

ABSTRACT

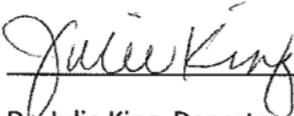
Something in the Water: Policy Analysis of the Biden Administration's Environmental Justice Plan and Its Impact on Drinking Water Inequality in the United States.

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Since the water crisis in Flint, Michigan, a resurgence in discussions concerning the drinking water quality in the United States has taken place. Yet, what many Americans failed to realize is that Flint is not the only community in the United States struggling with drinking water quality. There are hundreds of communities like Flint every year, but poor drinking water quality disproportionately affects certain communities over others. These environmental justice communities bear the highest burden caused by America's failing drinking water infrastructure. The Biden Administration has proposed a plan, which they will use to enact specific policies and promote legislation that directly focuses on environmental justice concerns. Implementing these specific policies outlined in the Biden Administration's plan could help to effectively resolve the ongoing drinking water issues in the United States while also working to address environmental justice concerns.

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ADMINISTRATION'S ENVIRONMENTAL JUSTICE PLAN AND ITS IMPACT ON
DRINKING WATER INEQUALITY IN THE UNITED STATES.

A Thesis Submitted to the Faculty of
Baylor University
In Partial Fulfillment of the Requirements of the
Honors Program

By
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Waco, Texas

December 2021

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ACKNOWLEDGEMENTS

I would like to thank Dr. Julie King for all of the help and guidance she has provided me throughout this process as my thesis advisor. She has provided me with advice and insights that have allowed me to greatly improve as a writer. I would also like to thank my family and friends for all the love and support they have provided me during my time at Baylor. I truly would not have been able to make it through college without them and I am so grateful to have each and everyone of them in my life.

INTRODUCTION

Even if you know almost nothing about drinking water in America, you likely know about Flint and automatically connect it to unsafe drinking water¹. As hundreds of stories flooded the news, people across the nation and across the world were shocked by the vast amount of lead in Flint, Michigan’s drinking water. Lead had contaminated Flint’s drinking water as the result of an “intentional, ill-considered and unlawful decision” by the city officials to switch their drinking water source to the Flint River². Despite the fact that the Flint River had been known to be highly corrosive, the decision was made with economic not public health interests in mind³. The alarmingly high levels of lead in Flint’s drinking water brought about serious health concerns for the city’s residents, particularly among the younger children. Drinking water regulations and monitoring systems failed to protect the residents of Flint from rising lead levels. Once these lead levels surpassed the regulatory limit, not even intervention on behalf of the state, local and federal governments could adequately address these ongoing drinking water quality issues. The drinking water crisis in Flint brought domestic water quality and safety into the forefront of Americans’ minds. This forced the America public to “confront the reality of its declining water infrastructure and the lax enforcement” of its drinking water legislation⁴.

¹ Siegel 123

² Pullen, Taylor & Roberts

³ Ibid.

⁴ Ibid.

The Flint water crisis rekindled a conversation on the quality of drinking water in the United States⁵. Unfortunately, Flint is not the only community in the United States that has had to face major drinking water quality issues. In 2015, around the same time that the Flint water crisis reached its height, “more than 77 million people were served by water systems that were in violation of the Safe Drinking Water Act”⁶. This amounts to nearly one in four Americans drinking water that is not in compliance with the nation’s premier piece of drinking water quality legislation⁷. Drinking water quality issues in the United States are persistent and reoccur in a variety of communities each and every year. From New Jersey to Southern California to the Midwest, issues with drinking water have become a part of everyday life for communities across the country.

In October 2021, the city of Benton Harbor, Michigan entered into a state of emergency due to the high levels of lead in the drinking water.⁸ The city has consistently been dealing with lead violations in their drinking water since 2018.⁹ Testing showed that the lead levels in drinking water in homes far surpassed the action limit of 15ppb with some homes testing as high as 889ppb.¹⁰ For nearly four years, the residents of Benton Harbor have had to deal with unsafe drinking water by implementing at-home solutions such as installing source filters on faucets to running the water for a designated length of time each day in the hopes of “reducing potential toxins.”¹¹

⁵ Pullen, Taylor & Roberts

⁶ Ibid, 12

⁷ Ibid, 12

⁸ Romine

⁹ Abdel-Baqui

¹⁰ Ellison

¹¹ Abdel-Baqui

The current and ongoing drinking water crisis in Benton Harbor, Michigan is simply one piece of the drinking water problems within this community. The outdated drinking water infrastructure has been responsible for increasing the amount of lead present in the water.¹² However, Benton Harbor's inadequate drinking water infrastructure and monitoring technologies have resulted in countless other types of issues. According to the Safe Drinking Water Information System (SDWIS), Benton Harbor currently has 180 active violations dating as far back as 2001.¹³ The violations cover a wide array of issues ranging from failing to release an annual water quality report to unsafe levels of lead and other contaminants¹⁴

Benton Harbor provides not only the most recent example of failing drinking water infrastructures in the United States, but also an example of another ongoing problem. Not all communities and towns in the United States are equally affected by these contaminations. Communities with larger percentages of minority and lower income residents and in more rural areas, are more likely to live in areas with increase drinking water quality violations. These factors are directly at play within Benton Harbor, a relatively small community home to primarily minority (84.7% Black), and low-income residents.¹⁵

¹² Ellison

¹³ Environmental Protection Agency. 2021. *Water System Violation Report for Benton Harbor*. Safe Drinking Water Information System

¹⁴ Environmental Protection Agency. 2021. *Water System Violation Report for Benton Harbor*. Safe Drinking Water Information System

¹⁵ Wang

How factors of race, geographic location, and socioeconomic status impact a community's drinking water quality can be best explained through the lens of Environmental Justice. Environmental Justice is the “absence of fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies”¹⁶. The modern environmental justice movement began in the 1970s and gained momentum as a movement as is acquired support from people across the country who struggled to protect their communities from pollutants and contaminants¹⁷.

“Environmental Justice Community” is a term that aptly describes towns or municipalities that are disproportionately affected by environmental issues.¹⁸ The NRDC's most recent report on drinking water quality in the United States provides an excellent definition of what the term entails and uses it throughout their report. An environmental justice community is simply a community that “faces greater environmental and health hazards when compared with communities with other communities that have more white and affluent residents.”¹⁹ This term considers the vast amount of research in this area of environmental justice that finds that “race and class matter in the distribution of environmental burdens.”²⁰ In relation to drinking water issues, it has been found that lower income and minority residents experience the

¹⁶ Gasteyer & Mueller

¹⁷ Christian-Smith 53.

¹⁸ Pullen, Taylor & Roberts 13

¹⁹ Pullen, Taylor, & Roberts 13

²⁰ Christian-Smith 55.

cumulative impacts of exposure to a wide array of contaminants and often do not have the same access to the necessary resources to correct these issues.²¹

The Environmental Justice movement addresses a wide range of environmental issues where such inequalities could arise. However, drinking water poses a unique and substantial problem for environmental justice communities. As Congresswoman Rashida Tlaib (MI-D) explained in the Congressional Hearing on the Flint water crisis, “when communities do not have access to clean water, that affects every aspect of their life.²² Clean and safe drinking water is a fundamental human right and should be provided for all Americans. Still, access to safe drinking water is anything but equitable in the United States. It often leaves lower socioeconomic and minority communities to face the most severe and persistent drinking water quality issues without the necessary tools to resolve the problem.²³

Considering environmental justice concerns when working to improve drinking water inequality is essential to resolve these types of problems in the United States. Nevertheless, with only a few EPA regulations and a single Executive Order by President Clinton, environmental justice has not been incorporated in passing environmentally related rules and legislation. President Biden has recommitted the government to focusing on environmental justice issues through the creation of his Environmental and Climate Justice Plan. This plan considers the inequitable effects of environmental issues and

²¹ Christian-Smith 56).

²² U.S. Congress. House of Representatives. Subcommittee on Environment and the Economy and the Subcommittee on Health of the Committee on Energy and Commerce. 2016. Flint Water Crisis: Impacts and Lessons Learned 4.

²³ Christian-Smith 57.

climate change on certain populations and proposes four key objectives to address these problems. These four objectives of the Biden Administration’s plan cover a wide array of issues and work to specifically address the problems face by environmental justice communities.

The use of “an inclusive and empowering all-of-government approach” is the first broad policy objective of the Biden Administration’s Environmental and Climate Justice Plan.²⁴ This objective is important to improving drinking water quality in environmental justice communities because these types of issues are often caused by communication breakdowns. By providing better avenues for communications among the different levels of government, the Biden Administration hopes to be able to better address these issues as they arise. This all-of-government approach will also help to better streamline the process of assessing drinking water violations and quality concerns and delegate the appropriate responsibilities to the correct agency or government.

The second objective of the Biden Administration’s plan is to “make decisions that are driven by data and science.”²⁵ Amending contaminant levels to be more reflective of the current scientific studies is a valuable way to combat inequalities in drinking water quality in the United States. The Safe Drinking Water Act (SDWA) was first passed in 1974 and has not received any major updates since 1996. These leaves a post-2021 America to deal with drinking water contaminants using outdated standards based on

²⁴ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

²⁵ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

previous scientific understandings how a certain contaminant effected human health. Amending the SDWA's contaminant levels to reflect the most up to date scientific data and providing the necessary resources to abide by these standards can aid environmental justice communities as they work to improve their drinking water quality.

“Targeting resources in a way that is consistent with prioritization of the environmental and climate justice” is the third objective of the Biden Administration’s Plan.²⁶ More specifically, targeting grants and federal assistance to rural, low-income, and smaller communities could help to better equip them to return to compliance with drinking water quality regulations. These communities often are unable to afford the testing and other measures needed to stay up to date on the quality of their drinking water. However, by establishing federal assistance programs and grants, the United States can help to provide for the resources needed to maintain safe drinking water in these communities. These types of investments in monitoring and preventative technologies can also help environmental justice communities to better maintain the quality of their drinking water and prevent violations from occurring in the future.

The fourth and final objective of the Biden Administration’s plan is to “assess and address risks to communities from the next publica health emergency.”²⁷ There are countless communities across the United States facing drinking water quality issues similar to Flint and many more will be faced in the future. By investing in better testing

²⁶ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

²⁷ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

and other preventative measures, local, state, and federal government could catch disparities in contaminant levels earlier on. This would enable these communities to address contaminant related issues before they become a threat to public health.

In this paper, I will research and examine ongoing drinking water quality issues that relate to each of the four objectives of the Biden Administration's Climate and Environmental Justice Plan. I will then examine how each of these issues are of particular concern within environmental justice communities. Finally, I will discuss how the specific policy or policies outlined in the objectives of the Biden Administration could work to address these issues as well as which are the most likely to help improve this problem within drinking water in the United States.

CHAPTER ONE

The Need for Greater Intergovernmental Involvement in Addressing Drinking Water Quality Issues

Lack of communication between different levels of government is one of the most common reasons that drinking water quality issues arise and persist to continue in the United States. Without updated legislation from the federal government, many local and state governments are left on their own to find solutions to these problems, despite being ill-equipped to fix them. Focusing on establishing environmental justice as a common goal and improving current communication channels between local, state, and federal governments are necessary to address drinking water issues. These are the primary focus of the policies included in the first objective of the Biden Administration's Plan. This objective will be implemented through three specific goals: Amending Executive Order 12898, establishing two Environmental Justice interagency councils in the Executive Branch and overhauling the EPA's External Civil Rights Compliance Office.²⁸

Providing a common goal for addressing environmental justice issues and improving current communication channels between local, state, and federal governments and government agencies are necessary to bringing about change in these environmental justice communities. Such measures are included within the Biden Administration's

²⁸ Biden-Harris Administration. 2020. "The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity"

Environmental and Climate Justice Plan’s first objective of improving intergovernmental relationships.

