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From Love Canal to the Flint Water Crisis: Government, Public Opinion, and Environmental Crises

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From Love Canal to the Flint Water Crisis: How Government, Public Opinion, and the Medical
and Scientific Community Interact with Environmental Crises

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Introduction

The debate between conservation, or the responsible use of nature, and preservation, or the protection of nature due to its inherent worth, gripped much of environmentalism's history in the United States.¹ Exceptions did exist, such as Ellen Swallow Richards's work on water and air that led to the creation of fields such as ecology and home economics, Alice Hamilton's achievements in improving conditions for workers by pioneering the field of industrial toxicology, and the work of progressives to solve social inequalities and improve the environmental conditions within cities, but they more so existed concurrently with the developing environmental movement rather than as proponents who characterized the widespread environmentalist body of thought.² While the traditional environmental movement did make major gains in terms of either the responsible use or protection of natural resources, many early environmentalists did not focus on areas where people lived or the environmental conditions that impacted human health.

This framework began to change after World War II. United States citizens, desiring a more comfortable standard of living after years of war and economic depression and believing that technological and scientific advancements would fix environmental problems, prioritized consumerism over protecting the environment.³ Both conservationists and preservationists

¹ For a more in-depth discussion on the contrasts between conservation and preservation, see Benjamin Kline, *First Along the River: A Brief History of the U.S. Environmental Movement* (New York: Rowman & Littlefield Publishers, Inc., 2011), 60-68.

² For a more in-depth discussion on the work of Ellen Swallow Richards, see Pamela Swallow, *The Remarkable Life and Career of Ellen Swallow Richards: Pioneer in Science and Technology* (Hoboken, New Jersey: John Wiley & Sons, Inc., 2014); for a more in-depth discussion of Alice Hamilton, see Barbara Sicherman, *Alice Hamilton: A Life in Letters* (Chicago: University of Illinois Press, 2003); for a more in-depth discussion on the work of progressives, and of women progressives and settlement houses in particular, see Maureen Flanagan, *America Reformed: Progressives and Progressivism 1890s-1920s* (New York, Oxford University Press, Inc., 2007).

³ Benjamin Kline, *First Along the River*, 79-80.

suffered from a lack of support and compensated by attempting to connect their goals with human needs and survival.⁴ This provided a favorable background to the development of the modern-day environmental movement, starting with the publication of *Silent Spring* in 1962. With *Silent Spring*, Rachel Carson drew attention to the dangers that indiscriminate uses of synthetic chemicals and pesticides, especially DDT, had not only for the environment but also for human health.⁵

Soon, environmentalism in the United States focused more and more on issues and crises related to the areas in which people lived and to the aspects that impacted public health rather than in a distant land of relatively untouched nature. In particular, the crisis at Love Canal in Niagara Falls, New York during the late 1970s and early 1980s provided the starting point to the awareness and activism of modern environmental history as well as early successes such as the development of Superfund. Recently, an environmental crisis related to drinking water occurred in Flint, Michigan in the mid-2010s that showcases how various aspects of the modern day environmental movement have developed over time since the Love Canal crisis. A comparison between the two events yields insights into the reactions that governmental figures, the medical and scientific community, and the public have in regards to environmental crises.

While these events show a consistency in how government officials and the public react to environmental crises impacting public health, the medical and scientific communities show a change in its actions in regards to these crises. Government officials tend to react to environmental crises impacting public health with apathy and denial until substantial citizen action prompts them to acknowledge and attempt to solve the problem. The way the public

⁴ Ibid, 81-82.

⁵ The use of metaphor to compare the widespread use of synthetic chemicals and nuclear fallout also resounded in the United States public given the context of the Cold War. Ibid, 83.

initially reacts to environmental crises causing public health issues has changed, with the public now generally trusting and supporting those impacted by the crises versus initially distrusting their claims, but the relationship between government action and citizen action has remained stable. In contrast, the orientation of the scientific and medical community towards activists in health-based environmental crises has remarkably changed; a comparison between the actions of scientific and medical experts in the Love Canal crisis and the Flint water crisis shows a historical shift where these experts now respond favorably to the activists' request for help, as opposed to staying uninvolved and to not having an ethical obligation to help residents fight against environmental injustice.

Background of the Love Canal crisis

History of the Niagara River as a Precursor to Love Canal

The foundation for a crisis such as Love Canal found its roots in colonial times from the 17th century. Early explorers recognized the river's potential for commercial prospects.⁶ As the Niagara Falls became established in the conscience of the North American sublime, private businessmen and countries took advantage of the waterway's business and military possibilities via developing transportation infrastructure. In the 1720s, the French built Fort Niagara, which became a symbol of overcoming the environment by the mid-1700s.⁷

As interest in developing the Niagara River increased throughout the 1800s, the belief that technology overpowered nature grew with it.⁸ Plans to build a Niagara Ship Canal began to develop in the 1830s, starting with William Williams, a renowned surveyor and famous engineer. Williams submitted a report to Congress in 1836 that detailed canal routes and engineering

⁶ Richard Newman, *Love Canal: A Toxic History from Colonial Times to the Present* (Oxford: Oxford University Press, 2016), 18-21.

⁷ *Ibid*, 22-24.

⁸ *Ibid*, 30, 31.

proposals for the canal.⁹ While never realized due to finances, this project embodied the growing trend of using the Niagara Falls to test the idea that people could redesign nature for their own purposes.¹⁰

This project also inspired William Love to seek a new canal project starting in the 1890s.¹¹ The trends in technological development turned to hydroelectric power, which intensified interest and development in the Niagara River.¹² Love planned to create a progressive, environmentally-conscious city close to the falls, where a canal deriving from it would provide hydroelectric power to a manufacturing hub.¹³ However, Love, too, would fail in his canal aspirations due to finances, but not before he had a canal already partially dug. Others who attempted to continue the canal project did not see it to completion, and they would forsake their projects without filling in the canal.¹⁴

Repurposing the Abandoned Canal

At first, the abandoned canal saw innocent uses, such as a child's swimming pool, but growth in the chemistry industry in the early 1900s would change that. Elon Huntington Hooker, the founder of Hooker Electrochemical, spearheaded the development of the chemistry industry in the Niagara River region, motivated by a vision of both "chemical superiority" and environmentally-conscious engineering inspired by Teddy Roosevelt-style conservatism.¹⁵ Due to the World Wars, the Cold War, and the growing consumer culture, Hooker's production exponentially increased, creating urgent disposal space problems. Hooker began to bury its

⁹ Ibid, 31-32; William Williams, *Report of a survey around the Falls of Niagara, with a view to the construction of a ship canal*, presented in the United States' 24th Congress, 1st Session, Document 214, April 14th, 1836.

¹⁰ Richard Newman, *Love Canal*, 34.

¹¹ Ibid, 34, 36.

¹² Ibid, 36.

¹³ Ibid, 36-37.

¹⁴ Ibid, 36-52.

¹⁵ Ibid, 51, 53-73.

chemical waste in the canal in 1942, legal at the time, and would eventually bury approximately 22,000 tons of waste in the canal, thinking that the clay foundation would contain the waste.¹⁶

The company did not worry about liabilities from the toxic dump. In fact, when Hooker sealed Love Canal in 1953, company officials did not follow through with plans to completely cover the top of the dump with a clay cap and did not fence the area off. Despite clear signs of future problems, such as signs of settling and leakage in the topsoil and reports of underground springs pressuring the dump, Hooker did not take any special records or concern. The lack of follow-through with safe disposal techniques and records corresponded to the status-quo of the industry at this time due to the lack of universal laws regarding toxic disposal and the common lack of concern from both companies and the government regarding future environmental hazards.¹⁷

The Baby Boom brought a rapidly increasing population to Niagara Falls' city, which had long since annexed Lasalle, the site of Love Canal. Soon, the area became sought after for development, and the Niagara Schools Board purchased Love Canal from Hooker in 1953 for a dollar. Despite repeated warnings of the toxins underground and a clause in the property deed that absolved Hooker of all liabilities related to the property, the board bought the property and immediately began building a school and neighborhood on it.¹⁸ In the face of problems such as the original foundation of the school sinking into "a pit of chemicals," construction carried on.¹⁹

When constructing the school, the contractor discovered the toxic dump while attempting to dig a foundation. The school board simply instructed the contractor to locate the school a few

¹⁶ Ibid, 74-82.

¹⁷ Ibid, 83-87.

¹⁸ United States Environmental Protection Agency, *Chemical Waste – Love Canal, Niagara Falls, New York*, by Lawrence Moriarty, October 18, 1977; Richard Newman, *Love Canal*, 87-89.

¹⁹ Richard Newman, *Love Canal*, 87-89.

yards away from the canal on a slab. Additionally, the school board ordered a drain that would collect leachate around the school and transport it to the sewers that led to the Niagara River.²⁰ This clearly evidenced a disregard for the environment and for public health in light of development and expansion, especially in the context of the demands that the increasing population and the post-war consumerism brought to Niagara Falls.

From the 1930s to the 1950s, environmentalism still focused on conservationist ideals and on saving the “wilderness” from adverse human activities and pollution. Environmentalists gained interest in the Niagara River region due to the rising water pollution and perceived industrial infringements upon its nature. As environmentalists attacked the idea that people could improve nature through technology and development, they defined nature as the area that people had not yet changed. Therefore, areas such as Love Canal did not come under scrutiny. Under a combination of environmentalist apathy and lack of concern by the City of Niagara Falls, the people forgot about the toxic dump under Love Canal.²¹ School would begin in 1955 without protests nor concerns.²²

However, the signs of the dump did not disappear as the public memory of the dump did. Love Canal continued to expand and become one of the most sought after subdivision to live in, but residents complained about “odd odors and various health concerns.”²³ These consistent reports led officials at all levels of government to investigate the canal by the mid-1970s. Rediscovering the dump, officials examined it between 1976 and 1978, finding that the chemicals leaked from the dump and contaminated the homes and the surrounding environment.

²⁰ Lois Gibbs, *Love Canal*, 91.

²¹ Richard Newman, *Love Canal*, 90-95.

²² *Ibid*, 89.

²³ *Ibid*, 101-103; United States Environmental Protection Agency, *Chemical Waste – Love Canal, Niagara Falls, New York*, by Lawrence Moriarty, October 18, 1977.

Various reports throughout 1977 and 1978 confirmed the problem, promoted containment of the chemicals, and even suggested moving the residents, yet the residents remained unaware of the toxins.²⁴

Lawrence Moriarty, an EPA officer, desired a solution other than containment. Seeing the dump as a public health hazard, he believed that officials should consider purchasing the homes around the canal, demolish them, and remediate the area.²⁵ However, fearing damage to Niagara Falls' reputation, local authorities refused to take drastic action and instead implemented "minimal containment measures" for the "relatively minor Love Canal problem."²⁶ Given the lack of public awareness about the problem, these officials did not face pressure to implement other measures.

In time, private citizens began to take more notice of the effects of the canal. The harsh freeze and thaw cycle in 1977 in Niagara Falls led to increased chemical leaks, and as residents watched health officials study their homes and neighborhood for toxin containment, concerns grew. This led Michael Brown of the *Niagara Gazette* to report a human-interest story on Love Canal in 1978 about families who reported environmental and health problems related to the chemicals.²⁷ His coverage would grab the attention of future Love Canal activists and would begin the grassroots movement of Love Canal.

²⁴ Richard Newman, *Love Canal*, 103-105; United States Environmental Protection Agency, *Chemical Waste – Love Canal, Niagara Falls, New York*, by Lawrence Moriarty, October 18, 1977; United States Environmental Protection Agency, *Draft Report: Analysis of a Ground Water Contamination Incident in Niagara Falls, New York*, by Fred C. Hart Associates, Inc., July 28, 1978; United States Environmental Protection Agency, *Final Report: Quantification of Toxic Materials in Ambient Air at "Old Love" Canal, Niagara Falls, NY*, by Edo Pellizzari and William Librizzi, circa 1978.

²⁵ Richard Newman, *Love Canal*, 105-107; United States Environmental Protection Agency, *Chemical Waste – Love Canal, Niagara Falls, New York*, by Lawrence Moriarty, October 18, 1977.

²⁶ Richard Newman, *Love Canal*, 106; United States Environmental Protection Agency, *Chemical Waste – Love Canal, Niagara Falls, New York*, by Lawrence Moriarty, October 18, 1977.

²⁷ Richard Newman, *Love Canal*, 107-109.

Story of Love Canal

In 1978, after reading Brown's articles, Lois Gibbs, a housewife living in the Love Canal neighborhood, became alarmed at the prospect that her son's severe illnesses may come from the chemicals buried underneath the school he attended.²⁸ When the school's superintendent refused to transfer her son to another school, Gibbs began informing her neighborhood about the toxic dump and organizing a petition to close the school.²⁹ As she gathered signatures, her neighbors talked to her about their illnesses and the environmental problems with their homes, and Gibbs realized that the chemical hazards "involved much more than the 99th Street School."³⁰ Soon afterwards, Gibbs concluded that environmental hazard created such a large and unavoidable public health risk that only relocation could keep the residents safe.

The local and state government officials did not initially agree to conduct a complete and permanent relocation, and over the next two years, Gibbs and other residents organized into the Love Canal Homeowners Association and into other organizations in order to protest what they perceived as governmental inaction in face of an urgent and hazardous environmental crisis. The interactions between residents and officials often did not result in productive discussion or action. Instead, a lack of transparency and an effort to undermine the residents' concerns and credibility tended to define the governmental response in these interactions.

Lack of Transparency and Undermining Resident Concerns

In accounts of meetings between residents and governmental officials, Gibbs often reported that officials answered resident questions and concerns with secrecy, a lack of transparency, and often an outright refusal to respond at all. This began at the start of the crisis

²⁸ Lois Gibbs, *Love Canal: And the Birth of the Environmental Health Movement* (Washington, D.C.: Island Press, 2011), 26-27.

²⁹ *Ibid*, 30-32.

³⁰ *Ibid*, 34.

in June 1978, when the New York State Department of Health (NYSDOH) held a public meeting in the neighborhood to explain that officials would take blood and environmental samples from the first ring houses to determine if the canal posed a health concern and to discuss the construction plan they developed in order manage the “overflow” of chemicals from the canal. Throughout the meeting, the citizens became increasingly frustrated at the lack of substantial answers or outright avoidance the staff provided in response to their concerns, questions, and criticisms that pointed out problems with the construction plan.³¹ At a follow-up reading where residents received air sample results from their homes, the officials’ inability or unwillingness to answer questions and describe the meanings behind the readings caused panic, confusion, and an increased tenor behind the resident complaints, especially when Gibbs’s professional contacts confirmed the severity of the readings. Frustrated, the residents’ support of Gibbs petition strengthened, and others, including residents such as Debbie Cerillo and outside experts, started to join her in actively protesting the government’s response to the crisis.³²

This initial increase in the tenor behind the residents’ complaints and the growing validity that experts gave to it seemed to encourage the government officials to discourage resident activism rather than act on their concerns. When announcing the emergency order regarding Love Canal that closed 99th Street School during construction, told residents to not eat from their gardens, and recommended that pregnant women and children under two should move, the NYSDOH scheduled the meeting in Albany instead of in the neighborhood.³³ The new location meant that fewer residents could attend, and despite calling the senator, the congressman, and the

³¹ Ibid, 35-38.

³² Ibid, 34, 39, 42-45.

³³ Gibbs, *Love Canal*, 45-49; Ecumenical Task Force of the Niagara Frontier, Inc., “History of Disaster at Love Canal: Chronology of Events” in Progress Report of the Ecumenical Task Force of the Niagara Frontier, Inc. (July 1980), 27-43; Robert Whalen, *Order: State of New York: Department of Health in the Matter of Love Canal Chemical Waste Landfill Sites Located in the City of Niagara Falls*, Albany, NY, August 2, 1978.

governor about this problem, Gibbs could not secure the relocation of the meeting to the neighborhood. In comparison, Hooker Corporation flew in a neighborhood representative who believed the construction would work and who did not want the other neighbors to get involved in the situation.³⁴ Given the publicity of this order, the government wanted the reporters to avoid noticing the vocal and upset residents.

When the attempt to avoid having vocal residents attend the emergency order failed, the officials acted to minimize the concerns the residents had. Residents worried that the chemicals in the canal harmed people who did not fit the order's parameters and wondered why the state did not offer any assistance in light of the emergency order.³⁵ Eventually, the health commissioner chose to leave rather than answer questions. In his absence, officials tried to reassure Gibbs and Cerillo that health surveys did not reveal a problem at health canal, but in reality, this health emergency declaration came from a state survey that interviewed 200 families residing close to the canal in depth and showed alarming and rising health impacts from the canal. Additionally, the engineer for the remedial construction plan avoided directly answering Gibbs's concerns about the impacts of underground streams on the project with answers deliberately crafted to be incomprehensible to a non-engineer.³⁶

The residents did not take kindly to an emergency order from officials who first created a road block to their participation in it and then refused to respond to their concerns and questions. The evening of the order, about 400 neighbors formed a mob on 99th Street, where they screamed and burned their mortgages and tax bills to protest the responses to their concerns and to demand

³⁴ Gibbs, *Love Canal*, 45-49.

³⁵ Thomas Fletcher, "Neighborhood change at Love Canal: contamination, evacuation, and resettlement," *Land Use Policy* 19 (2002), 314.

³⁶ Gibbs, *Love Canal*, 49-52; Newman, *Love Canal*, 114; for more information on the 1978 state data on known Love Canal pollution and health risks that also played a role in this health declaration, see State of New York Department of Health, *Love Canal – Public Health Time Bomb: A Special Report to the Governor and Legislature*, September 1978.

relocation.³⁷ In the local follow-up meeting the next day, the angered residents packed the auditorium interrupted the commissioner's reading of the order, demanding answers and shouting about the health impacts the canal had on them. Gibbs described the scene,

“Lois Heisner was crying. ‘My daughter already has birth defects. She already has horrible illnesses. She is already sick. What are you going to do for her? She’s already over three. Does that mean she has to stay and die? We have chemicals in our basement. You took an air reading. I’ve got this air reading and I don’t even know what it means. Does it mean our lives are in jeopardy?’ She just cried and cried. She looked so distraught, so helpless, pleading for help, and Tom Frey [the meeting’s conductor] said, ‘Let’s call this thing to order. One person at a time. We can’t have everybody screaming and hollering.’ The more he said that, the angrier the crowd got. Everyone started screaming...”³⁸

As the crowd became more and more hysterical, the officials failed to provide answers or solutions to the residents. For example, when asked to interpret the air readings distributed previously, the officials refused to make them clear because the OSHA standards did not apply to residential areas and populations, stating that, “We don’t have anything for a residential area.”³⁹ In the midst of this, Gibbs demanded to know why Governor Carey did not attend the meeting, given the emergency situation. When Frey answered that the governor would not come due to campaigning, the residents became belligerent, leading Frey to promise to ask the governor to come to Love Canal. As the meeting progressed, Gibbs described Whalen as staying silent and glaring at her.⁴⁰

Despite the fact that the government had known about the contamination from the dump since 1976 and had the health data to initiate an emergency order, officials acted to hide the problem from the residents and attempt to dissuade residential participation in solving the problem. They did not provide support for those wanting to follow the evacuation

³⁷ Gibbs, *Love Canal*, 52-55.

