

ARTICLES

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Preventing Emissions from Slipping Through the Cracks: How Collaboration on New Technologies to Detect Violations and Minimize Emissions Can Efficiently Enforce Existing Clean Air Act Regulations

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ABSTRACT

The link between air pollution and poor public health is well known and has been further documented during the COVID-19 pandemic,¹ but EPA has outdated methods and rules to detect air emissions. Enforcing existing environmental regulations presents challenges because the detection and monitoring technologies identified in the regulations, or the regulation language itself, may not sufficiently identify environmental pollution, let alone complex environmental fraud. How can EPA best use new technologies and concepts to detect violations, with the intent of minimizing emissions, to improve human health and environmental outcomes during the lengthy process of drafting and publishing new regulations? As EPA's expertise lies in the promulgation and enforcement of emission standards, not in developing software fixes or manufacturing technologies to detect or address violations, collaboration with other stakeholders is important to achieve overall emission reductions. This Article identifies the need for a collaborative approach with industry and public interest groups to explicitly adopt certain technologies and methods to detect violations, and it provides supporting case studies from recent mobile and stationary source air enforcement cases illustrating that improved detection leads to industry-developed technologies that minimize emissions. If regulated entities choose to use these technologies to monitor and maintain their own compliance with the Clean Air Act, overall emissions will decrease, with a likely increase in public health. This Article recommends that all stakeholders work together to propose new detection methods and remedial technologies that EPA

¹ See, e.g., Qian Di et al., *Air Pollution and Mortality in the Medicare Population*, 376 NEW ENG. J. MED. 2513 (2017) (finding, in a nationwide cohort study involving all Medicare beneficiaries from 2000 through 2012 (sixty-one million people), significant evidence of adverse effects related to PM2.5 and ozone exposure at concentrations below the National Ambient Air Quality Standards, which was most pronounced among vulnerable populations). Air pollution has exacerbated the impact of the COVID-19 pandemic. See, e.g., Daniel Kiser et al., *SARS-CoV-2 Test Positivity Rate in Reno, Nevada: Association with PM2.5 During the 2020 Wildfire Smoke Events in the Western United States*, J. EXPOSURE SCI. & ENV'T EPIDEMIOLOGY (2021); X. Wu et al., *Air Pollution and COVID-19 Mortality in the United States: Strengths and Limitations of an Ecological Regression Analysis*, 6 SCI. ADVANCES 45 (2020).

may use to collect evidence for enforcement actions and to resolve noncompliance. These technologies may be incorporated into future regulations to improve transparency and fairness in the enforcement process, ultimately minimizing the likelihood of complex litigation that may delay remedial actions that address excessive emissions.

INTRODUCTION

Sections 113 and 203 of the Clean Air Act (CAA or the Act) authorize the enforcement of actions to address noncompliant air emissions from mobile and stationary sources.² Individual regulations identify technologies or methods for demonstrating compliance, or they refer to specific performance or reference tests in the regulation appendices that are then used by the regulated party to demonstrate compliance.³ Some regulations, promulgated in prior decades, may not reference or require currently available methods and technologies for detecting or remedying air emissions, permitting the existing emissions to slip through and avoid detection. Regulated entities may be unaware of these emissions or the potential for noncompliance with the Act, and they may even be unfamiliar with the public health impact. As described in the case studies, the Environmental Protection Agency's (EPA) scientific approach to 1) identify CAA pollutants of concern, whether volatile organic compound (VOC) emissions from natural gas operations or oxides of nitrogen (NOx) emissions from motor vehicles with embedded defeat devices, and 2) ameliorate the emissions may not be specified in EPA regulations for these applications and thus must be developed with specific defendants in the context of a civil enforcement action.

In a series of cascading events, a company may receive a formal administrative notice from EPA alleging that it has violated the Act (often styled as a Notice of Violation (NOV)) based on EPA's use of new detection technologies for air emissions; this is often an

² 42 U.S.C. §§ 7413, 7523. These statutory provisions enforce the federal regulations in 40 C.F.R. subchapters C (Air Programs) and U (Air Pollution Controls).

³ *See, e.g.*, 40 C.F.R. pt. 60 app. A-7. (Reference Method 21 for the Determination of Volatile Organic Compound Leaks is often used for compliance with New Source Performance Standards, 40 C.F.R. pt. 60, and the National Emission Standards for Hazardous Air Pollutants, 40 C.F.R. pt. 63.).

unwelcome surprise and can create a highly adversarial environment.⁴ The company receiving the NOV will likely characterize the emission evidence as not relevant and thus inadmissible,⁵ possibly claiming that the evidence is not credible and cannot withstand judicial scrutiny.⁶ The company may also claim that EPA did not provide them with fair warning of its interpretation of the regulations or that the regulations were unclear and EPA cannot hold the company responsible for its noncompliance.⁷ If the enforcement action is public, citizen suits and consumer or toxic tort actions may quickly follow an EPA-led enforcement effort, resulting in significant legal expenses for a defendant and the possibility of protracted, consolidated multidistrict litigation (MDL). A company faced with a significant enforcement action may experience a drop in stock prices.⁸

Both the regulated community and EPA have a significant incentive to find a common space for agreement because of the expense of litigation in multiple forums and the delay in remedial action minimizing air emissions. Because EPA's expertise is in assessing the

⁴ An EPA CAA Notice of Violation sent to Fiat Chrysler Automobiles N.V. and FCA U.S. LLC (FCA) on January 12, 2017, prompted the blunt late FCA CEO Sergio Marchionne to claim that the agency was "smoking illegal material." See Sam Thielman, *Fiat Chrysler Used Software to Cheat Diesel Emissions, EPA Alleges*, THE GUARDIAN, (Jan. 12, 2017), <https://www.theguardian.com/business/2017/jan/12/fiat-chrysler-diesel-emission-cheating-software-epa> [<https://perma.cc/UUA7-EKAD>].

⁵ FED. R. EVID. 401, 402. See, e.g., *United States v. W.R. Grace*, 455 F. Supp. 2d 1196 (D. Mont. 2006) (finding evidence from asbestos fibers in soil samples admissible or inadmissible depending on relevance and proposed use in mine operator's prosecution for violating the Clean Air Act).

⁶ See generally *Credible Evidence Revisions*, 62 Fed. Reg. 8314, 8316 (Feb. 24, 1997) (to be codified at 40 C.F.R. pts. 51, 52, 60, 61). The pressing questions of the reliability and accuracy of data have expanded from discussions initiated by the promulgation of the "Credible Evidence Rule" for Title V operating permit compliance certifications to other air types of monitoring. See *Clean Air Implementation Project v. EPA*, 150 F.3d 1200 (D.C. Cir. 1998) (rejecting an industry challenge to the credible evidence rule prior to an enforcement action on ripeness grounds); *Sierra Club v. Tenn. Valley Auth.*, 430 F.3d 1337 (11th Cir. 2005) (finding that data generated by continuous operating monitors at a coal-fired power plant was time-barred from establishing evidence of opacity violations).

