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March | 2016

Flint Water Advisory Task Force

FINAL REPORT

Commissioned by the Office of Governor Rick Snyder
State of Michigan

March 21, 2016

Governor Rick Snyder
Office of Governor
P.O. Box 30013
Lansing, Michigan 48909

Dear Governor Snyder:

We, the Flint Water Advisory Task Force (FWATF), offer in this report our findings and recommendations regarding the Flint water crisis. We have come to our conclusions largely through interviews of individuals involved and review of related documents now available in the public record. Our report includes 36 findings and 44 recommendations, offered to fulfill our charge of determining the causes of the Flint water crisis, identifying remedial measures for the Flint community, and safeguarding Michigan residents.

We hope that our report serves three fundamental purposes:

1. Clarify and simplify the narrative regarding the roles of the parties involved, and assign accountability clearly and unambiguously.
2. Highlight the causes for the failures of government that precipitated the crisis and suggest measures to prevent such failures in the future.
3. Prescribe recommendations to care for the Flint community and to use the lessons of Flint's experience to better safeguard Michigan residents.

We are encouraged by your focus and expressed commitment to address the Flint community's needs, and to learn from the failures that have transpired. This commitment is appropriate because, though it may be technically true that all levels of government failed, the state's responsibilities should not be deflected. The causes of the crisis lie primarily at the feet of the state by virtue of its agencies' failures and its appointed emergency managers' misjudgments.

Given the extensive investigative reporting on the Flint water crisis (from which we have benefited greatly), we have limited our explanatory narrative. Rather, our report builds on the ample public record and information yielded through over 60 interviews and discussions to prescribe recommendations that, we hope, will ultimately safeguard and benefit Michigan residents for years to come. We have approached our work with a solemn commitment to the charge you invested in us: to place Michigan residents' well-being first.

Respectfully,



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Executive Summary

Summary Statement

The Flint water crisis is a story of government failure, intransigence, unpreparedness, delay, inaction, and environmental injustice. The Michigan Department of Environmental Quality (MDEQ) failed in its fundamental responsibility to effectively enforce drinking water regulations. The Michigan Department of Health and Human Services (MDHHS) failed to adequately and promptly act to protect public health. Both agencies, but principally the MDEQ, stubbornly worked to discredit and dismiss others' attempts to bring the issues of unsafe water, lead contamination, and increased cases of Legionellosis (Legionnaires' disease) to light. With the City of Flint under emergency management, the Flint Water Department rushed unprepared into full-time operation of the Flint Water Treatment Plant, drawing water from a highly corrosive source without the use of corrosion control. Though MDEQ was delegated primacy (authority to enforce federal law), the United States Environmental Protection Agency (EPA) delayed enforcement of the Safe Drinking Water Act (SDWA) and Lead and Copper Rule (LCR), thereby prolonging the calamity. Neither the Governor nor the Governor's office took steps to reverse poor decisions by MDEQ and state-appointed emergency managers until October 2015, in spite of mounting problems and suggestions to do so by senior staff members in the Governor's office, in part because of continued reassurances from MDEQ that the water was safe. The significant consequences of these failures for Flint will be long-lasting. They have deeply affected Flint's public health, its economic future,¹ and residents' trust in government.

The Flint water crisis occurred when state-appointed emergency managers replaced local representative decision-making in Flint, removing the checks and balances and public accountability that come with public decision-making. Emergency managers made key decisions that contributed to the crisis, from the use of the Flint River to delays in reconnecting to DWSD once water quality problems were encountered. Given the demographics of Flint, the implications for environmental injustice cannot be ignored or dismissed.

The Flint water crisis is also a story, however, of something that *did* work: the critical role played by engaged Flint citizens, by individuals both inside and outside of government who had the expertise and willingness to question and challenge government leadership, and by members of a free press who used the tools that enable investigative journalism. Without their courage and persistence, this crisis likely never would have been brought to light and mitigation efforts never begun.

A Series of Government Failures

Flint water customers were needlessly and tragically exposed to toxic levels of lead and other hazards through the mismanagement of their drinking water supply. The specific events that led to the water quality debacle, lead exposure, heightened *Legionella* susceptibility, and

¹ Direct and indirect economic impacts of the Flint water crisis include, for example, financial consequences to individuals and homeowners; impacts on economic development opportunities and on the revenue base for public services; and the costs of exacerbated requirements for water infrastructure repair and rehabilitation as well as long-term public health and social services.

infrastructure damage are a litany of questionable decisions and failures related to several issues and events, including, but not limited to:

- Decisions related to the use of the Flint River as an interim water supply source.
- Inadequate preparation (for example, staffing, training and plant upgrades) for the switch to full-time use of the Flint Water Treatment Plant using the Flint River as the primary water supply source.
- Inadequate and improper sampling of distribution system water quality, potentially in violation of the Safe Drinking Water Act.
- Intransigent disregard of compelling evidence of water quality problems and associated health effects.
- Callous and dismissive responses to citizens' expressed concerns.
- Persistent delays in coordinating appropriate responses to the resultant public health crises once irrefutable evidence of exposure and poisoning was presented.

We cannot begin to explain and learn from these events—our charge—without also highlighting that the framework for this decision-making was Michigan's Emergency Manager Law. This law replaces the decision-making authority of locally elected officials with that of a state-appointed emergency manager. While one must acknowledge that emergency management is a mechanism to address severe financial distress, it is important to emphasize that the role of the emergency manager in Flint places accountability for what happened with state government.

Our complete findings and recommendations are provided throughout this report and also are summarized at the close of this Executive Summary. They are formulated to offer specific measures to better safeguard public health, enhance critical water system infrastructure, improve governmental decision-making and regulatory oversight, and mitigate the many negative health and economic effects facing the people of Flint. We hope that our findings and recommendations serve as a guide and template for remediation and recovery in Flint, and for safeguarding the health and well-being of residents across our state.

FWATF Membership, Charge and Scope of Review

The FWATF—composed of five members with experience and backgrounds in public policy, public utilities, environmental protection, public health, and health care—was appointed by Governor Rick Snyder on October 21, 2015.² We were charged with conducting an independent review of the contamination of the Flint water supply: what happened, why it occurred, and what is needed to prevent a reoccurrence in Flint or elsewhere in the state. We assessed ongoing mitigation efforts to help assure that short and long-term public health issues and water management concerns will be properly addressed to safeguard the health and well-being of the Flint community. We have developed findings and offer recommendations on the following:

- Roles of Government Entities in the Flint Water Crisis
 - State of Michigan
 - Michigan Department of Environmental Quality (MDEQ)
 - Michigan Department of Health and Human Services (MDHHS)
 - Michigan Governor's Office
 - State-Appointed Emergency Managers

² Paragraph summaries of the FWATF members' backgrounds and experience are provided as Appendix I.

- City of Flint
- Genesee County Health Department (GCHD)
- United States Environmental Protection Agency and the Lead and Copper Rule
- Issues Presented by the Flint Water Crisis
 - The Reality of Environmental Injustice
 - Perspectives from Flint
 - Flint Recovery
 - State-Wide Recommendations

Before completing this report, the Task Force issued three interim letters to Governor Snyder offering findings and recommendations requiring immediate response, as follows:³

1. The first letter, issued December 4, 2015, identified our concerns about coordination of response measures and the need for a framework to measure results and clearly delineate responsibilities for continuing actions to protect public health.
2. The second letter, issued December 29, 2015, addressed the critical and urgent need to establish responsibility and ensure accountability for what happened in Flint.
3. Our third letter, issued January 21, 2016, addressed the need for the state to engage the scientific experts who overcame state and federal agency intransigence to expose the lead poisoning, and similarly to engage trusted, scientific experts drawn from independent institutions to address the implications of the Legionellosis outbreak.

In conducting our interviews, we have had complete independence and largely⁴ unfettered access to local, state and federal government personnel. Interview subjects were not compelled to participate in our review, and the FWATF held no subpoena or judicial enforcement powers. We are grateful to the parties involved for their forthright willingness to discuss the events that transpired and their perspectives.

We acknowledge that other reviews and investigations are taking place, some with tools that the FWATF did not have, such as the subpoena and judicial enforcement powers mentioned above. We appreciate and support these reviews because the magnitude of this tragedy warrants deep and detailed investigation. It is our hope that these or other reviews examine certain issues we had neither the time nor investigative tools to fully explore, and that fell outside our immediate scope given the accelerated timeframe for our information gathering and rendering of judgments. These issues include, but are not limited to:

- State approval and permitting of the Karegnondi Water Authority (KWA) in a region that had ample water supply and treatment capacity, yet faced economic distress sufficient to warrant emergency management in its two largest urban centers.
- The appropriate role of regulatory agencies and the water utility industry in addressing the dangers presented by widespread use of lead in public and private plumbing systems.

³ The FWATF's interim letters to Governor Snyder are provided as Appendix II.

⁴ The FWATF was not successful in scheduling an interview with representatives of the firm Lockwood, Andrews, & Newnam (LAN) despite several requests. LAN requested that questions be submitted to them in writing, and the questions we submitted are included in Appendix IV. As of the time of publication, the FWATF has not received responses to these questions.

Historically, regulatory agencies and the water utility industry at large have been reluctant to address these dangers beyond use of corrosion control treatment.⁵ Though the industry now endorses strengthening of the Lead and Copper Rule and ultimate replacement of lead service lines (LSLs),⁶ the industry has not (with notable exceptions) been proactive in reducing risk through full LSL replacement programs and has highlighted utility customers' obligations to manage lead risks on private property. While the recommendations of the National Drinking Water Advisory Council (NDWAC) advance objectives of full LSL replacements, enhanced monitoring, and improved public education, concerns persist about accountability, oversight and enforcement.^{7,8}

- Protocols for environmental compliance enforcement when EPA has delegated primacy (authority to enforce federal law) to state agencies, yet retains ultimate responsibility for protection of public health and management of environmental risks.
- Budgets for public health activities at federal, state, and local levels to ensure that highly skilled personnel and adequate resources are available. The consequences of underfunding include insufficient and inefficient responses to public health concerns, which have been evident in the Flint water crisis.
- The need for greater clarity on local and state processes and procedures for declaring emergencies in response to man-made catastrophes (in contrast to natural disasters). The efforts of local, state, and federal emergency operations teams in Flint beginning in

⁵ Historically, water industry groups have maintained that removing lead from water and plumbing systems is not necessary and would involve significant difficulty and expense (see, for example, "Controlling Lead in Drinking Water," Water Research Foundation, 2015). Notably, when EPA's Lead and Copper Rule (LCR) was published in 1991, it required replacement of entire LSLs, and in 1994 the water industry sought in court to limit this requirement to only the publicly owned portions of service lines (40 F.3d 1266, AWWA vs. EPA, 1994). In response, EPA revised the LCR in 2000 to allow for partial service line replacement—a practice the CDC later maintained was associated with *increases* in blood lead levels ("Important Update: Lead-Based Water Lines," Howard Frumkin, MD; CDC, May 2010). The water industry historically has focused on controlling lead exposure risks through use of chemical corrosion control methods and has offered a number of related studies (as compiled in "Lead and Copper Corrosion: An Overview of WRF Research," Jonathan Cuppett, Water Research Foundation, updated January 2016). The American Water Works Association (AWWA) also has published communications guides on lead-in-water issues (see, for example, "Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement," AWWA, 2014; and "Strategies to Obtain Customer Acceptance of Complete Lead Service Line Replacement," AWWA, 2005). Yet industry guidance has taken the position that managing lead-related risks associated with LSLs and plumbing fixtures on private property is largely the utility customers' responsibility. Many water utilities have not informed customers proactively (if at all) about the presence of LSLs. As a result, customers generally have limited awareness of the potential need to take action to protect themselves from lead in drinking water.

⁶ See, for example, AWWA press release: "AWWA Board supports recommendation for complete removal of lead service lines," March 8, 2016.

⁷ For example, there are concerns that the voluntary, customer-initiated sampling approach recommended by the NDWAC will substantially decrease public water systems' ability to track presence of lead over time, identify emerging public health threats, and inform LSL replacement programs. For more information on additional concerns, see, for example, "Strength of New EPA Lead Rule Depends on Accountability," by Brett Walton, Circle of Blue, February 10, 2016, www.circleofblue.org/2016/world/strength-of-new-epa-lead-rule-depends-on-accountability/.

⁸ NDWAC and water utility industry representatives have highlighted concerns about the significant financial resources and time required to effect full LSL replacement, suggesting the need to support reasonable yet aggressive scheduling of LSL replacement through both enforcement measures (within the LCR) and resource commitments of local, state and federal entities.

January 2016⁹ have demonstrated that emergency operations can be deployed appropriately and with multi-level coordination. However, delays in Flint occurred due to reluctance to elevate concerns, confusion and disagreement among authorities about how and what levels of emergency status were appropriate, and extensive application requirements.

We also note and acknowledge that additional information will continue to be revealed as other investigations and reviews of the crisis are conducted. The narrative, findings and recommendations in this report are based on our interviews and the public record available through February 2016. We believe this information alone warrants urgent and thorough response and supports our recommendations.

We hope that our earlier letters and this report contribute to the collective understanding of what transpired, evoke thoughtful consideration of our recommendations, and—most importantly—further motivate sustained response and support for the Flint community and more earnest and effective protection of all Michigan residents.

Acknowledgements

The FWATF would not have been able to complete its work without the support of many individuals and organizations that dedicated their time, resources and passion to facilitate our review. We are indebted to the Michigan State University's Center for Local Government Finance and Policy for their administrative support and insights, particularly with regard to Michigan's emergency manager laws; and to Chris DeWitt of DeWitt Communications for keeping the task force informed regarding media coverage. We have been aided by technical insights from individuals in the water utility and public health communities, too numerous to name individually here, who have educated us on a broad range of issues. Where we have accurately stated the technical attributes of specific issues, it reflects on their guidance. We are responsible for any technical inaccuracies or unintentional misstatements of fact.

Perhaps most notably, we are deeply indebted to the members of the Flint community and safe drinking water and public health advocates who ultimately entrusted us with profound expressions of their frustrations, concerns, perspectives and hopes for the future. We are especially thankful to Flint residents for giving voice to the searing personal costs that are too often muted in the discourses about public policy implications. We are acutely aware that as we are a task force commissioned by the State of Michigan, their forthrightness was a leap of faith given what happened in Flint. We hope that our report honors their trust, advances their hopes for the future, and helps ensure that Michigan communities are safer.

⁹ The FWATF recommended to the Governor's office that an emergency be declared as early as November 2015 and issued its first letter to the Governor on December 4, 2015 noting the acute need for more effective coordination of activities.

Findings of the Task Force

Note: Footnotes and text supporting these findings and recommendations are provided in the individual sections of the report. The footnotes and text provide substantive detail and important context for our findings and recommendations. Also please note that the findings and recommendations are independent lists; the findings do not correlate one-to-one to the recommendations.

Michigan Department of Environmental Quality (MDEQ):

- F-1. MDEQ bears primary responsibility for the water contamination in Flint.
- F-2. MDEQ, specifically its Office of Drinking Water and Municipal Assistance (ODWMA), suffers from cultural shortcomings that prevent it from adequately serving and protecting the public health of Michigan residents.
- F-3. MDEQ misinterpreted the LCR and misapplied its requirements. As a result, lead-in-water levels were under-reported and many residents' exposure to high lead levels was prolonged for months.
- F-4. MDEQ waited months before accepting EPA's offer to engage its lead (Pb) experts to help address the Flint water situation and, at times, MDEQ staff were dismissive and unresponsive.
- F-5. MDEQ failed to move swiftly to investigate, either on its own or in tandem with MDHHS, the possibility that Flint River water was contributing to an unusually high number of Legionellosis cases in Flint.

Michigan Department of Health and Human Services (MDHHS):

- F-6. MDHHS's lack of timely analysis and understanding of its own data on childhood blood lead levels, along with its reliance on MDEQ and reluctance to share state data with Dr. Mona Hanna-Attisha and Professor Marc Edwards, prolonged the Flint water crisis.
- F-7. MDHHS bears ultimate responsibility for leadership and coordination of timely follow-up efforts in Flint and across the state regarding childhood lead poisoning. While local entities (for example, healthcare professionals, GCHD, health insurance plans) are partners in efforts to protect children from lead poisoning, MDHHS has the lead role and failed to exercise its responsibility.
- F-8. The consequences of lead exposure for Flint residents are expected to be long-term and will necessitate sustained investments in education, public and mental health, juvenile justice, and nutrition needs over the next 10 to 20 years.
- F-9. Too few children in Michigan are screened for lead through routine blood tests as recommended for children ages 1 and 2. Statewide screening goals for children enrolled in Medicaid are met in very few instances at the county level or within Medicaid health plans. This lack of information leaves parents, healthcare professionals, and local and state public health authorities uninformed about the possibility of lead poisoning for thousands of Michigan children.
- F-10. Coordination between MDEQ and MDHHS was inadequate to properly address the public health issues related to water quality in Flint. Communication was infrequent, and when it did occur, the default position was to conclude that the health problems were not related

to the water supply switch – rather than to assume that the problems might be related to the switch.

- F-11. Communication and coordination among local and state public health staff and leadership regarding Legionellosis cases in 2014-2015 was inadequate to address the grave nature of this outbreak. The fact that these cases occurred *while* there were several simultaneous concerns about quality and safety of water in Flint should have caused public health staff and leadership at local and state levels to coordinate their actions to ensure a prompt and thorough investigation.

Michigan Governor’s Office:

- F-12. Ultimate accountability for Michigan executive branch decisions rests with the Governor.

- F-13. The Governor’s knowledge, and that of Governor’s office staff, of various aspects of the Flint water crisis was compromised by the information—much of it wrong—provided by MDEQ and MDHHS.

- F-14. The Governor’s office continued to rely on incorrect information provided by these departments despite mounting evidence from outside experts and months of citizens’ complaints throughout the Flint water crisis, only changing course in early October 2015 when MDEQ and MDHHS finally acknowledged the extent of the problem of lead in the public water supply.

- F-15. The suggestion made by members of the Governor’s executive staff in October 2014 to switch back to DWSD should have resulted, at a minimum, in a full and comprehensive review of the water situation in Flint, similar to that which accompanied the earlier decision to switch to KWA. It was disregarded, however, because of cost considerations and repeated assurances that the water was safe. The need to switch back to DWSD became even more apparent as water quality and safety issues continued and lead issues began to surface in 2015, notwithstanding reassurances by MDEQ.

- F-16. The Flint water crisis highlights the risks of over-reliance—in fact, almost *exclusive* reliance—on a few staff in one or two departments for information on which key decisions are based.

- F-17. Official state public statements and communications about the Flint water situation have at times been inappropriate and unacceptable.

State-Appointed Emergency Managers:

- F-18. Emergency managers, not locally elected officials, made the decision to switch to the Flint River as Flint’s primary water supply source.

- F-19. Treasury officials, through the terms of the local emergency financial assistance loan executed by the Flint emergency manager on April 29, 2015, effectively precluded a return to DWSD water, as Flint citizens and local officials were demanding, without prior state approval.

- F-20. The role of the emergency managers in Flint (in combination with MDEQ’s failures) places primary accountability for what happened with state government.

- F-21. Emergency managers charged with financial reform often do not have, nor are they supported by, the necessary expertise to manage non-financial aspects of municipal government.
- F-22. Michigan's Emergency Manager Law and related practices can be improved to better ensure that protection of public health and safety is not compromised in the name of financial urgency.

City of Flint:

- F-23. Flint Public Works personnel were ill-prepared to assume responsibility for full-time operation of the Flint WTP and distribution system.
- F-24. The Flint Water Treatment Plant (WTP) and installed treatment technologies were not adequate to produce safe, clean drinking water at startup of full-time operations. Flint's lack of reinvestment in its water distribution system contributed to the drinking water crisis and ability to respond to water quality problems.
- F-25. Flint Public Works personnel failed to comply with LCR requirements, including the use of optimized corrosion control treatment and monitoring for lead. Flint personnel did not identify residences with LSLs, secure an adequate number of tap water samples from high-risk homes, or use prescribed sampling practices (for example, line and tap flushing methods and sample bottle sizes).
- F-26. Flint Public Works acted on inaccurate and improper guidance from MDEQ.
- F-27. Many communities similarly rely on MDEQ to provide technical assistance and guidance on how to meet regulatory requirements. In the case of Flint, MDEQ assistance was deeply flawed and lax, which led to myopic enforcement of regulations designed to protect public health.
- F-28. The emergency manager structure made it extremely difficult for Flint citizens to alter or check decision-making on preparations for use of Flint River water, or to receive responses to concerns about subsequent water quality issues.

Genesee County Health Department (GCHD):

- F-29. Communication, coordination and cooperation between GCHD, the City of Flint and MDHHS were inadequate to protect Flint residents from public health threats resulting from inadequately treated Flint River water.
- F-30. The rate of follow-up on children with elevated blood lead levels through January 2016 was unacceptable, illustrating a low level of coordination between GCHD and MDHHS and insufficient resources devoted to this task.
- F-31. Management of the Flint River-sourced water supply may have contributed to the outbreaks of Legionellosis in 2014 and 2015 in Genesee County. Although the definitive cause of the outbreaks is uncertain at the time of publication, GCHD and MDHHS did not notify the public of the outbreaks in a timely fashion in order to urge caution.

United States Environmental Protection Agency (EPA):

- F-32. EPA failed to properly exercise its authority prior to January 2016. EPA's conduct casts doubt on its willingness to aggressively pursue enforcement (in the absence of

widespread public outrage). EPA could have exercised its powers under Section 1414 and Section 1431 of the SDWA or under the LCR, 40 CFR 141.82(i).

- F-33. Despite the clear intent of the LCR, EPA has accepted differing compliance strategies that have served to mute its effectiveness in detection and mitigation of lead contamination risks. These strategies have been adopted at water systems and primacy agencies across the country. Though there may be some ambiguity in LCR rule, none of it relates to what MDEQ should have done in Flint. There was and remains no justification for MDEQ not requiring corrosion control treatment for the switch of water source to the Flint River.
- F-34. EPA was hesitant and slow to insist on proper corrosion control measures in Flint. MDEQ misinformation notwithstanding, EPA's deference to MDEQ, the state primacy agency, delayed appropriate intervention and remedial measures.
- F-35. EPA tolerated MDEQ's intransigence and issued, on November 3, 2015, a clarification memo on the LCR when no such clarification was needed.

Issues Presented by the Flint Water Crisis:

- F-36. The Flint water crisis is a clear case of environmental injustice.

Recommendations of the Task Force

Note: Footnotes and text supporting these findings and recommendations are provided in the individual sections of the report. The footnotes and text provide substantive detail and important context for our findings and recommendations. Also please note that the findings and recommendations are independent lists; the findings do not correlate one-to-one to the recommendations.

Michigan Department of Environmental Quality (MDEQ):

- R-1. Implement a proactive, comprehensive cultural change program within MDEQ, specifically its ODWMA, to refocus the department on its primary mission to protect human health and the environment. MDEQ should aspire to become a national leader through a proactive program designed to detect and address contaminants in public water supplies in a timely manner.
- R-2. Establish an apprenticeship/certification program for MDEQ ODWMA employees that requires direct, hands-on experience with public water system operations. MDEQ ODWMA employees responsible for water system regulation and SDWA enforcement should be, or have access to, certified operators and subject matter experts (including, for example, those at EPA).
- R-3. Strengthen SDWA enforcement, most notably for the LCR. The state has the ability to strengthen its own enforcement of the SDWA and not wait for action to occur at the federal level.
- R-4. Participate in the Flint Water Inter-Agency Coordinating Committee's (FWICC's) work team established to oversee conversion from DWSD-supplied to KWA-delivered water. MDEQ should draw from that work to revise its policies and procedures for approval of water treatment and distribution system operating regimens, particularly when source water changes are contemplated.
- R-5. Participate in EPA's ongoing review and revision of the LCR, conveying lessons learned from the Flint water crisis.

Michigan Department of Health and Human Services (MDHHS):

- R-6. Establish policies and procedures at MDEQ and MDHHS to ensure input by health experts and scientists when permit decisions may have a direct impact on human health.
- R-7. Establish and maintain a Flint Toxic Exposure Registry to include all the children and adults residing in Flint from April 2014 to present.
- R-8. Re-establish the Michigan Childhood Lead Poisoning Prevention and Control Commission.
- R-9. Ensure that MDHHS is transparent and timely in reporting and analysis of aggregate data regarding children's blood lead levels. MDHHS data regarding lead levels shall be provided to individuals and organizations, based on their expertise, upon request and in cases when the interpretation of data by MDHHS is questioned.
- R-10. Establish a more aggressive approach to timely clinical and public health follow-up for all children known to have elevated blood lead levels, statewide. MDHHS should expand its local efforts and partnerships to accomplish this goal. Whenever possible, routine

screening for lead and appropriate follow-up should occur in children's primary care medical homes.

- R-11. Strive to be a national leader in monitoring and responding to exposure of children to lead by converting the Childhood Lead Poisoning Prevention Program (CLPPP) from passive collection of test results into an active surveillance and outreach program.
- R-12. Improve screening rates for lead among young children through partnerships with county health departments, health insurers, hospitals, and healthcare professionals.
- R-13. As the state authority on public health, and as the organization that conducted the epidemiologic study of Legionellosis cases in Genesee County in 2014-15, take responsibility for coordinating with GCHD and CDC to protect Michigan residents from further outbreaks of Legionellosis.
- R-14. In cases of switches in drinking water supplies in the future, assume that outbreaks of Legionellosis cases may be related to changes in water source and communicate the potential risk to the public, rather than assuming and communicating the opposite.

Michigan Governor's Office:

- R-15. Expand information flow to the Governor so that information providing the foundation for key decisions comes from more than one trusted source—and is verified.
- R-16. Create a culture in state government that is not defensive about concerns and evidence that contradicts official positions, but rather is receptive and open-minded toward that information. View informed opinions—even if critical of state government—as an opportunity for re-assessing state positions, rather than as a threat.
- R-17. Ensure that communications from all state agencies are respectful, even in the face of criticism, and sensitive to the concerns of diverse populations.
- R-18. The Governor must assume the leadership of, and hold state departments accountable for, long-term implementation of the recommendations in this report, including but not limited to the need for cultural changes across multiple state agencies, the need for health mitigation and LSL replacement in Flint, and the need for a funding strategy to address replacement of LSLs statewide.
- R-19. Review budget requests for MDEQ to ensure adequate funding is provided to the ODWMA. EPA audit and interviews indicate that Michigan's drinking water program might have one of the lowest levels of financial support within EPA Region V while having one of the largest, if not the largest, number of community water systems to regulate.