³⁸ *Ibid*, 56.

³⁹ *Ibid*, 57.

⁴⁰ *Ibid*, 56-58.

recommendation nor would they provide information or practical help for the residents. The residents would have to focus on increasing their protest efforts and public visibility in order to see further government action.

Residents Organize to Combat Governmental Inaction

Infuriated at the officials' behavior, Gibbs and the residents formed the Love Canal Homeowners Association on August 4th, 1978. They set four goals: evacuate residents who wanted to leave, especially when construction took place, find solutions to the sinking property values, fix the canal "properly", and have air, soil, and water testing done in the entire neighborhood in order to pinpoint the spread of the toxins.⁴¹ This association would develop a strong common front whose work in persuading the public that the entire neighborhood needed to evacuate at government expense and that Love Canal created a public health crisis led to eventual governmental action.⁴²

Formally organizing the residents and working towards increasing their political pressure via public awareness and media coverage of their protests seemed to prompt increased governmental action. Immediately after the formation of the association, governmental officials began to arrive at the neighborhood and ask Gibbs and Cerillo to give them a tour and show them the environmental concerns. In August, Governor Carey followed through with Gibbs's request to meet with the Love Canal residents, and when the residents' "screaming and shouting" during a televised meeting threatened to hinder his re-election campaign, Governor Carey suddenly agreed to buy the first and second ring homes and to pay for the relocation and damaged belongings of the residents. In response to other residents who wanted to move but lived further out, the governor promised to relocate residents "if contamination and health problems were

⁴¹ Ibid, 58-60.

⁴² Newman, *Love Canal*, 118-119.

proven in areas away from the canal.”⁴³ Additionally, President Carter declared a federal state of emergency in rings one and two, the first time a president did that for a man-made environmental crisis.⁴⁴ Apparently, the increased political pressure from the residents’ activism seemed to prompt further governmental action.

However, he “had promised more than he had federal money to pay for,” beginning a battle between state and federal agencies about where these funds would come from.⁴⁵ The economic recession in 1974-5 that New York had not yet completely recovered from exacerbated this issue, as the tight state budget did not seem to have the ability to accommodate a large purchase of homes and relocations.⁴⁶ While the activism and protests at that time prompted an official to verbally acquiesce to some of their demands, it did not guarantee which governmental agency would take responsibility for the demands nor did it guarantee a timely follow-through on the demands. Soon, residents would realize that they still needed to rely on activism in order to see a promise turn into governmental action.

Broken Promises

The next day, state officials denied these promises, refusing to relocate anyone who lived past the ring one houses. However, in the evening, Gibbs received a call from Bill Wilcox from the Federal Disaster Assistance Administration, who had earlier taken a tour of the Love Canal neighborhood. He asked her to attend a meeting at the White House the next day, where officials discussed Love Canal evacuations. Near the end, Frey asked Gibbs to join press conferences that released the news about the purchase of the ring two homes, and Gibbs realized that they wanted

⁴³ Gibbs, *Love Canal*, 61-71.

⁴⁴ Thomas Fletcher, “Neighborhood change at Love Canal,” 315.

⁴⁵ Gibbs, *Ibid*, 65-66.

⁴⁶ Amy Hay, “Recipe for Disaster: Motherhood and Citizenship at Love Canal,” *Journal of Women’s History* 21, no. 1 (2009), 113.

her there to show community involvement in the decision. After the press conferences, officials asked Gibbs to go to the school and stop a rally, which she refused.⁴⁷

As for Governor Carey's promise to consider relocations outside of the first two rings, the local and state officials showed signs of not relocating anyone else outside of ring one and ring two. The mayor, angered at the residents' persistence and worried a potential decline in tourism due to rising publicity on the Love Canal crisis, told them, "Let's get it over with. You are hurting Niagara Falls with your publicity. There is no problem here."⁴⁸ Despite submitting records showing contamination in their homes, the NYSDOH delayed reviewing them, justifying the delay with a mix of wanting to do a thorough evaluation and constant claims that residents had submitted incomplete records.⁴⁹ When Gibbs and Cerillo met Carey again in the fall and directly asked him about why the NYSDOH ignored the people who requested a relocation, Carey avoided answering her directly and made sure to avoid another promise that the government would help, leaving his answers open to having a non-profit help and framing his statement in a press release in such a way that no resident could "prove" anything, especially when combined with the state's refusal to perform an experiment with a control group.⁵⁰ Prioritizing public reputation and financial considerations over public health, officials would continue to fight against looking into solutions for residents facing problems from Love Canal's toxic contamination.

⁴⁷ Gibbs, *Love Canal*, 61, 67-71.

⁴⁸ Tourism in Niagara Falls had risen over the last three years due to "aggressive promotion efforts" by the city and by private businesses, but tourists started to show fears of visiting due to the Love Canal toxins. Ibid, 86; Ward Morehouse III, "Niagara businessmen concerned for tourism," *The Christian Science Monitor*, August 16, 1978.

⁴⁹ Ibid, 82-83, 85.

⁵⁰ Ibid, 86-88.

Additional Signs of Government Apathy

In response to the resistance the residents met when asking the government for help, the residents organized a health study. They found that, among various diseases and high rates of miscarriages, 56% of children born in Love Canal had a birth defect. When confronted with the data, government officials claimed that the neighborhood had “a random clustering of genetically defective people” and that the women did not miscarry but sought secret abortions because of the hysteria created by the activists.⁵¹ This response showed residents that they would have to fight the government’s decisions politically, not scientifically, in order to end its apathy and inaction.

Along with the broken promise and the undermined resident health study, the government showed ineptness in other areas. For example,

“The state did many things that shouldn’t have been done. Once they put some CETA workers on the canal to cut the grass on the north end with power mowers. The residents got upset because the chemicals had surfaced in some places. The mowers could have set themselves on fire or touched off an explosion. The CETA workers had no safety clothes. The state didn’t think about them any more than they thought about us. We yelled and screamed, and finally they ordered it stopped. The next morning at nine, the CETA workers were out there again. Again, we screamed and hollered, and the state ordered it stopped. The next day, they were out again. We had to confront them every single morning.”⁵²

The health department also conducted samples in improper ways. For instance, when it came to blood testing, health officials conducted the sampling in a disorganized and ineffective manner. Residents often found themselves waiting in line all day only to have officials tell them that they had to come back the next day because the supplies ran out or because the workers needed to leave. Yet, the state rejected all resident suggestions to make having a blood sample

⁵¹ Sharon Livesey, “Organizing and leading the grassroots: An interview with Lois Gibbs, Love Canal Homeowners’ Association Activist, Founder of Citizens Clearinghouse for Hazardous Waste, and Executive Director of the Center for Health, Environment and Justice,” *Organization & Environment* 16, no. 4 (December 2003): 492.

⁵² Gibbs, *Love Canal*, 79.

taken feasible.⁵³ With water and air samples, the officials did not handle the samples carefully, such as leaving them lying all around the school. This treatment of the samples led to readings consistently coming out wrong.⁵⁴ The CETA worker situation and the sample taking procedures provide examples of how government officials resisted taking actions that would improve their management of the Love Canal environmental hazards.

When it came to the safety plan for remedial construction, officials wanted Gibbs to okay the plan in order to show citizen input. However, the safety plan only involved ways to keep workers safe and not residents, and Gibbs worried that, with concerns as large as explosions, the residents might violently protest.⁵⁵ In the informational meeting on the safety plan, officials again frustrated residents with inadequate answers. Residents believed that only evacuation would keep them safe during construction due to the risk that construction would release toxic gases and potentially cause explosions. In their answers to these concerns, state officials eroded any confidence in the safety plan. For example, in response to concerns about toxic vapors escaping during construction, officials responded,

“It will smell like hell. It will smell like Hooker. But it won’t hurt you.”

‘Wait a minute,’ she said. ‘If there’s an odor in the air, and it’s going to smell like Hooker, something must be causing it. How do you know it won’t hurt my child?’ Dr. Huffaker said, ‘It will definitely smell. There’s no doubt about that. But it won’t hurt your baby.’

If you use common sense, you know that something causes a smell... It could affect [a child’s] lungs or it could be excreted and cause kidney or liver disease... But Dr. Huffaker expected us to believe that it wouldn’t...

Buses were supposed to be available to take people out of the area if toxic chemicals were released. Someone asked Dr. Vianna what he would do if toxic gases were released and the alarm sounded. Would he get on the bus? No, he said, he would run like hell. That was no way to build people’s confidence. Yet he didn’t understand why people were upset.”

⁵³ Ibid, 78.

⁵⁴ Ibid, 79.

⁵⁵ Ibid, 69, 76-77.

Additionally, officials could not describe the air tests that they would use to monitor the air for contamination. Later, Gibbs learned that at least one state health department official bragged about his performance at the meeting, saying “he had gotten away with giving political answers” instead of substantive ones.⁵⁶ This statement combined with the officials’ performance during the meeting showcased clear governmental apathy towards resident concerns and a refusal to act on them without further political pressure.

Furthermore, mishaps with the safety plan occurred before construction even began. After resident pressure at a task force meeting, the state organized a neighborhood-wide evacuation drill in the event of an emergency, such as the construction causing the chemicals in the canal to explode. The drill performed miserably, with buses leaving groups of waiting residents behind. This provided more reason for skeptical residents who already disagreed with the construction and safety plans to believe that the government would not adequately protect them.⁵⁷

When construction began, even more mishaps occurred immediately. Without providing any notice, the state ordered the demolition of a resident’s house. The resident only discovered this as he watched the beginning of the construction on the television and saw a crew destroying his garage and pool.⁵⁸ Gibbs furthered explained that the state broke many of its safety agreements and that the citizens had to diligently keep pressing officials to act on them. When a tank truck leaked leachate, the officials would not believe the citizens at first. Workers did not wash trucks down after they left the canal as instructed to from the safety plan.⁵⁹ These

⁵⁶ Ibid, 80-81.

⁵⁷ Ibid, 92-93.

⁵⁸ Ibid, 94-95.

⁵⁹ Ibid, 132-133.

instances provide more examples of how the government did not adequately manage the situation without building political pressure from the residents.

The Dismissal of the Swale Theory

While thinking of a way to “prove” that health problems resulted from the toxic dump, Gibbs made the connection between the underground swales and the patterns of illnesses and contamination.⁶⁰ When she showed Dr. Vianna, he told her to verify the swales before he would add it to the medical data. Recognizing that she would have to seek scientific expertise in order to add validity to the residents’ requests, she called Dr. Beverly Paigen, who agreed to conduct a medical survey with Gibbs and others from the association, carefully training them on how to frame questions and interpret their data. The *Niagara Falls Gazette* published a story on the theory, prompting readers to inform Gibbs about the locations of additional swales.⁶¹ However, the NYSDOH stalled on meeting with Dr. Paigen and Gibbs about the study. This resistance to looking into a theory that seemed to show a promising connection between the toxins and health concerns in the area further revealed how the government chose inaction and denial over taking an action that could protect public health but may have financial and reputational downsides.

When the health department agreed to finally meet with Dr. Paigen in November, she initially thought it went well. For instance, when the health department said the swales did not exist where she said, she asked them to put their idea of the swales on the map, and it fit the patterns better. Despite thinking that the meeting went well, the next day the state claimed that no evidence backed up the swale theory since housewives in Love Canal helped gather the results.⁶² This continued the trend of government officials saying one thing behind closed doors

⁶⁰ Ibid, 88-89.

⁶¹ Ibid, 90.

⁶² Gibbs, *Love Canal*, 104-105.

and retracting or changing their statements in public, which continued to delay work towards a solution for this crisis.

Despite the “housewife data” rejection, the state eventually used the swales theory in February 1979 in an order that agreed to move people temporarily and issued another order for the removal of pregnant women and families with children under the age of two.⁶³ This did not apply to women considering pregnancy; they would have to get pregnant and then be moved, and officials continued to avoid answering resident questions about women considering pregnancy despite growing evidence of miscarriages and birth defects. Moreover, although the state utilized the swale theory, Dr. Paigen faced harassment and roadblocks from the NYSDOH with her lab work and funds due to her involvement with the residents.⁶⁴ The increasing public pressure and the building legitimacy the movement gained from conducting studies caused these orders, but the hesitation to commit to more relocations in spite of the growing evidence of a public health crisis and the decision to harass an expert who worked with the residents showed that the government still did not truly want to act in regards to solving Love Canal’s problems.

The health department’s treatment of Dr. Paigen and other scientists and medical officers provided an insight as to why the broader scientific and medical community did not join her in assisting the residents and in studying the impacts Love Canal had on public health.⁶⁵ Along with the prospects of conducting research on Love Canal with no funds, scientists with

⁶³ David Axelrod, *Order: State of New York: Department of Health in the Matter of Love Canal Chemical Waste Landfill Site Located in the City of Niagara Falls*, Albany, NY, February 8, 1979.

⁶⁴ Dr. Paigen continued to face harassment from the state after the permanent relocation of the residents. The health commissioner refused to sign any of her federal grant applications, and the state reduced her workspace and staff at Roswell Park Memorial Institute. Someone sabotaged her materials and experiments twice, and she faced false claims about her income tax claims. Eventually, she had to resign and move in order to effectively continue her work. Gibbs, *Love Canal*, 105, 147-149, 168, 218; Beverly Paigen, “Controversy at Love Canal,” *The Hastings Center Report* 12, no. 3 (June 1982): 34.

⁶⁵ For more information on the other scientists who faced a backlash from the NYSDOH over Love Canal, see Beverly Paigen, “Controversy at Love Canal,” 33-34; the Niagara County Medical Society also refused to help given the NYSDOH’s connections with their members. Gibbs, *Love Canal*, 102.

controversial or minority opinions often faced discrimination and censorship tactics, and efforts to protect whistleblowers had not yet seen great success.⁶⁶ The scientists that did conduct a study despite these barriers found that their work faced tremendous scrutiny that the state's data did not face due to the secrecy surrounding it, creating yet another disincentive to help the residents.⁶⁷ To unveil the truth about Love Canal to the public and to receive help, the residents would have to rely on their own energy and the expertise of Dr. Paigen. Residents in other environmental crises in the late 1970s and 1980s also faced the same prospects of seeking help and conducting studies without a medical and scientific community that would offer them assistance due to connections with a health department.⁶⁸ In Love Canal, Dr. Paigen's support to and direct help for the residents resulted due to her individual ethics instead of a community-wide obligation and ethical code to help those in environmental distress, and the broader medical and scientific community would roadblock her attempts along with the residents' attempts to study and solve the Love Canal crisis.

After construction started, residents asked to meet with Governor Carey in April. At first, he would not agree to meet with the residents if they brought Dr. Paigen, but eventually he agreed to have her present as long as the health commissioner attended as well. Right before the meeting, an incident occurred as residents protested after his plane landed in Niagara Falls:

“He got into his car and started to drive past all the protesting people, when somebody screamed out, “You are a murderer! You are killing my children!” ...Governor Carey seemed annoyed. He told the crowd he was all they had going for them. If they wanted to be so public about it, he would be glad to take their names and make their health problems public knowledge. The residents told him their health problems were already public. They just wanted to be relocated. The governor seemed perturbed and got back into his car.”⁶⁹

⁶⁶ Beverly Paigen, “Controversy at Love Canal,” 33-34.

⁶⁷ *Ibid*, 34-35.

⁶⁸ *Ibid*, 33.

⁶⁹ Gibbs, *Love Canal*, 135.

The fact that the governor initially ignored the protestors and then reacted by threatening them for making Love Canal public showed that, without political pressure, he would not act further in regards to the public health crisis caused by an environmental crisis and would simply view resident complaints as an annoyance.

At the meeting itself, the health commissioner “belittled her scientific ability and qualifications and said her cancer study was no good.” He would not believe her when she said she had not conducted a cancer study nor would he provide evidence or data about his statements of no health impacts at Love Canal, showing again that Dr. Paigen’s attempts to stop the public health crisis at Love Canal did not mirror the actions and ethics of the broader medical and scientific community. When Carey looked over her study and heard that the survey did not have laboratory confirmation yet, he called it “worthless” and threw her papers around the room. Then, at one point in the debate with Dr. Paigen, Carey claimed his health department had no secrets despite the refusal to provide data just moments before.⁷⁰ The blatant misinformation about Dr. Paigen’s study that the officials tried to promote, their immediate rejection of it, and the secrecy surrounding the data and studies used to drive governmental decisions but the denial that any secrecy exists all pointed towards a government that views evidence of an environmental crisis with apathy and inaction until an outside public force provides enough pressure to motivate governmental action.

Continual Roadblocks

The association asked for another health department public meeting in November to update them on the studies. The department sent deputy health commissioner Dr. Haughie to present, but the meeting went wrong when Dr. Haughie would not confirm that the department

⁷⁰ Ibid, 135-140; for more information on the secrecy surrounding the health department data on Love Canal, see Beverly Paigen, “Controversy at Love Canal,” 33.

found dioxin in the canal and gave answers that the residents knew were wrong, such as dioxin could not migrate with other chemicals. As the residents became more and more frustrated with his evasive answers about the health studies and chemicals, Dr. Haughie said, “We aren’t keeping you prisoner here. You people can leave at any time.”⁷¹ Recognizing that officials such as Dr. Haughie would not only work to keep them misinformed but also refused to acknowledge the problems the residents faced from the lack of governmental support during the crisis, they began to picket the work at the construction despite threats of arrest and tried to convince the workers to not work.⁷²

The next month, a day before a task force meeting, the health department released a statement that the north end of the canal had normal miscarriage, birth defect, and birth weight rates.⁷³ Again, the department refused to provide data despite promising to release it the previous month, and the department continued to delay processing the relocation review.⁷⁴ This added to the number of roadblocks that government officials created in order to stop work towards a solution for the residents’ public health concerns.

In May 1979, the New York Senate held a hearing in Niagara Falls on Love Canal. Mike Cuddy, testifying for the state, estimated that the health department would take between two and two and a half years to evaluate the swale theory and then proceeded to avoid answering other questions. Gibbs and other residents provided testimony, demonstrated evidence for the swale theory, and described the conflicts of issues she saw in New York State’s health studies on Love Canal, given its financial incentives to show outcomes that did not favor large-scale solutions.