Revising Executive Order 12898

The Biden Administration sets their first objective of their Environmental and Climate Justice plan as wanting to create greater intergovernmental relationship among the different levels of government in the United States. They first plan to achieve this objective by planning to “revise and reinvigorate Executive Order 12898 (EO 12898) on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.”²⁹ EO 12898 was issued by President Bill Clinton on February 11th, 1994 with the intent to “direct each executive department, the EPA and certain other agencies to ‘make achieving environmental justice part of its mission’.”³⁰ This executive order generally wanted to “focus federal attention to the environmental and human health effects of federal actions on minority and low-income populations” and establish a way executive departments and their agencies could work to carry out this mission.³¹

EO 12898 directed eleven federal agencies to “identify and address environmental justice issues related to their activities” and were tasked to partake in an “interagency working group to coordinate federal environmental justice efforts.”³² However, many of

²⁹ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

³⁰ Bearden & Jones

³¹ Environmental Protection Agency. 2021. “Summary of Executive Order 12898”

³² U.S. Government Accountability Office. 2019

the agencies have not truly implemented environmental justice into their agencies day to day task and often fail to consider these kinds of issues when making major policy decisions. For instance, in a 2005 report the Government Accountability Office found that the Environmental Protection Agency (EPA) could be devoting more attention to environmental justice concerns when developing their clean air rules.³³ When the EPA was drafting these three specific clean air rules, the GAO found that they devoted little of their attention to addressing environmental justice issues in this area.³⁴ The EPA also failed to provide environment justice analyses for two of the three clean air measures and did not identify the type of data that would be necessary to analyze these impacts.³⁵

Establishing Advisory Environmental Justice Councils in the White House

Establishing new environmental justice advisory councils within the White House is another measure the Biden Administration plans to implement in order to achieve this first objective. The Biden Administration plans to focus on establish the White House Environmental Justice Advisory Council and the White House Environmental Justice Interagency Council in order to improve intergovernmental relationships.³⁶ Both of these councils will “report directly to the chair of the White House Council on Environmental Quality (CEQ), who then will report directly to the President.”³⁷ These Councils will be

³³ U.S. Government Accountability Office. 2005. 1

³⁴ Ibid, 2

³⁵ Ibid, 2

³⁶ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

³⁷ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

tasked to publish an annual public performance scored card on the effectiveness of the revisions made to EO 12898.³⁸

Establishing two new interagency councils within the White House could help to achieve this goal of improving intergovernmental communication. The Biden Administration does not explain how these councils will be structured but will most likely include representatives from the major agencies that have been tasked to include environmental justice within their mission. These councils will also likely include experts in the field of environmental justice including public health experts, environmental scientists, and experts in drinking water infrastructures.

These councils provide the opportunity for representatives from different agencies within the federal government to communicate with each other about how they are currently working to address environmental justice issues. Since many environmental issues cover a number of different policy areas, it is important that these agencies are able to learn about what the other agencies are working on. This can help to ensure that each agency is not repeating the work of another and provide them information about a certain situation that they might also need to help address.

Both of these councils then will directly report to the chair of the White House Council on Environmental Equality (CEQ). CEQ was established within the Executive Office of the President by Congress as a part of the 1969 National Environmental Policy

³⁸ Biden-Harris Administration. 2020. "The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity"

Act (NEPA).³⁹ This council is tasked with “coordinating Federal environmental efforts and works closely with agencies and other White House office in the development of environmental policies and initiatives.”⁴⁰

Having the environmental justice councils communicate directly with CEQ is another effective way to improve interbranch communication. Not only would CEQ be able to help delegate the appropriate resources to the agencies represented in these councils, they also could bring these issues up to the President directly. Involving the President in environmental justice issues could help bring them into public discourse and further encourage help from the federal government to help resolve the issues.

Furthermore, the environmental justice council’s communication with CEQ can also help to communicate their efforts to the Legislative Branch. In accordance with the American Recovery and Reinvestment Act, which was passed in 2009, CEQ is required to submit a report to Congress every quarter regarding the “status and progress of projects and activities receiving funds under the Act and how they have complied with their NEPA requirements.”⁴¹ CEQ would be able to discuss the environmental justice issues brought up to them by the two environmental justice councils within this report to Congress. Once presented to Congress, this report could help to inform Senators and Congressmen about environmental justice issues that their own communities could be

³⁹ Obama Administration. 2016. “Council on Environmental Quality: Open Government.”

⁴⁰ Ibid.

⁴¹ Ibid.

currently facing. This could then prompt the drafting of new environmental legislation that could also help to alleviate some of these ongoing issues.

In terms of addressing drinking water quality, the implementation of these two White House environmental justice councils can help to work directly on this issue. If a water quality emergency arises, like it did in Flint, the agencies could work together to come up with the most effective solution. Furthermore, if drinking water quality issues continue to persist because of a certain issue within drinking water systems or in a particular area, CEQ can inform Congress about these issues and the need for appropriate legislation.

Overhauling the EPA's External Civil Rights Compliance Office

A final measure the Biden Administration plans to implement in accordance with this first objective is to “overhaul the EPA’s External Civil Rights Compliance Office.”⁴² The Biden Administration makes the argument that “for too long, the EPA External Civil Right Compliance Office has ignored its requirements under Title VI of the 1964 Civil Rights Act” and that steps should be taken to correct this current course of action.⁴³ The overhaul of this office would focus on ensuring that it brings justice to communities that experience the worst impacts of climate change, or in other words, environmental justice communities.⁴⁴

⁴² Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

⁴³ Ibid.

⁴⁴ Ibid.

Title VI of the Civil Rights Act prohibits “recipients of federal financial assistance from discriminating based on race, color, or national origin in any program or activity.”⁴⁵ Under this section of the Civil Rights Act, each federal agency is tasked with creating their own regulations to achieve these goals.⁴⁶ Once created, these Title VI Plans for each agency are reviewed by the Department of Justice (DOJ) who will approve the plan or issue revisions.⁴⁷

Title VI and EO 12898 work hand in hand with one another to address environmental justice issues. Since EO 12898 directs each Federal agency to implement environmental justice as a part of their mission, it is possible that “many types of Title VI cases could involve environmental justice issues.”⁴⁸ According to the DOJ, when determining if a Title VI case raises environmental justice concerns the following factors should be considered: (1) does the affected people, neighborhood or state “suffer disproportionately adverse health or environmental effects, (2) do they “suffer disproportionate risks or exposures to environmental hazards” and (3) have they been “denied equal opportunity for meaningful involvement in governmental decision making relating to the distribution of environmental benefits or burdens.”⁴⁹

The Biden Administration plans to specifically address the shortfalls of the EPA and their Title VI requirements. Under Title VI, the EPA prohibits those receiving

⁴⁵ Environmental Protection Agency. 2021. “Environmental Justice: Title VI and Environmental Justice”

⁴⁶ Wagner, Annalise. 2021. “Rolling Back DOJ’s Title VI Protections: Trump’s Abandoned Attempt and Potential Impacts on EJ Enforcement.”

⁴⁷ Wagner, Annalise. 2021. “Rolling Back DOJ’s Title VI Protections: Trump’s Abandoned Attempt and Potential Impacts on EJ Enforcement.”

⁴⁸ U.S. Department of Justice. 2010. “Federal Coordination of Title VI and Environmental Justice.”

⁴⁹ U.S. Department of Justice. 2010. “Federal Coordination of Title VI and Environmental Justice.”

funding from them to take actions that are intentionally discriminatory or have discriminatory effects based on race, ethnicity, or national origin.⁵⁰ If an entity that received funding from the EPA, such as a state or local government agency, is found to be discriminating on the basis of race, the affected community can file a Title VI complaint with the EPA (Wagner). The EPA will then take on the responsibility of determining if there is sufficient evidence that can determine the offending entity violated Title VI.⁵¹

The EPA primarily carries out their Title VI responsibilities through their External Civil Rights Compliance Office (ECRCO).⁵² ECRCO is tasked with ensuring that each recipient of EPA funding will comply with Title VI.⁵³ However, the issue arises here because, despite being given the authority to enforce Title VI, does not mean that ECRCO actually enforce such regulations.⁵⁴ This lack of enforcement of the Title VI regulations can be clearly seen in a number of cities facing environmental justice issues across the U.S. However, one potent example of this failure to enforce Title VI by the EPA is within the city of Baton Rouge, Louisiana.

In 2009, after having to deal with an “invasion of sewer flies”, and pollution from the city of Baton Rouge’s North Wastewater Treatment Plant, the residents of the University Place subdivision filed a Title VI case with the EPA.⁵⁵ University Place is a

⁵⁰ Wagner, Annalise. 2021. “Rolling Back DOJ’s Title VI Protections: Trump’s Abandoned Attempt and Potential Impacts on EJ Enforcement.”

⁵¹ Ibid.

⁵² Ibid.

⁵³ Ibid.

⁵⁴ Ibid.

⁵⁵ Lombardi, Buford, and Greene

subdivision that is inhabited by mostly African American residents who found themselves in a situation where they were “suffering through the dreadful, unhealth, and downright shameful conditions” forced upon the community from the pollution from the wastewater treatment plant.⁵⁶ After months of waiting, the EPA rejected the University Place resident’s claim that the city of Baton Rouge had “violated the civil rights of black property owners around the North wastewater plant” (Buford et al.). University Place residents filed another Title VI claim in 2010, but the EPA once again decline to take on their case.⁵⁷ Two more Title VI complaints would be filed on behalf of the University Place, but both were promptly rejected.⁵⁸

The experience of communities like University Place are not unique, for more than 9 of every 10 complaints issued to the ECRCO at the EPA are rejected or dismissed.⁵⁹ The majority of these complaints were rejected prior to the ECRCO conducting any investigations on the merit of these claims.⁶⁰ It is clear that the ECRCO office within the EPA is not fulfilling their Title VI obligations to the highest degree possible. Moreover, the ECRCO fails to execute their authority to investigate claims “where they have reason to believe discrimination could be occurring.”⁶¹ The EPA’s ECRCO office is also required to issue a decision on whether or not they will take on a

⁵⁶ Lombardi, Buford, and Greene

⁵⁷ Ibid.

⁵⁸ Ibid.

⁵⁹ Ibid.

⁶⁰ Ibid.

⁶¹ Ibid.

Title VI case within 20 days after it is received.⁶² However, it takes the EPA on average 254 business-days to make these kinds of decisions.⁶³

The EPA's ECRCO does take on Title VI cases, but they are a rare occurrence. For instance, in January 2017, ECRCO issued a statement finding that "African Americans were treated less favorably than non-African Americans during the permit hearing for the Genesee Power Station" in Flint, Michigan.⁶⁴ However, this finding comes years after the initiation of the Flint water crisis in 2014. With nearly three years in between the beginning of the water crisis in Flint and the issuing of this Title VI violation finding, the residents of Flint were continually exposed to this discrimination. Because of the news and media coverage that Flint received it is possible that the EPA felt compelled to issue this statement because of public pressure and not on the merit of the claims filed by the residents.

It is clear the EPA's ECRCO office is not carrying out their Title VI responsibilities to the highest degree. They take nearly a year to issue a jurisdictional decision on whether they will take on a Title VI case, which further prolongs the discrimination occurring in the community in question. Further, without carrying out an investigation on the merits of the claims submitted, it is hard to see how the EPA can rightfully determine which cases are substantive. Not every Title VI claim should be

⁶² Lombardi, Buford, and Greene

⁶³ Lombardi, Buford, and Greene

⁶⁴ Buford.

accepted by the office, but investigations should take place over the merits of the claim prior to issuing a decision on the matter.