State-Appointed Emergency Managers:

- R-20. Review Michigan's Emergency Manager Law (PA 436) and its implementation, and identify measures to compensate for the loss of the checks and balances that are provided by representative government.
- R-21. Consider alternatives to the current emergency manager approach—for example, a structured way to engage locally elected officials on key decisions; an Ombudsman function in state government to ensure that local concerns are a factor in decisions made by the emergency manager; and/or a means of appealing emergency manager decisions to another body.

R-22. Ensure proper support and expertise for emergency managers to effectively manage the many governmental functions of a city. Decisions on matters potentially affecting public health and safety, for example, should be informed by subject matter experts identified and/or provided by the state.

City of Flint:

R-23. Establish and fund a team of subject matter experts in water system operations (treatment and distribution system management) to support and train water system personnel, guide safe system operation under current conditions, and prepare for successful conversion to KWA.

R-24. Implement a programmatic approach to Flint WTP and distribution system operations, maintenance, asset management, water quality, capital improvements and public engagement (including risk communication) to ensure that the disparate ongoing efforts to address Flint water system infrastructure needs are coordinated, fully documented, and structured to sustain high-quality potable water service over the long term.

R-25. Implement a robust public engagement and involvement program in conjunction with the anticipated conversion to KWA-delivered water and provide for regular reporting to the Flint Water Inter-Agency Coordinating Committee (FWICC).

Genesee County Health Department (GCHD):

R-26. Improve follow-up on public health concerns between GCHD, MDHHS and the City of Flint now and in the future, to effect timely, comprehensive, and coordinated activity and ensure the best health outcomes for children and adults affected.

R-27. Presume that the risk of *Legionella* may remain elevated in the Flint water distribution system and must take appropriate steps with public and private partners to monitor and mitigate that risk as concerns about water quality continue in the City of Flint.

R-28. Coordinate with state officials (MDHHS) and with local healthcare professionals and healthcare institutions in Genesee County and the City of Flint to mitigate the risk of Legionellosis in 2016 and beyond.

United States Environmental Protection Agency (EPA):

R-29. Exercise more vigor, and act more promptly, in addressing compliance violations that endanger public health.

R-30. In collaboration with the NDWAC and other interested partners, clarify and strengthen the LCR through increased specificity and constraints, particularly requirements related to LCR sampling pools, sample draw protocols, and LSL replacements—and, more generally, strengthen enforcement protocols with agencies delegated primacy.

R-31. Engage Michigan representatives in ongoing LCR revisions and development of enforcement protocols at EPA and MDEQ.

Issues Presented by the Flint Water Crisis

Environmental Injustice:

R-32. Issue an Executive Order mandating guidance and training on Environmental Justice across all state agencies in Michigan, highlighting the Flint water crisis as an example of environmental injustice. The state should reinvigorate and update implementation of an Environmental Justice Plan for the State of Michigan.

Flint Recovery and Remediation:

R-33. Sustainably fund the Flint Water Inter-Agency Coordinating Committee (FWICC) to provide adequate resources to engage supporting sub-committees for delivery of public health and water system services.

R-34. Clarify and effectively communicate the roles, work and expected outcomes of the City of Flint, FWICC and Mission Flint.

R-35. Through collaboration among MDHHS, GCHD, local healthcare professionals, and health insurance plans, ensure 100 percent clinical and environmental follow-up with Flint families whose children have been found to have elevated blood lead levels since April 2014, and work together to ensure that follow-up occurs in children's medical homes.

R-36. Offer all children listed in the recommended Flint Toxic Exposure Registry timely access to age-appropriate screening and clinically indicated follow-up for developmental and behavioral concerns by licensed healthcare professionals, as well as access to early childhood education and nutrition services.

R-37. Consider establishing a dedicated subsidiary fund in the Michigan Health Endowment Fund to facilitate funding of health-related services for Flint.

R-38. Establish a comprehensive Flint public health program, coordinated with county and state-level public health initiatives, that can serve as a model for population health across the state. This program should provide assessment, interventions, and support not only regarding the health effects of water contamination but also more broadly regarding the health effects of chronic economic hardship and other social determinants of poor health.

State-wide Recommendations:

R-39. Conduct an investigative review of the development and approval of the Karegnondi Water Authority and of the City of Flint's commitments to KWA water purchases.

R-40. Institute a school and daycare water quality testing program (which could serve as a model for the U.S.), administered collaboratively by MDEQ and MDHHS, that includes appropriate sampling and testing for lead contamination for all schools and childcare centers in the state and effective reporting of test results.

R-41. Develop a model LSL replacement program and funding mechanisms for financing work on private property.

R-42. Revise and enhance information distributed by public water systems on the implications of widespread use of lead in public and private plumbing.

- R-43. Use the occasion of the Flint water crisis to prompt local and state re-investment in critical water infrastructure, while providing mechanisms to advance affordability and universal access to water services.
- R-44. Prioritize health matters across all state agencies with establishment of a new Cabinet-level post focused on public health.

Background¹⁰

Flint, Michigan

The beleaguered history of Flint, Michigan over the last several decades is well known,¹¹ yet some facts are particularly important to provide context for our findings and recommendations.

The City of Flint has suffered dramatic declines in population. From a peak of more than 200,000 in 1960, Flint's population had fallen below 100,000 residents by 2014. Since 2000, Flint has lost over 20 percent of its population.¹² Of the remaining residents, approximately 57 percent are Black or African American.¹³

Poverty is endemic in Flint, with 41.6 percent of the population living below federal poverty thresholds—2.8 times the national poverty rate. The median value of owner-occupied housing is \$36,700, roughly one-fifth of the national average.¹⁴ Crime plagues the community; for 2013, Flint's crime index was 811 as compared to a national average of 295.¹⁵

Even before the Flint water crisis, Genesee County (in which Flint is the largest population center) exhibited poor health statistics. In a 2015 study, the county ranked 81st out of 82 Michigan counties in health outcomes. It ranked 78th in length of life, 81st in quality of life, 77th in health behaviors, 78th in social and economics factors, and 75th in physical environment measures. Only the quality of clinical care, for which the county ranked 22nd, is not a cause of acute community concern.¹⁶

Water Crisis

The Flint Water System was first organized in 1883 under private ownership, and the City purchased the water system in 1903. Before 1967, Flint treated Flint River water at its Water Treatment Plant (WTP). To ensure adequacy and reliability of water supplies, in 1967 Flint signed a long-term water supply contract with the Detroit Water and Sewerage Department (DWSD). From 1967 through 2014, the Flint WTP served as an emergency backup to DWSD-supplied water. As such, the Flint WTP was not operated on an ongoing day-to-day basis, but rather four times per year to maintain readiness as an emergency backup. The WTP was also upgraded periodically to keep it ready for use as an emergency backup.

¹⁰ The series of events and decisions that led to the Flint water crisis are (now) well documented, thanks to the tireless efforts of local activists and journalists. In addition, the public record has been supplemented by the release of e-mails and other documents by the Governor's office and key state agencies. We are indebted to this construction of a substantial public record. We believe that this public record, in combination with insights obtained through our interview process, provides more than ample basis for our findings and recommendations.

¹¹ For extensive information on Flint's economic decline and troubled circumstances, see the report and endnotes provided in "Long-Term Crisis and Systemic Failure: Taking the Fiscal Stress of America's Older Cities Seriously: Case Study, Flint Michigan," by Eric Scorson, Ph.D. and Nicolette Bateson, Michigan State University Extension, September 2011.

¹² BiggestUSCities.com, www.biggestuscities.com/city/flint-michigan

¹³ U.S. Census, Quickfacts for Flint, Michigan and the United States, www.census.gov/quickfacts/table/PST045215/00

¹⁴ Ibid

¹⁵ City-Data.com, www.city-data.com/crime/crime-Flint-Michigan.html

¹⁶ County Health Rankings,

www.countyhealthrankings.org/app/michigan/2015/rankings/genesee/county/outcomes/overall/snapshot

DWSD provided water to Flint under a 35-year contract signed on December 20, 1965. The initial contract term expired in 2000 and renewed each year unless it was terminated by either party. As one of DWSD's wholesale customers, Flint was subject to the terms and rate-setting practices applicable to all of DWSD's wholesale customer communities. During the final 10 years that Flint received contractual service from DWSD, the average annual increase in water charges to Flint was 6.2 percent. DWSD's water supply has been treated for corrosion control for over 20 years and is deemed optimized for corrosion control treatment.

On April 16, 2013, after a symbolic Flint City Council vote that accompanied the Flint emergency manager's decision, the City joined the Karegnondi Water Authority (KWA), which had been established to develop a raw water supply pipeline from Lake Huron. After being advised of the City of Flint's intent, DWSD notified the City of the termination of its then-current water supply contract terms, effective April 2014. DWSD and the City of Flint, both under emergency management, continued unsuccessfully to negotiate alternative water supply terms. Although the State of Michigan was in control of both cities at the time, efforts to arrive at an agreement between the parties during the final year of service to the City of Flint ultimately failed.

In April 2014, the City of Flint began treating Flint River water at the Flint WTP on a full-time basis and distributing the treated water to its customers. A critical element of that treatment—corrosion control, as required under EPA's Lead and Copper Rule (LCR)—was (incorrectly) determined by MDEQ not to be required immediately; instead, Flint could complete two 6-month monitoring periods and MDEQ would then determine whether corrosion control was necessary. Soon after the City began distributing treated water from the Flint WTP, Flint residents began to complain about its odor, taste and appearance. Numerous water quality problems and operational challenges resulted in water quality violations related to *E coli* contamination and disinfection by-products (total trihalomethanes or TTHMs). Ultimately, the corrosiveness of the drinking water leached lead from pipes and plumbing fixtures, and it may have increased the likelihood of water contamination with *Legionella*.¹⁷

Summary Timeline of Key Events

In this economically disadvantaged and ethnically diverse Michigan community, a series of disastrous decisions and events occurred. Following are the events most critical to development of our findings and recommendations:¹⁸

1. 1967: City of Flint enters into long-term water supply contract with the Detroit Water and Sewerage Department (DWSD).
2. 1991: U.S. Environmental Protection Agency (EPA) issues the Lead and Copper Rule to ensure routine local testing of drinking water and assurance of safe levels of lead and copper.
3. January 23, 2013: Mike Prysby/MDEQ e-mails colleague Liane Shekter Smith and others about feasibility of Flint switching to the Flint River, highlighting water quality concerns.

¹⁷ Bouffard K. Hospital ties Legionellosis to Flint water. *Detroit News*, January 23, 2016, www.detroitnews.com/story/news/politics/2016/01/22/legionnaires-bacteria-found-tests-mclaren-medical-centers-water/79183428/.

¹⁸ Appendix V provides a further, more detailed timeline that attempts to synthesize numerous timelines developed by other sources, including local media and government agencies.

4. March 26, 2013: Stephen Busch/MDEQ e-mails MDEQ Director Dan Wyant with Liane Shekter Smith and other MDEQ staff copied, with warnings about public health risks associated with Flint River water.
5. March 28, 2013: State Treasurer Andy Dillon e-mails Governor Snyder notifying him of his approval of Flint joining Karegnondi Water Authority (KWA) and MDEQ concurrence.
6. April 16, 2013: Flint Emergency Manager (EM) Ed Kurtz signs agreement with KWA and informs the State Treasurer that the City will join KWA (decision officially announced May 1, 2013).
7. April 17, 2013: DWSD issues letter to Flint notifying termination of contract to provide water service. Negotiations continue to establish alternative contractual arrangements for DWSD service to Flint.
8. June 26, 2013: Flint EM Ed Kurtz authorizes a sole-source contract with the firm of Lockwood, Andrews, & Newnam (LAN) for professional engineering services to place the Flint Water Treatment Plant (WTP) into operation using the Flint River as a primary drinking water source.
9. March 26, 2014: Stephen Busch/MDEQ e-mails Liane Shekter Smith and Richard Benzie/MDEQ on clarifying what Flint will be required to do before beginning full-time Flint WTP operation.
10. April 16-17, 2014: Michael Glasgow/Flint Utilities Department e-mails MDEQ, noting unpreparedness of Flint WTP and apparent political pressure to start distributing water.
11. April 29, 2014: Flint EM Darnell Earley notifies Detroit EM that Flint has switched water supply sources to the Flint River. Genesee County Drain Commission remains as a non-contract customer of DWSD.
12. July 1, 2014: Flint begins first 6-month monitoring period for lead and copper in drinking water.
13. August 15, 2014: *E. coli* bacteria violation in water sampled from the Flint distribution system leads to local boil water advisory.
14. September 10, 2014: MDEQ requests pre-emptive operational evaluation for disinfection byproducts called trihalomethanes (THMs).
15. October 1, 2014: MDEQ submits briefing paper to Governor's office re: City of Flint drinking water situation (boil water notices). Genesee County Health Department (GCHD) expresses concern to Flint Public Works regarding increased incidence of cases of Legionellosis since April 2014, and the possible relationship to use of the Flint River as the water supply. MDHHS epidemiology staff expresses concern but there is no further state-level evaluation.
16. October 13, 2014: General Motors (GM) announces that it will cease to use Flint WTP-sourced water for its Flint Engine Operations facility until the KWA connection is completed, due to corrosion concerns related to the chloride levels in water from the Flint WTP. MDEQ notes chloride in Flint WTP-treated water is within public health guidelines.
17. October 14, 2014: Valerie Brader, State Deputy Legal Counsel and Senior Policy Advisor, e-mails Governor's Chief of Staff Dennis Muchmore and other top aides arguing for a return to DWSD because of water quality problems. Michael Gadola, then the Governor's Legal Counsel, responds by agreeing with Brader. Brader and Rich Baird, another senior aide to

- the Governor, then discuss the idea with Emergency Manager Darnell Earley, who maintains the water quality problems can be solved and it would be cost-prohibitive to return to DWSD.
18. December 16, 2014: MDEQ notifies Flint of initial quarterly violation of SDWA Disinfection Byproducts (total trihalomethane, or TTHM) requirements.
 19. December 31, 2014: First 6-month round of LCR monitoring ends. Using 100 samples not necessarily drawn from highest risk homes (as the LCR intends), the 90th percentile lead level result is 6 parts per billion with 2 samples above action levels for lead (15 parts per billion). Given the 6 ppb result, Flint is disqualified from being exempted and will have to implement corrosion control treatment under the LCR, irrespective of subsequent 6-month monitoring results. MDEQ fails to properly advise Flint WTP of this regulation.
 20. January 12, 2015: In response to water quality concerns, the state installs water coolers in state offices in Flint, and state employees are given the option in their offices to use bottled water and provide bottled water to visitors.
 21. January 27, 2015: MDHHS epidemiology staff member contacts Genesee County Health Department (GCHD) to recommend that they construct a map of Legionellosis cases and correlate them to the City's water service area.
 22. January 2015 (date unclear): Staff from Genesee County hospitals, MDHHS, MDEQ and GCHD meet, and MDHHS Director Nick Lyon directs GCHD to conduct and complete its evaluation of the causes of the increased Legionellosis cases that had begun to occur in 2014.
 23. January 27, 2015: FOIA request sent by GCHD environmental hygienist James Henry to Flint DPW and Flint Mayor for information on water treatment to support the county's investigation of Legionellosis cases.
 24. January 30, 2015: Brad Wurfel/MDEQ e-mails Dave Murray, Governor Snyder's deputy press secretary, re: *Legionella*, saying said he didn't want MDEQ Director Wyant "to say publicly that the water in Flint is safe until we get the results of some county health department traceback work on 42 cases of Legionellosis in Genesee County since last May."
 25. February 25, 2015: LeeAnne Walters contacts EPA Region V regarding high levels of lead (104 ppb) found in drinking water at her home.
 26. February 26, 2015: Initial EPA-MDEQ correspondence regarding elevated lead in sample collected from LeeAnne Walters's house. Jennifer Crooks/EPA speculates Flint River water chemistry is leaching contaminants from pipes; this prompts the EPA's initial query of MDEQ about whether optimized corrosion control treatment (OCCT) is in place at the Flint WTP.
 27. February 26, 2015: Mike Prysby/MDEQ emails Jennifer Crooks/EPA indicating that all other samples in the monitoring period for July 1, 2014 through December 31, 2014 are below the EPA action level of 15 ppb.
 28. February 27, 2015: Miguel Del Toral/EPA, in e-mails to MDEQ and EPA staff, mentions possibility of biasing lead results low by collecting samples after flushing water through the taps; asks again about Flint OCCT, saying "they are required to have OCCT in place."

29. February 27, 2015: Stephen Busch/MDEQ e-mails Jennifer Crooks and Miguel Del Toral/EPA saying that the 90th percentile is 6 ppb for the monitoring period July 1-December 31, 2014 and that Flint has an optimized corrosion control program, and talks about EPA regulations requiring targeted sample pool to focus on highest risk homes.
30. March 3, 2015: In response to local complaints regarding drinking water quality and related health effects, Flint EM Ambrose cites \$12 million in costs associated with returning to DWSD.
31. March 12, 2015: Stephen Busch/MDEQ e-mails colleagues stating that there is no confirmation of *Legionella* in the water supply. No test data are provided to substantiate this statement.
32. March 13, 2015: Brad Wurfel/MDEQ e-mails Harvey Hollins/Governor's office and Dan Wyant/MDEQ noting uptick in Legionellosis cases, placing responsibility for follow-up on GCHD, and discounting GCHD environmental hygienist Jim Henry's concerns about a possible relationship between uptick in Legionellosis and change in water source.
33. March 13, 2015: Stephen Busch/MDEQ e-mails Jim Henry/GCHD stating there is unlikely to be *Legionella* at the Flint WTP, but that water main breaks and leaks may permit entry of *Legionella* into the water supply. Busch advises contacting MDHHS, but does not himself contact MDHHS.
34. March 30, 2015: MDEQ notifies Flint of results of first 6-month lead and copper monitoring period (July-December 2014) showing 6 ppb result.
35. March 31, 2015: Jennifer Crooks/EPA corresponds with MDEQ regarding a conference call that focused on increased cases of Legionellosis.
36. April 25, 2015: Miguel del Toral/EPA e-mails Pat Cook/MDEQ, questions how a large water system can be deemed to have optimal corrosion control without treatment, cites federal regulations that provide the only two scenarios for large systems to be deemed to have optimized corrosion control, and shows that Flint does not meet either of the two scenarios.
37. April 27, 2015: Miguel Del Toral/EPA e-mails Tom Poy/EPA and other colleagues stating that Pat Cook/MDEQ has confirmed the Flint WTP has no corrosion control treatment (CCT), which is "very concerning given the likelihood of lead service lines in the city."
38. April 27, 2015: Laurel Garrison/CDC e-mails GCHD stating that the Legionellosis outbreak in Genesee County is "very large, one of the largest in the past decade."
39. April 27, 2015: Miguel Del Toral/EPA visits LeeAnne Walters's house to inspect plumbing and deliver sampling bottles.
40. April 27, 2015: Pat Cook and Stephen Busch/MDEQ exchange e-mails complaining about Del Toral/EPA's questions on corrosion control treatment.
41. May 29, 2015: MDHHS's Surveillance of Infectious Diseases and Epidemiology team produces a report regarding Legionellosis cases in Genesee County in 2014-2015; the conclusion of the report is that "the outbreak is over."¹⁹

¹⁹ Of the Legionellosis cases in 2014-2015, 42 percent had healthcare (hospital) contact; 47 percent had contact with the Flint water supply. The report indicates that the lack of clinical specimens from patients prohibited

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42. June 24, 2015: Miguel Del Toral (EPA) provides Tom Poy/EPA his “Interim Report: High Lead Levels in Flint, Michigan,” summarizing information and concerns about lead levels in drinking water in Flint.
 43. June 10, 2015: EPA/MDEQ conference call includes discussion of the fact that Flint does not have CCT in place.
 44. June 25, 2015: Adam Rosenthal/MDEQ e-mails Mike Glasgow and Brent Wright/Flint Utilities Department (copying Mike Prysby and Stephen Busch/MDEQ) reminding them that 61 more lead and copper samples need to be collected and sent to the lab by June 30, 2015, “and that they are will be [sic] below the AL [action level] for lead. As of now with 39 results, Flint’s 90th percentile is over the AL for lead.”
 45. July 7, 2015: MDEQ is contacted by the American Civil Liberties Union regarding a draft letter from Miguel Del Toral/EPA to LeeAnne Walters that raises concerns about possible leaching of lead from service lines without appropriate corrosion control.
 46. July 10, 2015: Susan Hedman/EPA Region 5 (based in Chicago) writes to Flint Mayor Walling to say that EPA will work with MDEQ on issues related to lead in water.
 47. July 22, 2015: Governor Snyder’s chief of staff Dennis Muchmore e-mails director of MDHHS expressing that many members of the Flint community are raising concerns about water but feel they are not being heard.
 48. July 23, 2015: Linda Dykema/MDHHS e-mails Deputy Director of Population Health and Community Services Susan Moran and others at MDHHS (though not Director Lyon) stating that she has corresponded with MDEQ and that there has been no change in compliance regarding Flint water quality and appropriate state and federal law, and that Miguel Del Toral/EPA “acted outside of his authority” (these are MDEQ talking points).
 49. July 24, 2015: In response to Muchmore e-mail, Brad Wurfel/MDEQ writes, “The bottom line is that the residents of Flint do not need to worry about lead in the water supply, and MDEQ recent sampling does not indicate eminent [sic] health threat from lead.” Muchmore responds, “Thanks.”
 50. July 28, 2015: MDHHS epidemiologist Cristin Larder finds that children’s blood lead tests conducted in summer 2014 “lie outside the control limit” compared with prior years and that this finding “does warrant further investigation.” On the same day, CLPPP data manager Robert Scott analyzes the data over a 5-year period and concludes that “water was not a major factor.” Later that day, CLPPP manager Nancy Peeler concludes that the lack of persistently elevated blood lead levels in children in Flint beyond the summer months indicates no connection to the change in water in Flint in 2014. Larder then receives email communication from Peeler: Peeler has concluded from CLPPP data and communicated with MDHHS leadership that there is no problem with children’s lead levels in Flint.
 51. August 27, 2015: Virginia Tech professor Marc Edwards releases his first set of findings regarding tests of water in Flint. Over half of 48 samples have lead levels of more than 5 parts per billion (ppb) and 30 percent of samples have lead levels greater than 15 ppb.

testing that could have made a definitive link to the water supply as a source of *Legionella*. It indicates that there should be vigilance in 2015 regarding possible new cases of Legionellosis, including collection of clinical specimens.

52. August 31, 2015: EPA/MDEQ conference call: second 6-month monitoring test results for January 1-July 31, 2015 indicate 90th percentile at 11 ppb. It is determined that CCT is needed and implementation steps are delineated.
53. August 31, 2015: Brad Wurfel/MDEQ raises concerns about Professor Edwards's tests and accompanying media coverage to MDEQ, Muchmore, Harvey Hollins, Dave Murray and Sara Wurfel of Governor's office. There is no apparent communication with MDHHS regarding this issue.
54. September 8, 2015: Virginia Tech posts to FlintWaterStudy.org sample testing results on 252 samples of 300 sample kits provided. The Virginia Tech researchers concluded that: "mathematically, even if the remaining 48 samples returned have non-detectable lead... FLINT HAS A VERY SERIOUS LEAD IN WATER PROBLEM." Of the 252 water samples, 101 have lead in excess of 5 ppb. Flint's 90th percentile in Edwards' survey was 25 ppb. Several samples were over 100 ppb and one of the samples as over 1,000 ppb.
55. September 9-12, 2015: MDHHS begins to develop educational program materials for the public regarding reducing the risk of lead exposure for children, in response to media coverage of Professor Edwards's water testing results.
56. September 22, 2015: Dr. Mona Hanna-Attisha, director of the pediatric residency program at Hurley Medical Center, contacts Robert Scott/MDHHS to request access to the state's childhood lead testing records. This is a similar request to one filed by Professor Edwards several weeks before, to which the state had yet to respond. No data are shared.
57. September 23, 2015: Nancy Peeler/MDHHS, director of the state's Childhood Lead Poisoning Prevention Program (CLPPP), e-mails Robert Scott/MDHHS to consider re-running the analysis that had been conducted in July, and asks for formal epidemiologic help. Later that day, Mikelle Robinson/MDHHS writes to colleagues that the Governor's office briefing maintains that Flint water does not represent an "imminent public health problem."
58. September 24, 2015: Dr. Hanna-Attisha presents her findings about children tested for lead in a press conference at Hurley Medical Center, reporting that the proportion of children with elevated blood lead levels has increased since the switch to the Flint River water source in April 2014. MDHHS issues comments emphasizing differences between the Hurley analysis and preceding internal analyses by MDHHS that were not shared publicly. That same day, Robert Scott/MDHHS writes in an internal memo that he sees patterns in blood lead levels similar to what Dr. Hanna-Attisha has reported.
59. September 28, 2015: MDHHS Director Nick Lyon calls for analysis of the blood lead levels in order to "make a strong statement with a demonstration of proof that the blood lead levels seen are not out of the ordinary." No such analysis is ever provided. Later that day, Governor Snyder is briefed by staff that the Flint water system is in compliance.
60. September 29, 2015: The *Detroit Free Press* publishes an analysis of Flint blood lead tests, concluding that Dr. Hanna-Attisha's analysis is correct. GCHD issues a health advisory regarding the water quality. Governor Snyder's office contacts Director Wyant and Director Lyon to consider emergency responses.
61. October 1, 2015: MDHHS issues a statement confirming Dr. Hanna-Attisha's analysis.
62. October 16, 2015: Flint switches back to DWSD as source of drinking water for the city.

Regulatory Context

The federal Safe Drinking Water Act²⁰ (SDWA) was enacted in 1974 and governs regulation of drinking water throughout the United States. It has been amended multiple times since its enactment, most recently in 2015. From the United States Environment Protection Agency (EPA) website:

“The Act authorizes EPA to establish minimum standards to protect tap water and requires all owners or operators of public water systems to comply with these primary (health-related) standards. The 1996 amendments to SDWA require that EPA consider a detailed risk and cost assessment, and best available peer-reviewed science, when developing these standards. State governments, which can be approved to implement these rules for EPA, also encourage attainment of secondary standards (nuisance-related).”²¹

Michigan enacted the state Safe Drinking Water Act (PA 399) in 1976. It establishes state authority for regulating drinking water supplies in Michigan. It also provides the statutory basis for the EPA’s delegation to the Michigan Department of Environmental Quality (MDEQ) to implement the federal SDWA, including the Lead and Copper Rule (LCR).

