadium Site Shows Soil Contaminated by Unsafe Levels of Arsenic*, MIAMI HERALD (Aug. 8, 2019, 9:43 PM), <https://www.miamiherald.com/news/local/community/miami-dade/article234162647.html> [<https://perma.cc/4JCF-5WYY>] (While team officials initially “estimated the cleanup would cost in the range of \$35 million . . . officials have more recently estimated the cost could reach \$50 million. The true number and its feasibility won't be known until all parties consult with DERM to develop a cleanup plan.”).

¹²⁹ The enforcement risk may actually increase as a result of the transaction, given that some states require notice of the transfer of sites that may present a risk of contamination. See, e.g., N.J. STAT. ANN. § 13:1K-9(a) (West 2009); see also Revesz, *supra* note 83, at 605–06 (explaining the disclosure obligations under New Jersey law when an industrial establishment is transferred).

other sites.¹³⁰ For example, let us say that a developer buys Brownacre from Landowner and, while Landowner held title to the property, there was a release of hazardous substances that spread to a neighboring property, Greenacre. As the current owner of Brownacre, the developer could be held liable for the contamination of Greenacre. Thus, CERCLA-type liability can alter the developer's original plans by requiring it to clean up more contamination than would have been strictly necessary to develop the site it purchased.

To try to address these and other issues, CERCLA's 1986 amendments incorporated a liability defense for certain owners who were justifiably unaware of the existence of contamination at the time they purchased the site—the so-called “innocent landowner defense.”¹³¹ This mechanism, however, has very important limitations that make it unsuitable to effectively address liability concerns in the context of brownfield redevelopment. Chief among these limitations is the requirement that the buyer “did not know and had no reason to know of” the contamination.¹³² As a result, the innocent landowner defense does not cover many of today's real estate purchasers, who often knew of the site's potential contamination and bought it with the intention of cleaning it up and then developing it.¹³³ As explained in detail in Section II.A.1, CERCLA's 2002 amendments created

¹³⁰ Section 107(a)(4) of CERCLA imposes liability, among others, on owners of the property “from which there is a release” but does not limit the extent of that liability to the contamination that is presently on that site. If the contamination originates at a site and later migrates, the owner of the property where the initial release of hazardous substances took place is responsible for the cleanup of properties contaminated by the released substances. *See* 42 U.S.C. § 9607(a)(4) (2018); *Castaic Lake Water Agency v. Whittaker Corp.*, 272 F. Supp. 2d 1053, 1069 (C.D. Cal. 2003) (finding new owner liable for contamination that previous owner caused and that migrated to other sites); Jasmine M. Starr, *Making Good Neighbors: Liability for Passive Migration of Hazardous Waste Under CERCLA*, 31 *ECOLOGICAL L.Q.* 435, 450–51 (2004) (summarizing the facts and conclusions of the court in *Castaic Lake Water Agency v. Whittaker Corporation*).

¹³¹ Luis Inaraja Vera, *Compelled Costs Under CERCLA: Incompatible Remedies, Joint and Several Liability, and Tort Law*, 17 *VT. J. ENVTL. L.* 394, 399 (2016). This defense was carved into the preexisting “third party” defense. *See* Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, § 101(f), 100 Stat. 1613, 1616 (1986) (codified as amended at 42 U.S.C. §§ 9601(35)(A)(i), 9607(b)(3)). Many states have also adopted CERCLA's third party and innocent landowner defenses by reference. *See, e.g.*, CAL. HEALTH & SAFETY CODE § 25323.5(b) (West 2019) (effective May 26, 1999) (“For the purposes of this chapter, the defenses available to a responsible party or liable person shall be those defenses specified in Sections 101(35) and 107(b) of [CERCLA].” (citing 42 U.S.C. §§ 9601(35), 9607(b))); N.J. STAT. ANN. § 58:10-23.11g(d)(5) (2019).

¹³² *See* 42 U.S.C. § 9601(35)(A)(i).

¹³³ This has been the object of criticism. One author in particular has referred to this defense as a “mirage.” L. Jager Smith, Jr., *CERCLA's Innocent Landowner Defense: Oasis or Mirage?*, 18 *COLUM. J. ENVTL. L.* 155, 157 (1993) (pointing out that “the innocent landowner defense provides effectively *no* reliable defense to a purchaser of real estate today” (emphasis in original)).

the “bona fide prospective purchaser” liability protection to tackle the limitations of the 1986 innocent landowner defense.¹³⁴ The 2002 liability shield, however, only offers partial protection in states that have not incorporated an equivalent defense into their statutes.¹³⁵

Part I has highlighted that, despite the increasing sophistication of environmental law over the past few decades, certain problems resist resolution—for example, ensuring the cleanup and productive use of contaminated sites. The question becomes: what have regulators done to address these and other recalcitrant environmental issues? Part II answers this question by explaining the different mechanisms that the federal government and the states have adopted, as well as their limitations.

II. ADDRESSING THIRD-GENERATION ENVIRONMENTAL PROBLEMS: THE EXPANSION OF VOLUNTARY PROGRAMS

The existence of third-generation problems, such as those described in Part I, raises the question of whether third-generation solutions are an effective way of dealing with today’s enduring environmental problems.¹³⁶ This more recent wave of regulatory tools has received a variety of names, including “new governance,” “collaborative governance,” “responsive regulation,” and “modular environmental regulation.”¹³⁷ Two important common features of third generation approaches, however, are that they seek to achieve environmental goals in a flexible and efficient manner.¹³⁸

While third-generation government initiatives can adopt multiple forms, agencies have often chosen to create programs that rely on voluntary compliance by private actors. OSHA’s Voluntary Protection Programs, for example, removed certain facilities from its routine inspection list if they implemented a health and safety management system, agreed to improve workplace safety, and passed an

¹³⁴ See Small Business Relief and Brownfields Revitalization Act of 2001, Pub. L. No. 107-118, §§ 221–222, 115 Stat. 2356, 2370–72 (2002) (codified as amended at 42 U.S.C. §§ 9601(40), 9607(r) (201802)).

¹³⁵ See *infra* Section II.A.

¹³⁶ Some scholars have answered this question in the affirmative. See Orly Lobel, *The Renew Deal: The Fall of Regulation and the Rise of Governance in Contemporary Legal Thought*, 89 MINN. L. REV. 342, 343 (2004) (“[T]here is a growing consensus in legal scholarship that innovative approaches to law, lawmaking, and lawyering are possible and necessary.”).

¹³⁷ See Light, *supra* note 43, at 153.

¹³⁸ See Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795, 798 (2005); Rena I. Steinzor, *Reinventing Environmental Regulation: The Dangerous Journey to Command to Self-Control*, 22 HARV. ENVTL. L. REV. 103, 112 (1998).

initial inspection.¹³⁹ EPA has also adopted voluntary programs, such as Performance Track and 3/50.¹⁴⁰

Another area in which voluntary programs have flourished is brownfield redevelopment. While the voluntary cleanup programs have generally received less attention from legal scholars, they are key to accelerating the cleanup of contaminated sites. As the two following subsections show, both the federal government and states have adopted multiple initiatives to deal with the brownfield problem. Although both levels of government have focused on the two main issues that hinder brownfield redevelopment—liability and economic concerns—states have been more innovative in their approach by creating a wide variety of voluntary programs.

*A. Responses to Minimize the Unintended Effects of Regulation:
Addressing New-Owner Liability*

As explained earlier, under CERCLA and other state statutes, the buyer of a brownfield can become liable for the contamination that is present on the property and also for pollution that has migrated to other sites.¹⁴¹ The practical effect of this is that the landowner can be subject to enforcement actions from the federal government and the state, as well as to cost recovery or contribution actions brought by the federal government, the state, and third parties.¹⁴² As noted above, this expansive liability framework has often discouraged developers from redeveloping brownfields.¹⁴³ To address this problem, Congress and state legislatures have created legal protections that limit this type of liability in cases where the purchaser did not contribute to the contamination on the site or its migration to other properties.

¹³⁹ See Coglianese & Nash, *supra* note 7, at 15.

¹⁴⁰ See *id.* at 12–15; Steinzor, *supra* note 138, at 109.

¹⁴¹ See *supra* Section I.B.2.b.

¹⁴² The main liability provision in CERCLA, Section 107(a), states that liable parties are liable for costs incurred by the United States Government, a state, and “any other person.” 42 U.S.C. § 9607(a)(4)(A)–(B) (2018). These entities can sue potentially responsible parties to recover costs they incur to carry out a removal or remedial action. *Id.* § 9613(g)(2). Lawsuits brought under this section are generally referred to as “cost-recovery” actions. Jeffrey M. Gaba, *The Private Causes of Action Under CERCLA: Navigating the Intersection of Sections 107(a) and 113(f)*, 5 MICH. J. ENVTL. & ADMIN. L. 117, 117–20 (2015). Section 113(f) of CERCLA allows other potentially responsible parties to bring a “contribution” action in certain cases. See 42 U.S.C. § 9613(f)(1). Moreover, the statute also contains a provision authorizing citizen suits. See *id.* § 9659. Lastly, Section 106 provides enforcement authority to the federal government in cases of “imminent and substantial endangerment to the public health or welfare or the environment.” *Id.* § 9606(a).

¹⁴³ See *supra* Section I.B.2.b.

1. Federal Liability Protections: The Bona Fide Prospective Purchaser

CERCLA's innocent landowner defense, which was introduced in the 1986 amendments, protected purchasers who did not know or had no reason to know that the property they acquired was contaminated.¹⁴⁴ This left an important gap: there was no liability protection for innocent buyers of sites with known or even suspected contamination.¹⁴⁵ Developers are often in exactly this position, so EPA responded by granting covenants-not-to-sue to purchasers of brownfields.¹⁴⁶ These covenants protected landowners from enforcement and court actions initiated by EPA, but they were limited in that they did not prevent third-party claims—such as those filed by owners of neighboring properties.¹⁴⁷

In 2002, Congress amended CERCLA and created the bona fide prospective purchaser protection with the goal of dealing with the liability concerns under that the 1986 CERCLA amendments had left unaddressed.¹⁴⁸ Since the enactment of the 2002 amendments, buyers of contaminated sites are no longer liable to the federal government, the state, or *third parties* merely by becoming owners of the property, even if they *had* knowledge of the contamination.¹⁴⁹

Of course, to avail themselves of that favorable treatment, these purchasers must meet certain conditions aimed at ensuring that the buyer (i) took the necessary steps to learn about the existence and extent of the contamination and (ii) exercised

¹⁴⁴ See *supra* Section I.B.2.b.

¹⁴⁵ As some have pointed out, “this defense has been largely illusory since most courts have ruled that if the purchaser did not discover the contamination before the transaction, it probably did not conduct a sufficient inquiry.” See Lawrence P. Schnapf, *CERCLA Amendments Create New Defenses and Obligations for Owners of Contaminated Properties*, PRAC. REAL EST. LAW., Sept. 2002, at 43–44.

¹⁴⁶ EPA tried to facilitate specific real estate transactions by providing prospective purchasers with covenants not to sue. See U.S. ENVTL. PROT. AGENCY, GUIDANCE ON AGREEMENTS WITH PROSPECTIVE PURCHASERS OF CONTAMINATED PROPERTY 3–6 (May 24, 1995), <https://www.epa.gov/sites/production/files/documents/prosper-cont-mem.pdf> [<https://perma.cc/49LF-BW39>].

¹⁴⁷ Under these covenants, EPA agreed to not pursue an enforcement action. This, however, did not affect the remedies available to third parties under federal and state law.

¹⁴⁸ Small Business Relief and Brownfields Revitalization Act of 2001, Pub. L. No. 107-118, § 222(a), 115 Stat. 2356, 2370 (2002) (codified as amended at 42 U.S.C. § 9601(40) (2018)) (requiring that “[a]ll disposal of hazardous substances at the facility occurred before the person acquired the facility.”); see *Pakootas v. Teck Cominco Metals, LTD.*, 830 F.3d 975, 982 (9th Cir. 2016) (“[T]he ‘bona fide prospective purchaser defense,’ protect[s] facility owners from liability if they can prove, *inter alia*, that they did not acquire the facility until after the ‘disposal’ of hazardous substances at the facility.” (citations omitted)).

¹⁴⁹ See 42 U.S.C. § 9607(r)(1) (“[A] bona fide prospective purchaser whose potential liability for a release or threatened release is based solely on the bona fide prospective purchaser being considered to be an owner or operator of a facility shall not be liable as long as the bona fide prospective purchaser does not impede the performance of a response action or natural resource restoration.”).

appropriate care to address the risk of further releases or migration of contaminants after acquiring the property.¹⁵⁰ In other words, the 2002 amendments' goal was to increase the incentives to buy, clean up, and redevelop brownfields, but without relaxing the liability of those who caused the contamination or allowed it to worsen.

It is worth noting that, in practice, these conditions can make it very challenging for a buyer to acquire and maintain the bona fide prospective purchaser status. In *PCS Nitrogen Inc. v. Ashley II of Charleston LLC*, for example, it took the buyer of the property, Ashley, a year to implement the measures that would have helped prevent the spread of the contamination.¹⁵¹ The Ninth Circuit concluded that Ashley had not taken "appropriate care," and that, as a result, it could not invoke the bona fide prospective purchaser protection against a claim brought by another potentially responsible party.¹⁵²

2. *Tenants, Renewable Energy on Brownfields, and CERCLA's 2018 Amendments*

As explained above, it can be complicated for landowners to meet the requirements of the bona fide prospective purchaser protection, unless they are very diligent in addressing existing contamination. However, taking advantage of this protection was previously even more challenging for another category of potentially liable parties: tenants.¹⁵³

Under the version of CERCLA preceding the 2018 amendments, *tenants* could invoke the bona fide prospective purchaser status only if their *landlord* qualified for that legal protection as well.¹⁵⁴ Thus, if the landowner was not a bona fide

¹⁵⁰ 42 U.S.C. § 9601(40)(B)(i)–(viii) (requiring, among other duties, that the purchaser conduct appropriate inquiries with respect to the potential contamination, that it exercise appropriate care with respect to contaminants on the site, and that it comply with any existing institutional controls).

¹⁵¹ 714 F.3d 161, 181 (4th Cir. 2013).

¹⁵² *Id.*

¹⁵³ Courts have often treated tenants as either owners and operators for liability purposes. See John Morris, *What Tautology?: How the Whole Act Rule Could Inform CERCLA's Ownership Definition and Limit Lessees' Liability*, 44 TEX. ENVTL. L.J. 267, 271–72 (2014) (explaining that, after *Bestfoods*, courts have imposed so-called "lessee liability" when certain conditions about control of the facility have been met, and pointing out that "courts have come up with disparate answers to the question of whether. . . the rights possessed by a lessee are sufficient to rise to the level of ownership.").

¹⁵⁴ The previous version of section 101(40) of CERCLA provided that "[t]he term 'bona fide prospective purchaser' means a person (*or tenant of a person*) that acquires ownership of a facility" and meets certain requirements. 42 U.S.C. § 9601(40) (2012) (emphasis added). Therefore, if the landowner is not a *person* who qualifies for the liability protection, a tenant of that *person* will not qualify either. See David J. Freeman, *Federal Budget Act Expands Lessees' Ability to Claim Superfund Exemption as Bona Fide Prospective Purchasers*, GIBBONS (Apr. 6, 2018), <https://www.rpelawalert.com/2018/04/06/federal-budget-act-expands-lessees-ability-to-claim-superfund-exemption-as-bona-fide-prospective-purchasers>

prospective purchaser, or if it later lost that status, the tenant would not be protected from liability either.¹⁵⁵ While this problem affected tenants of contaminated properties broadly, EPA became concerned about this issue in the context of the development of renewable energy projects on contaminated sites.¹⁵⁶ To address this gap, EPA issued a guidance document in 2012 indicating that it would use its enforcement discretion to “treat the tenant” as a bona fide prospective purchaser in instances where this protection would not have been available under the statute.¹⁵⁷ However, unlike a full legislative exemption from liability, the 2012 EPA guidance document did not protect the tenant from cost recovery or contribution claims brought by third parties.¹⁵⁸

The Consolidated Appropriations Act, which was signed into law in March of 2018, provided further liability protections for tenants of contaminated sites.¹⁵⁹ It modified the scope of the bona fide prospective purchaser protection under CERCLA to unequivocally include tenants among the parties who may qualify.¹⁶⁰ As with EPA’s 2012 guidance, one of the main drivers of the 2018 amendment was the need to expand the use of brownfields to host renewable energy production projects.¹⁶¹

Two points should be made about the 2018 amendment. First, the expanded protection is likely to offer additional comfort to tenants of contaminated sites, given that EPA’s 2012 guidance document did not, strictly speaking, limit their CERCLA

/#.Wvct1YWcGmR [<https://perma.cc/CJD7-NTLH>] (“Until now, lessees were precluded from qualifying as a BFPP unless the property owner was also a BFPP.”).