⁷ *Gen. Elec. Co. v. EPA*, 53 F.3d 1324, 1329 (D.C. Cir. 1995). While the question of how best to handle PCB waste may seem outdated 20+ years later, the due process issue is not. See, e.g., *Wis. Res. Prot. Council v. Flambeau Mining Co.*, 727 F.3d 700, 707-08 (7th Cir. 2013) ("Informed by basic principles of due process, it is 'a cardinal rule of administrative law' that a regulated party must be given 'fair warning' of what conduct is prohibited or required of it.").

⁸ See Naomi Kresge & Richard Weiss, *Volkswagen Drops 23% After Admitting Diesel Emissions Cheat*, BLOOMBERG (Sept. 21, 2015), <https://www.bloomberg.com/news/articles/2015-09-21/volkswagen-drops-15-after-admitting-u-s-diesel-emissions-cheat> [<https://perma.cc/MJ3Q-VRU2>].

risk of specific pollutants and regulating pollutant emission levels, a collaboration with those who understand how best to eliminate, minimize, or control the emissions will inform EPA's efforts to detect noncompliance and, ultimately, minimize emissions if the regulated entity has sufficient incentive to implement reforms. This Article proposes a two-step approach to improve the efficiency of EPA's enforcement actions, leverage EPA's limited resources, and minimize potential legal challenges to a new rule: (1) collaboration among EPA, industry, academia, and environmental stakeholders for specific industry sectors to identify a technical approach to identify and ameliorate emissions that EPA may use, but is not limited to, in enforcement investigations and resolutions; and (2) regulations proposing the new detection and remedial methods. This approach balances deterrence and policing efforts with fairness among key players in a specific industry. A transparent collaboration to collect enforcement evidence will assist EPA in meeting the "burden of going forward" with the best evidence to identify violations of environmental law.⁹

I

EXISTING PRACTICES AND CONCERNS

In efforts to combat CAA noncompliance, EPA's collection of emission data necessarily includes methods and technologies that are not explicitly identified in outdated environmental regulations. High-profile examples have occurred in the context of mobile source enforcement. The U.S. Department of Justice (DOJ) has filed complaints against vehicle manufacturers alleging that manufacturers have designed their vehicles to pass the published EPA tests on the chassis dynamometer in the laboratory, but that same vehicle has increased emissions of NO_x in "real world" driving conditions.¹⁰ Manufacturers that fail to disclose engine software that affects emissions, or install devices like software algorithms that defeat emission controls in motor vehicles, have violated the prohibited acts

⁹ FED. R. EVID. 301.

¹⁰ Emission standards and test procedures are set forth in 40 C.F.R. pt. 86. Some deceptive practices are alleged in the following complaints: Complaint, United States v. Volkswagen AG, No. 3:15-md-02672 (N.D. Cal. Oct. 7, 2016); Complaint, United States v. FCA U.S. LLC, No. 2:17-cv-11633 (E.D. Mich. May 23, 2017); Complaint, United States v. Daimler AG, No. 1:20-cv-2564 (D.D.C. Sept. 14, 2020).

of Title II of the Clean Air Act.¹¹ However, there are various perspectives about the best procedures for evaluating whether real-world driving emissions are excessive. On September 25, 2015, EPA's Office of Transportation and Air Quality (OTAQ) issued a memorandum notifying light-duty diesel manufacturers that the National Vehicle and Fuel Emissions Laboratory would perform additional testing "using driving cycles and conditions that may reasonably be expected to be encountered in normal operation and use, for the purposes of investigating a potential defeat device."¹² There are no regulations to guide OTAQ's efforts to use Portable Emission Monitoring Systems (PEMS), a testing process where emission measurement devices are attached to vehicles that are then driven on roads under various driving conditions. OTAQ's testing of light-duty diesel vehicles revealed, among other things, that real-world operations of Ram 1500 and Jeep Grand Cherokee vehicles differed from the test results on the chassis dynamometer.¹³ EPA can also attempt to quantify the impact of aftermarket defeat devices on motor vehicles, which are purchased from nonautomotive manufacturers to remove or alter the existing factory emission controls. For example, EPA can test single defeat device products on single vehicle applications to estimate NOx and particulate matter emissions,¹⁴ but this is an expensive and time-consuming process and an area where there are no regulations on the appropriate test procedures for this type of evaluation.¹⁵

¹¹ Clean Air Act § 203(a), 42 U.S.C. § 7522(a).

¹² Letter from Byron J. Bunker, Dir., Compliance Div., Off. of Transp. & Air Quality, EPA, to Manufacturer (Sept. 25, 2015), <https://www.epa.gov/sites/default/files/2015-10/documents/cd-mfr-guid-ltr-2015-09-25.pdf> [<https://perma.cc/V8GM-RPVS>] (regarding "EPA Conducted Confirmatory Testing").

¹³ Letter from Phillip A. Brooks, Dir., Air Enf't Div., Off. of Civ. Enf't, EPA, to Kyle M.H. Jones, FCA US LLC Senior Couns., Env't, Health and Safety, Off. of the Gen. Couns., Jonathan S. Martel, Arnold & Porter LLP, Joel M. Gross, Arnold & Porter LLP (Jan. 12, 2017), <https://www.epa.gov/sites/default/files/2017-01/documents/fca-cao-nov-2017-01-12.pdf> [<https://perma.cc/Z83K-HEW4>] (regarding "Notice of Violation for Model Year 2014-2016 diesel light-duty vehicles (Dodge Ram and Jeep Cherokee)") [hereinafter Notice of Violation].

¹⁴ EPA undertook this evaluation for aftermarket defeat devices sold by Derive Entities. Complaint at ¶ 45, *United States v. Derive Systems Inc.*, No. 1:18-cv-02201 (D.D.C. Sept. 24, 2018).

¹⁵ For the limited purpose of light-duty vehicle technologies in the 1980s, a voluntary aftermarket certification program does exist at EPA. *See* Emissions Control System Performance Warranty Regulations and Voluntary Aftermarket Part Certification Program, 50 C.F.R. pt. 85 subpart V. Among the fifty states, only California has an aftermarket certification program.

In the stationary source context, where existing statutes and regulations may not provide details about current emission measurement techniques, EPA can require language on “good air pollution control practices for minimizing emissions” in Title V permits and other operating permits incorporating New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPs) regulations.¹⁶ This general approach can improve industry practices and provide flexibility, but the ambiguous nature of this term can create significant uncertainty for EPA, industry, and environmental stakeholders.¹⁷

For many stationary operations, EPA uses optical gas imaging (OGI) cameras to monitor fugitive emissions, as this technology can reliably identify invisible plumes of hazardous air pollutants (HAPs) and VOC emissions, including those from unconventional oil and gas operations.¹⁸ OGI methods are well established for certain chemicals and manufacturing operations, but the technology is mandated only for certain equipment in the Quad-O regulations applicable to

¹⁶ 40 C.F.R. § 64.7 (2021) (Compliance Assurance Monitoring Rule); 40 C.F.R. § 60.11(d) (2021) (NSPS Compliance with standards and maintenance requirements); 40 C.F.R. § 63.6(e) (2021) (NESHAP Compliance with standards and maintenance requirements). See also *EMC Compliance Assurance Monitoring*, EPA, <http://www.epa.gov/emc/emc-compliance-assurance-monitoring> [<https://perma.cc/JK5P-SK54>] (last visited Nov. 9, 2021).