⁷¹ Gibbs, *Love Canal*, 105-108.

⁷² *Ibid*, 108-110.

⁷³ This statement also appeared in State of New York Department of Health, *Love Canal – Public Health Time Bomb: A Special Report to the Governor and Legislature*, September 1978; *Ibid*, 140-141.

⁷⁴ Gibbs, *Love Canal*, 140-141.

Later, this hearing and others held in May provided the foundation on which senators sought federal relocation of the residents.⁷⁵

After the hearing, Gibbs called Dr. Vianna to check in on the relocation reviews, and he claimed that many records and documents were missing. The association encouraged every resident to call and ask about their records, and Dr. Vianna revealed that even more records were missing. These records were time consuming and difficult to get, and going through the steps to replace these records may have hindered the relocation efforts due to the burden placed on the residents. After enough complaints, the records were found, leaving the residents wondering if the department deliberately misplaced the records in order to hinder relocation efforts.⁷⁶

Temporary Relocation

A year later, construction commenced at the north end. Gibbs describes the impacts of the construction as,

“All the things we had worried about earlier now showed up. Residents were becoming ill. After the heavy construction on the north end began, the air was humid, hot, and stagnant, and it reeked of chemicals... I can't tell you what it was like on some days. It was hot, and the air would just hang there. The fumes were thick. They made your eyes water, or you coughed. Someone described it as similar to trying to breathe underwater.... The air around the canal was horrible. It smelled like a chemical factory. You could barely breathe.”⁷⁷

Despite the increase in serious illnesses, the health department continued to claim that no problem existed, and despite releasing a statement about the discovery of dioxin in the neighborhood, the NYSDOH still refused to relocate families and attempted to ban residents from attending a task force meeting related to the canal.⁷⁸ This provides further evidence that the

⁷⁵ Ibid, 142-144.

⁷⁶ Ibid, 144-145.

⁷⁷ Ibid, 150, 155.

⁷⁸ Ibid, 151-153; United States Senate Subcommittee on Toxic Substances & Chemical Wastes, *Testimony of Marie Pozniak, Resident of the Love Canal Area*, May 3, 1979.

state wanted to avoid further political pressure from the residents that would cause the state to cover the costs to protect residents from the environmental hazard of the toxic dump. Along the same lines, conversations with the EPA and the National Institute led Gibbs to a realization:

“The health department didn’t want the EPA looking over its shoulders. Therefore, the department was willing to give up a million-dollar contract [funds offered from the EPA to the health department to study and remediate Love Canal]. They didn’t want the Federal Disaster Aid Administration (FDAA) or the EPA in, so they didn’t request their help. They didn’t want the National Institute of Environmental Health Sciences to do a study. That didn’t make sense because it would have saved New York taxpayers a lot of money if they had. Of course, if the National Institute were doing the studies, New York State couldn’t control what the studies showed.... State officials seemed to be minimizing the risks.”⁷⁹

Residents temporarily relocated to a motel, but the state continued to threaten to send families back to Love Canal despite a court order to pay for temporary relocation.⁸⁰ At an August task force meeting, the health commissioner recommended against relocating women contemplating pregnancy, and when Gibbs questioned the decision and pressed for the studies used to make the decision, officials told her to “go home,” with Dr. Haughie asking her, “Why don’t you go home and tend to your garden?”⁸¹ Carey refused to meet with Gibbs and had an aide try to explain to her that she mistreated a great governor and health department.⁸² Carey went on the record as denying any future relocations, temporary or permanent.⁸³

During this time, Congress passed a bill to relocate everyone from 93rd and 103rd. In celebration, the residents left the motel on November 5th, believing a follow through soon to come. However, the city then formed a revitalization committee to determine Love Canal houses that new residents could move into and barred residents from joining the committee. Gibbs then

⁷⁹ Gibbs, *Love Canal*, 158.

⁸⁰ *Ibid.*

⁸¹ *Ibid.*, 160-161.

⁸² *Ibid.*, 161-162.

⁸³ *Ibid.*, 165.

released a survey on Love Canal miscarriages and birth defects to convince the public that no one should move into Love Canal.⁸⁴

Panic Leads to Hostages

In May 1980, the EPA officials informed families of the results of a chromosomal study.⁸⁵ Eleven residents out of thirty-six residents tested had chromosomal breakages, but the EPA refused to answer how it would impact the families, stating that the tests showed population-based health risks only and that if the effects came from Love Canal, untested family members faced chromosomal breakage risks too. This caused panic and screaming at EPA officials, especially in light of the insensitive treatment of families. Officials still refused to determine a relocation, but the mayor assaulted an EPA official and screamed, “You can’t drop a bomb in my city and then walk out, leaving me with this mess!”⁸⁶ Instead of feeling concern about the health impacts his citizens faced at Love Canal, he simply wanted to avoid any financial and reputational liability from the crisis.

The next Monday, when the association office opened again, residents, reporters, and other parties stormed the office in a state of hysteria and anger due to both the chromosomal reports and because a newspaper headline announced, “WHITE HOUSE BLOCKS LOVE CANAL EVACUATIONS.” Soon, the growing crowd began to set fires, stop traffic, and defy police orders to leave.⁸⁷ To control and direct the crowd’s emotion, Gibbs convinced EPA representatives to come to the neighborhood to answer questions, and the crowd held them hostage in the office. Gibbs informed Washington of the hostage situation and kept it until the

⁸⁴ Ibid, 166-7, 182-184.

⁸⁵ For comments from Dante Picciano on the study and the controversy around it, see Dante Picciano, “Love canal chromosome study,” *Science* 209, no. 4458, (August 1980): 754-756.

⁸⁶ Gibbs, *Love Canal*, 169-172.

⁸⁷ Ibid, 172-173.

FBI threatened to rush the crowd but not until she demanded an answer from Washington by Wednesday with a threat of escalated violence.⁸⁸ The hostage plan worked. On Wednesday, Washington announced that eight hundred and ten families from Love Canal would have temporary relocation, allowed immediately, covered by the Federal Disaster Assistance Administration.⁸⁹

Other Citizens' Reactions to the Love Canal Crisis

Throughout the crisis, the residents had to deal with other citizens who stigmatized them or did not believe that a crisis existed. For instance, citizens outside of the Love Canal neighborhood feared that the residents would contaminate them. When leaving the August 8th meeting, Gibbs detailed an incident where a man sitting next to her on a bus panicked because he feared the chemicals on her.⁹⁰ Ring one and two residents who temporarily moved to Falcon Manor while waiting for relocation reported that the apartment manager had them follow harsh rules to avoid contaminating the apartment. Many parents outside of Love Canal refused to let their children play with children in the neighborhood because of contamination fears.⁹¹

Local business leaders also tended to downplay the environmental crisis and focused more on the impacts protests would have on revenues. John Reardon Jr., the executive vice-president of the Niagara Falls Chamber of Commerce, claimed that tourism would drop as the “hysteria” over the false claims about Love Canal’s hazards continued. Susan Clark, publisher of the *Niagara Gazette*, also mentioned concerns about falling business revenues throughout the city because of the Love Canal protests. Restaurants reported drastic declines in sales due to the

⁸⁸ Ibid, 174-182.

⁸⁹ Ibid, 186-195.

⁹⁰ Ibid, 72-73.

⁹¹ Ibid, 73.

lack of tourists.⁹² When the state began auctions on contaminated Love Canal homes, residents came to protest and yell at landlords who bought them, but the landlords either sarcastically yelled back or ignored them.⁹³ In light of the falling revenues and threats to their livelihood, business leaders did not generally prioritize the health of the Love Canal residents.

During a board of directors meeting for the association in August 1979, the governor's liaison attended. Gibbs reported her behavior:

“Cora Hoffman was both aggressive and defensive. She kept saying, ‘I didn’t put the damn chemicals there. Why are you being so unreasonable? Why are you treating me this way? I didn’t put the damn chemicals there. I didn’t have anything to do with them. The governor had nothing do with it. It isn’t his fault.’ She spoke as if the victims of Love Canal were to blame... Cora Hoffman had no intention of discussing the problem with us.”⁹⁴

Journalists and interviewers from various media sources also sometimes failed to understand and show support for the residents. In an interview on *Buffalo AM*, the interviewer interrogated Gibbs about why the residents would not move out of the neighborhood without government help. He repeated, “Why don’t you move out? If it’s so bad, why don’t you just all get up and go? If you worry so much about your health, why don’t you move?” He continued to reject her explanations that they could not sell their houses, which had no value due to the crisis, and that the residents could not otherwise afford to move out.⁹⁵ During a state meeting after the February 8 order to temporarily relocate pregnant women and families with young children, a *Niagara Falls Gazette* reporter could not understand why residents wanted to talk about health problems during a meeting about the construction plans despite the explanations provided to him

⁹² Ward Morehouse III, “Niagara businessmen concerned for tourism,” *The Christian Science Monitor*, August 16, 1978.

⁹³ “State Opens Bids for the Sale of Love Canal Houses,” *New York Times*, May 26, 1979.

⁹⁴ Gibbs, *Love Canal*, 77.

⁹⁵ *Ibid*, 130-131.

and the attending officials' cold and inaccurate responses to resident concerns.⁹⁶ The lack of understanding that those in the media and news industries showed during the crisis concerned the residents, as media coverage on the situation provided the only outlet that other citizens may hear about Love Canal.

Private doctors, in fear of the NYSDOH and potential Love Canal lawsuits, often also failed to show support to the residents. When trying to gather doctor's verifications that the chemicals in the canal caused the residents' illnesses in order to qualify for evacuation, they often could not find a physician willing to agree to verify it.⁹⁷ While performing surveys, such as those used in the Swale Theory study, doctors often refused to provide data.⁹⁸

Additionally, Love Canal residents faced some trouble from United Way when organizing programs that would use funds the state provided for medical expenses and for children in order to limit their exposure from the construction. First, United Way initially cancelled the plans the residents created with the organization in order to send the children to a school in the Love Canal neighborhood. After the programs started, the residents did not feel like the rest of the funds supported them, as United Way used them to fund their secretary and other employees, none of whom were Love Canal residents.⁹⁹ While United Way provided additional help during relocation, the management of this grant shows that even those who supported the Love Canal residents sometimes did not understand the needs of the residents.

While Gibbs attempted to call the White House during the hostage situation, the secretary dismissed the residents' concerns, stating, "You people have blown Love Canal all out of

⁹⁶ Ibid, 134-135.

⁹⁷ Amy Hay, "Recipe for Disaster", 111.

⁹⁸ Gibbs, *Love Canal*, 102.

⁹⁹ Ibid, 146.

proportion. I have friends who have cancer and they don't live at Love Canal..."¹⁰⁰ Her statement reflected the belief that Love Canal did not create a public health concern and that the residents should accept the state explanations about the health concerns. This also reflects on how the lack of scientific knowledge of long-term exposure to toxins influenced public opinion of the events.

Some also criticized Gibbs's motivations behind protesting. Many of the criticisms call her efforts at protesting as "self-serving." These accusations often came from rings one and two residents who feared that further activism may undermine their evacuation order. However, this criticism also occasionally from outsiders such as reporters.¹⁰¹ This ad hominem against Gibbs provided another way that the public distrusted the activists instead of immediately rallying behind them.

In the face of less than optimal support from the public, the residents had to continue to try to win their support in order to gain progress. As Gibbs explained, "We had to keep the media's interest. That was the only way we got anything done. They forced New York State to answer questions. They kept Love Canal in the public consciousness. They educated the public about toxic chemical wastes."¹⁰² The focus on the media as a way to garner public support eventually paid off; as residents drew national attention to their cause, the government made more concessions to their demands.¹⁰³

Love Canal's Connection to the Flint Water Crisis

The Love Canal crisis revealed a government that initially lacked a sense of urgency to protect public health until the residents involved in the crisis overcame initial public cynicism via

¹⁰⁰ Ibid, 176.

¹⁰¹ Thomas Fletcher, "Neighborhood change at Love Canal," 317.

¹⁰² Gibbs, 120.

¹⁰³ Thomas Fletcher, "Neighborhood change at Love Canal," 317.

the use of the media. The residents purposefully sought publicity in order to garner enough public support to prompt officials to prioritize the health crisis more than financial or reputational concerns. In doing so, they not only attained permanent relocation but also created an environmental health movement that led to successful anti-toxin campaigns. However, they had to do so without the support of a broader medical and scientific community that had a moral and ethical obligation to help them. Even though Dr. Paigen responded positively to their request for help, the lack of a strong response from this community made it harder for the residents to make their case to the public and to the government.

The residents in the Flint water crisis would face many of the same difficulties that the Love Canal residents faced from the government, but the public nor the medical and scientific community in the mid-2010s would not give the same resistance to the Flint residents as it did in the late 1970s to the Love Canal residents. Public opinion immediately started off in favor of supporting the residents, and the medical and scientific community's reaction showed a new ethical code where experts gave strong support and legitimacy to the activists' claims with their research. The changed roles and perspectives of medical and scientific experts in the Flint water crisis provided a catalyst for quicker governmental action than the residents received in the Love Canal crisis.

Background of the Flint Water Crisis

Lead Contamination in the United States

From the 1890s through the 1930s, the public health field focused on changing the environment in order to help stop the spread of disease. Figures in the public health field, such as Jane Addams and other settlement house reformers, New York Commissioner of Health Hermann Biggs, and various other Progressives perpetuated the notion that the nation had a

collective responsibility towards public health and towards creating a society whose living and working conditions provided a strong foundation for health.¹⁰⁴ In particular, Alice Hamilton's work in occupation health led her to study chemically-based illnesses such as lead poisoning, and she fought the commonly-held idea that the working and living conditions in the United States could not create the public health issues that other countries worked to combat.¹⁰⁵

However, by the early 1900s, an opposing viewpoint for public health formed; this viewpoint proposed that public health should focus on individuals rather than the environment and that public health leaders should concentrate on individual treatment and behavior. Following the trends of professionalization and laboratory-based science that impacted other fields during this time, large-scale environmental reforms, such as housing reforms and industrial reforms, did not play a large role in public health by the 1950s. In addition, the general public health mindset had shifted from eliminating environmental risks and damage to finding acceptable levels of exposure and effects.¹⁰⁶

This new mindset did not bode well for the prevention of childhood lead poisoning, which became a well-known national issue in the 1950s and the 1960s.¹⁰⁷ Lead poisoning's causes lie in environmental aspects, such as paint, air, and water. In particular, consumer items heavily used lead by the 1920s, and lead became a part of gasoline in 1923. Researchers have identified lead paint as a danger to children since the 1930s.¹⁰⁸ Physicians could provide individual treatment for individuals afflicted with lead poisoning, but they could not cure the root cause of physical conditions and environmental conditions when it came to lead poisoning,

¹⁰⁴ Gerald Markowitz and David Rosner, *Lead Wars: The Politics of Science and the Fate of America's Children* (Berkeley, California: University of California Press, Ltd., 2013), 3.

¹⁰⁵ Barbara Sicherman, *Alice Hamilton*, 153.

¹⁰⁶ Gerald Markowitz and David Rosner, *Lead Wars: The Politics of Science and the Fate of America's Children*, 3-5.

¹⁰⁷ *Ibid.*

¹⁰⁸ *Ibid.*, 8-9, 15.

especially if those conditions derived from the product of a powerful industry such as gasoline or paint.¹⁰⁹ In the 1960s and 1970s, community activism would bring attention to the environment-based, preventative viewpoint that eliminating lead poisoning needed, and the government would begin to regulate environmental toxins such as lead, especially after the publication of *Silent Spring* and the resulting public pressure to do so.¹¹⁰

As political and economic concerns led public health activists to debate between reducing harm from lead poisoning and aiming to eliminate all lead poisoning in the 1980s and 1990s, the federal government created rules and passed laws aimed at regulating lead in water.¹¹¹ The EPA established the Lead and Copper Rule (LCR) in 1991 to prevent high levels of lead and copper in the water and to determine how to manage water systems that had high levels of these contaminants.¹¹² Congress passed the Safe Drinking Water Act in 1974, with amendments in 1986 and 1996, to protect drinking water from a number of hazards, including lead.¹¹³ However, the creation of these regulations did not stop environmental lead crises from occurring.

The Flint water crisis was not the first major crisis involving government agencies that denied high lead levels in drinking water in the beginning of the 21st century; the residents of Washington, D.C. faced a similar crisis. In 2001, the D.C. Water and Sewer Authority made a change to the chemical treatment for the drinking water and also caused lead to leach from the pipes into the water. Both the D.C. Water and Sewer Authority and the EPA discovered this

¹⁰⁹ Ibid, 11-12.

¹¹⁰ Ibid, 47, 52.

¹¹¹ Ibid, 122-142.

¹¹² "Lead and Copper Rule," *United States Environmental Protection Agency*, <https://www.epa.gov/dwreginfo/lead-and-copper-rule>.

¹¹³ United States Environmental Protection Agency, *Understanding the Safe Drinking Water Act* by the Office of Water, June 2004.

problem by 2002 but did not inform the public. In fact, the problem stayed hidden until 2004, when the *Washington Post* released a story on it.¹¹⁴

Instead of motivating the government to solve the crisis, the publicity led to further cover-ups that threatened to undermine not only this specific situation but also the scientific understanding of lead poisoning from drinking water. Hiding problems with its study, such as the fact that residents had started drinking only bottled water before the blood lead level tests, the CDC claimed that the lead levels in the water did not hurt anyone and that blood lead levels did not increase with the increase of lead in the drinking water.¹¹⁵ Local officials used this report to further undermine resident concerns. Shortly after, the EPA began to remove warnings about lead levels in water from its websites regarding the risk of water with 40 parts of lead per billion or more to pregnant women and children. This cover-up lasted several years until Marc Edwards, a professor from Virginia Tech and an expert on drinking water, released his own research on the situation and revealed documents about the CDC from a Freedom of Information Act request in 2009.¹¹⁶

Edwards' work would lead to an investigation by a House subcommittee that strongly condemned the CDC.¹¹⁷ In response to Edwards's research, the House report, and growing public outrage, the CDC simply added asterisks to its report to respond to some of the criticisms instead of retracting the report, and the CDC director explained the report as leaving "room for misinterpretation." To this day, some officials, such as DC Water chief George

¹¹⁴ Arthur Delaney and Philip Lewis, "How The Federal Government Botched Flint's Water Crisis," *Huffington Post*, January 12, 2016.

¹¹⁵ Ibid; Centers for Disease Control and Prevention, "Blood Lead Levels in Residents of Homes with Elevated Lead in Tap Water --- District of Columbia, 2004," *Morbidity and Mortality Weekly Report* (April 2004).

¹¹⁶ Arthur Delaney and Philip Lewis, "How The Federal Government Botched Flint's Water Crisis."