¹⁵⁵ See 42 U.S.C. § 9601(40) (2012).

¹⁵⁶ Memorandum from Cynthia Giles, Asst. Administrator, Office of Enforcement and Compliance Assurance, U.S. Env’tl. Prot. Agency & Mathy Stanislaus, Asst. Administrator, Office of Solid Waste and Emergency Response, U.S. Env’tl. Prot. Agency, to Regional Administrators, Regions I–X, U.S. Env’tl. Prot. Agency 1 (Dec. 5, 2012), <https://www.epa.gov/sites/production/files/2015-08/documents/tenants-bfpp-2012-mem-note.pdf> [<https://perma.cc/9PSQ-HVM6>].

¹⁵⁷ See *id.* at 3–4.

¹⁵⁸ For a clarification of the difference between cost recovery and contribution suits, see *supra* note 142.

¹⁵⁹ Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, 132 Stat. 348 (2018). Although less relevant for the purposes of this article, the amendment has also relaxed the standard that allows states and local governments to be exempt from liability when they acquire contaminated sites. See *id.* at Division N--BUILD Act, § 2, 132 Stat. at 1052 (codified at 42 U.S.C. § 9601(20) (2018)).

¹⁶⁰ See 42 U.S.C. § 9601(40)(A)(ii)(I) (2018) (which includes, in the amended version of this section, those “who acquire[] a leasehold interest in the facility . . .”).

¹⁶¹ *BUILD Act Alters CERCLA Liability Considerations and Funds Brownfield Redevelopment*, THOMPSON REUTERS: PRAC. L. REAL EST., Apr. 2, 2018, at 2–3 (“The BUILD Act provides much needed funding for brownfield site redevelopment efforts. It also shifts liability considerations for owners and lessees of contaminated real property, and incentivizes further renewable energy development.”).

liability.¹⁶² Stated differently, EPA’s 2012 recognition of the bona fide prospective purchaser status for a tenant only offered protection against enforcement and cost recovery actions from that federal agency.¹⁶³ The 2018 amendment, on the other hand, also protects tenants against cost recovery and contribution actions that states and third parties may bring under CERCLA.¹⁶⁴

The second point to note is that the 2018 amendment only protects against actions brought under CERCLA. As explained above, state statutes often provide an independent basis for enforcement and recovery of cleanup costs.¹⁶⁵ As a result, unless states incorporate similar protections for tenants into their statutes, state agencies will still be able to hold tenants liable for the contamination to the same extent as before the 2018 amendment.¹⁶⁶

3. *State Liability Protections: Voluntary Cleanup Programs*

A common theme explored in Section II.A of this Article is that the federal bona fide prospective purchaser status only protects potentially responsible parties against actions that arise out of CERCLA, but being designated a bona fide prospective purchaser does not foreclose imposition of liability based on state statutes. Thus, these state statutes can also have the effect of discouraging brownfield redevelopment.¹⁶⁷

What have states done to prevent the liability provisions in their own statutes from compounding the brownfield problem? Most states have taken one of two courses of action. One common approach has been to create the equivalent of CERCLA’s bona fide prospective purchaser liability protection at the state level.¹⁶⁸ Many states and at least one city, however, have chosen instead to create voluntary

¹⁶² As the document itself recognizes, the guidance merely “assist[ed] EPA personnel in exercising the Agency’s enforcement discretion [but did not] limit [] obligations under any federal, state, tribal, or local law.” Giles & Stanislaus, *supra* note 156, at 2.

¹⁶³ *See id.*

¹⁶⁴ *See* 42 U.S.C. § 9601(40)(A)(ii)(I).

¹⁶⁵ *See* Mark McIntyre, *How PlaNYC Will Facilitate Brownfield Redevelopment*, 54 N.Y. L. SCH. L. REV. 431, 435 n.17 (2010) (explaining that “[t]he [New York] Department of Environmental Conservation has broad authority to pursue parties that conduct inadequate cleanups.”).

¹⁶⁶ For an explanation of why CERCLA liability protections and defenses do not automatically limit state enforcement power, see *supra* Section I.A.3.

¹⁶⁷ *See* Pamela K. Elkow & Emilee Mooney Scott, *It’s More Than Just AAI – “Continuing Obligations” and Other Ways to Limit Purchaser Liability*, AM. BAR ASS’N 5 (Oct. 22, 2014), <https://studylib.net/doc/18665964/“continuing-obligations”-and-other-ways-to-limit-purchaser> [<https://perma.cc/Q994-U85W>].

¹⁶⁸ *See, e.g.*, KY. REV. STAT. ANN. § 224.1-415(2) (West 2019).

cleanup programs (“VCPs”).¹⁶⁹ VCPs, also known as “brownfields programs,”¹⁷⁰ aim to incentivize real estate developers to target brownfields, as these actors can be a driving force in cleaning up and putting these types of properties to productive use.¹⁷¹

VCPs incorporate multiple features of third-generation environmental tools. First, VCPs are voluntary and rely on agreements entered into between agencies and owners or prospective purchasers of brownfields.¹⁷² Second, the private sector plays a central role in this process by leading and assuming the primary financial responsibility for the cleanup and redevelopment of the sites.¹⁷³ Third, in order to obtain the involvement of the private sector, VCPs seek to provide a flexible and efficient avenue to perform the cleanups.¹⁷⁴

More specifically, the bargain typically goes as follows. The agency provides enrollees in the VCP—current owners or prospective purchasers of brownfields—with one or multiple benefits, often in the form of economic incentives or more robust liability protections under state law.¹⁷⁵ In exchange for these protections,

¹⁶⁹ See *infra* Section IV.A (describing New York City’s Voluntary Cleanup Program); Michael B. Gerrard, *New York State’s Brownfields Programs: More and Less than Meets the Eye*, 4 ALB. L. ENVTL. OUTLOOK 18, 19–20 (1999) (providing an overview of New York’s initial Voluntary Remedial Program).

¹⁷⁰ As professor David Dana explains, these two terms have become practically interchangeable. David A. Dana, *State Brownfields Programs as Laboratories of Democracy?*, 14 N.Y.U. ENVTL. L.J. 86, 86 n.2 (2005).

¹⁷¹ Eisen, *supra* note 18, at 886–87.

¹⁷² See Coglianese & Nash, *supra* note 7, at 12 (including voluntary programs in this newer wave of environmental tools); Freeman & Farber, *supra* note 138, at 909 (noting that agreement based decision-making is a key feature of modular environmental regulation).

¹⁷³ States also generally require developers to clean up the property that they purchased. See, e.g., N.C. GEN. STAT. § 130A-310.32(a)(2) (2019) (requiring that “the brownfields property will be suitable for the uses specified in the agreement while fully protecting public health and the environment”); ALA. ADMIN. CODE r. 335-15-4-.02(1)(d) (effective 2004) (“The limitation of liability provided by Code of Alabama 1975, §§ 22-30E-10 shall be contingent upon the applicant’s good faith implementation of the voluntary property assessment and/or voluntary cleanup plan as approved by the Department.”). Involvement of the private sector is also a feature of third-generation environmental initiatives. See Lobel, *supra* note 136, at 374.

¹⁷⁴ See Mark P. McIntyre, David J. Freeman, & Jesse Hiney, *City Brownfields Program Aims to Accelerate Site Cleanup*, N.Y. L.J. (Nov. 22, 2010) (explaining that the New York City Voluntary Cleanup Program offers ample eligibility for contaminated properties and provides expedited approvals). Scholars have typically viewed flexibility and efficiency as key features of third-generation environmental tools. See Lazarus, *supra* note 4, at 92 (citing Steinzor, *supra* note 138, at 103).

¹⁷⁵ While some states allow current owners to enter into VCPs or brownfields programs, other states, such as Connecticut and Georgia, allow only a “prospective purchaser” to take advantage of the liability protections. See CONN. GEN. STAT. § 32-769(a) (2019); GA. CODE ANN. § 12-8-203(b) (2019). Some have separate VCP and brownfield programs, one of which applies to current property owners while the other applies to prospective purchasers.

enrollees in the VCP must comply with a set of requirements. For example, in order to be eligible to join certain VCPs, purchasers must not have contributed to the contamination of the site—which could occur, for example, if a former operator of a property decided to buy it.¹⁷⁶ Another frequent requisite is that developers must clean up the property that they purchased, even if during the process they discover higher levels of contamination than initially expected.¹⁷⁷ If the developer still has to bear the risk of dealing with more extensive contamination than anticipated, what is, then, the utility of these liability protections? The answer is that, even if the developer must remediate the newly found contamination, liability relief provisions can still be very valuable because they will typically exempt VCP enrollees from off-site contamination (meaning hazardous substances that were released on the purchased property and subsequently migrated to other sites).¹⁷⁸

B. Addressing the Economic Barriers to Brownfield Redevelopment

Economic incentives try to address the other significant barrier to brownfield redevelopment: the additional costs associated with assessing and cleaning up the contamination, which can create a financing gap for developers.¹⁷⁹ There are many economic incentives that have been adopted, the most common being low-interest

See DEL. CODE ANN. tit. 7 § 9107 (2019) (covering VCPs in Delaware); *id.* §§ 9121–9126 (covering brownfields). When analyzing liability protections, it is important to distinguish between the full liability protection that some states offer—which also has the effect of precluding legal actions by third parties—and the practice of providing covenants not to sue—which often limit enforcement by state agencies but not by third parties. *Compare* CONN. GEN. STAT. § 32-769(i)(1) (2019) (“An applicant whose application has been accepted into the brownfield remediation and revitalization program shall not be liable to the state *or any person* for the release of any regulated substance at or from the eligible property.” (emphasis added)), *with* TENN. CODE ANN. § 68-212-224(a)(6) (2019) (requiring the fulfilment of additional conditions in order for the liability protection to prevent third-party contribution claims).

¹⁷⁶ *See, e.g.*, CONN. GEN. STAT. § 32-769(i) (2019) (limiting liability protection if the person enrolled in the program contributed to the contamination); N.H. REV. STAT. ANN. § 147-F:4.I.(b) (2019) (including not having contributed to the contamination as an eligibility criteria to enroll in the program).

¹⁷⁷ *See supra* note 173.

¹⁷⁸ *See, e.g.*, CONN. GEN. STAT. § 32-769(i) (2019) (exempting the participant in the program from liability “for the release of any regulated substance at or *from* the eligible property” (emphasis added)); N.Y. ENVTL. CONSERV. LAW § 27-1421.1 (LexisNexis 2019) (protecting those who have received a certificate of completion from liability “arising out of the presence of any contamination in, on *or emanating from* the brownfield site that was the subject of such certificate.” (emphasis added)).

¹⁷⁹ Julianne Kurdila & Elise Rindfleisch, *Funding Opportunities for Brownfield Redevelopment*, 34 B.C. ENVTL. AFF. L. REV. 479, 480, 480 n.5 (2007) (citing CHARLES BARTSCH & BARBARA WELLS, NE-MIDWEST INST., FINANCING STRATEGIES FOR BROWNFIELD CLEANUP AND REDEVELOPMENT 1, 7 (2003)).

loans, grants, and tax benefits.¹⁸⁰ When a state provides financial assistance, it typically does so in the context of a Voluntary Cleanup Program. The recipients of these economic incentives can also vary widely. The federal government generally awards grants and loans to states and municipalities, whereas states often offer economic assistance directly to developers.¹⁸¹

1. Overview of Federal Economic Incentives

The federal government has regularly provided loans, grants, and tax benefits for brownfield redevelopment. For example, the Brownfields Expensing Tax Incentive, also referred to as the Section 198 cleanup deduction, allowed taxpayers to deduct the cost of cleanup expenses.¹⁸² The success of this tax incentive—which was created in 1997 and discontinued on December 31, 2011—has been called into question. As EPA stated in a 2011 report, the cleanup deduction was not frequently used.¹⁸³ The report pointed to two main issues to explain the low popularity of the incentive: (i) the uncertainty over its availability (it lapsed five times and was then reauthorized for short periods of time);¹⁸⁴ and (ii) the fact that it could be recaptured in some instances.¹⁸⁵ Others have asserted that developers actually used the cleanup deduction more often than generally assumed, based on the high number of projects—630 in total—that were certified for the deduction across the United States.¹⁸⁶

Another brownfield redevelopment incentive program is the Small Business Liability Relief and Brownfields Revitalization Act, signed into law in 2002, which introduced a variety of federal incentives for brownfield redevelopment

¹⁸⁰ Sherman, *supra* note 119, at 338–39.

¹⁸¹ See *infra* Section IV.C.3.a.

¹⁸² U.S. ENVTL. PROT. AGENCY, A GUIDE TO FEDERAL TAX INCENTIVES FOR BROWNFIELDS REDEVELOPMENT 2–3 (2011), https://www.epa.gov/sites/production/files/2014-08/documents/tax_guide.pdf [<https://perma.cc/95LN-8P7Y>] [hereinafter U.S. ENVTL. PROT. AGENCY, BROWNFIELDS TAX INCENTIVES GUIDE].

¹⁸³ *Id.* at 3.

¹⁸⁴ See *id.* In late April of 2018, a new bill was introduced in the House—H.R. 5579, the Brownfields Redevelopment Tax Incentive Reauthorization Act of 2018—which would reauthorize this expired tax incentive for the cleanup and redevelopment of brownfields. This bill, however, is in its early stages and may experience significant changes throughout the legislative process. See Steve Dwyer, *Congress Tax Relief Proposal Good Harbinger for NYC Brownfields?*, N.Y.C. BROWNFIELD PARTNERSHIP (June 12, 2018), <https://nycbrownfieldpartnership.org/nycbp-industry-news/7842611> [<https://perma.cc/HQD6-XDQY>].

¹⁸⁵ See *id.* Recapture occurs when “an entity is required to add back a deduction or credit from a previous year to income.” Julia Kagan, *Recapture*, INVESTOPEDIA (Dec. 3, 2019), <https://www.investopedia.com/terms/r/recapture.asp> [<https://perma.cc/V966-VTJS>].

¹⁸⁶ REDEVELOPMENT ECON., THE FEDERAL BROWNFIELDS TAX INCENTIVE: CASE STUDIES AND ANALYSIS OF IMPACTS 2 (2015) (explaining that states “certified a total of 630 sites in the 14-year history of the program.”).

administered by EPA.¹⁸⁷ These include assessment grants, cleanup grants, job training grants, the revolving loan fund, and the Brownfields Area-Wide Planning program.¹⁸⁸ The direct recipients of these incentives, however, are mostly state, local, tribal governments, and certain “quasi-governmental authorities,” rather than developers.¹⁸⁹ The U.S. Department of Housing and Urban Development has also provided incentives specifically directed at brownfields, such as the Brownfields Economic Development Initiative awards.¹⁹⁰ No funds, however, have been appropriated for this latter program since 2010.¹⁹¹ In addition to brownfield-specific incentives, there are other sources of funding—e.g., tax credits for real estate projects more broadly—that could potentially be used for redevelopment projects located on brownfields.¹⁹²

2. *Recent Changes in Federal Funding for Brownfield Cleanup and Redevelopment*

The two most significant changes in federal funding for brownfield redevelopment are found in the Consolidated Omnibus Appropriations Act of

¹⁸⁷ See Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107-118, 115 Stat. 2356 (2002) (codified as amended at 42 U.S.C. §§ 9601, 9604, 9605, 9607, 9622, 9628).

¹⁸⁸ JONATHAN L. RAMSEUR, CONG. RESEARCH SERV., THE ENVIRONMENTAL PROTECTION AGENCY’S BROWNFIELDS PROGRAM: SCOPE, AUTHORITIES, AND IMPLEMENTATION 3–4 (2008); see also 42 U.S.C. §§ 9604(k), 9628(a) (2018).

¹⁸⁹ *Id.* at 3.

¹⁹⁰ *Brownfields Economic Development Initiative*, U.S. DEP’T OF HOUS. & URBAN DEV. EXCH., <https://www.hudexchange.info/programs/bedi/> [<https://perma.cc/3M4J-MMTQ>] (last visited Nov. 21, 2019) [hereinafter *Brownfields Economic Development Initiative*].

¹⁹¹ See *id.*

¹⁹² For example, the historic rehabilitation tax credit and the low-income housing tax credit could be used to redevelop certain brownfield sites. See Charlie Bartsch, *New Tax Law in Place – What Impacts on Brownfield Financing?*, BROWNFIELD LISTINGS (Jan. 11, 2018), <https://brownfieldlistings.com/blog/post/guest-post-bartsch-on-final-tax-bill-impact-to-brownfield-financing> [<https://perma.cc/X4UN-E55K>].