Changes that should be implemented in the EPA's ECRCO should focus on enforcing the 20-day limit on jurisdictional decision of Title VI Complaints, as well as ensuring that investigations of the merits of the claims are conducted before issuing opinions. In order to ensure that these actions are carried out, an advisory board can be created for ECRCO that would regularly watch over their actions and ensure that they are fulfilling their duties. The ability of communities to file Title VI complaints with the EPA's ECRCO is an important way to improving intergovernmental communication. Citizens and communities may be able to bring light to an issue that has been neglected by local, state, and federal agencies by filing a Title VI claim. This claim could then be used to help raise this issue with the appropriate governments and agencies and help to delegate the resources needed to address this issue.

CHAPTER TWO

Amending the Safe Drinking Water Act for Updated Contaminant Levels, and More Effective Testing in Environmental Justice Communities.

The second objective of the Biden Administration’s plan is to “make decisions driven by data and science” which they plan to achieve through four specific policy measures.⁶⁵ Firstly, the Biden Administration plans to improve the EPA’s EJSCREEN tool to “create a data-driven climate and economic justice screening tool to identify communities threatened by cumulative impacts of climate change, economic and racial inequality and multi-source environmental pollution.”⁶⁶ This tool will be used to annually publish maps that will identify the disadvantaged communities in relation to environmental issues.⁶⁷ These maps will be published in multiple languages and made widely accessible to the America public so that actions can be taken to properly address the issues faced in these disproportionately affected communities.⁶⁸

Secondly, the Biden Administration plans to mandate new monitoring requirements for “frontline and fence line communities.”⁶⁹ This will involve the federal government recommending that each state adequately monitor for contaminants and

⁶⁵ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ Ibid.

⁶⁹ Ibid.

pollution within environmental justice communities.⁷⁰ The Federal government will aid states and local governments to carry out their monitoring responsibilities by installing new monitoring technology. This investment in new monitoring technologies will provide accurate and publicly available real-time data as well as develop educational outreach programs.⁷¹

Updating the requirements for community notification of noncompliance with the Safe Drinking Water Act and in other drinking water quality legislation is the third way the Biden Administration plans to achieve this objective. These community notification requirements will primarily be carried out through working with Congress to pass the Altering Localities of Environmental Risks and Threats or the ALERT Act. Originally proposed in the U.S. House of Representative on April 17th, 2020, by Representative Blunt Rochester, the ALERT Act will amend the 1986 Emergency Planning and Community Right-To-Know Act to require “an emergency notification meeting in the event of the release of an extremely hazardous substance from a facility and for other purposes.”⁷² The act requires that within 72 hours of the release of extremely hazardous substance, the offending facility must publish a notice in the local newspaper and on a public website of the incident and hold a public meeting concerning the event.⁷³ At the public meeting, the offending facility must provide information of the name of the chemical or substance that has been released from the facility, an estimate of how much

⁷⁰ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

⁷¹ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

⁷² Alerting Localities of Environment Risks and Threats Act of 2020, H.R. 3684, 117th Cong. (2020)

⁷³ Alerting Localities of Environment Risks and Threats Act of 2020, H.R. 3684, 117th Cong. (2020)

of each chemical or chemicals had been released, and details on the “methods and procedures to be followed to responded to a lease of such a substance or substances.”⁷⁴

The ALERT Act provides an effective framework for how communities should be informed about any emergencies that could impact the quality of their drinking water. It requires the polluting companies to provide information to the surrounding community in a clear, easy to find manner. The requirement of holding a public information meeting also allows the public to learn more about the hazardous substances, their possible health effects, and ways to counteract the release of such substances in the drinking water supply. Public meetings are also a commonly used medium that are quite accessible to the majority of the public. The last action the took place on this Act was its referrals to the House Committee on Energy and Commerce on the same day it was introduced. However, as emergency COVID-19 legislation begins to die down, this type of legislation should be able to gain enough support from both parties to pass and become law.

The final way the Biden Administration plans to achieve their second objective is by “tackling water pollution in a science-based manner.”⁷⁵ More specifically, they plan to focus in on designating PFAS as a hazardous substance, create a maximum contaminant level goal and fund additional research on the chemical and its effects on human health.⁷⁶

⁷⁴ Alerting Localities of Environment Risks and Threats Act of 2020, H.R. 3684, 117th Cong. (2020),

⁷⁵ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

⁷⁶ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

Additionally, they plan to “accelerate the process to test for and address the presence of lead in drinking water and housing” across the U.S. (Biden Administration).

Impacts on Drinking Water Inequality in the United States

The focus placed on “tackling water pollution in a science-based manner” is a goal from the Biden Administration’s plan that would substantially benefit environmental justice communities as they work to address drinking water quality issues.⁷⁷ In particular, re-evaluating the current criteria contaminant standards listed in the Safe Drinking Water Act to be more reflective of today’s scientific knowledge and understandings is an especially impactful way to improve drinking water quality. Lead and nitrates have been regulated as criteria pollutants by the Safe Drinking Water Act since the early 1990s. However, these levels have not been re-evaluated since they were first implemented nearly thirty years ago. A review of the most recent research on these contaminants and the environmental justice concerns they pose, display the need for an extensive review and revisal of these contaminant levels in drinking water regulations.

Nitrates

Nitrates and nitrites are “nitrogen-oxygen chemical units which combine with various organic and inorganic compounds” and are commonly found in fertilizers.⁷⁸ The EPA’s regulation of the level of nitrates in drinking water were first implemented in 1992

⁷⁷ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

⁷⁸ Environmental Protection Agency. “Consumer Factsheet on: Nitrates/Nitrites.” 1

and established 10 parts per million as the Maximum Contaminant Level Goal (MCLG).⁷⁹ The MCLG for Nitrates by established by the EPA to protect the population from potential negative health effects, particularly methemoglobinemia.⁸⁰

Methemoglobinemia, or otherwise known as “blue baby syndrome,” is a condition that developed in infants exposed to high levels of nitrites.⁸¹ This type of nitrite exposure can interfere with the oxygen-carrying capacity of a child’s blood and can cause their health to deteriorate rapidly in a matter of days.⁸²

Nitrates’ MCLG of 10 parts per million has remained the same since 1992 and has helped to prevent methemoglobinemia from developing in younger children. Nevertheless, new studies suggest that serious health conditions, including elevated risk of cancer and birth defects can develop at levels below the EPA’s MCLG for Nitrates.⁸³ Epidemiological data also suggests that the level of nitrates in drinking water correlated with the “reproductive toxicity and development effects” within the effected community.⁸⁴ The findings of these studies call into question the integrity of this limit on nitrates in drinking water. Further, it suggests a need to review the most recent scientific data and then update the contaminant level standards to reflect the new scientific understanding of how these contaminants impact human health.

⁷⁹ Environmental Protection Agency. “Consumer Factsheet on: Nitrates/Nitrites.” 1

⁸⁰ Ward 1607

⁸¹ Environmental Protection Agency. “Consumer Factsheet on: Nitrates/Nitrites.” 1

⁸² Environmental Protection Agency. “Consumer Factsheet on: Nitrates/Nitrites.” 1

⁸³ Schaidler 1

⁸⁴ Balazs, Morello-Frosch, Hubbard & Ray 1273

The need to re-evaluate the MCLG for Nitrates using the most recent scientific data is an important part to properly addressing environmental justice concerns. Nitrates are commonly found in the fertilizer applied to the agricultural site's at large farms and confined animal facilities."⁸⁵ The nitrates from these fertilizers are then introduced into drinking water through surface run-off.⁸⁶ The communities surrounding these types of large agricultural facilities are typically located in a rural area with residents from lower incomes and minority backgrounds. These common characteristics of the communities surrounding large agricultural sites are more likely to experience the negative health effects of high levels of nitrates in drinking water and can therefore be considered a type of environmental justice community.

In one 2011 study, authors Carolina Balazas, Rachel Morello-Frosch and Isha Ray analyzed the "relationship between nitrate concentrations in community water systems (CWSs)⁸⁷ and the racial/ethnic and socioeconomic characteristics of customers" in the San Joaquin Valley of California.⁸⁸ California's San Joaquin Valley was chosen as the area of study for this research because of its proximity to largely irrigated agricultural areas which have resulted in this area having "two of the most contaminated aquifers in the nation and some of the highest levels contaminants in the country."⁸⁹ Furthermore, the San Joaquin Valley has some of the highest rates of poor and minority population in the

⁸⁵ Schaider 1

⁸⁶ Schaider 1

⁸⁷ PWS is a more relaxed definition of a CWS and they provide drinking water to at least 25 individuals daily for at least sixty days out of year in a system with at least 15 or more service connections. PWS and CWS are essentially the same, with simply the number of people served and number connections used to distinguish one from another.

⁸⁸ Balazs, Morello-Frosch, Hubbard & Ray 1272

⁸⁹ Balazs, Morello-Frosch, Hubbard & Ray 1273

state which offers an exceptional opportunity to examine how nitrate levels are impacted by demographic and socioeconomic factors.⁹⁰

The study collected samples from 327 systems that covered 96% of the San Joaquin Valley population served by CWSs.⁹¹ The average level of nitrate concentrations within these systems varied greatly, ranging from 0 to 150 mg NO₃/L.⁹² While this study found that only “3% of all CWSs in their sample had high average nitrate concentration” 56% of the people served by these nitrate contaminated CWSs were people of color.⁹³ More specially, the percentage of Latino or Hispanic residents served by CWSs with high nitrate concentrations was “higher than the percentage of Latinos served by CWSs in the other two nitrate categories (low and medium).”⁹⁴ Ultimately, this study concluded that a “1% increase in Latinos served by a CWS was associated with an increase of 0.04 NO₃/L” in nitrate levels within the community’s drinking water.⁹⁵ This effect is further exacerbated in smaller CWSs (less than 200 connections) where each 1% increase in Latino residents is associated with a 0.44 mg No₃/L increase in nitrate concentrations in the drinking water.⁹⁶

The result of this study is important because they demonstrate that as the percentage of Latino residents served by CWSs increase, the levels of nitrate in the drinking water increases as well.⁹⁷ Understanding the impact of race on a community’s

⁹⁰ Balazs, Morello-Frosch, Hubbard & Ray 1273

⁹¹ Ibid, 1275

⁹² Ibid, 1275

⁹³ Ibid, 1275 – 1276

⁹⁴ Ibid, 1276

⁹⁵ Ibid, 1276

⁹⁶ Ibid, 1276

⁹⁷ Ibid, 1276

drinking water quality is also important because it shows how this type of contamination can pose a “greater hazard to subpopulations that might have less access to healthcare” resulting in an entirely new set of issues and compounding problems.⁹⁸ Increased exposure to high levels of nitrates can bring about adverse health effects and may make consumers more likely to need to seek medical attention.