¹¹⁷ Marc Edwards and Dana Best, "Elevated Blood Lead in Young Children Due to Lead-Contaminated Drinking Water: Washington, DC 2001-2004," *Environmental Science & Technology* 43, no. 5 (2009), 1618-1623;

Hawkins, claim that evidence does not back claims that any residents faced injury from the lead in the drinking water.¹¹⁸

In five years, the Flint water crisis would begin, with officials seemingly not taking any lessons away from this situation. Similar to the Washington, D.C. crisis, the secrecy and denial surrounding the government's involvement in the crisis would appear again, and the residents would have their concerns about their water and health undermined. This time, however, the residents would have the backing of a medical and scientific community who would work with them to cause the government to acknowledge and act in regards to the Flint water crisis.

Michigan Department of Environmental Quality

On August 30, 2010, the EPA conducted a review of the MDEQ. The *Final Report: Program Review for the Michigan Department of Environmental Quality Water Bureau's* evaluation of the MDEQ, in hindsight, predicted many of the problems that would surface in the department's handling of the Flint water switch. For instance, the report describes the challenges the MDEQ had with Total Coliform Rule compliance, stating that local health departments needed further training on compliance, that "[t]here seems to be some confusion in applying the rules," and listed eleven discrepancies.¹¹⁹ With Disinfectant/Disinfection By-Products Rules, the report lists several practices that do not conform to requirements when it comes to chlorine residual and total organic carbon rules or led to a lack of scrutiny over data despite its technical compliance with the rules.¹²⁰ As for LCR compliance, MDEQ had 17 discrepancies, did not

¹¹⁸ Arthur Delaney and Philip Lewis, "How The Federal Government Botched Flint's Water Crisis," *Huffington Post*, January 12, 2016; Centers for Disease Control and Prevention, "Blood Lead Levels in Residents of Homes with Elevated Lead in Tap Water --- District of Columbia, 2004," *Morbidity and Mortality Weekly Report* (April 2004).

¹¹⁹ United States Environmental Protection Agency Public Water System Supervision Program, *Final Report: Program Review for the Michigan Department of Environmental Quality Water Bureau*, by The Cadmus Group, Inc., August 30, 2010, 22.

¹²⁰ *Ibid*, 25-26.

calculate all 90th percentiles (the value at which 90 percent of the samples have a measurement equal to or less than this point), did not immediately notify consumers of high lead levels in their drinking water, and did not review site-sampling plans or changes due to financial concerns.¹²¹ Coincidentally, the Flint water crisis would see problems with Total Coliform, disinfectants, and lead.

Furthermore, the report describes the MDEQ as facing budget and staffing problems that significantly impede the department's work. The report states:

“Resource limitations, including dramatic budget cuts, have had a significant impact on MDEQ’s PWSS [Public Water System Supervision] program. Increased regulatory requirements coupled with a decrease in available funding, have required MDEQ to prioritize program activities and focus resources on the most important program areas... Region 5 acknowledges that MDEQ is directing their limited resources to implementing and enforcing drinking water regulations that directly affect public health.”¹²²

“At the time of the review, MDEQ was asked by management to prepare numbers to show how they would absorb a further twenty-percent reduction in the general fund...”¹²³

“Frequent hiring freezes have impacted Michigan for about ten years. This has made it difficult to replace positions. There is also a ban on contract services... The state hiring process is cumbersome, which makes it difficult to hire people, even when positions can be replaced... good candidates find other positions before MDEQ can complete the paperwork.”¹²⁴

“MDEQ could use further training for water system operators, especially new operators and regarding new rules... Training for new staff would also be appreciated on fundamental public health issues and compliance decisions. The training provided at the onset of rules is sufficient at that time, but there needs to be more repetition after that. MDEQ would like to see subsequent trainings ‘repackaged’ into smaller modules that address critical points of decision-making.”¹²⁵

“Due to funding cuts and resource shifts, vacant positions are filled with staff from other programs that have been cut or eliminated. While this practice preserves jobs, it

¹²¹ Ibid, 27-28.

¹²² Ibid, 7.

¹²³ Ibid, 8.

¹²⁴ Ibid, 8.

¹²⁵ Ibid, 8.

decreases the technical knowledge of staff and requires tremendous resources to train these staff.”¹²⁶

These points about budget and staff did not necessarily cause the Flint Water Crisis.

However, they do show an overwhelmed department that found itself mishandling situations due to a lack of financial resources and personnel.

Flint’s Emergency Manager and the Decision to Leave the DWSD

Flint’s economy once depended on the auto industry and its General Motors plants.

However, starting in the 1980s, the auto industry began to decline in Michigan, leading to drops in both revenue and population. After about 30 years of a weakening economy, the city faced a poverty rate of approximately 40 percent in 2015, with 15 percent of homes abandoned. The increasing challenges led to rising rates of crime, and all of these problems came together to form the city’s financial struggles.¹²⁷ On November 29th, 2011, Flint came under the control of emergency managers (EMs).¹²⁸

For five decades before 2014, the City of Flint sourced its water from the Detroit Water and Sewerage Department (DWSD)’s pre-treated Lake Huron water but has used the Flint Water for emergencies, using the Flint Water Treatment plant to treat this water.¹²⁹ In 2014, Flint had a budget deficit, its seventh one in a row, and officials viewed the cost of using the DWSD as a significant contributor to the city’s financial problems, especially in the context of rising fees for using the DWSD and the strain the decreasing population had on Flint’s water revenues from

¹²⁶ Ibid, 9.

¹²⁷ Sara Ganim and Linh Tran, “How tap water became toxic in Flint, Michigan,” *CNN*, January 13, 2016.

¹²⁸ Flint previously had EMS between 2002 and 2004. Staff of Bridge Magazine, *Poison on Tap: How Government Failed Flint, and the Heroes Who Fought Back*, ed. Bob Campbell (Traverse City, Michigan: Mission Point Press, 2016), 27; Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report* by Matthew Davis, Chris Kolb, Lawrence Reynolds, Eric Rothstein, and Ken Sikkema, March 21, 2016, 39.

¹²⁹ Ron Fonger, “General Motors shutting off Flint River water at engine plant over corrosion worries,” *MLive Media Group: The Flint Journal (Flint, Michigan)*, October 13, 2014.

user fees.¹³⁰ In the decade before the switch to the Flint River, the water charges from the DWSD annually increased by 6.2 percent on average, and emergency managers would increasingly look to alternative water solutions in order to save money, such as when Mike Brown asked the DWSD in June 2012 for permission to blend Flint River water with Lake Huron water in order to save \$2 to \$3 million a year.¹³¹

In 2012, the Karegnondi Water Authority (KWA), an upcoming Municipal Water Supply System in the region that planned to sell raw water from Lake Huron to the surrounding counties with the intent of avoiding the rising costs of buying water from the DWSD, attracted the notice of officials in Flint and in the MDEQ.¹³² In May 2012, Howard Croft, the Flint Department of Public Works Director, sent an official letter to Mike Prysby, MDEQ District Engineer, requesting technical support to develop a partnership with the KWA, as it had “the potential to be a major factor in our region’s economic development efforts.” In November 2012, then-Flint Emergency Manager, Ed Kurtz, wrote to state Treasurer Andy Dillon about using the KWA in light of the DWSD’s rising costs, projected to be \$23 million per year by 2020.¹³³ These discussions and others focused on the cost-saving measures of using the KWA and the opportunity for more localized control over the economy.

Following the Treasury Department’s engineering study in February 2013 which showed that the KWA would save money as compared to using the DWSD, the Flint City Council voted

¹³⁰ Additionally, the infrastructure contributed to its water problems; leaks led to the city losing 20 to 40 percent of its water per year by 2014, and the city did not repair its water pipes in light of shrinking financial and human resources. Staff of Bridge Magazine, *Poison on Tap*, Ibid, 3; City of Flint Department of Finance and Administration, *Comprehensive Annual Financial Report: Fiscal Year Ended June 30, 2014* (Flint, MI, 2014).

¹³¹ Staff of Bridge Magazine, *Poison on Tap*, 27; Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force*, 16.

¹³² “Karegnondi Water Authority: About,” *Karegnondi Water Authority*, accessed September 24, 2016, <http://www.karegnondi.com/about>.

¹³³ Staff of Bridge Magazine, *Poison on Tap*, 27-28.

to buy from the KWA.¹³⁴ While this vote did not create a binding decision due to the appointment of an emergency manager over the city, it still showed local support of the move. State officials then used this vote to validate the switch to the KWA. For example, Genesee County Drain Commission Jeff Wright writes, "... I am glad the residents of Flint were able to have their voices heard via their elected officials.... There is a basic tenet of government is best when it has local control. We saw that with the council vote. Nobody... should have these types of decisions made by people who live outside their community."¹³⁵ With this symbolic vote conducted, state officials would work towards removing Flint from the DWSD.

The decision to use the KWA in the future rather than the DWSD did not create the water crisis in and of itself; rather, the following decision to use the Flint River water while waiting for the completion of the KWA and the management of that decision created the environmental hazard. When then-EM Edward Kurtz officially decided in April 2013 to move Flint to the KWA, the DWSD terminated services to the City of Flint, effective in one year.¹³⁶ While termination of services did not necessarily entail a water cut-off in a year, officials interpreted it as such, and in March 2014, the new EM, Darnell Early, would officially disconnect Flint from the DWSD. In the meantime, Kurtz contracted an engineering company to prepare the Flint Water Plant for full-time operation, and officials began to make plans to use the Flint River water between the end of services from the DWSD and the completion of the KWA.¹³⁷

¹³⁴ State of Michigan Department of Treasury, *City of Flint Water Supply Assessment*, by Tucker, Young, Jackson, Tull Inc., February 2013; "Flint City Council March 25th 2013," filmed March 2013, https://www.youtube.com/watch?v=U3gbZ8hZ_KI.

¹³⁵ Staff of Bridge Magazine, *Poison on Tap*, 28-29.

¹³⁶ Ibid, 32, 34, 126; Edward Kurtz, *EM Submission No. 2013 EM041: Resolution to Purchase Capacity from Karegnondi Water Authority*, March 2013; Sue McCormick to Inez Brown, *Termination of Contract for the Provision of Water Services by the City of Detroit, Water and Sewerage Department*, April 17, 2013.

¹³⁷ Staff of Bridge Magazine, *Poison on Tap*, 32, 34, 126; Edward Kurtz, *EM Submission No. 2013 EM140: Resolution Authorizing Approval to Enter into a Professional Engineering Services Contract for the Implementation of Placing the Flint Water Plant into Operation*, June 2013.

However, the water quality problems and eventual lead water crisis would later reveal the inadequacy of these preparations.

Story of the Flint Water Crisis

Considering the Use of the Flint River

Two studies analyzed the use of the Flint River for drinking water before the switch. The U.S. Geological Survey, the Michigan Department of Environmental Quality (MDEQ), and the Flint Water Utilities Department published one assessment in February 2004, titled “Source Water Assessment Report for the City of Flint Water Supply – Flint River Emergency Intake.” In this report, these governmental organizations detailed the weaknesses of using the Flint River for drinking water, describing 96 potential contaminant sources in the source water area and summarizing the river as having “a very high degree of sensitivity to potential contaminants.”¹³⁸ Rowe Engineering developed the second assessment, “Analysis of the Flint River as a Permanent Water Supply for the City of Flint,” in July 2011 and analyzed the ability that the Flint River had for providing a permanent drinking water source. This report stated that the Flint River would require higher operating costs than the Lake Huron supplies due to the additional treatments the river water would require, would have different “aesthetics” from the Lake Huron water, and would need an anti-corrosion agent, costing approximately \$100 per day, to make it potable. Rowe Engineering’s report also noted that current assessments had not conducted a “detailed investigation of potential sources of contamination.”¹³⁹ Combined, these two reports may have discouraged officials from plans to use the river.

¹³⁸ United States Geological Survey, Water Sources Division, Michigan District; Michigan Department of Environmental Quality, Water Division; and City of Flint Water Utilities Department, *Source Water Assessment Report for the City of Flint Water Supply: Flint River Emergency Intake*, February 2004, 12, 16.

¹³⁹ Staff of Bridge Magazine, *Poison on Tap*, 26-27; Elliot McLaughlin, “5 things to know about Flint’s water crisis,” *CNN*, January 21, 2016.

However, officials did not include either report as a “significant consideration” while discussing the potential switch to the Flint River for drinking water.¹⁴⁰ For example, on February 6th, 2015, Prysby, admitted that he did not know of a source water assessment of the Flint River, stating, “I am not aware of any source water assessment conducted for the Flint River watershed.”¹⁴¹ The fact that Prysby, described by other staff in the MDEQ as the “most knowledgeable staff member on the Flint and Genesee County water-supply issues” and as the one who managed the files for the reports and studies, did not know about the report showed that the MDEQ most likely did not consider it when making the switch.¹⁴² Without the use of the source water assessment or the analysis of the river’s water supply capabilities, officials could not take pre-emptive measures for the water concerns that developed from the switch.

As for the public opinion regarding the switch, the citizens of Flint had reservations about using the Flint River. In her account of the Flint water crisis, Danessa Violette described the citizens’ reaction towards this vote as “outraged,” explaining that residents viewed the river as “utterly filthy” and unusable. However, Violette described the citizens as trusting that the officials would take the “proper precautions” to make sure that the residents could safely drink the water.¹⁴³ For the time being, the citizens had faith that the government would act to protect public health, much like Lois Gibbs had in the beginning of the Love Canal crisis, and did not organize to stop the switch.

¹⁴⁰ John Bebow, “Years of missed warnings before Flint River switch,” *Bridge Magazine* (Ann Arbor, Michigan), February 17, 2016.

¹⁴¹ Staff of Bridge Magazine, *Poison on Tap*, 56.

¹⁴² *Ibid*, 56-57.

¹⁴³ Danessa Violette, *Poisoning a City: A True Story* (Seattle, WA: Amazon Digital Services LLC, 2016), Kindle edition, Loc. 70.

Despite what the residents assumed, not all officials agreed that the city should make the switch, at least not soon. Glasgow had some trepidation about an upcoming switch to the Flint River. He first sent an e-mail on April 16th to Adam Rosenthal of MDEQ:

“I am expecting changes to our Water Quality Monitoring parameters, and possibly our DBP on lead & copper monitoring plan... Any information would be appreciated, because it looks as if we will be starting the plant up tomorrow and are being pushed to start distributing water as soon as possible... I would like to make sure we are monitoring, reporting, and meeting requirements before I give the OK to start distributing water.”

Glasgow then sent a second e-mail on April 17th to Rosenthal, Prsyby, and Steve Busch, the Lansing and Jackson district supervisor of drinking water and municipal assistance from the MDEQ:

“I have people above me making plans to distribute water ASAP. I was reluctant before, but after looking at the monitoring schedule and our current staffing, I do not anticipate giving the OK to begin sending water out anytime soon. If water is distributed from this plant in the next couple of weeks, it will be against my direction. I need time to adequately train additional staff and to update our monitoring plans before I will feel we are ready. I will reiterate this to management above me, but they seem to have their own agenda.”¹⁴⁴

Notwithstanding these warnings, Busch e-mailed Wurfel talking points for a public meeting about the water switch and confirmed that the MDEQ “is satisfied with the City’s ability to treat water from the Flint River.”¹⁴⁵ Then, on April 24th, the City of Flint Utilities Administrator asked Croft, Prysby, and Busch to “convey [their] concurrence that there is no regulatory requirement for us to sign up a backup agreement with DWSD.”¹⁴⁶ Instead of heeding Glasgow’s warnings, the EM, MDEQ, and Flint would move on with the plans, showing the government’s willingness to risk a public health environmental health hazard in order to

¹⁴⁴ Staff of Bridge Magazine, *Poison on Tap*, 34.

¹⁴⁵ *Ibid*, 35.

¹⁴⁶ *Ibid*, 35; Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 44.

serve financial goals. This hastiness led to a water treatment plant that did not have the staff, resources, and knowledge needed to safely switch the city's water source.¹⁴⁷

On April 25th, 2014, Mayor Dayne Walling officially switched Flint's water from the DWSD to the Flint River as local officials and staff from the MDEQ joined the closing ceremony.¹⁴⁸ The quotes from these officials highlighted their belief that the switch returned power to the local authorities and that the switch would provide high quality treated water from the Flint River. For example, Walling stated, "Water is an absolute vital service that most everyone takes for granted. It's a historic moment for the city of Flint to return to its roots and use our own river as our drinking water supply." In light of the concerns that the citizens of Flint had brought to his attention, Walling explained that the "water quality speaks for itself." Busch further proposed that the citizens "shouldn't notice any difference" while Daughtery Johnson, the Flint Utilities Director, stated earlier that citizens should not have fears about the quality of the river water, as the Clean Water Act and the recent improvements at the water plant made the Flint River "a different river" and "a great asset the city has."¹⁴⁹ But while the officials celebrated the switch, a hidden problem began to form.

The river water started to leach lead from Flint's water pipes. Beforehand, the DWSD added a phosphate corrosion inhibitor to its water that created a passivation layer that protected the inner surface of the pipes.¹⁵⁰ This stopped the pipes from corroding into the water and releasing their lead-based materials into the water.¹⁵¹ However, the MDEQ did not continue

¹⁴⁷ Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 43.

¹⁴⁸ Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, (Timeline) 6.

¹⁴⁹ Dominic Adams, "Closing the valve on history: Flint cuts water flow from Detroit after nearly 50 years," *MLive Media Group: The Flint Journal* (Flint, Michigan), April 25, 2014.

¹⁵⁰ United States Environmental Protection Agency Region 5, *Drinking Water Technical Assistance for Flint, Michigan*, by Tinka Hyde, September 18, 2015.

¹⁵¹ Staff of Bridge Magazine, *Poison on Tap*, 91.

corrosion treatment for Flint's drinking water with the switch to the Flint River, telling the Flint Water Treatment Plant to wait on adding corrosion control until the MDEQ first conducted the six-month monitoring periods, an order that contradicted "longstanding" LCR policies.¹⁵² The higher chloride levels in the water removed the passivation layer and started to corrode the pipes, causing the beginning of the lead problem.¹⁵³ While officials noticed the "rustiness" of the water and recognized that this signaled a breakdown of the iron in the pipes would, they did not immediately connect it to a lead problem, which would grow without any notice until February of the following year.¹⁵⁴

Water Quality and Bacterial Concerns

While the lead leached into the water without notice, other water problems revealed themselves. Almost immediately after the switch, residents began complaining about the quality of the river water.¹⁵⁵ Residents also began reporting health concerns; Violette described how her family and friends began to lose large amounts of hair and experienced rashes on their bodies, which doctors believed developed from using the water.¹⁵⁶ Beyond complaints about potential health links and the smell and taste of the water, the water tested positive for total coliform and fecal coliform bacteria, prompting three boil water advisories in a 22-day span in the summer.¹⁵⁷ In response, the city added more chlorine to the water to kill the bacteria.¹⁵⁸ The additional chlorine would worsen the unknown pipe corrosion and lead leaching problem, but in the

¹⁵² Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 27.