2018,¹⁹³ also referred to as the “Omnibus Act,”¹⁹⁴ and the Tax Cuts and Jobs Act of 2017,¹⁹⁵ commonly known as the Trump Administration’s “New Tax Law.”¹⁹⁶

The main goal of the provisions of the Omnibus Act of 2018 pertaining to brownfields is to inject flexibility into the existing grant programs. For example, under the Omnibus Act, sites that are only contaminated with petroleum are now eligible for certain types of funding even if they do not meet the conditions that the previous version of the statute required, including now allowing funding for sites that present more than a “low risk.”¹⁹⁷ The Act also now allows grants that cover characterization, assessment, and remediation, whereas the previous statute required that separate grants be awarded for characterization/assessment and remediation.¹⁹⁸ In addition to greater flexibility, the amendments also increased the maximum amounts of remediation grants from \$200,000 to \$500,000, with the possibility of reaching \$650,000 with EPA’s approval.¹⁹⁹ It is important to note, however, that the total authorization for appropriations will remain at the same level as in the previous version of the statute, i.e., \$200,000.²⁰⁰

The New Tax Law was signed into law on December 22, 2017.²⁰¹ One of the main innovations was the creation of tax benefits for projects in opportunity zones. While this incentive is not specific to brownfields, many of the opportunity zones—low-income census tracts that are designated in accordance with the statutory

¹⁹³ Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, 132 Stat. 348 (2018).

¹⁹⁴ Michael J. Quinn, *United States: The BUILD Act: Revisions to Environmental Due Diligence and Brownfields Affect Who Is Liable and How*, MONDAQ (Sept. 20, 2018), <https://www.mondaq.com/unitedstates/Environment/738120/The-BUILD-Act-Revisions-To-Environmental-Due-Diligence-And-Brownfields-Affect-Who-Is-Liable-And-How> [<https://perma.cc/K7HM-6YDS>].

¹⁹⁵ Budget Fiscal Year, 2018, Pub. L. No. 115-97, 131 Stat. 2054 (2017) (codified as amended in scattered sections of 26 U.S.C.).

¹⁹⁶ See, e.g., Darla Mercado, *Trump Wants to Extend His Tax Overhaul. What It Means for You*, CNBC (Feb. 10, 2020, 4:09 PM), <https://www.cnbc.com/2020/02/10/trump-wants-to-extend-his-tax-overhaul-what-it-means-for-you.html> [<https://perma.cc/CZT9-MHMN>].

¹⁹⁷ Compare 42 U.S.C. § 9601(39)(D)(ii)(II)(bb)(AA) (2002) (requiring that petroleum-only sites be “relatively low risk”), with 42 U.S.C. § 9601(39)(D)(ii)(II)(bb) (2018) (no longer including such a requirement).

¹⁹⁸ See Consolidated Appropriations Act, 2018, Division N—BUILD Act § 9(3), 132 Stat. at 1056 (codified as amended at 42 U.S.C. 9604(k)(4) (2018) (creating the multipurpose brownfield grants)); David J. Freeman, *Budget Act Makes Changes to Federal Brownfield Program*, GIBBONS (Apr. 10, 2018), <https://www.rpelawalert.com/2018/04/10/budget-act-makes-changes-to-federal-brownfield-program/#.Wv8peIWCgM> [<https://perma.cc/N8G6-KBUT>].

¹⁹⁹ See Consolidated Appropriations Act, 2018, Division N—BUILD Act § 8, 132 Stat. at 1055.

²⁰⁰ See *id.* § 13, 132 Stat. at 1058.

²⁰¹ Budget Fiscal Year, 2018, Pub. L. No. 115-97, 131 Stat. 2054.

procedure²⁰²—have a high concentration of contaminated sites.²⁰³ The incentives for investors include the possibility to defer tax on prior capital gains invested in opportunity zones and other mechanisms that could have favorable tax treatment when the investment is sold after ten or more years.²⁰⁴ Moreover, the Omnibus Act has not eliminated the existing tax incentives that could potentially be used for brownfields, such as the historic rehabilitation tax credits, the new markets tax credits, the low-income housing tax credits, etc.²⁰⁵ It is worth noting, however, that some of these incentives may become less valuable given the general reduction in the corporate tax rate.²⁰⁶

3. State-Level Economic Incentives Linked to VCPs

Federal incentives have helped redevelopment efforts in numerous contaminated sites.²⁰⁷ However, federal programs can only address a very limited number of brownfields in any given state every year. As a brownfield redevelopment expert put it, federal funding for these types of sites has only been “a drop in the bucket.”²⁰⁸

To fill the funding gap, many states have created their own economic incentives for brownfield redevelopment, which they often provide to enrollees in their Voluntary Cleanup Programs.²⁰⁹ The State of Colorado, for example, provides “a 40% tax credit on cleanup expenses up to \$750,000 and a 30% credit on cleanup

²⁰² The designation procedures include a nomination by the state and certification by the Secretary of the Treasury. *See id.* § 13823, 131 Stat. at 2183 (codified as amended at 26 U.S.C. § 1400Z-1(b)).

²⁰³ *Webinar: Opportunity Zones - Spurring Brownfields Revitalization with the New Tax Law*, CTR. FOR CREATIVE LAND RECYCLING, <https://www.cclr.org/civicrm/event/info?reset=1&id=246> [<https://perma.cc/W55R-VV2P>] (last visited May 18, 2018) (implying the overlap between opportunity zones and corridors of contaminated properties).

²⁰⁴ *See* Budget Fiscal Year, 2018 § 13823, 131 Stat. at 2183 (codified as amended at 26 U.S.C. § 1400Z-2(b), (c)).

²⁰⁵ *See supra* note 192 and accompanying text.

²⁰⁶ *See* Bartsch, *supra* note 192.

²⁰⁷ *See, e.g.*, REDEVELOPMENT ECON., *supra* note 186, at 6–7 (listing a number of projects that benefited from the Brownfields Expensing Tax Incentive).

²⁰⁸ Sylvia Carignan, *Trump Proposes New Funding Options for Superfund, Brownfields (I)*, BLOOMBERG ENV'T, <https://www.bna.com/trump-proposes-new-n57982088681/> [<https://perma.cc/4LBP-FRDT>] (last updated Feb. 12, 2018, 4:27 PM) (quoting Dan French, chief executive officer of Brownfield Listings).

²⁰⁹ It is important to note, however, that some of these state incentives are funded through the federal programs mentioned above. *See, e.g.*, WIS. DEP'T NAT. RES., PUB. NO. RR-753, WISCONSIN READY FOR REUSE PROGRAM: HAZARDOUS SUBSTANCE LOANS & GRANTS, <https://dnr.wi.gov/files/PDF/pubs/rr/RR753.pdf> [<https://perma.cc/M2ST-TT2Z>] (“The D[e]partment of]N[at]ural]R[esources] receives funding for this program through U.S. Environmental Protection Agency (EPA) Revolving Loan Fund grants.”).

expenses greater than \$750,000 up to \$1,500,000.”²¹⁰ Other states, including Massachusetts, New York, and Delaware, offer brownfield-specific tax credits to developers.²¹¹ Wisconsin awards grants for cleanup activities of up to \$200,000.²¹² Ohio provides “property assessment services at no cost to eligible applicants,” which must be local governments or quasi-government entities.²¹³ Indiana makes low-and-zero interest loans available to public and private parties to cover brownfield cleanup costs.²¹⁴

Part II has examined how agencies are using third-generation tools—and Voluntary Cleanup Programs in particular—to deal with complicated environmental issues. This raises three important questions: (i) are these tools effective?, (ii) how can policymakers improve them?, and (iii) which level of government is in the best position to lead these efforts? The remainder of this Article aims to advance the conversation on these three questions.

III. ASSESSING THE PERFORMANCE OF THIRD-GENERATION ENVIRONMENTAL TOOLS

As regulatory instruments become increasingly complex, so does the task of evaluating their performance. Sophisticated government programs, such as third-generation voluntary tools, often have many moving parts and are intertwined with initiatives led by other agencies.²¹⁵ Nevertheless, as is true of any other government action involving public expenditures, measuring their success is critical to ensuring that agencies use their limited economic resources wisely.

Unfortunately, there are a number of factors that complicate this task. First, third generation voluntary programs tend to have multiple goals—VCPs, for example, aim to promote fast cleanups, address environmental justice issues, ensure compliance with health standards, etc.²¹⁶ Second, measuring if the agency is

²¹⁰ See U.S. ENVTL. PROT. AGENCY, STATE BROWNFIELDS AND VOLUNTARY RESPONSE PROGRAMS 51 (2017), https://www.epa.gov/sites/production/files/2017-12/documents/state_brownfields_voluntary_response_program_report_508_11-2017_web.pdf [<https://perma.cc/5RE2-CSUG>].

²¹¹ See *id.* at 7, 13, 16.

²¹² See WIS. DEP’T NAT. RES., *supra* note 209.

²¹³ *Grant-Funded Brownfield Assistance*, OHIO ENVTL. PROT. AGENCY, http://epa.ohio.gov/derr/SABR/Grant_Assistance.aspx [<https://perma.cc/BH6L-TQUJ>] (last visited Aug. 19, 2019).

²¹⁴ *Financial Assistance*, IND. FIN. AUTH., <https://www.in.gov/ifa/brownfields/2366.htm#taxincentives> [<https://perma.cc/Q4SW-GUBY>] (last visited Aug. 19, 2019).

²¹⁵ See *infra* Section IV.C.3 (analyzing the challenges of isolating the effects of a local program when state and federal initiatives are also involved).

²¹⁶ See *infra* Section III.A.

successfully achieving each goal requires the use of different methodological approaches. These two obstacles are typically connected: the literature often fails to assess goals that, despite their importance, are more complicated to measure.²¹⁷ The next two sections delve into the practical aspects of this problem by exploring the challenges of measuring the success of VCPs.

A. Determining an Adequate Measure of Success for VCPs

Scholars and policymakers have a variety of strategies at their disposal to assess the performance of VCPs. For example, one could focus on the number of sites that have enrolled in the program and conclude that a high figure is reflective of success.²¹⁸ Other options include determining the number of sites that have been cleaned up since the inception of the program,²¹⁹ average duration of the cleanup process, or the cleanup standards reached for the sites enrolled in the VCP.²²⁰ Some scholars have even analyzed the distributional impacts of these types of programs and the variations in property values that they may have triggered.²²¹

All this information can be useful. For example, given its voluntary nature, high enrollment in a VCP may signal that participants are finding the program to be advantageous. Moreover, quick cleanups may indicate that the program is run in an efficient manner. However, these approaches neglect to evaluate one of the most critical features of a VCP: whether the program is actually spurring brownfield redevelopment.²²² Stated differently, the question is whether a VCP is actually incentivizing public and private parties to acquire, clean up, and redevelop brownfields that would otherwise remain vacant or underused; as opposed to merely increasing the benefit for those who, as a result of the market forces, were going to purchase these sites anyway.

There are other ways of framing the success of VCPs that can also lead to an overestimation of their benefits. When the parcels remediated under a VCP have been put to commercial uses, agencies sometimes argue that the program has been successful by pointing to job creation or private investment figures associated with

²¹⁷ See *infra* Section III.B.

²¹⁸ See, e.g., U.S. ENV'T PROT. AGENCY, STATE BROWNFIELDS AND VOLUNTARY RESPONSE PROGRAMS (2017), https://www.epa.gov/sites/production/files/2017-12/documents/state_brownfields_voluntary_response_program_report_508_11-2017_web.pdf [<https://perma.cc/Y46G-4CHV>] (noting the number of sites enrolled in each state VCP).

²¹⁹ See *id.* (including the number of remediated sites under each state VCP).

²²⁰ See INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 11–12.

²²¹ See, e.g., Hunter Bacot & Cindy O'Dell, *Establishing Indicators to Evaluate Brownfield Redevelopment*, 20.2 ECON. DEV. Q. 142, 154 (2006); McCarthy, *supra* note 115, at 293–94.

²²² See Sherman, *supra* note 119, at 368 (“[F]rom a policy viewpoint, the core question is whether the incentive really would spur development at a site that otherwise would not be feasible and thus would be ignored by the private sector.”).

the activities that are carried out at the site after the cleanup is complete.²²³ These types of statements contain an implied assumption about VCPs, which is that redevelopment of brownfields would not occur *but for* these programs and that, consequently, the positive effects observed can be directly attributed to the programs.²²⁴ Interestingly, this assumption is seldom proven when government agencies or scholars make statements about how a certain VCP created X number of jobs or attracted Y millions of dollars in investment.²²⁵

But, is this premise accurate or even reasonable? The scholarship on this question is extremely scarce. However, there are some basic principles that can provide some insight as to whether the claim that a given VCP is actually incentivizing brownfield redevelopment is justified. The following table captures two key scenarios that can guide this type of inquiry:

	Property Values	Cleanup Cost	Economic Incentive Provided
Scenario A (VCP more likely to spur development)	Low	High	High
Scenario B (VCP's ability to spur development is uncertain)	High	Low	Low

The premise that a significant proportion of the sites that enroll in a VCP would not be redeveloped but for the existence of the program may be accurate in some instances. In scenario A, for instance, the return on investment in brownfields may be low or even negative as a result of the land value, high cleanup costs, and the conditions of the real estate market in the area, but the economic incentives provided by the program are high. When a scenario like this occurs, a very undesirable property is being matched with a very generous incentive, and it is certainly likely that the property would not have been redeveloped without the incentive.²²⁶ However, the but-for assumption does not necessarily hold true in the reverse scenario, scenario B, when the value of the land is relatively high despite the contamination, and the financial assistance for brownfield redevelopment is modest. In this context, the need for the incentive is much lower, so it is not reasonable to simply assume that the VCP is changing developers' behavior without proof.²²⁷

²²³ See Hula & Bromley-Trujillo, *supra* note 115, at 279.

²²⁴ This assumption is implicit in statements suggesting that, by creating a VCP, "the state receives the increased tax revenue from the redevelopment, improved environmental quality for its citizens, and conserves state enforcement resources." Fortney, *supra* note 13, at 1873.

²²⁵ See Hula & Bromley-Trujillo, *supra* note 115, at 279.

²²⁶ See Sherman, *supra* note 119, at 368 (explaining that a sizeable grant has the ability to "enhance project feasibility").

²²⁷ As noted in the literature, even different developers can respond differently to the same subsidy and liability protection package, injecting additional complexity to this issue.

B. The Challenges of Measuring Whether a VCP Is Incentivizing Brownfield Redevelopment

Determining if a VCP is incentivizing brownfield redevelopment is an arduous task because agencies rarely have sufficient data to do so. As explained above, it is relatively easy to gain access to information on the number of sites enrolled in a VCP. High enrollment in a VCP is indicative of success in a very narrow sense. Robust enrollment confirms that, when given the opportunity to take advantage of this type of program, redeveloping a site under the VCP is more attractive than doing so without government intervention. This is a significant accomplishment. VCPs require the approval of certain documents by the supervising agency,²²⁸ which will inevitably delay the investigation and cleanup process. The fact that a developer is willing to take on this burden voluntarily strongly suggests that the incentives that the program offers outweigh the delay and other inconvenience that dealing with the agency may entail.²²⁹ From a public health standpoint, increasing the number of supervised cleanups is also a laudable goal, as this is likely to result in greater compliance with the applicable remediation standards and best practices.²³⁰

However, as noted above, enrollment figures alone cannot support the conclusion that the program has been successful in spurring brownfield redevelopment.²³¹ Without more information, one cannot rule out other possible explanations for high enrollment in the program. For example, the plausible possibility that most of the observed redevelopment would have also occurred without the VCP—which is likely to be true in areas where real estate markets are thriving. There are, of course, intermediate options. Thus, the VCP may have increased the redevelopment of brownfields by 20%, 50%, or any other percentage.

How, then, should we evaluate if a VCP is spurring brownfield redevelopment? Another option could be to rely on vacancy periods—the number of years during which a property was vacant before joining the program. If we are examining the

Anna Alberini et al., *The Role of Liability, Regulation and Economic Incentives in Brownfield Remediation and Redevelopment: Evidence from Surveys of Developers*, 35 REG'L SCI. & URB. ECON. 327, 349 (2005).

²²⁸ Bacot & O'Dell, *supra* note 221, at 148.

²²⁹ It is important to note, however, that in some cases the option of conducting an unsupervised cleanup may not exist, if the property has been flagged by the federal, state, or local governments as being potentially contaminated. This could occur, for example, if a previous owner reported a spill of hazardous substances in the past.