However, these communities due to socioeconomic, and other factors might not have access to quality healthcare to effectively deal with these health concerns. This creates a detrimental pattern for such residents, leaving them continual at risk of developing drinking water contaminant related health issues and lack of resources to effectively deal with these health issues once they arise. While there are some other possible explanations for this phenomena, including the proximity to large agricultural areas and the ability of residents to participate in CWS governance, the results of this study are clear that “in smaller, more rural systems where nitrate levels are highest, those from minority background, are affected the most”.⁹⁹

It is evident that nitrates affect certain communities drinking water supplies more than others and more often than not these are composed people from lower-income, rural and minority backgrounds . As more research is conducted, the current MCLG level for nitrates may be failing to protect the residents of environmental justice communities from adverse health effects. By working with scientific data, the MCLG level for nitrates can

⁹⁸ Balazs, Morello-Frosch, Hubbard & Ray 1276

⁹⁹ Balazs, Morello-Frosch, Hubbard & Ray 1276

be amended to better reflect its current effects on communities across the U.S. and work to better protect the health of these disproportionately effected communities

Lead

Lead is another drinking water contaminant that poses significant environmental justice concerns at their current regulated levels and should be re-evaluated to better protect the public's health. Lead is currently regulated under the Lead and Copper Rule (LCR), which was first established by the EPA in 1991.¹⁰⁰ While lead is rarely found in large significant quantities in natural sources of water, it is most commonly introduced into drinking water through "lead pipes, and brass/bronze faucets and fixtures."¹⁰¹

Exposure to lead in drinking water at any level poses a significant risk to human health and can cause damage to the brain, red blood cells and kidneys particularly in young children and pregnant women.¹⁰² The MCLG for lead was set by the EPA at "zero since there is not level of exposure to lead that is without risk."¹⁰³ However, it did establish an action level of 0.015 mg/L for lead which would trigger an alert in the system and prompt other water safety requirements to come into play.¹⁰⁴ While there have been some minor revisions over the years to the LCR, the basic limits and regulations have remained the same since 1991.

¹⁰⁰ Environmental Protection Agency. 2020. "Understanding the Lead and Copper Rule."

¹⁰¹ Environmental Protection Agency. 2020. "Understanding the Lead and Copper Rule."

¹⁰² Environmental Protection Agency. 2008. "Lead and Copper Rule: A Quick Reference Guide."

¹⁰³ Environmental Protection Agency. 2020. "Understanding the Lead and Copper Rule."

¹⁰⁴ Environmental Protection Agency. 2008. "Lead and Copper Rule: A Quick Reference Guide."

Since the adoption of the LCR in, the EPA has seen a “decrease by over 90%” in the amount of lead in some of the nation’s largest drinking water systems.¹⁰⁵ Additionally, in data collected in 2019, the EPA found that 97% of the United States’ water systems have not reported an action level exceedance in the past three years.¹⁰⁶ This data would seem to suggest that the LCR has been effective at reducing the overall lead levels in drinking water, and thus able to better protect the public from the negative health effects that lead exposure can bring about. However, what this data fails to display is that not everyone has benefitted from the LCR equally as communities of color and lower incomes remain troubled by lead contamination in their drinking water.

In a 2019 study, author Jessie Gleason, Jaydeep Nanavaty and Jerald Fagliano examined how “demographic, socioeconomic, and environmental factors may confound or interact with each other and whether these relationships have changed over time.”¹⁰⁷ Studying “all New Jersey resident children aged 6 to 26 months with a least one blood lead specimen collected between 2000-2004 or 2010-2014” the authors examined if these demographic and social factors impacted children’s blood lead levels.¹⁰⁸ In total, the study examined the blood lead level tests of 615,288 children in New Jersey.¹⁰⁹ Overall, the study found that “children’s blood lead level had decreased over time from a statewide geometric mean of 2.47 µg/dL in 2000-2004 to 1.57 µg/dL in 2010-2014.”¹¹⁰ Nevertheless, the study did find that certain population of children were still experiencing

¹⁰⁵ Environmental Protection Agency. 2020. “Understanding the Lead and Copper Rule.”

¹⁰⁶ Environmental Protection Agency. 2020. “Understanding the Lead and Copper Rule.”

¹⁰⁷ Gleason, Nanavaty, & Fagliano 409

¹⁰⁸ Ibid, 409

¹⁰⁹ Ibid, 411

¹¹⁰ Ibid, 409

higher levels of lead in their blood samples despite this overall decrease.¹¹¹ In general, their research found that “blood levels decreased as percent white increased and increased with increasing percent Hispanic ethnicity, percent living in poverty and percent of homes built pre-1950 and pre-1970.”¹¹²

The findings of this study are consistent with other research in this area, but their results are still just as troubling.¹¹³ Type of housing as a factor in increased blood lead levels in children is further supported by the history of lead piping in the United States. Despite being more expensive to purchase and install than pipes made from other materials, such as steel, “lead pipes were a better investment for municipalities and building owners because they lasted so much longer” and required less maintenance.¹¹⁴ Lead piping’s image as a better long-term investment was convincing to cities and building owners which resulted in the widespread adoption of lead piping for waterways across the country.¹¹⁵ By 1923, “twenty-five of the United States’ largest cities and 85% of all cities, primarily used lead service lines for drinking water.”¹¹⁶

It was not until much later, first coming into discussion in 1943, did Americans begin to realize that lead might have negative effects on human health, including causing cognitive impairments in young children.¹¹⁷ Many years passed before federal law would put an end to the use of lead pipe in drinking water services lines in 2014.¹¹⁸ With older

¹¹¹ Gleason, Nanvaty, & Fagliano 411

¹¹² Ibid, 411

¹¹³ Ibid, 413

¹¹⁴ Siegel 128

¹¹⁵ Ibid, 128

¹¹⁶ Ibid, 129

¹¹⁷ Ibid 129

¹¹⁸ Ibid 217

housing being more affordable, it is no surprise that over 42% of the children that lived in housing built before 1946 were found to have overall higher lead levels in their blood.¹¹⁹ Access to housing with the most up to date infrastructure and building materials is another way in which environmental justice communities can be disproportionately affected by environmental problems. Not only are these families then put at a higher risk of lead related health problems, but they are also much less likely to have the financial resources available to them to respond to these health concerns.

There are no safe levels at which humans can be exposed to lead without negative health effects, yet water facilities are not informed of any presence of lead in the system until it reaches the action level for the contaminant. However, by the time the lead action level is reached, the damage to a community's health has already begin to occur. The confounding factors of race, socioeconomic status, and poverty place these individuals at substantially increased risk to lead exposure via drinking water. By updating the Lead and Copper Rule, to inform water utilities of a potential contaminant breach at an earlier level much lower than the current action level, countless lives could be saved and would help to lessen the potential health risk in these environmental justice communities.

¹¹⁹ Gleason, Nanvaty, & Fagliano 414

Adding New and Emerging Chemicals to the SDWA's Contaminant List: PFAS/PFOS

In addition to re-evaluating current criteria contaminant levels, the Biden Administration also plans to conduct more research on new and emerging contaminants that pose a threat to the public's health. In particular, the Biden Administration wants to focus on emerging contaminants that disproportionately affect certain communities' drinking water within the United States more so than others. The Biden Administration has listed PFAS as one of the new and emerging contaminants that pose a specific threat to environmental justice communities.

PFAS or per- and polyfluoroalkyl substances, are a group of chemicals that are used to make fluoropolymer coatings and products that are resistant to heat, oil, stains, grease, and water.¹²⁰ PFAS chemicals are used in a wide variety of produce and industries, but are most commonly used in non-stick cookware, stain resistant clothing and firefighting foam.”¹²¹ PFAS are composed of a chain of linked carbon and fluorine atoms, making them extremely strong and durable chemical that does not biodegrade once introduced into the environment.¹²² With no way to biodegrade, these chemicals accumulate overtime and contaminate the drinking water, soil and even the air.¹²³ There are thousands of PFAS chemicals, and they can be easily replaced with another variation of each other. For instance, Perfluorooctanoic Acid (PFOA) and Perfluorooctane

¹²⁰ Agency for Toxic Substances and Disease Registry. 2020. “Per- and Polyfluoroalkyl Substances (PFAS) and Your Health.”

¹²¹ National Institute of Environmental Health Sciences. 2021. “Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS).”

¹²² Ibid.

¹²³ Ibid.

Sulfonate (PFOS) were two of the most widely used and studied PFAS chemicals.¹²⁴ However, once these PFOS and PFOA were no longer manufactured in the United States, they were replaced with a wide array of other PFAS chemicals.¹²⁵ This is important to note, because the vast amount of PFAS chemicals used and made each year poses a significant threat to the environment and to environmental justice communities.

The inability to biodegrade within the environment, and the widespread use of PFAS poses a significant potential risk to human health, for once they are introduced into a system, they become a permanent addition and continually contaminate the environment in which they are present. One CDC study found that 97% of Americans have PFAS chemicals within their blood.¹²⁶ The vast scope of the use of PFAS chemicals make it imperative that the U.S. understand the potential health risks of the chemical and protect Americans from any potential negative health effects. Unfortunately, not very many studies have been conducted in this area and more need to take place in order to gain a better understanding of how these chemicals specifically impact human health.

However, the studies that have been conducted on examining the health effects of PFAS have shown that exposure to high levels of PFAS can lead to “increased cholesterol levels, decreased vaccine response in children, changes in liver enzymes, increased risk of high blood pressure, increased risk of pre-eclampsia in pregnant women,

¹²⁴ Environmental Protection Agency. 2021. “Our Current Understanding of the Human Health and Environmental Risks of PFAS.”

¹²⁵ Environmental Protection Agency. 2021. “Our Current Understanding of the Human Health and Environmental Risks of PFAS.”

¹²⁶ National Institute of Environmental Health Sciences. 2021. “Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS).”

small decreases in infant birth weights and increased risk of kidney or testicular cancer.”¹²⁷ One recent study has found that there may be a potential correlation between PFAS blood levels and COVID-19 severity, citing that as “concentrations of PFAS increased, so did the likelihood of hospital ICU admissions or death.”¹²⁸

Not only does exposure to PFAS present a potentially negative effect on human health, but it also poses environmental justice concerns as well. Despite, the fact that nearly every American has some levels of PFAS chemicals within their blood, residents of environmental justice communities are more likely to have very high levels of PFAS pollution.¹²⁹ Similar to other drinking water contaminants, PFAS chemical distribution is positively associated with age, income, education, water system size, and proximity to PFAS producing plants.¹³⁰

The level of PFAS present in a drinking water system has also been found to be associated with race/ethnicity and country of origin. In a 2019 study, researchers “examined potential determinants of PFAS in serum samples from the Study of Women’s Health Across the Nation” in order to determine which factors correlated with PFAS Levels.¹³¹ Ultimately, the study found that different demographic factors were determinants for different types of PFAS chemicals. For instance, Black women were found to have the highest concentrations of linear and branches PFOS, while white

¹²⁷ Agency for Toxic Substances and Disease Registry. 2020. “Per- and Polyfluoroalkyl Substances (PFAS) and Your Health.” <https://www.atsdr.cdc.gov/pfas/health-effects/index.html>

¹²⁸ Rodgers & Beck

¹²⁹ Lee, Kar & Reade 11

¹³⁰ Wise et al. 1

¹³¹ Park et al. 187

women were found to have the highest concentrations of linear PFOA.”¹³² This correlation was also influenced by geographical location across the United States, for instance women located in Southeastern Michigan had higher overall PFAS levels than women from California.¹³³

Since environmental justice communities are disproportionately affected by PFAS chemicals, the lack of regulations for the level of PFAS in a drinking water system further complicates this issue. PFAS are not listed on the SDWA’s contaminant list, and therefore water systems are not required to test for this contaminant or ensure that it stays below a certain level. A study of California’s drinking water systems found that there was “PFAS testing data available for 77% of these disadvantage communities, of which 69% have had PFAS detected in their water systems.”¹³⁴ However, at least 20% of these environmental justice communities that tested for PFAS, had some of the highest levels (top quartiles) in the state.¹³⁵ For systems that already struggle to remain in compliance for SDWA contaminants, attempting to regulate a new and unregulated chemical like PFAS is simply unobtainable. If a water system struggling to remain in compliance with current SDWA regulated contaminants, they are highly unlikely to take on the additional financial burden of testing for a non-regulated chemical.