¹⁵³ Staff of Bridge Magazine, *Poison on Tap*, 54.

¹⁵⁴ City of Flint Department of Utilities, *City of Flint 2014 Annual Water Quality Report*, circa December 2014.

¹⁵⁵ Staff of Bridge Magazine, *Poison on Tap*, 136.

¹⁵⁶ Violette, *Poisoning a City*, loc. 150.

¹⁵⁷ Ron Fonger, "General Motors shutting off Flint River water at engine plant over corrosion worries," *MLive Media Group: The Flint Journal (Flint, Michigan)*, October 13, 2014; City of Flint Department of Utilities, *City of Flint 2014 Annual Water Quality Report*, circa December 2014.

¹⁵⁸ Staff of Bridge Magazine, *Poison on Tap*, 37.

meantime, officials continued to tell residents that they could safely drink the water and waited to see the results of the six-month testing rounds under the Lead And Copper Rule, the first of which began in July 2014.¹⁵⁹

Furthermore, on October 13, 2014, the General Motors' Flint Engine Operations publicly stated that it made an agreement to use Lake Huron water instead of the city's Flint River water until the completion and initiation of the KWA. The company's spokesman explained the decision, stating that the higher chloride levels from the river water could cause damage to the metal in the plant and that the company had noticed it and began discussing the problem "some time ago." At the time, the city's tests showed the water having a range of 50 to 60 milligrams of chloride per liter, higher than the 20 milligrams per liter "excellent" level but lower than the 250 milligrams per liter "objectionable" level, and Prysby publicly maintained that this level of chloride would not harm public health.¹⁶⁰

While officials could have taken this announcement as a sign to begin anti-corrosion measures or as a signal to examine any potential impacts from the rise in chloride throughout the city, they did not. Instead, officials worried about the public reputation implications of the announcements. After an inquiry from Ron Fonger, a reporter from MLive's *Flint Journal*, about the General Motors water switch, Prysby stressed to other officials at the MDEQ to not brand the Flint River water as corrosive in a public health viewpoint since public health and manufacturing required different boundaries for chloride levels.¹⁶¹ This showed that officials tended towards a myopic focus on meeting minimal requirements versus analyzing the changes in water quality in order to predict and discover potential problems.

¹⁵⁹ Ibid, 37-38.

¹⁶⁰ Ron Fonger, "General Motors shutting off Flint River water at engine plant over corrosion worries," *MLive Media Group: The Flint Journal (Flint, Michigan)*, October 13, 2014.

¹⁶¹ Staff of Bridge Magazine, *Poison on Tap*, 37-38.

While the MDEQ did not see the announcement as a potential indicator of water quality problems, Snyder aides became alarmed. On October 14th, deputy legal counsel Valerie Brader urged many colleagues in the administration to ask the emergency manager to consider switching back to the DWSD until Flint could use the KWA.¹⁶² Chief legal counsel Michael Gadola joined her, stating,

“... (T)o anyone who grew up in Flint as I did, the notion that I would be getting my drinking water from the Flint River is downright scary. Too bad the (emergency manager) didn’t ask me what I thought, though I’m sure he heard it from plenty of others. My Mom is a City resident. Nice to know she’s drinking water with elevated chlorine levels and fecal coliform. I agree with Valerie. They should try to get back on the Detroit system as a stopgap ASAP before this thing gets too far out of control.”¹⁶³

Snyder then requested a briefing paper about Flint’s water from the MDEQ, which blamed the boil-water advisories on e-coli bacteria, with a main cause as the corrosion from the iron water pipes.¹⁶⁴ This briefing paper showed that the MDEQ knew that corrosion had created a bacterial problem, and even though the paper does not mention lead, this knowledge combined with previous recommendations to utilize optimized corrosion control could have led officials to consider corrosion control. Instead, the MDEQ continued to ignore the signs, even when such a signal came from its own report.

Another bacterium, *Legionella*, would soon become another concern with Flint’s water. On October 21st, the Michigan Department of Health and Human Services (MDHHS) notified Genesee County that a recent outbreak of Legionnaires’ disease may have derived from Flint’s water. In fact, the corroding pipes may have contributed to providing a favorable environment

¹⁶² Ibid, 38.

¹⁶³ Ibid, 39.

¹⁶⁴ Ibid, 39; Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 17.

for *Legionella* growth.¹⁶⁵ Between the water switch in June 2014 and November 2015, 87 residents would develop this disease, leading to 10 fatalities. However, the MDEQ would not act for months in regards to these emerging concerns.¹⁶⁶ Liane Shekter Smith, head of the Office of Drinking Water and Municipal Assistance for the MDEQ, instead worried that the county would announce that the water caused an outbreak of Legionnaires' disease.¹⁶⁷

On the contrary, the Genesee County Health Department (GCHD) would struggle to obtain time-sensitive information for its *Legionella* investigation from the Flint Department of Public Works and the MDEQ, who also initially refused to meet with the health department and to consider studying the water as a potential source of *Legionella*.¹⁶⁸ When James Henry from the GCHD e-mailed both agencies in March 2015 to complain about the lack of communication and information, e-mails from MDEQ officials showed confusion about the requests for information and irritation over the health department's desire to investigate the water as a potential cause. For instance, Wurfel informed an aide to Snyder that, while Legionnaires' cases have increased in Genesee County, Henry made a "beyond irresponsible" assumption that the drinking water in Flint caused the cases and that his department "failed to do the necessary traceback work to provide any conclusive evidence of where the outbreak is sourced." Busch, with the support and agreement of several other officials in the MDEQ, responded to Henry's inquiry, claiming that *Legionella* most likely did not come from the water and that the GCHD showed "premature and prejudice" in their judgment, directing the department to investigate

¹⁶⁵ Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 16.

¹⁶⁶ Furthermore, the public would not even receive notice of the Legionnaires' outbreak until Snyder's announcement in January 2016. Ralph Ellis and Sara Ganim, "Flint learns of Legionnaires' disease spike as water crisis continues," *CNN*, January 13, 2016.

¹⁶⁷ Staff of Bridge Magazine, *Poison on Tap*, 39.

¹⁶⁸ The health department wanted to quickly analyze the *Legionella* problem before the summer of 2015, as *Legionella* "is at its peak" during the season's higher temperatures. Staff of Bridge Magazine, *Poison on Tap*, 65-66.

“water main breaks, water leaks, and system repairs.”¹⁶⁹ The MDEQ’s response also lacked information on the lack of corrosion control, which would have provided evidence to the GCHD of the water’s potential cause in the outbreak.¹⁷⁰ Henry replied, stating,

“There have not been any conclusions regarding the source of the illnesses. Our team is gathering information and we suspect there may be several sources. It has been made clear that the Flint municipal water system is in compliance with the Safe Water Drinking Act. It seems reasonable that your office would be involved regardless if a potential health risk from municipal water is related to... exposure...”

“...I was informed there was no reason to meet because the municipal water system is in compliance with the Safe Water Drinking Act.... Based upon [discussions with the MDCH, the CDC, the EPA, Legionella experts, and water system experts] we have been informed that it is likely that a small amount of Legionella will survive the water treatment process at the plant and enter into the distribution system.”¹⁷¹

The March 2015 correspondence would not remove the conflicts between the GCHD and the MDEQ, and, when the MDHHS later condemned the GCHD for contacting the CDC, Henry would continue to assert that other state officials impeded the GCHD’s work on the outbreak.¹⁷² An e-mail from Crooks to the MDEQ describing how changes to the water typically leads to quality issues and how *Legionella* may result from the water distribution system did not seem to resolve this impediment.¹⁷³ In later e-mails to colleagues, he condemned the state officials for sabotaging the investigation and causing deaths, with criticisms ranging from calling the MDEQ department “a stubborn 2yr old child” to describing some state officials as “criminals [who are good] at covering their tracks.”¹⁷⁴ The inaction of the MDEQ when it comes to the *Legionella*

¹⁶⁹ Ibid, 65-66.

¹⁷⁰ Siddhartha Roy, “Did you think the story of MDEQ malfeasance could not get worse? Wrong again. MDEQ’s negligence quite possibly killed a few of the very people they were paid to protect,” *FlintWaterStudy.org*, February 4, 2016, <http://flintwaterstudy.org/2016/02/did-you-think-the-story-of-mdeq-malfeasance-could-not-get-worse-wrong-again-mdeqs-negligence-quite-possibly-killed-the-very-people-they-were-paid-to-protect/>.

¹⁷¹ Staff of Bridge Magazine, *Poison on Tap*, 68.

¹⁷² Ibid, 72, 74; Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, (Timeline) 12.

¹⁷³ Ibid, 69.

¹⁷⁴ Matthew Dolan, et al., “Flint e-mails: CDC voiced concerns over Legionnaires’ actions,” *Detroit Free Press*, February 9, 2016.

outbreak and its reaction to the GCHD's investigation revealed that, while an agency removed from the decisions related to the environmental crisis and the management of the crisis wanted to investigate and potentially solve an aspect of it, officials involved in the decision or management of the crisis show resistance to investigating it.¹⁷⁵

Water quality tests in December 2014 revealed another water quality concern, this time involving a chemical problem. Flint citizens received a letter in January 2015 from the city stating that their drinking water violated the Safe Water Drinking Act because of the level of trihalomethane (TTHM), a by-product of chlorinating the water due to the bacterial concerns.¹⁷⁶ Over time, exposure to TTHM can increase cancer risks and liver, kidney, and central nervous system concerns.¹⁷⁷ In addition, these results initially led officials to believe that the high TTHM levels may have caused the discoloration complaints, but in late January, Jim Sygo, MDEQ's Deputy Director, forwarded a Bridge Magazine story about Flint Water published earlier that week to Shekter Smith and explained how he did not think TTHM by itself could cause the discoloration residents see in their water, and Shekter Smith theorized that perhaps the different water chemistry caused the discoloration. She stated,

“A change in water chemistry can sometimes cause more corrosive water to slough material off of pipes as opposed to depositing material or coating pipes in the distribution system. This may continue for a while until things stabilize. It would be unusual for water leaving the plant to have color like people are seeing at their taps. Generally, this is a distribution system problem or a premise plumbing issues. Since it appears widespread, it's most likely a distribution system problem.”¹⁷⁸

¹⁷⁵ The MDHHS would later declare the outbreak over in a May 2015 report while refusing to identify the source of the *Legionella* and not evaluating the situation with enough consideration given to the circumstances behind the water switch. Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 6, 16, 19, 33.

¹⁷⁶ Michigan Department of Environmental Quality, *Violation Notice – Maximum Contaminant Level for Total Trihalomethanes Operational Evaluation – Total Trihalomethanes, 4th Quarter 2014 Monitoring Period*, December 16, 2014; City of Flint Department of Utilities, *City of Flint 2014 Annual Water Quality Report*, circa December 2014.

¹⁷⁷ Staff of Bridge Magazine, *Poison on Tap*, 50.

¹⁷⁸ *Ibid*, 46-47.

Here, the top official in the MDEQ realized in writing that the water may have caused city-wide corrosion in Flint's pipes. In a department full of experts on drinking water, someone could have analyzed the situation further and realized that the lack of corrosion control created a risk of a lead hazard. However, the MDEQ officials took no action in regards to the signs of corrosion beyond theorizing about it, and the department later fought against using corrosion control in spite of these early hints.

Throughout the beginning of the Flint water crisis, the water provided various challenges to public health that government officials in the MDEQ handled ineffectively. While they did act to control the total coliform and fecal coliform bacteria levels and did notify the residents of a TTHM violation, officials performed them to minimally comply with the water safety laws; officials did not act to solve other developing concerns that did not have laws mandating action to solve them, such as the rise in resident reports of negative health effects from the water, the growing signs that the water needed an anti-corrosion treatment, and the outbreak of Legionnaires' disease.¹⁷⁹ Instead, officials continued to publicly defend the decision to switch to the Flint River and focused on increasing public confidence in the water. The residents would have to organize a stronger protest in order to prompt a different governmental response.

Initial Protests

The 2015 new year brought in a growing number of resident complaints and protests about Flint's water. Richard Benzie, operations chief of the DEQ's Office of Drinking Water and Municipal Assistance, noted the number of calls and their "tenor" about Flint's water to other DEQ staff in an e-mail sent on January 7th. The discussion focused on restoring public confidence and its perception of the safety of Flint's water, as would other official discussions

¹⁷⁹ Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 29.

related to Flint's water in January.¹⁸⁰ While the rising complaints had received attention, they had not yet gotten to the point where officials would reconsider their management of Flint's water problems.

On January 21st, Flint citizens such as Florlisa Fowler organized a protest against Flint's water at Flint City Hall before a city council meeting. Councilman Eric Mays joined the protest, proposing that Flint return to the DWSD, and citizens such as Cindy Marshall agreed with this stance.¹⁸¹ At the city council meeting itself, Flint citizens, many carrying bottles of their discolored tap water, filled the town hall as Department of Public Works Director Howard Croft explained the city's plan to improve the water quality. Walters attended both the protest and the meeting.¹⁸² After reviewing the water quality concerns, officials such as Busch instructed those at the meeting that only certain individuals should worry about the water quality and could seek advice from their doctors. Croft ended the meeting despite not answering all of the previously submitted questions, leaving residents furious and feeling like the meeting wasted time instead of finding a solution, as reported by citizens such as Claire McClinton. Another Councilman, Scott Kincaid, continued to propose switching back to the DWSD after the meeting, despite Ambrose telling councilmembers before the meeting that solutions would only focus on fixing the water distribution and treatment systems.¹⁸³

Two days after the meeting, Walling released a statement that, even though the city voted to join the KWA, it did not have a say in using the Flint River. He put the blame on the

¹⁸⁰ Staff of Bridge Magazine, *Poison on Tap*, 42-43.

¹⁸¹ Kurt Nagl, "Flint protesters take to City Hall before water meeting," *MLive Media Group: The Flint Journal* (Flint, Michigan), January 21, 2015.

¹⁸² Staff of Bridge Magazine, *Poison on Tap*, 126; Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, (Timeline) 8.

¹⁸³ Ron Fonger, "Officials say Flint water is getting better, but many residents unsatisfied," *MLive Media Group: The Flint Journal* (Flint, Michigan), January 21, 2015.

emergency manager, the Snyder Administration, and the DWSD for the situation.¹⁸⁴ Meanwhile, the Snyder administration worried about how Flint's water would impact the government's public relations. Ari Adler, the Special Projects Manager, e-mailed Jarrod Agen, the Communications Director, on January 23rd about Flint water, saying,

“This is a public relations crisis – because of a real of perceived problem is irrelevant – waiting to explode nationally. If Flint had been hit with a natural disaster that affected its water system, the state would be stepping in to provide bottled water or other assistance. What can we do given the current circumstances?”¹⁸⁵

In the meantime, residents continued to protest Flint's water and the state's insistence that the water did not pose a safety concern, especially when a Flint city audit showed that their water rates would rise by 6 percent in the current year.¹⁸⁶ In a January 29th Bridge Magazine article titled “Cringe over Troubled Water: Flint's smelly dilemma,” Chastity Dawsey reported on the rising fear and frustration in the city in regards to the water. She interviewed Ineatha Waters about how she did not use the water she paid for despite the city assuring residents that the water did not pose “an emergency nor public safety threat”, and Rev. Bryon Moore of Concerned Pastors for Social Action stated the anger over the costs, the water quality, and “the lack of a democratic process” with emergency manager's control of the situation. He further explained that his organization in particular planned to organize the community to prompt state action and that citizens considered a class-action suit in regards to the water. Mayor Walling also explained his frustrations with the state government and how he directly petitioned Snyder for financial

¹⁸⁴ Staff of Bridge Magazine, *Poison on Tap*, 45.

¹⁸⁵ Ibid.

¹⁸⁶ Due to protests, “The previously adopted FY16 budget anticipated a 6% increase in water and sewer rates, but that has been eliminated.” City of Flint, *City of Flint, Michigan – Setting a Sustainable Course for the City of Flint: Five Year Financial Plan 2016-2020, Adopted Budget for FY16 and FY17, Future Projections for FY18, FY19, and FY20*, April 2015, 7.

help for the city. These demands aligned with his constituents' blame on Snyder for the emergency manager.¹⁸⁷

In spite of the growing public and local negativity towards the use of the Flint River water, state officials did not change their stances on how to manage Flint's water situation. Ambrose rejected the DWSD's offer of a waived reconnection fee to rejoin on January 29th. A day later, public protests prompted Dave Murray, Snyder's Deputy Press Secretary, to explain that he did not want Wyant to publicly claim Flint water's safety until the county health department completed trace back work on the Legionnaires disease outbreak.¹⁸⁸ The MDEQ also released a backgrounder on Flint's water to Snyder that showed its unchanging stance towards the water crisis. Describing the boil-water advisories and trihalomethanes as "hiccups," the report further detailed them as "not like an imminent threat to public health." Instead of showing urgency about these problems, the report stated that the issues will naturally fade "once the city connects to the new KWA system in 2016."¹⁸⁹ These officials' stance against moving back on to the DWSD and not taking any drastic measures to fix the water problems but instead simply waiting for the completion of the KWA to solve these issues would continue to hold strong.

An exception lied with the other officials in Snyder's administration. Dennis Muchmore, the Chief of Staff, worried about how the public perceived the administration in light of Flint's water. He wrote to his coworkers, "Since we're in charge we can hardly ignore the people of Flint... if GM refuses to use the water in their plant and our own agencies are warning people

¹⁸⁷ Staff of Bridge Magazine, *Poison on Tap*, 48-53.

¹⁸⁸ *Ibid*, 47.

¹⁸⁹ Similar to other reports, the backgrounder did not discuss a potential lead problem in Flint's water. *Ibid*, 57-59; Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, (Timeline) 9.

not to drink it... we look pretty stupid hiding behind some financial statement.”¹⁹⁰ Although the administration still believed that switching Flint back to the DWSD would not help in light of the financial concerns, Snyder’s administration did announce \$2 million in infrastructure funding for Flint in light of the “civil unrest” in Flint and the increasing number of complaints and requests for help.¹⁹¹ In this case, the growing public outcry has begun to cause the administration to act, even if the EM’s actions did not change.