²³⁰ *EPA Principles for Greener Cleanups*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups> [<https://perma.cc/BVW7-LAEZ>] (last updated Sept. 5, 2018).

²³¹ Hula & Bromley-Trujillo, for example, conclude that data indicating that a program has been widely used “is evidence that, at a minimum, the [program] has *created* a viable market in [brownfields].” Hula & Bromley-Trujillo, *supra* note 115, at 280 (emphasis added). However, this market could have existed before the programs were put into place. *See id.*

success of a new program, long vacancy periods followed by enrollment in the VCP would seem to suggest that the program is triggering the redevelopment of sites that would otherwise still be vacant. However, the vacancy period approach presents serious limitations. First, it focuses on a particular type of brownfield: those that are vacant. The vacancy period approach does not consider sites that, while not being vacant, are underutilized because of the contamination. As explained above in Section I.B.1, these properties also fall within the scope of EPA's definition of brownfield.²³² Second, there are many reasons, other than the effect of the program, that could explain why properties that had been vacant for several years are now being redeveloped. For example, the real estate market could be rebounding after a recession. This could spur the development of properties that were not attractive to developers a few years earlier.²³³ A similar phenomenon could occur as a result of a rezoning process. If a certain area is up-zoned—meaning that higher-value or denser uses will now be permitted—sites that had been vacant for a long time could suddenly become more appealing to developers.²³⁴ In short, as with enrollment numbers, an analysis of vacancy periods alone does not provide enough information to evaluate whether a VCP is incentivizing brownfield redevelopment.

An alternative strategy would be to determine whether there has been a noticeable change in brownfield redevelopment in a particular jurisdiction since the agency launched the program. While this methodology can lead to sound conclusions, it presents a number of practical challenges. First, to make such a comparison, it is necessary to have an inventory of the existing brownfields in the jurisdiction, or a significant portion thereof. VCP enrollment data is insufficient because it provides information on which properties are, or have been, in the programs but does not indicate which brownfields have been redeveloped outside of a program or the number of brownfields that were being redeveloped before the program was created.²³⁵ Having data on the redevelopment of brownfields before the inception of the program is necessary to establish a baseline to determine whether there was a significant increase in the redevelopment rates for brownfields after the launch of a program.

Second, determining if a *particular* VCP is spurring brownfield redevelopment can be challenging due to the existence of multiple layers of incentives and regulations—federal, state, and local—that could mask or enhance the perceived

²³² See *supra* Section I.B.1.

²³³ Joseph Nguyen, *4 Key Factors that Drive the Real Estate Market*, INVESTOPEDIA, <https://www.investopedia.com/articles/mortgages-real-estate/11/factors-affecting-real-estate-market.asp> [<https://perma.cc/4MA7-JLUY>] (last updated June 25, 2019).

²³⁴ See *Up-zoning*, THE WORLD BANK, <https://urban-regeneration.worldbank.org/node/21> [<https://perma.cc/DY7B-458T>] (last visited, Aug. 19, 2019).

²³⁵ As noted in the literature, “[o]ne key difficulty in adequately evaluating brownfield programs is the lack of capacity to track the existence and redevelopment of sites.” Hula & Bromley-Trujillo, *supra* note 115, at 277. Others have also noted the difficulties of establishing a baseline for comparison. See Alberini & Segerson, *supra* note 17, at 160.

effects of the program that is being evaluated.²³⁶ Thus, it is important to have a clear understanding of the most significant incentives—in addition to those offered by the VCP that is being evaluated—that could have affected brownfield redevelopment in a certain geographic area during a given period. Part IV takes on this challenge by proposing a methodology to address these and other practical challenges.

IV. ASSESSING THE SUCCESS OF THE FIRST LOCAL VCP

In 2010, New York City created the first municipally run brownfield cleanup program.²³⁷ The City's VCP has two features that make it a particularly interesting case study. First, developers have used the program widely even though it has only been in place for ten years. Second, and most important, this VCP is a particularly good example of a program whose ability to drive development, if not tested, would be uncertain. This uncertainty results from a combination of factors: the program targets mildly contaminated sites (which tend to have lower cleanup costs), it operates in a geographic area with high property values, and it provides relatively low economic incentives. As explained above, this is the type of context—scenario-B-type cases—in which it is a priori unclear whether the VCP would have an impact on the redevelopment rate of brownfields.²³⁸

A. NYC's Voluntary Cleanup Program

The City's decision to create a cleanup program was, in part, in response to changes in 2005 to the administration of the New York State Brownfield Cleanup Program ("state program") that had the effect of making a large number of brownfields in New York City ineligible to enroll in the state program.²³⁹ The City programs sought to provide an alternative for these New York City sites, while also bringing new businesses and jobs, and new affordable housing and open space.²⁴⁰

The primary City program is the NYC Voluntary Cleanup Program ("NYC VCP"), which monitors the investigation, cleanup, and site management activities

²³⁶ See *supra* Part II (explaining the variety of state- and federal-level incentives for brownfield redevelopment).

²³⁷ *About OER*, N.Y.C. OFF. ENVTL. REMEDIATION, <https://www1.nyc.gov/site/oer/about/directors-message.page> [<https://perma.cc/3Y3K-UPHN>] (last visited Aug. 19, 2019).

²³⁸ See *supra* Section III.A.

²³⁹ See McIntyre et al., *supra* note 174.

²⁴⁰ THE CITY OF NEW YORK, PLANYC: PROGRESS REPORT 2014, at 11 (2014), http://www.nyc.gov/html/planyc2030/downloads/pdf/140422_PlaNYCP-Report_FINAL_Web.pdf, [<https://perma.cc/UE4E-ZVMJ>] (tracking the increase in jobs and housing correlated to city goals) [hereinafter PLANYC]; N.Y.C. OFFICE OF ENVTL. REMEDIATION, N.Y.C. VOLUNTARY CLEANUP PROGRAM, <http://www.nyc.gov/html/oer/html/voluntary-cleanup-program/vcp.shtml> [<https://perma.cc/YCE5-YYEX>] (last visited Feb. 3, 2020).

at enrolled brownfields.²⁴¹ Landowners interested in enrolling a property in the NYC VCP may file an application to the agency administering the program. Any real property within New York City with light to moderate levels of contamination is eligible to enroll in the NYC VCP, with limited exceptions, such as sites enrolled in the state cleanup program.²⁴²

The NYC VCP offers multiple incentives to its participants, including a covenant not to sue,²⁴³ a formal recognition that properties remediated under the program have achieved all applicable government cleanup standards in New York State,²⁴⁴ and grants for investigation and cleanup.²⁴⁵ The grant program is an important part of this framework. It has the stated goal of “promot[ing] the cleanup and redevelopment of brownfield properties in the city of New York.”²⁴⁶ The grant amounts, however, are rather modest. Although the maximum grant that a project may receive varies depending on the type of project—and, in some instances, the type of developer—the following figures are illustrative of the order of magnitude of these economic incentives. The standard grant has two caps, the highest being \$35,000.²⁴⁷ The maximum amount that a project may claim—if it meets the criteria to be considered a “city-supported development”²⁴⁸—was initially set at \$100,000

²⁴¹ Site management activities have the goal of minimizing exposure to the contaminants that remain at the site after cleanup. *See* 14 R.C.N.Y. § 43-1402.eee (2020).

²⁴² Sites with light to moderate levels of contamination include those with “detectable levels of contamination, the presence of which does not require an applicant or enrollee to conduct any mandatory, governmental-supervised investigation or remediation of the contamination under any state or federal law.” N.Y.C. ADMIN. CODE § 24-902 (2019). Other exceptions include sites that contain petroleum, listed in certain state and federal registries, or subject to enforcement actions. *See* 14 R.C.N.Y. § 43-1403 (2020); N.Y.C. ADMIN. CODE § 24-902 (2019).

²⁴³ *See infra* Section V.B.

²⁴⁴ *See* 14 R.C.N.Y. § 43-1429(b) (2020) (defining “green property certification”).

²⁴⁵ *See id.* § 43-1415 to -1423.

²⁴⁶ *Id.* § 43-1415(a).

²⁴⁷ *See id.* § 43-1422.c.1, Schedule A. The amount can reach \$50,000 if the applicant is a not-for-profit developer or a developer of a residential building where all units are affordable. *See id.* § 43-1422.c.2.

²⁴⁸ City-supported development properties are those:

[A]t publicly-owned sites, at affordable and/or supportive housing sites funded by the New York city department of housing preservation and development, at industrial or manufacturing development sites supported by the New York city economic development corporation or other projects receiving substantial support from the City, and at environmental tax lien sites designated by the New York city office of management and budget.

14 R.C.N.Y. § 43-1417(a), (b) (2019).

and was raised to \$250,000 in 2016.²⁴⁹ These amounts are an order of magnitude lower than the average tax credit granted under the state program, which the New York State Comptroller's Office estimated at \$9.4 million per project in 2013.²⁵⁰

B. Traditional Methods of Assessing VCPs: Enrollment

As discussed in Part III, knowing how many sites have enrolled in a VCP, while not being a particularly compelling method of measuring overall success, can still provide valuable insights on important aspects of the program. The agency running the NYC VCP, the NYC Mayor's Office of Environmental Remediation ("OER"), has reported basic figures on the program. For example, based on OER's estimates, the developments performed under the NYC VCP have yielded over 9,000 units of affordable and supportive housing and created more than 13,000 permanent jobs.²⁵¹

Obtaining more detailed data on the sites enrolled in the NYC VCP, however, has required the collection of thousands of technical documents. These datasets were built based on the data available on OER's two websites.²⁵² The number of applications in 2010 through 2017 was in excess of 560, and over 500 sites ultimately enrolled in the NYC VCP.²⁵³ These figures, when compared to other state cleanup programs, show the NYC VCP has been very broadly used. To provide some perspective, it is illustrative to examine application and enrollment data from state programs that share similar features with the NYC VCP.²⁵⁴ The New York State program was created in 2003, and as of January of 2017, the agency administering it had approved 713 applications since the program's inception.²⁵⁵ VCPs in Illinois

²⁴⁹ With the caveat that, if the project is enrolled in the NYC VCP, the site is also eligible for a \$50,000 cleanup grant. *See* 14 R.C.N.Y. § 43-1422.c.12 (2019).

²⁵⁰ THOMAS P. DINAPOLI, N.Y. STATE COMPTROLLER, BROWNFIELD RESTORATION IN NEW YORK STATE: PROGRAM REVIEW AND OPTIONS 15 (April 2013), <https://nysl.ptfs.com/awweb/pdfopener?sid=A5C1E2DDEE71D433813D51F1004C7B1BD&did=114817&fl=%2FLibrary1%2Fpdf%2F852898120.pdf> [<https://perma.cc/RV8K-M2SA>].

²⁵¹ PLAN NYC, *supra* note 240, at 11 (reporting 3,900 new affordable housing units and 6,400 jobs created from 2011 to 2014 as a result of the VCP program); THE CITY OF NEW YORK, PROGRESS REPORT: ONE NYC 2018, at 71 (2018), https://onenyc.cityofnewyork.us/wp-content/uploads/2018/04/OneNYC_Progress_2018-2.pdf [<https://perma.cc/9X5H-LEDY>] (reporting an increase of 5,200 units and 7,000 jobs from 2014 to 2018 as a result of the VCP program).

²⁵² *Voluntary Cleanup Program*, N.Y. DEP'T OF ENVTL. CONSERVATION, <https://www.dec.ny.gov/chemical/8442.html> [<https://perma.cc/HYA7-2MET>] (last visited Jan. 13, 2020).

²⁵³ INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 6.

²⁵⁴ The New York State, Illinois, and Ohio VCPs are similar to the NYC VCP in that they are voluntary, they provide economic incentives, and they include assurances that those who remediate sites under the program will either enjoy liability protections or a lower likelihood of enforcement.

²⁵⁵ *See* U.S. ENV'T PROT. AGENCY, STATE BROWNFIELDS AND VOLUNTARY RESPONSE PROGRAMS 13 (2017), <https://www.epa.gov/sites/production/files/2017-12/documents/state>

and Ohio were launched in the 1990s but had enrolled 799 and 655, respectively, as of January 1, 2017.²⁵⁶

The duration of the cleanup can also shed some light on whether a particular program is being administered efficiently. How swiftly the process moves forward is generally related not only to the duration of the cleanup activities but also to the amount of time that the agency supervising the remediation takes to grant the approval of the different documents that the developer is required to generate at the various stages of the process. As explained in detail elsewhere, it takes an NYC VCP enrollee approximately 21 months on average to complete the cleanup, compared to almost 58 months under the state program.²⁵⁷ To make a fair comparison, however, it is important to note that sites in the state program tend to be more contaminated than NYC VCP sites, and therefore may require more extensive remediation.²⁵⁸

C. Has the NYC VCP Spurred Redevelopment?

The metrics examined above, while impressive and useful, do not address a key question that many VCPs raise: Is the program, in addition to recruiting enough enrollees, driving the redevelopment of contaminated sites? One of the main goals of VCPs generally is to promote the redevelopment of brownfields that, in the absence of these programs, would be left vacant or underused.²⁵⁹ As the City has made clear on multiple occasions, the NYC VCP is no exception.²⁶⁰ This Section addresses this question by examining if the redevelopment rate of brownfields in

[_brownfields_voluntary_response_program_report_508_11-2017_web.pdf](https://perma.cc/5RE2-CSUG) [https://perma.cc/5RE2-CSUG].

²⁵⁶ See *id.* at 32, 36; *Site Remediation Program Database Search*, ILL. ENVTL. PROT. AGENCY, <http://www.epa.illinois.gov/topics/cleanup-programs/bol-database/srp/index> [https://perma.cc/ZET2-9QGQ] (last visited Jan. 13, 2020).

²⁵⁷ INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 12.

²⁵⁸ *Id.* at 11.

²⁵⁹ See Sherman, *supra* note 119, at 317 (“Recognizing the need to secure the cleanup of historic contamination and spur the redevelopment of underutilized sites, government policy-makers have sought to reform the regulatory framework under which brownfield issues are addressed.”).

²⁶⁰ See, e.g., *About: Director’s Message*, N.Y.C. OFF. ENVTL. REMEDIATION, <https://www1.nyc.gov/site/oer/about/directors-message.page> [https://perma.cc/3Y3K-UPHN] (last visited, Aug. 19, 2019) (“The New York City Mayor’s Office of Environmental Remediation (OER) is a team of scientists and engineers that design and operate programs to promote the cleanup and redevelopment of vacant contaminated land in NYC.”); Stu Loeser & John Gallagher, *Mayor Bloomberg Presents PlaNYC: A Greener, Greater New York*, CITY OF N.Y. (Apr. 22, 2007), <https://www1.nyc.gov/office-of-the-mayor/news/119-07/mayor-bloomberg-presents-planyc-a-greener-greater-new-york/#/0> [https://perma.cc/5639-R5ZJ] (“We propose to speed the clean-up of all 7,600 acres of brownfields still in our city – while also ensuring public health protections by developing new time-saving strategies, new city-specific remediation guidelines, and a new city brownfields office to oversee the initiatives and encourage community involvement.”).

New York City has increased since the creation of the program in 2010. This required dealing with three major issues: distinguishing brownfields from non-brownfields; defining an adequate measure of redevelopment rates; and minimizing the effects of other programs so as to adequately measure the impact of the NYC VCP on brownfield redevelopment rates.

1. Defining the Treatment and Control Groups: Which Lots Should Be Considered Brownfields?

Brownfields are usually defined very broadly as properties that are either contaminated or present a risk of contamination.²⁶¹ While there is no official list of brownfields in New York City, the City does maintain two lists of tax lots with potential environmental issues. The agency adds tax lots to these lists when they receive an E-designation or an environmental restrictive declaration (“ERD”) in the context of the City’s environmental review process,²⁶² which typically takes place when one or more lots are rezoned.²⁶³ The compilation of these lists started in the 1980s, but the vast majority of E-designations and ERDs have been added after 1999.²⁶⁴ The purpose of the two lists is to ensure that developers address the environmental issues in listed lots before they reuse or redevelop them. To achieve this goal, City regulations require that OER, the agency running the NYC VCP, grant its approval before the Department of Buildings may grant a building permit for a lot that has an E-designation or ERD.²⁶⁵

There are three types of E-designations and ERDs: hazardous materials, noise, and air quality.²⁶⁶ Lots with hazardous materials E-designations or ERDs are good

²⁶¹ *Overview of EPA’s Brownfields Program: EPA’s Brownfields and Land Revitalization Program Overview*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/brownfields/overview-epas-brownfields-program> [<https://perma.cc/94N2-3TJC>] (last visited Jan. 13, 2020).