¹⁷ Another enforcement tool exists for highly problematic emission events, but it is rarely used. CAA section 303 emergency power authority is appropriate when a pollution source presents an imminent and substantial endangerment to public health or welfare, or the environment. 42 U.S.C. § 7603. EPA can exercise this authority unilaterally or on consent, but the United States has only utilized it on approximately thirteen occasions since 1971. Memorandum from Eric V. Schaeffer, Dir., Off. of Regul. Enf't, EPA, to Addressees (Apr. 1, 1999), <https://www.epa.gov/sites/default/files/2021-05/documents/transmittalofguidanceonsection303ofcaa040199.pdf> [<https://perma.cc/3NFV-544P>] (regarding the “Transmittal of ‘Guidance on Section 303 of the Clean Air Act’”).

¹⁸ FLIR sells optical gas imaging equipment and encourages its use for environmental protection. FLIR states on its website:

There are calculations and models that can be used to attain a theoretic value for fugitive emission of storage tanks and pipelines and such, but many recent international studies have shown that the real-life emission figures are usually much higher than the theoretical value predicted by the formulas. These formulas do not take into account the possibilities that storage facilities might contain broken man holes that do not close properly without any of the company employees noticing or other forms of unnoticed maintenance issues which may cause additional fugitive emissions.

Environmental Protection with a FLIR Optical Gas Imaging Camera, TELEDYNE FLIR, <https://www.flir.com/discover/instruments/gas-detection/environmental-protection-with-a-flir-optical-gas-imaging-camera/> [<https://perma.cc/CCB6-RVFT>] (last visited Nov. 9, 2021).

unconventional oil and gas extraction and processing.¹⁹ OGI is a “best system of emission reduction” for compressor stations but not for the equipment associated with gathering and boosting operations.²⁰

These data collection and analysis limitations have placed federal courts in the position of identifying appropriate practices for detecting violations and minimizing emissions. Consider the recent *R.M. Packer* case in the District of Massachusetts.²¹ In this case, EPA and state inspectors identified leaks of VOC vapors during a fuel loading event from aboveground tanks into tanker trucks by using an infrared video camera (a form of OGI).²² The pressure vacuum relief valve was not functioning and had not been properly maintained, in violation of the CAA, and the “equipment had fallen into disrepair and started leaking harmful emissions.”²³ In filing for summary judgment, the United States claimed, and the court agreed, that the defendant failed to operate in a manner consistent with safety and good air pollution control practices.²⁴ While the evidence was sufficient for the court to establish liability on summary judgment in this case,²⁵ relying on a court-by-court evaluation is unlikely to replicate the consistency achieved when regulations are used to establish uniform enforcement and remedial policies.

¹⁹ 40 C.F.R. pt. 60, subpart OOOO (commonly known as Quad-O). This regulation originally established volatile organic compound and methane emissions monitoring and reduction requirements for owners and operators in the oil and gas industry, but only for storage vessels, well completions, compressors, pneumatic controllers, and other similar equipment. Excluded equipment includes pneumatic pumps, maintenance operations, and compressors at compressor stations. EPA has observed emissions and brought actions for excess emissions against Noble, MarkWest, and QEPFS Field Services Companies. *See also Civil Cases and Settlements*, EPA, <https://cfpub.epa.gov/enforcement/cases/> [<https://perma.cc/54WQ-VNKH>] (last visited Oct. 7, 2021). Not all observed emissions are fugitive emissions or leaks, as they may occur on a routine basis and pursuant to a permit. The Quad-Oa regulations addressed some of the Quad-O limitations and were revised during the Trump Administration to remove sources in the transmission and storage segment from the source category and rescind the methane-specific requirements of the new source performance standards applicable to sources in the production and processing segment. Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review, 85 Fed. Reg. 57,018 (Sept. 14, 2020). Congress revoked these 2020 amendments in 2021 by use of the Congressional Review Act. On November 2, 2021, EPA announced the proposal of new oil and gas regulations.

²⁰ 40 C.F.R. §§ 60.5365a, 60.5397a (2021).

²¹ *United States v. R.M. Packer Co.*, 355 F. Supp. 3d 66 (D. Mass. 2018).

²² *Id.*

²³ *Id.* at 75.

²⁴ *Id.*

²⁵ *Id.*

To address excess emissions in their communities, environmental groups and individual citizens are actively utilizing new technologies, including OGI, to identify air emissions around them. The results are often published online and shared with county, state, and federal regulators.²⁶ The academic community has actively sought to understand and use this data.²⁷ Separately, environmental groups, such as Wildlife Guardians, may exercise their rights under the environmental statutes to bring their own actions if state and federal regulators fail to act quickly.²⁸ While such litigation can be very important, it also introduces a risk that “more cooks in the kitchen,” or numerous parties to a litigation, may delay efforts between the United States and the defendant to achieve immediate injunctive relief and remediate existing excess emissions. For example, defendants will often challenge the standing of environmental groups in citizen actions, and even though the defendants’ arguments may be unsuccessful, they are time-consuming and detract from settlement discussions between the defendant and the federal government.²⁹ Additionally, discovery issues and disputes among multiple parties, despite negotiated case management orders, may complicate the litigation process, leaving less time for fulsome settlement discussions. As another example, while there are benefits to an MDL, such as a single forum for the convenience of parties and witnesses, the MDL can address only pretrial discovery and pretrial motions, after which the cases are transferred back to the original districts for trial on remaining issues, such as damages and causation.³⁰

²⁶ See, e.g., EARTHWORKS, <https://earthworks.org/> [<https://perma.cc/9CAE-ZFUH>] (last visited Nov. 9, 2021).

²⁷ See Robert L. Glicksman, David L. Markell & Claire Monteleoni, *Technological Innovation, Data Analytics, and Environmental Enforcement*, 44 *ECOLOGICAL L.Q.* 41 (2017).

²⁸ See Press Release, WildEarth Guardians, Lawsuit Filed to Defend Public Health from Illegal Oil and Gas Industry Air Pollution (May 3, 2019), <https://wildearthguardians.org/press-releases/lawsuit-filed-to-defend-public-health-from-illegal-oil-and-gas-industry-air-pollution/> [<https://perma.cc/WZ8G-7BE7>].

