



Center
for Progressive
Reform | CPR

Toxic Floodwaters

The Threat of Climate-Driven Chemical Disaster in Virginia's James River Watershed

by Noah Sachs and David Flores

March 2019

Acknowledgments

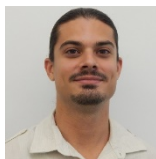
CPR is grateful to an anonymous donor for supporting this project, as well as to the Deer Creek Foundation, Rowboat Foundation, and Bauman Foundation for their support of our work in general.

CPR is also grateful to our project partners at Chesapeake Commons and the James River Association. In particular, we wish to thank John Dawes from Chesapeake Commons and Jamie Brunkow, Ben Watson, and Shawn Ralston at James River Association who helped to develop our Toxic Floodwaters methodology and analysis and who contributed to various aspects of this report. CPR is also grateful to our former legal intern, Elena Franco, who contributed to development of our methodology and provided policy research that supports this report.

Authors



Noah M. Sachs is a Professor at the University of Richmond School of Law and Director of the Robert R. Merighe Jr. Center for Environmental Studies. He is a Member Scholar of the Center for Progressive Reform.



David Flores is a Policy Analyst at the Center for Progressive Reform. He received his law degree from the University of Maryland in 2016 with a concentration in environmental law.

Connect With CPR

Website: www.progressivereform.org

CPRBlog: www.progressivereform.org/CPRBlog.cfm

Twitter: [@CPRBlog](https://twitter.com/CPRBlog)

Facebook: <https://www.facebook.com/CenterforProgressiveReform/>

Direct media inquiries by email to [Brian Gumm](mailto:brian.gumm@cpr.org) or [Matthew Freeman](mailto:matthew.freeman@cpr.org), or by phone at 202.747.0698.

Cover photo courtesy of the James River Association.

Table of Contents

Acknowledgments	ii
Authors.....	ii
Executive Summary	1
Whose Responsibility?	4
Recommendations	5
Climate Change and Industrial Facilities in Virginia.....	8
The <i>Toxic Floodwaters</i> Methodology	9
Social Vulnerability	10
Storing or Handling Toxic Chemicals or Substances	12
Flood-Exposed Facilities.....	13
Principal Findings from the James River Watershed	14
Conclusion and Principal Recommendations	21
A Guide for Citizen Action: Relevant Laws, Regulations, and Opportunities.	29
Clean Water Act	29
Virginia Registered Tank Program.....	31
Risk Management Program.....	34
Resource Conservation and Recovery Act	37
Emergency Planning and Community Right-to-Know Act	39
Superfund	42
Virginia Voluntary Remediation Program	44
Endnotes	47

Toxic Floodwaters

The Threat of Climate-Driven Chemical Disaster in Virginia's James River Watershed

Executive Summary

The James River watershed in Virginia is among the regions of the country most vulnerable to the consequences of climate change. It faces higher than average sea-level rise, intensifying precipitation rates, and increased hurricane risks. As major storms cause serious and potentially toxic flooding in the James River watershed – and elsewhere in the United States – residents are reminded that the industries surrounding them are not doing enough to plan and adapt to our changing world.

In the last two years, extreme rainfall and storm surge from Hurricanes Florence and Harvey flooded industrial facilities ill equipped to handle such massive storms. Contaminants ranging from oil and gas to toxic metals were let loose by floodwaters and spread into the surrounding communities. These discharges may be accurately described as “toxic floodwaters”: storm-induced or climate change-related flooding that carries toxic and hazardous contaminants.

Toxic floodwaters have serious health consequences. After Florence and Harvey, residents in North Carolina and Texas complained of headaches, burning eyes and throats, dizziness, and other health problems. Public health professionals raised concerns about floodwaters leaving a hazardous residue in homes, businesses, water systems, and more.

Such health and environmental risks are amplified by social and legal factors. For example, communities that lack access to reliable transportation and temporary housing are more likely to face prolonged exposure to floodwaters and residual contamination. In this way, social vulnerability interacts with geography and climate to produce a health crisis.

The Commonwealth of Virginia is no stranger to documented toxic floodwater incidents:

- **The Election Day Flood of 1985** resulted in some of the most widespread flooding the state has ever experienced. The flood is also one of the first incidents for which records identify chemical spills and their impacts, such as wastewater overflows in Staunton and Waynesboro and pesticide spills that killed grazing cattle.

- **Hurricane Floyd** caused extensive flooding throughout the state in 1999, triggering spills of diesel fuel, toppling chemical storage tanks, and carrying chemical barrels downstream in Franklin County.
- **Intense rainfall** in June 2016 resulted in “1,000-year” flooding that caused oil spills in Covington and drowning deaths in neighboring West Virginia.
- Later that same year, storm surge from **Hurricane Matthew** washed away parts of a public landfill in Virginia Beach. A similar event occurred in 2011 when storm surge from Hurricane Irene washed a landfill into the Elizabeth River. Heavy precipitation contributed to widespread wastewater overflows throughout the Hampton Roads region.

Virginia has always been vulnerable to hurricane storm surge, river flooding, and sea-level rise. But no one has conducted a comprehensive examination of the threat that storms and flooding pose to the vulnerable, fence-line

communities surrounding hazardous chemical storage sites throughout the Commonwealth. Once toxic chemicals or other hazardous substances spill into floodwaters, there is very little time to react before they pose a serious public health threat.

That is the challenge this report takes up: providing the first comprehensive analysis of the threat of toxic floodwaters to Virginia’s environmental justice communities that are among the most socially vulnerable to natural and human disasters. In addition to examining the threats, this report outlines existing legal tools that these communities can use to demand better protections from climate-driven chemical disasters.



In 1999, flooding from Hurricane Floyd toppled storage tanks and carried away oil drums, resulting in floodwater contamination in Franklin, Virginia. Credit: Liz Roll/FEMA News Photo.

This report is the culmination of a three-year partnership between the Center for Progressive Reform, the James River Association, and Chesapeake Commons. This report focuses specifically on threats to communities identified by the federal government as high in social vulnerability to disaster. It should be noted, however, that there are also flood-exposed facilities storing toxic chemicals that pose risk to people of all socioeconomic backgrounds in the James River watershed.

We used a three-part methodology to prepare this report:

First, we identified all industrial facilities in the watershed likely to handle toxic and hazardous substances – those regulated under seven different

state and federal pollution programs that specifically target hazardous chemicals.

Second, we created a novel geospatial model to map how these industrial facilities are exposed to potential flooding. To explore the flooding scenarios, we used environmental data for river flooding, storm surge, and sea-level rise from two federal agencies with expertise in the area, the Federal Emergency Management Agency and the National Oceanic and Atmospheric Administration.

Finally, we added information on social vulnerability to disaster for communities living near these facilities. For this part of our research, we relied upon data from the Centers for Disease Control and Prevention's Social Vulnerability Index (SVI) to identify the census tracts that are in the highest quartile nationally for social vulnerability to disaster events. The Index integrates U.S. Census data for 15 social, economic, and demographic metrics that together measure vulnerability to disaster. For example, the index includes metrics for vehicle access, crowded housing, age, education, English language usage, household income, and federal poverty status. Taken together, our analysis is the first step in understanding the health risk to the most vulnerable Virginians from the potential hazard of flood-driven chemical spills.

Our key findings are:

- More than 2,700 industrial facilities regulated by federal and state programs for toxic and hazardous chemicals are located in the most socially vulnerable census tracts in the James River watershed. We found that more than 1,000 of these facilities are exposed to potential river flooding, hurricane storm surge, and/or projected sea-level rise.
- In the tidal region of the James River, from Hampton Roads upriver to Richmond, 234 facilities regulated for hazardous or toxic substances would be flooded by future sea-level rise between one and five feet. Moreover, 91 of these facilities would be flooded by just one foot of sea-level rise, which climate scientists expect to occur no later than 2050.
- Flood-exposed industrial facilities in Virginia are regularly using and storing toxic and hazardous substances dangerous to human health, should the chemicals be carried off in floodwaters. The facilities we identified include everything from gas stations and agricultural suppliers to contaminated brownfields, chemical manufacturers, and major port facilities. The hazardous chemicals we identified include toxic metals, carcinogenic and flammable petroleum products, solvents, corrosive acids, coal ash waste, and pesticides. In some cases, these substances are stored securely, under cover with various monitored controls. In other

cases, these substances are exposed to the elements with few controls, and some have already contaminated soil and water.

- Of the census tracts in the James River watershed that rank in the highest quartile for social vulnerability to disaster in the United States, as determined by the CDC's Social Vulnerability Index, 125 tracts contain at least one flood-exposed industrial facility. Many contain more. On average, these socially vulnerable census tracts each contain 25 flood-exposed industrial facilities.
- More than 473,000 Virginians live in the 125 census-tract designated communities that are both high in social vulnerability and contain flood-exposed industrial facilities. These residents are most at risk from toxic floodwaters. The 473,000 figure means that nearly 1 out of 6 people who live in the James River watershed live in these vulnerable census tracts. Virginians who attend school or work in these communities are also at risk.
- The Hampton Roads region of the James River watershed is especially vulnerable to potential climate-driven chemical disasters, accounting for more than half of the census tracts identified by our analysis as at-risk. However, flood-exposed facilities and highly vulnerable communities are also located in central and western portions of the Commonwealth, in both urban and rural communities.

Whose Responsibility?

Facility owners and operators should bear most of the burden of preventing toxic floodwaters, and state and federal environmental regulators should hold companies accountable for their actions. We have focused on industrial facilities regulated under seven different state and federal programs that require industrial facilities to take measures to prevent, mitigate, and respond to chemical spills. For the most part, Virginia regulators at the Department of Environmental Quality (DEQ) are responsible for enforcing these laws and addressing the threat from toxic floodwaters. Virginia residents also have a role to play in holding facility operators accountable when they violate the law and by pressing state regulators to enforce the law.

Unfortunately, our careful examination leads to the inescapable conclusion that Virginia is simply not prepared to prevent or respond to toxic floodwaters. Our research and analysis show that lawmakers and regulators in the Commonwealth have not effectively addressed flooding risks at industrial facilities – risks that are growing due to climate change. Commonwealth residents face the potential for widespread pollution spills like the spills in Texas and North Carolina. Furthermore, without disaster

planning and resources specifically focused on protecting these communities, it may take weeks, months, or even years to remediate toxic floodwater contamination in homes, schools, and businesses.

Virginia's lawmakers and regulators must act to address the threat of toxic floodwaters, focusing on the most vulnerable communities first.

Recommendations

Our key policy recommendations are:

- Virginia's environmental regulators should utilize existing authority under state and federal law to prevent and mitigate climate-driven chemical disasters at industrial facilities. For example, the Virginia DEQ should investigate whether a facility's pollution or spill-prevention plan, required under the Clean Water Act or the Clean Air Act's Risk Management Program, accurately and adequately considers the risks of site flooding. Similarly, DEQ should ensure that risk assessment and remediation plans submitted by brownfields redevelopers under state law are responsive to the potential risk that contamination could spread off-site due to a flood. DEQ should prioritize inspection and enforcement efforts in the most socially vulnerable Virginia communities.
- Virginia's environmental regulators should also improve public access to information about potential chemical hazards. In particular, Virginia DEQ is required by state and federal laws to publicly disclose information about facilities that store hazardous chemicals and designated "extremely hazardous substances."
- Virginia regulators should ensure that facilities comply with hazardous chemical reporting requirements. Facilities must share reporting data with regulators and with local first responders and emergency planners in accordance with federal law.
- The Virginia General Assembly recently passed legislation that strengthens requirements for coal ash waste disposal by mandating the removal of 21 million tons of ash from vulnerable ponds beside the James and Elizabeth Rivers. However, the law and applicable state regulations fall short of preventing disposal of coal ash waste in flood-exposed landfills. Virginia regulators and policymakers should ensure the coal ash is disposed and contained within landfills that are not exposed to present-day flood risks or to future risk from sea-level rise.
- Virginia lawmakers should establish a new program creating siting, construction, and monitoring standards for above-ground chemical storage tanks. These significant hazards are currently unregulated under

state law. The regulatory program should build on existing regulations for petroleum storage tanks and should include requirements for spill prevention and control that are responsive to potential flood damage. The program should require new aboveground chemical and oil storage tanks in flood-exposed areas to be elevated at least four feet off the ground. West Virginia offers a potential model. There, a 2014 spill from an unregulated chemical tank near Charleston left some 300,000 residents without access to drinking water. In response, the state adopted a regulatory program for unregulated chemical tanks.

- Finally, Virginia's General Assembly and Governor should establish and fund a task force to recommend policy reforms addressing climate impacts on pollution permitting and regulatory design. The task force should issue criteria for deploying resilience and disaster-response funding to the most vulnerable populations in the Commonwealth, with the aim of mitigating the risk of harm from climate-driven chemical disasters. Such a task force would also create an opportunity for the Commonwealth's philanthropic community to contribute by making new investments in community-based organizations that have the expertise and ability to hold industrial facilities and regulators accountable.

Hurricane Florence: Hog Waste and Coal Ash Flooding North Carolina Communities

In 2018, flooding from Hurricane Florence inundated coal ash storage facilities and hog waste lagoons in North Carolina, discharging pollution into floodwaters downstream and spreading the contamination – toxic metals and fecal matter – throughout the state's southeastern communities. The incident was neither unprecedented nor unpredictable. Rather, the history of storm-driven spills and the impacts to some of the state's most vulnerable communities is well-documented and understood. In 1999, Hurricane Floyd triggered flooding and subsequent discharges from at least 61 hog facilities and waste lagoons. Then in 2016, rainfall from Hurricane Matthew caused spills from dozens of hog waste lagoons and from at least two coal ash facilities. Extreme precipitation was also implicated in coal ash spills in 2008 and 2017.