²⁶² These two categories have, for the most part, merged into one. *See* INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 3 n.8 (“The rules before the 2012 amendment did not allow the city to place an E-designation on a lot if the applicant (of the rezoning) was also the owner. In these cases, the environmental requirements were incorporated into an environmental restrictive declaration. The 2012 amendment expanded the scope of the E-designation provisions to include lots owned by the applicant.”).

²⁶³ N.Y.C. ZONING RESOLUTION § 11-15 (2012); 15 R.C.N.Y. § 24-04 (2019). In some instances, lots may also receive an E-designation or ERD as a result of zoning actions that do not involve a formal rezoning (e.g., special permits or variances). *Id.* § 24-04.b; *see id.* § 24-03 (defining “Zoning Action”).

²⁶⁴ N.Y.C. ZONING RESOLUTION app. C, tbl.1 and tbl.2.

²⁶⁵ *See id.* § 24-08(a) (notice of satisfaction). Other options are a notice of no objection and a notice to proceed.

²⁶⁶ Hazardous materials E-designations currently include the former “underground gasoline storage tank” E-designation. The term “hazardous materials” in this article will be used to encompass both “hazardous materials” and “underground gasoline storage tank” E-designations.

proxies for brownfields. As reflected in the definition of brownfield discussed in Part I, it is the potential, not actual, presence of contamination that can deter developers from targeting these types of sites.²⁶⁷ Sites receiving an E-designation or ERD for hazardous materials are precisely that: real property that the City believes presents a reasonable risk of contamination.²⁶⁸ Therefore, the treatment group for the purposes of this Article’s analysis is defined as tax lots that received hazardous materials E-designation or ERD. For simplicity, these types of lots will be referred to as “brownfields” or “treatment” in the remainder of Part IV.

Because the overwhelming majority of hazardous materials E-designated/ERD sites are located in rezoned areas,²⁶⁹ the analysis in this Section is limited to parts of New York City that have been rezoned.²⁷⁰ Interestingly, over 80% of the sites enrolled in the NYC VCP—which could, in theory, be anywhere in the City—are located in areas rezoned between 2002 and 2016.²⁷¹ This trend is consistent with the theory that developers are enjoying the benefits of the program to develop properties that they would have developed anyway. Of course, this observation cannot be conclusively established based on the overlap alone, which is why the analysis of redevelopment trends discussed in this Section is necessary to answer whether developers are receiving a benefit for actions they would have taken anyway.

2. *Measuring Redevelopment Rates*

The estimation strategy measures variation in redevelopment rates of tax lots in rezoned areas of New York City before and after 2010—the year in which the City created the NYC VCP. A tax lot is deemed to undergo redevelopment on a particular year if the Department of Buildings granted a building permit for new construction or major alteration that year.²⁷² For each rezoned area and year, the rate of redevelopment is calculated as follows: for the treatment group, the area of brownfields—i.e., lots receiving E-designation or ERD for hazardous materials—that received a building permit on year X in rezoned area Y, divided by the total area of brownfields in rezoned area Y. The same approach is used for the control group, that is, the area of non-brownfields that received a building permit on year X in rezoned area Y divided by the total area of non-brownfields in rezoned area Y. The Appendix provides further detail on how redevelopment rates are calculated.²⁷³

²⁶⁷ See *supra* Section I.B.1.

²⁶⁸ N.Y.C. ZONING RESOLUTION § 11-15 (“The designation (E) or an environmental restrictive declaration . . . indicate that environmental requirements pertaining to *potential* hazardous materials . . . impacts have been established.” (emphasis added)).

²⁶⁹ See *supra* note 263 and accompanying text.

²⁷⁰ The analysis relies on a shapefile of areas rezoned between 2002 and 2016, which constrains our analysis to that period. However, roughly 80% of the rezonings to date have occurred within that period of time.

²⁷¹ This estimate was obtained using geographic information system mapping technology.

²⁷² Specifically, major alterations that will change use, egress, or occupancy.

²⁷³ See *infra* Appendix.

3. *Isolating the Effect of the NYC VCP*

To make an accurate estimation of how the NYC VCP may have affected the redevelopment rate of brownfields, it is critical to consider other factors that could mask or distort that effect. Given that the variations in the real estate market are accounted for because the control group is subject to these same fluctuations, the main source of distortion could come from changes in federal or state legislation or policies during the estimation period.

(a) *Federal Programs*

The most important federal brownfield redevelopment programs were introduced in 2002 by the Small Business Liability Relief and Brownfields Revitalization Act.²⁷⁴ The Act included legal protections for bona fide prospective purchasers of brownfields and the creation of economic incentives administered by the Environmental Protection Agency.²⁷⁵ However, private developers are not eligible to receive these federal incentives directly; only state, local, tribal governments, and certain “quasi-governmental entit[ies]” may do so.²⁷⁶ Therefore, in the case of New York City, fluctuations in the amounts granted by the federal government may affect the cost of maintaining the City’s programs,²⁷⁷ but they do not directly change developers’ incentives to redevelop brownfields. The same is true for the financial assistance provided by the U.S. Department of Housing and Urban Development: with very limited exceptions, the parties that are eligible to receive these types of economic incentives are state, tribal, and local governments.²⁷⁸

Another important incentive for brownfield redevelopment was the Brownfields Expensing Tax Incentive, also referred to as the “Section 198 cleanup

²⁷⁴ Pub. L. No. 107-118, 115 Stat. 2356 (2002) (codified as amended at 42 U.S.C. §§ 9601, 9604, 9605, 9607, 9622, 9628).

²⁷⁵ Assessment grants, cleanup grants, job training grants, revolving loan fund, Brownfields Area-Wide Planning program. See *Brownfields Grant Fact Sheet Search*, U.S. ENVTL. PROT. AGENCY, https://cfpub.epa.gov/bf_factsheets/ [<https://perma.cc/S6HU-8ES6>] (last visited Feb. 4, 2020) (listing the recipients of the grants, the state or territory in which the grant will be used, and the purpose of the grant).

²⁷⁶ See 42 U.S.C. § 9604(k)(1) (2018); see also *id.* § 9628(a) (discussing state response programs and the assistance to states).

²⁷⁷ Insofar as the City could have been a grantee.

²⁷⁸ *Brownfields Economic Development Initiative*, *supra* note 190. The community Development Block Grant (CDBG) “provides financial assistance to eligible cities, towns, and villages.” *Homes and Community Renewal: Community Development Block Grant*, N.Y. STATE, <https://hcr.ny.gov/community-development-block-grant> [<https://perma.cc/M2L5-FLSS>] (last visited Feb. 5, 2020). Section 108 Loan Guarantee Program assistance is granted to “public entities.” See 24 C.F.R. § 570.702 (2020). The main exception is the Sustainable Communities Regional Planning Grant program, for which non-profit organizations are also eligible.

deduction.”²⁷⁹ This program was created in 1997 and discontinued on December 31, 2011.²⁸⁰ Therefore, some years when the deduction was active fall within this Article’s study period (2002–2016). However, there is reason to believe that the expiration of the Section 198 cleanup deduction did not have an important effect on brownfield redevelopment in New York City. As EPA stated in a 2011 report, this tax incentive was not frequently used.²⁸¹ Actual usage figures for the tax incentive suggest that, while it was more broadly utilized in New York City in the last few years it was available, the number of lots for which it was claimed was small.²⁸²

(b) *State Programs*

New York State’s brownfield programs date back to 1994, with the creation of the Voluntary Cleanup Program.²⁸³ In 2003, the State launched the Brownfields Cleanup Program (“BCP”), which, unlike its predecessor, included tax credits and liability protection.²⁸⁴ In 2005 and 2006, New York State’s Department of Environmental Conservation (“DEC”) adopted two measures that drastically reduced the eligibility of New York City sites to join the state BCP. In 2005, DEC issued a guidance document limiting the BCP to properties with high contamination levels.²⁸⁵ In 2006, DEC’s new regulations excluded sites with historic fill—a type of potentially contaminated fill that is very common in New York City—from the BCP.²⁸⁶

The New York legislature also amended the BCP in 2008 to introduce caps on the tax credits associated with the program.²⁸⁷ Because this Article’s estimation strategy relies on redevelopment and not enrollment, and redevelopment takes place after the cleanup, any effect of this legislative amendment on redevelopment would be perceived, at the earliest, several months later (i.e., after the cleanup is completed). For this reason, the 2008 amendment could affect the analysis in this Article, which is based on a comparison of redevelopment rates before and after 2010. Given that the State provides information about the sites enrolled in the BCP, and enrollment is necessary to be eligible to receive tax credits, these sites have been removed from the sample altogether to minimize any effect that the 2008 amendment could have on the estimation of the effects of the NYC VCP.

²⁷⁹ See *supra* II.B.1.

²⁸⁰ U.S. ENVTL. PROT. AGENCY, BROWNFIELDS TAX INCENTIVES GUIDE, *supra* note 182, at 3.

²⁸¹ *Id.*

²⁸² Analysis of Properties Claiming Section 198 Cleanup Deduction in New York State (Feb. 5, 2013) (dataset) (on file with author).

²⁸³ DiNAPOLI, *supra* note 250, at 1.

²⁸⁴ See *id.* at 2.

²⁸⁵ McIntyre et al., *supra* note 174.

²⁸⁶ *Id.* at n. 5.

²⁸⁷ DiNAPOLI, *supra* note 250, at 2, 19.

4. *Results and Discussion*

The performance of the NYC VCP has been impressive in various respects, as enrollment and efficiency figures corroborate.²⁸⁸ As explained in more detail in the Appendix, however, the empirical estimation suggests that the redevelopment rate of brownfields in New York City did not increase in a statistically significant manner after the creation of the NYC VCP.²⁸⁹ Given that enrollment in the program is high, this finding is consistent with the theory that enrollees may be using the NYC VCP to clean up and redevelop sites that would likely be selected even in the absence of this program. These results, however, do not automatically support the conclusion that the NYC VCP is not playing a valuable role. In fact, it allows the New York City Office of Environmental Remediation to supervise the cleanup of contaminated sites that may otherwise be redeveloped without government oversight. It is important to note, however, that many of the sites enrolled in the NYC VCP would be subject to governmental control anyway given that the majority of these properties are E-designated or have received an ERD, which means they cannot receive a building permit without the environmental agency's prior approval.²⁹⁰

The reason why the NYC VCP may not be increasing the redevelopment rate of brownfields is likely to be related, at least in part, to the structure of its incentives. As explained at length below, the NYC VCP offers a covenant not to sue, but does not provide the type of stronger liability protections that some state programs—including New York State—afford their participants.²⁹¹ The relative weakness of the NYC VCP covenant may deter risk-averse developers from targeting certain types of brownfields. Moreover, the economic incentives granted by the City are substantially lower than those that the State offers to the participants in its state-level VCP. As a result, the NYC VCP subsidies may be insufficient to cover a consequential portion of the investigation and cleanup costs at many contaminated sites.

V. BROADER LESSONS FOR ENVIRONMENTAL LAW

One could conclude this Article with the analysis in Parts III and IV. While this analysis alone would be useful to policymakers, it would miss an opportunity to suggest solutions and advance the conversation on issues that arise in other areas of the law.²⁹² This Part uses the insights obtained through the analysis of NYC's VCP

²⁸⁸ See *supra* Section IV.B.

²⁸⁹ See Appendix.

²⁹⁰ See *supra* Section IV.C.1 and accompanying discussion.

²⁹¹ See *infra* Section V.B.

²⁹² See Robert L. Fischman & Lydia Barbash-Riley, *Empirical Environmental Scholarship*, 44 *ECOLOGICAL L.Q.* 767, 769 (2018) (pointing out, after a careful analysis of dozens of law review articles, that legal environmental scholarship often fails at providing useful policy recommendations that go beyond the identification of problems).

to propose a set of policy recommendations that apply broadly to voluntary programs and other third-generation tools.

A. Making Regulatory Programs More Effective: The Need for More Comprehensive Data Collection

Consistently with what numerous adaptive management scholars have stated,²⁹³ Parts III and IV of this Article strongly suggest that policymakers' ability to improve government programs is tied to how well they can evaluate the success of these programs.²⁹⁴ However, one of the most common obstacles to assessing the performance of a government program is the lack of sufficient high-quality data.²⁹⁵ Examples of how information gaps can complicate the resolution of environmental problems abound. Some of the difficulties in dealing with nonpoint sources of water pollution, for instance, are a result of insufficient data on the origin, amounts, and nature of this type of diffuse contamination.²⁹⁶

As explained below, in the brownfield context, creating accurate and up-to-date inventories of the sources and location of contaminated sites is of crucial importance. However, the quality of these inventories matters. In a 2002 amendment to CERCLA, Congress created several financial incentives for brownfield redevelopment but conditioned states' eligibility to receive certain federal grants on the inclusion of a "[t]imely survey and inventory of brownfield sites in the State" in the states' cleanup programs.²⁹⁷ The problem with the 2002 amendment was that

²⁹³ See, e.g., Robin Kundis Craig & J.B. Ruhl, *Designing Administrative Law for Adaptive Management*, 67 VAND. L. REV. 1, 22–23 (2014) (explaining that agencies should have monitoring tools and other assessment methods in place to be able to evaluate their programs); J.B. Ruhl & Robert L. Fischman, *Adaptive Management in the Courts*, 95 MINN. L. REV. 424, 429 (2010) (pointing out that "management policy must put a premium on collecting information, establishing measurements of success, monitoring outcomes, using new information to adjust existing approaches").

²⁹⁴ See *supra* Sections III.B., IV.B.

²⁹⁵ See *supra* Section III.B (noting that without enough information about the location of brownfields, it is not possible to assess the success of VCPs); Holly Doremus, *Adaptive Management as an Information Problem*, 89 N.C. L. REV. 1455, 1458 (2011) (highlighting that the feasibility of adaptive management lies on the availability of information).

²⁹⁶ See Douglas R. Williams, *When Voluntary, Incentive-Based Controls Fail: Structuring a Regulatory Response to Agricultural Nonpoint Source Water Pollution*, 9 WASH. U. J.L. & POL'Y 21, 31–32 (2002); REVESZ, ENVIRONMENTAL LAW AND POLICY, *supra* note 105, at 605.

²⁹⁷ Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. 107-118, 115 Stat. 2356, 2376 (2002); see 42 U.S.C. § 9628(a)(1)(A), (2)(A) (2018) (discussing assistance to States in the form of federal grants and the elements of a State response program including the timely survey and inventory of brownfield sites in the State).

“taking reasonable steps” to create an inventory also sufficed to qualify for these CERCLA grants.²⁹⁸

This lenient standard that required states to merely take reasonable steps towards creating inventories led to the brownfield lists that can barely be considered an inventory. Vermont’s list, for example, contains 176 active sites in the entire state as of April 2020.²⁹⁹ Connecticut’s inventory only includes sites that have received state or EPA grants or loans and sites that are enrolled in any of the state liability relief programs.³⁰⁰ In other words, Connecticut’s and Vermont’s inventories are compilations of other lists of brownfields, and they do not include the most important sites: contaminated properties that are not yet taking advantage of any program and that could be good candidates for redevelopment in the future. In defense of these states, it must be acknowledged that the challenge of creating more comprehensive inventories is that identifying and assessing contaminated sites is a laborious and expensive task.

Despite how cumbersome creating inventories of the sources and location of brownfields can be, there are three main reasons why these types of inventories can be very valuable—as long as they are comprehensive and accurate. The most straightforward advantage of brownfield inventories is that they allow policymakers, community groups, developers, and the public to know the location of the brownfields in a given jurisdiction, allowing them the potential to minimize any negative health impacts.

Of course, the utility of this information will also depend on how comprehensive the inventory is. Lists of brownfields that merely include information already available elsewhere—as with Connecticut’s inventory—may be convenient but are not contributing to the identification of new brownfield sites. New York City is a good example of how to go beyond merely unifying existing lists. The City’s Searchable Property Environmental E-Database (“SPEED”) provides access to a variety of environmental remediation information.³⁰¹ This database includes data from state and federal databases, but it also offers additional information. SPEED includes a map that contains a layer with vacant properties, specifying which of these lots are likely to present potentially contaminated fill

²⁹⁸ 42 U.S.C. § 9628(a)(1)(A)(i). Section 104(k) of CERCLA authorized grants that can be used to create these inventories. *Id.* § 9604(k)(2).

²⁹⁹ See *Vermont Environmental Research Tool: Brownfield Site List*, VT. OFF. ST. WEBSITE: AGENCY OF NAT. RES., <https://anrweb.vt.gov/DEC/ERT/Brownfields.aspx> [<https://perma.cc/7CFW-36QT>] (last visited Apr. 5, 2020) (this number excludes those sites that have already obtained a certificate of completion or where no further action is contemplated).