Lead and Copper Rule

The Lead and Copper Rule (LCR), promulgated in 1991,²² falls under the SDWA. Short-term revisions, prompted following the incidence of elevated lead levels in the District of Columbia’s water distribution system, were published in the Federal Register in 2007.²³ From the guidance to the states on the rule:

The goal of the LCR is to provide maximum human health protection by reducing lead and copper levels at consumers’ taps to as close to the [Maximum Contaminant Level Goals] MCLGs as is feasible. To accomplish this goal, the LCR establishes requirements for community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) to optimize corrosion control and conduct periodic monitoring. Systems are required to perform public education when there are lead action level exceedances at more than 10 percent of the taps that are sampled, treat source water if it contributes significantly to lead and copper levels at the tap, and replace lead service lines in the distribution system if the lead level at the tap continues to exceed the action level after optimal corrosion control and/or source water treatment has been installed.²⁴

The MCLG for lead in water is 0 milligrams per liter (mg/L); the action level requiring public notification of exceedance is 0.15 mg/L (also expressed as 15 parts per billion).

Large water systems, defined as those serving over 50,000 people, were required to have optimal corrosion control treatment (OCCT) by 1997. The rule requires large water systems that have met

²⁰ 42 U.S.C. §300f et seq., 1974

²¹ www.epa.gov/laws-regulations/summary-safe-drinking-water-act

²² 56 FR 26460, June 7, 1991

²³ 72 FR 57782, October 2007

²⁴ LCR Short-Term Revisions State Implementation Guidance-Final June 2008

the OCCT requirements through the installation of corrosion control treatment to continue to operate and maintain that treatment.²⁵

Currently, EPA is in the process of reviewing and revising the LCR through its established rulemaking procedures.

Public Health Context

Flint is now confronted by public health challenges: mitigating the effects of toxic lead exposure and ensuring an appropriate case-tracking and containment response to the outbreak of Legionellosis in Flint. Several attributes of these public health challenges are particularly noteworthy and informed our findings and recommendations:

Lead Exposure

Lead is a potent neurotoxin. For any given exposure, lead has more profound health effects in children because the exposure is distributed throughout the body's volume. Children's smaller body volumes convey larger risks from lead exposure; these effects are concentrated in brain cells.

One of the most concerning aspects of lead exposure is that once it has been deposited in the nervous system, lead cannot be removed. The impact of lead poisoning on neurological development is permanent. Recent research has indicated that, with each 1 microgram per deciliter increase in blood lead level, children demonstrate decreasing performance on intelligence tests.²⁶

Given the neurotoxicity of lead, for many decades medicine and public health experts have focused on how to reduce lead exposure, particularly for children. Known historical sources of lead include lead in paint, lead in gasoline, and lead in water sources.²⁷ Major federal laws have addressed these sources by prohibiting lead in paint, prohibiting lead in gasoline, and requiring corrosion control and testing of public drinking water sources to identify lead contamination in water (via the LCR, above).

In Michigan, prior to the Flint water crisis, trends in lead test results for children had told a story of public health progress. As recently as the late 1990s, almost 50 percent of young children (ages 1 to 2) in Michigan had blood lead levels of 5 micrograms per deciliter or above. By 2013, fewer than 5 percent of young children in Michigan had levels of 5 micrograms per deciliter or above.²⁸ This downward trend mirrors similar improvements in communities across the United States.

²⁵ 40 CFR 141.82 (g) *Continued operation and monitoring*. All systems optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the State under paragraph (f) of this section, in accordance with this paragraph for all samples collected under §141.87(d) through (f).

²⁶ Citations offered in "Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response," by Mona Hanna-Attisha, MD, MPH; Jenny LaChance, MS; Richard Casey Sadler, PhD; and Allison Champney Schnepf, MD, *American Journal of Public Health*, November 2015.

²⁷ For a discussion of the prevalent use of lead in the United States and the lead industry's conduct in light of the determination of its toxicity, see *Lead Wars: The Politics of Science and the Fate of America's Children* (2013), by Gerald Markowitz and David Rosner, who are interviewed on National Public Radio's *Fresh Air* in a March 3, 2016 episode titled, "America's 'Lead Wars' Go Beyond Flint, Mich.: 'It's Now Really Everywhere.'"

²⁸ Known as the "reference level" as stated by the federal Centers for Disease Control and Prevention.

These improvements have largely been attributed to reductions in lead paint in households rather than reductions in lead exposure through drinking water.

In Michigan, routine blood lead level checks are recommended for children 1 to 2 years old who live in communities that are known to have historically high proportions of children with levels at the reference level or higher, and for all children with Medicaid health coverage. For the past decade, Flint has been one of 14 Michigan communities that have been identified by MDHHS as “focus communities” because of historically high levels of children with elevated blood lead levels. Local and state health agencies are responsible, in coordination with children’s healthcare providers (physicians, nurse practitioners, etc.), for following up on elevated blood lead levels. Appropriate follow-up includes:

- Providing advice to families regarding increasing the nutritional quality of the child’s diet to increase the amount of foods with high levels of iron, calcium, and vitamin C;
- Rechecking blood lead levels within 3 to 6 months to see whether the level has decreased below 5 micrograms per deciliter, and continuing interventions and re-testing at this interval to assure progress; and
- Performing in-home assessments for environmental sources of lead (for example, lead paint, lead in dust) for children with blood lead levels of 10 micrograms per deciliter or more.²⁹

Of note, before the Flint water crisis, in-home assessments did not routinely include testing of drinking water as a potential source of lead exposure.

Legionella

Infections caused by *Legionella* bacteria can cause relatively mild illness in generally healthy adults but can cause life-threatening illness and even death in elderly and immune-compromised patients. Such infections almost never occur in children. Legionellosis, the name given to infections caused by *Legionella* bacteria, has been recognized since the 1970s as often occurring in environments with self-contained air supply systems (such as healthcare facilities) during non-winter months when cooling towers for air conditioning can serve as breeding grounds for the bacteria. Historically, Legionellosis is fatal in approximately 10 percent of cases.

Legionellosis is a reportable disease, meaning that infections with *Legionella* must be reported to local and state public health authorities. Public health specialists known as epidemiologists conduct analyses of cases, especially when the pattern of cases exceeds historical levels in a given jurisdiction.

Prior to the switch to the Flint River as a source of drinking water in 2014, the number of cases of Legionellosis in Genesee County had not exceeded 10 cases per year for several years. From June 2014 to March 2015, there were 45 cases of Legionellosis in Genesee County, with 5 deaths. This was described by an expert from the CDC in 2015 as “one of the largest [outbreaks of Legionellosis] in the past decade.” About 40 percent of the cases had known exposure to possible

²⁹ Prior to the Flint water crisis, environmental assessments were not performed for children with blood lead levels of 5 to 9 micrograms per deciliter, but only for children with blood lead levels of 10 micrograms per deciliter or higher.

healthcare sources of *Legionella*; almost 50 percent of cases had known exposure to Flint River-sourced water supply.³⁰

According to the MDHHS report issued on May 29, 2015, it was not possible for the state epidemiologists to draw definitive conclusions that the change in water supply was related to the outbreak of disease, given the lack of clinical specimens of *Legionella* from patients diagnosed with the disease in 2014-15. It is speculated that clinical respiratory specimens (sputum) were not available because antibiotic treatment was started presumptively after a positive urine test for *Legionella*, rendering any subsequent specimens indeterminate. Although urine specimens can confirm a diagnosis of Legionellosis, urine specimens cannot be used for determining the source of *Legionella*.

Subsequent data reported publicly by MDHHS on January 21, 2016, indicated that there were 42 additional cases of Legionellosis from May 2015 through October 2015, with 4 deaths.³¹ Taking the 2014-15 data together with additional 2015 data, MDHHS reported that 36 percent of cases likely were exposed to Flint River-sourced drinking water, and that again there were too few clinical specimens to draw definitive conclusions about contaminated water as the source of infection in these cases.

At the time of this report, the pattern of an abrupt increase in cases of Legionellosis in Genesee County in 2014-15 that occurred after a shift to the Flint River strongly implicates the water source and treatment of the water as a potential cause of higher Legionellosis case incidence. EPA experts Del Toral and Lytle have suggested that the treated water from Flint WTP has disrupted the previously stable lining and “biofilm” of water lines to such an extent that chlorine in the water supply has been excessively depleted. Del Toral also suggested that the flushing of fire hydrants may have stripped the biofilm and released bacteria (*Legionella*) that the biofilm had contained. If true, this may have led to a situation where *Legionella* may grow more abundantly than in a distribution system conveying properly treated drinking water.

Unfortunately, these are hypotheses. Definitive data for the analysis of cases in 2014 and 2015 are not available, so it is not possible to be conclusive about the cause. Nonetheless, great concern should remain about the clustering of cases among patients potentially exposed in healthcare facilities in the City of Flint and cases among individuals whose homes receive water from the Flint WTP.

MDHHS and GCHD have indicated that they will have a high level of vigilance in monitoring for cases of Legionellosis in 2016. They have reminded healthcare professionals treating patients in Genesee County to obtain appropriate clinical (respiratory) specimens in suspected cases of Legionellosis before initiating treatment. This cooperation between public health and medical professionals will be crucial to identifying the cause of future Legionellosis cases in Genesee County and controlling outbreaks in the future. In addition, a team of scientists from multiple

³⁰ Some of these cases had exposure to both Flint River water and to healthcare facilities.

³¹ Twenty-two of the 42 cases reported from May-October 2015 had known healthcare-related exposures in the two weeks prior to development of symptoms, and 21 of these were from the same healthcare facility. Sixteen of the 42 cases of Legionellosis in Genesee County from May-October 2015 were in individuals who had neither exposure to a healthcare facility nor exposure to Flint River-sourced water.

Michigan universities is expected to test Flint drinking water in 2016 to assess whether conditions in the system created an environment that heightened the likelihood of *Legionella* contamination.

Roles of Government Entities in the Flint Water Crisis

Many individuals, agencies and groups participated in the events leading to the Flint water crisis and the subsequent response. Their various roles and responsibilities have been subjects of considerable discussion and debate. In the subsequent sections, we describe the defined (or statutory) roles of many of these parties, as well as the nature of their involvement in the Flint water crisis. Findings and recommendations are also provided.

The water crisis in Flint is effectively elevating public awareness of the latent dangers associated with lead in water systems, which regulators and many water utilities historically have been reluctant to address beyond the addition of corrosion control treatment. As it responds to the acute crisis in Flint, the State of Michigan is in a position to set important precedents that may have application well beyond the state, as more utilities and regulatory agencies prepare for more aggressive approaches to address the problem of lead in water. This opportunity is noted in several of the recommendations provided below.

Michigan Department of Environmental Quality (MDEQ)

Defined Role

MDEQ is responsible for enforcement of the SDWA (including the Lead and Copper Rule (LCR)), the Clean Water Act (CWA) and other environmental regulations in the State of Michigan. With respect to drinking water, MDEQ's stated goal is that "Michigan's water resources are clean and safe" and a measure of success towards that goal is that "100 percent of the population has safe drinking water with no reported violations of health based standards."³² The agency's responsibility for SDWA compliance enforcement derives from it, like all other states except Wyoming, being delegated "primacy" by the EPA.

Within the MDEQ, the Office of Drinking Water and Municipal Assistance (ODWMA) has responsibility for SDWA enforcement and lending assistance to public water suppliers. The ODWMA Community Water Supply Program's "primary function is regulatory oversight of approximately 1,425 community public water supplies in Michigan."³³ The Community Water Supply Program provides capacity development and operator training and certification, operates certified laboratories, and monitors and reports on public water system violations. ODWMA staff who regulate compliance with the SDWA are not required to be licensed operators or have experience with drinking water treatment plant or distribution system operations.

For many communities, ODWMA has been and continues to be relied upon to provide technical assistance and guidance on water treatment processes, approaches to managing distribution

³² "Sustaining Michigan's Water Heritage: A Strategy for the Next Generation, Draft for Public Review," June 4, 2015. Prepared by the Michigan Office of the Great Lakes, in collaboration with Michigan Department of Environmental Quality, Michigan Department of Natural Resources, Michigan Department of Agriculture and Rural Development, and Michigan Economic Development Corporation, p. 6.

³³ www.michigan.gov/deq/0,1607,7-135-3313_3675_3691---,00.html

system water quality, and overall utility management. ODWMA historically has taken a collaborative approach with public water suppliers, offering guidance on technical requirements for compliance with environmental regulations.

Discussion

MDEQ is responsible for ensuring that community water systems comply with the SDWA. According to EPA Region V, ODWMA, which was originally within the state Department of Community Health, has more community water systems to regulate than other Region V states. Additionally, while all states' water system regulators in Region V are stretched financially, Michigan is particularly challenged because fees to operate the program are generally lower than fees charged by other states, requiring the state to rely more heavily on general funds and federal revenue.

For a variety of reasons, MDEQ discounted use of the Flint River as a permanent water source in 2013. However, it did agree to use of the river as a temporary source, conditioned upon completion of identified improvements to the Flint Water Treatment Plant (WTP). Flint was granted two permit modifications in April 2014 that allowed the treatment plant to operate full-time with the Flint River as the water source.

In advance of the City of Flint's conversion from DWSD water supply to use of Flint River water, MDEQ had multiple communications and meetings with Flint Utilities Department staff and their consultants. A plan of treatment of Flint River water was discussed and covered numerous issues including dosing of chemicals, use of polymers, and unit process performance. When asked by Flint water plant personnel about adding phosphate in the treatment process, as DWSD does for corrosion control, MDEQ said that a corrosion control treatment decision would be made after two 6-month monitoring periods were conducted to see if corrosion control treatment was needed. Similarly, distribution system operations requirements were outlined, including sampling and testing for compliance with the LCR that involved obtaining tap water samples from high-risk residences. ODWMA anticipated that use of Flint River water would be problematic³⁴ but deferred to state emergency manager decisions to proceed.³⁵ Subsequently:

- MDEQ advised Flint WTP staff, in contradiction to longstanding federal policy under the LCR, that corrosion control treatment was not required.
- MDEQ did not require appropriate sampling of tap water quality as mandated by the LCR.
- MDEQ obstinately used water quality test results based on flawed sampling and insisted on the accuracy of the erroneous data.
- MDEQ dismissed expressed concerns of Flint residents, elected officials, and external subject matter experts (as well as EPA).

³⁴ Internal March 26, 2013 MDEQ e-mail (Busch to Wyant, Shekter Smith, and others) noting, among other points: "Continuous use of the Flint River at such demand rates would: Pose an increased microbial risk to public health (Flint River vs. Lake Huron source water), Pose an increased risk of disinfection by-product (carcinogen) exposure to public health (Flint River vs. Lake Huron source water), Trigger additional regulatory requirements under the Michigan Safe Drinking Water Act."

³⁵ Internal March 27, 2013 MDEQ e-mail (Sygo to Busch) noting, among other points: "As you might guess we are in a situation with Emergency Financial Managers so it's entirely possible that they will be making decisions relative to cost. The concern in either situation is that a compliant supply of source water and drinking water can be supplied."

- MDEQ inaccurately reported information about Flint’s corrosion control to EPA, stating that Flint had an optimized corrosion control program when, in fact, it was not employing corrosion control treatment.
- MDEQ deferred requiring Flint to implement CCT until after the second 6-month monitoring period was completed and showed lead levels of 11 ppb, though EPA advised MDEQ to require Flint to have CCT as early as April 2015.
- MDEQ waited on legal opinions about SDWA compliance requirements and delayed admission of its incorrect interpretation of SDWA compliance requirements for (at least) 2 months.
- MDEQ insisted, even after compelling evidence of lead poisoning of children was presented, that Flint water quality met applicable SDWA standards.
- MDEQ failed (for more than a year) to work with MDHHS leadership and staff to ensure an appropriate and comprehensive public health response to repeated requests to address health concerns related to drinking water. MDEQ continued to insist the water was safe and met all federal requirements, and discouraged any statements that would imply that the water was not safe.

The obvious question that MDEQ, along with the City and its consultants, should have asked was: “What will happen without corrosion control treatment?” Similarly, they could have asked why a less corrosive source of water (Lake Huron water) would be required to have corrosion control treatment, but not the more corrosive Flint River source. In Flint, the more corrosive water source ultimately destroyed the protective scaling on pipes and plumbing that orthophosphate addition had provided through the water supplied by DWSD.

Findings

The FWATF, as stated in our second letter to Governor Snyder,³⁶ places primary responsibility for the Flint water crisis on the MDEQ, and specifically its ODWMA. This finding is based on numerous interviews and reviews of publicly available documents. Nothing in our subsequent interviews or our review of thousands of pages of related documents has dissuaded us from this fundamental conclusion. We found that:

- F-1. MDEQ bears primary responsibility for the water contamination in Flint.
- F-2. MDEQ, specifically its ODWMA, suffers from cultural shortcomings that prevent it from adequately serving and protecting the public health of Michigan residents.
- F-3. MDEQ misinterpreted the LCR and misapplied its requirements. As a result, lead-in-water levels were under-reported and many residents’ exposure to high lead levels was prolonged for months. Specifically:
 - MDEQ’s misinterpretation of the LCR and lack of due caution resulted in the decision not to require corrosion control upon the switch to the Flint River but, rather, to begin two consecutive 6-month water quality monitoring periods.
 - MDEQ failed to promptly require corrosion control even after the initial 6-month monitoring period results were received and 90th percentile lead sampling results were at 6 ppb, which would have disqualified Flint from being exempted from

³⁶ See Appendix II for copies of the FWATF’s letters to Governor Rick Snyder.

having to have corrosion control treatment—even under MDEQ’s flawed interpretation.

- MDEQ’s guidance to Flint on LCR compliance sampling techniques (calling for pre-flushing, use of small-mouthed bottles, etc.), while possibly technically permissible, was not designed to detect risks to public health. MDEQ failed to take adequate steps to correct Flint water operations staff’s inaccurate LCR sampling.
- MDEQ ODWMA advised Flint Utilities Department personnel to make sure the rest of the water samples in the second 6-month monitoring period were clean, since the samples they had already submitted exceeded EPA’s action level for lead.
- MDEQ conveniently, and without adequate investigation, excluded LeeAnne Walters’s water quality test results for purposes of determining whether Flint sampling results exceeded EPA’s action level.

F-4. MDEQ waited months before accepting EPA’s offer to engage its lead (Pb) experts to help address the Flint water situation and, at times, MDEQ staff were dismissive and unresponsive.

F-5. MDEQ failed to move swiftly to investigate, either on its own or in tandem with MDHHS, the possibility that the Flint water system was contributing to an unusually high number of Legionellosis cases in Flint.

MDEQ caused this crisis to happen. Moreover, when confronted with evidence of its failures, MDEQ responded publicly through formal communications with a degree of intransigence and belligerence that has no place in government. These failures are not diminished, nor should focus on them be deflected, by the fact that other parties contributed to the disastrous decisions or the prolonging of their consequences.

Recommendations

- R-1. Implement a proactive, comprehensive cultural change program within MDEQ, specifically its ODWMA, to refocus the department on its primary mission to protect human health and the environment. MDEQ should aspire to become a national leader through a proactive program designed to detect and address contaminants in public water supplies in a timely manner.³⁷
- ODWMA should heighten its focus on protection of public health and provide technical assistance to advance public water system performance.
 - Technical assistance should not be oriented toward defining minimum requirements to achieve technical compliance with regulatory requirements.
 - In the event that regulatory requirements are ambiguous, ODWMA should default to public health protection.

³⁷ For example, in the case of lead detection, ODWMA’s program should have adopted water quality sampling procedures that maximized the potential for detection by identifying high-risk homes, prohibiting pre-flushing of service lines, and improving sample draw procedures.

- MDEQ's program restructuring should address the findings of this and other program and incident reviews, and commit to transparent, accessible reporting on implementation of associated recommendations.
- R-2. Establish an apprenticeship/certification program for MDEQ ODWMA employees that requires direct, hands-on experience with public water system operations. MDEQ ODWMA employees responsible for water system regulation and SDWA enforcement should be, or have access to, certified operators and subject matter experts (including, for example, those at EPA).
- R-3. Strengthen SDWA enforcement, most notably for the LCR. The state has the ability to strengthen its own enforcement of the SDWA and not wait for action to occur at the federal level:
- Reiterate (and clarify where necessary) appropriate sampling procedures, and establish them in rule revisions or guidelines such that they are clear for all to understand. Provide resources for public water systems to obtain authoritative guidance in the event of questions or concerns.
 - Make water sample test results required under the Lead and Copper Rule available to the public while protecting personally identifiable information.
- R-4. Participate in the Flint Water Inter-Agency Coordinating Committee's (FWICC's) work team established to oversee conversion from DWSD-supplied to KWA-delivered water. MDEQ should draw from that work to revise its policies and procedures for approval of water treatment and distribution system operating regimens, particularly when source water changes are contemplated.
- R-5. Participate in EPA's ongoing review and revision of the LCR, conveying lessons learned from the Flint water crisis.³⁸

Michigan Department of Health and Human Services (MDHHS)

Defined Role

The Michigan Department of Health and Human Services (MDHHS)³⁹ is responsible for addressing all matters of public health for the population of the state. MDHHS works to achieve this goal through a combination of primary prevention—preventing illnesses before they occur⁴⁰—and secondary prevention—reducing the burden of disease once it has occurred.⁴¹

Meeting the responsibilities of MDHHS requires constant attention through surveillance programs and effective communication and coordination with public health partners at multiple levels of government (city, county, federal). MDHHS conducts surveillance for dozens of diseases

³⁸ Also applicable for recommendations related to the LCR offered in the report section on the EPA and LCR.

³⁹ Created from the combination of the Department of Community Health and Department of Human Services in 2015.

⁴⁰ For example, promoting and facilitating childhood vaccination against diseases such as measles and influenza.

⁴¹ For example, conducting screening programs to identify individuals who have developed cancer so that they can receive appropriate medical care.

and health conditions through a wide variety of efforts. For instance, MDHHS is recognized for a high-quality system of tracking childhood vaccination through the Michigan Care Improvement Registry (MCIR). MCIR allows state officials to assess children's vaccination levels on a regular (weekly) basis, and to identify neighborhoods and schools where vaccination levels may be so low that outbreaks of vaccine-preventable diseases are possible. As a result, MDHHS can then communicate with healthcare professionals who administer vaccines, and with parents of children who are not up-to-date on their vaccinations, to encourage them to protect their children against disease.

MCIR is a very positive example of the public health function of MDHHS. In the case of Flint, however, MDHHS's response to two public health concerns, related to lead exposure and cases of *Legionella* infection, did not meet the agency's own standard of performance.

Discussion

Children's Exposure to Lead in Drinking Water

MDHHS includes the Childhood Lead Poisoning Prevention Program (CLPPP), which is responsible for tracking the results of all children's blood lead tests, and the Healthy Homes program, which is responsible for coordinating remediation of homes when high levels of environmental lead exposure are found for a child with an elevated blood lead level. All blood lead tests conducted in the state must be reported to CLPPP, under state law. For many years, CLPPP has functioned as a registry of blood lead tests, comparing aggregate results at the state level in the most recent year to levels in prior years—typically in annual reports released in the summer following the end of a given calendar year. The primary outcomes reported have been the proportions of children with blood lead levels ≥ 10 micrograms per deciliter and proportions with blood lead levels ≥ 5 micrograms per deciliter. For more than a decade, CLPPP has also specifically tracked local lead testing results in 14 "focus communities" known to have higher proportions of children with elevated blood lead levels than in other communities in Michigan. Flint is one such focus community.

The CLPPP operated under the assumption that children with elevated blood lead levels were being managed by their respective healthcare professionals. Therefore, no urgency was given to performing the comparisons that they published in annual reports, which were posted online without any public announcements. For this reason, there is no evidence that MDHHS conducted an analysis of blood lead levels in 2014 prior to late July 2015, after Governor Snyder's chief of staff Dennis Muchmore wrote to MDHHS officials expressing concern about many complaints from Flint residents about water quality in Flint.

On July 28, 2015, a MDHHS epidemiologist (Larder) performed a classic epidemiologic analysis of 2014 blood lead test data versus prior years and found a concerning pattern of elevated levels in Flint. On the same day, the CLPPP data manager (Scott) compared data over the preceding 5 years and concluded that the 2014 data were not substantially different than several preceding years. Scott's analysis was fundamentally flawed because he failed to consider that the proportions of children with high blood lead were declining over the years 2011-2013, and therefore 2014 levels represented a clear deviation from the improving trend in previous years. For unclear reasons, these conflicting conclusions of Scott and Larder were not elevated to higher levels of authority within MDHHS. Rather, the explanation that there was no difference (from a data manager rather than an epidemiologist) was allowed to persist for another 2 months. Messages from other MDHHS officials over that subsequent time period indicated that they were

aware of the MDEQ narrative that the water in Flint was “safe” and did not present “an imminent public health problem.”

By September 2015, Dr. Mona Hanna-Attisha released her analysis of blood lead tests performed at Hurley Medical Center, showing that children’s blood lead levels were clearly abnormal at a higher rate than in prior years. Of note, Dr. Hanna-Attisha and Professor Marc Edwards of Virginia Tech had formally requested release of CLPPP data from MDHHS (Scott) in previous weeks and months, but had never received such data, leading Dr. Hanna-Attisha to analyze data from Hurley Medical Center only. When the Hurley data were released, MDHHS issued statements indicating that the Hurley data were analyzed using different methodology than the state would employ, and MDHHS did not endorse the Hurley findings. A few days later, MDHHS Director Lyon sent a memo to MDHHS staff asking them to “make a strong statement with a demonstration of proof that the blood lead levels seen are not out of the ordinary.” Within a few days, MDHHS epidemiologists had re-analyzed the data and reversed course, agreeing publicly with the Hurley-based analysis by October 1, 2015.