Hurricane Harvey: Industrial Spills Along the Gulf Coast

In 2017, flooding from Hurricane Harvey caused widespread industrial spills along the Gulf Coast's expansive petrochemical corridor. Based upon self-reported incidents alone, at least 22,000 barrels of petroleum products and other toxic chemicals were spilled in the floodwaters at facilities in Texas.¹ A spill of gasoline at a storage facility in Galena Park, near Houston, accounted for half of reported spills. In one analysis, the Union of Concerned Scientists identified more than 650 industrial facilities in Texas and Louisiana that were potentially exposed to floodwaters from Hurricane Harvey.²

Along with spills of liquid chemicals, flooding also contributed to uncontrolled air emissions of more than 360 tons of toxic chemicals from the Valero Energy refinery and other Houston facilities. Flooding damaged the Arkema chemical plant in Crosby, resulting in explosions of hazardous organic peroxides and wastewater spills amounting to more than 23,000 pounds of contamination.

Subsequent monitoring uncovered elevated levels of heavy metals, dioxins, and other toxic contaminants in homes and soils near the plant. In another example, flooding contributed to the failure of containment structures at the San Jacinto River Waste Pits Superfund site, likely causing toxic dioxins to be carried downstream to flooded communities. After the storm, community and environmental advocates successfully pushed the EPA to require the facility owners to remove the contaminated sediment from the flood-prone waste site.³

Climate Change and Industrial Facilities in Virginia

In Virginia, the accelerating consequences of climate change are increasing the risks of chemical disasters, environmental pollution, and hazards to public health from flood-exposed facilities. In the analysis that follows, we deem a facility flood-exposed if it is located in a federally designated flood zone, if it is in a location that would be flooded by storm surge from up to a Category 3 hurricane, or if it would be flooded by levels of sea-level rise – up to 5 feet – predicted this century. Some facilities are flood-exposed because of all three risks.

In the southeast United States, the intensity of precipitation has increased substantially in the last 70 years, and the largest rainfall events have increased 16 percent in frequency, driving the incidence of river flooding dramatically in some areas.⁴ Federal climate scientists expect this trend to continue over the next several decades, with heavy rainfall incidents doubling in frequency and the volume of rainfall during these events increasing by 21 percent.⁵ In one recent national study, scientists determined that climate change has increased the number of people exposed to river flooding by between 260 percent and 310 percent beyond those accounted for in current federal river flooding designations, which are based on past observations.⁶

Virginia is already particularly vulnerable to damage from hurricane storm surge and will become even more so as climate change continues to produce larger and more destructive hurricanes more likely to follow northerly tracks.⁷ Research suggests that in the North Atlantic, climate change will increase the frequency of Category 4 and 5 hurricanes by 50 percent, with an average 20 percent increase in rainfall volumes.⁸ These predictions are supported by recent studies that tie climate change to substantially increased rainfall levels and intensities of specific storms, including Hurricanes Harvey and Florence.⁹

Hampton Roads, already prone to land subsidence, is also experiencing one of the fastest rates of sea-level rise nationally. As a result, the region already experiences sunny-day flooding of roads and communities on a monthly basis. By 2050, however, Hampton Roads is expected to experience at least one foot of sea-level rise from present-day levels and several more feet of sea-level rise by 2100, with the possibility of as many as eight additional feet.¹⁰ Mean sea level projections do not account for the impact of high tides, which will begin to inundate and degrade underground chemical and petroleum storage units, for example, before aboveground facilities and infrastructure are swamped by rising seas.

Hurricane storm surge, river flooding, and sea-level rise each pose a present and future threat to industrial facilities and communities in Virginia. Chemical spills can occur when industrial facilities do not adequately

prepare for flooding on their property, and the potential harms of industrial spills can extend far beyond the fence line. A factory might store toxic chemicals in open containers, for example, or packages of powdered pesticides might be lying in storage outdoors. Chemical storage tanks may corrode and spill their hazardous contents when subjected to saltwater during a flood. When floodwaters rise, the flood-induced chemical spill or discharge can contaminate rivers, streams, communities, and neighborhoods downstream, leaving a toxic residue in homes, businesses, and water systems.

The Toxic Floodwaters Methodology

The Center for Progressive Reform, the James River Association, and Chesapeake Commons embarked on this project to develop solutions to river flooding, storm surge, and sea-level rise at industrial facilities throughout some of the most socially vulnerable communities in Virginia.

Our initial research, detailed in this report, focused on the James River watershed. The watershed is approximately 10,000 square miles and is home to over 2.9 million people.

The facilities we studied are located in some of the most socially vulnerable census tracts nationally that are within the James River watershed, from the western Highlands to Hampton Roads. The facilities all meet three criteria:

1. The facilities are situated within census tracts that are in the highest quartile nationally for social vulnerability to disaster, as defined by the Centers for Disease Control's SVI.
2. The facilities are regulated by one or more of seven federal and state pollution control programs that likely indicate the presence of toxic substances.
3. The facilities are vulnerable to flooding, particularly during heavy storms of the sort that will grow more common and more severe as climate change progresses.

The analysis was produced using a novel Geographic Information Systems (GIS) model to identify and prioritize potentially flood-exposed industrial facilities. Our overall conclusion is that 1,095 different facilities are both flood-exposed and potential sources of toxic or hazardous contamination during floods. This report does not, however, assess the likelihood that a spill or discharge will occur at any single facility under a flooding scenario.

Our model relies on projections by federal scientists of present-day risks of river flooding and hurricane storm surge and projections of future sea-level rise in Virginia. It includes only a subset of the total number of industrial facilities in the Commonwealth, focusing on facilities that are regulated under one of seven federal and state programs.

Social Vulnerability

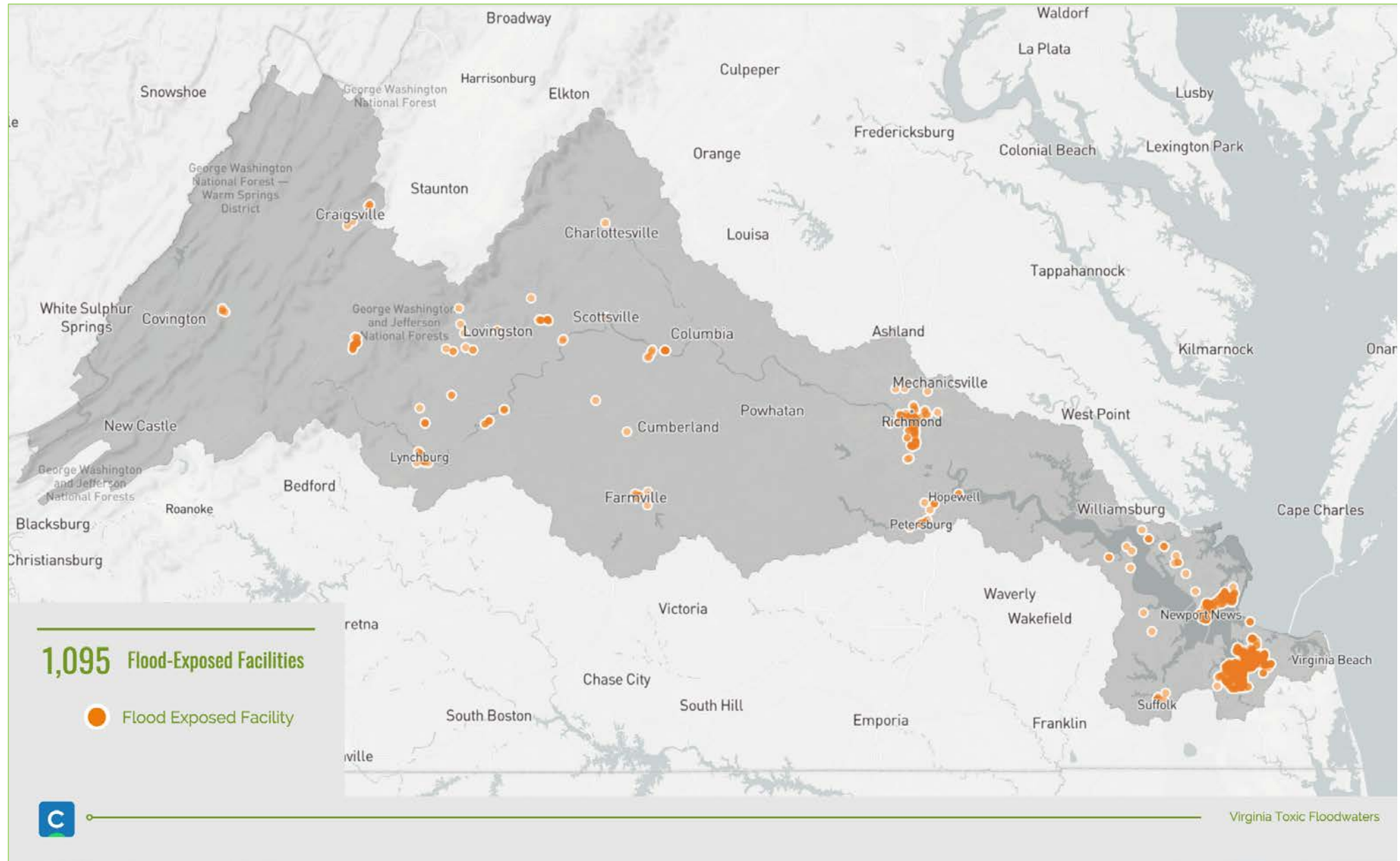
In recognition of the social dimension of potential harm from chemical exposures, the analysis focuses exclusively upon people living in census tracts in the James River watershed that have been evaluated by the Centers for Disease Control and Prevention as being among the highest-quartile nationally for social vulnerability to disaster. A census tract on average contains about 4,000 people, though some contain as many as 8,000. We chose to focus this report on socially vulnerable communities because it is here that the greatest harm is liable to occur in the event of a disaster, just as the greatest harms from Katrina befell the most vulnerable communities in the Gulf Coast region.

Millions of Virginians live and work in communities that are considered socially vulnerable. Social vulnerability is a complex concept. The CDC defines it as a community's ability to prevent human suffering and financial loss in a disaster, and the CDC explains that social vulnerability is influenced by factors such as poverty, race, and access to transportation. In the event of climate and chemical disaster, a household without reliable transportation to evacuate may be immobilized in their homes and exposed to toxic contamination from floodwaters. Similarly, low-income or socially isolated households may not be able to afford or have access to temporary housing. They may lack the means to fully remediate contamination in and around their homes, resulting in prolonged exposure to contaminants.

Certain populations, including children and the elderly, are more susceptible to harmful pollution. For example, exposure to contamination may be higher in children, who have more skin surface area per unit of body weight than adults, and in the elderly, who are less mobile than young and middle-aged adults. Historic disinvestment in some communities leaves them without easy access to high-quality health care or other social services to protect their health and aid their recovery from disaster. Finally, for reasons of economics, politics, and racism, some of the communities characterized by social vulnerability are also among the most flood-prone and have some of the highest concentration of industrial facilities, which could result in floodwater contamination at especially high concentrations.

Researchers at the CDC hoping to promote policymaking to address these and other causes of socioeconomic inequality have created a "Social Vulnerability Index" (SVI) that we used in studying the James River watershed. The SVI measures socioeconomic and demographic data to identify census tract-designated communities that are most vulnerable to potential harm from disaster events. For the purposes of our analysis, we identified and prioritized the census tracts with SVI scores among the highest quartile nationally.

Flood-Exposed Hazardous Chemical Facilities in Census Tracts Scoring in the Highest Quartile Nationally for Social Vulnerability



A high SVI score suggests that a community would benefit from additional support from government institutions, the social sector, and private industry to support disaster resilience, response, and recovery. The SVI is a useful tool for high-level research, although it fails to capture the capacity of individual community leaders and motivated citizens' groups to effect change. We use it here as a starting point for a conversation about policy reform and priorities for limiting environmental risks as climate change reshapes Virginia.

Storing or Handling Toxic Chemicals or Substances

To identify flood-exposed industrial facilities in the James River watershed that are likely to use or store toxic and hazardous substances, we created a database of all industrial sites subject to seven different state and federal pollution permitting programs, including Superfund, the Clean Water Act, the Clean Air Act's Risk Management Program, the Resource Conservation and Recovery Act, the Emergency Planning and Community Right-to-Know

Act, Virginia's Voluntary Remediation Program, and Virginia's program for registered petroleum storage tanks. The database includes a range of industrial facilities, including major chemical manufacturers, petroleum and coal importers, wastewater plants, rural agricultural suppliers, contaminated brownfields, and gas stations with underground petroleum storage tanks.

A facility regulated under one or more of these programs is highly likely to be using or storing toxic or hazardous substances (as defined by federal law) or to be a site where these

substances were released in the past and still remain. For any individual facility, we did not seek to identify the exact chemical substances at the site, or the nature and amount of these substances; these factors can change over the course of a year. For sites currently subject to regulation for past releases of hazardous substances (such as Superfund sites or the Virginia Voluntary Remediation Program sites), it is possible that some or most of the

Identifying Facilities that Threaten Communities

Of the more 17,000 state and federally regulated industrial facilities in the James River watershed, we identified at least 4,500 industrial facilities that are located in communities that are the most socially vulnerable to disaster, based upon national rankings by the CDC. We focused our analysis on 2,726 facilities in these communities that are regulated under seven state and federal programs for toxic and hazardous chemicals:

- *Superfund*
- *Clean Air Act's Risk Management Program*
- *Clean Water Act*
- *Resource Conservation and Recovery Act*
- *Emergency Planning and Community Right-to-Know Act*
- *Virginia's Voluntary Remediation Program*
- *Virginia's Registered Petroleum Storage Tank Program*

contamination has already been excavated or contained; however, on-site containment or remediation practices may be vulnerable to flooding episodes. Therefore, a facility's regulation under one of these seven programs is highly indicative of a facility's use, storage, or presence of toxic or hazardous substances, but our analysis did not extend to identifying the amount and type of substances at particular facilities. Nor did we assess the construction, layout, or chemical use or storage practices at any of the facilities identified in our analysis.