While high percentage of water systems that serve environmental justice communities currently testing PFAS levels in California may be encouraging to some,

¹³² Park et al. 190

¹³³ Park et al.11

¹³⁴ Lee, Kar, & Reade 11

¹³⁵ Lee, Kar, & Reade 11

they fail to display the full picture of PFAS' presence in the state's drinking water supply. Thousands of California's Public Water Systems (PWSs) have not implemented monitoring system for PFAS.¹³⁶ Even if they have been implemented by the PWSs, regular testing for PFAS is not conducted, finding that "45% of these systems failed to test all four quarters for PFAS."¹³⁷ Monitoring and testing PFAS levels can prove to be an even more difficult task when taking into account that there are thousands of possible PFAS chemicals that could be present in the drinking water and it is hard for PWSs to determine which types of PFAS they should be testing for.¹³⁸

The potential health effects of high exposure to PFAS, their disparate impact on in drinking water displays the need for the EPA to take a more proactive stance of research and adding new chemicals to the contaminant list. However, the EPA's has faltered in their responsibility under the SDWA to review and add new chemicals to the contaminant list. This has once again result in unequal exposure to potentially hazard chemicals in communities across the U.S. Moreover, since these chemicals are not included on the contaminant list or monitored for by the water systems, they can continue to persist in drinking water at any level, regardless of the consequences on human health.

MCLG for current contaminants listed within the Safe Drinking Water Act have remained relatively unchanged since their implementation. Further, new, and emerging contaminants that could pose a potential risk to the public's health have also not been

¹³⁶ Lee, Kar, & Reade 13

¹³⁷ Ibid, 13.

¹³⁸ Ibid, 13

added to the contaminant list in a timely manner. In order to better protect communities across America, particularly those that are disproportionately affected by these issues, revision to the contaminant list in the SDWA should be made. Both revising current MCLG for contaminants and adding new contaminants are an essential part to improving drinking water quality in environmental justice communities and helping them to maintain safe drinking water for their residents.

CHAPTER THREE

Targeting Grants & Federal Assistance to Rural, Low-Income and Small Community Water System Areas

During the 1970s, the United States Congress passed two major pieces of legislation that would “combat industrial water pollution and ensure clean drinking water supplies nationwide”: The Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA).¹³⁹ Both pieces of legislation were designed to “safeguard both environmental and human healthy by providing an acceptable level of water quality in lakes, and streams.”¹⁴⁰ However, only the SDWA directly regulated drinking water contaminants.¹⁴¹

Since the implementation of the SDWA, its ability to achieve its goals of improving drinking water quality has, at times, been called into question.¹⁴² This type of examination has uncovered that the implementation of the SDWA’s violation system has not been effective at encouraging systems found in violation to promptly correct the issue and return to compliance. Without feeling the pressure to return to compliance, may water systems take longer to address these violations. This results in their customers being exposed to unsafe levels of drinking water contaminants for longer periods of time and at higher risk for developing health issues. Furthermore, the types of residents that are exposed to these long-term violations are not even in their distribution across the

¹³⁹ Grooms 1

¹⁴⁰ Ibid, 2

¹⁴¹ Ibid, 2

¹⁴² Ibid, 3

American public. Typically, the affected communities are composed of lower-socioeconomic, rural and minority residents. The policy measure that should be implemented in order to properly address these issues within the SDWA violation system are two-fold. Firstly, the current SDWA violation systems should be revised in a way that better encourages drinking water systems to promptly return back to compliance after a violation has been issued. The other policy measure that should be implemented is improving upon and establishing federal grant and aid programs to provide financial assistance to environmental justice communities to help implement new monitoring and preventative technologies.

How SDWA Violations Operates

In order to recognize how drinking water violations, present an environmental justice issue, it is important to first understand how and why SDWA violations are issued. The SDWA “does not guarantee Americans clean drinking water.”¹⁴³ Rather it “identifies and develops rules related to harmful contaminants” in the drinking water distributed by the water systems in hopes of protecting communities from the potential health risks.¹⁴⁴

Under the SDWA, the Congress has delegated the power to develop rules for contaminant levels in drinking water that will protect communities from any harmful health effects to the EPA. The EPA primarily achieves this goal by setting Maximum

¹⁴³ Grooms 4

¹⁴⁴ Grooms 4

Contaminant Level Goals or MCLGs, for the amount of a particular contaminant in the drinking water.¹⁴⁵ Using peer-reviewed scientific reports and data, the EPA determines which contaminants to regulate.”¹⁴⁶ Contaminants such as nitrates, arsenic, and lead have a MCLG that the EPA has developed, and they are required to reassess its regulations of all contaminants every six years.¹⁴⁷

Once setting these MCLGs for most contaminants, the responsibility to enforce these limits, falls upon the EPA, unless the state has received primacy.¹⁴⁸ Primacy is the power given to a state to “implement SDWA regulations within their jurisdiction” so long as they implement standards that are at least as strict as the EPA’s regulations and ensure that all the state’s water systems within the states agree to comply with these standards.¹⁴⁹ A large majority of the states have obtained this power and are able to implement and enforce the SDWA standards through their own agencies. These state agencies are tasked with the responsibility of monitoring and enforcing these standards within their Public Water Systems (PWSs).¹⁵⁰

States carry out their monitoring duties typically in one of two forms. The first is when the State “dispatches inspectors to detect and remedy treatment issues to help water systems remain in compliance.”¹⁵¹ While there is a “minimum inspection rule that ranged from once a year to once every three years, this type of inspection is fairly inconsistent in

¹⁴⁵ Grooms 4

¹⁴⁶ Grooms 4

¹⁴⁷ Statman-Weil 1-2.

¹⁴⁸ Cory & Rahman 1829

¹⁴⁹ Cory & Rahman 1829.

¹⁵⁰ Grooms 4

¹⁵¹ Grooms 5

its frequency.¹⁵² The second and more common way that a State carries out their monitoring function under the SDWA is to require the individual water systems to regularly test for contaminants and report the results.¹⁵³ Through regular testing, the states can oversee the drinking water quality in these communities and issue violations when the PWSs have violated the standards set by the SDWA.

These violations occur when one of two types of issues arise within the water system. The first type is a “monitoring and reporting” violation, which arises when a system “fails to monitor and sample for contaminants on a prescribed schedule or when systems fail to report these results” on time.¹⁵⁴ The second type of violation and the ones that “are of the greatest concern” are health-based violations.¹⁵⁵ Health-based violations “relate to the utilities’ ability to control the levels of a particular contaminant in their water supply.”¹⁵⁶ Surpassing the MCL goal of a contaminant or failing to comply with a certain water treatment technique, could result in this type of violation.¹⁵⁷ Since these violations pose an immediate risk or impact on the public’s health, they “trigger public notification and more intense follow-up monitoring (Groom 5).

The intent of the SWDA’s violation notification process is intended to bring about “public and regulatory scrutiny” that should “encourage systems to return to compliance” as quickly as possible.¹⁵⁸ Public scrutiny is taken very seriously by the regulated PWSs

¹⁵² Grooms 5

¹⁵³ Ibid, 5

¹⁵⁴ Ibid, 5

¹⁵⁵ Ibid, 5

¹⁵⁶ Switzer & Teodoro 41

¹⁵⁷ Switzer & Teodoro 41

¹⁵⁸ Grooms 6

and has proven to be an effective tool in deterring violations from occurring (Grooms 7). Moreover, regulatory public notification requirements, such as the 1996 SDWA Amendment's requirement for systems to "file an annual Consumer Confidence Reports" provide PWSs with "a large incentive to return to compliance."¹⁵⁹ Consumer Confidence Reports or CCRs, are a type of "mandatory disclosure of information to the public" that inform consumers of all violations within their water systems as well as the current levels of contaminants even if they are not above the MCLG limit.¹⁶⁰ CCRs help to decrease violations by providing information to the public about the quality of their drinking water and can trigger continued scrutiny from the public towards the system until they amend a previous SDWA violation.¹⁶¹

While increased scrutiny, both public and regulatory have proven to be effective at preventing violations within a PWSs, one study found that once they are issued, SDWA violation system do not encourage the system to return to compliance.¹⁶² In her 2015 study, Dr. Katherine K. Grooms, associate Professor of Economics and Business at Southwestern University, examined PWSs across the State of California in order to "provide empirical evidence on the reaction of water systems to violations."¹⁶³ She chose to examine specifically how these PWSs handled nitrate and arsenic violations, and once a violation was issued if this encouraged systems to quickly return to comply with SDWA regulations or not.

¹⁵⁹ Grooms 7

¹⁶⁰ Ibid, 6

¹⁶¹ Ibid, 7

¹⁶² Ibid, 3

¹⁶³ Ibid, 3

Overall, Dr. Grooms found that “contaminant levels significantly increased when averaged over the seven quarters following a violation.”¹⁶⁴ It appeared that for both contaminants examined in this study, the issuing of SDWA violation had little effect on the contaminant levels and did not result in a decreased in the contaminant levels post-violation.¹⁶⁵ “A violation one quarter prior has a positive, and statistically significant effect on the probability of being in violation this quarter.”¹⁶⁶ This persistence of a violation reveals that “an MCLG violation does not entice water systems to lower contaminant levels back to compliance levels after the first violation was issued.”¹⁶⁷ Therefore, Dr. Grooms concluded in her research that while “public scrutiny may deter systems from violating once they go into violation,” it is not as “effective at encouraging the system to return to compliance” promptly.¹⁶⁸

Examining the effect of SDWA violations impact on the actions taken by the water system after a violation is issued presents a useful way of investigating environmental justice issues within these communities.¹⁶⁹ Since regulatory compliance is regarded as a common goal for all utilities drinking water providers, “regardless of their personal opinions about the regulations,” should recognize the necessity of compliance with existing regulatory requirements.¹⁷⁰ Moreover, since all drinking water providers are “tasked with similar regulatory requirements under the SDWA,” this “common

¹⁶⁴ Grooms 19

¹⁶⁵ Ibid, 19

¹⁶⁶ Ibid, 20

¹⁶⁷ Ibid, 20

¹⁶⁸ Ibid, 21

¹⁶⁹ Switzer & Teodoro 41

¹⁷⁰ Switzer & Teodoro 41

regulatory framework” should mean that everywhere in the U.S. had comparable levels of drinking water quality.¹⁷¹

In 2017, authors David Switzer and Manuel P. Teodoro examined where “community drinking water quality in the United States systematically correlated with class, race and/or ethnicity.”¹⁷² By collecting “water utilities and violations data from the Safe Drinking Water Information System” the authors were able to analyze “12,972 drinking water utilities over four years, representing all local government-owned utilities that serve populations of 10,000 or more.”¹⁷³ After collecting and analyzing their data, the authors were able to find that in general “race and ethnicity had a major impact on the number of violations committed by a utility, but the relationship is conditional on poverty level within the community.”¹⁷⁴

In communities that were more affluent, levels of “race and ethnicity had little effect on the number of violations.”¹⁷⁵ Although in communities with higher levels of poverty, “race and ethnicity strongly predicted the number of violations committed by a utility.”¹⁷⁶ Moreover, the study found that an increase in certain minority populations directly impacted the number of violations within the lower-income community. Increases in Hispanic and Black populations within a poorer community, increase the “number of violations committed by a utility that is both statistically and substantively