Subsequently, MDHHS changed its approach and began to analyze blood lead level data in the CLPPP database on a basis closer to “real time.” In a series of reports released approximately every 2 weeks since November 2015, MDHHS has communicated with the public regarding the proportion of children in Flint with blood lead tests ≥ 5 micrograms/deciliter. This is a promising step in transparency and timeliness.

However, excessive and likely harmful lead exposure already has occurred for hundreds and perhaps thousands of children in Flint, and it is now MDHHS’s responsibility to follow up with comprehensive secondary prevention. MDHHS reports that about 200 children in Flint are known to have had childhood lead levels ≥ 5 micrograms/deciliter when they were tested since April 2014 (the month of the water switch to the Flint River). This number of children is likely a profound underestimate of the number of children exposed; based on Census estimates and Medicaid records, the number of children under 6 years old living in the City of Flint is approximately 10,900. Given the known risks of lead neurotoxicity for young children, appropriate near-term, middle-term, and long-term follow-up for children exposed to lead in Flint will include:

- Neurodevelopmental assessments,
- Timely access to early childhood education,
- Behavioral assessments and interventions in preschool years,
- Educational assessments in preschool and school years accompanied by appropriate learning support, and
- Appropriate counseling and medical therapy to address attentional and behavioral concerns at school age and into adolescence.

Such comprehensive approaches to secondary prevention for children in Flint are consistent with a model framework for medical and public health response proposed by Dr. Mona Hanna-Attisha at Hurley Medical Center.

Despite the unmistakable connection between the quality of drinking water and public health, there is no liaison between MDEQ and MDHHS to ensure that complaints or concerns about water are brought to the attention of MDHHS staff in a timely fashion to prompt investigative action. The lack of a liaison function within state government also adversely affected the response to cases of Legionellosis, as described below.

Cases of Legionella Infection

Legionellosis is an infection with species of bacteria called *Legionella*, so called because it came to prominence when many attendees at an American Legion conference fell ill in 1976.

Legionellosis has a broad spectrum of severity, causing relatively mild illness in some individuals who are generally healthy and causing much more severe illness in seniors and patients whose immune systems are weakened. It is generally fatal in about 10 percent of cases.

Legionella bacteria live in water supplies and flourish in warmer temperatures and standing water, present in locations such as cooling towers for air conditioning systems. It is a reportable disease, meaning that any healthcare professional who makes the diagnosis must report the case to the local health department. In turn, the local health department reports cases to the state health department. Fewer than 10 cases of Legionellosis per year were reported by GCHD in years immediately preceding the switch of water source to the Flint River.

MDHHS assisted GCHD with evaluation of the Legionellosis outbreak that began in 2014 and extended into early 2015, at GCHD's request. When the initial evaluation report was issued by MDHHS epidemiology team in May 2015, it is unclear why they asserted the "the outbreak is over"; subsequent reports released in January 2016 indicated that additional cases occurred beginning in May 2015.⁴² MDHHS indicated in its May 2015 report that data were inconclusive regarding a community source such as the water supply because of a lack of clinical specimens.

While MDHHS's statement regarding the absence of conclusive evidence of a community source has scientific merit, it is evident that MDHHS was not calibrating its evaluation for the unusual circumstance of the switch to the Flint River in April 2014. In fact, although the report mentions it as a possible source, there is no explicit mention of the switch to a new raw water source in Flint, and new water treatment protocols, as possible causal factors. Although there was a January 2015 meeting that included MDHHS, MDEQ and GCHD regarding cases of Legionellosis in Genesee County, subsequent discussions of Legionellosis appear to have occurred within the silos of MDEQ and MDHHS until late 2015, and remained uncoordinated until the Governor's announcement about ongoing *Legionella* investigations in January 2016.

Findings

- F-6. MDHHS's lack of timely analysis and understanding of its own data on childhood blood lead levels, along with its reliance on MDEQ and reluctance to share state data with Dr. Mona Hanna-Attisha and Professor Marc Edwards, prolonged the Flint water crisis.
- F-7. MDHHS bears ultimate responsibility for leadership and coordination of timely follow-up efforts in Flint and across the state regarding childhood lead poisoning. While local entities (for example, healthcare professionals, GCHD, health insurance plans) are partners in efforts to protect children from lead poisoning, MDHHS has the lead role and failed to exercise its responsibility.
- F-8. The consequences of lead exposure for Flint residents are expected to be long-term and will necessitate sustained investments in education, public and mental health, juvenile justice, and nutrition needs over the next 10 to 20 years.

⁴² This may have been related to delays in reporting between local healthcare professionals, GCHD, and MDHHS.

- F-9. Too few children in Michigan are screened for lead through routine blood tests as recommended for children ages 1 and 2. Statewide screening goals for children enrolled in Medicaid are met in very few instances at the county level or within Medicaid health plans. This lack of information leaves parents, healthcare professionals, and local and state public health authorities uninformed about the possibility of lead poisoning for thousands of Michigan children.
- F-10. Coordination between MDEQ and MDHHS was inadequate to properly address the public health issues related to water quality in Flint. Communication was infrequent, and when it did occur, the default position was to conclude that the health problems were not related to the water supply switch – rather than to assume that the problems might be related to the switch.
- F-11. Communication and coordination among local and state public health staff and leadership regarding Legionellosis cases in 2014-2015 was inadequate to address the grave nature of this outbreak. The fact that these cases occurred *while* there were several simultaneous concerns about quality and safety of water in Flint should have caused public health staff and leadership at local and state levels to coordinate their actions to ensure a prompt and thorough investigation.

Recommendations

- R-6. Establish policies and procedures at MDEQ and MDHHS to ensure input by health experts and scientists when permit decisions may have a direct impact on human health.
- R-7. Establish and maintain a Flint Toxic Exposure Registry to include all the children and adults residing in Flint from April 2014 to present.
- The Flint Toxic Exposure Registry will serve as an authoritative reference source of information (including contact details [for example, primary contact information, back-up contact information, and preferred mode of contact]) for purposes of timely health assessments in the short-term and long-term, as well as subsequent communication regarding policies and scientific findings. Timely assessments will include clinical evaluations and re-evaluations in healthcare settings, appropriate follow-up conducted by public health professionals, and longitudinal assessments of the impact of environmental exposure on children's and adults' health (including among pregnant women).
- R-8. Re-establish the Michigan Childhood Lead Poisoning Prevention and Control Commission.
- The Commission would perform a comprehensive review of the state's lead poisoning prevention program; evaluate the effectiveness of the program, including its ability to satisfy federal law requiring that 100 percent of all young children enrolled in Medicaid be screened with a blood lead test; and make recommendations for the program's improvement. The Commission would also conduct public hearings, review information from other sources, and study other states' experiences. The Commission must also develop short- and long-range strategic recommendations for childhood lead poisoning prevention and control in Michigan.
- R-9. Ensure that MDHHS is transparent and timely in reporting and analysis of aggregate data regarding children's blood lead levels. MDHHS data regarding lead levels shall be provided

to individuals and organizations, based on their expertise, upon request and in cases when the interpretation of data by MDHHS is questioned.

- R-10. Establish a more aggressive approach to timely clinical and public health follow-up for all children known to have elevated blood lead levels, statewide. MDHHS should expand its local efforts and partnerships to accomplish this goal. Whenever possible, routine screening for lead and appropriate follow-up should occur in children’s primary care medical homes.
- R-11. Strive to be a national leader in monitoring and responding to exposure of children to lead by converting the Childhood Lead Poisoning Prevention Program (CLPPP) from passive collection of test results into an active surveillance and outreach program.
- Performance of the surveillance program should be reported to the public. MDHHS should be prepared to amplify its efforts if performance targets are not met.
- R-12. Improve screening rates for lead among young children through partnerships with county health departments, health insurers, hospitals, and healthcare professionals.
- R-13. As the state authority on public health, and as the organization that conducted the epidemiologic study of Legionellosis cases in Genesee County in 2014-15, take responsibility for coordinating with GCHD and CDC to protect Michigan residents from further outbreaks of Legionellosis.⁴³
- R-14. In cases of switches in drinking water supplies in the future, the state must assume that outbreaks of cases of Legionellosis may be related to changes in water source and should communicate the potential risk to the public, rather than assuming and communicating the opposite.

Michigan Governor’s Office

Defined Role

The Governor of Michigan heads the executive branch of Michigan state government and has the power to reorganize state departments and appoint department heads. All executive branch departments of state government report to the Governor, including the three key departments involved in the Flint water crisis: MDEQ, MDHHS, and Treasury. The Governor also appoints personal staff to keep him informed of issues and events. Among other responsibilities, the Governor (through the Michigan Department of Technology, Management and Budget) submits an annual budget and has a line-item veto for appropriations bills.

Rick Snyder, Michigan’s 48th Governor, took office in January 2011. He began his second term in January 2015.

⁴³ Specific steps should include: (a) anticipate the risks of Legionellosis infections going forward; (b) take timely steps to minimize those risks in Flint drinking water by working with EPA, MDEQ and Flint WTP; (c) coordinate with healthcare facilities to minimize risks of healthcare facility-acquired Legionellosis; (d) communicate with the public about steps being taken and cases of Legionellosis that occur.

Discussion

The Flint water crisis occurred during Governor Snyder's tenure. The Governor and his office were directly involved in *some* aspects of the crisis and briefed on *some* of the major decisions surrounding Flint drinking water. Emergency managers that he appointed made key decisions that led to and prolonged the crisis. He appointed the directors of the three state departments—MDEQ, MDHHS, and Treasury—that bear differing degrees of responsibility for what happened.

The Governor and the Governor's office must rely heavily on information from state departments to make decisions, set directions, and take action. In this case, the individuals and departments on which the Governor relied for guidance provided wrong information, particularly on the issues related to lead in the drinking water and elevated blood lead levels in children. In particular, two state agencies attempted to dismiss and discredit credible evidence of threats to public health. MDEQ did not acknowledge the true extent of the Flint water problems until late September 2015. Likewise, MDHHS, which misread its own data on children's blood lead levels in Flint, did not inform the Governor of lead poisoning related to use of the Flint River as a water source until late September 2015.

However, Governor Snyder and certain executive staff members were aware before late September 2015 of several issues that are noteworthy and relevant. For example:

- The Department of Treasury approved the Flint emergency manager's decisions (supported by Flint City Council) to switch to KWA after negotiations across two entities under emergency management failed. Members of the Governor's staff—and the Governor himself—participated in some of those discussions.
- The Governor's office received citizen complaints and was well aware of numerous press stories about water quality problems as early as May 2014 and continuing throughout 2015.^{44,45}
- The decision by General Motors (GM) in October of 2014 to use Flint Township water instead of Flint WTP-sourced water for its Flint Engine Operations facility was not only known to executive staff members of the Governor, but was also cited as a reason to switch back to DWSD (see below).
- In late January 2015, at least one member of the Governor's office was informed that concerns were being raised in the MDEQ about the Legionellosis outbreak in Genesee County and *possible* connection to the Flint water supply.⁴⁶
- In March 2015, at least one of the Governor's office staff members was advised of the Legionellosis outbreak in Flint and local health department concerns of a potential link to the Flint water conversion.⁴⁷

⁴⁴ This was subsequent to Department of Treasury's approval of the Flint emergency manager's decision to contract with LAN to upgrade the Flint WTP to treat water from the Flint River as the primary drinking water supply, instead of purchasing water from DWSD.

⁴⁵ The October 1, 2014 MDEQ briefing paper to Governor's office regarding City of Flint drinking water situation (boil water notices) ascribes problems to aged, inadequately maintained, cast iron pipe in the distribution system.

⁴⁶ See January 30, 2015 e-mail from Brad Wurfel/MDEQ to Dave Murray, Governor Snyder's deputy press secretary, re: *Legionella*.

- In March 2015, the Governor’s chief of staff proposed buying and distributing bottled water in Flint because of citizen concerns about water quality.
- In mid-summer 2015, an aide to Governor Snyder arranged for the donations of water filters to be distributed in Flint to address concerns about water quality.
- In mid-summer 2015, the Governor and senior staff discussed Flint water issues; lead was apparently part of those discussions.

The switch to the Flint River as the primary source of drinking water for the City of Flint occurred in late April 2014. On October 14, 2014, after citizen complaints about the water’s odor, color and taste⁴⁸ and the decision by GM to leave the Flint water system, two key executive staff members traded emails suggesting that, given these problems, it was time to switch back to DWSD for Flint’s drinking water. Other executive staff members received these emails, and—according to the Governor’s chief of staff at the time—the Governor was informed of the concern and the suggestion. A phone conversation occurred between key staff members Valerie Brader and Rich Baird and the Flint emergency manager about the suggestion. The emergency manager assured these Governor’s office staff members that the water quality problems were not of a permanent nature and asserted that it would be too costly to switch back to DWSD. That conversation ended any serious discussion about switching back to DWSD at that time.

The suggestion to switch back to DWSD was revisited in mid-summer 2015. However, MDEQ continued to provide reassurances that the treated water reaching homes in Flint was both safe and in compliance with SDWA requirements. These continuing reassurances, as well as the cost issue, apparently prevented any systemic or comprehensive review of the water situation in Flint.

According to Governor Snyder, it was not until after September 28, 2015, that he was personally advised that MDEQ and MDHHS had been wrong for months about the reality of lead in the water and children’s blood lead levels.

Discussions about the Flint water situation were also conducted in the context of overarching discussions about financially distressed cities served by emergency managers, and Flint in particular. Flint water issues were a focal point for senior staff and were discussed with the Governor. Considerable frustration was apparent due to new issues arising just as immediate problems seemed on the road to improvement. Continued reliance on MDEQ drove poor decisions—or the lack of decisions.

As the Flint water crisis unfolded, certain state agencies’ perceived need to defend the original decision to switch to the Flint River and resist a return to DWSD resulted in public relations and communications efforts that have, at times, been inappropriate. In the spring and summer of 2015, for example, this perceived need to defend a flawed decision manifested itself in attempts by MDEQ and MDHHS to discredit accurate information on lead in drinking water and elevated blood lead levels provided by outside experts. Citizen concerns were at times derided and dismissed, in spite of the fact that various members of the Governor’s staff had expressed—and were expressing—concerns about the water situation in Flint at the same time.

⁴⁷ See March 13, 2015 E-mail from Brad Wurfel/MDEQ to Harvey Hollins/Governor’s office.

⁴⁸ Though not, at that time, related to lead or TTHMs.

To some extent, inappropriate official public relations efforts continue to this day. Even as the state is aggressively engaged in mitigation efforts in Flint, the statement that the Flint water crisis was a local, state, and federal failure implies that blame is attributable equally to all three levels of government. Primary responsibility for the water contamination in Flint lies with MDEQ. In addition, at the time of the water crisis, Flint was under the control of state-appointed emergency managers, who made key decisions that contributed to the crisis. Because of these two facts, the state is fundamentally accountable for what happened in Flint.

Though delayed, we acknowledge and support the many steps the Governor has taken to date to address the implications of lead in the Flint water supply—the state declaration of emergency, the establishment of both the Flint Water Inter-Agency Coordinating Council and Mission Flint, additional funding for addressing the health issues faced by lead-poisoned children in Flint, partial reimbursement for water bills paid during the time of lead contamination, and progress on a plan to replace LSLs.

Findings

- F-12. Ultimate accountability for Michigan executive branch decisions rests with the Governor.
- F-13. The Governor’s knowledge, and that of Governor’s office staff, of various aspects of the Flint water crisis was compromised by the information—much of it wrong—provided by MDEQ and MDHHS.
- F-14. The Governor’s office continued to rely on incorrect information provided by these departments despite mounting evidence from outside experts and months of citizens’ complaints throughout the Flint water crisis, only changing course in early October 2015 when MDEQ and MDHHS finally acknowledged the extent of the problem of lead in the public water supply.
- F-15. The suggestion made by members of the Governor’s executive staff in October 2014 to switch back to DWSD should have resulted, at a minimum, in a full and comprehensive review of the water situation in Flint, similar to that which accompanied the earlier decision to switch to KWA. It was disregarded, however, because of cost considerations and repeated assurances that the water was safe. The need to switch back to DWSD became even more apparent as water quality and safety issues continued and lead issues began to surface in 2015, notwithstanding reassurances by MDEQ.
- F-16. The Flint water crisis highlights the risks of over-reliance—in fact, almost exclusive reliance—on a few staff in one or two departments for information on which key decisions are based.
- F-17. Official state public statements and communications about the Flint water situation have at times been inappropriate and unacceptable.

Recommendations

- R-15. Expand information flow to the Governor so that information providing the foundation for key decisions comes from more than one trusted source—and is verified.
- R-16. Create a culture in state government that is not defensive about concerns and evidence that contradicts official positions, but rather is receptive and open-minded toward that

information. View informed opinions—even if critical of state government—as an opportunity for re-assessing state positions, rather than as a threat.

- R-17. Ensure that communications from all state agencies are respectful, even in the face of criticism, and sensitive to the concerns of diverse populations.
- R-18. The Governor must assume the leadership of, and hold state departments accountable for, long-term implementation of the recommendations in this report, including but not limited to the need for cultural changes across multiple state agencies, the need for health mitigation and LSL replacement in Flint, and the need for a funding strategy to address replacement of LSLs statewide.
- R-19. Review budget requests for MDEQ to ensure adequate funding is provided to the ODWMA. EPA audit and interviews indicate that Michigan’s drinking water program might have one of the lowest levels of financial support within EPA Region V while having one of the largest, if not the largest, number of community water systems to regulate.

State-Appointed Emergency Managers

Defined Role

The role of the emergency manager (EM) under the Emergency Manager Law, PA 436, is clear and unambiguous. Though they report directly to the Department of Treasury, EMs have complete authority and control over municipal decisions. In that context, the EMs had the responsibility to ensure that Flint water system operations were adequately resourced and supported by personnel and consultants with adequate training and expertise.

Discussion

Owing to significant declines in economic vitality and substantial outmigration since (at least) the 1990s, Flint was first placed in financial receivership under an emergency “financial” manager between 2002 and 2004.⁴⁹ Since 2011, the City has been under some form of state-ordered and controlled emergency financial management.⁵⁰ During this time, four different EMs have served for varying lengths of time, one serving twice.⁵¹

Our interviews confirmed the EMs reported to and interacted regularly with Treasury officials. They discussed issues such as public safety, staffing requirements, and financial matters. The EMs, working through Treasury, also would contact other state agencies for assistance on a regular basis, such as the State Police on law enforcement matters.

⁴⁹ Imposed under PA 72 of 1990.

⁵⁰ In 2011, PA 72 was replaced by PA 4, which amplified the powers of an appointed EM. The voters repealed PA 4 in November 2012, but a subsequent statute was passed by the legislature in December 2012: PA 436 of 2012. That statute is not subject to a voter referendum and has been in effect since March 2013.

⁵¹ Ed Kurtz served as Flint’s emergency financial manager under PA 72 of 1990 from May 2002 to 2004; Michael Brown was appointed in December 2011 under PA 4; Ed Kurtz became EM again in August 2012; Michael Brown was reappointed again in June 2013; Darnell Earley replaced Brown in October 2013; Jerry Ambrose replaced Earley in January 2015; and Ambrose left in April 2015 when control over the city’s finances was assigned to a city administrator under the supervision of a Receivership Transition Advisory Board.

Numerous decisions were made between December 2011 and April 2015 that had some impact on the decision to use the Flint River as the primary source of drinking water for the City of Flint. Various state-appointed EMs served during this timeframe and it was these EMs who made these decisions, **not locally elected officials**. Although it is true that some locally elected officials supported, acknowledged, embraced, and even celebrated some of the decisions, the decisions were not theirs to make. The state-appointed EMs made the decisions.

Specifically, Flint EM Ed Kurtz authorized use of the Flint River as a water source for Flint, as clearly indicated by his approval of a sole-source contract for the engineering firm Lockwood, Andrews, & Newnam (LAN) to prepare the Flint WTP for full-time treatment of Flint River water. Darnell Earley was the incumbent Flint EM and presided over the switch of water sources in April 2014. He and later EM Jerry Ambrose were in place during periods when citizens requested a return to DWSD because of health problems they were experiencing. Neither Darnell Earley nor Jerry Ambrose seriously considered a return to DWSD in part because MDEQ, local staff and their consultants assured the EMs that the water quality problems were manageable and that there was nothing seriously wrong with the water.⁵² In March 2015, nearly one year after the source water conversion, Jerry Ambrose stated that a reconnection to DWSD would cost the City \$10.1 million per year and that water purchases could be as high as \$1 million per month—essentially asserting that it was unaffordable.⁵³

In any event, the facts in this case point to the reality that state government, as the entity in charge of Flint decision-making, failed to protect the health of the city's residents. Regardless of any successes of the EM process in other Michigan cities, this failure must force us to review the EM law and the general approach to financial problems. Government approaches to cities in fiscal distress must balance fiscal responsibility with the equally important need to address quality of life, economic development, and infrastructure maintenance and provision.

Findings

F-18. Emergency managers, not locally elected officials, made the decision to switch to the Flint River as Flint's primary water supply source.

F-19. Treasury officials, through the terms of the local emergency financial assistance loan executed by the Flint emergency manager on April 29, 2015, effectively precluded a return to DWSD water, as Flint citizens and local officials were demanding, without prior state approval.

The Emergency Manager Law is predicated on the provision that any ongoing accumulated local government deficit is resolved prior to the termination of receivership (P.A. 436 of 2012). As the city of Flint neared the end of its Emergency Manager status in March 2015, the city still retained an \$8 million accumulated deficit in the General Fund. To resolve this accumulated deficit, the state and the Flint EM, with the concurrence of Flint's City Council, signed an emergency loan agreement between the City of Flint and

⁵² See, for example, "City of Flint Water System Update with Questions and Answers," February 16, 2015, posted to City of Flint website at www.cityofflint.com/wp-content/uploads/Water-Sysytem-FAQ-Update-2-16-151.pdf, as confirmed in FWATF interviews of Flint's former EMs.

⁵³ Memorandum dated March 3, 2015, to Deputy State Treasurer Wayne Workman.

Michigan’s Local Emergency Financial Assistance Loan Board for nearly \$8 million.⁵⁴ This emergency loan included a provision that the City of Flint could not, without prior state approval, return to DWSD or lower water rates.

- F-20. The role of the EMs in Flint (in combination with MDEQ’s failures) places primary accountability for what happened with state government.

Trying to assign responsibility to an individual EM for the decision to use the Flint River is pointless—and the answer ambiguous. One EM set it in motion, another presided over the actual event, and two EMs did not seriously entertain reversing the decision in the face of public protest. The latter refusals were for simple reasons: they received “expert” advice that the water was safe to drink, and they concluded that switching back to DWSD would be too costly.

We believe the larger issue is one of accountability. Who is accountable for the decisions made by the EMs in Flint? We believe the state must assume that accountability. If the state does not assume that responsibility, given the role the state has in both the appointment of EMs and the line of accountability to the Department of Treasury, then no accountability exists at all.

- F-21. EMs charged with financial reform often do not have, nor are they supported by, the necessary expertise to manage non-financial aspects of municipal government.
- F-22. Michigan’s Emergency Manager Law and related practices can be improved to better ensure that protection of public health and safety is not compromised in the name of financial urgency.

The EM Law is predicated on the concept that a local financial crisis—such as that which occurred in Flint in 2011—is due to the inability of local officials to address the problem. The EM is supposed to be able to better handle the situation, make better and faster decisions, and resolve the crisis. The EM law states “[t]hat the fiscal stability of local governments is necessary to the health, safety, and welfare of the citizens of this state and it is a valid public purpose for this state to assist a local government in a condition of financial emergency.”⁵⁵ The EM is deemed necessary not only to resolve the fiscal problem but also to protect the public health and safety.

Yet in the case of Flint, while other state and local officials were involved, EMs were at the heart of decision-making processes that prolonged lead exposure occasioned by MDEQ’s failure to prescribe appropriate treatment for the Flint water system.

Recommendations

- R-20. Review Michigan’s Emergency Manager Law (PA 436) and its implementation, and identify measures to compensate for the loss of the checks and balances that are provided by representative government.

⁵⁴ Note that the Resolution presented to Flint City Council by the Flint EM, Resolution 150302.1, contained no information regarding the DWSD and water rates conditions contained in the emergency loan.

⁵⁵ Michigan Public Act 436 of 2012, Section 3 (c).

Although we acknowledge that controversy will always accompany state receivership in whatever form, we recommend a review of PA 436. While some of the checks and balances inherent in democratic decision-making are necessarily and by definition absent under emergency management—as is also true under bankruptcy—proper and efficient checks and balances per se should not be a casualty of state receivership. Neither should avenues for citizens to voice their concerns, particularly regarding matters of public health and safety.

R-21. Consider alternatives to the current EM approach—for example, a structured way to engage locally elected officials on key decisions; an Ombudsman function in state government to ensure that local concerns are a factor in decisions made by the EM; and/or a means of appealing EM decisions to another body.

R-22. Ensure proper support and expertise for EMs to effectively manage the many governmental functions of a city. Decisions on matters potentially affecting public health and safety, for example, should be informed by subject matter experts identified and/or provided by the state.

EMs are asked to ensure the protection of the public health and safety and yet are not provided adequate tools and resources to achieve this objective. EMs are empowered to effect cost-cutting measures such as the ability to terminate contracts and restructure budgets. However, they are given little or no priority access to state or federal resources or assistance in undertaking the complex activities of running a municipality. Other states take different approaches that may do a better job of balancing the need for fiscal discipline with the need to provide basic public services, especially when scientific, health, and/or engineering expertise is involved.

City of Flint

Defined Role

As the owner of its public water system, the City of Flint has responsibility for compliance with the SDWA under Act 399. These responsibilities include “ensuring proper design, construction, operations and maintenance, so that contaminants in tap water do not exceed the standards established by law.” The City is “required to employ properly certified water operators that are trained and experienced to operate the treatment and distribution system.”

The City must “test its water routinely for specified contaminants and report the results to MDEQ.” If a water system is not meeting these standards, it is the water supplier’s responsibility to notify its customers when there is a problem with water quality.⁵⁶ With a planned change in water source, it is the City’s responsibility to carefully plan and test water treatment techniques, ensure staff is knowledgeable about treatment protocols, and monitor distribution system water quality. We note that decisions affecting these responsibilities, particularly those that had financial implications, were ceded to Flint’s EMs throughout the course of the Flint water crisis.

⁵⁶ Quotes are from the MDEQ’s “Outline of Flint Drinking Water Issues for Flint Water Task Force,” p.3.