Flood-Exposed Facilities

Using this database of regulated facilities, we then identified those exposed to potential flooding by screening the facilities using three criteria: federally designated 100- and 500-year flood-zones; modeled storm surge from Category 1 through 3 hurricanes; and sea-level rise projections of between one and five feet. Flooding from 100- and 500-year storms and hurricane storm surge represent present-day risks of flooding because they could occur in any year in the near future. Sea-level rise, in contrast, represents a future risk of permanent inundation of industrial sites as climate change progresses.

Curbing Coal Ash Contamination

The James River Association and their allies in the Virginia environmental advocacy community recently won enhanced pollution controls for storage of toxic coal ash waste at several waterfront facilities in the Commonwealth. Grassroots leaders and environmental groups coordinated for several years to secure new state rules on permanent disposal and containment of leaking coal ash pits through negotiations with state regulators, bipartisan members of the General Assembly, the Governor, and Dominion Energy, the owner of the coal ash facilities. In the years to come, environmental advocates will continue their efforts to ensure accountability in coal ash waste disposal through public participation and advocacy.

Principal Findings from the James River Watershed

FINDING: *More than 473,000 Virginians who live in 125 socially vulnerable census tracts in the James River watershed face the risk of toxic floodwaters because of flood-exposed industrial facilities.*

We found that more than 473,000 Virginians reside in the 125 census tracts that *both* have a high national SVI score (top quartile) *and* have at least one flood-exposed industrial facility. Many of the James River watershed's census tracts among the most socially vulnerable to disaster are located within metropolitan Richmond and Hampton Roads, such as Petersburg, Hopewell, Norfolk, Newport News, Hampton, and Chesapeake. Others are found in rural areas, such as Surry and Buckingham counties, and small towns and cities in the western portion of the state, such as Clifton Forge



Waterfront industry in Hopewell, Virginia. Credit: James River Association.

and Buena Vista. In most cases, these tracts include communities facing issues of environmental justice exacerbated by climate change – that is, they are low-income or minority communities disproportionately affected by industrial pollution and the impacts of climate change.

One of these highest quartile SVI tracts, in Norfolk, contains 164 flood-exposed industrial facilities and a population of more than 3,600 residents within one square mile. On average, these highest quartile

SVI communities in the James River watershed each contain 25 flood-exposed facilities regulated for toxic and hazardous chemicals.

FINDING: *More than 1,000 flood-exposed industrial facilities that contain hazardous and toxic chemicals are located in highly vulnerable census tracts in the James River watershed.*

In the James River watershed, we identified more than 2,700 facilities regulated for storage, use, contamination, and discharge of toxic and hazardous substances located within census tracts among the highest quartile nationally for social vulnerability. Of these, we determined that 1,095 are flood-exposed, as defined in our methodology section above.

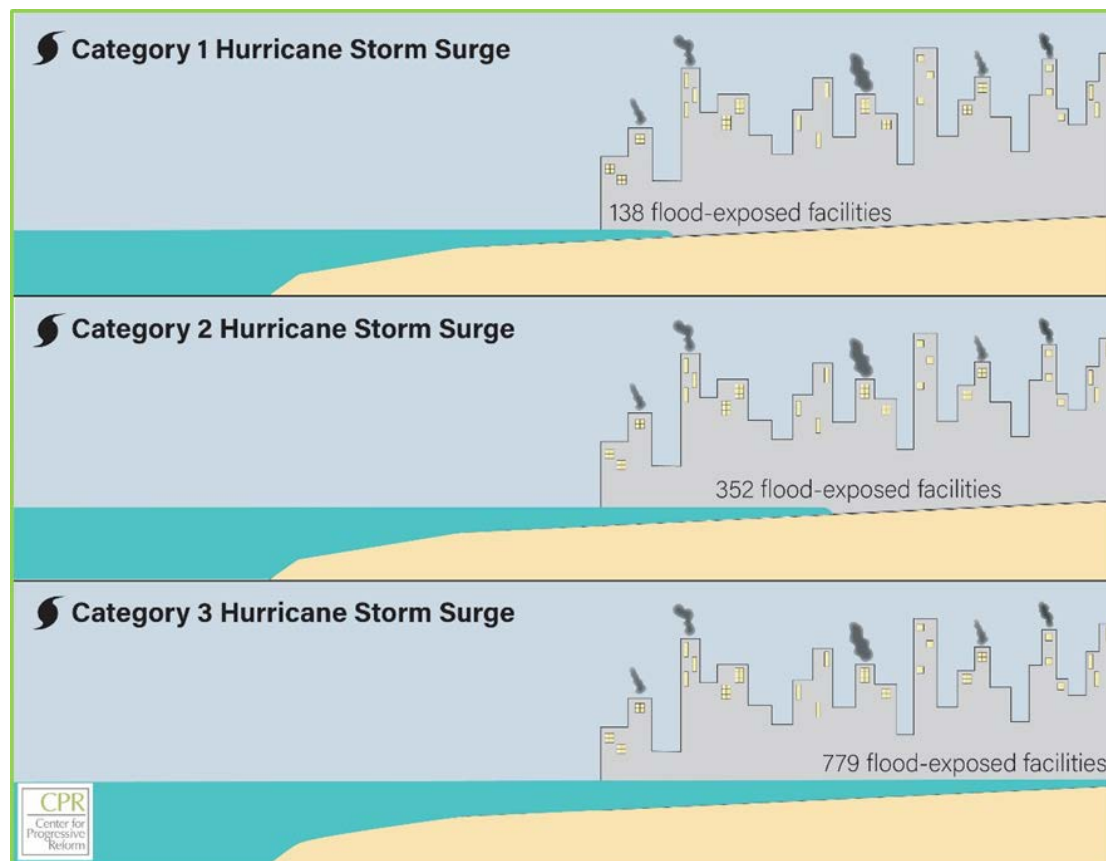
Of these 1,095 facilities, we identified 567 facilities that are exposed to any two sources of flooding. 171 of these facilities are highly flood-exposed

because *any* source of flooding – sea-level rise, storm surge, or heavy rain events in flood-zones – would affect them.

Zeroing in geographically, we found that 234 facilities regulated for toxic and hazardous substances and located in the highest quartile SVI tracts within the tidal region of the James River – from Hampton Roads to Richmond – are likely to be flooded by future sea-level rise between one and five feet. Strikingly, 91 of these facilities will be flooded by only one foot of sea-level rise, which climate scientists expect to occur by 2050. This last statistic is particularly significant because it means these facilities will be under water within the next 30 years. They should be closely assessed by regulators, industry, and community groups to determine what can be done to reduce risks of off-site contamination.

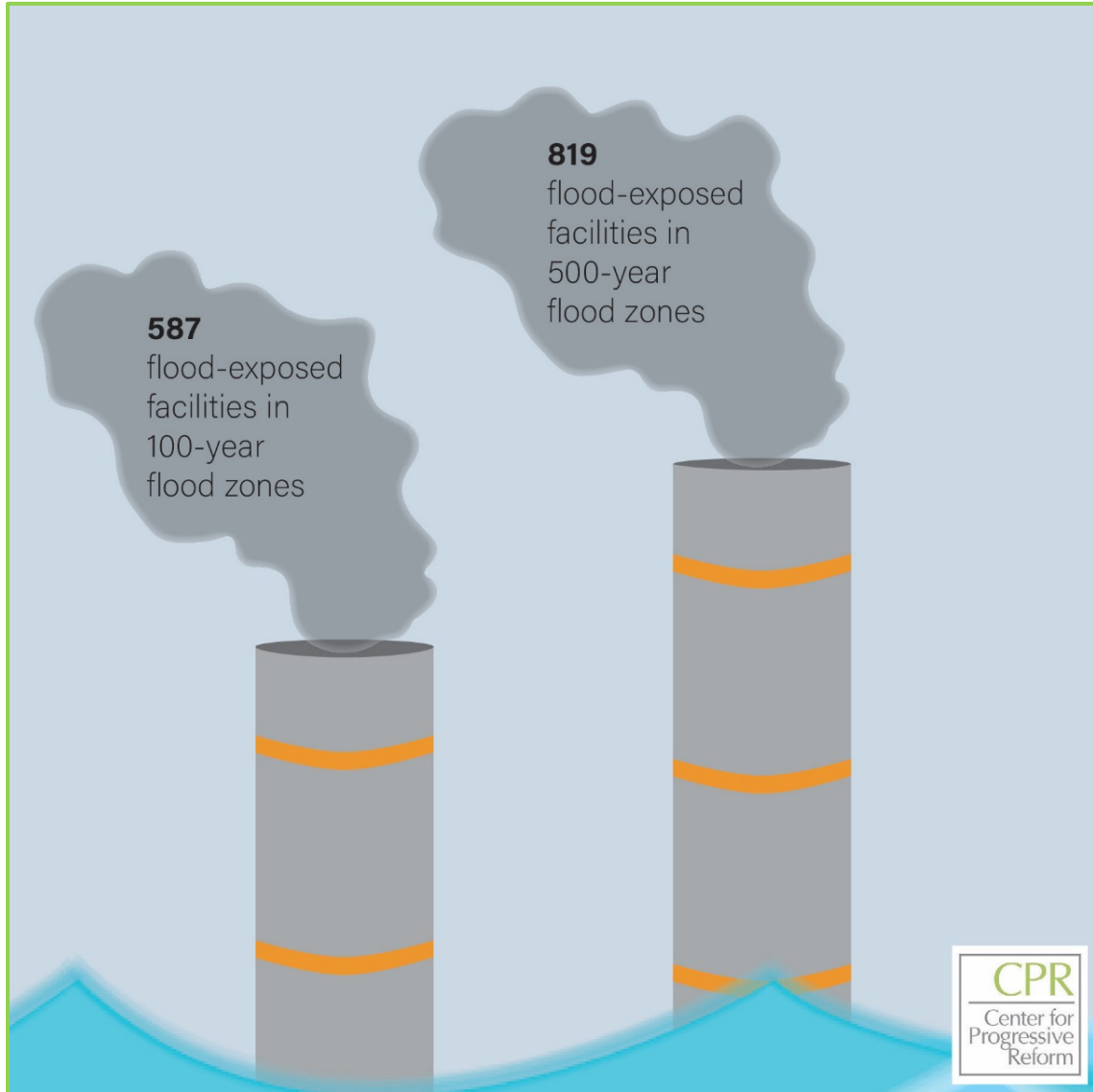
Our research identified facilities in census tracts in the highest quartile for social vulnerability nationally that are potentially exposed to flooding from sea level rise, based upon projections from National Oceanic and Atmospheric Administration modeling. We found that only one foot of sea level rise would expose 91 facilities likely containing hazardous chemicals to regular flooding. Climate scientists expect Virginia to experience one additional foot of sea level rise by 2050. We also found that further degrees of sea level rise expected by 2100 would result in potential flood exposure of 99, 115, 155, and 234 facilities for two, three, four, and five feet of projected sea level rise, respectively.

Figure 1: Industrial Facilities Exposed to Flooding from Hurricane Storm Surge, James River Watershed



Our research identified facilities in census tracts in the highest quartile for social vulnerability nationally that are potentially exposed to flooding from hurricane storm-surge scenarios, based upon National Oceanic and Atmospheric Administration modeling. We found that Category 1 and Category 2 storm surge would expose 138 and 352 facilities likely containing hazardous chemicals, respectively. Storm surge from a Category 3 hurricane – considered the lowest level of "major hurricane" – would expose at least 779 facilities to flooding.

Figure 2: Industrial Facilities Exposed to Flooding from Rainfall Events, James River Watershed



Our research identified facilities in census tracts in the highest quartile for social vulnerability nationally that are potentially exposed to flooding because they are located in Federal Emergency Management Agency-designated flood zones. We found that 587 facilities likely containing hazardous chemicals are located in designated 100-year flood zones, which based upon past observations has at least a 1 percent chance of flooding in any given year. We found 819 facilities located in designated 500-year flood zones that have a 0.2 percent change of flooding in any given year.

FINDING: *Flood-exposed facilities are regulated under different state and federal programs for toxic and hazardous chemicals.*

Virginians depend on the Virginia Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA) to prevent harm to their safety, health, and environment through rigorous regulation of chemical use and storage, discharge of pollution into the environment, and chemical contamination at industrial sites. We focused our analysis on industrial facilities that are regulated under seven specific federal and state pollution control laws and rules, including Superfund and the Clean Water Act. We also focused on less well-known regulatory programs or pollution controls that may offer fewer protections, such as Virginia’s Voluntary Remediation Program and the so-called Tier II reporting requirements for hazardous chemicals, extremely hazardous substances, and petroleum products found in the federal Emergency Planning and Community Right-to-Know Act. We chose these seven programs because the facilities they regulate are highly likely to be using or storing toxic and hazardous substances on site.

As noted, we found that 1,095 flood-prone facilities in the James River watershed’s high SVI census tracts are regulated under at least one of the seven state and federal programs, and many facilities are regulated under multiple programs.