Flint’s Lead Crisis Begins to Surface

Officials started to see evidence of the lead crisis in February 2015. Jennifer Crooks, the EPA’s program manager for Michigan’s Region 5 Drinking Water Branch, e-mailed officials in both the MDEQ and the EPA regarding lead in Flint’s water.¹⁹² Since January, Crooks corresponded with LeeAnn Walters, a Flint resident, about the water in her home. Walters, who others described as a “classic stay-at-home mom”, noted the change in water quality and its impacts on her family in December 2014.¹⁹³ After reporting black sediment in the water and health concerns related to the water, Glasgow from the water treatment plant tested her water, leading him to discover that her water contained 104 parts per billion of lead.¹⁹⁴ Crooks described how the new water source’s chemistry may have caused contaminants to escape the biofilms in the pipes and asked the department of community health to view it from an epidemiological perspective.¹⁹⁵

¹⁹⁰ Staff of Bridge Magazine, *Poison on Tap*, 56.

¹⁹¹ Ibid, 56-57.

¹⁹² Ibid, 59-60.

¹⁹³ Ibid, 125.

¹⁹⁴ High levels of iron in water can indicate high levels of lead. Ibid, 61; United States Environmental Protection Agency Region 5, *High Lead Levels in Flint, Michigan – Interim Report*, by Miguel Del Toral, June 24, 2015, 2-3; City of Flint, *Consumer Notice of Lead & Copper Results in Drinking Water (LeeAnn Walters) 2/18/2015*, February 18, 2015.

¹⁹⁵ Staff of Bridge Magazine, *Poison on Tap*, 60.

Officials from the MDEQ did not show alarm over the lead in LeeAnn Walters' home. While Prysby responded to Crooks that the city would help Walters, he restated that the city itself was within the lead allowable limit, and Busch sent an e-mail to officials at the MDEQ, stating, "As indicated by Mike and Adam the city is meeting 90th percentile. Not sure why region 5 sees this one sample as such a big deal."¹⁹⁶ That same day, the MDEQ falsely notified the EPA that Flint treated its water for corrosion.¹⁹⁷ This lie, combined with the apathetic response the MDEQ showed to Walters' sample, would help stop progress on the lead crisis for months.

A day later on February 27th, Miguel Del Toral, the EPA's Ground Water and Drinking Water Regulations Manager from Region 5, further contributed to the previous discussions and warned the MDEQ about a potential lead problem. Identifying the potential problem as particulate lead, Del Toral described how pre-flushing the tap before taking samples of the drinking water can bias the results towards low lead measurements, as particulate lead "sporadically" escapes from lead piping, meaning that pre-flushing the tap temporarily clears it out and leads to a lower level of lead than what the population intakes on a daily basis. He additionally asked what optimized corrosion control treatment Flint used for its water and stated that Flint had to have such a treatment according to the Lead and Copper Rule.¹⁹⁸ However, the MDEQ does not take action with Del Toral's correspondence nor does the organization look into corrosion control.

¹⁹⁶ Ibid.

¹⁹⁷ Doug Ringler, to Jim Ananich, December 23, 2015; Ibid, 59

¹⁹⁸ Forms instructing residents on how to collect their water samples directed them to pre-flush their water. Michigan Department of Environmental Quality, *Drinking Water Lead & Copper Sampling Instructions*, circa 2015; Staff of Bridge Magazine, *Poison on Tap*, 60-61.

Additionally, Veolia, an engineering firm, released a report about the Flint River water and how to improve it for drinking water.¹⁹⁹ Despite not mentioning a lead problem, Veolia detailed several revisions for chemical treatment, among which they listed corrosion control in the form of a polyphosphate chemical to manage the discoloration of the water.²⁰⁰ MDEQ also rejected the corrosion control advice from the report, and both of these rejections would foreshadow the department's resistance towards future requests to implement optimized corrosion control.

Instead, government officials continued to promote Flint water as safe to drink and as healthy as the water from the DWSD. Then-Flint Emergency Manager Jerry Ambrose sent two memos on March 3rd, one to the Michigan Department of Treasury and one to Deputy State Treasurer Wayne Workman, proposing that switching back to the DWSD would cost too much, that water quality might not change with a switch due to the city's infrastructure, and that the water met all safety standards.²⁰¹ Concurrently, the Snyder Administration began to plan to hand out water bottles and water filters to Flint citizens without having the city itself distribute them in order to not "undercut" the idea that the population could safely drink the water.²⁰²

In the meantime, Walters became more and more involved in the Flint water crisis. After receiving a phone call in February to not allow her children to drink the water after her water samples, Walters started studying in depth about lead, which led to her realization that her son had lead poisoning. She began to go door-to-door to warn the residents of Flint about the dangers. While informing other residents, she continued to contact Crooks, especially when a follow-up test showed her lead water levels at 397 parts per billion and when a blood lead level

¹⁹⁹ Veolia North America, *Flint, Michigan: Water Quality Report*, March 12, 2015.

²⁰⁰ Staff of Bridge Magazine, *Poison on Tap*, 67.

²⁰¹ Jerry Ambrose to Wayne Workman, March 3, 2015; *Ibid*, 63-64.

²⁰² Staff of Bridge Magazine, *Poison on Tap*, 63-64.

test showed that her son had 6.5 micrograms of lead per deciliter. Furthermore, as Ambrose assured the Treasury department that the city should continue to use the Flint River, Walters first contacted Del Toral, who then connected her to Edwards, the same expert who led the revelation of the lead contamination in the Washington, D.C. water system. She would contact Edwards in April 2015 in a “pivotal moment” and lead him to research Flint Water.²⁰³ Unlike in the Love Canal crisis, the Flint residents would soon receive a large support base from the medical and scientific community that would cause a critical change in the outcome of the crisis.

On March 24th, the Flint City Council voted 7-1 to stop using the Flint River and to “do all things necessary” to return to the DWSD. Ambrose, despite having heard about the Legionnaires’ outbreak and its potential link to the water two weeks ago, immediately issued a statement that called switching back to the DWSD “incomprehensible” and financially illogical, as he believed that the costs would rise to a minimum of 30 percent higher if the city switched to the DWSD while waiting for the KWA.²⁰⁴ In addition, he restated that both the EPA and MDEQ guaranteed that citizens could safely drink the water.²⁰⁵ The residents’ protests and reports had convinced the local officials of the need to take drastic action, but the state officials would take longer to change their course of action.

On April 24th, Pat Cook, a water treatment specialist in the MDEQ, asked Prysby about Flint’s corrosion control. Prysby responded that the water treatment plant had not implemented a corrosion control treatment, which contrasted with the statement they made with the EPA in

²⁰³ Ibid, 68, 126-127.

²⁰⁴ The City of Flint published Ambrose’s statement on its website. Kristin Moore, “Emergency Manager Statement on Water: Spending Extra Million on Detroit Water ‘Incomprehensible’ When Flint Water Just as Safe,” March 24, 2015, <https://www.cityofflint.com/2015/03/24/emergency-manager-statement-on-water-spending-extra-12-million-on-detroit-water-incomprehensible-when-flint-water-just-as-safe/>.

²⁰⁵ Ron Fonger, “Emergency manager calls City Council’s Flint River vote ‘incomprehensible,’” *MLive Media Group: The Flint Journal* (Flint, Michigan), March 24, 2015; Ron Fonger, “Snyder’s Flint manager told of Legionnaires’ outbreak 11 months ago,” *MLive Media Group: The Flint Journal* (Flint, Michigan), February 9, 2016.

February. Busch confirmed with both Cook and Prysby that the Lead and Copper Rule did not require Flint to implement corrosion control based on the results of the two rounds of lead copper monitoring. Cook agreed but warned that Del Toral would call to disagree, a prediction which proved correct on that same day. In response to the call, Busch and Cook discussed Del Toral in e-mails sent on April 27th, describing how they viewed his actions as “over-reaches” and that they grew tired of having their interpretation and implementation of the law challenged.²⁰⁶

With this discussion validating their viewpoint, Cook e-mailed Del Toral, with copies to Crooks, Thomas Poy (EPA Ground Water and Drinking Water Branch Chief), Benzie, and Busch, explaining the MDEQ’s interpretation of the EPA’s rules on corrosion control that Flint did not need optimal corrosion control unless their two six-month monitoring samples showed a problem that bypassed the allowable measurements. (The first six-month samples showed lead at 6 parts per billion in a sample size of 100 homes, meeting the legal requirements.)²⁰⁷ After describing that the MDEQ would not make a “formal decision” on the implementation of corrosion control until after the second round of six-month monitoring on June 30th, 2015, Cook went on to say, “As Flint will be switching raw water sources in just over one year from now, raw water quality will be completely different than what they currently use. Requiring a study at the current time will be of little to no value in the long term control of these chronic contaminants.”²⁰⁸

On May 28th, samples taken at Walters’ house showed an improvement in lead levels. This came after the replacement of a city water main.²⁰⁹ Given this update and the fact that her

²⁰⁶Staff of Bridge Magazine, *Poison on Tap*, 71-72.

²⁰⁷ City of Flint Department of Utilities, *City of Flint 2014 Annual Water Quality Report*, circa December 2014.

²⁰⁸ Staff of Bridge Magazine, *Poison on Tap*, 69, 73, 83; Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, (Timeline) 12.

²⁰⁹ Staff of Bridge Magazine, *Poison on Tap*, 74, 126.

house's plastic plumbing could not leach lead, officials should have seen this as a sign that the lead derived from city water main and not her individual plumbing. Combined with the previous signs and warnings of corroding pipes, these water system experts could have begun an inquiry as to whether the pipes leached lead elsewhere in the city. However, officials continued to abide by their interpretation that their compliance with the rules had stopped any serious water problems and that any major concerns came from individual plumbing issues.

On June 24th, Del Toral sent an eight-page memo to Poy regarding Flint's lack of corrosion control and lead levels.²¹⁰ In it, he described how the lack of corrosion control, the pre-flushing sampling techniques, the addition of chloride to combat organic matter and TTHM violations, the increasing blood lead levels of Walters' son since the switch, the fact that Walters' residence contained plastic plumbing that would not have led to leach all point to a hidden lead problem in Flint, and other resident-requesting testing without pre-flushing all revealed a hidden lead problem in Flint.²¹¹ He made several recommendations on mitigating lead in water and reviewing Flint's compliance with optimal corrosion control and with its sampling pool.²¹² The MDEQ first heard of this memo on June 30th, when Tinka Hyde (Water Division Director of EPA's Region 5) e-mailed Shekter Smith. Hyde stated that after the memo underwent revisions, the MDEQ would receive a copy of the memo, and she also mentioned that Del Toral shared the memo with Walters due to the use of her situation in the report.²¹³

²¹⁰ Ibid, 75.

²¹¹ United States Environmental Protection Agency Region 5, *High Lead Levels in Flint, Michigan – Interim Report*, by Miguel Del Toral, June 24, 2015, 1-4.

²¹² Ibid, 4-5.

²¹³ Staff of Bridge Magazine, *Poison on Tap*, 76.

In spite of Del Toral's findings, Crooks further downplayed the lead problem on July 1st and showed a lack of urgency when she encouraged the MDEQ to not implement a corrosion control study. In her e-mail, she stated,

“Our discussions with MDEQ indicate that no phosphates/corrosion control has been added to the system since April 2014 when the source of drinking water changed to the Flint River. We understand that the City is just finishing up its second set of 6-month initial monitoring for lead where the results will probably warrant a Corrosion Control Study to be conducted. Since Flint has lead service lines, we understand some citizen-requested lead sampling is exceeding the Action Level, and the source of drinking water will be changing again in 2016, so to start a Corrosion Control Study now doesn't make sense.

Miguel believe[s] that lead levels in Flint are being affected by the lack of corrosion control being conducted by the City.... Steve Busch stated that in the Lead sampling pool, almost all of the lead sample sites are lead service lines and the State is not seeing large increases in lead levels at tap....

Miguel's point is that... the existing requirements in the LCR may not be as protective as previously thought. Thus, he can only make recommendations as to how to revise sampling protocols.”²¹⁴

Her acceptance of the MDEQ's alternative compliance strategy for corrosion control followed a national trend that the EPA had of allowing differing compliance strategies across the country, which weakened the agency's ability to decrease lead risks. Additionally, the EPA could have chosen to act on Miguel's memo and enforce corrosion control, but it decided not to. It would take increased public pressure to motivate the EPA to take more authority over the situation.²¹⁵

On the same day, Susan Hedman further undercut Del Toral's memo and concerns in an e-mail to Walling, who requested Del Toral's memo after hearing about it from the ACLU. Hedman apologized for the spread of the preliminary draft report.²¹⁶ However, Hedman still refused to send Walling a copy of Del Toral's report under the premise that it had not undergone

²¹⁴ Ibid, 79-80, 188.

²¹⁵ Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 9.

²¹⁶ Ibid, 81.

vetting by the EPA.²¹⁷ This led Walling to conclude that the EPA did not agree with Del Toral's findings, and during his re-election campaign, he told voters that "Del Toral's report didn't reflect the opinion of the entire agency."²¹⁸

On July 9th, Curt Guyette used Del Toral's memo to break the story about lead in Flint's water. This made the report available for everyone to read, including the MDEQ officials who have waited on the EPA internal review.²¹⁹ Wurfel reacted, "Miguel apparently asserts that the DEQ and EPA are at odds on proper protocol. Which seems weird." Busch asserted that the MDEQ will not comment on the draft report given its interim nature but put forward the strategy of citing regulations to defend MDEQ's sampling procedures. Hedman provided a public comment from the EPA that stated that the EPA and MDEQ continued to work together to examine lead contamination and ensured that the water met federal safety standards.²²⁰

Public stunts in June and July would further work towards discrediting the concerns about Flint water, especially when the ACLU reported about Del Toral's memo. Walling joined Crooks in downplaying water quality issues, drinking a cup of Flint water on TV to show its safety.²²¹ Wurfel released a statement over the radio to tell citizens to "relax" about any potential lead problems while privately e-mailing the Snyder administration to complain about how the community groups "worked hard at keeping [residents] confused and upset... and misinformed."²²² However, the community decided to respond to governmental inaction and

²¹⁷ Ibid, 81.

²¹⁸ Arthur Delaney and Philip Lewis, "How The Federal Government Botched Flint's Water Crisis."

²¹⁹ See Susan Hedman, Dayne Walling, and Jason Lorenz, e-mails on ACLU and Del Toral memo, June-July 2015.

²²⁰ Staff of Bridge Magazine, *Poison on Tap*, 82.

²²¹ Ibid, 132.

²²² Ibid, 10.

undermining through the legal system and began to prepare a lawsuit, providing a counterpoint in the media against the officials' statements and behavior.²²³

Additionally, the MDEQ decided to require only 60 samples for the second six-month testing period under the guise that Flint's population had decreased, despite the EPA's statement that Flint needed 100 samples.²²⁴ In light of the building disagreements between the EPA and the MDEQ on the MDEQ's use of the lead and copper rule, the two agencies had a conference call on July 21st. However, this did not seem to reconcile the differing beliefs on the implementation of the rule.²²⁵ The EPA could have utilized its authority under the Safe Drinking Water Act or the LCR to enforce its sample requirements but chose not to do so, perhaps because the public outrage and protests had not grown to a point where the EPA would take further action.²²⁶

These 60 samples showed 11 parts per billion of lead in the drinking water, almost twice as much as the first six-month testing period showed.²²⁷ Busch's e-mails on July 24th relaying these results to Wurfel and others in the MDEQ maintained that, despite the increase, the results did not cause a concern because they did not reach the Action Level Standard of 15 parts per billion and that Flint had maintained a lead level under 15 parts per billion for the last 20 years

²²³ Staff of Bridge Magazine, *Poison on Tap*, 74; Natural Resources Defense Council and American Civil Liberties Union of Michigan to Karen Weaver, Rick Snyder, Dan Wyant, Nick Khouri, Frederick Headen, "Notice of Intent to Sue Under the Safe Drinking Water Act, 42 U.S.C. 300j-8(b)(1)(a), for Failure to Control Lead in Drinking Water in Flint, Michigan, and Failure to Assist Michigan Schools with Lead Testing and Remediation," November 2015; Concerned Pastors for Social Action, Melissa Mays, American Civil Liberties Union of Michigan, and Natural Resources Defense Council, Inc. v Nick Khouri, Frederick Headen, Michael Townsend, David McGhee, Michael Finney, Beverly Walker-Griffea, Natasha Henderson, and City of Flint, Case No. 16-10277 (January 27, 2016).

²²⁴ Additionally, officials did not check to make sure that these houses connected to lead piping. The department maintained records of which houses connected to lead piping on 45,000 index cards, and officials did not go through them before sampling. *Ibid*, 82-83, 148; Michigan Department of Environmental Quality, *Draft of the Lead and Copper Report and Consumer Notice of Lead Result Certificate for Community Water Supply*, circa July 2015.

²²⁵ Staff of Bridge Magazine, *Poison on Tap*, 83.

²²⁶ Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 8-9.

²²⁷ Michigan Department of Environmental Quality, *Flint, City of, Lead and Copper Monitoring of Drinking Water Taps*, by Adam Rosenthal, August 17, 2015.

(despite the fact that Flint used the less corrosive Lake Huron water during those years).²²⁸ He went on to further state that the samples met regulatory requirements and that Flint would conduct a corrosion control study within 18 months and would install a fully optimized corrosion control treatment within two years.²²⁹

As the MDEQ finished conducting the monitoring samples and discussed this prolonged timeframe for acting, residents increasingly targeted the Snyder administration for the water protests and activism. For example, Flint ministers arranged a meeting with the Snyder administration and brought along residents, an engineer, and a college professor to discuss the high lead levels found in 80 water tests.²³⁰ While MDEQ officials discussed how to “edify” this conversation to show the safety of Flint’s water, the Snyder administration considered acting on these concerns. Muchmore asked both Nick Lyon, the director of the MDHHS, and Wyant to look further into Flint’s water, stating, “These folks are scared and worried about the health impacts and they are basically getting blown off by us (as a state we’re just not sympathizing with their plight).”²³¹

The MDEQ quickly acted to persuade the administration that the government should not take action on these protests. Wurfel e-mailed Muchmore, Wyant, and Tom Saxton at the Michigan Department of Treasury, stating that, “Everything checks out in terms of compliance, but now the next step is optimizing the water supply... Conceivably, by the time we’re halfway through [the corrosion control study], the city will begin using a new water source with KWA... In terms of near-future issues, the bottom line is that residents of Flint do not need to worry

²²⁸ Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 85.

²²⁹ Staff of Bridge Magazine, *Poison on Tap*, 86.

²³⁰ *Ibid*, 85.

²³¹ *Ibid*, 84-85.

about lead in their water supply, and DEQ's recent sampling does not indicate an eminent health threat from lead or copper."²³² Convinced that the MDEQ gave him sound information and recommendations, Muchmore simply replied, "Thanks."²³³

As for the MDHHS's response to Muchmore's concerns that the state blew off the public's concern, the department began analyzing blood lead levels in Flint.²³⁴ Epidemiologists noticed that blood-lead levels in children under 16 rose right after the switch to Flint River water but swiftly concluded that this derived from seasonality, not from the water switch.²³⁵ Until disputed, this study would cement the officials' stance to not take action in regards to the water crisis and to tell the public to continue consuming the water.