²⁹ Karl S. Coplan, *Citizen Suits*, in *ENVIRONMENTAL LITIGATION: LAW AND STRATEGY* 295, 308–20 (Kegan A. Brown & Andrea M. Hogan eds., 2d. ed. 2019).

³⁰ J. Alan Harrell & Barbara L. Arras, *Toxic Tort Litigation*, in *ENVIRONMENTAL LITIGATION LAW AND STRATEGY* 257, 274–76 (Kegan A. Brown & Andrea M. Hogan eds., 2d. ed. 2019).

II

THE BENEFITS OF COLLABORATION AMONG STAKEHOLDERS

The Clean Air Act encourages collaboration with others for EPA to meet the congressional objectives of the Clean Air Act.³¹ For both the government and the defendants in a civil environmental enforcement action, the collaborative approach of settlement is the preferred strategy as it minimizes resources, reduces risk, and avoids delay.³² Most proposed civil enforcement cases are resolved through settlement.³³ And, for EPA's outside counsel for judicial matters, the Department of Justice, Executive Order No. 12,988 generally requires that a defendant be offered a settlement opportunity prior to the commencement of litigation.³⁴ Collaboration among parties in settlement discussions can develop the trust and candor that is needed in an adversarial situation to identify novel resolutions. It is this collaboration that is needed to improve enforcement outcomes before formal enforcement actions are initiated, and it is the rare enforcement action that does not involve other stakeholders in this collaboration, whether state or tribal partners or environmental nonprofit organizations, all with different agendas and interests.

While there has been much discussion among environmental law scholars as to whether adversarial or cooperative approaches are the best fit for the enforcement toolbox,³⁵ these policy debates seem less relevant given the technology gaps in the existing regulations and the available and effective practices for detecting and remedying emissions in what has been called the Fourth Industrial Revolution.³⁶ Given the space between the regulator and the regulated community, reasonable regulated entities should, or presumably would, find some comfort in

³¹ 42 U.S.C. §§ 7401–7671q; *Massachusetts v. EPA*, 549 U.S. 497, 500–01 (2007).

³² Joel M. Gross, *Civil Environmental Enforcement Litigation*, in *ENVIRONMENTAL LITIGATION LAW AND STRATEGY* 97, 132–37 (Kegan A. Brown & Andrea M. Hogan eds., 2d. ed. 2019) (“[E]nforcement is never a pleasant thing, and there is certainly an advantage, as with other unpleasant things, in simply bearing the pain and getting it over with sooner rather than later.”).

³³ *Id.* at 132.

³⁴ Exec. Order No. 12,988, 61 Fed. Reg. 4729 (Feb. 5, 1996).

³⁵ See generally Matthew D. Zinn, *Policing Environmental Regulatory Enforcement: Cooperation, Capture and Citizen Suits*, 21 *STAN. ENV'T L.J.* 81 (2002).

³⁶ See generally Klaus Schwab, *The Fourth Industrial Revolution: What It Means, How to Respond*, *WORLD ECON. F.* (Jan. 14, 2016), <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/> [<https://perma.cc/E6UT-USSP>]. Schwab is concerned that widespread governmental failure to employ and regulate new technologies will not help regenerate the natural environment or undo the harm caused by prior industrial revolutions.

contributing to an ongoing governmental-led effort to detect and resolve emissions because they can work toward monitoring methods and technologies that are representative of their sectors and avoid the significant expense of noncompliance. The negative impact of toxic tort actions, particularly class actions, cannot be underestimated in influencing industry to collaborate and settle claims with the federal government in lieu of litigation, as a class action complaint may rely on key facts from a federal complaint as a basis for filing a contemporaneous action.³⁷ The Judicial Panel on Multidistrict Litigation breaks MDLs into only ten separate categories, and product liability, the area for most environmental toxic tort actions, is one of them, indicating the prevalence of complex environmental cases with high litigation costs.³⁸ Lastly, as momentum to minimize the impacts of climate change increases,³⁹ regulated entities increasingly seek identification as an environmental and climate change leader, rather than as a polluter.⁴⁰

III

CASE STUDIES

A. Fiat Chrysler Automobiles—Developing Methodologies for On-Road “Off-Cycle” Emission Testing

One example of a collaborative approach with industry, which resulted in timely environmental remediation, is the high-profile mobile source civil settlement between the United States and Fiat Chrysler Automobiles (FCA) in 2019.⁴¹ In 2017, EPA issued a Notice

³⁷ Cf. *New-Indy Catawba, LLC* (May 13, 2021) (Clean Air Act section 303 Emergency Order), <https://response.epa.gov/sites/15198/files/New%20Indy%20Order%205132021.pdf> [<https://perma.cc/EKH4-TW3D>]; Complaint, *White v. New-Indy Catawba, LLC*, No. 0:21-cv-01480 (D.S.C. May 18, 2021).

³⁸ U.S. JUD. PANEL ON MULTIDISTRICT LITIG., <http://www.jpml.uscourts.gov> [<https://perma.cc/JPK9-X2CW>] (last visited Nov. 9, 2021). See generally Harrell & Arras, *supra* note 30, at 274–75.

³⁹ Exec. Order No. 14,008, 86 Fed. Reg. 7619 (Jan. 27, 2021).

⁴⁰ See, e.g., Saijel Kishan & Alastair Marsh, *BofA’s Finucane Says ESG Gauges to Drive Change: Summit Update*, WASH. POST (Dec. 1, 2020), https://www.washingtonpost.com/business/on-small-business/bofas-finucane-says-esg-gauges-to-drive-change-summit-update/2020/12/01/2e4a5d14-33ff-11eb-9699-00d311f13d2d_story.html [<https://perma.cc/TG58-QFEV>].

⁴¹ *FCA (Fiat Chrysler Automobiles) Diesel Vehicle Violations*, EPA, <http://www.epa.gov/fca> [<https://perma.cc/N7E8-VWWY>] (last visited Nov. 9, 2021); *Fiat Chrysler Automobiles Clean Air Act Civil Settlement Information Sheet*, EPA (Jan. 10, 2019),

of Violation alleging that FCA had installed undisclosed software and potential emission defeat devices in approximately 103,000 diesel-fueled Jeep and Ram vehicles, causing excess NO_x emissions from these vehicles.⁴² On May 23, 2017, DOJ, on behalf of EPA, filed a complaint alleging that FCA had installed undisclosed software and emission defeat devices in these vehicles; the case was later consolidated into multidistrict litigation in the Northern District of California.⁴³ Besides the United States and FCA, the MDL parties were class action plaintiffs represented by multiple law firms and another defendant, Bosch, the manufacturer of software for the diesel-fueled vehicles. This civil case, developed and filed in the wake of the larger Volkswagen “Dieselgate” matter, illustrates the importance of collaboration on the collection and analysis of emission data to determine how vehicle noncompliance with the mobile source emission standards can be remedied.⁴⁴

Why would FCA agree to settle the alleged violations with EPA, rather than continue in the MDL in the Northern District of California federal court?⁴⁵ While the precise motives of any litigant are impossible to ascertain, the publicly available materials demonstrate that EPA was able to accept FCA’s software “fix” because the manufacturer and EPA had collaborated on effective remediation of the excessive emissions from the Jeep and Ram vehicles in advance of settlement. This solution

<https://www.epa.gov/enforcement/flat-chrysler-automobiles-clean-air-act-civil-settlement-information-sheet> [<https://perma.cc/T63N-VLQT>].