Figure 3: Industrial Facilities Regulated Under Various Environmental Programs

	Number of Facilities Located in Highest Quartile SVI Census Tracts	Number of These Facilities that Are Flood-Exposed
Resource Conservation and Recovery Act	1,193	335 (28%)
Clean Water Act	1,112	458 (41%)
Risk Management Program	28	5 (18%)
Superfund	19	9 (47%)
Tier II Chemical Inventory Reporters	158	36 (23%)
Virginia Voluntary Remediation Program	62	18 (29%)
Virginia Registered Petroleum Storage Tanks	263	263 (100%)

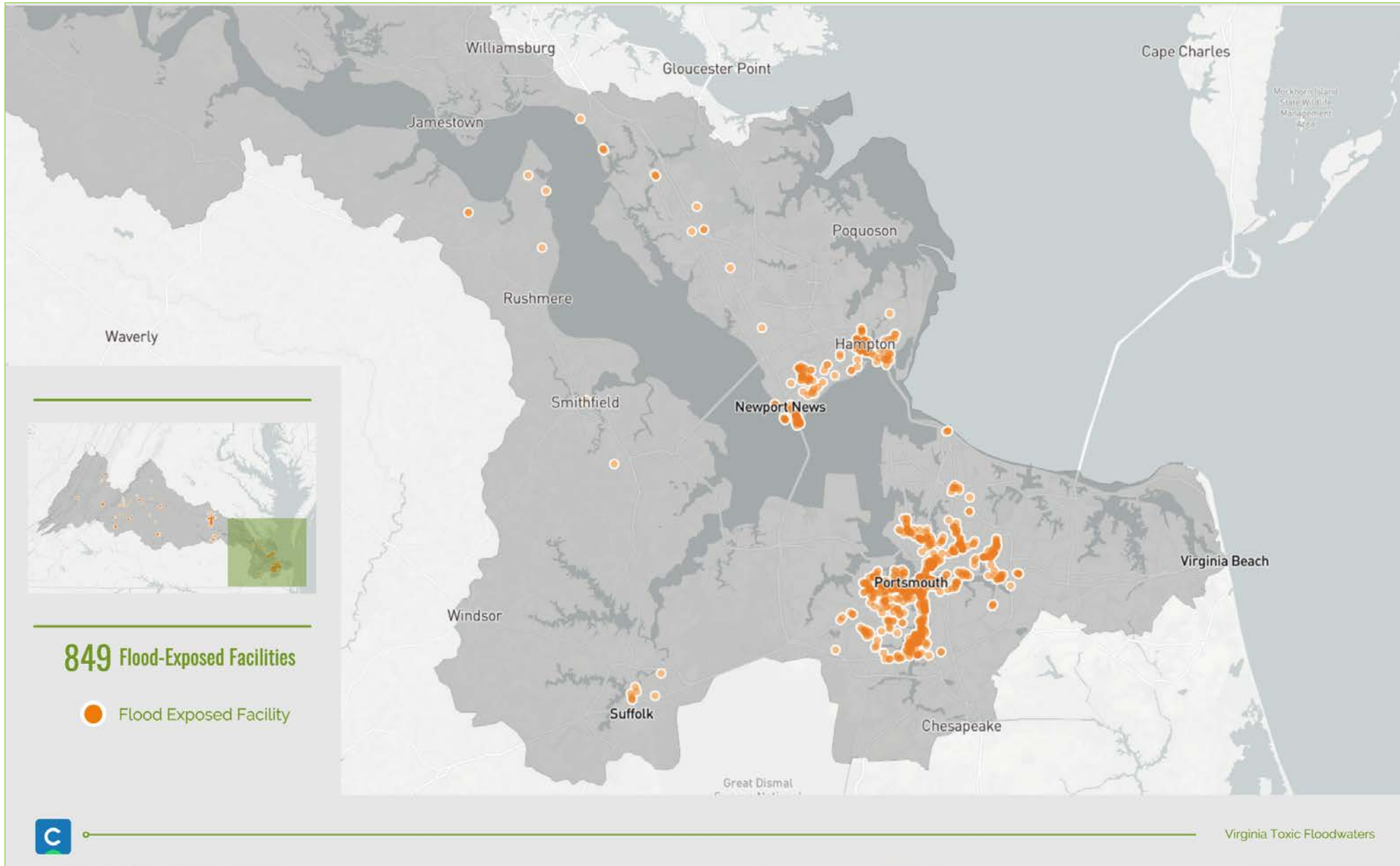
FINDING: *Hampton Roads is especially vulnerable to climate-driven chemical disasters.*

By virtue of its geography and economy, Hampton Roads faces particularly severe risks of damage from toxic floodwaters. Hampton Roads encompasses nine municipalities that sit at the mouth of the James River where it empties into the Chesapeake Bay. This tidewater region is flat, with a high water table and land that is subsiding while local sea levels are rising. As a result, it is one of the most climate-vulnerable regions in the United States. The largest naval base in the world is located in Hampton Roads. In fact, every branch of the U.S. military and NASA have facilities in the area, bringing jobs and investment but also myriad sources of pollution. Hampton Roads also has massive civilian intermodal port operations and other industrial facilities that process toxic and hazardous materials and discharge toxic pollution into surrounding communities.

Despite its robust economy, Hampton Roads, like many metropolitan regions nationally, is plagued by economic inequality. In some Hampton Roads localities, more than one in six residents lives in poverty. In Norfolk and Portsmouth, for example, almost a third of children live in poverty and a quarter of residents face housing insecurity or substandard housing conditions.¹¹ Even those with incomes ranking above federal poverty thresholds – nearly half of the households in Hampton and Newport News, for example – can barely afford regular living expenses on wages from one or multiple jobs.¹² Many Hampton Roads residents may be unable to avoid exposure to toxic floodwaters and other environmental pollution in a post-disaster scenario. They may have limited transportation and housing options and may be unable to seek health care necessary to manage exposure.

More than half (70) of the 125 census tracts with highest quartile SVI scores in the James River watershed that contain flood-exposed industrial facilities regulated for hazardous and toxic chemicals are located in Hampton, Newport News, Virginia Beach, Suffolk, Portsmouth, Chesapeake, and Norfolk. Of the 1,095 flood-exposed facilities regulated for hazardous and toxic chemicals in high SVI census tracts in the watershed, 849 (78 percent) are located in Hampton Roads. These individual census tract-designated communities are also among those containing the highest quantity and extent of industrial facilities that would be flooded by storm events and sea-level rise. Among 30 census tracts in the James River watershed that both rank in the highest quartile nationally on the SVI and had the highest quantity and degree of flood-exposed facilities, we found that 23 are located in Hampton Roads.

Flood-Exposed Hazardous Chemical Facilities in Hampton Roads Census Tracts Scoring in the Highest Quartile Nationally for Social Vulnerability



Conclusion and Principal Recommendations

Flood-induced chemical disasters pose a serious and underappreciated risk to the most vulnerable communities throughout Virginia, and state and local governments are not prepared for toxic floodwaters.

Virginia lawmakers and regulators have not effectively responded to the threat posed by flooding of industrial sites resulting in hazardous contamination within nearby communities.

Without urgent and meaningful response to this threat, Virginia is vulnerable to community-wide contamination incidents of the type recently observed in Texas and North Carolina. Plant operators will continue to operate in increasingly flood-exposed sites without taking steps to prevent toxic floodwaters. If flooding occurs, weeks and months will pass before contamination can be thoroughly identified and remediated, which will be too late for affected communities to receive the resources they need to protect their health and property. Therefore, Virginia lawmakers and regulators must act with urgency today to address pollution control at flood-exposed industrial facilities and prepare for additional reform as climate change increasingly floods parts of the Commonwealth.

In short, while we may not be able to prevent flooding, as climate change advances, policymakers will face an imperative: require that facilities that use or store toxic and hazardous chemicals be hardened to prevent discharges in the case of severe flooding, or more simply, require that hazardous substances be removed from the path of likely floodwaters. This is a difficult task, given the sheer quantity of facilities that pose a threat, but ignoring the problem will threaten lives, livelihoods, and entire communities.

We recommend that Virginia's elected officials, policymakers, and regulators examine the risks from toxic floodwaters and take steps to reduce the threat. State and local governments, in collaboration with community partners, should also dedicate meaningful resources to support those communities that bear the greatest risk of harm from toxic floodwaters.

Officials have shown this is possible, as Virginia is already starting to respond to certain climate-related threats. Last year, the Commonwealth's political leadership launched new efforts to implement adaptation strategies.¹³ The efforts are intended to promote flood and climate resilience. For example, agencies are beginning to develop a Virginia Coastal Resilience Master Plan and set construction standards for state facilities. The Governor has appointed a cabinet-level Chief Resilience Officer for the Commonwealth to lead the multi-agency directive. These efforts are an important first step, but they do not match the scale of Virginia's climate adaptation challenge, and

none of them focus specifically on the regulatory reforms necessary to address chemical-related risks from industrial sources.

RECOMMENDATION: *Use existing legal authority to prevent climate-driven chemical disasters.*

State regulators and their partners should develop a statewide, comprehensive analysis of the climate vulnerability of industrial facilities, and they should conduct a risk assessment for chemical disasters and climate-driven pollution. The analysis should consider all areas of the Commonwealth and should prioritize 1) facilities with high levels of



Dominion Coal Terminal in Newport News, Virginia. Credit: James River Association.

potential flood exposure and 2) facilities in socially vulnerable communities.

State and local regulators should also evaluate how existing laws could be used to prevent toxic floodwaters. Under existing legal authority, regulators could force facilities to consider future risks for site flooding from extreme weather and sea-level rise. If flooding risks are present, they should be noted and addressed in spill contingency plans or stormwater pollution

prevention plans. State regulators could also take steps to prevent flood-induced spills without new rulemakings or legislation. For example, regulators could issue new guidance to industry for how to implement spill prevention and control practices that consider climate vulnerability.

Regulators should also target enforcement against those facilities, located in flood-prone environmental justice communities, that are discharging above permitted levels or failing to develop required pollution prevention plans. To this end, DEQ should realign its enforcement policy and invest new resources to prioritize inspection and enforcement efforts on flood-exposed facilities located near the Commonwealth's most socially vulnerable communities.

RECOMMENDATION: *Improve public access to data about potential chemical hazards.*

The Virginia DEQ and the Virginia Emergency Response Council should provide public access to facility reporting data pursuant to the Virginia Freedom of Information Act and the federal Emergency Planning and

Community-Right-to-Know Act (EPCRA). Congress enacted EPCRA in the wake of the 1984 chemical plant explosion in Bhopal, India, which killed at least 3,700 and injured more than half a million. EPCRA was, however, years in the making, arising from coordinated state-level advocacy by labor and environmental advocates that drove change nationally. In EPCRA, Congress enshrined a right to information about the hazards that polluting industry had once foisted on the public without our knowledge. But EPCRA's promise, and Congress' intent, has been undermined in many states. In Virginia, communities have not been given access to some EPCRA information.

In particular, EPCRA requires disclosure of so-called Tier II facility reporting data to the public to alert communities about risks when a company is storing certain chemicals and so-called "extremely hazardous substances." The law also requires disclosure by state regulators to local government and emergency responders in order to promote safe and effective disaster response planning. The chemicals subject to reporting include heavy metals, corrosive acids, toxic ammonia, and petroleum products. EPCRA also requires annual reporting of *releases* of toxic chemicals to the air, water, and land (the so-called Toxics Release Inventory). While DEQ makes the release data easily available on its website, it has not disclosed the data on the chemicals being *stored* at industrial facilities, which is far more relevant for the toxic floodwaters scenarios discussed in this report.

Many flood-exposed facilities that store hazardous chemicals, such as warehouses and retail facilities, are likely not regulated under any other federal or state pollution control program. EPCRA is therefore the only law through which the public can know about the hazards in their communities. DEQ disclosed Tier II data to citizens in earlier reporting years but more recently has restricted access, a regressive development for the Commonwealth. We used this earlier data in our facility flood-exposure analysis.

DEQ should immediately reverse its recent policy on public disclosures of Tier II data and should make this hazardous chemical storage data

freely accessible to residents through online access, as other states, such as Illinois, have already done.¹⁵ The agency should also take steps to ensure appropriate use of this open information by providing context and interpretation to help residents understand the risks that go along with storage of hazardous chemicals and extremely hazardous substances in their communities. DEQ's decision to withhold this data from the public raises

Illinois Makes Tier II Data Freely Accessible to Public

Illinois' Emergency Management Agency provides publicly accessible and searchable databases for Tier II facility reporting data, including facilities that use and store hazardous chemicals and extremely hazardous substances, as well as facility reports for incidents involving hazardous materials.¹⁴

serious questions about whether the agency is effectively utilizing this data for its regulatory purposes. DEQ should clarify whether Tier II chemical storage data are being actively shared with first responders and emergency planners, like local firefighters and local emergency planning councils, as EPCRA requires. The agency should also consider whether the Tier II reporting data can be used by regulators to promote reduction in the use of certain hazardous chemicals. Critically, DEQ should devote enforcement resources and coordinate with EPA, as necessary, to ensure rigorous compliance by what is likely a large number of diverse facilities subject to Tier II reporting requirements.

RECOMMENDATION: *Establish new requirements for unregulated chemical storage tanks.*

Virginia lawmakers and regulators should work together to establish a comprehensive regulatory regime for aboveground chemical storage tanks. The new program should reflect Virginia's established regulatory program for tanks storing petroleum projects and certain hazardous substances. Currently, there are no siting, construction, monitoring, or spill-prevention standards in place for most aboveground chemical storage tanks.

In 2014, a chemical spill occurred at the Freedom Industries chemical storage facility on the Elk River near Charleston, West Virginia. Thousands of gallons of a toxic chemical used for cleaning coal were found to have leaked into the river from an unregulated aboveground storage tank. Some 300,000 residents in and around Charleston were without access to drinking water. West Virginia lawmakers responded by passing new reporting and regulatory requirements for aboveground chemical storage tanks. As of 2016, West Virginia regulated nearly 42,000 aboveground chemical storage tanks, of which more than a quarter are over 30 years old and, in some cases, older than 75 years.¹⁶

A new program in Virginia should be responsive to present and future flood risks. For example, regulations for new chemical storage tanks should require siting and construction standards to prevent or limit flood risk, including, for example, standards for elevation of tanks. We recommend that all new chemical and oil storage tanks in flood-exposed areas be elevated at least four feet above the ground to minimize risk from floods and storm surge. Like Virginia's program for petroleum storage tanks, state regulations should require leak monitoring devices and secondary containment mechanisms for all new tanks and for existing tanks within a certain time period. Finally, the program should also set maximum age limits for tanks and require regular inspections and maintenance measures to ensure that no spills will be caused by degraded storage tanks.

RECOMMENDATION: *Ensure removal and containment of coal ash waste into landfills that are not flood-exposed, under present-day or future climate conditions.*

Millions of tons of toxic coal ash are stored in unlined pits along rivers in Virginia, including the James River and its tributary the Elizabeth River. Monitoring of groundwater and surface water near these facilities has confirmed that toxic chemicals, like arsenic and cadmium, are already leaking from these sites during normal, dry-weather conditions into streams, rivers, and drinking water wells. These sites are also exposed to flooding from rivers and hurricane storm surge, which will only be further exacerbated by future sea-level rise. Thousands of people are living in census tracts that scored moderate to the highest level of social vulnerability and that are located adjacent to and downstream of these coal ash pits.