¹⁷¹ Grooms 41

¹⁷² Switzer & Teodoro 41

¹⁷³ Ibid, 41

¹⁷⁴ Ibid, 43

¹⁷⁵ Ibid, 43

¹⁷⁶ Ibid, 43

significant.”¹⁷⁷ For instance, in a community where “poverty is high” an increase from “0% Black population to 80% Black population” results in a “45% increase in the number of expected health-based” drinking water violations.”¹⁷⁸ Even after accounting for socioeconomic factors, the authors find that these “racial and ethnic disparities” in drinking water quality remain evident.¹⁷⁹

Communities served by smaller drinking water systems and located in more rural areas are also placed at an increased risk for experiencing an SDWA violation. In 2020, a study was conducted that wanted to better understand “whether there were disparities in compliance with the SDWA” by specifically investigating the “relationship between socioeconomic status and race as well as other water system variables.”¹⁸⁰ Through examining community water systems within the State of Pennsylvania, this study concluded found that “there is no clear pattern in the spatial distribution of the total SDWA violations by CWS or health-based SDWA violations.”¹⁸¹ The statistical results of the study, however, did find that the “rural variable is significantly related to total SDWA violations” within a community.¹⁸² Rural CWSs “were found to be less compliant across all models” and on average experience “approximately 10 to 13 more total SDWA violations than an urban CWS” during the same period.¹⁸³ Smaller CWSs also were found to have more “total violations in all the models.”¹⁸⁴

¹⁷⁷ Switzer & Teodoro 43

¹⁷⁸ Ibid, 44

¹⁷⁹ Ibid, 44

¹⁸⁰ Statman-Weil 1

¹⁸¹ Ibid, 5

¹⁸² Ibid, 6-7

¹⁸³ Ibid, 8

¹⁸⁴ Ibid, 7

Examining the disproportionate impact of SDWA violations within these communities, the Biden Administration plans to take active steps to address these issues within the third main objective of their Environmental justice plan. The Biden Administration begins explaining their plans for carrying out this third objective by stating that they plan to commit to “providing low-income and communities of color preference in competitive grant programs” to better address these issues relating to environmental justice.¹⁸⁵ The administration’s plan is modeled closely off of New York State’s climate law and will focus primarily on “targeting relevant investment with the goal of delivery 40% of the overall benefits from those investments to disadvantaged communities.”¹⁸⁶ More specifically, they plan to achieve this goal by “targeting investments made through programs related to clean energy... and the development of critical clean water infrastructure.”¹⁸⁷ Through using the reports provided by the EPA’s EJScreen Tool, the Biden Administration plans to better identify the types of communities that would benefit the most from economic assistance, including communities that are “threatened by the cumulative impacts of the multiple stresses of climate change, economic and racial inequality and multi-source environmental pollution.”¹⁸⁸

Often these communities facing higher rates of SDWA violations occur as a result of an inability to afford to remain in compliance. Just as there is a cost for water systems

¹⁸⁵ Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

¹⁸⁶ Ibid.

¹⁸⁷ Ibid.

¹⁸⁸ Ibid.

for violating SDWA regulations, compliance also comes at a cost to the water system.¹⁸⁹ In “any given period, the system must balance compliance costs against expected penalties” and if the “expected penalty is less than the cost of compliance” the water system may opt to remain in violation for the sake of financial concerns.¹⁹⁰ This is of particular for lower-income, rural and small CWS communities for they simply may not have the financial resources to return their system to SDWA compliance. To address fixing contaminant levels in drinking water, water systems may need to take on “large, fixed cost capital investments, such as new treatment plants or technologies” and the cost of such measures may be completely out of question for some of these disproportionately affected communities.¹⁹¹

In order to “induce compliance” across all drinking water services in the United States, two kinds of measures should be implemented by the federal government. First, the cost of noncompliance should be increased to better promote compliance within CWSs. If it is more expensive to remain in violation, this will encourage drinking water systems to return to comply with the SDWA regulation in a more quick and timely manner. This will also help to prevent increased contaminant exposure and provide improved drinking water quality to the community's residents. Secondly, to address the ongoing disparities in drinking water violations in lower-income, minority, small, and rural water systems, targeted grants in aid should be implemented. These grants and federal assistance programs would help these communities implement the needed

¹⁸⁹ Grooms 7

¹⁹⁰ Ibid, 7 – 8

¹⁹¹ Ibid, 8

treatment techniques to help reduce contaminant levels and return to SDWA compliance. Such grants are also needed to help implement new monitoring systems, which could help these communities pick up on changes in contaminant levels in a more consistent way. Better monitoring would in turn help them to detect a possible contaminant issue earlier and treat it before it reaches beyond the MCL goal of that contaminant.

The types of grant and assistance programs that would be a beneficial tool in properly addressing these environmental justice issues and can be seen within the proposed Infrastructure and Jobs Act or HR 3684. Commonly referred to as the “Bipartisan Infrastructure Deal”, This bill was first introduced in June 2021 and is sponsored by Representative DeFazio of Oregon.¹⁹² While this act “authorizes fund for Federal-aid highways, highway safety program and transit programs” it also authorizes funds “for other purposes” including drinking water infrastructure.¹⁹³ While there are numerous provisions within the Drinking Water section of this bill, the proposed amendments to existing grant programs and the establishment of new ones could greatly impact these communities and help to provide more Americans with safe drinking water.

Section 50104 of HR 3684 is one of the bill's provisions that through amending current grant programs, could benefit these environmental justice communities greatly. This section is primarily concerned with amending Section 1459A of the SDWA, which was first implemented by the 2016 Water Infrastructure Improvements for the Nation Act

¹⁹² Infrastructure Investment and Jobs Act of 2021, H.R. 3684, 117th Cong. (2021)

¹⁹³ Infrastructure Investment and Jobs Act of 2021, H.R. 3684, 117th Cong. (2021) 1

and the 2018 America’s Water Infrastructure Act.¹⁹⁴ Section 1459A authorizes the EPA to “award grants to states to assist underserved, small and disadvantaged communities that are unable to finance activities needed to comply with the SDWA, as well as respond to a drinking water contaminant.”¹⁹⁵

This section of the SDWA provides a potent tool for combating environmental justice concerns in drinking water quality but as it is currently written it does not provide aid for implementing filters, and filtration systems within the community. HR 3684 plans to amend this section to allow for the “purchase of point-of-entry or point-of-use filters and filtration systems that are certified by a third party using science-based testing methods for the removal of contaminants of concern.”¹⁹⁶ In addition to providing more funds to implement such a change, this amended version of Section 1459A of the SDWA could greatly improve the disadvantaged community’s ability to control the contaminant levels within its system. Furthermore, this change to Section 1459A could be more easily implemented than other forms of legislation. Since the two previous acts that implement this section of the SDWA were passed by a majority of Senators and Representatives from both major political parties.

Another section of HR 3684 that works to establish grant programs to better serve environmental justice communities is Section 50106. Section 50106 focuses on

¹⁹⁴ Environmental Protection Agency. 2019. “Assistance for Small and Disadvantaged Communities Drinking Water Grant Program: Grant Implementation Document.”

¹⁹⁵ Environmental Protection Agency. 2019. “Assistance for Small and Disadvantaged Communities Drinking Water Grant Program: Grant Implementation Document.”

¹⁹⁶ Infrastructure Investment and Jobs Act of 2021, H.R. 3684, 117th Cong. (2021)

“improving the operation of a small water system through the identification and prevention of potable water loss due to leaks, breaks or other metering or infrastructure failures.”¹⁹⁷ This section of the Act focuses on working with small water systems or water systems that serve less than 10,000 people. As seen in previous studies, smaller water systems are often unable to afford the necessary preventative measure and monitoring technology to prevent contamination from occurring in their drinking water.

This section’s focus on the needs of smaller water systems is directly addressed through its creation of a program within the EPA that plans to “award grants to eligible entities for the purpose of improving the operational sustainability of one or more small systems.”¹⁹⁸ This grant program would be based on an application system where qualifying towns, cities and water systems can apply for a grant by submitting a proposal for what the funds would be used for.¹⁹⁹ As long as the project would help to improve the “deficiencies or suspected deficiency in operational sustainability” of the water system(s), and provides a detail summary of how such improvements would benefit the water system, they are eligible to receive a grant under this program.

Since the federal government will cover the majority of the costs of these projects, 90% of the total cost, smaller communities will be able to overcome the cost barriers and implement these much-needed updates to their water systems.²⁰⁰ A waiver can also be submitted to have the Federal government fund the entirety of the project if there is a

¹⁹⁷ Infrastructure Investment and Jobs Act of 2021, H.R. 3684, 117th Cong. (2021) 1891.

¹⁹⁸ Ibid, 1891

¹⁹⁹ Ibid, 1892

²⁰⁰ Ibid, 1895

demonstrated need.²⁰¹ As of June 2021, the Act has appropriated \$50 million dollars a year for the next four years to be used to fund this grant program. An investment in working to assist rural communities to improve their drinking water systems is an extremely important and necessary measure. These funds can help to bring these rural communities back into compliance with drinking water quality standards and help to even out drinking water quality across the country. Providing additional assistance to more rural communities can help to create a more consistency in drinking water quality in communities across the U.S. regardless of their geographically location.

In the early weeks of November 2021, H.R. 3684 passed both House of Congress and awaits to be signed into law by President Biden. Despite some negotiation difficulties, the Bill passed with support from both major political parties. Even more importantly, the drinking water infrastructure sections of the bill remain a largely undebated section of the bill and remained the same in the text throughout the negotiation process. This provides some evidence, that despite growing problems with partisan politics drinking water legislation remains neutral and largely supported by both sides of Congress. The implementation of these measures within H.R. 3684 will help to provide the necessary funding to get these smaller, lower-income and rural water systems back on track and help them to improve their monitoring systems. Passage of H.R. 3684 also provides some insight into how potential legislation calling for revisions in the SDWA and its contaminant violation system may fair. While there is no current proposed

²⁰¹ Infrastructure Investment and Jobs Act of 2021, H.R. 3684, 117th Cong. (2021) 1895

legislation in place for this type of legislation, the provisions in H.R. 3684 may begin a conversation on this topic and spark further change.

However, H.R. 3684 only address one aspect of this ongoing problem. Providing target grants to more rural and smaller communities to carry out much needed updates to their water infrastructure can be a potent tool in combating ongoing drinking water violations. Being able to invest in the best drinking water infrastructure and technology, can provide these communities with safe drinking water and help to prevent violations in the future. Yet, the problems within the SDWA violation systems remain even with the passage of grant programs like those included in H.R. 3684. SDWA violations once issued do not encourage water providers to return their drinking water to compliance standards in a timely manner. This leaves the community's residents exposed to harmful contaminants for longer periods of time and could result in major health consequence.

A study of the shortfalls of the SDWA violation should be conducted to determine why exactly the current system is not effective at encouraging violating systems to return to compliance. This study should then be used by legislators to create a new system for SDWA violations that will be effective at encouraging a quick and timely return to compliance among water providers. Since this would result in a complete overhaul of the current violation system to the SDWA, Congress would need to institute these changes through amending this act. While concerns over the increase of partisan politics in Congress continue, drinking water quality still remains a largely bipartisan issue. Drinking water quality problems affect all Americans, regardless of where they live or

who they voted for but have simply not been a priority for Congress since the last amendments to the SDWA in the 1990s. Brining issues with the current SDWA to light, such as the ineffectiveness of the violation system to prompt water providers to return to compliance, can help to bring these issues of the forefront of lawmakers minds and prompt legislation. A complete re-design of the SDWA violation system by Congress could fill the current gaps and create a system that effectively addresses the issues within today's drinking water.