Continuing disagreements between the MDEQ and the EPA on corrosion control followed these studies in August. On August 3rd, the EPA relayed meeting notes from the July 21st conference call to Shekter Smith.²³⁶ Neither agency showed concern over the increase in lead in the water, and the meeting minutes mostly discussed corrosion control.²³⁷ While the MDEQ refused to change its practice of pre-flushing before taking samples, the notes showed that the MDEQ agreed to "get phosphate addition going in Flint as soon as possible" and to continue corrosion control when the city switched to the KWA.²³⁸ However, the MDEQ does

²³² Ibid, 87.

²³³ Ibid.

²³⁴ Ibid, 88.

²³⁵ Seasonal trends in blood-lead levels occur due to changing behavior in warmer weather; for instance, people open their windows more often in the summer, which can cause the lead-based paint around the window to chip and fall and make it easier for young children to access. Ibid, 88-89.

²³⁶ United States Environmental Protection Agency, *Notes on Call with MDEQ on July 21, 2015: MDEQ Implementation of LCR Rule and Flint Issues*, July 21, 2015.

²³⁷ Staff of Bridge Magazine, *Poison on Tap*, 91-92; United States Environmental Protection Agency, *Notes on Call with MDEQ on July 21, 2015: MDEQ Implementation of LCR Rule and Flint Issues*, July 21, 2015.

²³⁸ Staff of Bridge Magazine, *Poison on Tap*, 91-92.

not order optimized corrosion control to Flint until two weeks later, and the MDEQ gives Flint two years to do so.²³⁹

These instances with the Snyder administration, the MDEQ, the MDHHS, and the EPA and the earlier incident with the GCHD's Legionnaires' investigation showed that, even though public protests and action may convince part of the government to act in regards to an environmental crisis, the residents' activism needed to reach a point where enough agencies and officials viewed the crisis as something that needs urgent attention. Otherwise, those still leaning towards apathy and inaction may work to convince the other officials and agencies to not take action or to hinder those that act on the crisis.

The Virginia Tech Study

As the MDEQ debated the EPA on the necessity for corrosion control, the MDEQ escalated its conflicts with residents in a meeting with Flint residents, including Walters. In this meeting, officials proclaimed that "Del Toral had been 'handled'" and that the EPA would reject his report. Additionally, when confronted with Walters' concerns, the officials acted in much the same way as government officials did in the Love Canal crisis; the residents reported that officials smirked and laughed at her, refusing to respond to her in a serious and professional manner.²⁴⁰ Angered at this response, Edwards informed the MDEQ on August 23rd that his team from Virginia Tech would study Flint's water.²⁴¹

After this meeting, Wurfel further undermined Walters, who contacted Senator Gary Peters after receiving no support from the MDEQ. Mike Brown, Snyder's senior federal policy representative, contacted Wurfel on August 27th about her contact with Peters and asked why her

²³⁹ Ibid, 93.

²⁴⁰ Arthur Delaney and Philip Lewis, "How The Federal Government Botched Flint's Water Crisis."

²⁴¹ Staff of Bridge Magazine, *Poison on Tap*, 93.

lead levels far surpass the 90th percentile. Walters, describing Walters as “a very vocal resident” and as the resident “who had EPA lead specialist come to her home and do tests, then released an unvetted draft of his report (that EPA apologized to us profusely for) to the resident, who shared it with ACLU, who promptly used it to continue raising hell with the locals,” explained that the lead issues derived from plumbing in individual homes.²⁴² He further described,

“Bottom line is that folks in Flint are upset – because they pay a ton for water and many of them don’t trust the water they’re getting – and they’re confused, in no small part because various groups have worked hard at keeping them confused and upset. We get it. The state is trying like mad (to) get the word out that we’re working on every aspect of the health safety of local water that we can manage, and the system needs a lot of work.... (It’s been rough sledding with a steady parade of community groups keeping everyone hopped-up and misinformed.”²⁴³

This type of dismissive response towards actions taken by private citizens would define the MDEQ’s response to the Virginia Tech results.²⁴⁴ On September 2nd, Edwards and the team of researchers from Virginia Tech University released the results of their research into the lead in water in Flint. After analyzing 120 water samples from Flint, the team found that 42% of the samples measured more than 5 parts per billion of lead levels, with 20% of those having more than 15 parts per billion, the level at which the EPA sets as the lead action limit. In response, Croft released a statement saying that the city of Flint followed all safety and quality standards, and Wurfel stated that the Virginia Tech results do not match the city’s two rounds of testing and that Flint’s water met all safety standards.²⁴⁵

²⁴² Ibid, 94-95.

²⁴³ Ibid, 95.

²⁴⁴ Siddhartha Roy, “Analysis of water samples from an additional 72 Flint homes are concerning,” *FlintWaterStudy.org*, August 31, 2015, <http://flintwaterstudy.org/2015/08/analysis-of-water-samples-from-an-additional-72-flint-homes-are-concerning-as-well/>; Siddhartha Roy, “Flint River water is very corrosive to lead, and causing lead contamination in homes,” *FlintWaterStudy.org*, September 2, 2015.

²⁴⁵ Ron Fonger, “Lead leaches into ‘very corrosive’ Flint drinking water, researchers say,” *MLive Media Group: The Flint Journal* (Flint, Michigan), September 2, 2015.

The MDEQ quickly acted to convince the public of the inaccuracy of Virginia Tech's Results. On the same day that Edwards released the research, Wurfel gave a press release to Ron Fonger, a reporter from the MLive Media Group, stating that the water and the city's transmission lines did not cause any lead problems but that individual homes' plumbing contaminated their drinking water with lead. In the same press release, Wurfel stated that Virginia Tech's results did not match any of the state's blood lead-level testing in order to further show that the public should not take Virginia Tech's report into consideration.²⁴⁶ Wurfel repeated the same with Michigan Radio on September 6th, explaining,

“The samples don't match the testing that we've been doing in the same kind of neighborhoods all over the city for the past year. With these kinds of numbers, we would have expected to be seeing a spike somewhere else in the other lead monitoring that goes on in the community.”²⁴⁷

The Flint Department of Public Works joined the MDEQ in assuring the public of the water's safety. On September 3rd, Croft e-mailed many state and local officials, stating that the water complied with EPA standards on lead and with the Michigan Safe Drinking Water Act. He also defended the decision to not use corrosion control at first, explaining how phosphate based corrosion control chemicals can support bacteria in the water and that both the MDEQ and an engineering firm discussed delaying corrosion control until further testing took place.²⁴⁸

Seeing a repeat of the denial that happened in the Washington, D.C. water crisis, the Virginia Tech team created FlintWaterStudy.org to post their results and updates on the crisis.²⁴⁹ Edwards described the rationale behind using this strategy, saying, “... we started directly working with ACLU and the activist groups in Flint, which is kind of something you don't do,

²⁴⁶ Staff of Bridge Magazine, *Poison on Tap*, 100.

²⁴⁷ Steve Carmody, “Team testing Flint water for lead sample by samples,” *Michigan Radio*, September 6, 2015.

²⁴⁸ Staff of Bridge Magazine, *Poison on Tap*, 100.

²⁴⁹ Arthur Delaney and Philip Lewis, “How The Federal Government Botched Flint's Water Crisis.”

because people will say you're an activist... But what I learned in D.C., science alone is powerless... to these agencies."²⁵⁰ On September 8th, Edwards used this website to publish the full results of the Virginia Tech team's tests.²⁵¹ Reporting that the Virginia Tech's samples showed a 90th percentile of 25 parts per billion of lead in the water, which exceeded the EPA's allowable level of 15 parts per billion, and describing very high samples, such as one sample reaching over 1000 parts per billion, the article decried the MDEQ's statements regarding the safety of Flint's water.²⁵²

The next day, Wurfel e-mailed Fonger of MLive.com to state that the MDEQ "is just as perplexed by Edwards' results as he seems to be by the city's test results, which are done according to state and federal sampling guidelines and analyzed by certified labs."²⁵³ He attempted to convince Fonger that the Virginia Tech team did not properly conduct their research, simply "set out to prove" their pre-determined theory, and used their research to "[fan] political flames irresponsibly."²⁵⁴ Wurfel not only acted to manipulate the public opinion of the Virginia Tech's study but also attacked their credibility as scientists in order to do so, mimicking the officials' behavior toward Dr. Paigen in the Love Canal crisis.

The MDHHS had a delayed reaction to the Virginia Tech results. Eleven days later, e-mails showed that several key officers in the department still had not analyzed the Virginia Tech results. At the same time, the MDHHS worried about the impacts the public meetings organized by the researches had on the public opinion, and reports from Michigan Radio and MLive Media

²⁵⁰ Ibid.

²⁵¹ Staff of Bridge Magazine, *Poison on Tap*, 101.

²⁵² Siddhartha Roy, "Our sampling of 252 homes demonstrates a high lead in water risk: Flint should be failing to meet the EPA Lead and Copper Rules," *FlintWaterStudy.org*, September 8, 2015, <http://flintwaterstudy.org/2015/09/our-sampling-of-252-homes-demonstrates-a-high-lead-in-water-risk-flint-should-be-failing-to-meet-the-epa-lead-and-copper-rule/>.

²⁵³ Ibid, 102.

²⁵⁴ Ibid, 103.

Group further alarmed the department, which described the issue as “blowing up.” On September 23rd, the MDHHS began to prepare a briefing for Snyder about Flint water. In Mikelle Robinson’s e-mail, she described the explanation the DEQ gave her, which contained an explanation of how the water “is not an imminent public health problem but a public confidence problem due to the many groups getting involved and controversial reports/media coverage.”²⁵⁵

As Edwards attempted to convince EPA officials of the faults and violations in the MDEQ’s sampling procedures, EPA departments outside of Region 5 noticed the reports and coverage on his research. In particular, Dr. Yanna Lambrinidou from the EPA National Drinking Water Advisory Council Lead and Copper Rule workgroup, a group that recommended revisions to the Lead and Copper Rule, sent an inquiry to Wurfel and Busch about Flint’s water. He asked about the optimal water quality parameter ranges that MDEQ determined for Flint’s water and wanted to know where to find them. Busch responded that, since Flint had not implemented an optimized corrosion control treatment, the MDEQ did not set any water quality parameters.²⁵⁶ Given the MDEQ’s resistance to implemented corrosion control until the KWA came online, this heavily suggested that the MDEQ had not planned on ever setting water quality parameters while using the Flint River.

The Virginia Tech results and subsequent public reaction did not cause a change in governmental stance nor action on Flint’s water. Similar to the officials’ reactions in the Love Canal crisis, the MDEQ, MDHHS, and Flint Department of Public Works undermined the data and evidence provided by private citizens that point to an environmental and public health crisis and instead focused on how to control the damage to the public confidence in the officials’ stances and decisions. In order to change the officials’ actions of managing their public

²⁵⁵ Ibid, 103, 106-107.

²⁵⁶ Ibid, 103, 105-107.

reputation to conceding to public demands, residents and researchers would have to further work on revealing and decrying the Flint water crisis.

The Hurley Study

As Edwards and the Virginia Tech team studied samples of Flint's water, Dr. Mona Hanna-Attisha, who became interested in a potential lead problem in Flint in August 2015 after hearing about the lack of corrosion control, and her team from the Hurley Medical Center looked into levels of lead in 1,746 blood samples from Flint children, with a focus on the distribution of water lead levels based on zip codes.²⁵⁷ These samples came only from the Hurley Medical Center because the MDHHS refused to release their blood sample data to both Hanna-Attisha and Edwards.²⁵⁸ After the switch from the DWSD to the Flint River, she found that the percentage of children with 5 micrograms per deciliter of lead in their blood or higher almost doubled (from 2.1 percent to 4 percent) while the children most at-risk saw almost triple the rates of elevated blood lead levels (from 2.5 percent to 6.3 percent). The report urged the city to declare a health advisory in order to receive federal assistance.²⁵⁹

Before Hanna-Attisha released the results on September 24th, the MDHHS prepared to deal with the public backlash with a mix of alarm and scorn. MDHHS Deputy Director GERALYN Lasher, in her e-mail to other MDHHS officials, described the Hurley report as a “study,” with

²⁵⁷ Mona Hanna-Attisha, “Pediatric Lead Exposure in Flint, MI: Concerns from the Medical Community,” (presentation, Hurley Medical Center, Flint, MI, September 24, 2015); Mona Hanna-Attisha, et al, “Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response,” *American Journal of Public Health* (February 2016), 283-290.

²⁵⁸ Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 32.

²⁵⁹ Ron Fonger, “Elevated lead found in more Flint kids after water switch, study finds,” *MLive Media Group: The Flint Journal* (Flint, Michigan), September 24, 2015; Staff of Bridge Magazine, *Poison on Tap*, 135; Mona Hanna-Attisha, “Pediatric Lead Exposure in Flint, MI: Concerns from the Medical Community,” (presentation, Hurley Medical Center, Flint, MI, September 24, 2015); Mona Hanna-Attisha, et al, “Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response,” *American Journal of Public Health* (February 2016), 283-290.

the quotations implying that she considered the report as something other than serious scientific results to take into account.²⁶⁰ The talking points that MDHHS developed noted that the MDHHS did not yet review Hurley's results and that the state's methodology and seasonality theory "provide[d] a much more robust picture" of blood lead levels.²⁶¹ Snyder's Deputy Press Secretary Dave Murray warned numerous officials at the MDHHS and Wurfel that the Hurley report took a "very emotional approach" of "pointing to individual children."²⁶²

After the release, the MDHHS disputed Hanna-Attisha's study, claiming that her findings resulted from seasonal variables, not due to the water. This aligned with the MDHHS' July study, prompted from Snyder's chief of staff's concerns about lead in Flint water, that any increase in blood lead levels resulted from normal seasonal differences. Additionally, MDHHS staff such as Wesley Priem of the Healthy Homes Section accused Hanna-Attisha's study of finding its motive in "little science and a lot of politics."²⁶³ Deputy Director Geralyn Lasher, in her critique of the Hurley report, also described the data as "'data'", with the quotations again implying a lack of seriousness or authenticity.²⁶⁴ Wurfel joined the criticism, labelling Hanna-Attisha as causing "hysteria" with "unfortunate" comments given that "Flint's drinking water is safe in that it's meeting state and federal standards. The system has an aging portion that needs to be addressed."²⁶⁵ The Detroit Free Press quoted Wurfel as saying, "We're confident with what we've done, but we know there are concerns."²⁶⁶

The officials' immediate dismissal of the Dr. Hanna-Attisha's work had similarities to the reaction officials had to Dr. Paigen's report, but a significant difference occurred in the way their

²⁶⁰ Staff of Bridge Magazine, *Poison on Tap*, 109.

²⁶¹ Ibid.

²⁶² Ibid, 110.

²⁶³ Ibid, 188-189.

²⁶⁴ Ibid, 113.

²⁶⁵ Ibid, 112, 116

²⁶⁶ Ibid, 112, 135.

institutions and professional connections treated them due to their research. While Dr. Paigen faced harassment and eventually had to leave the state to continue her work, Dr. Hanna-Attisha reported that “everybody [Flint and the medical community] had [her] back.” She explains, “Even though we are city-chartered and we get state funding and this was politically messy, there was never a question that we had to do what was best for the community.”²⁶⁷ This support from the scientific and medical community and this team’s belief that they needed to take an active role in combating the environmental injustice in the Flint water crisis showed a change since Love Canal, when scientific and medical experts did not rally to support Dr. Paigen and fight against an environmental injustice.

Meanwhile, Edwards sent Robert Scott, the lead data manager at MDHHS, a scathing e-mail questioning why both himself and the Hurley team could not access the state’s data, stating:

“Can you tell me why it is so difficult to get this data, and why your agency is raising so many obstacles to sharing it with everyone who asks?... I have to say, it is very disturbing that the state keeps issuing these blood lead reports and statements in their press releases, and refuses to share the data backing them up with outside researchers.... I note that I have been asking to see your data since MDEQ first sent it to reporters back in August, and I count 10 emails that I sent responding to all your questions. As of yet, you have given me nothing in response.”²⁶⁸

Scott crafted an e-mail stating the confidential nature of the data and apologizing for not completing the process of getting the data to him before leaving on vacation. Nancy Peeler from the MDDHS reviewed the e-mail and told him to make it less apologetic and less open to attack on image protection, believing that Edwards intended to “escalated and spin things” with his e-mail. Scott agreed.²⁶⁹ However, while this is taking place, Scott used Hurley’s methodology to attempt a recreation of their results. While prefacing it with an explanation that he did “not

²⁶⁷ Bridget Kuehn, “Pediatrician Sees Long Road Ahead for Flint After Lead Poisoning Crisis,” *JAMA* 315, no. 10 (2016): 968.

²⁶⁸ Staff of Bridge Magazine, *Poison on Tap*, 110.

²⁶⁹ *Ibid*, 111.

[find] as much difference as (Hurley) did,” he admitted to seeing similar results but stated that he did not want the public to see these findings.²⁷⁰

Scott and Peeler followed through with this statement. The day after his discovery, Flint issued a Lead Advisory, which increased public attention and media requests from reporters.²⁷¹

While developing a lead story on the advisory, the Detroit Free Press’ Kristi Tanner requested a response to her conclusions that the switch to the Flint River led to an increase in lead poisoning, and Scott and Peeler planned to respond that lead poisoning as a whole decreases year by year even though some areas see “bumps from year to year while still trending downward overall.”²⁷²

They blatantly hid their findings from the previous day. Less than two hours later, Scott concealed more information, this time from Hanna-Attisha. The day before, he asked Peeler about analyzing MDHHS’ data only for children ages 0 to 5. On the 25th, Hanna-Attisha pointed out the uncommonness of measuring lead levels for children older than 5 and asked if he analyzed the data just with younger children. He responded that he had not without letting her know of his indications that the department should look at this data.²⁷³

Other staff in the MDHHS failed to competently react to the situation and to feel the increasing panic that the Flint residents had in regards to the developments, even in light of increasing media coverage. Various staff failed to locate a copy of the Hurley report or data but did not feel pressured to find a solution.²⁷⁴ In any case, MDHHS Director Nick Lyon prepared to build a case against both the Hurley report and the Virginia Tech report. On September 28th,

²⁷⁰ Ibid, 110.

²⁷¹ The advisory states: “The City of Flint is issuing a Lead Advisory for residents to be aware of lead levels in drinking water after hearing concerns from the medical community. While the city is in full compliance with the Federal Safe Drinking Water Act, this information is being shared as part of a public awareness campaign to ensure that everyone takes note that no level of lead is considered safe.” Ibid, 113.