Massachusetts Is Working to Prevent Toxic Floodwaters

In Massachusetts, the Office of Technical Assistance (OTA) works with flood-exposed businesses to identify and reduce the use of toxic chemicals. Through its "Chemical Safety and Climate Change Preparedness" initiative, OTA has mapped EPCRA Tier II reporting facilities, CWA permitted facilities, and underground storage tanks, among other industrial facilities vulnerable to inundation from hurricane storm surge, sea-level rise, and river flooding events. OTA deploys technical guidance, training, and direct assistance to local government, first responders, and emergency planning councils to help raise awareness about the threat of storm-induced chemical disasters. OTA also assists in integrating this information into local emergency plans and preparedness programs. Finally, OTA provides free and confidential consultations with affected businesses to identify toxic chemicals and develop plans for reduction in toxic chemical use or adoption of less toxic alternatives.

Massachusetts produced the type of analysis that we have presented in this report, while also committing substantial resources to use the data to better protect at-risk communities by reducing vulnerability at flood-exposed facilities. Virginia should follow Massachusetts' lead.

In February 2019, the Virginia General Assembly enacted legislation that strengthens the weak Federal Coal Ash rules, which allow utilities to close coal ash impoundments in place. If the coal ash is left in place for decades, there is a substantial risk of flood-induced spills and resulting toxic contamination similar to incidents recently observed in North Carolina during Hurricane Florence. Construction of new coal ash landfills in these highly vulnerable areas would not meet EPA criteria, yet current federal regulations allow utilities to leave decades old coal ash impoundments in place.

The recent Virginia legislation requires Dominion Energy to remove hazardous coal ash from several uncontrolled, riverfront storage pits throughout the Commonwealth, including three within the James River watershed. The law requires disposal and containment of the coal ash waste



Coal ash storage at Dominion's Chesterfield Power Station facility, Virginia. Credit: James River Association.

into new or existing landfill facilities, which are required to comply with state regulations on solid waste disposal.¹⁷ However, only new landfills are bound by a state regulatory prohibition on siting within the 100-year floodplain or "base flood."¹⁸ The coal ash legislation and state regulations do not prohibit disposal into landfills, new or existing, that are exposed to flooding from 500-year storm events, hurricane

storm surge, or future sea-level rise. In other words, even under the new legislation, Dominion could excavate coal ash from its existing pits and dump it into newly constructed landfills that are still flood-exposed.

Virginia regulators should ensure that Dominion selects new or existing landfills for disposal of coal ash waste that are not presently flood-exposed or likely to become flood-exposed in the future. To this end, regulators should consider reforming state regulations on solid waste disposal to address flood exposure and climate vulnerability at new and existing landfills.

RECOMMENDATION: *Establish a toxic floodwaters task force to investigate and recommend policy reforms.*

While leveraging existing legal authorities to address toxic floodwaters is a critical first step, substantial regulatory reforms are urgently needed to reduce the growing threat of climate-driven industrial pollution in Virginia. The Governor and the General Assembly should commission a task force to broadly investigate ways to improve state pollution permitting, regulatory design, and disaster policy to address climate-driven chemical disaster.

The task force should meaningfully engage public and private partners and be comprised of key stakeholders, including government agencies, members of affected communities and community-based nonprofit organizations, and the philanthropic and business sectors. The commission should also leverage expertise by aligning its work with other state and local commissions, planning districts, and workgroups focused on climate change, environmental justice, disaster management, and adaptation. Virginia's philanthropic community should support meaningful and enduring participation by key stakeholders through grant-making to community-based groups that have local expertise and work on behalf of communities vulnerable to toxic floodwaters.

The task force should undertake its own investigation of facility site exposure to present-day flood risks and future flood impacts from sea-level rise. The study should not be limited by the geographic or regulatory scope of this report but rather include facilities throughout the Commonwealth and those regulated by all of the relevant state and federal pollution control programs. The task force should document the particular site conditions at industrial facilities that may increase the likelihood of chemical releases during flood events. Finally, the task force should examine existing regulations to identify gaps in spill prevention and response. The task force should prioritize opportunities to move facilities away from flood-prone areas or reduce risks through on-site flood and pollution control practices.



Dominion's Chesterfield Power Station is located on the James River, Virginia. Credit: James River Association.

Climate-driven chemical disasters may not be preventable in every circumstance, but the harms may be reduced. Pre-disaster planning is crucial. To this end, the task force should investigate whether local emergency planning councils and first responders have adequate resources and effective strategies in place. The task force should also examine whether the most vulnerable populations and communities have access to emergency transportation, housing, health care, and other services.

Pre-planning for long-term recovery can be equally as important as mitigation and response planning. Therefore, the task force should investigate whether Virginia has adequate resources to ensure timely testing and remediation of chemical spills.

A Guide for Citizen Action: Relevant Laws, Regulations, and Opportunities

In every community, leaders and dedicated advocates fight daily for their neighbors' safety, health, and prosperity. Environmental laws are a vital tool in that fight, and government agencies such as the Virginia Department of Environmental Quality (DEQ) are accountable for ensuring that these laws work as intended. Many environmental laws have "citizen suit" provisions or other opportunities for judicial review that allow communities to hold polluters and government agencies accountable for their actions (or inaction in some cases).

In this section of the report, we provide a citizens' guide to the major environmental laws. The seven programs summarized below are the best place to start looking for levers to reduce risks from toxic floodwaters and promote community resilience.

Clean Water Act

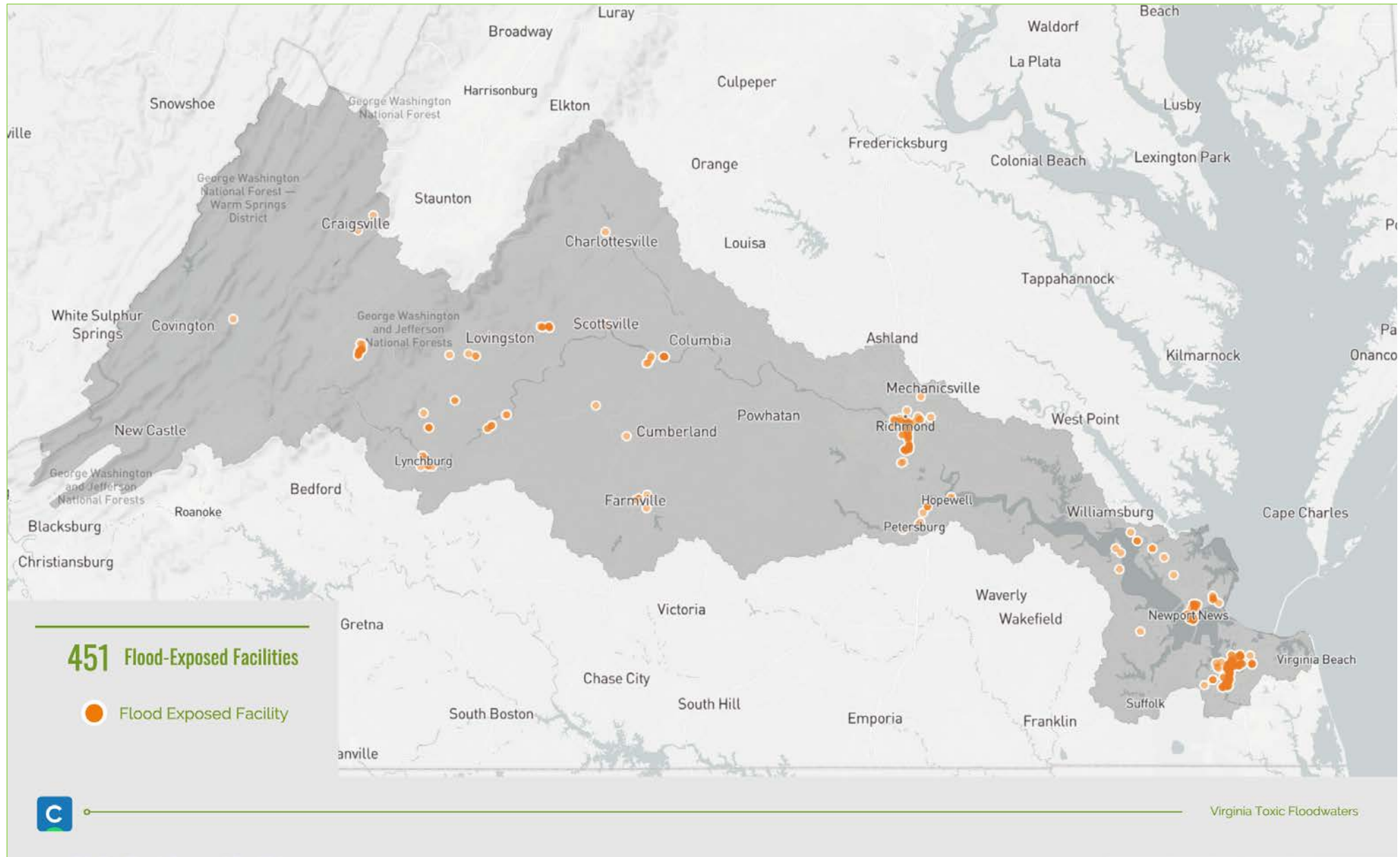
The Clean Water Act (CWA) is the major law protecting Virginia's waters through regulation of entities that discharge pollution to waterways. The U.S. EPA has delegated authority to the Commonwealth to implement the CWA, and the Virginia DEQ is in charge of issuing pollution permits to dischargers and enforcing planning and pollution control requirements. State regulators can use the CWA and the state water laws to address climate-induced chemical spills. They should, for example, strengthen requirements for planning, site design, and spill prevention.

In the James River watershed, we identified a total of 1,112 facilities with state CWA pollution permits and/or required CWA pollution prevention plans that are located within 125 census tracts that score in the highest quartile nationally for social vulnerability to disaster. Of this number, we found 458 facilities that are flood-exposed.

In addition to pollution permits, which regulate wastewater discharges, most industrial facilities are also required to obtain permit coverage for stormwater discharges. These facilities must draft site-specific Storm Water Pollution Prevention Plans.

Under the CWA, facilities that store large quantities of oil (above 1,320 gallons) above or below ground must take measures to prevent, prepare for, and respond to accidental discharges of oil and must prepare a Spill Prevention, Control, and Countermeasure (SPCC) plan. The largest oil storage facilities (above 1 million gallons) must prepare a more detailed Facility Response Plan (FRP) that includes planning for worst-case oil discharges.¹⁹

Flood-Exposed Clean Water Act Sites in Census Tracts Scoring in the Highest Quartile Nationally for Social Vulnerability



Citizens can use the CWA to investigate the climate vulnerability of industrial facilities and to pressure regulators and facilities to address risks from climate-driven chemical spills:

- Citizens have access to required plans, such as SWPPP, SPCC, and FRP plans, and to compliance data. The plans and data are useful to determine whether facilities have considered potential flooding and whether accidental discharges, upsets, or other compliance issues are already problematic. State policymakers should improve access and interpretation of this information by vulnerable communities.
- The CWA includes public participation and citizen suit provisions that provide opportunities for the public to review, comment, and seek judicial review of pollution permits and the actions of government agencies.²⁰ Citizens may submit information and analysis through public comments that raise questions about whether a given permit is adequate in a flood-prone area. Citizen suits can also be used against facilities that violate requirements to prevent accidental releases.
- Citizens should demand timely and reliable public notification of accidental spill reports that CWA-permitted facilities file with state regulators. All CWA permittees are required to report unlawful discharges, including accidental spills or bypasses, within 24 hours.²¹

Virginia Registered Tank Program

The Virginia DEQ oversees implementation of federal and state regulatory controls for certain aboveground and underground petroleum storage tanks. As described on page 24, Virginia does not regulate most aboveground chemical storage tanks. In some cases, state-regulated petroleum tank facilities are also subject to federal regulatory controls, such as the CWA Spill Prevention, Control, and Countermeasure (SPCC) and Facility Response Plan (FRP) rules.

In the James River watershed, we identified a total of 263 registered aboveground and underground petroleum tank facilities located within census tracts that score in the highest quartile nationally for social vulnerability to disaster. Remarkably, all 263 of these facilities are flood-exposed to varying degrees of river flooding, hurricane storm surge, and/or sea-level rise.

The regulations for aboveground petroleum tank facilities require certain pollution prevention practices, such as secondary containment for spills and corrosion protections.²² Operators of aboveground petroleum storage facilities are also required to develop oil discharge contingency plans, which must be filed and approved by the State Water Control Board and updated every 60 months.²³ The required plan must contain assessments of natural

resources and built infrastructure potentially exposed to oil spills. It must also assess consequences of the “worst case discharge,” defined as the total and instantaneous release of oil in the tanks during adverse weather conditions.²⁴

Operators of underground petroleum storage tanks are required to install, maintain, and inspect certain spill prevention and containment practices, such as secondary containment, spill detection and alarms, and protections against corrosion.²⁵ Owners of these tanks must demonstrate financial



responsibility for any potential corrective actions and liability for potential releases.²⁶ Operators must report and monitor suspected petroleum releases, investigate suspected off-site impacts, and must report, monitor, and remediate verified releases through development, approval, and implementation of a corrective action plan approved by the Board.²⁷

Aboveground storage tanks in the James River watershed, Virginia. Credit: James River Association.

Citizens have two key levers they can use to investigate climate

vulnerability of petroleum storage tanks and to pressure regulators and facilities to address risks from climate-driven chemical disasters:

- For underground petroleum storage tanks, citizens are entitled to review, provide comment, and request a public hearing by the State Water Control Board to consider information related to spills and the facility operator’s proposed corrective action plan.²⁸
- For aboveground petroleum storage tanks, citizens may submit freedom-of-information requests to DEQ for a facility’s contingency plans to determine whether operators have adequately considered climate and flooding impacts on the tanks. Citizens can also obtain each facility’s worst-case discharge assessments.