CHAPTER FOUR

Improved Preparation & Prevention Measure for Drinking Water Quality Related Public Health Crises

When drinking water quality-related public health crises occur, oftentimes the damage has already been done and the contaminant has surpassed MCL and resulted in a violation. This places further pressure on water systems, especially environmental justice communities, to solve these issues and return to compliance more quickly. However, as discussed in the previous chapter, returning to compliance can often prove to be a difficult task for these communities for a variety of reasons, including lack of financial resources or proper water system technologies. Another way to solve these types of issues in environmental justice communities is through providing means to help them prevent such contamination from occurring in the first place. Through implementing better real-time monitoring systems, better communicating water quality updates and issues with the community, and making water quality data more accessible, environmental justice communities could catch rises contaminant spikes earlier and work to fix them before they surpass their MCL goals.

These types of policy solutions fit well with the Biden Administration's fourth and final objective of their Environmental Justice and Climate Plan. This objective focuses on implementing measures that will help the United States to "do a better job to prepare for and prevent public health emergency, particularly in communities that have

been disproportionately impacted by environmental stressors.”²⁰² When compared with the three previous objectives, this final objective primarily focuses on mitigating the future effects of climate change on these vulnerable communities as well as addressing the ongoing COVID-19 pandemic. However, the goals can also be applied to drinking water quality and help to improve upon an area that has long been overlooked. Specific policy initiatives that should be implemented by the Biden Administration to achieve this objective concerning improving drinking water quality in environmental justice communities are (1) encouraging water systems to create Water Safety Plans to prepare for increased contaminant levels or emergencies, (2) make water quality information within annual CRRS report more accessible and understandable for the general public ,and (3) reimplement EPA’s EMPACT program.

Encouraging the Use of Water Safety Plans

Effective management of drinking water systems is critical to ensure the delivery of safe drinking water and preventing contamination.²⁰³ However, many U.S. water utilities fail to implement procedures of plans for what to do when a contaminant level rises or an emergency occurs, leaving them effectively unprepared for these types of events when they do occur. Water safety plans or WSPs, “offer an internationally recognized systematic risk management approach” that can help water systems to

²⁰² Biden-Harris Administration. 2020. “The Biden Plan to Secure Environmental Justice and Equitable Economic Opportunity”

²⁰³ Baum, Amjad, Luh & Bartram 677

improve “water quality regulatory compliance communication, asset management, and a public health outcome.”²⁰⁴ Water Safety Plans were first developed by the World Health Organization from 1994 to 2003, and they were created to “ensure that all hazards and risks that could adversely affect drinking water safety are managed to assure the safety of drinking water.”²⁰⁵ WSPs are comprised of three main components: system assessments, operational monitoring and management, and communication.²⁰⁶ These components of a WSPs are implemented through an 11-step process which includes steps such as “developing, implement and maintaining an improvement plan” and “describing the water supply system.”²⁰⁷ Several studies have been conducted which found that when water system implement WSPs they experience “an increase in regulatory compliance, improvements in microbiological water quality, greater customer satisfaction, and better asset management, leading to potential financial benefits.”²⁰⁸

Currently, very few water systems in the U.S. have implemented WSPs and based on the studies conducted on the effectiveness of such a management tool the addition of “WSPs in the U.S. could offer added value to existing regulations.”²⁰⁹ A 2015 study compared WSPs to already existent U.S. Water legislation and regulation and found that “differences exist that highlight the potential added benefits of WSPs to U.S. water systems.”²¹⁰ U.S. water quality regulations tend to focus on “setting national standards for MCL, best treatment process, and best available technologies for contaminant

²⁰⁴ Baum, Amjad, Luh & Bartram 677

²⁰⁵ Ibid, 679

²⁰⁶ Ibid, 679

²⁰⁷ Ibid, 679

²⁰⁸ Ibid, 679

²⁰⁹ Ibid, 679

²¹⁰ Ibid, 681

reduction.”²¹¹ However, what these regulations tend to neglect to focus on is “internal risk assessment and prioritization, management procedures and plans, and team procedures and training” all of which are key focuses of WSPs.²¹²

Risk assessment and prioritization are not “required by national regulations” but play a key role in WSPs which expect that water systems identified cross-connection and backflow contamination and “control measure would be developed and monitored.”²¹³ By implementing WSP, water systems would be able to better “recognize and control” all potential hazards and risks on the system to “ensure safe drinking water.”²¹⁴ Oftentimes water systems in the U.S. are reluctant to adopt such preventative measures due to “time and money constraints” but also a “lack of policy priority shared by the utility and regulator.”²¹⁵ WSPs can help to address the latter concern by allowing utilities to implement “site-specific risk assessments” which will allow them to respond to the unique and plausible “risks they face and the capabilities of their systems to manage those risks.”²¹⁶ While applying common standards for all water systems to meet is an important part of providing safe drinking water to Americans, each individual water system faces its unique issues and problems, which simply cannot all be adequately addressed by national legislation. By implementing WSPS, communities would be able to better know the ins and outs of their water system, understand what types of

²¹¹ Baum, Amjad, Luh & Bartram. 681

²¹² Ibid, 681

²¹³ Ibid, 683

²¹⁴ Ibid, 683

²¹⁵ Baum, Bartram, and Hrudey 1

²¹⁶ Baum, Bartram, and Hrudey 1

contaminants they are susceptible to and how to better prevent these contaminants from infecting their drinking water supply.

WSPs can also help water systems to implement procedures that “ensure that monitoring occurs to help prevent contamination events.”²¹⁷ In the same study, four of the contaminant outbreaks they studied were caused due to a “lack of treatment and failure of disinfection contributed” an issue that can be improved through the implementation of WSPs.²¹⁸ Currently, the SDWA does require that water systems have certified operations, but there is no requirement for providing these operators with “greater clarity, the institutional memory of the sense of ownership.”²¹⁹ The SDWA only requires systems to “pass their initial assessment” and once passing, it does not require the water system to update nor revise their practices.”²²⁰

To “reduce errors and mitigate potential risks,” it is essential that these water system operators “understand the potential incidents” that can occur within the system and how to properly address them. Through the implementation of WSPs, water systems can provide additional guidelines to operators about how to address the “system-specific contaminants of concern” and how to mitigate their effects.²²¹ For environmental justice communities, this type of training would be key to addressing the contaminants which disproportionately affect their community more than others. For instance, if water systems that are located more closely to large agricultural sites were able to better train

²¹⁷ Baum, Amjad, Luh & Bartram 683

²¹⁸ Ibid, 683

²¹⁹ Ibid, 683

²²⁰ Ibid, 684

²²¹ Ibid, 684

their operators on the effects of this type of activity, they could work to prevent specific contaminant outbreaks including nitrates. Working to create specific, targeted solutions for the issues these communities face is essential to properly addressing environmental justice concerns, and therefore, WSPs and other similar types of preventative planning should be implemented.

Improving Readability of CCRs for the General Public

Consumer Confidence Reports or CCRs, which were first implemented in 1998, require that “all community water systems provide annual water quality reports to their consumers.”²²² CCRs contain “information regarding water source, levels of any detected contaminants, compliance with drinking water regulations and relevant educational information” all of which are meant to “improve public health protection” by creating a well-educated and informed consumer base.²²³ While the need for “providing water quality information to consumers has been repeatedly emphasized” in helping to improve the “public’s confidence in their drinking water”, but the effectiveness of CCRs has been limited.²²⁴ One study found that in a random sample of New Jersey residents, reading water quality reports, like the CCRS, “did not shift customers’ evaluation of water quality and utility performance from the evaluation of those in the control group, who did not see a report.”²²⁵

²²² Roy et al. 645

²²³ Ibid, 645

²²⁴ Ibid, 646

²²⁵ Ibid, 646

Studies like the one in New Jersey, display the need for “water utilities to actively ensure their consumers receive and understand their CCRs in order to positively impact perception.”²²⁶ However, presenting information that is understandable and meaningful to scientists...and to the general public can prove to be a challenge for water utilities when creating CCRs.²²⁷ The EPA provides a “CCR iWriter software, available on the internet, for maintaining a standardized format for information delivery” but it does not “include standards to improve the comprehension of CCR messaging” to the public.²²⁸

Due to this gap in CCR guidelines and the need for these reports to be better understood by the greater public, Siddhartha Roy and several other professors from Virginia Tech conducted a study to “assess the readability of CCRs to determine the degree to which the content is accessible to a broad cross-section of the population and to compare results to those recommended for public health communications.”²²⁹ Collecting CCRs from 30 different water utilities from across the U.S. from 2011 – 2013, and using the Flesch-Kincaid readability test to evaluate their readability, the study found that CCRs proved to be quite difficult to read.²³⁰ CCRs reading ease across the thirty examined in the study, “ranged from 26.3 to 43.8, which is within the academic/scientific level.”²³¹ To provide context for this readability score, the “Harvard Law Review journal has a reading ease in the low 30s.”²³² Further, the study found that all CCRs issued by water utilities, regardless of their size, had a grade-level reading score that ranged from

²²⁶ Roy et al. 646

²²⁷ Ibid, 646

²²⁸ Ibid, 646

²²⁹ Ibid, 646

²³⁰ Ibid, 648

²³¹ Ibid, 648

²³² Ibid, 648

“11.1 to 14.3 with a median value of 12.6” which is “substantially higher than the NIH’s recommended 6-7th grade level for health materials.”²³³

Ultimately, the study pointed to the “mandated EPA language seen in” the CCR iWriter template as the main contributor to CCRs’ high readability score.²³⁴ The use of technical wording and industry-specific vocabulary included in the CCR template, might further explain why water systems find it most difficult to communicate with their residential customers.”²³⁵ A 2003 study found that not only were residential customers ranked by water systems as the most difficult to communicate with, but that also “water quality” was the most difficult topic to discuss with them.²³⁶ The water systems cited “opposition”, “lack of understanding of understanding” and “complexity (the topic was difficult for people to understand)” as their reasons why communicating water quality to residential customers was so difficult.²³⁷ Looking at the readability score of CCRs provide by the Virginia Tech study, it is easy to understand why water systems are experiencing these communication issues. Despite the information about water quality being readily available to consumers, it is presented in such a way that renders it almost completely not understandable for most consumers.

Despite these difficulties, the fact they these are “social and communication barriers” rather than “intrinsic issues to the topic itself” point to the fact that “overcoming these barriers” for effective communication is fairly easy.²³⁸ To improve communication

²³³ Roy et al. 648

²³⁴ Roy et al. 649

²³⁵ Bishop 44

²³⁶ Ibid, 44

²³⁷ Ibid, 44

²³⁸ Ibid, 45

with customers about water quality, water systems need to shift their focus to creating CCRs in a way that is geared towards the abilities of its consumers. Virginia Tech's study recommended using more “familiar units, explaining action levels and health effects, and using fewer acronyms and more graphical representations” as ways to improve the readability of CCR reports.²³⁹ These measures can help to provide the same scientific information already included in CCRs but in a more accessible way to the general public. Included below is an example of such a measure being implemented in the 2020 CCR for the City of Waco.