³⁰⁰ See *Connecticut Brownfields Inventory*, CONN. OFF. ST. WEBSITE: DEP’T OF ENERGY & ENVTL. PROT., <http://www.ct.gov/deep/cwp/view.asp?a=2715&q=488996> [<https://perma.cc/KN8T-UPDV>] (last updated Oct. 25, 2019).

³⁰¹ See *SPEED: Welcome to the SPEED Portal Help*, N.Y.C. OFF. ENVTL. REMEDIATION, https://maps.nyc.gov/moer/speed/help/public/SPEED_Portal_Help.htm [<https://perma.cc/3RHG-ULSV>] (last visited Aug. 19, 2019).

material.³⁰² More remarkably, this database includes information about sites with a potential presence of hazardous substances, regardless of whether they are vacant or not.³⁰³

The second advantage of creating comprehensive inventories of brownfields is that they can be instrumental in evaluating the success of VCPs. As explained in Section III.B, assessing the performance of VCPs requires having data that will allow a comparison of the pre- and post-program brownfield redevelopment trends. Comprehensive inventories can provide this information. For example, the list of potentially contaminated sites that New York City has been updating since the 1980s is what made it possible for the author of this Article to evaluate the effects of the NYC VCP. Another shortcoming of most brownfield lists is that they typically do not include properties that are not enrolled in a cleanup program.³⁰⁴ Non-enrolled sites could include brownfields or non-brownfields. As the empirical analysis in Part IV shows, this distinction is critical to be able to differentiate between the control and treatment groups,³⁰⁵ and account for the distortive effect that general variations in real estate development trends could have on the analysis of a particular program.³⁰⁶ Comprehensive inventories such as New York City's SPEED solve this issue by also including sites that are not enrolled in any cleanup program and further specifying whether the sites are likely to be contaminated (e.g., properties that hosted manufacturing uses in the past).

Third, comprehensive brownfield inventories can be key to ensuring broader supervision of cleanups by agencies. When a contaminated property is not part of an inventory, and thus not a known brownfield, developers often find themselves in a position to choose between two options. One option is cleaning the property up under the supervision of a government agency—perhaps by enrolling in a VCP—and the other option is to conduct a so-called “at risk” cleanup, which is not government-supervised.³⁰⁷ By identifying previously unknown brownfields, comprehensive brownfield inventories can increase the number of supervised cleanups. This is especially so when a comprehensive inventory is coupled with a mechanism that prevents the reuse or redevelopment of the property until the agency administering the program considers that the site can be safely used for its intended

³⁰² *SPEED: Layer Control Panel: Glossary: VPD Fill Properties*, N.Y.C. OFF. ENVTL. REMEDIATION, https://maps.nyc.gov/moer/speed/help/public/SPEED_Portal_Help.htm [<https://perma.cc/3RHG-ULSV>] (last visited Aug. 19, 2019).

³⁰³ As explained in Part IV, these are properties that have received hazardous materials E-designations or environmental restrictive declarations. *See supra* Section IV.C.1.

³⁰⁴ *See supra* notes 299–300 and accompanying text.

³⁰⁵ *See supra* Section IV.C.1 (describing how the control and treatment groups were defined).

³⁰⁶ *See supra* Section IV.C.3 (explaining how these distortive effects were addressed in the empirical estimation).

³⁰⁷ McIntyre, *supra* note 165, at 435. In NYC most cleanups may actually be performed “at-risk.” *See id.* (“[T]he number of at-risk cleanups routinely conducted in the city dwarfs the number of cleanups overseen by state regulators.”).

purpose—usually by finding that the property has been remediated or because cleanup is not necessary.

This raises the following question: how does an agency implement the agency review mechanism? At least two alternatives are possible. One option is to withhold building permits for sites that are included in the inventory. The agency can then lift this prohibition when it is satisfied with the cleanup or with documentation showing that the site is either not contaminated or has levels of contamination that are compatible with the future use of the property.³⁰⁸ Another option is to require similar assurances when a new owner or operator intends to acquire control of the site. So-called “transfer laws” have adopted this type of approach by relying on the former use of the property instead of on brownfield inventories to identify the sites to which the policy applies. For example, under New Jersey’s Industrial Site Recovery Act, owners or operators of “industrial establishments” may not transfer their property until it has been remediated or the agency has granted permission to proceed with the transaction.³⁰⁹

While both of these alternatives provide an avenue to ensure that a government agency supervises the cleanups, both approaches are also most effective when they rely on the information provided by a comprehensive inventory of contaminated properties. A strategy requiring the investigation of sites based solely on whether it had a particular prior use—often industrial, as some transfer laws do³¹⁰—would be overlooking many other types of potentially contaminated properties (e.g., those polluted as a result of *commercial* activities such as dry cleaning or lots that were contaminated by fill material containing hazardous substances).³¹¹

In sum, having more accurate and comprehensive data about environmental risks is of great importance. In some cases, knowing more about the location of environmental hazards can help citizens reduce their exposure. Just as importantly, by allowing for more thorough assessments of the performance of government initiatives, this information can play a crucial role in improving regulatory programs and implementing them more effectively.

³⁰⁸ This is the approach adopted by New York City with its E-designation program. See Larry Schnapf, *Property Contamination and Its Impact on Commercial Leasing in NYC*, 88 N.Y. ST. B. ASS’N J. 32, 33–35 (Feb. 2016).

³⁰⁹ See N.J. STAT. ANN. § 13:1K-9(a), (b)(1)–(2) (West 2019). See generally LARRY SCHNAPF, *MANAGING ENVIRONMENTAL LIABILITY - BUSINESS TRANSACTIONS AND BROWNFIELD REDEVELOPMENT* § 7.03 (2015) (providing a thorough analysis of the disclosure and transfer requirements in the New Jersey Industrial Site Recovery Act).

³¹⁰ See SCHNAPF, *supra* note 309.

³¹¹ For example, properties affected by the migration of off-site contaminants or sites with underground storage tanks.

*B. Lessons for Environmental Federalism: Improving the Integration
Between State and Local Programs*

Determining which level of government is best positioned to address a given environmental issue is a challenging task. Those in favor of a centralized model have cautioned against the dangers of state or local level regulation—pointing to race-to-the-bottom or agency capture concerns.³¹² Proponents of a decentralized approach to environmental regulation, on the other hand, have noted that state and local agencies tend to be closer to the problems and, as a result, are in a better position to tailor their programs to state or local conditions.³¹³ Other scholars have posited that complex environmental issues need the involvement of various levels of government, in what they have referred to as “cooperative federalism,” “cooperative localism,” or other monikers.³¹⁴

This Article makes two important contributions to this ongoing debate. First, as Part IV illustrates, the argument that tailoring programs to local conditions can justify a strong local role is especially justified in the context of VCPs. The need for local regulation can arise, for example, when state law creates a “local regulatory gap.” As explained above, New York State’s brownfields program made certain types of properties that were particularly abundant in New York City ineligible to enroll in the state’s VCP.³¹⁵ Without the creation of its local counterpart—the NYC VCP—the owners of many brownfields in the City would not have had a voluntary path to conduct agency-supervised cleanups in New York City.³¹⁶

Second, even when multiple levels of government cooperate to address an environmental problem, the success of a cooperative approach will depend on how integrated the different layers of regulation are. The remainder of this Section illustrates this point by first analyzing the challenges associated with integrating

³¹² See *supra* Section I.A.3. As commentators have explained, “[t]raditional capture theory examines the extent to which regulated industries have captured their regulators.” Bradford C. Mank, *Superfund Contractors and Agency Capture*, 2 N.Y.U. ENVTL. L.J. 34, 49 (1993).

³¹³ Adler, *supra* note 24, at 137 (noting the advantage that states have over the federal government when tailoring policies to local conditions); Davidson, *supra* note 20, at 1034 n.47 (“[E]nvironmental protection is increasingly a local government issue.”); Nolon, *supra* note 25, at 415 (“The diversity of local conditions . . . suggests that centralized approaches to environmental protection are not necessarily desirable when dealing with environmental problems.”).

³¹⁴ See Davidson, *supra* note 20, at 960 (using the term “cooperative localism”); Daniel C. Esty, *Toward Optimal Environmental Governance*, 74 N.Y.U. L. REV. 1495, 1554 (1999) (“The fact that environmental protection involves problems at various levels makes necessary a multi-tier regulatory structure with appropriate entities at the local, state, federal, and international levels.”); Snyder & Binder, *supra* note 20, at 247 (explaining that “a comprehensive approach involving multiple levels of government” is necessary to address environmental problems).

³¹⁵ See *supra* Section IV.A.

³¹⁶ See *id.*

state and local authority to provide liability protections in the context of VCPs and then suggesting strategies to navigate these complexities.

The NYC VCP is a good example of why local governments may not be able to provide enrollees in their VCPs with an adequate level of liability protections without adequate state legislation. Under the NYC VCP, sites that have received a certificate of completion under this city program receive two types of assurances. First, the City will not require further investigation or remediation at these sites, subject to certain exceptions—if necessary to protect public health or the environment, if the applicant committed fraud, or if there is a violation of the cleanup agreement.³¹⁷ Second, the New York State Department of Environmental Conservation (“NYSDEC” or “the State”) has agreed—in a memorandum entered into with New York City’s Office of Environmental Remediation—that it “does not *plan or anticipate* taking administrative or judicial enforcement action seeking to require a removal or remedial action” at NYC VCP sites.³¹⁸ However, this memorandum also states that nothing in the agreement “limits NYSDEC’s authority to take action where it deems appropriate.”³¹⁹

Given that, in general, the State is one of the most likely actors to initiate an enforcement action with respect to a contaminated site, one could easily argue that the protection afforded under the NYC VCP is not particularly robust. A comparison of the NYC VCP assurances with those provided under the *state* program supports this claim.

First, the memorandum of agreement between the State and the City notes that, while the State does not *plan* to take enforcement action with respect to NYC VCP sites, it still reserves the right to do so. In contrast, the state statute governing the protections for state program’s applicants guarantees that the “applicant shall not be liable to the state upon any statutory or common law cause of action.”³²⁰ Second, the liability exemption for the state program’s applicants goes beyond the remediated site and includes contamination that, while having originated on that site, migrated to other properties.³²¹ In other words, the owner of a site that receives a certificate

³¹⁷ N.Y.C. ADMIN. CODE § 24-906(a)(2), (b) (2019).

³¹⁸ Memorandum of Agreement Between the New York State Department of Environmental Conservation and the New York City Office of Environmental Remediation 4 (June 7, 2010) (emphasis added) [hereinafter NYC-NYSDEC MOA].

³¹⁹ *Id.*

³²⁰ See N.Y. ENVTL. CONSERV. LAW § 27-1421.1 (2020). The statute includes certain exceptions in cases of danger to public health or the environment, non-compliance with the cleanup agreement, fraud, change of use of a property with restricted use, etc. *Id.* § 27-1421.2(a).

³²¹ New York’s liability protection includes “statutory or common law causes of action arising out of . . . contamination in, on or *emanating from* the brownfield site” that receives a certificate of completion. *Id.* § 27-1421.1 (emphasis added). Participants, however, may be required to clean up off-site contamination. This higher standard is applied because these types of enrollees can be liable based on more than mere ownership of the site (e.g., they

of completion under the state program will not be required to clean up off-site contamination. Participation in the NYC VCP, however, currently provides no protection against state enforcement with respect to off-site contamination.³²²

Third, the liability protection for sites enrolled in the state program has the additional advantage of limiting third-party claims to recover cleanup costs from the enrollee in the program.³²³ The provisions governing the liability of those who obtain a certificate of completion under the NYC VCP, however, offer no third-party contribution protection. The following table summarizes the differences in liability protections between the NYC VCP and state program sites:

	Liability to State (on-site contamination)	Liability to State (off-site contamination)	Third-party contribution claims
State Program	Full legislative exemption	Full legislative exemption	Reduced by statute
NYC VCP	Assurances in memorandum of agreement	No exemption	No protection

These liability gaps can discourage developers from pursuing construction projects in contaminated sites.³²⁴ In fact, the evolution of federal law suggests that covenant-not-to-sue-type protections—like in the memorandum of agreement between the City and the State—are often perceived as insufficient. Before the

contributed to the contamination). *See id.* § 27-1405.1(a) (defining “participant” to include parties responsible through other “statutory or common law liability” principles).

³²² The memorandum of agreement notes that NYSDEC “does not plan or anticipate taking administrative or judicial enforcement action . . . at a site addressed by this Agreement,” i.e., sites enrolled in the City’s VCP, as long as sites remain in compliance with the VCP and once sites receive a certificate of completion. NYC-NYSDEC MOA, *supra* note 318, at 4 (emphasis added). Off-site contamination is not protected from liability, and indeed the agreement directs the City to coordinate with NYSDEC regarding properties where contamination came from off-site sources. *See id.*

³²³ A person who has received a certificate of completion is not liable to third parties for costs related to the contamination that has been addressed at the specific site under the state program. N.Y. ENVTL. CONSERV. LAW § 27-1421.6; Larry Schnapf, *New York Environmental Laws Affecting Commercial Leasing Transactions*, 88 N.Y. ST. B. ASS’N J. 30, 33 (2016). Obtaining a certificate of completion under the state program also protects enrollees against contribution claims filed under CERCLA. *See HLP Properties, LLC v. Consol. Edison Co. of New York*, No. 14 Civ. 01383 LGS, 2014 WL 6604741, at *4 (S.D.N.Y. Nov. 21, 2014) (citing *Niagara Mohawk Power Corp. v. Chevron U.S.A. Inc.*, 596 F.3d 112, 126 (2d Cir. 2010)).

³²⁴ ENVTL. LAW INST., *A GUIDEBOOK FOR BROWNFIELD PROPERTY OWNERS* 8–9 (1999), <https://www.eli.org/sites/default/files/eli-pubs/d9.11.pdf> [<https://perma.cc/FN69-V2BK>] (discussing liability and liability insurance for developers because of the liability challenges they face).

creation of the bona fide prospective purchaser protection, and also before it was extended to tenants in 2018, EPA issued guidance documents indicating circumstances in which it was unlikely to use its enforcement power with respect to sites owned or occupied by these types of landowners or tenants.³²⁵ Nevertheless, a legislative amendment later codified this policy to alleviate the justifiable concerns that EPA's guidance documents did not completely shield these types of potentially responsible parties from federal enforcement actions, and offered no protection against third-party claims.³²⁶

In light of CERCLA's complex covenant-not-to-sue history, why would the State be reluctant to provide liability protection for NYC VCP projects that is comparable to that offered to the state program's enrollees? A likely explanation is that there were concerns about potential risks of a local government running a type of program that had previously been administered at the state level.³²⁷ In other words, such limited liability protection probably resulted from hesitancy about whether the newly created VCP, run by an office that had just come into existence, would adequately ensure that cleanups were sufficiently protective of the environment and human health.

Regardless of whether limiting the scope of local liability protections was a reasonable approach at the time or not, there are multiple reasons that support reassessing the covenant-not-to-sue dilemma in the NYC VCP context. First, the program has been in place for over eight years, and, to the author's knowledge, there have been no reasonable public allegations that cleanups conducted under the NYC VCP were not ensuring the protection of human health or the environment. Second, the cleanup standards and guidelines that apply to remediation carried out under the NYC VCP are set by the State, not the City.³²⁸ Therefore, cleanups throughout the state must meet the same standards, regardless of whether they are performed under the state program or the NYC VCP.

Third, if a particular cleanup happens to be inadequate, the level of liability protection that the state provides already offers enough flexibility to address these types of issues. As noted above, the state still maintains its authority to require additional investigation or remediation of sites in cases where the cleanup is "no longer protective of public health or the environment," the cleanup agreement has been violated, the applicant committed fraud, or there is a "change in an environmental standard, factor, or criterion."³²⁹ Therefore, affording the same treatment to NYC VCP sites with respect to liability protection would leave the State

³²⁵ See *supra* Sections II.A.1 and II.A.2 (explaining how these defenses were recognized by statute after a period during which EPA had provided assurances that it would not bring enforcement actions).

³²⁶ See *supra* Sections II.A.1. and II.A.2.

³²⁷ This understanding is based on informal conversations with government officials. See INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 13.

³²⁸ See N.Y.C. ADMIN. CODE § 24-903(d) (2020) ("Cleanup standards and remedial selection criteria shall be consistent with standards and criteria applicable to the state brownfield cleanup program.").

³²⁹ See N.Y. ENVTL. CONSERV. LAW § 27-1421.2(a)(i)–(iv) (2019).

ample opportunity to act if a cleanup conducted under the NYC VCP were found to be substandard in any way.