⁴² Notice of Violation, *supra* note 13.

⁴³ Complaint, United States v. FCA U.S. LLC, No. 2:17-cv-11633 (E.D. Mich. May 23, 2017). See generally *In Re: Chrysler-Dodge-Jeep “EcoDiesel” MDL*, U.S. DIST. CT. N.D. OF CAL., <https://www.cand.uscourts.gov/judges/chen-edward-m-emc/in-re-chrysler-dodge-jeep-ecodiesel-mdl/> [<https://perma.cc/G9FB-E6Z4>] (last visited Nov. 9, 2021).

⁴⁴ Starting in 2016, Volkswagen admitted to altering nearly 600,000 U.S. vehicles with defeat devices and, as a consequence of the civil settlement with EPA and California Air Resources Board (CARB), was required to spend approximately \$25 billion on vehicle buybacks, vehicle repairs, extended warranties, and massive mitigation projects; Volkswagen is still under investigation in Germany, and some Volkswagen employees have served prison sentences in the United States. Volkswagen stated that admitting liability for its Clean Air Act Title II violations was necessary to regain its global automotive dominance, and Volkswagen share prices greatly increased after “Dieselgate” concluded in the United States. *Volkswagen Clean Air Act Civil Settlement*, EPA (Jan. 10, 2019), <https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement> [<https://perma.cc/XAL6-7YD7>].

⁴⁵ *In Re: Chrysler-Dodge-Jeep “EcoDiesel” MDL*, *supra* note 43.

satisfies EPA and the individual vehicle owners and minimizes protracted and expensive litigation.⁴⁶ EPA's press materials state:

FCA has performed extensive emissions testing to demonstrate that the emissions modification works and maintains emission controls that will meet applicable emission standards under real-world driving conditions. EPA observed this on-site testing at FCA and conducted confirmatory testing of vehicles with the emissions modification. This testing included standard regulatory emissions tests ("on-cycle" testing), as well as special tests ("off-cycle" testing) conducted in an EPA laboratory, and on-road testing using a Portable Emissions Measurement System (also called a PEMS test).⁴⁷

To date, there are no regulations addressing the use of PEMS in motor vehicle certification, and EPA has no formal agreement with the automobile manufacturing industry on test methods for evaluating real-world compliance on a chassis dynamometer or on the road.⁴⁸ But, as the materials make clear, outside the regulatory environment and in an adversarial litigation situation, EPA and FCA worked together on effective methods to demonstrate real-world compliance for the noncompliant vehicles to resolve the alleged violations and fix the vehicles immediately. To apply the FCA model broadly to noncompliant mobile sources, a standing, detailed agreement between on-road or non-road manufacturers and EPA for a clearly established process identifying appropriate test methods and driving routes to evaluate real-world compliance could encourage manufacturers to use this process to manufacture compliant vehicles or engines, or remediate those with

⁴⁶ Elizabeth Cabraser, court-appointed Lead Counsel and chair of the Plaintiffs' Steering Committee, stated in a press release: "By holding FCA and Bosch accountable for their diesel emissions cheating, consumers will now receive the vehicle they were promised plus cash compensation, while protecting our environment." *\$307.5M Class Settlement with Fiat Chrysler, Bosch Will Compensate Owners and Lessees, Provide Repairs That Protect Environment While Maintaining Performance and Fuel Economy*, LIEFF CABRASER HEIMANN & BERNSTEIN (Jan. 10, 2019), <https://www.lieffcabraser.com/2019/01/307-5m-class-settlement-with-fiat-chrysler-bosch-will-compensate-owners-and-lessees-provide-repairs-that-protect-environment-while-maintaining-performance-and-fuel-economy/> [<https://perma.cc/8HTK-VU3L>] [hereinafter *Fiat Chrysler Class Settlement*].

⁴⁷ *Learn About FCA Violations*, EPA, <https://www.epa.gov/fca/learn-about-fca-violations#questions> [<https://perma.cc/CY8G-4S6T>] (last visited Nov. 9, 2021).

⁴⁸ No such materials are identified in EPA's vehicle and engine certification and compliance database. *Overview of Certification and Compliance for Vehicles and Engines*, EPA, <https://www.epa.gov/ve-certification> [<https://perma.cc/NNL9-ML4Y>] (last visited Nov. 9, 2021).

existing excess emissions.⁴⁹ The transparent process need not include all EPA real-world testing plans to limit the “testing to the test,” but sufficient information that a manufacturer may use to implement its own PEMS process, rather than ignoring agency-collected data as nonrepresentative of “real-world” driving conditions. Such a process would promote fairness among industry competitors in a highly competitive industry sector. Without an EPA-manufacturer agreement on what is considered regulatory compliance for real-world vehicle emission performance, only the targets on enforcement actions will be aware of what may be compliant due to the nature of the settlement discussions.⁵⁰ And, in many cases, such materials would likely be withheld from disclosure to third parties because they are either subject to federal court protective orders⁵¹ or because a manufacturer may claim that the material contains Confidential Business Information.⁵² It would be an unjust result if only those vehicle manufacturers that EPA identified as noncompliant were privy to EPA’s perspective on vehicle emissions tests that can effectively demonstrate real-world vehicle emissions compliance.

Perhaps most importantly, because EPA was able to work with FCA to develop an effective, remedial process, EPA achieved its own goal, as stated in EPA’s press materials: “EPA’s priority has been to address the pollution problem and get the polluting vehicles off the road or bring them into compliance with emission standards. With this settlement, we are doing just that.”⁵³

⁴⁹ The FCA model appears to have been the basis for EPA’s September 14, 2020, settlement with Daimler AG and Mercedes Benz USA (collectively Daimler) for Daimler’s alleged cheating on emission tests and failure to disclose unlawful defeat devices in approximately 250,000 diesel vehicles in the United States. Daimler agreed to implement a recall program to repair the noncompliant vehicles, among other settlement terms. *Daimler AG and Mercedes-Benz USA, LLC Clean Air Act Civil Settlement*, EPA, <https://www.epa.gov/enforcement/daimler-ag-and-mercedes-benz-usa-llc-clean-air-act-civil-settlement> [<https://perma.cc/3YVX-T4TC>] (last visited Nov. 9, 2021).

⁵⁰ See Notice of Violation, *supra* note 13; *Fiat Chrysler Automobiles Clean Air Act Civil Settlement Information Sheet*, *supra* note 41.

⁵¹ See, e.g., Stipulated Protective Order, *United States v. FCA US LLC*, No. 3:17-md-02777-EMC (N.D. Cal. Aug. 31, 2017).