Discussion

City of Flint Public Works executive leadership and staff were immediately responsible for treating Flint River water and for monitoring water quality in the distribution system. SDWA compliance is the obligation of the public water supplier, and it is their hands that public trust is placed. Flint was responsible for ensuring that its WTP was adequately upgraded and tested to perform full-time operations, that operations staff members were adequately trained and familiar with treatment processes, that the treatment technologies used were adequate to produce safe drinking water, and that the water quality throughout the distribution system (all the way to consumers' taps, in the case of the LCR) was in compliance with regulatory requirements, as confirmed using appropriate sampling procedures. These standards of practice were not met in Flint.

The City relied on Flint Utilities Department staff's limited experience, consultant advice, and most substantially MDEQ for technical support. In this respect, Flint was similar to many communities in Michigan that rely on MDEQ for technical assistance and advice on regulatory compliance requirements. However, in Flint, that reliance was tragically misplaced.

Our interviews underscored several troubling aspects of the inexorable drive to leave the DWSD system and use the Flint River as an interim supply source for drinking water. Most obviously, the parties simply failed to adequately appreciate (or signal) the complexities involved in treating Flint River water, or the potential implications of water chemistry changes to the city's water distribution network. We note that Flint endured a series of water quality threats—from *E coli* contamination to high total trihalomethane (TTHM) levels—that could have been prevented. Increased lead exposure and increased incidences of Legionellosis likely are the most serious health consequences of a sustained period of water quality problems that clearly overwhelmed Flint staff. At best, consultant support for Flint River water treatment, and later for redress of distribution system water quality problems, focused on specific issues without adequate consideration for latent public health dangers.

The Flint Utilities Department personnel were under-trained, inexperienced with full-time plant operations, and ill-prepared to manage complex water chemistry issues. We note that selected staff members conveyed concerns as events unfolded, only to have those concerns discounted. Several aspects of the situation are particularly troubling.

- Less than one month before startup of full-time Flint WTP operation, MDEQ was uncertain about its requirements for the transition. MDEQ staff noted internally that Flint would face complexities in treating Flint River water and challenges with full-time operation of the dated WTP.⁵⁷
- It is not clear that Flint's resident consulting engineers, LAN, had adequate expertise and experience with river water treatment, yet the firm was engaged through a sole-source contract.⁵⁸

⁵⁷ See, for example, Stephen Busch e-mail of March 26, 2014 – and his e-mail of exactly one year earlier.

⁵⁸ LAN representatives were not made available for interview. Questions were provided in writing and sent to LAN (and are included in Appendix IV); responses were not received prior to publication of this report.

- Flint WTP operators were hired too late in plant ramp-up efforts to enable full-time staffing, which precluded adequate training on plant operations.
- MDEQ misinterpreted the Lead and Copper Rule (LCR) in determining that corrosion control treatment was not necessary with commencement of full-time WTP operation. Neither Flint Utilities Department staff nor their consulting engineers were given either to question this misinterpretation, or to institute rigorous distribution system water quality monitoring to safeguard against corrosion-causing water quality issues.

We note that Flint WTP supervisory personnel's expressed concerns regarding readiness to begin full time operations—including appropriate LCR-mandated sampling—and these concerns went unheeded.⁵⁹ However, it seems clear that these concerns were voiced in an environment that was unreceptive to reconsideration of the City's chosen course, mandated by its EMs.⁶⁰

We also are dismayed by the inadequate and technically flawed efforts Flint Utilities Department personnel undertook, based on MDEQ's instructions, to assess distribution system water quality. As a result, Flint's water quality sampling was fundamentally flawed, giving false assurances and an untenable basis for MDEQ's claims that Flint's system was delivering safe water. The series of missteps and outright errors is well documented,⁶¹ including sampling of pre-flushed lines, use of narrow-mouthed bottles, and perhaps most egregiously failure to select high-risk homes for testing, as required by the LCR. It is hard not to attribute this conduct to a misguided objective of securing nominal LCR compliance irrespective of what conditions might actually exist in the homes of Flint residents.

Also troubling, though not altogether uncommon among U.S. water systems, is Flint's admission that it had not conducted a census of LSLs as required by the LCR. Without this information, Flint was not in a position to identify high-risk homes to properly monitor lead levels and comply with the LCR.

In summary, while we cannot begin to explain or excuse MDEQ's transgressions in its oversight of the conversion to the Flint River water supply, the Flint Public Works role in the crisis appears attributable to an inexperienced and poorly resourced organization struggling to take on enormous, untenable responsibilities. Flint's EM, relying on sole-sourced consultant support, held responsibility for ensuring adequate staffing, training, and preparation for conversion of Flint's drinking water source. Those responsibilities were not met.

Findings

- F-23. Flint Public Works personnel were ill-prepared to assume responsibility for full-time operation of the Flint WTP and distribution system.

⁵⁹ April 17, 2014 e-mail from Flint Utilities Department's Michael Glasgow to Adam Rosenthal, Mike Prysby, and Stephen Busch at MDEQ.

⁶⁰ See, for example, April 24, 2014 e-mail from Daugherty Johnson, City of Flint Utilities Administrator, and Mike Prysby and Stephen Busch/MDEQ, including Flint Public Works Director Howard Croft.

⁶¹ See, for example, "COMMENTARY: MDEQ Mistakes and Deception Created the Flint Water Crisis," September 30, 2015, Siddhartha Roy, Flintwaterstudy.org, and February 27, 2015 e-mail from Miguel Del Toral/EPA to MDEQ: "If systems are pre-flushing the tap the night before collection of LCR compliance samples (MDEQ still provides these instructions to public water systems) this clears particulate lead out of the plumbing and biases the results low by eliminating the highest lead values."

- F-24. The Flint WTP and installed treatment technologies were not adequate to produce safe, clean drinking water at startup of full-time operations. Flint's lack of reinvestment in its water distribution system contributed to the drinking water crisis and ability to respond to water quality problems.
- F-25. Flint Public Works personnel failed to comply with LCR requirements, including the use of optimized corrosion control treatment and monitoring for lead. Flint personnel did not identify residences with LSLs, secure an adequate number of tap water samples from high-risk homes, or use prescribed sampling practices (for example, line and tap flushing methods and sample bottle sizes).
- F-26. Flint Public Works acted on inaccurate and improper guidance from MDEQ.
- F-27. Many communities similarly rely on MDEQ to provide technical assistance and guidance on how to meet regulatory requirements. In the case of Flint, MDEQ assistance was deeply flawed and lax, which led to myopic enforcement of regulations designed to protect public health.
- F-28. The EM structure made it extremely difficult for Flint citizens to alter or check decision-making on preparations for use of Flint River water, or to receive responses to concerns about subsequent water quality issues.

Recommendations

- R-23. Establish and fund a team of subject matter experts in water system operations (treatment and distribution system management) to support and train water system personnel, guide safe system operation under current conditions, and prepare for successful conversion to KWA.

In addition to creating water quality problems, the switch to the Flint River may have precipitated conditions in Flint's water system that increase the potential for *Legionella* to occur. With warmer temperatures in 2016, there is a heightened need for multi-agency coordination on testing of the Flint water system for the presence of *Legionella*, and on public health monitoring for the incidence of Legionellosis and determinations of sources.

- R-24. Implement a programmatic approach to Flint WTP and distribution system operations, maintenance, asset management, water quality, capital improvements and public engagement (including risk communication) to ensure that the disparate ongoing efforts to address Flint water system infrastructure needs are coordinated, fully documented, and structured to sustain high-quality potable water service over the long term.

Though not the subject of the FWATF's review, it is apparent that the Flint water utility faces acute financial challenges due to earlier financial management practices, as well as successful challenges to EM-ordered rate increases. These circumstances impose an unprecedented context for establishing defensible water rates and collection practices in a community that was already facing difficult water affordability challenges. Careful financial planning and management will be required to secure and effectively deploy external funding assistance, and to gradually stabilize water system revenues to sustain water utility operations over the long term. This must be complemented by an effective public education and engagement program, and innovative water affordability strategies to advance universal access to potable water service.

R-25. Implement a robust public engagement and involvement program in conjunction with the anticipated conversion to KWA-delivered water and provide for regular reporting to the Flint Water Inter-Agency Coordinating Committee (FWICC).

Genesee County Health Department (GCHD)

Defined Role

As a local health department, the Genesee County Health Department (GCHD) is responsible for all government public health functions for residents in their jurisdiction, including the City of Flint. Like the vast majority of cities in Michigan, Flint does not have its own public health officials and instead relies on its county health department (GCHD) to perform public health functions. GCHD must coordinate and communicate effectively with city officials and the public. Specific to the Flint water crisis, GCHD responsibilities include investigating outbreaks of reportable diseases such as Legionellosis and conducting timely in-home assessments of potential sources of lead exposure for children found to have elevated blood lead levels.

Importantly, the functions of local health departments also include cooperative coordination with state public health authorities (MDHHS), and in turn with federal public health authorities (for example, Centers for Disease Control and Prevention [CDC]) as needed. The expectation is that local health departments manage issues that arise in their jurisdictions. State public health authorities become involved at the request of local authorities and/or when events such as an outbreak involve more than one jurisdiction (that is, more than one local health department). In turn, MDHHS requests help from the CDC as needed. This local-to-state-to-federal sequence is designed to facilitate communication, coordination, and follow-up among officials at multiple levels of authority, and it requires mutual trust, collaboration and effective communications across agencies.

Discussion

In summer 2014, after the change of water source for the City of Flint, there were two public health problems that arose within the jurisdiction of GCHD: exposure to lead and exposure to *Legionella*.

Exposure to Lead

In contrast to Legionellosis, which has involved GCHD as a front-line responder, GCHD was not extensively involved in responding to exposure of children to lead from the Flint water supply. Elevated blood lead level records are maintained as part of a regularly updated listing of test results by MDHHS in the statewide Childhood Lead Poisoning Prevention Program (CLPPP). GCHD was involved as a coordinating organization for conducting tests and relaying test results to the state.

Clinicians are responsible for testing children's blood for lead in early childhood on a routine basis. Health insurance plans (especially those that contract with state Medicaid) are responsible for encouraging families and clinicians to have children screened at the appropriate ages and then following up with children whose blood lead levels are elevated. GCHD would get involved for children with elevated lead levels that prompted in-home assessments of possible sources of environmental lead exposure.

Since the switch to the Flint River, a higher proportion of children in Flint have had elevated lead levels that would prompt in-home assessments. Several aspects of the GCHD-MDHHS response are noteworthy:

- GCHD was overwhelmed with the need for in-home assessments, and MDHHS supported training and placement of outreach nurses in GCHD to supplement its workforce.
- GCHD had been asked only to reach out to pregnant women who might have had lead exposure, rather than performing their usual in-home assessment duties. MDHHS tasked an outside firm with performing the in-home assessments.
- As of late January 2016, only about one-fifth of children known to have had elevated blood lead levels in Flint since April 2014 had received in-home environmental assessments (including water testing).

Legionella

After the switch to the Flint River in 2014, the Flint Utilities Department began flushing water mains citywide to address brown-colored water resulting from corrosion of pipes in the distribution system. Many fire hydrants ran for days, which may have disrupted the “biofilm,” a slime coating (which is distinct from the scaling provided by corrosion control treatment) on the inside surface of the water mains and water service lines. When the biofilm was disrupted, *Legionella* and other bacteria may have been released. In addition, EPA experts Del Toral and Lytle believe that corroding pipes likely absorbed chlorine in the water, leading to extremely low chlorine levels that were insufficient to kill *Legionella* in the water. Also, given the small population in Flint compared to the large water distribution system developed to serve the city’s larger population in decades past, water likely pooled in the system for excessively long periods, providing an ideal environment for bacterial growth.

As noted above, several cases of Legionellosis occurred in patients who likely were exposed to *Legionella* in healthcare facilities. McLaren Medical Center in Flint responded to the incident by hiring a *Legionella* expert, spending \$300,000 for systems to eliminate the bacteria, and changing practices on their wards to instruct patients not to take showers (because aerosols can spread *Legionella*).

During this timeframe, the City of Flint (Mayor Dayne Walling, EM Jerry Ambrose and others) asserted the water was safe. Even while outbreak investigations were ongoing, GCHD and MDHHS did not issue a bulletin to the medical community or the public. The *Legionella* expert hired by the hospital and other water quality experts cannot dismiss the possibility of a link between the Legionellosis outbreaks and lack of proper corrosion control and disinfection in the City’s water system.

In Flint, neither the Flint EM nor his appointed City Administrator, GCHD, or MDHHS fully disclosed the Legionellosis outbreak to local medical professionals or the general public. Moreover, this outbreak, *which is always associated with water supplies*, was not communicated by MDEQ with sufficient urgency to the Governor’s office.

In contrast, New York City experienced an outbreak of Legionellosis attributed to several hospital cooling systems in different parts of the city in summer 2015. Public health officials made

announcements to City residents about the cases and the outbreak was reported in the media, along with health advice for the public.

Findings

- F-29. Communication, coordination and cooperation between GCHD, the City of Flint and MDHHS were inadequate to protect Flint residents from public health threats resulting from inadequately treated Flint River water.
- F-30. The rate of follow-up on children with elevated blood lead levels through January 2016 was unacceptable, illustrating a low level of coordination between GCHD and MDHHS and insufficient resources devoted to this task.
- F-31. Management of the Flint River-sourced water supply may have contributed to the outbreaks of Legionellosis cases in 2014 and 2015 in Genesee County. Although the definitive cause of the outbreaks is uncertain at the time of publication, GCHD and MDHHS did not notify the public of the outbreaks in a timely fashion in order to urge caution.

Recommendations

- R-26. Improve follow-up on public health concerns between GCHD, MDHHS and the City of Flint now and in the future, to effect timely, comprehensive, and coordinated activity and ensure the best health outcomes for children and adults affected.
- R-27. Presume that the risk of Legionella may remain elevated in the Flint water distribution system and must take appropriate steps with public and private partners to monitor and mitigate that risk as concerns about water quality continue in the City of Flint.
- R-28. Coordinate with state officials (MDHHS) and with local healthcare professionals and healthcare institutions in Genesee County and the City of Flint to mitigate the risk of Legionellosis in 2016 and beyond.

It is not clear whether the switch back to DWSD in October 2015 and subsequent addition of corrosion control will change the conditions for *Legionella* growth in the Flint water distribution system. In addition, the strong predominance of cases linked to healthcare exposure at one particular hospital in Flint underscores the critical importance of appropriate and timely antiseptic use by healthcare facilities to reduce the risk of Legionellosis.

To facilitate appropriate collection of *Legionella* specimens that will permit tracing of *Legionella* species in the setting of any further outbreaks, healthcare professionals in Genesee County should be vigilant and err on the side of collecting respiratory specimens before initiating therapy in cases of presumed Legionellosis.

U.S. Environmental Protection Agency (EPA) Oversight and the Lead and Copper Rule

Defined Role

EPA has responsibility under the Safe Drinking Water Act to set and enforce health-based drinking water quality standards. EPA establishes National Primary Drinking Water Regulations that set enforceable maximum contaminant levels in drinking water and prescribe treatment

requirements. Each standard also includes requirements for water systems to test for contaminants in the water to make sure standards are achieved.

EPA regulates public water systems through its Public Water System Supervision (PWSS) program. From the description of that program:

EPA's and states' primary means of monitoring public water system compliance with the SDWA and its implementing regulations is the review and evaluation of analytical results of water samples collected by public water systems. These reports provide the water systems and regulators with the data they need to ensure that drinking water monitoring is ongoing and that the drinking water standards are being met. When results indicate that a contaminant is present at a level that exceeds standards, states and EPA work with public water systems to take steps to prevent or remove the contaminants, and notify consumers so that they can make informed choices.⁶²

EPA is required to oversee the regulatory actions of state and local agencies and ensure that local public water suppliers adhere to the standards set under the SDWA.⁶³ The SDWA authorizes the EPA to delegate primary enforcement responsibilities to the states. Forty-nine states, including Michigan, have this delegated authority.

While the states are delegated regulatory primacy, there are two sections of the SDWA that give EPA authorization to act:

- a. Sec. 1414 of the Act says that when the agency finds a public water system out of compliance, the EPA must notify the state and public water system of the violation. If after 30 days the state has not commenced enforcement action, then the EPA must issue an order to comply. In the case of Flint, EPA did not use this authority as required by the SDWA.
- b. Sec. 1431 of the Act grants emergency powers to the EPA when the Administrator is aware of a contaminant or threat “which may present an imminent and substantial endangerment to the health of persons, and that appropriate state and local authorities have not acted to protect the health of such persons, the EPA Administrator may take such actions as he or she may deem necessary in order to protect the health of such persons.” The EPA used this authority when it issued its emergency order on January 21, 2016.

Lead and Copper Rule:

The Lead and Copper Rule (LCR) is intended to protect public health by reducing lead and copper in drinking water at customers' taps. For the rule to be effective, and for lead and copper contamination to be detected, water sampling practices must be rigorous. Ample industry guidance⁶⁴ emphasizes the requirements for this rigor, which include selecting residences at high

⁶² www.epa.gov/compliance/safe-drinking-water-act-sdwa-compliance-monitoring

⁶³ Before the federal EPA was established, states regulated drinking water. The SDWA kept that regulatory structure in place and assigned EPA oversight responsibility for state regulatory activities.

⁶⁴ See, for example, “A Field Comparison of Sampling Protocols for Measuring Lead in Drinking Water,” Porter, A., M. Del Toral, and M. Schock. In *Proceedings*, Water Quality Technology Conference, Long Beach, CA, November 3-7, 2013, American Water Works Association, Denver, CO (2013).

risk for lead exposure, prohibiting pre-flushing and aerator removal, and observing minimum stagnation times. More fundamentally, public water systems must identify the LSLs in their service areas, advise customers of their presence and potential implications, and facilitate full service line replacements in the event of action level exceedances. The LCR also requires public water systems to minimize lead and copper levels in drinking water by controlling corrosion in the distribution system, which is achieved by implementing corrosion control treatment (CCT).

Unfortunately, despite the clarity of its intent, the LCR's language has been subject to various interpretations from one state, and one water system, to another. Though MDEQ's misinterpretations may be among the most egregious examples of lax and myopic compliance practices, there are pronounced concerns that the effectiveness of the rule has been compromised.⁶⁵ EPA is in the process of reviewing and revising the LCR through its established rulemaking procedures.

While the states are delegated regulatory primacy, 40 CFR 141.82(i) gives the EPA Regional Administrator authority to review treatment decisions made by a state and issue federal treatment determinations consistent with the LCR.

Discussion

Prior to Flint's water supply conversion, EPA's delegation of primacy for enforcement of the SDWA in Michigan had been challenged by a series of disagreements and concerns over compliance requirements and sampling practices.⁶⁶ These were heightened with the series of events that precipitated the water crisis. EPA Region V was first notified of a potential problem in Flint by resident LeeAnne Walters, who called to inform them of the high lead level (104 ppb) found in her drinking water. In early 2015, EPA's Miguel Del Toral worked with Walters to diagnose water quality problems at her residence. During this time, EPA inquired (repeatedly) about CCT at the Flint WTP, advised MDEQ that the LCR unambiguously requires CCT, and were told incorrectly that Flint had an optimized corrosion control program.

In this timeframe, EPA was trying to determine whether the high lead levels at LeeAnne Walters's house represented an isolated or system-wide problem. Ultimately, it required LeeAnne Walters's inquiry of Flint Utilities Department personnel for EPA to learn that Flint did not have CCT in place. It took 2 months from EPA's first inquiry for MDEQ to acknowledge that Flint was not implementing CCT.

Given this information, EPA tried to convince MDEQ by persuasion and forthright referencing to the LCR that Flint needed to add CCT (as DWSD had been doing for decades) However, MDEQ was entrenched in its (incorrect) position that two 6-month monitoring periods are allowed before a decision on CCT is required. MDEQ forestalled imposing the requirement for CCT pending issuance of a legal opinion.

⁶⁵ See, for example, Dr. Yanna Lambrinidou's dissenting opinion on long-term revisions for the LCR, submitted to the EPA National Drinking Water Advisory Council in October 2015 ("EPA NDWAC LCR WG, Dissenting Opinion, Oct. 2015"), www.epa.gov/sites/production/files/2015-11/documents/ndwaclcrstatementofdissent.pdf; and the Northeast-Midwest Institute's Elin Betanzo's article, "Clarifications Needed to Strengthen the Lead and Copper Rule Working Group's Recommendations for Long Term Revisions to the Federal Lead and Copper Rule," November 17, 2015, www.nemw.org/wp-content/uploads/2015/11/NEMWI-LCR-recommendations.pdf.

⁶⁶ FWATF interviews with Miguel Del Toral. Also see April 27, 2015, e-mail exchanges among MDEQ's Cook, Busch and Prysby regarding Del Toral's question on corrosion control treatment.

EPA was similarly hampered by poor information derived from Flint's flawed water quality sampling for LCR compliance. Not only did MDEQ persist in prescribing sampling methods that limited opportunities for detection of lead contamination, it did not ensure that a proper sample pool was obtained from the Flint system. The first 6-month monitoring period results showed the 90th percentile lead level results to be 6 ppb, and the second 6-month monitoring period results showed the 90th percentile to be 11 ppb. Both of these outcomes fell beneath the lead action level of 15 ppb. Unfortunately, because of the flawed sampling pool and sampling techniques, the extent of the lead problem was under-reported. It came to light in September 2015 with the results of Dr. Marc Edwards's lead sampling program. After testing 252 water samples taken in Flint, the 90th percentile⁶⁷ of Dr. Edward's samples was found to be 25 ppb, and more than 100 samples had lead over 5 ppb.

Even given the City's flawed sampling program, EPA staff did become aware of the potential risks in April 2015 when MDEQ's failure to require CCT was revealed, and EPA leadership was advised of acute concerns in an interim report by Miguel del Toral in June 2015:

"In effect, the City of Flint stopped providing treatment used to mitigate lead and copper levels in the water. In accordance with the Lead and Copper Rule (LCR), all large systems (serving greater than 50,000 persons) are required to install and maintain corrosion control treatment for lead and copper. In the absence of any corrosion control treatment, lead levels in drinking water can be expected to increase.

The lack of mitigating treatment is especially concerning as the high lead levels will likely not be reflected in the City of Flint's compliance samples due to the sampling procedures used by the City of Flint for collecting compliance samples."⁶⁸

However, with the exception of the strident e-mails and interim report by Del Toral,⁶⁹ EPA refrained from elevating concerns or taking action. EPA did not insist on implementation of CCT between the end of April 2015, when it learned CCT was not in place, and July 21, 2015, when the second round of LCR monitoring results ended MDEQ's misinformed interpretation of the LCR. Only after broad public revelation of the magnitude of the crisis and of MDEQ's multiple failures—and, not coincidentally, the opportunity to garner positive recognition—did EPA exercise its authority under the SDWA and issue its Emergency Order on January 21, 2016.

EPA did not cause the problem in Flint, and it was EPA employees (in particular Del Toral) who asserted the need for Flint to have CCT in place. Unfortunately, EPA was not insistent or forceful enough to prompt MDEQ to require Flint to add CCT for almost 3 months after EPA was aware of its absence. This needlessly extended the time during which Flint residents were exposed to corrosive drinking water with potentially high levels of lead.

Finally, EPA entertained and acquiesced to MDEQ's request for a legal opinion regarding the long-standing and well-understood requirement for corrosion control, ultimately issuing a clarification memo on LCR compliance requirements that suggested ambiguities.

⁶⁷ For a discussion of the arithmetic related to calculation of the 90th percentile, see the YouTube video: "How to calculate Flint's 90th percentile lead level with EMU math professor Chris Gardiner," www.youtube.com/watch?v=9pql00zr700&feature=em-share_video_user.

⁶⁸ "Interim Report: High Lead Levels in Flint, Michigan," by Miguel del Toral, transmitted to Thomas Poy, Chief, Ground Water and Drinking Water Branch, on June 24, 2015; p. 2.

⁶⁹ See, for example, Miguel Del Toral's e-mail to Jennifer Crooks MDEQ dated April 25, 2015.

Findings

- F-32. EPA failed to properly exercise its authority prior to January 2016. The agency's conduct casts doubt on its willingness to aggressively pursue enforcement (in the absence of widespread public outrage). EPA could have exercised its powers under Section 1414 and Section 1431 of the SDWA or under the LCR, 40 CFR 141.82(i).
- F-33. Despite the clear intent of the LCR, EPA has accepted differing compliance strategies that have served to mute its effectiveness in detection and mitigation of lead contamination risks. These strategies have been adopted at water systems and primacy agencies across the country. Though there may be some ambiguity in LCR rule, none of it relates to what MDEQ should have done in Flint. There was and remains no justification for MDEQ not requiring corrosion control treatment for the switch of water source to the Flint River.
- F-34. EPA was hesitant and slow to insist on proper corrosion control measures in Flint. MDEQ misinformation notwithstanding, EPA's deference to MDEQ, the state primacy agency, delayed appropriate intervention and remedial measures.
- F-35. EPA tolerated MDEQ's intransigence and issued, on November 3, 2015, a clarification memo on the LCR when no such clarification was needed.

Recommendations

- R-29. Exercise more vigor, and act more promptly, in addressing compliance violations that endanger public health.
- R-30. In collaboration with the NDWAC and other interested partners, clarify and strengthen the LCR through increased specificity and constraints, particularly requirements related to LCR sampling pools, sample draw protocols, and LSL replacements—and, more generally, strengthen enforcement protocols with agencies delegated primacy.⁷⁰
- The LCR should be modified to address a host of issues that have been the subject of ongoing debate and were tragically exemplified by the Flint water crisis. In particular, the LCR should be revised to:
- Unambiguously require optimized corrosion control treatment as a default practice for all large public works systems, and consider extending this requirement to small and medium-sized public water systems.⁷¹ EPA should remove any loopholes or flexible provisions that could be misinterpreted as allowing utilities to defer or avoid corrosion control, as was done in Flint. Optimized corrosion control will continue to be important in the long term, even after LSLs are replaced, due to other sources of lead in the distribution system such as lead solder and brass fixtures.

⁷⁰ For a further discussion of opportunities to strengthen the LCR, see Dr. Yanna Lambrinidou's dissenting opinion on long-term revisions for the LCR, submitted to the EPA National Drinking Water Advisory Council in October 2015 ("EPA NDWAC LCR WG, Dissenting Opinion, Oct. 2015"), www.epa.gov/sites/production/files/2015-11/documents/ndwaclcrstatementofdissent.pdf.