Last, there are a number of benefits associated with expanding the scope of the liability protections at the local level. Stronger protections from state enforcement actions and third-party claims would be a valuable incentive for the redevelopment of any site that is eligible to join the NYC VCP. This improved liability protection, however, would be particularly advantageous for NYC VCP sites from which contamination may have migrated to other neighboring properties. As noted above, under the current framework, the State may require enrollees in the NYC VCP to remediate off-site contamination. Increasing the liability protection to match that offered to sites in the state program would solve this problem by protecting NYC VCP enrollees against enforcement actions in these situations.

It is important to note that the proposed expansion in liability protections would not necessarily entail leaving off-site contamination unaddressed. Even if enrollees in the NYC VCP would not be liable for the migrated contamination, they would still have to deal with the source of contamination, which would theoretically prevent future releases and further migration of pollutants from the site that is being remediated. Moreover, regardless of the level of liability protection, enrollees in the program are going to assess the site that is being redeveloped and share the results with the City.³³⁰ This process facilitates the identification of contaminants that present a risk of migration and allows the City and the State to become aware of the potential existence of a contamination plume that, without the involvement of a developer, may have otherwise remained unidentified.

The analysis in this Section offers an important lesson that policymakers can apply in other states. With regard to local programs specifically, if the concern is that a newly created local agency may not be able to guarantee quality cleanups, a possible solution is to grant liability protections in two stages. During the first stage, liability protections could be more modest, for example, providing a level of protection similar to that in the NYC VCP. If, after a certain period of time or a given number of cleanups, the State determines that remediations performed under the local program meet the necessary standards, the liability protections for new enrollees could be increased to match those offered under the state program.

C. Efficient Voluntary Programs: The Importance of Minimizing Delays

While efficiency is desirable in any government initiative, this feature is of critical importance when dealing with voluntary programs. Voluntary programs are viable only if they are able to recruit a sufficient number of enrollees. In addition to the financial assistance that the program may offer, potential enrollees also give significant weight to the efficiency with which the agency runs the program.

³³⁰ The regulations require that an applicant submit a copy of the “remedial investigation report and a remedial action work plan” to the city agency running the NYC VCP. *See* 14 R.C.N.Y. § 43-1404.c.3 (2019).

As the analysis in Part IV of this Article confirms, running a VCP efficiently—which includes, of course, avoiding delays—can be very useful in attracting the interest of potential new program participants. Scholars examining this question in the context of VCPs note that the delays associated with government approvals can easily deter developers from pursuing brownfield redevelopment projects.³³¹ Even when that is not the case, if the programs are truly voluntary, developers’ willingness to avoid bureaucratic delays can lead them to dodge the VCP and conduct at-risk, unsupervised cleanups instead.³³²

How, then, can policymakers make their voluntary programs more efficient? The analysis of the NYC VCP yields three very valuable insights to that effect. First, as interviews with developers, lawyers, and consultants confirm, the agency running the NYC VCP is very quick responding to requests, especially when compared to other programs.³³³ Interviewees stressed the ease with which interested parties can schedule a meeting with agency officials on short notice and, more broadly, the swiftness of the different approvals that are required to move forward with the cleanup process.³³⁴ This is one of the factors that may explain the differences observed in Part IV between the NYC VCP and the New York State program in terms of average time to cleanup completion.³³⁵

Second, interviewees have noted that the NYC VCP is very predictable and that this strength has contributed to their decision to enroll subsequent projects.³³⁶ The process starts with a pre-application meeting to discuss “the suitability of the property for participation in the program” and other strategic aspects of the remedial investigation.³³⁷ To make the process more predictable and efficient, the office administering the NYC VCP provides a set of templates of the main documents that the enrollee will need to provide throughout the process, which detail the results of the investigation as well as the remedial plan.³³⁸

Third, participation in a VCP facilitates developers’ access to financing, especially when the agency running the program supports enrollees’ efforts to secure

³³¹ See, e.g., Bacot & O’Dell *supra* note 221, at 148.

³³² See, e.g., McCarthy, *supra* note 115, at 292 (explaining how “administrative delays” during environmental reviews explained the low enrollment numbers in Ohio’s VCP).

³³³ The developers, lawyers, and consultants that were interviewed had experience with other VCPs—at least with the New York state program and, often, with other states’ VCPs.

³³⁴ INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 5.

³³⁵ See *supra* Section IV.B. Another factor that may explain this difference, however, is the lower levels of contamination present in sites enrolled in New York City’s VCP. See *supra* Section IV.A.

³³⁶ INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 5.

³³⁷ 14 R.C.N.Y. § 43-1404(a) (2019).

³³⁸ NYC Voluntary Cleanup Program, N.Y.C. OFF. ENVTL. REMEDIATION, <http://home2.nyc.gov/html/oer/html/voluntary-cleanup-program/vcp.shtml> [<https://perma.cc/E4JZ-6SJA>] (last visited Aug. 19, 2019) (“Each of the[application] documents has a well-defined template, or boilerplate, that simplifies preparation and enables predictable and timely navigation of the NYC VCP.”).

it. Enrollment in any VCP suggests that a government agency is supervising the investigation and cleanup activities. Mere enrollment, therefore, usually provides a certain level of comfort to lenders. In some cases, the issue may arise that a developer is seeking financing before formally enrolling the site in the VCP. This may raise doubts as to whether the landowner will be able to enroll the property in the VCP at all. To address this problem, the office administering the NYC VCP will often issue a “pre-VCP enrollment ‘comfort letter,’” which shows the lender that the borrower is on the right track and taking the necessary steps that will lead to the enrollment of the site in the NYC VCP.³³⁹

D. Towards Simpler Regulatory Tools: The Brownfield-Renewable Energy Link

Professor Richard Epstein, in his seminal book *Simple Rules for a Complex World*, claimed that today’s proclivity to make rules more complex has a negative impact on “the productive efficiency of the society they regulate.”³⁴⁰ As shown in Parts III and IV of this article, having intricate regulatory programs with many different goals can also complicate the task of evaluating and improving them. This Section examines these concerns in the context of so-called brightfields, the increasingly popular idea of dedicating brownfields and other contaminated sites to renewable energy production. Specifically, the question is whether cleanup programs are the right tool to incentivize this particular use, or if making VCPs more complex in that regard is undesirable.³⁴¹

1. The Notion of Brightfield

Contaminated lands have the potential of hosting sufficient renewable energy installations to meet most states’ renewable energy generation goals, and an important share of these targets could be achieved using solar energy.³⁴² To promote the installation of solar energy technologies on brownfields, the U.S. Department of Energy (“DOE”) and EPA launched the so-called “brightfields initiative” in 2000.³⁴³

³³⁹ Schnapf, *supra* note 308, at 33. The Office of Environmental Remediation also issues other types of letter, for example, when the contamination levels at the site do not require further action. *See id.*

³⁴⁰ EPSTEIN, *supra* note 11, at 307.

³⁴¹ *See* Bacot & O’Dell, *supra* note 221, at 148.

³⁴² Jacqueline L. Waite, *Land Reuse in Support of Renewable Energy Development*, 66 LAND USE POL’Y 105, 105–06, 108–09 (2017) (including in this analysis “Superfund sites, RCRA corrective action sites, Brownfield grantees, and sites that were identified through EPA’s Landfill Methane Outreach Program,” and some “state abandoned mine inventories and/or clean-up programs.”).

³⁴³ Lori Ribeiro, *Waste to Watts: A “Brightfield” Installation Has the Potential to Bring Renewed Life to a Brownfield Site*, 8 REFOCUS 46, 46 (2007); *see also* CHRISTOPHER DE SOUSA & THIERRY B. SPIESS, INST. ENVTL. SCI. & POL’Y, SUSTAINABLE BROWNFIELDS

The term “brightfield” has been used broadly to include “a ground-mounted solar array, a solar manufacturing plant, or a building with rooftop solar that is developed on a brownfield.”³⁴⁴ However, brightfield is traditionally used more narrowly to describe ground-mounted solar installations built on current or former brownfields.³⁴⁵ This Section applies this narrower definition when discussing brightfields.

One of the reasons why the term brightfields is primarily associated with ground-mounted solar arrays is that, once a building has been erected on the property, the decision of whether to install rooftop solar will generally not depend on whether the site was originally a brownfield. As a brightfields expert has expressed it, rooftop solar is “[t]he type of [solar] project [on brownfields] most likely to succeed [. . .] [because] [t]hese projects have occurred without DOE intervention [given that] it is fairly straightforward to install [a photovoltaic array] on a building, whether or not on a brownfield.”³⁴⁶ With these projects, the developer obtains the revenue generated by the building plus all the additional benefits of rooftop solar. A ground-mounted installation, on the other hand, would preclude property owners from maximizing the use of their property. The trends observed with rooftop solar also apply to other types of solar installations that are compatible with additional uses of the property, such as parking lot solar canopies. In these cases, the solar panels do not negatively interfere with the use of the property as a parking facility and can actually enhance it by providing shade to its users.³⁴⁷

2. *Should VCPs Promote the Creation of Brightfields?*

For the reasons noted in the preceding paragraph, a building with a rooftop solar installation is often going to be a superior option to a ground-mounted brightfield. A more important and thorny question, however, is whether, in the specific case of

CONSORTIUM, BROCKTON BRIGHTFIELD, BROCKTON, MASSACHUSETTS: A SUSTAINABLE BROWNFIELD REVITALIZATION BEST PRACTICE 1 (May 10, 2013), <https://brownfields.org.uic.edu/research-results/documents/BrocktonBrightfield-finalforposting-May102013.pdf> [<https://perma.cc/38KK-KRGN>] (describing the historical basis and coinage of the term “brightfield”).

³⁴⁴ See Ribeiro, *supra* note 343, at 46.

³⁴⁵ See, e.g., Steve Goodbody, *From Brownfields to Brightfields*, SOLAR POWER WORLD, (Mar. 20, 2017), <https://www.solarpowerworldonline.com/2017/03/from-brownfields-to-brightfields/> [<https://perma.cc/X78T-RNSS>] (using the term to refer to a ground-mounted brightfield in Billerica, MA); ROBERT HERSH, CTR. FOR PUB. ENVTL. OVERSIGHT, PROMOTING SOLAR POWER ON BROWNFIELDS IN BROCKTON, MASSACHUSETTS 6 (2010), <http://www.cpeo.org/pubs/Brockton.pdf> [<https://perma.cc/WZ22-LQZP>] (using the term to refer to a ground-mounted brightfield in Brockton, MA).

³⁴⁶ See Ribeiro, *supra* note 343, at 49.

³⁴⁷ *Parking Lot Solar Canopy Installation*, EMPIRE: RENEWABLE ENERGY, <http://solarbyempire.com/why-solar/solar-options/118-parking-lot-canopies> [<https://perma.cc/9DWL-N8E4>] (last visited Jan. 6, 2020).

contaminated sites, VCPs should favor brightfields over constructions with no solar panels or vice-versa. There are multiple factors that can affect the relative desirability of these two alternatives, such as the need for more distributed generation in a certain area, its solar irradiance, the prevailing land characteristics, or contamination type, etc. Therefore, there is no universal answer to this conundrum. However, the following considerations can be useful when making decisions about whether to prioritize brightfield developments.

First, neither brightfields nor non-solar constructions are better uses for brownfields per se. Brightfields have the advantage of generating energy from a renewable source, and constructions can host a virtually limitless number of socially beneficial uses and activities, including housing, commercial, and industrial uses. Thus, it is not surprising that various levels of government have created incentives for many of the different uses to which a property—brownfield or not—may be put.³⁴⁸ This has resulted in a particular balance of incentives for these various uses in each locality. Even brownfield programs already tend to reflect the priorities of a given jurisdiction—e.g., revitalizing low-income areas, creating more affordable housing, or accelerating the cleanup of brownfields located in the floodplain.³⁴⁹

Second, it is unclear that the presence of contamination should, by itself, tip the scales in favor of using contaminated sites as brightfields. One could claim that, because ground-mounted panels do not typically require as thorough a cleanup as other uses, brightfield development lowers remediation costs, making brightfields the more economical choice.³⁵⁰ However, the savings are not always going to be substantial. For one thing, a building used for industrial or commercial purposes may not necessitate a complete cleanup either.³⁵¹ For another, mounting solar panels on contaminated land can present a variety of issues that may affect the total cost of the solar installation.³⁵² The potential for ground disturbance is a key complication that

³⁴⁸ These include, for example, incentives to promote new manufacturing uses or housing. *See* N.Y.U. FURMAN CTR., THE EFFECTS OF THE LOW-INCOME HOUSING TAX CREDIT (LIHTC) 1 (2017) (describing the basic features of the “largest federal subsidy for the development and preservation of affordable housing.”); Vicki Been, “Exit” as a Constraint on Land Use Exactions: Rethinking the Unconstitutional Conditions Doctrine, 91 COLUM. L. REV. 473, 513–14 (1991) (explaining the various mechanisms that many states have in place to attract industrial activity).

³⁴⁹ *See, e.g.*, 14 R.C.N.Y. §§ 43-1417(a), (b) (2020) (providing higher grants for development projects “on publicly-owned sites, at affordable and/or supportive housing” and on “designated coastal flood zone[s].”).

³⁵⁰ *See* Warren, *supra* note 33 at 2 (“The nature of renewable energy projects is such that they often do not require full remediation.”).

³⁵¹ Under state law, commercial or industrial uses may have more permissive cleanup standards. *See, e.g.*, N.Y. COMP. CODES R. & REGS., tit. 6 § 375-6.8(b) (2019) (requiring different contaminant levels for residential, restricted-residential, commercial, and industrial uses).

³⁵² *See* Gil Hough & Chad Fairless, *Brownfield to Brightfield Initiative in Oak Ridge*, TN 3 (WM2012 Conference, Paper No. 12346, 2012) (on file with the Utah Law Review);

solar developers may have to deal with. For example, if contamination is present but has been contained or capped through “solidification, stabilization, or encasing,” the weight of solar trackers and transformers can lead to sinking, thereby compromising the integrity of the cap.³⁵³ Moreover, the degree of ground disturbance that is advisable based on the contamination at a particular site can also limit the type—or affect the cost—of the solar installations that can be used on that property.³⁵⁴

Third, all other incentives being equal, brightfields tend to be more viable in non-urban areas for two reasons: property sizes and access to light. The size of a property can have a significant impact on whether a brightfield development would be viable. Utility-scale solar energy projects, for example, generally require at least five acres of land to produce one megawatt of power, which is the threshold to be considered economically feasible.³⁵⁵ Some studies have situated the median size of brownfields at 5 acres or more.³⁵⁶ While it may not be unusual for brownfields in rural areas to meet these requirements, in densely populated urban areas brownfield sites tend to be substantially smaller. For example, the analysis in Part IV of the brownfields enrolled in the NYC VCP revealed that these sites have an average area of less than half an acre.³⁵⁷

Unobstructed access to sunlight is another critical factor for the success of any solar energy installation.³⁵⁸ For a brightfield to receive direct sunlight for as many hours as possible, shading from trees or nearby buildings must be minimized.³⁵⁹ As with the previous factor, the likelihood that a ground-mounted solar installation will be viable is lower in more densely populated areas. Even in the rare instances where an urban lot may be suffering no shading at the time the solar array is installed, densely populated areas present a higher “risk that neighbors will erect buildings or plant trees on their properties that shade the panel[s].”³⁶⁰

Although the relative undesirability of turning urban brownfields into brightfields may lead some to think that incentivizing brightfields in rural areas may

Thierry Spiess & Christopher De Sousa, *Barriers to Renewable Energy Development on Brownfields*, 18 J. ENVTL. POL’Y & PLAN. 507, 507 (2016).

³⁵³ Spiess & De Sousa, *supra* note 352, at 516.

³⁵⁴ Hough & Fairless, *supra* note 352, at 4–5.

³⁵⁵ *See id.* at 2; Rebecca R. Hernandez et al., *Solar Energy Development Impacts on Land Cover Change and Protected Areas*, 112 PROC. NAT’L ACAD. SCI. 13,579, 13,579 (2015).

³⁵⁶ Kris Wernstedt et al., *The Brownfields Phenomenon: Much Ado About Something or the Timing of the Shrewd?* 8 (Resources for the Future, Discussion Paper 04–46, 2004), <http://ageconsearch.umn.edu/record/10660?ln=en> [<https://perma.cc/G8LW-R4TZ>].

³⁵⁷ Luis Inaraja Vera, NYC Brownfields Dataset (Aug. 2018) (on file with author) [hereinafter Inaraja Vera, Dataset].

³⁵⁸ Waite, *supra* note 342, at 107.

³⁵⁹ *Transforming Brownfields to Brightfields (B2B)*, ENVTL. L. & POL’Y CTR., <http://elpc.org/b2b/> [<https://perma.cc/G8LW-R4TZ>] (last visited June 4, 2018).