⁵² See 40 C.F.R. pt. 2 subpart B (regarding EPA’s confidential business information regulations).

⁵³ *Learn About FCA Violations*, *supra* note 47. See also *Fiat Chrysler Automobiles Clean Air Act Civil Settlement Information Sheet*, *supra* note 41.

B. Derive Entities—Developing a Methodology for Testing Whether Aftermarket Products Are Automotive Defeat Devices

A second example of a collaborative approach to compliance outside the regulatory context is a 2018 settlement with Derive Entities (Derive), a popular developer of handheld tuning devices and custom tuning software for vehicles.⁵⁴ This matter was EPA’s first significant judicial settlement to address the use of aftermarket defeat devices (or “tuners”) and a precursor case to EPA’s National Compliance Initiative (NCI) *Stopping Aftermarket Defeat Devices for Vehicles and Engines*.⁵⁵ While the CAA prohibits tampering with emissions controls, and manufacturing, selling, and installing aftermarket devices intended to defeat those controls,⁵⁶ EPA has no regulations for remedying tampering. However, EPA does have an enforcement policy requiring that a defendant have a “reasonable basis” for any claim that alterations to a vehicle do not result in an emissions increase.⁵⁷ The Derive settlement terms established a baseline for testing aftermarket defeat devices to assess whether their use increases vehicle emissions compared to the original manufacturer’s vehicle configuration, which avoids a violation of Title II of the Act.⁵⁸

⁵⁴ DERIVE SYSTEMS, <http://www.derivesystems.com> [<https://perma.cc/L9QC-QCBS>] (last visited Nov. 9, 2021).

⁵⁵ Complaint, United States v. Derive Sys., Inc., No.1:18-cv-02201 (D.D.C. Sept. 24, 2018); *National Compliance Initiative: Stopping Aftermarket Defeat Devices for Vehicles and Engines*, EPA, <https://www.epa.gov/enforcement/national-compliance-initiative-stopping-aftermarket-defeat-devices-vehicles-and-engines> [<https://perma.cc/LCH2-S7TJ>] (last visited Nov. 9, 2021).

⁵⁶ Clean Air Act § 203, 42 U.S.C. § 7522; Clean Air Act § 213, 42 U.S.C. § 7547.

⁵⁷ On November 23, 2020, EPA issued a new tampering policy to address civil enforcement of the CAA’s prohibitions on vehicle and engine tampering and aftermarket defeat devices. This policy, “EPA Tampering Policy: The EPA Enforcement Policy on Vehicle and Engine Tampering and Aftermarket Defeat Devices under the Clean Air Act,” states: “The EPA reaffirms its longstanding practice of using enforcement discretion not to pursue conduct that could potentially constitute a violation of the Clean Air Act if the person engaging in that conduct has a documented, reasonable basis to conclude that the conduct does not adversely affect emissions.” See Memorandum 1a from Norman D. Shulter, Dir. Mobile Source Enf’t Div., Off. of Enf’t and Gen. Couns., EPA (June 25, 1974), <https://afdc.energy.gov/files/pdfs/2753.pdf> [<https://perma.cc/D9NZ-WBM6>]; Memorandum from Susan Parker Bodine, Assistant Adm’r for Enf’t and Compliance Assurance, EPA (Nov. 23, 2020), <https://www.epa.gov/sites/production/files/2020-12/documents/epatamperingpolicy-enforcementpolicyonvehicleandenginetampering.pdf> [<https://perma.cc/M59V-83A9>].

⁵⁸ *Derive Systems Clean Air Act Settlement*, EPA (Sept. 24, 2018), [https://www.epa.gov/enforcement/derive-systems-clean-air-act-settlement#:~:text=\(Washington%2C%20DC%20%2D%20September%2024,part%2C%20to%20defeat%20the%20emissions](https://www.epa.gov/enforcement/derive-systems-clean-air-act-settlement#:~:text=(Washington%2C%20DC%20%2D%20September%2024,part%2C%20to%20defeat%20the%20emissions) [<https://perma.cc/64L5-PK7B>].

Derive sold approximately 363,000 aftermarket defeat devices that were allegedly designed to remove or alter the existing emissions controls of motor vehicles.⁵⁹ These products, sold to distributors under the brand names of “Bully Dog” and “SCT,” are highly favored in the aftermarket tuning community because of their versatility. Derive offers products for gasoline and diesel-fueled vehicles, including the so-called big rigs or tractor-trailers, and markets the products as improving vehicle performance.⁶⁰ One crucial component of the settlement required Derive to create a testing program to ensure that all its products have a reasonable basis for sale, with test results demonstrating that its product did not increase vehicle emissions over a certain set of testing conditions.⁶¹ Appendix C of the Derive Consent Decree outlines a testing methodology for this determination.⁶²

While this case resolved the liability of one defendant, as previously described, in the absence of a uniform testing methodology for evaluating aftermarket defeat devices, EPA would need to test individual aftermarket products and document increases in emissions for each vehicle application to create evidence for an enforcement action. This would be an expensive and time-consuming process to follow for each enforcement case, and one that is not transparent to interested stakeholders or enforcement targets, many of whom may be small businesses, entities that traditionally have received targeted regulatory compliance assistance from the federal government, such as the Small Business Administration.⁶³ In the case of aftermarket defeat devices, EPA has already identified a reasonable basis for demonstrating compliance with the Act,⁶⁴ and the settlement is in the public domain. The collaboration with a significant manufacturer has led to a testing methodology, Appendix C of the Derive Consent Decree, that can be independently implemented by any aftermarket product manufacturer.

⁵⁹ *Id.*

⁶⁰ DERIVE SYSTEMS, *supra* note 54.

⁶¹ Derive could also apply for and obtain an Executive Order from the California Air Resources Board (CARB) as a reasonable basis for sale. *See* Consent Decree at ¶¶ 20, 27, *United States v. Derive Systems, Inc.*, No. 1:18-cv-02201 (D.D.C. Sept. 24, 2018), <https://www.epa.gov/sites/production/files/2018-09/documents/derive-cd.pdf> [<https://perma.cc/885Q-QZQG>].

⁶² *Id.* at app. C.

⁶³ The cases that EPA has resolved pursuant to the NCI appear to involve businesses of all sizes, some appearing to be more sophisticated than others. *National Compliance Initiative: Stopping Aftermarket Defeat Devices for Vehicles and Engines*, EPA, <https://www.epa.gov/enforcement/national-compliance-initiative-stopping-aftermarket-defeat-devices-vehicles-and-engines> [<https://perma.cc/LCH2-S7TJ>] (last visited Nov. 9, 2021).

⁶⁴ DERIVE SYSTEMS, *supra* note 54; 42 U.S.C. §§ 203, 213.