Flood-Exposed Registered Petroleum Tanks in Census Tracts Scoring in the Highest Quartile Nationally for Social Vulnerability



Virginia Environmental Groups File Lawsuit to Tackle Climate Vulnerable Facility

In one case, environmental advocates in Virginia have already taken notice of the climate-driven threat of industrial pollution in the James River watershed. Dominion Energy owns and operates the Chesapeake Energy Center on the Elizabeth River, a tidal tributary of the James in Hampton Roads. The facility contains an impoundment of more than two million tons of coal ash waste. In 2016, the Southern Environmental Law Center (SELC), on behalf of the Sierra Club, filed a lawsuit to challenge pollution flowing through groundwater from the coal ash pit to the Elizabeth River.

At the time of the lawsuit, Dominion, under state solid waste permits, was planning to leave the coal ash waste in place indefinitely, which would allow discharge of pollutants like arsenic to the Elizabeth River. SELC and Sierra Club were supported in their lawsuit by university researchers, who prepared a detailed climate vulnerability assessment of the facility. In their report, they found that the coal ash waste is highly vulnerable to flood hazards given that the site is exposed to river flooding and Category 1 hurricane storm surge, while projected coastal erosion and sea-level rise will exacerbate groundwater contamination and flood risk in the coming decades.

SELC and Sierra Club secured a federal court ruling requiring development of remediation plans for the site. It was the first trial court ruling in the nation about coal ash pits as a source of water pollution. The Fourth Circuit Court of Appeals later ruled that the trial court had not interpreted the Clean Water Act correctly. At present, however, Dominion is planning for excavation of all the coal ash at the Chesapeake Energy Center due to legislation passed by the Virginia General Assembly (as described on page 25).

Risk Management Program

The Clean Air Act (CAA) is the principal federal program for controlling air pollution in Virginia, and under its terms the Commonwealth is delegated the authority to issue and enforce air pollution permits. The Risk Management Program (RMP), part of the CAA, requires permitted facilities containing certain hazardous chemicals in quantities exceeding established thresholds to implement risk management plans for accidental releases.³¹

In the James River watershed, we identified a total of 28 RMP facilities that are located within census tracts that score in the highest quartile nationally for social vulnerability to disaster. Of this number, we found five facilities that are flood-exposed. Hazardous and flammable chemicals such as

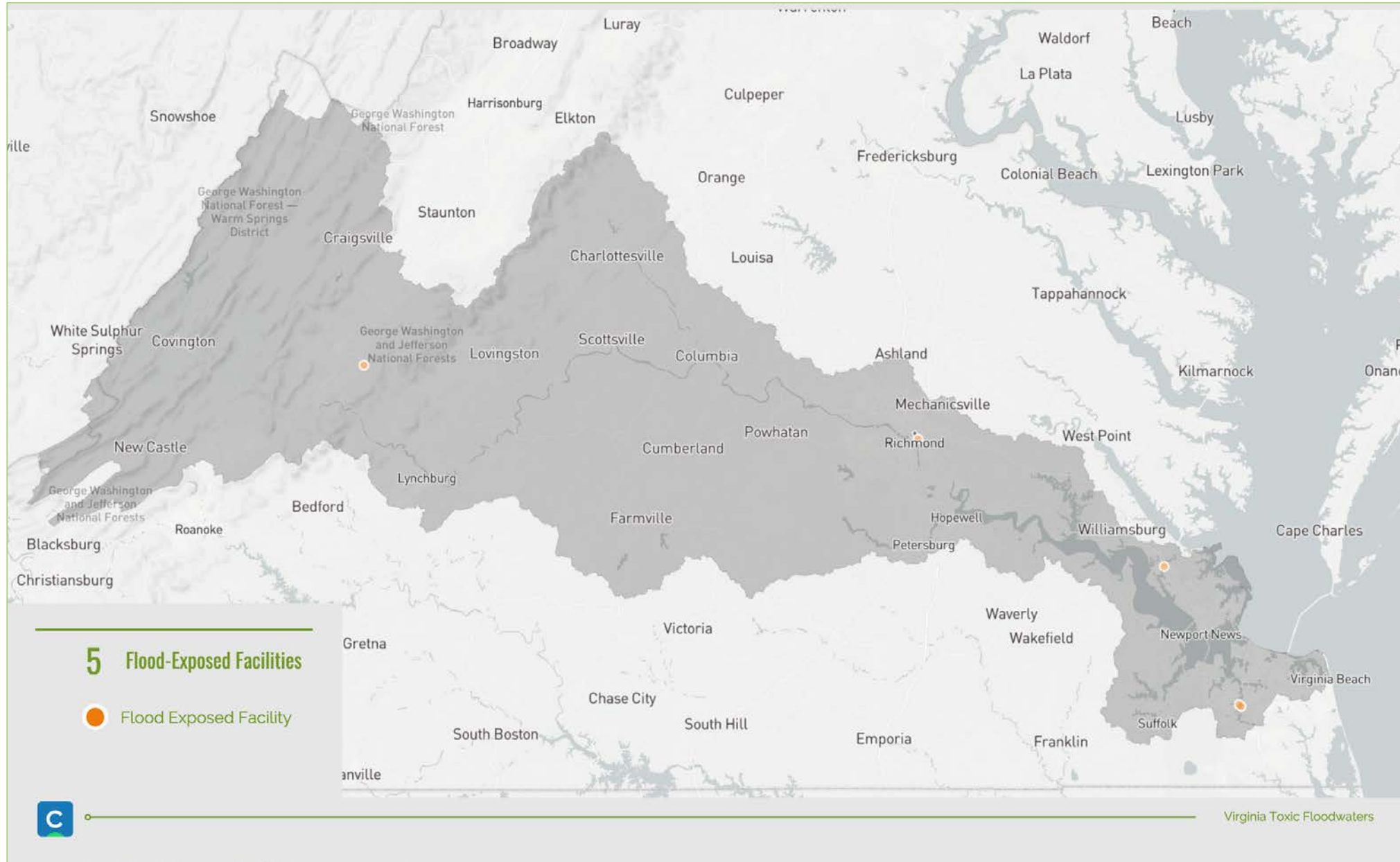
chlorine, ammonia, oleum, and butane are among the most prevalent, in terms of location and quantity, at RMP-regulated facilities in Virginia.

RMP regulations require facilities to submit risk management plans and to update them every five years. These plans require analysis of potential worst-case scenarios, including, for example, the impact of potential flooding, as well as five-year accident histories, information about process and mitigation systems, and plans for coordination with local emergency response agencies.³² The CAA's General Duty Clause also requires facilities to prevent, minimize, and respond to accidental discharges of extremely hazardous substances.³³ Regulators evaluate facility hazards for several factors, including historic accidents, proximity to population centers, and requests from local governments and community groups. If regulators determine there is imminent and substantial endangerment to human health, they may order the facility to take steps to prevent threatened releases.³⁴

There are a number of important opportunities and key levers that citizens can use to investigate climate vulnerability of industrial facilities regulated by the CAA and RMP and to pressure regulators and facilities to address the risks from climate-driven chemical spills:

- Citizens can read portions of facility's risk management plans. However, the process is time-consuming and requires submission of formal requests and scheduling of an in-person review of documents at designated federal "reading rooms."³⁵ The Right-to-Know Network and the *Houston Chronicle* have reviewed RMP plans for facilities nationwide and have made summaries available to the public online (<http://www.rtk.net/>).
- Like the CWA, the CAA includes public participation and citizen suit provisions, which may provide opportunities for the public to review, comment, and seek judicial review of permits that inadequately address climate impacts and permittees that violate requirements to prevent accidental releases.³⁶ During a permit proceeding, citizens may submit public comments that raise questions about whether a given RMP facility has adequately addressed projected climate and flooding impacts in its risk management plans and analyses.

Flood-Exposed Risk Management Program Facilities in Census Tracts Scoring in the Highest Quartile Nationally for Social Vulnerability



Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) is a federal regulatory program for managing the environmental and human health risks associated with hazardous wastes. In Virginia, regulators have been delegated authority to implement RCRA permitting and enforcement programs.

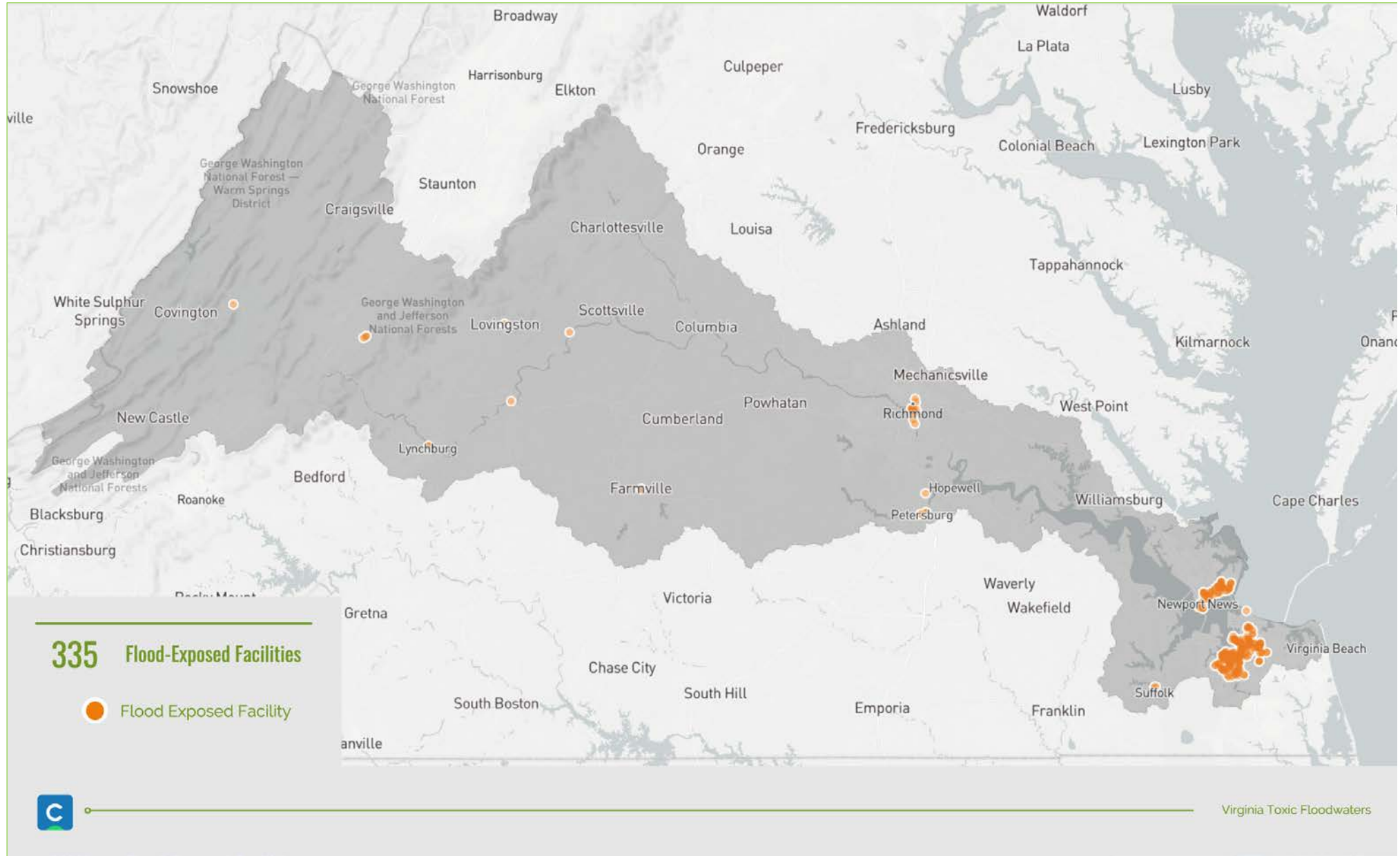
In the James River watershed, we identified a total of 1,193 RCRA-permitted facilities located within 125 census tracts that score in the highest quartile nationally for social vulnerability to disaster. Of this number, we found 335 facilities exposed to flood risks. The facilities include a variety of operations involved in the transport, storage, and disposal of hazardous waste. There are also facilities that generate thousands of pounds of hazardous and highly toxic waste per month and are required to have designated emergency coordinators and contingency plans for spills. Six of these flood-exposed RCRA facilities have been required to take corrective action to remediate historic site contamination.

RCRA permits impose standards for siting, design, and construction of facilities that are intended to prevent and mitigate unpermitted releases of hazardous materials.³⁷ The standards include criteria for flood protection only if the facility is located in a 100-year floodplain.³⁸ All RCRA permittees are also required to develop and implement plans for preparedness, contingency, emergency response, and for prevention of accidental releases.³⁹ The effectiveness of these pollution prevention requirements are, however, totally dependent on timely and technically thorough inspection and enforcement by regulators.

There are a number of important opportunities and key levers that citizens can use to investigate climate vulnerability of industrial facilities regulated by RCRA and to pressure regulators and facilities to address potential climate-driven chemical disasters:

- Citizens have a right to public records such as permit applications, regulatory inspection reports, and compliance data. These documents may reveal whether actions have been taken by the facility operator or imposed by regulators to address flood vulnerabilities.⁴⁰ DEQ should make this information available online and assist underserved and vulnerable communities in understanding the significance of the records and data.