³⁶⁰ Troy A. Rule, *Shadows on the Cathedral: Solar Access Laws in a Different Light*, 2010 U. ILL. L. REV. 851, 853 (2010).

be a better idea, market forces, brownfield redevelopment incentives, and the existing regulations already tend to favor the development of brightfields in non-urban locations. In fact, most brightfield success stories involve sites in low-density—often rural or exurban—areas.³⁶¹ There can be cases, however, in which the balance of incentives for these different uses is disrupted. Some municipalities, for example, have passed moratoria to halt renewable energy projects altogether while they make the necessary changes to zoning regulations to better accommodate these projects in the future.³⁶² After these moratoria are lifted, additional incentives may help these types of projects gain traction in higher density areas.

In short, this analysis shows that adding excessive complexity to VCPs to promote brightfields over other uses can be counterproductive. Brightfields are not intrinsically superior to other uses of land. Moreover, the fact that a property was or is contaminated does not necessarily make solar developments more valuable than other types of uses. There are areas—namely those with less population density—where brightfields may be particularly appealing based on the need for distributed generation or because the prevailing type of property where the panels would be installed meets certain size or light exposure requirements. Existing incentives and market forces already spur the development of brightfields in these locations. Therefore, including additional mechanisms in VCPs to incentivize brightfield development on brownfields should not be treated as the default course of action. Default preferences for brightfields will often be unnecessary, and they will also make voluntary cleanup programs overly complex and harder to evaluate.

CONCLUSION

In the current era of political polarization, voluntary programs are one of the critical tools that government agencies have at their disposal to achieve a wide array of goals. Unfortunately, policymakers often have a limited ability to improve voluntary initiatives because they lack the data to perform comprehensive assessments of these programs. This Article has shown that, in the few cases in which such information is available, a great deal can be learned from the study of voluntary environmental programs. This Article also explained the different reasons why, despite its cost, obtaining better data on environmental hazards should be a priority. The analysis of the first local Voluntary Cleanup Program yields additional insights, such as the critical role that municipal voluntary programs can play in

³⁶¹ See, e.g., HERSH, *supra* note 345, at 3–5 (describing development of a ground-mounted brightfield at a site on the outskirts of Brockton, MA, a city 20 miles south of Boston); Goodbody, *supra* note 345 (displaying photographs of ground-mounted brightfields in several suburban areas of Massachusetts).

³⁶² THE NATURE CONSERVANCY & THE ALL. FOR CLEAN ENERGY N.Y., ACCELERATING LARGE-SCALE WIND AND SOLAR ENERGY IN NEW YORK: PRINCIPLES AND RECOMMENDATIONS 9 (2017), <https://www.nature.org/content/dam/tnc/nature/en/documents/accelerating-large-scale-wind-and-solar-energy-in-new-york.pdf> [<https://perma.cc/P54L-NE5L>].

addressing local regulatory gaps. Finally, there are ways in which agencies can make voluntary environmental initiatives more efficient and remove unnecessary complexity in order to maximize enrollment.

APPENDIX: DETAILED METHODOLOGY AND RESULTS

Methodology

To estimate whether the NYC VCP has had an effect on the redevelopment rate of brownfields, we use the following econometric model³⁶³:

$$\begin{aligned}
 \text{redevelopment rate}_{ijt} &= \text{brownfield}_i + \beta_1 \text{years before rezone}_{it} \\
 &+ \beta_2 \text{years after rezone}_{it} \\
 &+ \beta_3 \text{2yrs postrezone}_{it} * \text{brownfield}_i + \beta_4 \text{post2013}_t \\
 &+ \beta_5 \text{post2013}_t * \text{2yrs postrezone}_{it} * \text{brownfield}_i + \sum_{j=1}^J \delta_j \\
 &+ \sum_{t=1}^T \delta_t \left(\text{or} + \sum_{j=1}^J \delta_{jt} \right) + \varepsilon_{ijt}
 \end{aligned}$$

In this model, “i” is the index for lots, “j” is the index for blocks or community districts, and “t” is the index for years. Only after a rezoning is there a chance that a lot will be classified as a brownfield (i.e., the lot will be E-designated or receive an ERD).³⁶⁴ In our regression sample, only those lots that were rezoned between 2002 and 2016 are included. The outcome variable is whether lot “i” in block/community district “j” received a building permit in year “t,” which measures the redevelopment rate. *Brownfield_i* is a dummy indicating whether lot “i” has ever been designated as a brownfield during the 2002–2016 period. This dummy variable captures whether the brownfield lots, regardless of having been classified as a brownfield or being classified as a brownfield in the future, tend to have higher redevelopment rates compared to the rest of the lots in the rezoned areas.

The control variables, *Years before rezone_{it}* and *Years after rezone_{it}*, capture whether redevelopments are more frequent before or after a rezoning takes place. The interaction term *2yrs postrezone_{it} * brownfield_i* indicates whether brownfields tend to have a higher redevelopment rate once they are “discovered” by

³⁶³ I owe a special thanks to Wei You for writing the equation, running the regression, and providing very valuable insights on the interpretation of the results.

³⁶⁴ See *supra* Section IV.C.1. (explaining what E-designations and ERD are and how they are assigned to lots).

the rezoning processes.³⁶⁵ We consider a two-year lag because, once a lot is designated as a brownfield, it usually takes real estate developers approximately two years to clean up the field before they can obtain a permit to develop on it.³⁶⁶ $Post2013_t$ is the time dummy that takes a value of 1 after 2013. We introduce this dummy because the NYC VCP was in effect since late 2010. Taking into account this two-year lag between the time that developers learned about the program and the time they were able to receive a building permit for a remediated property, we choose 2013 as the cutoff year. The triple interaction term, $post2013_t * 2yrs\ postrezone_{it} * brownfield_i$, is the key, which indicates whether, following a rezoning, a brownfield is more likely to be redeveloped after 2013 compared to what it was before 2013. If the NYC VCP program is effective in incentivizing redevelopment in brownfields, we should expect that $\beta_5 > 0$.

In addition to these controls, we also add neighborhood fixed effects and year fixed effects, or the interaction of the two sets of fixed effects, as controls. By including neighborhood fixed effects, the redevelopment rate for each lot is the deviation from the neighborhood's average redevelopment rate over the study period. By including year fixed effects, the redevelopment rate for each lot is the deviation from the city-wide average redevelopment rate in that year. In other words, with both neighborhood fixed effects and fixed effects simultaneously in the regressions, the outcome is normalized. We are comparing the normalized development rates for brownfields and non-brownfields all over New York City, and comparing whether such differences changed before and after 2013.

Alternatively, we also add neighborhood-by-year fixed effects into the regressions. This is the preferred comparison as it is the most granular of the four. Under this set of controls, the redevelopment rate is the deviation from the average redevelopment rate in each year in each neighborhood. That is, we are comparing the redevelopment rate of the brownfields to the rate of the other lots *within the same neighborhood in the same year*. We adopt two definitions of neighborhoods: community districts and blocks. There is a larger number of blocks than community districts.³⁶⁷ Therefore, we prefer the econometric specification with block-by-year fixed effects. Finally, in all the regressions, we weight each plot/observation by its area.

³⁶⁵ Before they are E-designated or receive an ERD, private actors can also identify whether they are potentially contaminated (and, therefore, brownfields).

³⁶⁶ See INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 12 (20.81 months on average from the time the comment period starts). This does not include the time needed to conduct a remedial investigation which, in the NYC VCP, takes place before the start of the comment period. *Id.* at 12 n. 47.

³⁶⁷ There were 13,748 blocks and 59 community districts, respectively, in NYC in 2016. See Inaraja Vera, Dataset, *supra* note 357; MAXWELL AUSTENSEN ET AL., N.Y.U. FURMAN CTR., STATE OF NEW YORK CITY'S HOUSING AND NEIGHBORHOODS IN 2016, at 141 (2016) (listing all community districts in New York City), http://furmancenter.org/files/sotc/SOC_2016_Full.pdf [<https://perma.cc/KWD8-6HAP>].

*Results***Table 1: Main Results**

VARIABLES	(1) lag2yrs	(2) lag2yrs	(3) lag2yrs	(4) lag2yrs
Years before rezoning	-0.012 (0.059)	-0.005 (0.059)	0.009 (0.189)	-0.023 (0.290)
Years after rezoning	-0.013 (0.063)	-0.034 (0.068)	0.042 (0.046)	-0.286 (0.584)
Brownfield	0.026 (0.362)	0.165 (0.356)	0.152 (0.251)	0.266 (0.236)
2-Years-Post-rezoning	-0.059 (0.152)	0.208 (0.205)	-0.085 (0.156)	1.902 (2.065)
Brownfield*2-Years-Post-rezoning	2.192*** (0.595)	2.073*** (0.579)	2.176*** (0.492)	2.419*** (0.500)
Post2013	-0.102 (0.361)		-0.066 (0.728)	
Post2013*Brownfield*2-Years-Post-rezoning	0.482 (0.713)	0.213 (0.809)	1.198* (0.650)	-0.287 (0.633)
Observations	3,500,055	3,500,055	3,501,095	3,501,095
R-squared	0.008	0.016	0.104	0.331

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 1 displays the main regression results: Column (1) reports the year fixed effects and community district fixed effects; Column (2) reports the community district-by-year fixed effects; Column (3) reports the year fixed effects and block fixed effects, and Column (4) reports the block-by-year fixed effects. Throughout the four specifications, we see that the coefficient for *Brownfield* is small and statistically insignificant. This suggests that lots that have, at any time, been designated as brownfields do not have a significantly different redevelopment rate than the other lots.

The coefficient for *2-Years-Post-rezoning* is also insignificant, suggesting that the post-rezoning years are not associated with higher or lower redevelopment rates. However, we see a large and statistically significant coefficient for *Brownfield*Post-rezoning*, which suggests that, after rezoning, the redevelopment rate in brownfields increases sharply. This could be explained by the increase in the value of the properties after they are up-zoned.³⁶⁸ The coefficient for *Post2013* is close to zero and insignificant, implying that 2013—approximately two years after

³⁶⁸ This entails a change in the zoning to allow higher-value or denser uses. See *Up-zoning*, *supra* note 234.

the creation of the NYC VCP—is not a year in which the city-wide redevelopment rate changes discontinuously.

The main coefficient of interest is for *Post2013*Brownfield*2-Years-Post-rezoning*. While we find that brownfields are much more likely to be redeveloped after a rezoning, we are interested in whether such a relationship changed around 2013, which reflects the effects of the program. Columns (1) to (4) report different results. The only significant estimated coefficient is in Column (3), in which we control for the year fixed effects and block fixed effects. Under this specification, we are comparing normalized redevelopment rates between the brownfields and non-brownfields all over the city. However, when we restrict the comparison to brownfields and their nearby non-brownfields within the same block, which is shown in Column (4), we see a negative and imprecisely estimated effect. Therefore, according to our preferred econometric specification, we do not find evidence that there is an effect of the NYC VCP on the redevelopment rate on the brownfields in NYC.

Table 2: Timing of the Effects

	(1)	(2)	(3)	(4)	(5)
VARIABLES	2010	2011	2012	2013	2014
Years before rezoning	-0.005 (0.282)	-0.017 (0.287)	-0.022 (0.289)	-0.023 (0.290)	-0.024 (0.291)
Years after rezoning	-0.265 (0.579)	-0.278 (0.582)	-0.285 (0.583)	-0.286 (0.584)	-0.288 (0.584)
Brownfield	0.267 (0.236)	0.267 (0.236)	0.266 (0.236)	0.266 (0.236)	0.266 (0.236)
2-Years-Post-rezoning	1.850 (2.065)	1.875 (2.065)	1.897 (2.065)	1.902 (2.065)	1.912 (2.065)
Brownfield*2-Years-Post-rezoning	3.708*** (0.910)	2.872*** (0.685)	2.503*** (0.586)	2.419*** (0.500)	2.315*** (0.461)
Post2010*Brownfield*2-Years-Post-rezoning	-1.813* (0.933)				

Post2011*Brownfield*2- Years-Post-rezoning	-0.850 (0.718)				
Post2012*Brownfield*2- Years-Post-rezoning		-0.372 (0.666)			
Post2013*Brownfield*2- Years-Post-rezoning			-0.287 (0.633)		
Post2014*Brownfield*2- Years-Post-rezoning				-0.069 (0.660)	
Observations	3,501,095	3,501,095	3,501,095	3,501,095	3,501,095
R-squared	0.331	0.331	0.331	0.331	0.331

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In Table 2, we examine the timing of the effect of the NYC VCP. While the program was introduced at the end of 2010 and is expected to have an effect in 2013 (assuming that the reaction time is approximately two years), it is possible that the effects of this program were felt before 2013 (if, for example, real estate developers anticipated this policy's benefits and prioritized developing brownfields immediately). The effects of this program could also become apparent after 2013 because it may have taken some time for many real estate developers to learn about this program. In short, it is possible that the NYC VCP was indeed effective when we consider a different timing.

To address this concern, we run a second set of regressions in Table 2, in which we experiment with different years—from 2010 to 2014—as the cutoff year. Throughout Table 2, we include the block-by-year fixed effects, which is our preferred specification. The coefficient of interest is on the triple interaction term. We find that, except in 2010, there are no significant changes in the redevelopment rate in brownfields following a rezoning in these cutoff years. In 2010, there is actually a significant decrease, meaning that brownfields became less likely to be redeveloped following a post-2010 rezoning than they did before 2010. In sum, there is no significantly positive effect of the NYC VCP on the redevelopment rate on the NYC brownfields in either 2013 or the neighboring years.

Tables 3 and 4: Effects in an Area with a High Concentration of NYC VCP Projects

VARIABLES	(1) lag2yrs	(2) lag2yrs	(3) lag2yrs
Years before rezoning	0.716** (0.310)	0.978* (0.568)	-0.022 (0.550)
Years after rezoning	1.656*** (0.607)	1.844*** (0.700)	0.183 (0.607)
Brownfield	0.198 (0.352)	0.836 (0.723)	0.525 (0.613)
2-Years-Post-rezoning	-1.725* (0.964)	-2.646* (1.549)	1.615 (1.501)
Brownfield*2-Years-Post-rezoning	1.506 (1.220)	2.095** (1.012)	2.897** (1.144)
Post2013	-4.433 (3.195)	-4.466 (3.072)	
Post2013*Brownfield*2-Years-Post-rezoning	1.182 (1.361)	1.520 (1.280)	-1.014 (1.377)
Observations	83,674	83,674	83,674
R-squared	0.019	0.081	0.384

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

VARIABLES	(1) 2010	(2) 2011	(3) 2012	(4) 2013	(5) 2014
Years before rezoning	0.010 (0.550)	-0.006 (0.550)	-0.022 (0.550)	-0.022 (0.550)	-0.022 (0.551)
Years after rezoning	0.238 (0.606)	0.222 (0.604)	0.182 (0.606)	0.183 (0.607)	0.184 (0.607)
Brownfield	0.518 (0.614)	0.516 (0.614)	0.524 (0.613)	0.525 (0.613)	0.525 (0.613)
2-Years-Post-rezoning	1.349 (1.530)	1.312 (1.565)	1.625 (1.543)	1.615 (1.501)	1.606 (1.507)
Brownfield*2-Years-Post-rezoning	4.036*** (1.508)	3.740** (1.507)	2.889** (1.302)	2.897** (1.144)	2.919** (1.129)
Post2010*Brownfield*2-Years-Post-rezoning	-2.137 (1.696)				
Post2011*Brownfield*2-Years-Post-rezoning		-1.975 (1.604)			
Post2012*Brownfield*2-Years-Post-			-0.725		

rezoning					
			(1.561)		
Post2013*Brownfield*2-Years-Post-rezoning				-1.014	
				(1.377)	
Post2014*Brownfield*2-Years-Post-rezoning				-1.651	
				(1.370)	
Observations	83,674	83,674	83,674	83,674	83,674
R-squared	0.384	0.384	0.384	0.384	0.384

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In Tables 3 and 4 we examine whether we can find a statistically significant effect in the geographic area in which the program has the highest concentration of enrolled projects. While New York City has 59 community districts,³⁶⁹ almost 25% of NYC VCP projects are located in one community district, Greenpoint/Williamsburg.³⁷⁰ Even in this community district, we find that the coefficient for the triple interaction term is not statistically significant, and this result holds true even if we use different years—from 2010 to 2014—as our cutoff points.

³⁶⁹ See AUSTENSEN ET AL., *supra* note 367, at 141.

³⁷⁰ See INARAJA VERA, N.Y.U. FURMAN CTR., *supra* note 21, at 7.