²⁷² Ibid, 111.

²⁷³ Ibid, 112.

²⁷⁴ Ibid, 115, 117.

he wrote, “I would like to make a strong statement with a demonstration of proof that the lead blood levels seen are not out of the ordinary and are attributable to seasonal fluctuations.”²⁷⁵ The desire to immediately build a case against the Hurley report without first considering its potential validity delayed progress towards solving the lead crisis.

On the 29th, Lasher e-mailed the department that Genesee County had released a health advisory for Flint and had stated, “The county is prepared to take further action if the State fails to provide the requested data [the state blood-level data] by September 30, 2015. Further action could include a request for outside independent evaluation of the data and to declare a Public Health Emergency in Flint.”²⁷⁶ Lasher named the notice “a ransom date.”²⁷⁷ Concurrently, Lasher asked various staff in the MDHHS, including Scott and Peeler, about blood lead level data in children under six. However, the staff conversed with each other and agreed that, “It’s bad enough to have a data war with outside entities, we absolutely cannot engage in competing data analyses within the Department, or, heaven forbid, in public releases.”²⁷⁸

Meanwhile, the Muchmore sent an e-mail to Snyder and others in the administration about the situation. He analyzed it on a political level, explaining how the MDEQ and MDHHS felt like the issue has turned into “a political football” with the various groups in Flint accusing the departments of “shift[ing] responsibility to the state.” He described that the administration dedicated large amounts of time to Flint’s water not only because of lead poisoning’s impacts and the controversy of the switch but also because of Dillon’s role in the decision to switch the water.²⁷⁹ The next day, in another political analysis, Muchmore stated,

²⁷⁵ Ibid, 117.

²⁷⁶ Ibid, 119, 121.

²⁷⁷ Ibid, 120.

²⁷⁸ Ibid.

²⁷⁹ Ibid, 112.

“The water certainly has occasional less than savory aspects like color because of the apparently more corrosive aspects... but that has died down with the additional main filters. Taste and smell have been problems also and substantial money has been extended to work on those issues.

“Now we have the anti everything group turning to lead content which is a concern for everyone, but DEQ and DHHS and EPA can’t find evidence of a major change... Of course, some of the Flint people respond by looking for someone to blame instead of working to reduce anxiety. We can’t tolerate increased lead levels in any event, but it’s really the city’s water system that needs to deal with it. We’re throwing as much assistance as possible at the lead problem as regardless of what the levels, explanations or proposed solutions, the residents and particularly the poor need help to deal with it... The residents are caught in a swirl of misinformation and long term distrust of local government unlikely to be resolved.”²⁸⁰

Muchmore’s explanations not only show that he continued to trust the MDEQ and MDHHS of their stance on the safety of Flint’s water but that their stances have also hardened him against the Flint water activists. Furthermore, on September 28th, Snyder received another briefing that the lead levels in Flint complied with federal standards and that replacing the lead service lines would cost at least \$60 million to the city, possibly \$8,000 for homeowners to replace their private lead connections, and would take 15 years.²⁸¹ The agencies entrusted with protecting public health and his own administration showed a solitary front against taking the activists’ information and demands seriously.

In spite of this, Snyder showed signs of taking an opposing viewpoint and of listening to activists and supportive politicians such as State Senator Ananich.²⁸² On September 29th, the Executive Director to the Governor, Allison Scott, sent an e-mail that showed Snyder’s shift away from deflections to action. Calling the situation an “emergency,” the e-mail detailed the items Snyder would like to talk about in a meeting:

²⁸⁰ Ibid, 115-116.

²⁸¹ Ibid, 118.

²⁸² State Senator Ananich writes to Snyder on September 28th, “It is completely unacceptable that respected scientific experts and our trusted local physicians have verified that the City of Flint’s drinking water is dangerous for our citizens,” demanding for changes such as switching back to DWSD, corrosion control, filters and bottled water, and fixing the infrastructure. Ibid, 116.

- “1. Emergency Management – similar to disasters, is there some form of action we can engage for this situation to help manage.
2. Chief medical officer – should be speaking with Hurley
3. WIC – re water and formula – status update
4. Drain commissioner – how do we expedite KWA”²⁸³

The sense of urgency and desire to speak to the private citizens driving the protests and counterpoints showed that the public outcry reached a point to where the governor would work towards meeting the demands of the residents and activists in spite of the advice from his own administration. Publicly, the Snyder administration still abided by the MDEQ’s stance that the residents could safely drink the water, such as when one of his spokesman confirmed the secret delivery of 1,500 water filters to residents but still maintained that the water met all safety standards, but behind the scenes, the administration made swift moves to solve the environmental crisis.²⁸⁴

Reconnecting to the DWSD

At the start of October 2015, the Snyder Administration made serious inquiries into having Flint rejoin the DWSD that soon turned into reality. In response to the Snyder inquiry, DWSD offered an immediate, short-term reconnect with no reconnect fee, a fixed monthly rate of \$662,000, and other expenses charged without an added profit margin expense.²⁸⁵ At the same time, the MDHHS admitted that an analysis of both the Hurley report and the MDHHS data pointed to the same conclusions when using the same zip code methodology from the

²⁸³ Ibid, 119.

²⁸⁴ On September 29th, The Flint Journal reported Snyder’s delivery of the 1,500 water filters to reduce lead and TTHM levels, detailing how the Concerned Pastors for Social Action received the filters in return for remaining silent about the state’s involvement with the delivery. Rev. Alfred Harris of the organization noted that the group accepted the terms in order to get help to the Flint citizens but proposed that the secret delivery showed that the government knew the water harmed the people. Dave Murray, one of Snyder’s spokesmen, confirmed that governor worked with a corporate donor to source the filters but that Flint’s water met all safety standards and that the filters aimed to fix aesthetics such as water discoloration and odor. Ron Fonger, “Governor helped hush-hush delivery of water filters to Flint pastors,” *MLive Media Group: The Flint Journal*, September 29, 2015.

²⁸⁵ Staff of Bridge Magazine, *Poison on Tap*, 142.

Hurley report.²⁸⁶ Immediately afterwards, the Snyder administration released an action plan for Flint's water crisis.²⁸⁷ Within a week of the announcement, the water filter distribution drastically increased, the State Budget Director determined \$10.4 million in state aid for the action plan, and Flint developed a plan on switching back to DWSD.²⁸⁸ The reconnection to DWSD officially occurred on October 16th.²⁸⁹

The reconnection did not automatically solve the lead crisis. Due to 18 months of corrosion, the pipes no longer had any remaining barrier to stop the lead scales from leaching out of the pipes. The corrosion control would take time to optimize.²⁹⁰ Furthermore, the health crisis for residents who suffered from lead poisoning would continue for the long-term, and the city would need increased, long-term investments in education, public and mental health, juvenile justice, and nutrition for up to 20 estimated years in order to combat these effects.²⁹¹ However, without residential activism and an involved scientific and medical community, the reconnection would not have occurred. Reconnection would provide the necessary first step to resolving the environmental crisis in Flint.

Shaken Faith in Government

In January 2016, CNN reported that all of the residents and officials that they interviewed laid the blame at both Snyder and the MDEQ. Early in the month, around 100 protesters

²⁸⁶ Ibid, 148-149.

²⁸⁷ Michigan Department of Environmental Quality, Michigan Department of Health and Human Services, United States Environmental Protection Agency, and the City of Flint, *Taking Action on Flint Water*, October 2, 2015.

²⁸⁸ Snyder signed the official bill on October 15th, allocating \$6 million of state funds dedicated to switching Flint back to the DWSD until the KWA came online. With the passage of the bill, millions of more funds became available for Flint's related needs, such as water samples, water filters, and health services for impacted children. These extra funds came from a mix of sources: the state, Flint itself, and the Charles Stewart Mott Foundation. Staff of Bridge Magazine, *Poison on Tap*, 143.

²⁸⁹ This would not immediately fix the lead issues, as the changed water source would not stop the damage and corrosion the pipes had already faced. Lead would keep leaching out of the pipes, and residents would still need to drink bottled water well into 2016. Ibid, 144.

²⁹⁰ Bridget Kuehn, "Pediatrician Sees Long Road Ahead for Flint After Lead Poisoning Crisis," 969.

²⁹¹ Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 6.

marched from the city hall in Flint and called for Snyder's resignation.²⁹² Social media intensified the blame as celebrities, activists, and other citizens joined together to criticize the governor.²⁹³ The Snyder administration recognized this growing anger; Snyder himself apologized in his State of the State address and began to work more towards providing solutions for the crisis, such as seeking \$28 million in aid from the state and requesting support from the National Guard.²⁹⁴ To regain public trust, he released his administration's e-mails related to the crisis.²⁹⁵ The crisis also caused the resignation, firing, and/or criminal prosecution of various officials involved in the situation. This list eventually included Wyant, Wurfel, Busch, Prysby, Glasgow, Croft, Hedman, and Shekter Smith. Walling lost his reelection due to the crisis.²⁹⁶ However, these actions did not seem to reinstate public trust in the government.²⁹⁷

Chastity Pratt Dawsey again reported on the residents' reaction to Flint water, this time in February 2016. Due to experiencing false and conflicting information, bad communication, and a length of time with no solution, she found that the culture in Flint included a mistrust in government, suspicion, and even "paranoia" as described by government agencies. Dawsey reported residents that did not trust water filters and donated water, some even rejecting them, and that many residents no longer believed the blood and water tests conducted by government officials. Residents reported still feeling effects from the water and wondered if their lives

²⁹² Sara Ganim and Linh Tran, "How tap water became toxic in Flint, Michigan."

²⁹³ Ebony Stith, "Social media helping to put a spotlight on the Flint water crisis," *Sinclair Broadcast Group, Inc.: 25News*, January 14th, 2016; Julie Hinds, "Stars use social media to express outrage over Flint," *Detroit Free Press*, January 20, 2016.

²⁹⁴ Sara Ganim and Linh Tran, "How tap water became toxic in Flint, Michigan"; Emily Badger and Juliet Eilperin, "Amid water crisis, mayor of Flint, Mich., talks of 'broken trust,'" *Washington Post*, January 20th, 2016; Kate Abbey-Lambertz and Arthur Delaney, "Rick Snyder to Flint: 'I Will Fix This,'" *Huffington Post*, January 20th, 2016; John Counts, "How government poisoned the people of Flint," *MLive Media Group: The Flint Journal*, January 21, 2016.

²⁹⁵ Julie Bosman, Monica Davey, and Mitch Smith, "As Water Problems Grew, Officials Belittled Complaints From Flint," *New York Times*, January 20th, 2016.

²⁹⁶ Staff of Bridge Magazine, *Poison on Tap*, 13-14, 23.

²⁹⁷ Emily Lawler, "Gov. Rick Snyder's approval rating plummets after Flint water crisis," *MLive Media Group: The Flint Journal*, April 18th, 2016.

would ever return to normal. One resident even spoke of fearing that the National Guard members distributing water might shoot her. Residents detailed their fears for their children's futures in light of positive tests for lead poisoning. Victoria Marx testified of how her diagnosis of Parkinson's disease may have resulted from the lead she consumed from Flint's water and blamed the emergency manager for this development. Kathleen Fridline noted that the MDEQ sent a letter to her mother about her water containing 78 parts per billion but that the letter had no actions outside of calling the local health departments about any questions.²⁹⁸

Dr. Hanna-Attisha further described in March 2016 of how parents still did not trust the government. She describes, "Parents are traumatized. For almost 2 years, we were betrayed. There is a huge lack of trust in the government and a fear of the unknown."²⁹⁹ In her opinion, both the events during the Flint water crisis and the long-lasting health impacts that remain will cause long-lasting mistrust in the government, and she called for other physicians to take on more whistle-blower roles in regards to environmental crises causing public health issues, stating,

"This is our job. This is why we went to medical school—to help people. As we progress through medical school and training, we get jaded. We focus on reimbursement and EMRs [electronic medical records], and we lose focus of what we are called to do. It's even more of a calling as pediatricians. Kids can't vote. They can't tell you, give me immunizations. They can't tell you they need a car seat or better gun control. It's our job to be their voice, even more so in communities that are voiceless and underserved. I think pediatricians no longer think they are credible in their communities. [But] this change [in the state and federal response to Flint water contamination] happened because of physicians, not because of public health or other community voices. Moms were complaining. Activists were complaining. Pastors were complaining. The water experts were complaining. But it took the voice of physicians to make change. Physicians need to realize their powerful role in communities, to do good for their communities."³⁰⁰

²⁹⁸ Ibid, 199-204.

²⁹⁹ Bridget Kuehn, "Pediatrician Sees Long Road Ahead for Flint After Lead Poisoning Crisis," 969.

³⁰⁰ Ibid.

Her quote further emphasized the changed roles and values found in the scientific and medical community in regards to whistle-blowing and taking an active role in fighting against public health issues created by environmental injustices. In contrast to Love Canal, the scientific and medical community in the Flint water crisis felt an ethical obligation to help the residents cause a change.

Connecting the Two Events

As seen in both the Love Canal and Flint water crisis events, the governmental reaction remained similar. Officials first did not believe an environmental public health emergency existed and maintained this stance even in the face of residential complaints. The rationale behind this behavior remained similar both events, as officials prioritized economic concerns over the risks to public health, defended their reputation and their integrity instead of listening to the residents and recognizing that they needed to change their course of action, and focused on technically complying with the law instead of determining whether they needed to act further in order to prevent or stop a public health crisis.³⁰¹ In order to cause a shift in governmental action, residents had to both become increasingly noticed in the public eye and initiate contact with scientists who listened to their concerns and produced scientific studies whose revelations would arm the residents with formal evidence to use in their complaints.

³⁰¹ In regards to Love Canal and the officials' compliance with the law, no previous case had set a precedent upon which officials could readily look to for guidance, and no laws detailed how to address a chemical environmental emergency or who should address it. Various agencies and levels of government conflicted about the solution and source of funding. Even as the situation worsened and the residents' voices grew louder, neither official mechanism nor law existed to force officials to act. The situation called for the development of new protocols, but in the meantime, officials had not broken the law by their inaction. Richard Newman, *Love Canal*, 4-5; With the Flint water crisis, officials at the MDEQ believed that basic compliance with the rules absolved them from health concerns. In the face of complaints about a potential health problem, officials could point to the guidelines and say that they have acted responsibly. See Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 29, (December 2015 letter) 1-2.

The residents in Flint achieved this quicker than the residents in Love Canal for a variety of reasons. The public itself had changed since Love Canal in ways that made them more receptive to the activists' calls for action. For example, the public knowledge of environmental hazards grew between the Love Canal crisis and the Flint water crisis, meaning that the Flint activists had to spend less time educating the public and convincing others that they needed help.³⁰² In addition, United States citizens developed a sense of complacency in the 1990s about environmental issues and had lost a sense of fear and urgency about looming environmental dangers.³⁰³ Therefore, an event such as the Flint water crisis came as a shock to many in the public.

Along with the changes seen in the general public in the United States, the activists in Flint also found a scientific and medical community that showed them more support than what the activists in Love Canal had. Comparing these two events show a historical change in the scientific and medical community in the United States in regards to their response to public health issues related to environmental crises; beforehand, Love Canal showed that this community did not view itself as inherently responsible for assisting those experiencing a public health crisis due to environmental injustice, especially in the context of conflicts of interests with governmental officials or bodies. In the recent Flint water crisis, the response of the Virginia Tech team, the Hurley Medical Center, and the experts involved to the residents' request for help

³⁰² At the time of the Love Canal crisis, the public did not have a lot of knowledge on the human health impacts of chemical exposure on populations outside of adult male workers who spent four hours a week working with high chemical levels. Marci Culley and Holly Angelique, "Women's Gendered Experiences as Long-Term Three Mile Island Activists," *Gender and Society* 17, no. 3 (June 2003): 452; The public had widespread knowledge of the dangers of polluted water, especially when it comes to lead poisoning. On a national and state level, lead poisoning had greatly decreased since the 1990s due to legislation aimed to prevent lead poisoning and increased knowledge of lead's impacts on health. Therefore, the residents did not have to work towards convincing other private citizens that polluted water and lead endangered human health. Instead, the public immediately viewed them as innocent victims of governmental actions. Office of Governor Rick Snyder: Flint Water Advisory Task Force, *Flint Water Advisory Task Force: Final Report*, 23.

³⁰³ Kline, *First Along the River*, 145.

and for working with them to combat the government's actions revealed a shift in the ethical and moral obligations that this community felt towards those experiencing environmental injustice. The actions of these scientists and doctors revealed that the scientific and medical community felt obligated to assist those in environmental crises versus declining the residents' request for aid.

In the future, environmental historians should further research this shift in the scientific and medical community. For example, new research could focus on how activities and events in the environmental health movement in the United States impacted the way scientists and medical experts interact with and view public health issues related to environmental crises.³⁰⁴ Historians could also examine specific actors in major events, such as Gibbs in Love Canal and Walters in the Flint water crisis, in order to see how their requests and actions influenced the scientific and medical community.³⁰⁵ In any case, studying this change in the scientific and medical community has the potential to create exciting developments in the field of environmental history in the United States.

³⁰⁴ Love Canal provided the foundation for the environmental health movement and the success for anti-toxin campaigns. Gibbs, first starting to act in regards to her son's health and then the relocation of the local residents, connected the struggle to issues with toxins across the nation. The protests against Love Canal did not just lead to the relocation of the residents; it also led to the development of Superfund or the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, designed to handle other "Love Canal" waste disposal situations. However, national environmental organizations did not generally join Gibbs in fighting toxin issues across the United States, prompting her to form the Citizens Clearinghouse for Hazardous Wastes to provide support from one grassroots movement to other local movements, the results of which led to substantial victories for anti-incineration campaigns. Gibbs, *Love Canal*, 2-3, 200; Christopher Rootes, "Acting Locally: The Character, Contexts and Significance of Local Environmental Mobilisations," *Environmental Politics* 16, no. 5 (2007): 736.

³⁰⁵ Despite her move to Virginia in October 2014, Walters stayed connected with the events in Flint. As of this writing, she continues to advocate for the city and for other cities with lead problems, such as Philadelphia, and she has testified before governmental committees investigating Flint water. Her original concern of the increased lead levels at her residence and the impacts on her family has developed into her involvement in a widespread, universal issue, which may influence the scientific and medical community further. Staff of Bridge Magazine, *Poison on Tap*, 127; when officials claim that residents are wrong about their experiences with an environmental crisis, those involved have to prepare to debate them with more than just their personal accounts; they have to study the scientific fields related to their situation and research their issue. Repeated requests and calls for help with this over time may have also contributed to the change in the scientific and medical community. Marci Culley and Holly Angelique, "Women's Gendered Experiences as Long-Term Three Mile Island Activists," 447.

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