Flood-Exposed Resource Conservation and Recovery Act Facilities in Census Tracts Scoring in the Highest Quartile Nationally for Social Vulnerability



- Citizens are also entitled to public review and comment on proposed RCRA permits, with a corresponding legal right to seek judicial review of legally deficient permits.⁴¹ Citizens may submit information and analysis through public comments that raise questions about whether regulators have adequately addressed projected climate and flooding impacts in a given RCRA permit. For newly proposed facilities, citizens can demand that proposed siting and design address projected climate impacts.⁴²
- Finally, RCRA permits citizens to file suit against regulated facilities in order to prevent unlawful discharges of hazardous materials that present an “imminent and substantial endangerment to health or the environment.”⁴³

New England Nonprofit Files Lawsuits to Tackle Climate Vulnerable Facilities

In two recent cases, the nonprofit Conservation Law Foundation (CLF) has filed RCRA and CWA lawsuits alleging certain facilities have failed to take action to address “imminent and substantial endangerment” arising from the facilities’ vulnerability to increased precipitation, storm surge, and sea-level rise.⁴⁴ In its cases against ExxonMobil Corp. and Shell Oil Products US, CLF has alleged that the operators of the oil and gas marine terminals in Everett, Massachusetts, and Providence, Rhode Island, have failed to address present-day risks of pollution discharges arising from increased precipitation and potential storm surge. CLF has also alleged that the companies have knowledge of site risks from climate impacts, included projected sea-level rise, but have failed to disclose this information to regulators or address the vulnerabilities at these facilities through, for example, required CWA pollution prevention plans. As of early 2019, both cases are still pending in court.

Emergency Planning and Community Right-to-Know Act

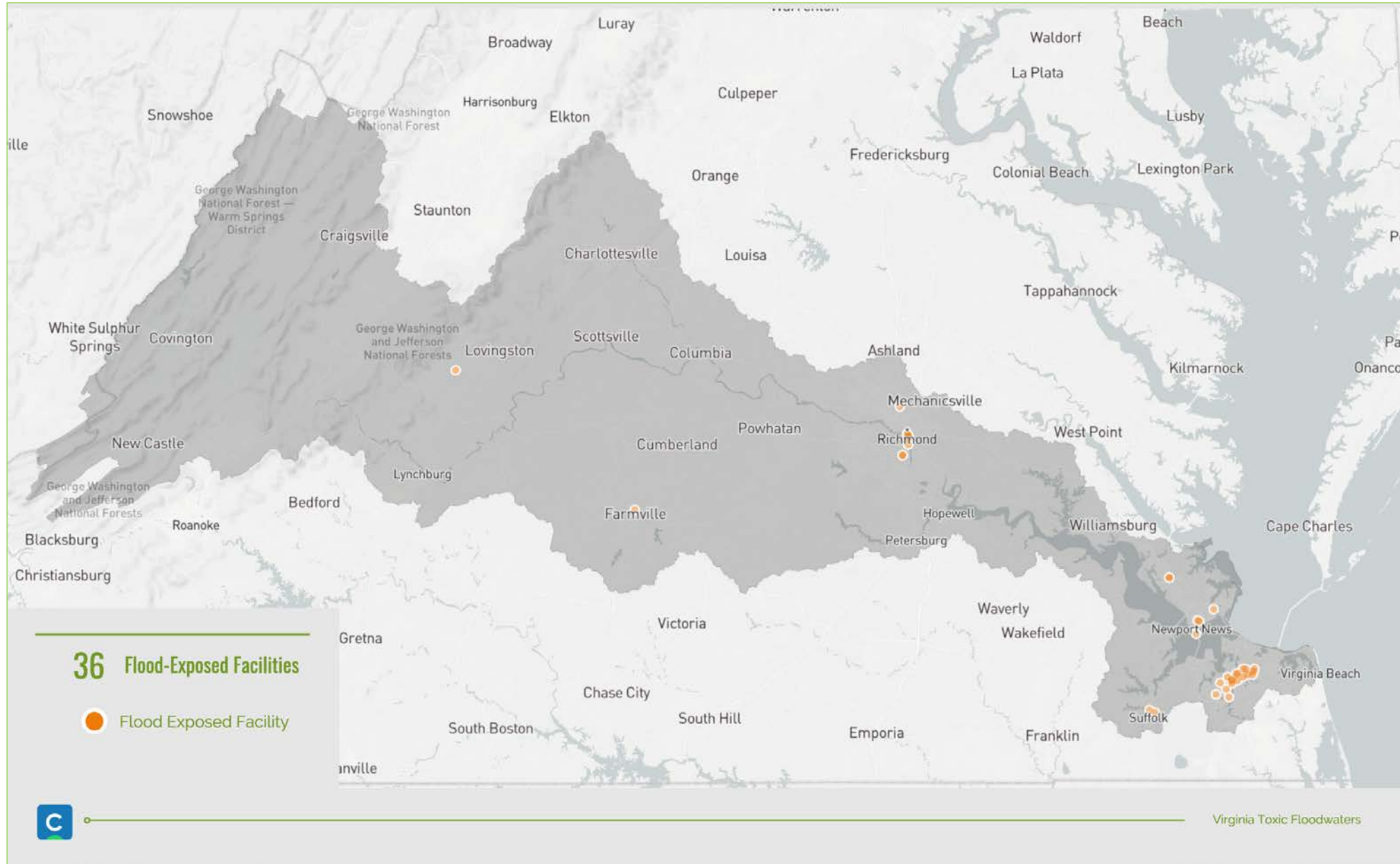
The Emergency Planning and Community-Right-to-Know Act (EPCRA) is a federal law focused on promoting interagency planning for and increased public transparency about storage of chemicals and accidental chemical releases. The law requires emergency planning and coordination between federal, state, and local governments to respond to potential chemical disasters.⁴⁵ EPCRA also requires reporting by so-called Tier II facilities that are storing hazardous chemicals, extremely hazardous substances, and petroleum products above certain threshold amounts.⁴⁶ Such facilities are required to report to Virginia DEQ, on an annual basis, the amount and name of hazardous substances that they are storing on site.

In the James River watershed, we identified a total of 158 companies reporting storage of hazardous chemicals at or above Tier II reporting thresholds that are located within census tracts that score in the highest quartile nationally for social vulnerability to disaster. Of this number, we

found 36 facilities that are flood-exposed. These facilities, such as shipping terminals, chemical plants, and home improvement retailers, have reported that they have on site hazardous substances, such as acids, heavy metals, ammonia, and oil and gas products.

EPCRA provides at least one key lever that citizens can use to further investigate climate vulnerability of industrial facilities and to pressure regulators: Citizens are entitled to access and review Tier II reporting data for facilities that use or store hazardous chemicals and extremely hazardous substances. Virginia DEQ has restricted its disclosure, however. With this information, residents would be able to learn more about potential chemical hazards in their communities and use this information to advocate for state and local emergency planning that addresses the potential for flood risks at these facilities. For further discussion, refer to our recommendation about EPCRA Tier II data disclosure on page 22.

Flood-Exposed Tier II Reporting Facilities in Census Tracts Scoring in the Highest Quartile Nationally for Social Vulnerability



Superfund

The federal Comprehensive Environmental Response, Compensation, and Liability Act, better known as the “Superfund” program, authorizes the investigation and remediation of legacy hazardous contamination at thousands of former industrial sites. Superfund sites are typically among the most contaminated by uncontrolled hazardous and toxic substances. While in many instances these facilities have already been remediated, contamination may remain on-site that is still vulnerable to flooding episodes despite controls put in place to limit exposure during normal circumstances.

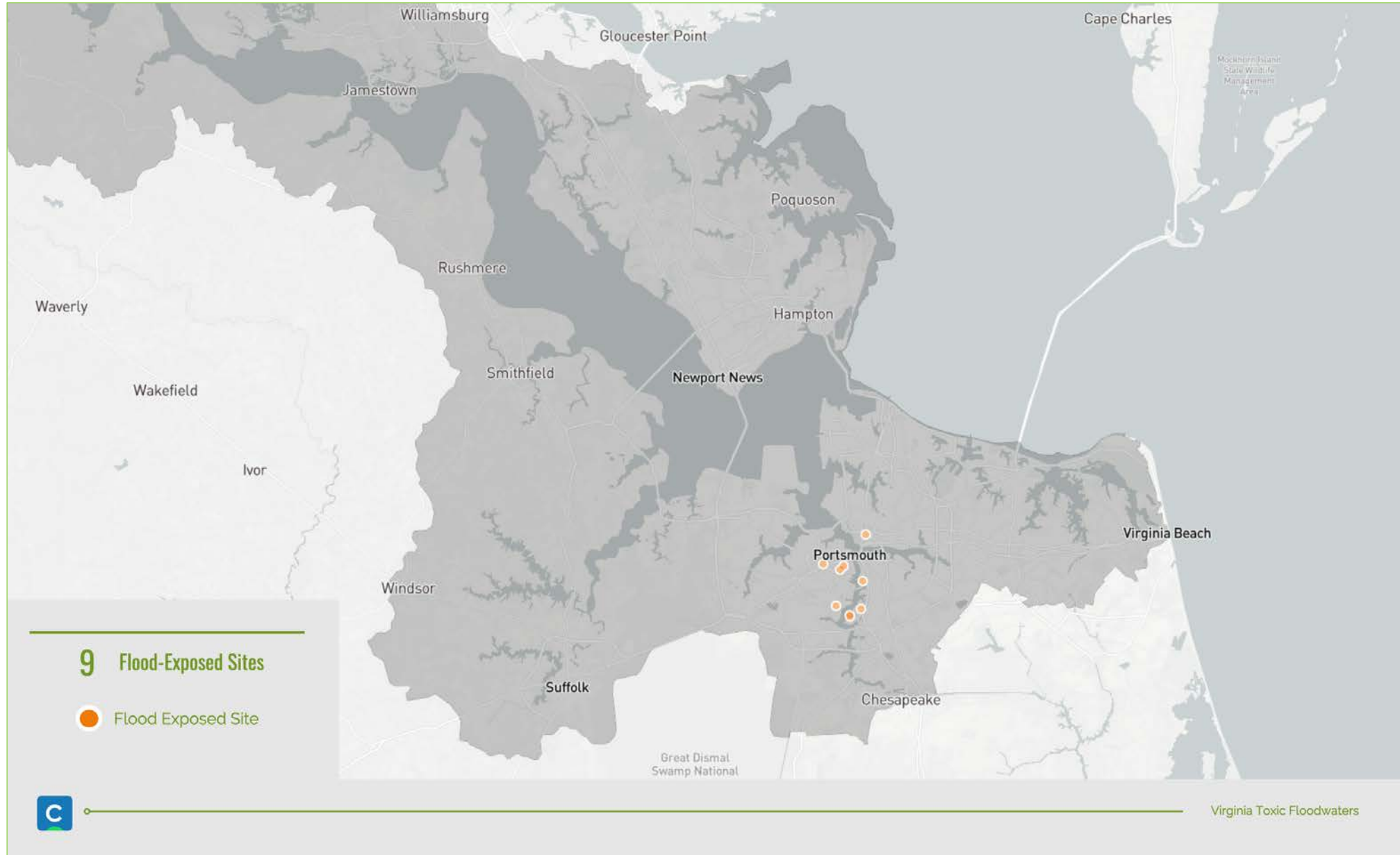
In the James River watershed, we identified 19 facilities either currently or formerly regulated under Superfund that are located within census tracts that score in the highest quartile nationally for social vulnerability to disaster. Of this number, we found nine Superfund facilities that are exposed to potential flooding. These sites include a former foundry, a U.S. Navy ordnance storage facility, and a residential site where soil was contaminated by lead.

The Superfund process begins with a preliminary assessment for potential contamination of air, groundwater, and surface water and harm to public health. If sufficient potential for hazardous contamination and harm exists, the site is added to the National Priorities List, which triggers potential federal enforcement to impose financial liability on parties responsible for the legacy contamination, like the generators of the waste, and also opens access to federal Superfund resources for further study and eventual site remediation.⁴⁷ In the next phase, federal regulators produce a remedial investigation and feasibility study, select a preferred alternative for site remediation, and publish the draft cleanup plan for public review and comment.⁴⁸ The selected alternative must meet a number of criteria, including the long-term effectiveness and permanence of the remediation practice and whether the alternative adequately protects human health and the environment, both of which may be affected by the impacts of climate change.⁴⁹ Finally, EPA regulators are required to conduct reviews of the site cleanup at five-year intervals following implementation of the remedial action.

Superfund provides at least two key levers for citizens to pressure regulators to address the climate vulnerability of current and potential Superfund sites:

- Citizens are entitled to review and provide formal comment on proposed cleanup plans. However, the minimum 30-day comment period is very brief by comparison to the many months and years of investigation and study of alternatives. A longer period of community outreach, through EPA’s Community Involvement Program, provides opportunity for engagement, including citizen advisory groups and public meetings that

Flood-Exposed Superfund Sites in Census Tracts Scoring in the Highest Quartile Nationally for Social Vulnerability



track the entire cleanup process. In cases where cleanup proposals and actual remediation may have already been completed, citizens may review approved cleanup plans or delisted sites to determine whether flooding would be likely to spread hazardous contamination and harm human health or the environment.