Derive has stated that this settlement allows it to demonstrate compliance with the Clean Air Act and establishes certainty in the aftermarket industry:

The agreement between Derive Systems and the EPA is the first of its kind. The newly established practices will include new product development procedures [and] revamped product testing The enhanced procedures set an industry-leading model for automotive aftermarket companies to ensure continued sales of products and the introduction of new products with certainty and continuity in partnership with EPA.⁶⁵

Even in this context, where technologies advance at a remarkable pace, including custom tuning software delivered via wireless connections to a vehicle, the settlement established at least one mechanism that the regulated community can now reference, promoting fairness among industry competitors. As stated earlier with respect to real-world vehicle testing for vehicle manufacturers with alleged emissions defeat devices, it would be an unjust result if only the targets of an EPA enforcement action became aware of the appropriate EPA methodology for assessing whether their aftermarket devices comply with Title II of the Act.

C. MarkWest—Developing Technologies to Measure and Minimize Pigging Emissions from Midstream Oil and Gas Processors

This case study describes an unconventional oil and gas enforcement matter where not only were new technologies and methods used to detect and quantify emissions but also a collaborative nonregulatory approach that resulted in the development of new technologies to minimize emissions for the benefit of the entire industry. On April 23, 2018, EPA, Pennsylvania Department of Environmental Protection (PADEP), and MarkWest Liberty Midstream & Resources, L.L.C. and Ohio Gathering Company, L.L.C. (collectively, MarkWest) lodged a Consent Decree to settle a CAA matter resolving New Source Review (NSR), Prevention of Significant Deterioration (PSD), and Title V violations for excess emissions of VOCs at pig launching and receiving operations at compressor stations and stand-alone stations in eastern

⁶⁵ *Derive Systems Enters Agreement with EPA to Enhance Industry Practices*, CISION (Sept. 25, 2018), <https://www.prnewswire.com/news-releases/derive-systems-enters-agreement-with-epa-to-enhance-industry-practices-300718323.html> [https://perma.cc/H85W-TH4D].

Ohio and western Pennsylvania.⁶⁶ Within the Marcellus and Utica Shale formations in these two states, MarkWest owns and operates numerous natural gas pipeline facilities, including pig launchers and receivers, compressors, and storage tanks; the facilities in western Pennsylvania are located in an ozone nonattainment area. Since 2013, citizens in Washington County, Pennsylvania, have raised concerns regarding venting activities and reported health impacts, noise, and other concerns related to daily pigging operations at MarkWest facilities.⁶⁷ There has been significant media coverage regarding the health impacts from pigging operations in southwestern Pennsylvania.⁶⁸ Individual citizens and environmental groups, such as EarthWorks, often use optical gas imaging, which is not required by the Clean Air Act for most oil and gas applications, to identify the air pollution and share that information with the public and regulatory agencies.⁶⁹

EPA has not explicitly addressed the detection or remediation of air emissions from pigging operations through the Quad-O or Quad-Oa regulations.⁷⁰ While PADEP had evaluated and set requirements for pigging operations as part of its Annual Emissions Inventory VOC

⁶⁶ *MarkWest Clean Air Act Settlement Information Sheet*, EPA, <https://www.epa.gov/enforcement/markwest-clean-air-act-settlement-information-sheet> [<https://perma.cc/7UMR-TLS4>] (last visited Nov. 9, 2021). “Pigging operations” with “pigs” are maintenance activities that can be performed on a daily, weekly, or monthly basis to prevent buildup of natural gasoline liquids or any other type of condensate in field gas gathering and transmission pipelines. These operations require a facility to vent and blowdown any pressure in the line prior to removing the device known as a pig used for the maintenance activities, including cleaning the interior of the pipeline from buildup of liquids. In wet gas operations, the vented gas stream can consist of methane, ethane, and VOCs such as propane, butane, and benzene.

⁶⁷ AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, U.S. DEP’T OF HEALTH & HUMAN SERVS., PUBLIC HEALTH EVALUATION OF ENVIRONMENTAL DATA (AIR, GROUNDWATER, AND SURFACE WATER) COLLECTED IN THE VICINITY OF THE CARTER IMPOUNDMENT (2015), https://www.atsdr.cdc.gov/HAC/pha/CarterImpoundment/CarterImpoundment_HC_%2007-30-2015_508.pdf [<https://perma.cc/4QMV-BE3H>]. See also *Citizen Concerns Regarding the Cumulative Impacts to Communities from Shale Gas Development*, THRIVING EARTH EXCH., <https://thrivingearthexchange.org/wp-content/uploads/2017/12/AGU-Team-Report-REVISED-FINAL.pdf> [<https://perma.cc/PR3Q-7EJ5>] (last visited Nov. 9, 2021).

⁶⁸ See, e.g., Laura Legere, *No Venting at Night? Agency Finds Tweaks to Pipeline Maintenance Tools Could Reduce Risks to Residents*, PITTSBURGH POST-GAZETTE (Sept. 19, 2017, 3:30 AM), <https://www.post-gazette.com/business/powersource/2017/09/19/pig-launcher-health-study-dep-mount-pleasant-pennsylvania-agency-for-toxic-substances-natural-gas-emissions/stories/201709150053> [<https://perma.cc/KP33-2WZE>].

⁶⁹ See generally THRIVING EARTH EXCH., *supra* note 67; *Community Empowerment Project*, EARTHWORKS, <https://www.earthworks.org/campaigns/community-empowerment-project/> [<https://perma.cc/2NDE-L2D6>] (last visited Nov. 9, 2021).

⁷⁰ 40 C.F.R. pt. 60 subparts OOOO and OOOOa.

reporting requirements in the PADEP GP-5 permit process, pursuant to the Pennsylvania Air Pollution Control Act,⁷¹ MarkWest was allegedly not in compliance with the state program requirements.⁷² In a 2019 EPA enforcement alert regarding excess VOC emissions from pigging activities, EPA referenced the MarkWest settlement, stating that it “requires innovative solutions designed to evaluate and address VOC emissions from pigging operations at gathering compressor stations and standalone pigging stations.”⁷³ These innovative solutions are detailed in the enforcement alert and in the MarkWest settlement term requirements. They include both EPA-recommended technological solutions, such as jumper lines that direct condensate from high-pressure systems to lower-pressure lines, and proprietary pig ramp technology developed by MarkWest to reduce hydrocarbon condensate accumulation prior to venting.⁷⁴ MarkWest agreed to increase VOC emission calculations from the pigging operations above the standard generally used by industry for evaluating emissions (the Real Gas Law).⁷⁵ Additionally, MarkWest is sharing its proprietary pig ramp emission reduction technology with industry as a Supplemental Environmental Project,⁷⁶ and the technology is available on the company’s website.⁷⁷

This case demonstrates not only that EPA’s enforcement collaboration with a defendant resulted in new technologies that will be

⁷¹ 35 PA. STAT. AND CONS. STAT. §§ 4001–4015 (West 2020).