⁷¹ The current LCR language requires corrosion control for small and medium-sized systems only if water testing indicates action level exceedances, and it allows cessation of treatment if subsequent testing is below action levels. EPA should define procedures for small and medium-sized systems to safeguard public health and water quality through evaluation of corrosion control treatment requirements.

- Reiterate (and clarify) lead-in-water tap monitoring and sampling protocols to *ensure* that lead sampling will capture the worst-case lead levels in the highest risk homes, as the LCR intends.
- Clarify requirements for full LSL replacement, avoiding or eliminating language that allows utilities to count a LSL as “replaced” if water from a service line tests under the lead action limit in a one-time sample.
- Ban partial LSL replacements, which have been found by the CDC to increase risks of elevated blood lead levels.

In addition, the 15 ppb lead action level in the LCR should be revisited given that it is widely acknowledged that no lead is safe, and that the CDC recently lowered its 10 micrograms/deciliter “blood lead level of concern” to a 5 micrograms/deciliter “reference level.”

Also, the LCR should call for frequent and accessible public outreach and education on lead-in-water risks, including instructions on steps consumers can take to protect themselves. The LCR should require utilities to provide customers with explicit and urgent public notification of lead risks associated with activities that may cause physical disturbance of LSLs; inform customers when a LSL is present at their home; and provide customers clear information on how to request testing of lead-in-water levels in their homes.

Perhaps most fundamentally, the LCR should mandate proactive, full replacement of LSLs⁷² in a manner that appropriately balances risks and financial impacts. The LCR should require LSL replacements to be explicitly incorporated into water utilities’ renewal and replacement programs with required (and monitored) timelines that preclude undue (multi-decade) delays in replacements.

R-31. Engage Michigan representatives in ongoing LCR revisions and development of enforcement protocols at EPA and MDEQ.

EPA is conducting a process to define revisions to the LCR, which provides an opportunity to clarify ambiguities in requirements and to strengthen measures to protect public health and safety. State and local representatives, chastened by Flint’s experience, should participate in this revision process and ensure lessons learned are clearly and effectively communicated to decision-makers, including the National Drinking Water Advisory Council and EPA.

Issues Presented by the Flint Water Crisis

While our review has enabled us to draw a number of findings and conclusions about respective roles, it also occasions us to speak to issues and consequences that transcend the accountabilities assigned to individual agencies or entities. These issues convey many of the lessons learned from

⁷² This recommendation is consistent with recommendations of the Lead and Copper Rule Working Group: *Report of the Lead and Copper Rule Working Group To the National Drinking Water Advisory Council, August 24, 2015.* <https://www.epa.gov/sites/production/files/2016-01/documents/ndwaclcrwgfinalreportaug2015.pdf>

the Flint water crisis, evoke collective empathy for the Flint community, and speak to the opportunities for the crisis to improve the conduct and performance of government.

The Reality of Environmental Injustice

Discussion

Environmental justice embraces two fundamental principles: (1) the fair, non-discriminatory treatment of all people; and (2) the provision for meaningful public involvement of all people—regardless of race, color, national origin or income—in government decision-making regarding environmental laws, regulations and policies.⁷³ Environmental justice or injustice, therefore, is not about intent. Rather, it is about process and results—fair treatment, equal protection, and meaningful participation in neutral forums that honor human dignity.

Environmental injustice is not about malevolent intent or deliberate attacks on specific populations, nor does it come in measures that overtly violate civil rights. Environmental injustices as often occur when parties charged with the responsibility to protect public health fail to do so in the context of environmental considerations.

The facts of the Flint water crisis lead us to the inescapable conclusion that this is a case of environmental injustice. Flint residents, who are majority Black or African American and among the most impoverished of any metropolitan area in the United States, did not enjoy the same degree of protection from environmental and health hazards as that provided to other communities. Moreover, by virtue of their being subject to emergency management, Flint residents were not provided equal access to, and meaningful involvement in, the government decision-making process.

The occurrence of environmental injustice in the Flint water crisis does not indict or diminish other public and private efforts to address Flint's many challenging circumstances. However, irrespective of the intent of the parties involved, the simple reality is that the Flint water crisis is a case of environmental injustice.⁷⁴

⁷³ From the Environmental Justice Plan for the State of Michigan and Department of Natural Resources and Environment, December 17, 2010:

"The term "environmental justice" is defined in Executive Directive No. 2007-23 as follows: Environmental justice means the fair, non-discriminatory treatment and meaningful involvement of Michigan residents regarding the development, implementation, and enforcement of environmental laws, regulations, and policies by this state. The two "pillars" of environmental justice, thus, are the fair treatment of all people and providing for meaningful public involvement in government decision-making."

From the U.S. EPA (www3.epa.gov/environmentaljustice):

"Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work."

⁷⁴ There is ample evidence that the lead poisoning crisis is one in a series environmental injustices visited on the citizens of Flint. See, for example, "The Racist Roots of Flint's Water Crisis," by Julia Craven and Tyler Tynes,

Findings

F-36. The Flint water crisis is a clear case of environmental injustice.

Recommendations

R-32. Issue an Executive Order mandating guidance and training on Environmental Justice across all state agencies in Michigan, highlighting the Flint water crisis as an example of environmental injustice. The state should reinvigorated and update implementation of an Environmental Justice Plan for the State of Michigan.

Perspectives from Flint

The FWATF believes that by characterizing some of the prevailing perspectives of Flint residents, its members can provide valuable context for effectively implementing the recommendations herein.

From the viewpoint of medical services providers charged with responsibility to mitigate health consequences, there is both depression and anxiety associated with understanding what is occurring in Flint. The Flint water crisis is a chronic toxic exposure of an entire population in a sharply demarcated geographic area. Several key aspects point to the long-term health and social consequences:

- a. The manifestations of this toxic exposure depend on where along the life course a person may be. At different ages, critical structures and functions are injured or altered to different degrees. These changes may not manifest in functional derangements for months or years after exposure. The science of epigenetics addresses the interaction between genes and the environment, suggesting that some of these changes can be passed on from one generation to the next.
- b. Blood lead levels do not indicate peak lead exposures beyond a 30- to 35-day window. The damage from lead toxicity may be done months before the first blood lead level is taken or after the last is drawn, especially for newborns and children younger than 6 years of age. This suggests that the findings related to elevated lead levels measured in Flint children are merely the tip of the iceberg of actual exposure across children living in Flint.
- c. Documented risks of learning, behavioral, and cognitive problems are present for all potentially exposed children in Flint. Aggressive and impulsive behaviors that can emerge in adolescence related to lead exposure put children in the crosshairs of the criminal justice system, unemployment and underachievement.
- d. The risk of kidney problems, hypertension, gout and stillbirths may affect exposed adults in Flint over the coming years and decades.

For those serving in Flint's already distressed schools and mental health agencies, new and unprecedented challenges derive from balancing the need to track children and adults in a toxic exposure registry for preventative and supportive services, while being mindful of the stigma of low expectations for those listed in the registry.

Huffington Post, February 3, 2016, www.huffingtonpost.com/entry/racist-roots-of-flints-water-crisis_us_56b12953e4b04f9b57d7b118.

For well-intentioned parents, there is a need for significant sensitivity and expertise as they struggle to address and understand the guilt and depression that derive from unknowingly exposing their children, based on the hollow reassurances of those appointed and elected at city and state levels that the water was safe.

For non-English-speaking Flint residents, equally subject to the toxic effects of lead and related psychological trauma, communications and instructions regarding water use were not available, especially for those not literate in their native language. The sight of uniformed state troopers and National Guardsmen entering neighborhoods in convoys with flashing lights frightened many who did not open their doors to accept filter or water distributions. Initial requirements for identification scared many families away from distribution sites. There has been no provision for necessary medical and behavioral services for undocumented residents, regardless of age. There is fear that those presenting for extensive medical services will be deported, potentially dividing families. While there are several organizations that provide services regardless of status, it is essential that trusted members of the community can vouch for those organizations and help with appropriate documents which are unfamiliar to local service providers.

Among African American seniors, the protracted Flint water crisis echoes the tragic Tuskegee syphilis study and the decision not to treat smallpox among freedmen in the aftermath of the American Civil War. From this perspective, it is noted that measuring blood lead levels without removing the sources of lead from the environment—in this case, lead-tainted water—appears the equivalent of using Flint’s children (and adults) as human bioassays.

From the perspective of Flint community leaders, these consequences are traumatic and contribute to a dynamic that requires care and interventions as for any survivors of a traumatic event. These interventions must occur for individuals, neighborhoods and the community. Leaders must work to counter the doubtful views of many residents that public health and political systems do not have the will to sustain primary prevention but, rather, are willing to consign some people by virtue of their home address to the long-lasting neurodevelopmental and health impacts of lead exposure. Flint will have to engage in self-care and healing as it dissects the implications of what has occurred and is reminded of how much further we must go to become a just society.

Flint Recovery / Remediation

In light of the damage done, and the long-term health, economic, and social consequences for the Flint population, the Flint Water Advisory Task Force endorses the visions of responsive model public health and infrastructure renewal programs outlined by Dr. Mona Hanna-Attisha, Professor Marc Edwards and Miguel Del Toral. Flint’s population, exposed to toxic levels of lead, must be provided mitigating health services, public health infrastructure and skilled personnel. Flint’s water system, damaged by corrosive water, must be renewed and rehabilitated with high-risk LSL replacements prioritized. The State of Michigan must bear the primary responsibility for funding and securing federal funding for mitigation efforts in light of the responsibilities of state agencies, as well as the fact that state-appointed emergency managers governed Flint as key decisions were made that led to the water crisis.

As our initial letter to Governor Snyder called for a coordinated response to the Flint water crisis, we are gratified to see the efforts, now coordinated through emergency management personnel, to the immediate problems imposed by uncertainty regarding the safety of Flint’s tap water.

Recommendations

Our final recommendations look beyond the most immediate challenges of the unsustainable and expensive bottled water and filter distribution program that was needed, but clearly must serve as an interim emergency response. We offer the following mid-term and long-term Flint-specific recommendations:

- R-33. Sustainably fund the Flint Water Inter-Agency Coordinating Committee (FWICC) to provide adequate resources to engage supporting sub-committees for delivery of public health and water system services.

The FWICC has been charged with developing an incident action plan; reviewing our recommendations; establishing routine protocols for communications at the local, executive and legislative levels; making recommendations regarding the health impacts of the affected population; and assessing the status of infrastructure and determining feasible actions for upgrading Flint's water system.⁷⁵ The FWICC also should ensure transparent, public reporting of the status of various Flint-related measures, including the sources and uses of local, state and federal funds. Charitable organizations should be asked to provide accounting of their Flint-related activities to facilitate comprehensive reporting and information dissemination on available services.

- R-34. Clarify and effectively communicate the roles and work of the City of Flint, Flint Water Inter-Agency Coordinating Council and Mission Flint.

While many of the current efforts and investigations are critically important to safeguard Flint residents, address immediate challenges, and further establish accountability, the FWICC and Mission Flint are now in place to work with the City of Flint in coordinating sustained service delivery and remediation measures. These entities, and accompanying committees and work teams, have complementary roles and responsibilities that should be clearly delineated and communicated to all Flint residents. Communication must include efforts to reach Flint residents for whom English is not the primary language, and residents whose literacy in any language is limited. The status of the projects and programs that these entities are shepherding should be clearly communicated and measured against aspirational goals and objectives.

- R-35. Through collaboration among MDHHS, GCHD, local healthcare professionals, and health insurance plans, ensure 100 percent clinical and environmental follow-up with Flint families whose children have been found to have elevated blood lead levels since April 2014, and work together to ensure that such follow-up occurs in children's medical homes.

For the majority of >200 children residing in Flint and known to have elevated blood lead levels (≥ 5 micrograms per deciliter) from April 2014 to present, appropriate clinical and public health follow-up has not been timely. Such limitations in follow-up reflect a lack of coordination among state and county public health authorities, health insurance plans, local healthcare professionals, and parents. These children, and others who have elevated

⁷⁵ Drawn from January 11, 2016 Press Release: "Gov. Rick Snyder: Flint Water Interagency Coordinating Committee will support long-term needs in Flint."

blood levels on testing after this report is issued, will need long-term monitoring and access to a support services that include focused public health, nutrition and educational services.

- R-36. Offer all children listed in the recommended Flint Toxic Exposure Registry timely access to age-appropriate screening and clinically indicated follow-up for developmental and behavioral concerns by licensed healthcare professionals, as well as access to early childhood education and nutrition services.

Importantly, all children in the recommended Flint Toxic Exposure Registry are at risk for toxic lead exposure, even if they were not screened for blood lead levels during the time period of April 2014 to present. Therefore, all children listed should have access to the same screening and appropriate follow-up services as children who were found to have elevated blood lead levels.

- R-37. Consider establishing a dedicated subsidiary fund in the Michigan Health Endowment Fund to facilitate funding of health-related services for Flint.

The Michigan Health Endowment Fund (MHEF) statute created eight areas of focus for the fund, including several that are pertinent to the Flint water crisis. The MHEF focuses on access to healthy food (known to offset children's absorption of environmental lead), wellness programs (such as those known to encourage primary and secondary prevention), access to mental health services (such as behavioral therapy for children adversely affected by lead exposure), and foodborne illness prevention (such as averting exposure to lead in food prepared with lead-contaminated drinking water). Given the substantial overlap between the focus areas of the fund and the areas of short- and long-term activity for the people of Flint, it is appropriate to establish a subsidiary fund that would be administered to facilitate funding of health-related services for children and adults in the Flint Toxic Exposure Registry. Because Michigan has been successful in securing federal funds to expand Medicaid coverage for persons under age 21 years in Flint, the subsidiary MHEF Fund would be designed to focus on facilitating and supporting services not explicitly covered by Medicaid. The Fund should also provide funding to support timely and transparent evaluation of the health impact of these supplementary services for the people of Flint.

- R-38. Establish a comprehensive Flint public health program, coordinated with county and state-level public health initiatives, that can serve as a model for population health across the state. This program should provide assessment, interventions, and support not only regarding the health effects of water contamination but also more broadly regarding the health effects of chronic economic hardship and other social determinants of poor health.

State-Wide Initiatives

Beyond remediation of the impacts inflicted upon Flint, outstanding issues and lessons learned from the Flint water crisis provide an opportunity to improve public water supplies and coordination of institutions charged with safeguarding public health.

Recommendations

Our recommendations include:

R-39. Conduct an investigative review of the development and approval of the Karegnondi Water Authority and of the City of Flint's commitments to KWA water purchases.

The development of the KWA and the decision by the City of Flint to join it is complicated by an array of factors related to regional water system capacities, utility capital project contracting and financing, and local control over the implementation of facilities to promote economic development. As noted, issues related to state approval and permitting of the KWA are beyond the scope of our review.⁷⁶ However, the specific attributes of the decisions related to KWA warrant investigative review. We note:

- State and local officials repeatedly characterized Genesee County and Flint leadership, including Flint's emergency managers, as adamant in their promotion of KWA and desire for independence from DWSD.
- Several firms, each with ties to the respective and effectively competing parties, issued conflicting studies as to the merit of KWA. Independent review was requested of MDEQ, an agency ill-equipped to render judgments regarding economic feasibility.
- Contracting related to Flint's water purchase commitments and to use of the Flint WTP on an interim basis were effected through action of Flint's emergency managers.

An entity with proper tools and resources, such as the Michigan Attorney General or the U.S. Attorney's office, should do a complete and thorough review of the development and approval of KWA and of the City of Flint's commitments to KWA water purchases.

R-40. Institute a school and daycare water quality testing program (which could serve as a model for the U.S.), administered collaboratively by MDEQ and MDHHS, that includes appropriate sampling and testing for lead contamination for all schools and childcare centers in the state and effective reporting of test results.

Drinking water and water available for food preparation in schools and may be sources of lead and other hazards for school children. Currently, federal and state regulations do not require city, county or state authorities to routinely test water in school buildings. Furthermore, there is no state law, guidance or regulation regarding testing of drinking water in various childcare and pre-school settings (children below kindergarten-age).

Michigan should institute a school and day care water quality testing program, administered collaboratively by MDEQ and MDHHS, that includes appropriate sampling and testing for lead contamination in all schools and childcare centers in the state. Findings from such testing should be made available to all parents of children enrolled in the facilities where testing is performed. If lead is discovered through this testing, immediate remediation of the situation (for example, replacement of LSLs and lead-containing fixtures) must be required.

School testing requirements also should be applied to licensed day care settings across the state, given that young children are at the highest risk of profound health effects from lead exposure.

⁷⁶ These issues may (and perhaps should) prompt general inquiry into how utility regulation may better promote regional optimization of infrastructure investments.

A “Safe Water in Schools for Health (SWISH) program”⁷⁷ would include regular testing (and re-testing) of tap water at school and licensed day-care facility faucets and water fountains for regulated contaminants and for bacteria growth (like *Legionella*) known to be contained in plumbing systems. For schools found to have unsafe water, the program would provide funding and implementation support for either lead pipe replacements or installation of filters capable of treating the water to federal standards. The program could establish goals to install high-quality water fountains that facilitate effective water quality monitoring (as well as student use with refillable bottles). For some schools, this program could include the participation of science programs and students, working with independent testing laboratories. In any event, all water quality testing results should be posted both at the facilities and online, and communicated to parents.

R-41. Develop a model LSL replacement program and funding mechanisms for financing work on private property.

Notwithstanding the water industry’s historical reluctance to advocate for full LSL replacements, the state should develop a funding mechanism and program to evaluate and replace LSLs statewide, recognizing that some communities already have replaced their LSLs.⁷⁸ The state should develop a model statewide LSL replacement program that could serve as a national model, in collaboration with EPA, with the following attributes:

- Requirement for developing censuses of LSLs in utility service areas that are accessible on utility systems’ computerized Geographical Information Systems (GIS) and asset management systems. Censuses should be comprehensive, covering full lengths of service lines and ownership status, and be made publicly available to facilitate satisfaction of customer queries.
- Evaluation of lead line conditions and associated risks (placing high priority on replacements of lines to high-risk properties (for example, schools, childcare centers, hospitals, older neighborhoods and residences of vulnerable populations).
- Programming of full LSL replacements in federal- and state-sponsored public housing.
- Provision of health risk information to customers with LSLs when homeowners are presented with the option to pay for the private part of their LSL replacement.
- Explicit incorporation of LSL risk considerations in utility renewal and replacement programs to enable orderly, yet expeditious, full LSL replacement (including replacement of LSLs on private property).
- Establishment or enhancement of funding mechanisms to facilitate full LSL replacements by:
 - Reviewing strategies used by other communities and approaches to addressing funding of improvements on private property;

⁷⁷ These recommendations are drawn from (and reflect our substantive concurrence with) recommendations offered by Peter Gleick, president of the Pacific Institute, and Professor Marc Edwards, Virginia Tech. See “One step to help restore trust in Flint,” *Detroit Free Press*, March 6, 2016.

⁷⁸ Information on industry experience and perspectives is provided in “Strategies to Obtain Customer Acceptance of Complete Lead Service Line Replacement,” American Water Works Association, 2005.

- Facilitating public water systems' access to LSL replacement funding, including through provisions in drinking water state revolving loan fund program administration;
- Facilitation of public water system customer funding for replacement of LSLs and lead-containing fixtures on private property;
- Review of LCR-established authority to require full service line replacements; and
- Mitigation of low-income water affordability challenges through financial assistance and innovative financing mechanisms.

The program should provide for MDEQ to require annual reporting and tracking of the census of LSLs as part of regular reporting requirements. MDEQ should compile, analyze and publicly report on the submitted data, enabling state legislature and the general public to readily access information on progress of LSL replacements throughout the state while protecting personal information.

- R-42. Revise and enhance information distributed by public water systems on the implications of widespread use of lead in public and private plumbing.

Independently, or in conjunction with the model LSL replacement program recommended above, the state should improve dissemination of accurate information on the dangers presented by lead in water systems and plumbing. Readily accessible information should be broadly provided about potential sources of high levels of lead in water, including, for example, the potential for the release of lead particulates from piping disturbed by construction activities, as well as lead solder, galvanized plumbing, and brass fixtures. Consider and model successful public engagement (and, more generally, LSL replacement) programs used in countries such as the Netherlands that have more successfully managed lead risks.⁷⁹

- R-43. Use the occasion of the Flint water crisis to prompt local and state re-investment in critical water infrastructure, while providing mechanisms to advance affordability and universal access to water services.

Nationally, water system infrastructure renewal and rehabilitation requirements are expected to exceed \$1 trillion over the next generation.⁸⁰ Michigan is no exception in facing a significant infrastructure funding gap, even without prospective funding of full LSL replacements. State and local decision-makers, water utility representatives, and community groups should partner to garner support for water system re-investment (through local service rates and state funding mechanisms), while balancing potential

⁷⁹ Refer to "Water production and distribution in the Netherlands," Andr. Struker, Waternet, Jan Vreeburg, KWR, Jan Peter van der Hoek, Delft University, Waternet, February 2016 – presentation to Flint Water Inter-Agency Coordinating Committee.

⁸⁰ See, for example:

- "Report Card for America's Infrastructure," American Society of Civil Engineers (ASCE), 2013, www.infrastructurereportcard.org/a/#p/grade-sheet/americas-infrastructure-investment-needs
- *Buried No Longer: Confronting America's Water Infrastructure Challenge*, AWWA, 2012, www.awwa.org/Portals/0/files/legreg/documents/BuriedNoLonger.pdf
- *Drinking Water Infrastructure Needs Survey and Assessment, Fifth Report to Congress*, U.S. EPA, 2011, www.epa.gov/sites/production/files/2015-07/documents/epa816r13006.pdf

impacts on low-income populations. Stakeholders should work to define new and innovative water service pricing and funding approaches⁸¹ to advance water affordability and universal access to service.

R-44. Prioritize health matters across all state agencies with establishment of a new Cabinet-level post focused on public health.

The Flint water crisis illustrates that MDEQ and MDHHS failed to coordinate and collaborate in responding to multiple health-related concerns raised by members of the Flint community and by public health partners such as GCHD. Governor Snyder indicated that there is no liaison function at the Cabinet level in Michigan state government to connect inter-agency actions regarding health matters. Although the FWICC is designed to function in an inter-agency manner, its purpose is Flint-centric. There is a strong argument that such inter-agency functionality for health should be instituted at the state level, to help safeguard the health of all Michigan residents.

The sheer size of the current MDHHS potentially dilutes the role of the state in important public health matters. The Task Force recommends that a physician or nurse with public health and/or health policy credentials serve on the Governor's Cabinet, and be supported by a staff and budget appropriate for the activities of this role. This person would serve an overall supervisory and inter-agency liaison role for all activities that have a bearing on health for Michiganders. Given the suboptimal health status of the Michigan public on a wide array of matters (for example, infant mortality, obesity, life expectancy, smoking), not to mention the health concerns that are now paramount in Flint, this person would have a broad mandate.

Conclusions

The conclusion we made in December 2015 that primary responsibility for causing the Flint water crisis rests with the MDEQ has only been substantiated by our subsequent interviews and research. This final report, however, documents the failings, shortcomings and problems in other agencies and entities as well, such as MDHHS, GCHD, the local water treatment plant, the EM structure, the Governor's office, and the U.S. EPA. These failures reflect the discounting of profound public health concerns and indifference to Flint residents' plight.

The value in documenting what went wrong is not to ascribe blame for blame's sake, but to establish the foundation for moving forward, both in Flint and throughout the state. The state clearly must respond with dedicated and systematic attention to health concerns for people of Flint. But it also has the opportunity to demonstrate that lessons have been learned from the Flint experience—as traumatic as it has been and will continue to be—and develop model infrastructure renewal and public health programs that will serve all Michigan residents for generations to come.

Flint residents and their fellow Michigan citizens deserve no less.

⁸¹ See, for example, "Blue Ribbon Panel on Affordability Final Report," City of Detroit, 2016, www.detroitmi.gov/brpa.

APPENDIX I: Flint Water Advisory Task Force (FWATF)

Flint Water Advisory Task Force (FWATF)

Matthew Davis, MD, MAPP, is professor of pediatrics and internal medicine at the University of Michigan Health System and professor of public policy at the Gerald R. Ford School at the University of Michigan, having joined the faculty in 2000. Davis also is a professor of health management and policy at the School of Public Health. He previously served as the chief medical executive of the Michigan Department of Community Health/Department of Health and Human Services.

Chris Kolb (Co-Chair) is president of the Michigan Environmental Council, a statewide coalition of 70 environmental, public health and faith-based nonprofit groups. Before joining the MEC, Kolb represented Ann Arbor in the state House for six years and served six years on the Ann Arbor City Council. He has been president of the MEC for seven years and has more than 12 years of experience in the environmental management field.

Lawrence Reynolds, MD, is a pediatrician in Flint who serves as president of the Mott Children's Health Center. He received his medical degree from Howard University College of Medicine and has been in practice for 36 years. He has served as president of the Genesee County Medical Society and the Michigan Chapter of the American Academy of Pediatrics. He has been honored for his humanitarian and advocacy efforts on behalf of children from the Community Foundation of Greater Flint.

Eric Rothstein is a national water issues consultant and principal at the Galardi Rothstein Group. He served as an independent advisor on the creation of the Great Lakes Water Authority. Rothstein also has served as Jefferson County, Alabama's rate consultant and municipal adviser for litigation related to the county's bankruptcy and issuance of \$1.7 billion in sewer warrants and led strategic financial planning for the City of Atlanta's Department of Watershed Management. He has more than 30 years of experience in water, wastewater and stormwater utility finance and rate-making assessments.

Ken Sikkema (Co-Chair) is a senior policy fellow at Public Sector Consultants, where he specializes in public finance, environment, and energy policy. Prior to joining the firm, Sikkema served in both the Michigan House and Senate, culminating with four years as Senate majority leader. He has also served as both an adjunct and visiting professor at Grand Valley State University.