- Citizens are also entitled to seek judicial review of EPA cleanup decisions that violate any Superfund regulatory requirement or standard.⁵⁰

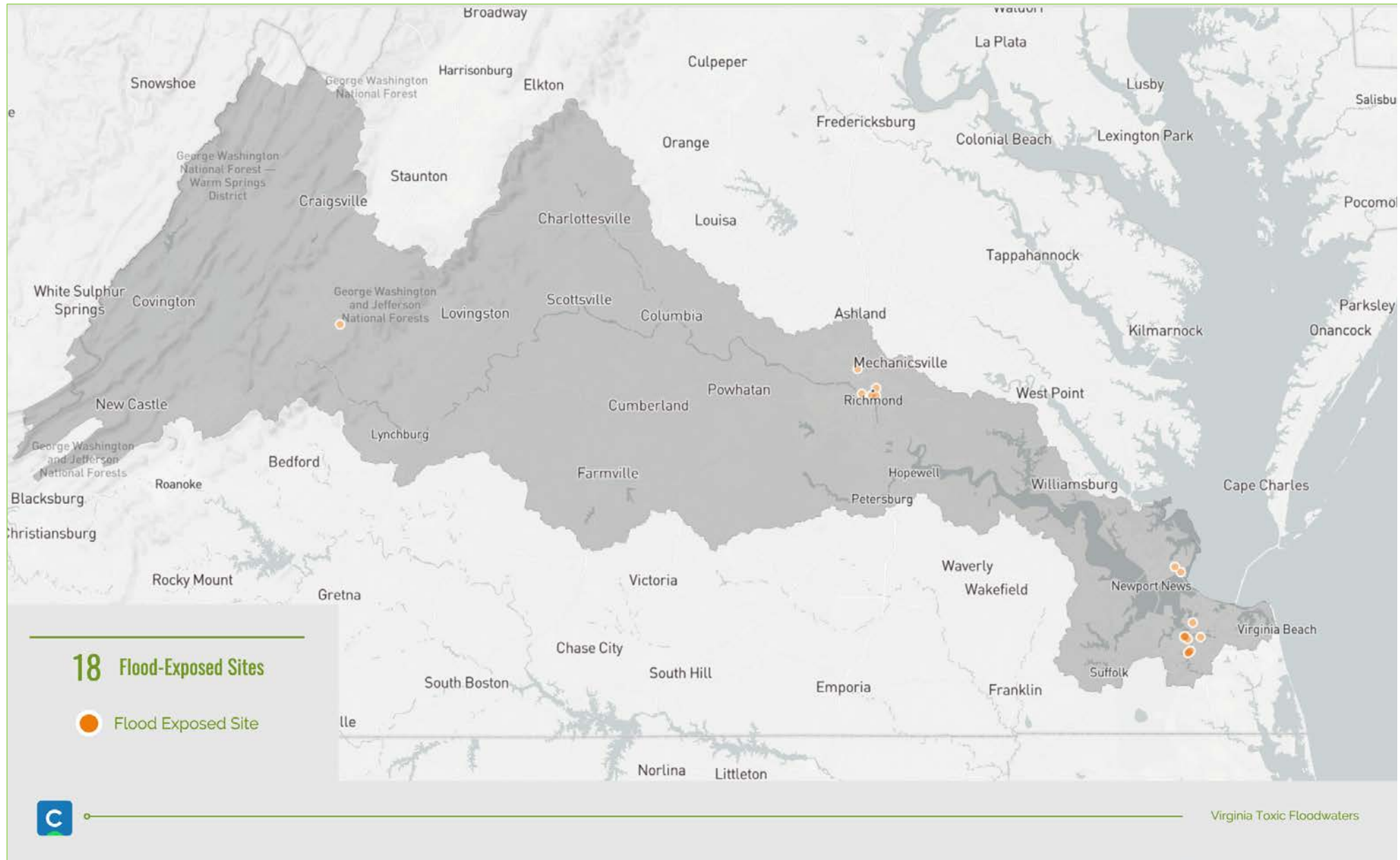
Virginia Voluntary Remediation Program

Virginia's Voluntary Remediation Program (VRP) is a state regulatory program for the oversight of voluntary remediation of hazardous contamination at commercial and industrial sites for the purpose of brownfields redevelopment. Like the federal Superfund program, the VRP addresses the uncontrolled contamination of air, groundwater, surface water resources on the site, and the potential harm to human health.⁵¹ Importantly, eligibility requirements prevent owners from participating in VRP if the remediation of hazardous site contamination is otherwise mandated by other state and federal law, including, for example, CWA, Superfund, RCRA, and Virginia hazardous waste and solid waste regulations.⁵² Like Superfund facilities, VRP facilities may have already been remediated to state regulatory standards, but the contamination that remains on-site could still be vulnerable to flooding episodes even with approved containment controls in place.

In the James River watershed, we identified a total of 62 facilities either currently or formerly participating in VRP that are located within census tracts that score in the highest quartile nationally for social vulnerability to disaster. Of this number, we found 18 facilities that are flood-exposed. These sites include a former automotive assembly plant, dry cleaning facility, riverfront power plant, and a brewery.

After an applicant site meets the eligibility criteria and is enrolled in the program, the participant must develop and submit a number of reports to state regulators, including a site characterization report, a risk assessment, a remedial action plan, documentation of public notice, and a demonstration of completion.⁵³ The extent of remediation is determined in consultation with state regulators and falls into three categories: contamination consistent with background levels; contamination that meets regulatory standards for human health and environmental quality; or contamination based upon risk assessments that is less protective but considers restrictions on future land use.⁵⁴ The participant must provide public notice and comment for a minimum 30-day period and must respond to any citizen that submits a comment. The facility operator must then provide the comments and responses to state regulators.⁵⁵

Flood-Exposed Virginia Voluntary Remediation Sites in Census Tracts Scoring in the Highest Quartile Nationally for Social Vulnerability



VRP provides at least one key lever that citizens can use to further investigate climate vulnerability of industrial facilities contaminated by hazardous substances and to pressure regulators and facilities to address potential climate-driven chemical disasters:

- Review and public comment on participant site reports, remedial action plans, and other required submissions. Citizens could petition to revoke or modify the Commonwealth-issued certificate of completion or its conditions, if, for example, the site owner's risk assessment does not account for potential exposures arising from site flooding.⁵⁶

Endnotes

- ¹ Flitter, E. and Valdmanis, R. Oil and chemical spills from Hurricane Harvey big, but dwarfed by Katrina. Sept. 15, 2017. Reuters. Retrieved from <https://www.reuters.com/article/us-storm-harvey-spills/oil-and-chemical-spills-from-hurricane-harvey-big-but-dwarfed-by-katrina-idUSKCN1BQ1E8>.
- ² Union of Concerned Scientists. Hurricane Harvey's Impact on Energy and Industrial Facilities. Retrieved from <https://ucsusa.maps.arcgis.com/apps/MapJournal/index.html?appid=1e958eff5c3e45a983e52ad523c2ffdd>.
- ³ Biesecker, M. EPA orders cleanup at Texas toxic site flooded by Harvey. Oct. 12, 2017. *Associated Press*. Retrieved from <https://www.apnews.com/a56858fd42ec4a1ab154d8f603b90b84>.
- ⁴ Carter, L., et. al. 2018: Southeast, *in* Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., et. al. (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 743–808. doi: 10.7930/NCA4.2018.CH19
- ⁵ Id.
- ⁶ E J Wing, et. al. 2018. Estimates of Present and Future Flood Risk in the Conterminous United States. *Environmental Research Letters*. 13. 034023. 10.1088/1748-9326/aaac65.
- ⁷ R. Kleinosky, et. al. 2007. Vulnerability of Hampton Roads, Virginia to Storm-Surge Flooding and Sea-Level Rise. *Natural Hazards*. 40. 43-70. 10.1007/s11069-006-0004-z.; Baldini, L. M., et. al. 2016. Persistent Northward North Atlantic Tropical Cyclone Track Migration over the Past Five Centuries. *Scientific Reports*, 6, [37522]. <https://doi.org/10.1038/srep37522>.
- ⁸ Walsh, K. J., et. al. (2016), Tropical Cyclones and Climate Change. *WIREs Clim Change*, 7: 65-89. doi:[10.1002/wcc.371](https://doi.org/10.1002/wcc.371)
- ⁹ S-Y Simon Wang et. al. 2018. Quantitative Attribution of Climate Effects on Hurricane Harvey's Extreme Rainfall in Texas. *Environ. Res. Lett.* 13 054014.
- ¹⁰ Boon, J. D., et. al. 2018. Anthropocene Sea Level Change: A History of Recent Trends Observed in the U.S. East, Gulf, and West Coast Regions. Special Report in Applied Marine Science and Ocean Engineering (SRAMSOE) No. 467. Virginia Institute of Marine Science, College of William and Mary. <https://doi.org/10.21220/V5T17T>; Sweet, W.V., et. al. 2017: Sea Level Rise, *in* Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., et. al. (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 333-363, doi: [10.7930/JOVM49F2](https://doi.org/10.7930/JOVM49F2).
- ¹¹ County Health Rankings. Virginia. Retrieved from <http://www.countyhealthrankings.org/app/virginia/2018/downloads>.
- ¹² Canty, M. Study: More than 1 million Virginians are 'working poor.' July 28, 2017. *Daily Press*. Retrieved from <https://www.dailypress.com/health/dp-nws-working-poor->

[families-continue-struggle-hampton-roads-0728-20170727-story.html](#); United for Alice. Virginia. Retrieved from <https://www.unitedwayalice.org/virginia>.

¹³ Va. Exec. Order No. 24 (Nov. 2., 2018) “Increasing Virginia’s Resilience to Sea Level Rise and Natural Hazards.”
<https://www.governor.virginia.gov/media/governorvirginiagov/executive-actions/ED-24-Increasing-Virginias-Resilience-To-Sea-Level-Rise-And-Natural-Hazards.pdf>

¹⁴ Illinois Emergency Management Administration. Search for Tier II Facilities with 302 Reports. Retrieved from <https://public.iema.state.il.us/FOIAHazmatSearch/TII302search.aspx>; Illinois Emergency Management Administration. Search for Tier II Facilities with Hazardous Chemicals. Retrieved from <https://public.iema.state.il.us/FOIAHazmatSearch/T2Search.aspx>; Illinois Emergency Management Administration. Search for Hazardous Materials Incident Reports. Retrieved from <https://public.iema.state.il.us/FOIAHazMatSearch/>.

¹⁵ Amanda Frank and Sean Moulton. Chemical Hazards in Your Backyard. Center for Effective Government, 2015. Retrieved from <https://www.foreffectivegov.org/chemical-hazards-your-backyard>.

¹⁶ West Virginia Department of Environmental Protection. AST Registration Graphical Information. Retrieved from <https://dep.wv.gov/WWE/ee/tanks/abovestoragetanks/Pages/ASTRegistrationGraphicalInformation.aspx>.

¹⁷ 9 VAC 20-81.

¹⁸ See 9 VAC 20-81-120. Siting Requirements.

¹⁹ 40 CFR Part 112.

²⁰ 33 U.S.C. § 1365.

²¹ 40 CFR §122.41(l)(6).

²² 9 VAC 25-91-130. Pollution Prevention Standards and Procedures.; 9 VAC 25-91-140. Performance Standards for Aboveground Storage Tanks Newly Installed, Retrofitted, or Brought into Use.

²³ 9 VAC 25-91-170. Contingency Plan Requirements and Approval.

²⁴ Id.

²⁵ 9 VAC 25-580.

²⁶ 9 VAC 25-590-10 et seq.

²⁷ 9 VAC 25-580-190 - 280.

²⁸ 9 VAC 25-580-300.

²⁹ Young, R. et. al. 2017. Coastal Hazard and Sea-level Rise Vulnerability Assessment: Chesapeake Energy Center Coal Ash Disposal Site, Chesapeake, VA. Western Carolina University. Retrieved from

https://www.southernenvironment.org/uploads/words_docs/Chesapeake_Energy_Center_Final_Vulnerability_Assessment1.pdf.

³⁰ Southern Environmental Law Center. Court rules Dominion’s coal ash illegally pollutes Virginia’s Elizabeth River.

³¹ 40 CFR §68.150-195.

³² 40 CFR §68.165-180.

³³ 42 U.S.C. § 7412(r)(1).

³⁴ 40 CFR §68.20-42; 42 U.S.C. § 7412(r)(9).

³⁵ U.S. EPA. Vulnerable Zone Indicator System. Available at <https://www.epa.gov/rmp/forms/vulnerable-zone-indicator-system>; U.S. EPA. Federal Reading Rooms for Risk Management Plans. Available at <https://www.epa.gov/rmp/federal-reading-rooms-risk-management-plans-rmp>.

³⁶ 42 U.S.C. § 7604; 40 CFR §70.4(b)(3)(x).

³⁷ 40 CFR Part 264.

³⁸ 40 CFR §264.18(b).

³⁹ 40 CFR §264.50.

⁴⁰ For example, during the Obama administration EPA regulators recommended incorporating analysis of climate change impacts into RCRA permitting. U.S. EPA, “Office of Solid Waste and Emergency Response Climate Change Adaptation Implementation Plan, June 2014” available at <https://www3.epa.gov/climatechange/Downloads/OSWER-climate-change-adaptation-plan.pdf> (last accessed June 22, 2017).

⁴¹ 40 CFR §124; 40 CFR §270.

⁴² 40 CFR §270.32(b)(2).

⁴³ 42 U.S.C. § 6972(a)(1)(B).

⁴⁴ Complaint, Conservation Law Foundation v. ExxonMobil Corp., 1:16-cv-11950-MLW (D. Mass. 2016); Climate Case Chart. Conservation Law Foundation, Inc. v. Shell Oil Products US. Retrieved from <http://climatecasechart.com/case/5619/>; Climate Case Chart. Conservation Law Foundation v. ExxonMobil Corp. Retrieved from <http://climatecasechart.com/case/conservation-law-foundation-v-exxonmobil-corp/>.

⁴⁵ 42 U.S.C. §§ 11001-11003.

⁴⁶ 42 U.S.C. §§ 11021-11022.

⁴⁷ 42 U.S.C. § 9601.

⁴⁸ 40 C.F.R. § 300.430.

⁴⁹ 40 C.F.R. § 300.430(e)(9)-(f).

⁵⁰ 42 U.S.C. § 9659; 42 U.S.C. § 9613(h).

⁵¹ 9 VAC 20-160-90. Remediation Levels.

⁵² 9 VAC 20-160-30. Eligibility Criteria.

⁵³ 9 VAC 20-160-70. Work to Be Performed.

⁵⁴ 9 VAC 20-160-90. Remediation Levels.

⁵⁵ 9 VAC 20-160-120. Public Notice.

⁵⁶ 9 VAC 20-160-110(h). Certification of Satisfactory Completion of Remediation.

© Center for Progressive Reform, 2019



Connect With CPR

Website: www.progressivereform.org

CPRBlog: www.progressivereform.org/CPRBlog.cfm

Twitter: [@CPRBlog](https://twitter.com/CPRBlog)

Facebook: <https://www.facebook.com/CenterforProgressiveReform/>

Direct media inquiries by email to [Brian Gumm](mailto:brian.gumm@progressivereform.org) or [Matthew Freeman](mailto:matthew.freeman@progressivereform.org), or by phone at 202.747.0698.