WACO WATER QUALITY TEST RESULTS								
Inorganic Contaminants								
COLLECTION DATE OR YEAR	CONTAMINANT	HIGHEST LEVEL DETECTED	MIN - MAX LEVELS	MCL/MCLG	UNITS	VIOLATION	LIKELY SOURCE OF CONTAMINATION	
2020	Arsenic	2	0 - 2.1	10	0	ppb	No	<i>Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.</i>
2020	Barium	0.0675	0.0436 - 0.0675	2	2	ppm	No	<i>Decay of natural and man-made deposits</i>
2020	Cyanide	180	0 - 180	200	200	ppb	No	<i>Discharge from plastic and fertilizer factories; Discharge from steel/metal factories</i>
2020	Fluoride	0.7	0.73 - 0.99	4	4	ppm	No	<i>Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories</i>
2020	Nitrate	0.24	0 - 0.24	10	10	ppm	No	<i>Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits</i>

Figure 1: City of Waco CCR 2020 ²⁴⁰

Breaking the data into tables, like in the example provided, can help to break a large amount of information into more manageable portions for readers to examine. Furthermore, the Waco CCR also provides information about where these contaminants

²³⁹ Roy et al. 649

²⁴⁰ City of Waco. 2020. *City of Waco: 2020 Water Quality Report*

come from within the community, which can be extremely helpful for residents in understanding why these contaminants are present and what they can do on their own to help mitigate their effects. The City of Waco CCR report for 2020 certainly provides an increase in readability for its consumers, and effectively implements the recommendations provided by studies such as the Virginia Tech one discussed in this paper. However, more steps can be taken to better improve CCR reports to not only increase customer understanding but also help to prevent future contaminant outbreaks from occurring.

Including information on where MCL violation for a specific contaminant occurred is one example of an additional change that can be implemented in CCR reports. Especially for environmental justice communities, it is important to know where exactly the violation occurred and when. This can help consumers assess their own personal health risks and allow them to make better-informed decisions regarding their health. Another addition that should be implemented in CCR reports is the use of a timeline to display the overall contaminant levels within a community over a certain period. When looking at this section of the City of Waco CCR, we see that none of these contaminants surpasses the MCL goal and resulted in a violation. However, what the report does not relay to its consumers is how the current contaminant levels compared to years past. Allowing consumers to see the history of a contaminant's level within their drinking water can not only make them more informed consumers, but also allow them to point out to water systems when a contaminant level is trending upwards. Allowing the public to play a more prominent role in monitoring contaminant levels, can help water systems

to stop a potential contaminant rise from surpassing the MCL goal and resulting in a violation.

Reimplementing EPA's EMPACT PROGRAM

One policy measure that should be implemented to help improve monitoring systems and prevent drinking water contamination by educating residents is to reinstate the EPA's EMPACT program. EMPACT or Environmental Monitoring for Public Access and Community Tracking Program was an "interagency program first established in 1997" with the goal of improving "the measurement, access and understanding, and dissemination of key environmental information in communication across the U.S."²⁴¹ EMPACT emphasized "applying innovative technologies that support environmental monitoring" and "provide effective tools for managing and communicating the resulting environmental information."²⁴² This program covered collecting data on a wide variety of environmental areas including air quality, water quality, and ecosystem quality. By employing a "community-based approach to environmental protection" EMPACT hoped to "enhance the citizen's understanding of environmental issues and develop tools, information, and data that would build the capacity for communities to address these issues."²⁴³ State or local municipalities could apply for a grant under this program, which would assist them to "develop and

²⁴¹ Environmental Protection Agency. 2000. "Environmental Monitoring for Public Access and Community Tracking, EMPACT."

²⁴² Ibid.

²⁴³ Ibid.

demonstrate innovative and effective ways to monitor contaminants” and deliver accurate, real-time information to its citizens.”²⁴⁴

Des Moines Water Works (DMWW) in Iowa, has applied for such a grant under the program in 2001 and received around \$200,000 from EMPACT to work with them to “develop a progressive drinking water monitoring and reporting system.”²⁴⁵ This project “provided interactive, real-time information to the public concerning testing results of treated water, as well as source water quality” allowing users to “search the database for detected contaminants in treated water” from 1994 – 1999.²⁴⁶ This EMPACT program database for DMWW was originally available on their website and focused on specific water contaminant concerns specific to the city, including the impact of urban runoff.²⁴⁷ However, this information has since been removed from DMWW’s website and the EMPACT program ended shortly after this project began. EMPACT program is not currently listed on EPA’s website as an active program and information about it is only available in the EPA’s archives. It is unclear why EMPACT ended but it was most likely was due to a decrease in the funding made available for these projects.

However, despite the abrupt ending of the program in the early 2000s, this kind of drinking water quality system would be an effective tool in better informing the public about their water system and preventing MCL violations before they happen. Currently, the EPA relies on its SDWIS tool to help track SDWA violations and compliance. Below

²⁴⁴ Environmental Protection Agency. 2000. “Environmental Monitoring for Public Access and Community Tracking, EMPACT.”

²⁴⁵ Davis & Mausberg 15

²⁴⁶ Ibid, 16

²⁴⁷ Ibid, 16

is an example of the type of information available on the SDWIS system. Users can search by state and pull up water quality records for specific counties, water systems, and cities. Below are the results for the City of Waco water system.

Health Based Violations: amount of contaminant exceeded safety standard (MCL) or water was not treated properly.

Type of Violation	Compliance Period Begin Date	Compliance Period End Date	Drinking Water Rule or Contaminant	Analytical Result	Violation ID
MCL, Monthly (TCR)	OCT-01-2013	OCT-31-2013	Coliform (TCR)	---	716

No follow-up action has been reported to EPA for this violation. Please contact the state drinking water program for more information.

Monitoring and Reporting and Other Violations: system failed to complete all samples or sample in a timely manner, or had another non-health-based violation. A significant monitoring violation means the system failed to take a large percentage of the required samples. Non-significant monitoring violations indicate that the water system failed to take some of the required samples, but did do some of the required sampling.

Type of Violation	Compliance Period Begin Date	Compliance Period End Date	Drinking Water Rule or Contaminant	Violation ID
Lead Consumer Notice	DEC-30-2014		Lead and Copper Rule	798

Figure 2: SDWIS Data for City of Waco Water System²⁴⁸

Through examining the City of Waco SDWIS report, we see that it only provides information on when the last SDWA violation was issued and when the issue was resolved. It does not provide any information about where specifically in the water system the violation occurred, how the violation came to be, or what specific steps were taken to return to compliance. Furthermore, the SDWIS does not offer any other

²⁴⁸ Environmental Protection Agency. 2021. *Water System Violation Report for City of Waco*. Safe Drinking Water Information System (July).

monitoring data that could better inform consumers about their overall drinking water quality within their specific area of the city.

By implementing the EMPACT program, communities would be able to work with the EPA alongside other agencies to create a real-time monitoring system that could provide its residents with the most up-to-date and accurate information about their drinking water. Furthermore, the database could be reflective of the specific concerns for a particular town municipality or water system and track the trends of those concerns over time. As seen with DMWW, their original EMPACT project focused on tracking the affecting of urban runoff on their drinking water, a concern unique to them and their residents.

Implementing an interactive system that resembles those implemented to track COVID-19 in municipalities and universities across the country, including the City of Waco and Baylor University, could be an extremely user-friendly model that the EMPACT database project could resemble. By allowing users to click on specific locations within a town or water system, they could easily access drinking water data about the location and review graphs and tables about the current trends in drinking water quality. Creating overall timeline graphs as well, could help residents to see the history of specific contaminant levels within this location and help them to contextualize what the most recent contaminant levels mean for them and their health.

For environmental justice communities, this type of monitoring system is especially potent in addressing their concerns and helping to prevent contaminant levels

from reaching violation levels. Oftentimes these communities feel left out of the policy-making process, they feel that their concerns have been ignored, and ultimately, they are left with a drinking water situation that will not be fixed. However, when we “develop laws and policies that specifically address the unique environmental issues that are confronting” these communities, environmental justice issues can finally be addressed.²⁴⁹ Furthermore, providing communities with the most up-to-date information can help to keep their citizens well-informed, and allow them to advocate for themselves when contaminants begin to rise, or other drinking water issues present themselves. Placing the power in the hands of the people within these communities can help to restore faith in their water systems and improve them in the long run.

²⁴⁹ U.S. Congress. House of Representatives. Subcommittee on Environment and the Economy and the Subcommittee on Health of the Committee on Energy and Commerce. 2016. Flint Water Crisis: Impacts and Lessons Learned 19

CONCLUSION

The current gaps in the drinking water systems in the United States are substantial and will require a large amount of effort, time, and money to correct them. The Biden Administration's Climate and Environmental Justice Plan provides one pathway to address these gaps, in a way that will directly impact environmental justice communities. This plan could help to alleviate some of the disproportionate impacts on environmental justice communities and provide them with the necessary tools to combat these issues in the future.

However, while it is promising that the Biden Administration hopes to each all of these policies, is not an obtainable goal to completely achieve during a single presidential term. For this reason, prioritizing which policies are implemented first is essential for it can help to ensure that the policies that will have the greatest impact are implemented first. Two of the specific policy measures mentioned within the Biden Administration's Climate and Environmental Justice plan should be prioritized in their implementation for this very reason.

The first policy that should be implemented in the improving public education efforts through the creation of better CCR reports and improved monitoring systems. One of the strongest tools that the current drinking water system fails to include in the monitoring and prevention process is the public. The public is acutely attuned to issues facing the community they live in and they care deeply about issues that directly affect them and the people they know. A large number of Americans are simply unaware of the

potential water quality issues occurring within their communities and without this knowledge they are unable to inform governmental officials when a problem arises. Creating CCR reports which are easy for the public to understand the information, can help them to be more aware of the particular concerns within their communities drinking water and make them more aware of where potential issues could arise.

Typically, by the time the public does begin to notice an issue with their water, it is too late, and they have already been exposed to unsafe levels of contaminants. This is why implementing real-time monitoring systems and making this information accessible to the public is an effective preventative measure. If a community is well informed on the specific issues their water systems face, they can actively look into the levels of these contaminant(s) on a regular basis. Having access to real-time monitoring data can allow a community to actively observe their drinking water quality and be able to catch when a discrepancy occurs. They can raise this issue with water system providers or city officials, which could help stop contamination issues early on and prevent it from reaching an unsafe level.

Another policy that should be prioritized in its implementation is amending the Safe Drinking Water Act to address today's most prevalent water issues more effectively. The United States is currently trying to solve 21st century drinking water issues with tools from the 20th century. While the drinking water legislation of the 20th century provided a strong foundation for U.S. drinking water, it is simply not equipped to address these new and arising issues. Amending the Safe Drinking Water Act to adjust the MCLG for contaminants based on the most recent scientific data as well as adding new contaminants

to the list are just some of the needed updates to the act. Furthermore, the Safe Drinking Water Act also needs to include a more effective way to manage MCLG violations, one which will prompt water systems to quickly address contaminant violation and return to compliance. This could be included introducing higher penalties for systems that remain in non-compliance for longer periods of time or even the revoking of a state's primacy to enforce the SDWA if they are unable to address the violation in a timely manner.

The ongoing political climate in the U.S., can at often times be contentious and divisive but drinking water remains a largely supported policy area. Keeping these types of issues in public discourse can help to bring Congressional attention to the issue and encourage them to implement some of these measures. Everyone in the United States deserves to have clean and safe drinking water, and it is on the government systems to ensure that this right is fulfilled. Even if that means providing additional help to disproportionately affected communities, the government should do whatever they have to in order to achieve this goal. Environmental justice is a movement that can benefit all Americans, not just those disproportionately affected by drinking water issues. These types of issues when they effect one community affect all communities across the United States. In providing the extra assistance to environmental justice communities, the United States could work to truly ensure safe and clean drinking water for all Americans.

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