APPENDIX II: FWATF Letters

December 7, 2015

Dear Governor Snyder:

On Wednesday, November 18, 2015, the Flint Water Advisory Task Force met with representatives of the Michigan Department of Environmental Quality (MDEQ) and the Michigan Department of Health and Human Services (MDHHS) to discuss elements of the 10-point Action Plan designed to address various issues related to the ongoing public health protection challenges precipitated by lead in the Flint water supply. These discussions were held at our request as part of our task to make recommendations to prevent a similar occurrence in Flint or elsewhere, and also to monitor ongoing mitigation efforts.

Subsequent to those meetings, on Tuesday, November 24, 2015, members of the Task Force participated in a conference call with yourself, members of the Administration, and representatives of these agencies to discuss the progress to date on the 10-point Action Plan, as well as several other related issues.

We want to acknowledge the steps that have already been taken to implement the action plan, specifically in the areas of outreach efforts to facilitate blood lead testing for children, communication with health care providers in the Flint community about the importance of testing children for lead, and the training of additional public health nurses in the Genesee County Health Department. We do believe, however, that additional steps need to be taken to reach additional children for blood lead testing, assure proper follow-up with children found to have elevated blood lead levels, and to continue water testing. We will continue to assess state and local efforts and make recommendations regarding specific steps that we believe are warranted.

One primary concern we have at this point is that the current efforts appear to be taking place in the absence of a larger project coordination framework that measures results and clearly delineates responsibilities for continuing actions to protect public health. We believe the state is best positioned to facilitate this larger framework, which should address the following:

1. The need for MDHHS and MDEQ—and, possibly, other state agencies—to set **goals** for actions in collaboration with local and federal agencies and organizations.
2. The need for a set of corresponding **timelines** for the goals.
3. The need to establish **responsibility** for meeting the goals in a timely fashion and for **contingency plans** for the state if the goals are not being met.
4. The need for clear, regular **communication** with the Flint community and stakeholder groups regarding action steps and updates.

We also believe it important that a single person or entity—potentially independent of any one particular state agency and mutually agreeable to this Task Force and you, Governor—be established to provide effective coordination of ongoing activities and reporting on the status of mitigation measures. For this, we also believe a readily understood “dashboard” should be developed that reports on the goals, timelines and assignments. This will enable members of the Flint community, public health providers, and state agencies to know about the status of the Flint water crisis mitigation program, as

well as promote coordination and accountability. The Task Force is prepared to assist in the development of that dashboard.

We believe it is vitally important that trusted members of the Flint community be engaged in communication on this issue, as well as the distribution of information conveyed by our suggested dashboard reporting. Accordingly, in advance of our final report, we would like to ensure the independent coordinator suggested above engage trusted community groups to begin rebuilding community trust in state actions.

We appreciate your personal interest in this issue, commitment to assisting the Task Force in our review, and—most importantly—commitment to ensuring that the full measure of state resources are brought forward to protect the public health in Flint and throughout the state.

Respectfully yours,

Flint Water Advisory Task Force:

Dr. Matt Davis

Chris Kolb

Dr. Larry Reynolds

Eric Rothstein

Ken Sikkema

December 29, 2015

Dear Governor Snyder:

The Flint Water Advisory Task Force, which you appointed on October 21, 2015, has devoted considerable effort and countless hours to our review of the contamination of the Flint water supply: what happened, why it occurred, and what is needed to prevent a recurrence in Flint or elsewhere in the state. We have also been assessing ongoing mitigation efforts to help assure that short- and long-term public health issues and water management concerns will be properly addressed to safeguard the health and well being of the Flint community.

Shortly after we began our work, we recognized the immediate need for better coordination of the state's response to the ongoing public health issues in Flint, and for assignment of a single person to provide this coordination. We addressed these concerns in a letter to you on December 7, 2015, and you responded with immediate adoption of these recommendations. We thank you for the commitment your response demonstrates.

In our continuing efforts, we have now interviewed numerous individuals at state and local levels; reviewed many documents, articles, and emails; and deliberated repeatedly as a group. Both individually and as a group, we have visited Flint several times during the past several weeks to meet with citizens, public health officials and healthcare providers, individuals who have water management responsibilities at the city and county levels, and other public officials.

It is clear to us, particularly as we listen to the people of Flint, that it is both critical and urgent to establish responsibility for what happened in their community and to ensure accountability. This is a first step in a long process to re-establish the trust they no longer have in their government and the agencies whose responsibility it is to protect their health. It is urgent because this deep distrust of government continues to compromise the effective delivery of protective services designed to address ongoing public health issues. It is for these reasons that we are sending this letter at this time.

We believe the primary responsibility for what happened in Flint rests with the Michigan Department of Environmental Quality (MDEQ). Although many individuals and entities at state and local levels contributed to creating and prolonging the problem, MDEQ is the government agency that has responsibility to ensure safe drinking water in Michigan. It failed in that responsibility and must be held accountable for that failure.

The Safe Drinking Water Act (SDWA) places responsibility for compliance with its requirements on the public water system. In this instance, the City of Flint had the responsibility to operate its water system within SDWA requirements, under the jurisdiction of the MDEQ. The role of the MDEQ is to **ensure** compliance with the SDWA through its regulatory oversight as the primary agency having enforcement responsibility for the Flint water system.

The MDEQ failed in three fundamental ways.

Regulatory Failure

We believe that in the Office of Drinking Water and Municipal Assistance (ODWMA) at MDEQ, a culture exists in which "technical compliance" is considered sufficient to ensure safe drinking water in Michigan.

This minimalist approach to regulatory and oversight responsibility is unacceptable and simply insufficient to the task of public protection. It led to MDEQ's failure to recognize a number of indications that switching the water source in Flint would—and did—compromise both water safety and water quality. The MDEQ made a number of decisions that were, and continue to be, justified on the basis that federal rules "allowed" those decisions to be made. ODWMA must adopt a posture that is driven not by this minimalist technical compliance approach, but rather by one that is founded on *what needs to be done to assure drinking water safety*.

A culture change must occur within ODWMA. It must be driven by a mission that is aspirational regarding the role of the MDEQ in ensuring the safety and the quality of Michigan's drinking water. We believe, and have expressed to MDEQ Director Dan Wyant, that as a Great Lakes State, Michigan should aspire to have the safest drinking water in the nation, rather than merely aiming for technical compliance with regulatory requirements.

Failure in Substance and Tone of MDEQ Response to the Public

Throughout 2015, as the public raised concerns and as independent studies and testing were conducted and brought to the attention of MDEQ, the agency's response was often one of aggressive dismissal, belittlement, and attempts to discredit these efforts and the individuals involved. We find both the tone and substance of many MDEQ public statements to be completely unacceptable. In a real way, the MDEQ represents the public, including the very individuals it treated dismissively and disrespectfully in public statements. We recognize that the agency might disagree with the opinions of others on a variety of issues, including testing protocol, interpretation of testing results, the requirements of federal law and rules, and other matters. What is disturbing about MDEQ's responses, however, is their persistent tone of scorn and derision. In fact, the MDEQ seems to have been more determined to discredit the work of others—who ultimately proved to be right—than to pursue its own oversight responsibility.

Failure in MDEQ Interpretation of the Lead and Copper Rule

The federal Lead and Copper Rule (LCR) is central to what happened in Flint, because that rule, at least theoretically, is designed to prevent lead and copper contamination of drinking water. The federal LCR calls for "optimized corrosion control treatment," which the MDEQ did not require in the switch to the Flint River. Prior to the switch, MDEQ staff instructed City of Flint water treatment staff that corrosion control treatment (CCT) was not necessary until two six-month monitoring periods had been conducted. The need for CCT would be evaluated after the results from those two monitoring periods were reviewed. The decision not to require CCT, made at the direction of the MDEQ, led directly to the contamination of the Flint water system.

The MDEQ seems to have taken different positions on whether it faithfully followed the LCR in the Flint situation. It first maintained that it followed the LCR, then stated that it did not follow the rule properly, and most recently claimed that a federal memorandum issued by the US EPA in early November 2015 suggests that the original MDEQ interpretation was possibly correct.

We are not convinced. Even the MDEQ's latest interpretation of the US EPA's November memorandum is overly legalistic and misunderstands the intent of the LCR, which is to minimize risks of lead and copper exposure for human health.

We believe ODWMA's single-minded legalistic focus is the heart of the problem, and it is part of the "technical compliance" culture described above. ODWMA should not be basing its actions solely on a

legally possible interpretation of the LCR. It should be focusing on how to protect Michigan's citizens from lead in drinking water.

We met with MDEQ Director Wyant on December 16, 2015, to discuss these issues, as well as many others. We note his substantial agreement with many of our conclusions, particularly as it relates to the regulatory failure and the abysmal public response of his agency. It is our understanding that he has drawn similar conclusions in his own evaluation of the MDEQ's role in the Flint water crisis. At the same time, it was disappointing to hear his weak defense of the CCT decision based on the EPA's November 2015 memorandum.

We are not finished with our work. Other individuals and entities made poor decisions, contributing to and prolonging the contamination of the drinking water supply in Flint. As an example, we are particularly concerned by recent revelations of MDHHS's apparent early knowledge of, yet silence about, elevated blood lead levels detected among Flint's children. We also feel it important to further review local government decision processes under emergency management. Our final report will highlight and discuss those concerns, among many others, to provide some context to a comprehensive series of recommendations. **As stated earlier in this letter, however, we believe that establishing responsibility is a critical and urgent need, and one that should not wait for our final report in 2016. Individuals and agencies responsible must be held accountable in a timely fashion.**

It is our hope that the heightened awareness of the dangers of lead poisoning can be an opportunity to make Michigan safer, particularly for its children. Drinking water must be recognized as a potential source of health risk exposure when water lines and fixtures containing lead are disturbed or compromised. Proper testing, not only in high-risk areas but also in facilities serving children (e.g., schools), must be considered. Facilitating long-term financing of a model public health program, and also replacement of lead-containing water service lines and fixtures, would enable Michigan to realize a positive lasting legacy from the tragedy of the Flint water crisis. Our final report will address some of these issues.

The City of Flint's water customers—fellow Michigan citizens—were needlessly and tragically exposed to toxic levels of lead through their drinking water supply. They deserve a commitment to properly assess responsibility and ensure accountability. They also deserve a commitment to needed mitigation in both the short and long term. The Flint water crisis never should have happened. Having failed to prevent it, state government should coordinate a sustained, public-health-focused response to remedy, to the fullest extent possible, the impacts on the Flint community.

Respectfully yours,

Flint Water Advisory Task Force:

Matt Davis
Chris Kolb
Larry Reynolds
Eric Rothstein
Ken Sikkema

January 22, 2016

Governor Rick Snyder
Office of Governor
P.O. Box 30013
Lansing, Michigan 48909

Dear Governor Snyder:

The Flint Water Advisory Task Force (FWATF) appreciates your recent efforts to secure federal and mobilize state emergency response resources to address the immediate water supply issues in Flint.

This letter is to encourage a similarly robust response to the challenges of re-establishing a reliable, trusted potable water distribution system in Flint. This is required as soon as possible to replace the unsustainable and expensive bottled water and filter distribution program that has been necessitated, but which clearly must serve as an interim, emergency response.

Consistent with the priorities identified in the Safe Drinking Water Emergency Order issued by the EPA on January 21, 2016, we recommend the following actions to address scientifically grounded concerns that the water system in Flint remains unsafe because of lead contamination and Legionella. Public trust in the safety of the water supply may only begin to be re-established through the state's forthright engagement of the scientific experts who overcame state and federal agency intransigence to expose the lead poisoning.

Our recommendations are:

- Engage US EPA staff experts versed in Lead and Copper Rule (LCR) requirements – specifically Miguel del Toral, Darren Lytle and Michael Shock. These individuals should be empowered to guide implementation of a comprehensive LCR sampling program in Flint that will monitor lead levels now and throughout the conversion to raw water supply by the Karegnondi Water Authority (KWA) and full-time use of the Flint Water Treatment Plant.
- Establish an inter-disciplinary work group comprising subject matter experts drawn from respected public utility associations and institutions of higher learning in Michigan and elsewhere (including Marc Edwards of Virginia Tech), to oversee the conversion to KWA-supplied raw water.
- Commission and/or contract with an unbiased third-party organization or consortium (hereafter: Flint water safety scientific assessment team [FWSSAT]) that will be responsible for assessing the quality and safety of drinking water in residences, schools and child care settings in Flint, and hospitals and other healthcare facilities served by the

Flint water system. The explicit focus of FWSSAT activities will be lead and Legionella; however, the FWSSAT may include other considerations in its work.

The FWSSAT will be invested with the responsibility of declaring when the public water supply in Flint is safe for routine consumption. The FWSSAT will employ the most rigorous scientific standards, using a sampling strategy that is designed to optimize detection of water contamination in home, school, and child-care settings, and healthcare environments. All schools and healthcare facilities must be included in the sampling approach. Rigorous sampling of residences and child-care settings (whether centers or in-home) will also be implemented, using any and all available information about lead water service lines. In addition, if a homeowner or renter whose dwelling has not been included in sampling wishes to have the dwelling included, they will also be sampled. The sampling efforts and reporting process of the FWSSAT will be fully transparent to the public; results of testing should be published on local, state, and federal (EPA) websites.

- To assure the re-building of community trust and assure sufficient expertise for future water quality and safety, the FWSSAT should partner with local (Flint Water Treatment) and state (MDEQ) personnel in its activities. The FWSSAT should have an interdisciplinary advisory committee that includes local community leaders, local and state officials, national scientific authorities regarding water quality and safety and public health, and the leader of the interagency state effort regarding the Flint water crisis. When the FWSSAT advisory committee is satisfied that the FWSSAT scientific procedures have thoroughly assessed water quality and safety in Flint residences, schools and child care settings, and healthcare facilities and found the water to be sufficiently free of contamination, then the committee will advise the public of the findings. The FWSSAT will then organize the transfer of responsibility to local and state authorities to sustain the sampling and reporting methods thereafter, including the conversion to KWA raw water in the future.

We also believe that a forthright response to the Legionella outbreak must similarly engage trusted, scientific experts drawn from independent institutions. Accordingly, we recommend:

- The Michigan Department of Health and Human Services (MHHS) should make a formal request to the federal Centers for Disease Control and Prevention (CDC) for assistance in assessing the outbreak of Legionnaire's disease in Flint, if they have not already done so. MHHS, working with CDC, should develop a strategy for improving prevention, rapid detection, and timely treatment of cases of Legionellosis in Michigan in 2016 and beyond. While the MDHHS evaluation of the dozens of cases of Legionellosis in 2014 and 2015 has strongly suggested a link to the shift to drinking water from the Flint River in 2014, further and more intensive evaluation of clinical isolates (i.e., samples from infected patients) is necessary to understand the route(s) of transmission from contaminated water to humans. The unique set of outbreak circumstances in the setting of a change in water source strongly indicates that support from federal public

health authorities would be a welcome way to amplify the public's collective understanding of risk of contracting Legionella in residences served by the Flint water system, and in Flint healthcare facilities.

- The state should specifically request federal support from the CDC – and, as appropriate, additional federal experts and agencies – to advise and assess Flint healthcare facilities and Flint-based healthcare providers regarding: (a) appropriate application and timely re-application of biocides to air treatment systems and cooling towers in all healthcare facilities in Flint, in order to prevent colonization with Legionella; and (b) proper assessment and timely diagnosis of Legionella among patients in Flint who present with characteristic signs and symptoms and have a history of potential exposure to contaminated water. Of note, the risk of resurgent Legionellosis in Spring 2016 is on the horizon; the first cases of Legionellosis in the 2014 and 2015 outbreaks were diagnosed in June and May, respectively, and Legionella is known to be much more common in the spring, summer, and fall than in the winter months. Time is of the essence.
- MDHHS should work with its federal partners to assure that investigative efforts related to Legionella regarding quality and safety of water are conducted in coordination with the FWSSAT described above. Furthermore, MDHHS should regularly communicate its findings to the Flint community regarding its efforts to prevent, detect, and treat cases of Legionella until case levels return to pre-2014 levels.

We expect that these measures will provide members of the Flint community with assurance that the quality of their tap water is being appropriately monitored and that forthcoming announcements that Flint's tap water is safe to drink are well-founded. Notwithstanding earnest state agency actions, we believe that the engagement of independent subject matter experts, whether to assess drinking water quality or public health concerns, is critical to overcome, over time, the understandable skepticisms that prevail in the Flint community.

We hope that you will receive these recommendations in the same spirit with which they are offered – to advance the recovery and reinvigoration of the Flint community.

Respectfully,

Matthew Davis, M.D.
Chris Kolb
Lawrence Reynolds, M.D.
Eric Rothstein, CPA
Ken Sikkema

APPENDIX III: Interviewee Listing

Flint Water Advisory Task Force

Interviews and Discussions Listing

No.	Last Name	First Name	Organization
Federal and State Office Holders / Key Officials			
1	Kildee	Daniel T.	U.S. House of Representatives
2	Ananich	James	Michigan State Senate
Michigan Governor's Office			
3	Snyder	Rick	Michigan Governor's Office
4	Muchmore	Dennis	Michigan Governor's Office
5	Baird	Rich	Michigan Governor's Office
6	Hollins	Harvey	Michigan Governor's Office
Michigan Department of Treasury			
7	Dillon	Andy	Treasury Department
8	Workman	Wayne	Treasury Department
9	Saxton	Thomas	Treasury Department
10	Byrne	Randall	Treasury Department
11	Sampson	Jeremy	Treasury Department
Flint Emergency Managers - Office Holders			
12	Ambrose	Jerry	City of Flint
13	Earley	Darnell	City of Flint
14	Kurtz	Ed	City of Flint
15	Brown	Michael	City of Flint
16	Weaver	Karen	City of Flint
17	Walling	Dayne	City of Flint
18	Henderson	Natasha	City of Flint
19	Freeman	Josh	City of Flint
City of Flint Staff and Consultants			
20	Lundquist	Jody	City of Flint
21	Brown	Inez	City of Flint
22	Croft	Howard	City of Flint
23	Johnson	Daugherty	City of Flint
24	Wright	Brent	City of Flint
25	Glasgow	Mike	City of Flint
Flint Community			
26	Mays	Melissa	Flint Citizen
27	Overton	Allan	Flint Citizen
28	Shariff	Nayyirah	Flint Citizen
Michigan Department of Environmental Quality			
29	Wyant	Dan	MDEQ
30	Sygo	Jim	MDEQ
31	Creagh	Keith	MDEQ
32	Krisztian	George	MDEQ
33	Anderson	Madhu	MDEQ
34	Shekter Smith	Liane	MDEQ
35	Rosenthal	Adam	MDEQ

Flint Water Advisory Task Force

Interviews and Discussions Listing

No.	Last Name	First Name	Organization
36	Busch	Stephen	MDEQ
37	Prysbly	Mike	MDEQ
Michigan Department of Health and Human Services			
38	Lyon	Nick	MDHHS
39	Becker	Tim	MDHHS
40	Wells	Eden	MDHHS
41	Larder	Cristin	MDHHS
42	Lasher	Gerilyn	MDHHS
43	Moran	Susan	MDHHS
US EPA			
44	Hyde	Tinka	EPA
45	Crooks	Jennifer	EPA
46	Hedman	Susan	EPA
47	Kaplan	Bob	EPA
48	Del Toral	Miguel	EPA
49	Porter	Andrea	EPA
50	Blair	Rita	EPA
51	Poy	Tom	EPA
Technical Experts - WQ and Lead			
51	Betanzo	Elin	Northeast-Midwest Institute
52	Edwards	Marc	Virginia Tech
53	Sullivan	Laura	Kettering University
54	McElmurry	Shawn	Wayne State University
Public Health Community			
54	Hanna-Attisha	Mona	Hurley Medical Center
55	Valacak	Mark	Genesee County Health Dept.
56	Doerr	Kay	Genesee County Health Dept. - Board of Health
57	Henry	James	Genesee County Health Dept.
Media			
58	Guyette	Curt	ACLU
59	Fonger	Ron	MLive
KWA - DWSD			
59	Wright	Jeff	GCDC
60	O'Brien	John	GCDC
61	Jansen	Dave	GCDC
62	Wolfson	William	GLWA / DWSD
63	Koesters	Laurie	GLWA / DWSD

APPENDIX IV: Questions of Lockwood, Andrews, & Newnam

Lockwood, Andrews and Newnam
Flint Water Advisory Task Force Questions
February 22, 2016

1. Please describe your firm's experience with drinking water treatment facilities, specifically related to drinking water quality, treatment of river water supply, disinfection and disinfection byproduct management, corrosion control, and startup for full-time operation.
2. Please describe your firm's experience with distribution system management, including corrosion control, disinfection and DBP management, and Legionella management.
3. Please provide the scope of work for your engagements related to preparing the Flint Water Treatment Plant for full-time operation, as well as any subsequent engagements.
4. Please describe the procurement processes used for contracting these scopes of service. Please provide copies of relevant proposals and contracts.
5. Please provide a narrative describing LAN's involvement with City of Flint and MDEQ staff throughout your engagement with the City related to full-time operation of the Flint Water Treatment Plant.
6. Please provide a list of your findings and recommendations to address the various water quality problems that occurred following startup of full-time operation of the Flint Water Treatment Plant.
7. Please provide your subjective assessment of the condition and technologies at the Flint Water Treatment Plant and distribution system prior to full-time operation of the plant.
8. Please identify all team members (including LAN staff and any subconsultants) who worked on the project to prepare the Flint Water Treatment Plant for full-time operation. Describe their respective roles on the project and their experience. If any other staff or consultants were engaged for guidance or review, please include those individuals as well.
9. Please describe the reporting structure (both LAN's project team reporting structure and its reporting relationship to City of Flint staff and Emergency Manager) for LAN's work on the Flint Water Treatment Plant, specifically for preparations for full-time operation of the plant.
10. Please provide a copy of any deliverables prepared to support full-time operation of the Flint Water Treatment Plant, including the plan of treatment that was reviewed with MDEQ.
11. Please review your discussions with the City of Flint utility staff and MDEQ regarding Flint River water chemistry and treatment requirements, specifically relating to:
 - a. Anticipated treatment challenges related to use of Flint River
 - b. Prospective disinfection requirements and options for management of DBPs
 - c. Corrosion control
12. Please describe the decision-making processes related to treatment requirements, specifically with regard to corrosion control treatment.

13. What was the nature of the discussions regarding Lead and Copper Rule compliance requirements?
 14. Did LAN identify requirements for Lead and Copper Rule compliance in advance of discussions with MDEQ?
 15. Did LAN express any concerns or cautions with respect to MDEQ's interpretation of Lead and Copper Rule requirements for water treatment?
 16. What were the outcomes of discussions with MDEQ regarding treatment requirements, specifically regarding compliance with Lead and Copper Rule requirements?
 17. Please outline your interactions with other consultants and suppliers working on the Flint Water Treatment Plant, both during preparation for and after startup of full-time operation, including Rowe Professional Consultants, Veolia and any others.
 18. Please describe LAN's involvement with the City of Flint's Technical Advisory Committee. Please provide copies of any presentations or handouts offered in the context of the Technical Advisory Committee discussions.
 19. Please offer any key points or information not already provided that you think would be of value in addressing the causes of the Flint water crisis and avoiding similar situations in the future. Please provide any recommendations to address prospective Flint water system needs.
 20. Please offer any key points or information not already provided that you think would be of value in addressing the causes of the Flint water crisis and avoiding similar situations in the future. Please provide any recommendations to address prospective Flint water system needs.
-

APPENDIX V: Detailed Timeline

**Flint Water Advisory Task Force
Integrated Event Timeline**

March 21, 2016

Note: This timeline was compiled by the Flint Water Advisory Task Force to support its investigation of the Flint water crisis. It includes selected events that occurred before and during the crisis. The timeline ends February 29, 2016.