⁷² *Id.*; Complaint, United States v. MarkWest Liberty Midstream & Res., L.L.C., No. 2:18-cv-00520-LPL (W.D. Pa. Apr. 23, 2018).

⁷³ EPA, EPA OBSERVES AIR EMISSIONS FROM NATURAL GAS GATHERING OPERATIONS IN VIOLATION OF THE CLEAN AIR ACT 6 (2019), <https://www.epa.gov/sites/production/files/2019-09/documents/naturalgasgatheringoperationinviolationcaa-enforcementalert0919.pdf> [<https://perma.cc/K4H6-QGFX>].

⁷⁴ *Id.* at 6–7.

⁷⁵ Consent Decree at ¶ 11, United States v. MarkWest, LLC, No. 218-cv-00520-LPL (W.D. Pa. Apr. 24, 2018), <https://www.epa.gov/enforcement/consent-decree-markwest-clean-air-act-settlement> [<https://perma.cc/D4EZ-5GYQ>] [hereinafter United States v. MarkWest Consent Decree].

⁷⁶ Memorandum from Cynthia Giles, Assistant Adm’r, Off. of Enf’t and Compliance Assurance, EPA, to the Regional Administrators (Mar. 10, 2015), <https://www.epa.gov/sites/production/files/2015-04/documents/sepupdatedpolicy15.pdf> [<https://perma.cc/3JYM-4GNY>] (regarding the “Issuance of the 2015 Update to the 1998 U.S. Environmental Protection Agency Supplemental Environmental Projects Policy”). See United States v. MarkWest Consent Decree, *supra* note 75, ¶ 28a.

⁷⁷ *Pipeline Launcher/Receiver Emission Reduction Systems*, MPLX, <https://www.mplx.com/content/documents/mplx/markwest/Launcher%20Receiver%20Design%20Detail.pdf> [<https://perma.cc/AZ7V-GPT8>] (last visited Nov. 9, 2021).

shared with industry for potentially immediate emission reductions but also that these efforts improved state permitting processes. PADEP and the Ohio Environmental Protection Agency relied on an EPA white paper, *Quantifying the Potential Impact of Natural Gas Condensate Hold-up on Uncontrolled Volatile Organic Compound Emissions from Pig Receivers During Depressurization in Wet Gas Gathering Operations*,⁷⁸ to develop and improve state-specific permits to include pigging operations.⁷⁹

DISCUSSION AND CONCLUSION

The case studies demonstrate that, for specific industry sectors where existing regulations do not clearly identify or address all air emissions, collaboration on new technologies for measuring and minimizing emissions, whether PEMS driving routes, aftermarket product “reasonable basis” testing methods, or a full accounting of VOCs from unconventional oil and gas operations, can result in an immediate reduction of air emissions and a standard that can be adopted across an entire industry. Based on the information in the filed complaints,⁸⁰ each of the enforcement case studies was a multiyear effort. While these methodologies were successful, they were developed seriatim, over a period of several years, during actual enforcement actions. A better alternative might be up-front collaboration between all stakeholders to identify useful methodologies for a particular sector that can be successful and efficient in both detecting and addressing air

⁷⁸ U.S. EPA OFF. OF CIV. ENF'T AIR ENF'T DIV., *QUANTIFYING THE POTENTIAL IMPACT OF NATURAL GAS CONDENSATE HOLDUP ON UNCONTROLLED VOLATILE ORGANIC COMPOUND EMISSIONS FROM PIG RECEIVERS DURING DEPRESSURIZATION IN WET GAS GATHERING OPERATIONS* (Discussion Draft, May 2016).

⁷⁹ PA. DEP'T OF ENV'T PROT., *TECHNICAL SUPPORT DOCUMENT FOR THE GENERAL PLAN APPROVAL AND/OR GENERAL OPERATING PERMIT FOR UNCONVENTIONAL NATURAL GAS WELL SITE OPERATIONS AND REMOTE PIGGING STATIONS* 49 n.23 (June 2018), [http://www.depgreenport.state.pa.us/elibrary/PDFProvider.ashx?action=PDFStream&docID=19616&chksum=&revision=0&docName=04+FINAL+TECHNICAL+SUPPORT+DOCUMENT+FOR+GP-5+\(2700-PM-BAQ0267\)+AND+GP-5A+\(2700-PM-BAQ0268\).PDF++%3Cspan+style%3D%22color%3Ablue%3B%22%3E\(NEW\)%3C%2Fspan%3E&nativeExt=pdf&PromptToSave=False&Size=1516623&ViewerMode=2&overlay=0](http://www.depgreenport.state.pa.us/elibrary/PDFProvider.ashx?action=PDFStream&docID=19616&chksum=&revision=0&docName=04+FINAL+TECHNICAL+SUPPORT+DOCUMENT+FOR+GP-5+(2700-PM-BAQ0267)+AND+GP-5A+(2700-PM-BAQ0268).PDF++%3Cspan+style%3D%22color%3Ablue%3B%22%3E(NEW)%3C%2Fspan%3E&nativeExt=pdf&PromptToSave=False&Size=1516623&ViewerMode=2&overlay=0) [https://perma.cc/H4F4-J6BS]; DIV. OF AIR POLLUTION CONTROL, OHIO ENV'T PROT. AGENCY, *PROJECT: MID-STREAM COMPRESSOR STATION GENERAL PERMIT RESPONSE TO INTERESTED PARTY COMMENT 25* (Feb. 17, 2017), <https://epa.ohio.gov/Portals/27/genpermit/RSCompGP20170217Final.pdf> [https://perma.cc/H862-A8AG].

⁸⁰ *Complaint, United States v. FCA U.S. LLC*, No. 2:17-cv-11633 (E.D. Mich. May 23, 2017); *Complaint, United States v. Derive Sys., Inc.*, No.1:18-cv-02201 (D.D.C. Sept. 24, 2018); *Complaint, United States v. MarkWest Liberty Midstream & Res., L.L.C.*, No. 2:18-cv-00520-LPL (W.D. Pa. Apr. 23, 2014).

pollution. If manufacturers and companies choose to use these identified technologies to monitor and maintain their own compliance with the Act, this approach can be more expedient than individual actions by environmental stakeholders, case-specific federal court decisions, or protracted litigation with uncertain outcomes. The industry incentive to pursue this up-front collaboration and implement appropriate compliance measures is to develop monitoring methods and technologies that are representative of their sectors (as manufacturers are best suited to assess their own operations), maintain a level playing field with their competitors, potentially avoid costly EPA enforcement actions because they have full notice of the enforcement expectations, and minimize unnecessary litigation from third-party plaintiffs. The final step in developing these measures is for EPA to incorporate them in future regulations, where they are less likely to be challenged due to the significant pre-rule collaboration. Ultimately, tackling the challenges of monitoring and measuring emissions will not only improve transparency and fairness for all stakeholders in the enforcement process, and leverage limited enforcement resources to address the most significant air polluters, but also capture those emissions that slip through the cracks at a time when air quality improvements would improve public health.