Date	Event	Reference Document	Sources	Accessed
1883	Flint's water system is organized and built under private ownership as the Flint Water Works Company, pumping raw water from the Flint River to customers	"The Water Supply of Flint, Michigan" (brochure)	Brochure provided to FWATF by City of Flint	
1903	City of Flint purchases water utility (\$262,500) and converts it to a Municipally Owned Corporation	"The Water Supply of Flint, Michigan" (brochure)	Brochure provided to FWATF by City of Flint	
1911	City of Flint adds water filtration to Flint's water system	"The Water Supply of Flint, Michigan" (brochure)	Brochure provided to FWATF by City of Flint	
1947 - 1955	City of Flint invests in capital improvements to the water utility (\$12.5M) including improved water storage, treatment and pumping. "Polyphosphate is added in small amounts to lessen the corrosion of water pipe when in contact with the cold water," p. 11	"The Water Supply of Flint, Michigan" (brochure)	Brochure provided to FWATF by City of Flint	
1967	City of Flint executes long-term water supply contract with Detroit Water and Sewerage Department (DWSD) and begins receiving water from DWSD. Flint Water Treatment Plant (WTP) subsequently is converted to a backup supply source	Contract referenced in "Detroit Water and Sewerage Department - The First 300 Years," posted to DWSD website	dwsd.org/downloads_n/about_dwsd/history/complete_history.pdf	3/12/16
1991	EPA issues Lead and Copper Rule (LCR) to control lead and copper in drinking water	LCR history and current rule posted to EPA's website	www.epa.gov/dwreginfo/lead-and-copper-rule	3/12/16
2000	Flint water supply contract with DWSD expires	Timeline/Analysis/Recommendations (July 15, 2010), prepared by DWSD Wholesale Customer Outreach Team	Information provided to FWATF	
2001	DWSD and Flint enter into contract negotiations - subsequently suspended	Timeline/Analysis/Recommendations (July 15, 2010), prepared by DWSD Wholesale Customer Outreach Team		
July 2002	Under Michigan's Public Act 72 of 1990, Flint is placed under an Emergency Financial Manager (EFM) until 2004. Ed Kurtz is appointed Flint EFM	MLive (Nov. 10, 2011): "What happened last time? A look back at Flint's 2002 state takeover" (Mostafavi)	www.MLive.com/news/flint/index.ssf/2011/11/what_happened_last_time_a_look.html	3/12/16
February 2004	Technical assessment of Flint River raises concerns about its use for drinking water, noting the source's susceptibility to contamination	"Source Water Assessment Report for the City of Flint Water Supply - Flint River Emergency Intake," prepared by U.S. Geological Survey, MDEQ and Flint Water Utilities Department. As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
January 2006	Genesee County Drain Commission (GCDC) commissions feasibility study on alternatives to provide water service to existing and new customers. Report indicates Flint River water can be safely treated but does not have adequate capacity for permanent use	"Preliminary Report - Long-Term Water Supply for Genesee County," prepared by Rowe, Jones & Henry, Gannett Fleming. Included in Gov. Snyder's Flint Water timeline (released Jan. 2016)	Report provided to FWATF by MDEQ. Gov. Snyder's timeline: mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	3/20/16
January 2007	DWSD (Mercado/Foster) discusses water contract options with Genesee County Drain Commission (GCDC)	Timeline/Analysis/Recommendations (July 15, 2010), prepared by DWSD Wholesale Customer Outreach Team	Information provided to FWATF	
September 2007	DWSD brings forward pipeline loop in its capital plan to address concerns of City of Flint, Genesee County, and Michigan Department of Environmental Quality (MDEQ)	Timeline/Analysis/Recommendations (July 15, 2010), prepared by DWSD Wholesale Customer Outreach Team	Information provided to FWATF	
2008				
June 3, 2008	GCDC requests negotiation with DWSD for water supply contract; requests short-term contract due to ongoing evaluation of long-term needs	Letter from O'Brien/GCDC to Mercado/DWSD	Information provided to FWATF	
June 12, 2008	DWSD issues response to GCDC negotiation request (referenced in July 16, 2008 letter)	Mercado/DWSD letter	Information provided to FWATF	
July 16, 2008	Flint advises DWSD that GCDC will represent its interests in negotiations	Letter from Williamson & Wright to Detroit Deputy Mayor Adams	Information provided to FWATF	
September 3, 2008	GCDC and DWSD meet on water supply contracting	Meeting Summary - Project Innovations	Information provided to FWATF	
2009				
February 11, 2009	GCDC submits permit application for 85-mgd surface water withdrawal from Lake Huron	Permit application and supporting data posted to MDEQ website	www.michigan.gov/documents/deq/deq-wb-dwehs-wateruse-gdcwwpermitapp_280312_7.pdf	3/12/16
March 10, 2009	DWSD offers partnership arrangement: GCDC fund Flint loop north of Oakland border (\$200 million) and obtain 40% reduction on service rates	Timeline/Analysis/Recommendations (July 15, 2010), prepared by DWSD Wholesale Customer Outreach Team. MLive (March 11, 2009): "Half Price Water Offer from Detroit Not Exactly What it Seems" (Fonger)	Information provided to FWATF. www.MLive.com/news/flint/index.ssf/2009/03/halfprice_water_offer_from_det.html	3/19/16

Date	Event	Reference Document	Sources	Accessed
June 2009	DWSD and SOCWA file comments opposing GCDC withdrawal permit application	Timeline/Analysis/Recommendations (July 15, 2010), prepared by DWSD Wholesale Customer Outreach Team	Information provided to FWATF	
June 25, 2009	GCDC announces plans to build \$600 million water system	Referenced in July 25th letter - DWSD Director Pam Turner	Information provided to FWATF	
June 25, 2009	"Lake Huron Water Supply Study - Karegnondi Water Authority (KWA) Executive Summary" issued	"Lake Huron Water Supply Study - Karegnondi Water Authority Executive Summary," prepared by AECOM, Jones & Henry, LAN, O'Malia, Rowe and Wade Trim	Attachment 3 - MDEQ documentation provided to FWATF Nov. 6, 2015	
July 10, 2009	DWSD Interim Director Pamela Turner publishes Letter to Editor in MLive	MLive (July 10, 2009): "Another View: Genesee County Water Venture is Risky Business. Think AutoWorld" (Hughes)	www.MLive.com/opinion/flint/index.ssf/2009/07/another_view_genesee_county_wat.html	3/20/16
August 13, 2009	Foster Group provides observations on GCDC cost analysis re: KWA	Foster Group memo: "Observations on Cost Analysis from the Lake Huron Water Supply Karegnondi Water Authority Preliminary Engineering Report"	Information provided to FWATF	
August 28, 2009	MDEQ issues permit to GCDC for 85-mgd Lake Huron withdrawal for KWA	MDEQ Large Quantity Water Withdrawal Permit posted to MDEQ website	www.michigan.gov/documents/deq/deq-wb-dwehs-wwciu-gcdclqwpermit_290342_7.pdf	3/12/16
September 2009	"Lake Huron Water Supply - KWA Preliminary Engineering Report" issued	"Lake Huron Water Supply Study - Karegnondi Water Authority Preliminary Engineering Report," prepared by AECOM, Jones & Henry, LAN, O'Malia, Rowe and Wade Trim	www.scribd.com/doc/52254829/Karegnondi-Water-Authority-Preliminary-Engineering-Report-Sept-2009	3/12/16
2010				
February 22, 2010	DWSD posts letter to potential KWA partners (Flint, Genesee, Lapeer)	MLive (Feb. 25, 2010): "Another View: Detroit Water and Sewerage wants to work with leaders in Genesee and Lapeer counties" (Letter from Pamela Turner/DWSD)	www.MLive.com/opinion/flint/index.ssf/2010/02/another_view_detroit_water_and.html	3/12/16
April 13, 2010	Genesee County approves KWA Articles of Incorporation	MLive (April 13, 2010): "Genesee County starts regional water authority, potential partners plan votes in coming weeks" (Fonger)	www.MLive.com/news/flint/index.ssf/2010/04/genesee_county_starts_regional.html	3/12/16
May 14, 2010	MLive reports on GCDC contract with political consultant Sam Riddle	MLive (May 14, 2010): "Drain commissioner paid Sam Riddle \$2,000 a month to work on Genesee county water pipeline" (Longley)	www.MLive.com/news/flint/index.ssf/2010/05/drain_commissioner_paid_sam_ri.html	3/12/16
June 17, 2010	DWSD and GCDC meet to negotiate water supply contract. Notes re: contract termination: "Does not mean DWSD will not continue to provide water but rates will reflect stranded cost charge to protect the system"	Meeting summary - Project Innovations	Information provided to FWATF	
July 10, 2010	GCDC issues Consumer Confidence Report supporting KWA pipeline	"2013 Consumer Confidence Report" posted to GCDC website. MLive (July 10, 2010): "Genesee County drain commissioner's new water quality report focuses on benefits of building new water pipeline" (Fonger)	www.gcdcwms.com/images/contentImages/file/2014%20Water%20Color-WE.pdf www.MLive.com/news/flint/index.ssf/2010/07/genesee_county_drain_commissio_10.html	3/12/16
2011				
July 1, 2011	Report is completed for City of Flint on feasibility of using Flint WTP and Flint River as primary water supply. Notes Flint River water will require more treatment than Lake Huron water; recommends capital improvements and projects capital and operating costs (including phosphate addition)	"Analysis of the Flint River as a Permanent Water Supply for the City of Flint," prepared by Rowe and LAN	Report: www.scribd.com/doc/64381765/Analysis-of-the-Flint-River-as-a-Permanent-Water-Supply-for-the-City-of-Flint-July-2011 Appendices: www.scribd.com/doc/64382181/Analysis-of-the-Flint-River-as-a-Permanent-Water-Supply-for-the-City-of-Flint-July-2011-Appendices-1-to-8	3/12/16
August 29, 2011	Michigan Department of Treasury conducts preliminary review of City of Flint finances and recommends appointment of a Financial Review Team. Noting the city's accumulated deficits of \$25.7 million, it concludes "probable financial distress" exists in the city	Letter posted to State of Michigan website	www.michigan.gov/documents/treasury/Flint-GovernorsDetermination-11-8-11_417435_7.pdf	1/31/16
September 16, 2011	City of Flint increases water and sewer rates by 35 percent, following a water and sewer rate increase of 25 and 22 percent, respectively, that took effect in January 2011	MLive (Aug. 16, 2011): "Flint water, sewer rates increasing 35 percent" (Longley)	www.MLive.com/news/flint/index.ssf/2011/08/flint_water_sewer_rates_increa.html	3/12/16
September 30, 2011	Gov. Snyder appoints 8-member Financial Review Team, which convenes in October-November and recommends appointment of Emergency Manager in Flint	Letter posted to State of Michigan website	www.michigan.gov/documents/treasury/Flint-GovernorsDetermination-11-8-11_417435_7.pdf	1/31/16
November 11, 2011	Gov. Snyder notifies Flint Mayor Dayne Walling via letter of intent to appoint Emergency Manager	Letter posted to State of Michigan website	www.michigan.gov/documents/treasury/Flint-GovernorsDetermination-11-8-11_417435_7.pdf	1/31/16
November 29, 2011	Gov. Snyder places City of Flint in receivership under PA 4	Detroit Free Press (February 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16

Date	Event	Reference Document	Sources	Accessed
December 1, 2011	Michael Brown replaces Ed Kurtz as City of Flint EFM. Brown lays off high-ranking City Hall appointees and eliminates pay for mayor and city council (which he later partially restored)	Detroit Free Press (November 30, 2011): "Governor names Flint native city's emergency financial manager" MLive (June 30, 2013): "He's back: A timeline of Michael Brown's moves as Flint's emergency manager" (Adams)	www.MLive.com/news/flint/index.ssf/2013/06/hes_back_a_timeline_of_michael.html	3/12/16
2012				
March 7, 2012	Gov. Snyder delivers statewide public safety message from Flint City Hall to announce plan including reopening Flint lockup and boosting state police patrols in Flint	MLive (March 7, 2012): "Gov. Snyder unveils public safety proposal in Flint calling for more state police, forensic techs in high-crime cities" (Longley)	www.MLive.com/news/flint/index.ssf/2012/03/gov_snyder_unveils_public_safe.html	3/12/16
March 15, 2012	Judge grants temporary restraining order against any action by EM Brown pending lawsuit filed by city employee Sam Mum (head of AFSCME Local 1600) alleging state violated Open Meetings Act in appointing him	MLive (March 15, 2012): "Restraining order against Flint emergency manager leaves city without clear chain of command" (Longley)	www.MLive.com/news/flint/index.ssf/2012/03/emergency_manager_restraining.html	3/12/16
March 20, 2012	Ingham County Circuit Court Judge Rosemarie Aquilina rules in favor of Muma, removing Brown from office and restoring power to the mayor and city council	MLive (June 30, 2013): "He's back: A timeline of Michael Brown's moves as Flint's emergency manager" (Adams)	www.MLive.com/news/flint/index.ssf/2013/06/hes_back_a_timeline_of_michael.html	3/12/16
March 26, 2012	Michigan Court of Appeals reinstates Brown as Flint EM	MLive (March 26, 2012): "Flint emergency manager reinstated as battle over Public Act 4 continues" (Longley)	www.MLive.com/news/flint/index.ssf/2012/03/flint_emergency_manager_reinst.html	3/12/16
April 24, 2012	City of Flint's Fiscal Year 2013 budget passed by an "executive order"	"City of Flint Financial and Operating Plan - Fiscal Year 2013," posted final to City of Flint website Sep. 25, 2012	www.cityofflint.com/wp-content/uploads/Reports/FinPlanFY13pdf.pdf	3/12/16
May 9, 2012	Flint Department of Public Works (DPW) Director Howard Croft sends letter to District Engineer Mike Prysby, MDEQ Office of Drinking Water and Municipal Assistance (ODWMA), stating KWA "has the potential to be a major factor in our region's economic development... The City of Flint is pleased to be a partner in the process and we pledge to offer our assets to support the development. We appreciate your technical support as we develop our components of the project."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
May 24, 2012	Flint City Council President Scott Kincaid files lawsuit against City seeking to repeal recent (Sep. 2011 and May 2012) increases in water and sewer rates	MLive (May 24, 2012): "Lawsuit filed against Flint by council president over water rate increases" (Ridley)	www.MLive.com/news/flint/index.ssf/2012/05/lawsuit_filed_against_flint_by.html	3/12/16
May 30, 2012	Emergency Manager Brown further increases water rates by 12.5 percent and sewer rates 45 percent, and ratifies Sep. 2011 increases. (Appeals court subsequently invalidates.) With this increase, Flint water customers had seen a "110 percent increase in their average water and sewer rates since January 2011"	Emergency Manager Order No. 31 - Water and Sewer Rate Increases, posted to City of Flint website Referenced in MLive (June 19, 2015): "Flint council members want water customers refunded, lawsuit settled" (Fonger)	www.cityofflint.com/wp-content/uploads/CityPDF/031.pdf www.MLive.com/news/flint/index.ssf/2015/06/flint_council_members_say_city.html	3/12/16
June 26, 2012	Flint EM Brown sends letter to DWSD for permission to begin blending Flint River water with treated water from DWSD. Letter indicates MDEQ is supporting this option, which would save City \$2 million to \$3 million annually	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
July 2, 2012	State appeals court dismisses Kincaid lawsuit challenging recent Flint water and sewer rate increases	MLive (July 2, 2012): "State appeals court dismisses Flint water rate lawsuit" (Longley)	www.MLive.com/news/flint/index.ssf/2012/07/appeals_court_dismisses_flint.html	3/12/16
August 8, 2012	Ed Kurtz (who served as Flint EFM from 2002 to 2004) replaces Brown as Flint EFM, after Brown has to exit because the state's EM law, Public Act 4, is officially suspended due to referendum to repeal it. Kurtz appoints Brown as Flint City Administrator	NBC25 News (Aug. 8, 2012): "Ed Kurtz returns to Flint as emergency manager"	nbc25news.com/news/local/ed-kurtz-returns-to-flint-as-emergency-manager?id=785990	3/12/16
September 10, 2012	Flint City Council files suit against Kurtz's appointment as EFM	MLive (Sep. 10, 2012): "Flint City Council members sue emergency financial manager Ed Kurtz" (Longley)	www.MLive.com/news/flint/index.ssf/2012/09/flint_city_council_members_sue.html	3/12/16
September 20, 2012	Flint EFM Ed Kurtz sends letter to DWSD requesting written permission to implement the blending option. Approval is requested by October 1, 2012	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
October 31, 2012	Analysis by Flint Finance Director suggests annual cost to purchase water from DWSD will steadily increase to \$23M per year by fiscal year 2020	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
November 2013	Department of Treasury retains Tucker, Young, Jackson and Tull (TYJT) to evaluate KWA proposal to the City of Flint	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
November 6, 2012	Michigan voters overturn state's EM Law (Public Act 4) in referendum. Kurtz remains as Flint's EFM under Public Act 72	MLive (Nov. 7, 2012): "Flint gains public safety millage, loses emergency manager law" (Longley)	www.MLive.com/news/flint/index.ssf/2012/11/flint_gains_public_safety_millage.html	3/12/16
November 6, 2012	Flint EFM Kurtz sends letter to State Treasurer Andy Dillon indicating that a proposal from DWSD is expected, but that the initial assessment shows switching to KWA is in the best interest of the City of Flint	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
December 27, 2012	Michigan legislature approves new EM law	MLive (Dec. 12, 2012): "Michigan House approves new emergency manager legislation" (Eggert)	www.MLive.com/news/index.ssf/2012/12/michigan_house_approves_new_emergency_manager_legislation.html	3/12/16

Date	Event	Reference Document	Sources	Accessed
2013				
January 23, 2013	Prysbys/MDEQ e-mails Liane Shekter Smith, head of ODWMA, and other colleagues re: feasibility of Flint switching to Flint River. "I agree that the city should have concerns of fully utilizing the Flint River (100%) for the following: the need to soften, the potential for more advanced treatment after next round of crypto monitoring, available capacity in Flint River at 100-year low flow, residuals management (disposal of lime sludge)."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
February 6, 2013	TYJT issues final report to Department of Treasury on comparison between KWA and DWSD, raising concerns about KWA cost estimates and system governance	"City of Flint Water Supply Assessment," prepared by TYJT	www.scribd.com/doc/131442949/City-of-Flint-Water-Supply-Assessment-Final-Report-February-6-2013	3/12/16
March 2013	DWSD contacts City of Flint to begin direct negotiations on contract extension. Multiple options are provided to Flint EFM Kurtz	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
March 25, 2013	Flint City Council approves resolution to buy water from KWA and contract with KWA to build a pipeline from Lake Huron to Genesee County. Council votes 7-1 to leave DWSD and go to KWA for water supply. Council's vote is not binding; final decision to switch from DWSD to KWA is Treasurer Dillon's	"Amended Resolution to Purchase Capacity from Karegnondi Water Authority" included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 142-3/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
March 26, 2013	Genesee County Drain Commissioner Jeffrey Wright issues statement praising Flint City Council for approving resolution to join KWA	Press release posted online	media.wix.com/ugd/60e74e_474a2f7e6f0902948ba9327284c79601.pdf	3/12/16
March 26, 2013	Busch/MDEQ e-mails MDEQ Director Wyant with Shekter Smith and other MDEQ staff copied, warning about Flint River water quality and microbial/DBP risks	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 27, 2013	Sygo/MDEQ e-mails Busch re: Flint River water source switch. "As you might guess we are in a situation with Emergency Financial Managers so it's entirely possible that they will be making decisions relative to cost."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 28, 2013	Treasurer Dillon e-mails Gov. Snyder recommending support for Flint's decision to join KWA	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 28, 2013	State of Michigan's new EM law, Public Act 436, takes effect; Kurtz remains in place as Flint EM	MLive (March 27, 2013): "Ed Kurtz expected to remain Flint's emergency manager through June 30 as new state law takes effect Thursday, March 28" (Adams)	www.MLive.com/news/flint/index.ssf/2013/03/ed_kurtz_expected_to_stay_be_f.html	3/12/16
March 29, 2013	City of Flint enacts resolution signed by EM Kurtz, City Attorney and Finance Director to purchase capacity from KWA	"By the Emergency Manager: Resolution to Purchase Capacity from Karegnondi Water Authority"	Attachment 5 - MDEQ documentation provided to FWATF Nov. 6, 2015	
March 29, 2013	Flint EM Kurtz requests state approval of Flint purchasing capacity from KWA	Letter from EM Kurtz to Treasury referenced in letter of approval from Treasurer Dillon, included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 140/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	
April 1, 2013	DWSD issues statement that Flint's water supply plan will not save money	Detroit Free Press (February 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
April 11, 2013	State Treasurer Andy Dillon authorizes Flint EM Kurtz, pursuant to Section 12(3) of PA 436 of 2012, to enter into a contract with KWA if a final offer from DWSD is either not received or rejected in good faith based upon specific objections	Letter of approval from Treasurer Dillon included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 140/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
April 15, 2013	DWSD provides a best and final offer to the City of Flint, representing 20% savings compared to KWA proposal	DWSD (McCormick) letter to Flint EM Kurtz and KWA. ThinkProgress (Jan. 25, 2016): "Leaked Documents Undermine Official Story Of Flint Water Crisis" (Israel)	reason.com/assets/db/1453755551018.pdf thinkprogress.org/health/2016/01/25/3742625/documents-michigan-contradict-flint-narrative-snyder/	3/12/16
April 15, 2013	Analyses by Flint EM Kurtz, MDEQ and Treasury's Office of Fiscal Responsibility independently conclude that the KWA option is cheaper for the City of Flint	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
April 16, 2013	GCDC Commissioner Wright and Flint EM Kurtz issue joint statement re: why KWA is preferable to DWSD's final offer	Press release posted to GCDC website	www.gcdcws.com/images/contentImages/file/Press%20Release.Official.Final%20Decision%20on%20KWA.pdf	3/12/16
April 16, 2013	Flint EM Kurtz signs agreement with KWA and informs State Treasurer Dillon that the City will join KWA (decision officially announced May 1, 2013)	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
April 17, 2013	DWSD transmits letter to Flint EM Kurtz terminating service to the City of Flint effective April 17, 2014	Press Release: DWSD Director Makes Statement on Flint's Decision, provided by MDEQ. Detroit Free Press (Oct. 11, 2015): "Chemical testing could have predicted Flint's water crisis" (Wisely, Erb). The Detroit News (Jan. 6, 2016): "Ex-Detroit official reignites Flint water switch tiff" (Lynch)	Attachment 6 - MDEQ documentation provided to FWATF Nov. 6, 2015. www.freep.com/story/news/local/michigan/2015/10/10/missed-opportunities-flint-water-crisis/73688428/ www.detroitnews.com/story/news/michigan/flint-water-crisis/2016/01/26/ex-detroit-official-reignites-flint-water-switch-tiff/79379770/	3/12/16

Date	Event	Reference Document	Sources	Accessed
May 1, 2013	GCDC announces rejection of DWSD's final offer and partnership with KWA	Announcement and attachments from Kevin Sylvester, GCDC Communications Director, posted to GCDC website	www.gcdcws.com/images/contentImages/file/Final%20KWA%20Decision.05.01.13.pdf	3/12/16
May 29, 2013	Kurtz sends Gov. Snyder resignation letter indicating July 3, 2013 will be his last day	MLive (May 30, 2013): "Flint emergency manager Ed Kurtz submits resignation notice to the state" (Adams)	www.MLive.com/news/flint/index.ssf/2013/05/flint_4.html	3/12/16
June 1, 2013	KWA begins construction on pipeline project	Detroit Free Press (February 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
June 2013	City of Flint decides to use the Flint River as a water source, per Gov. Snyder timeline	Gov. Snyder's Flint Water timeline (released Jan. 2016); no other documentation located	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	3/12/16
June 26, 2013	Flint EM Kurtz signs resolution that allows Flint to hire the engineering firm Lockwood, Andrews, and Newnam (LAN) to prepare Flint WTP for full-time operation using Flint River as primary drinking water supply source	Resolution posted online. Detroit Free Press (February 2016): "How Flint's Water Crisis Unfolded" (Dixon). Referenced in MLive (Oct. 26, 2015): "Ex-emergency manager says local leaders made decision to use Flint River water" (Fonger) and in Detroit Free Press (Nov. 22, 2015): "Flint water mystery: How was decision made?" (Egan)	Resolution: mediad.publicbroadcasting.net/p/michigan/files/201512/water_p lan_resolution.pdf?_ga=1.129405580.1036207224.1446746452 www.freep.com/pages/interactives/flint-water-crisis-timeline/ www.MLive.com/news/flint/index.ssf/2015/10/ex-emergency_manager_says_loca.html www.freep.com/story/news/politics/2015/11/21/snyders-top-aide-talked-flint-water-supply-alternatives/76037130/	3/12/16
June 2013	Flint notifies MDEQ of intent to operate Flint Water Treatment Plant full time using Flint River for drinking water	Flint WTP Facility Meeting Agenda	Attachment 7 - MDEQ documentation provided to FWATF Nov. 6, 2015	
June 26, 2013	Michael Brown is again appointed by Gov. Snyder as Flint EM	MLive (June 30, 2015): "He's back: A timeline of Michael Brown's moves as Flint's emergency manager" (Adams)	www.MLive.com/news/flint/index.ssf/2013/06/hes_back_a_timel ine_of_michael.html	3/12/16
June 26, 2013	Groundbreaking for KWA begins. City of Flint also requests DEQ approval for full-time use of the Flint WTP with Flint River water as source	Department of Treasury timeline (dated Sept. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
June 28, 2013	KWA hosts Pipeline Groundbreaking Ceremony	Brochure: "KWA Pipeline Groundbreaking Ceremony - Dawn of a New Era"	Attachment 8 - MDEQ documentation provided to FWATF Nov. 6, 2015	
June 28, 2013	Financing Contract between City of Flint and KWA is approved, effective August 1, 2013 (document is signed by EM Michael Brown)	Department of Treasury timeline (dated Sept. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
June 29, 2013	City of Flint, Genesee County, MDEQ and LAN representatives meet at Flint WTP to discuss feasibility of using Flint River as a temporary water supply source while waiting for KWA to come online. Flint DPW and Finance Department recommend using the Flint River as a temporary water source.	"City of Flint Water System Questions and Answers," dated January 13, 2015. Detroit Free Press (February 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.cityofflint.com/wp-content/uploads/CoF-Water-System-QA.pdf www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
June 30, 2013	Flint EM Kurtz submits "City of Flint Financial & Operating Plan, Third Update" (and EM Kurtz's closing memorandum) to MI Treasury Dept.	"City of Flint Financial & Operating Plan - Third Update" posted to City of Flint website	www.cityofflint.com/wp-content/uploads/Reports/City%20of%20Flint%20Update%203%20 Financial%20&%20Operating%20Plan%20062813.pdf	3/12/16
July 2013	City of Flint begins testing Flint River water treatment at Flint WTP "to see if the river could adequately supply drinking water during KWA pipeline construction"	MLive (July 23, 2015): "Flint River now an option for drinking water following Detroit's termination of contract" (Adams)	www.MLive.com/news/flint/index.ssf/2013/07/city_readying_wat er_plant_to_t.html	3/12/16
July 8, 2013	City of Flint retains Lockwood Andrews & Newnam (LAN) engineering firm to get the City's WTP up and running while KWA pipeline is built	Department of Treasury timeline (dated Sept. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
August 2013	Rowe Professional Services Company completes an engineering proposal for improvements to the Flint WTP that would allow continuous operation of the WTP utilizing the Flint River in lieu of continuing service from DWSD	From October 2014 MDEQ briefing to the Snyder Administration - as reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
September 2013	Michael Brown resigns as Flint EM, effective October 31, 2013, and Darnell Earley is appointed as replacement	MLive (Sept. 11, 2013): "New Flint emergency manager Darnell Earley to take over after Michael Brown resigns" (Adams)	www.MLive.com/news/flint/index.ssf/2013/09/michael_brown_r esigns_as_flint.html	3/12/16
October 3, 2013	City of Flint publishes engineering costs for Flint WTP upgrade	City of Flint Water Timeline: "City receives engineered estimates on the ability to upgrade the Flint Water Plant along with costs estimates"	www.flintneighborhoodsunitied.org/wp-content/uploads/2015/03/COF-TTHM-Data.pdf	3/12/16
2014				
February 19, 2014	KWA Board of Directors adopts Resolution 2014-01, authorizing KWA to bond for water line construction on behalf of City of Flint	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
February 27, 2014	MDEQ approves KWA permit for Lake Huron Pump Station	MDEQ Permit 142004	media.wix.com/ugd/60e74e_86bc474fd094f019332018dcb332 9a.pdf	1/31/16
March 1, 2014	City of Flint enters consent agreement with MDEQ re: Flint WTP's lime sludge facility	Department of Treasury timeline (dated Sept. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 39/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16

Date	Event	Reference Document	Sources	Accessed
March 7, 2014	Flint EM Earley sends letter to Sue McCormick/DWSD explaining that the City of Flint has "actively pursued using the Flint River as a temporary water source" instead of accepting DWSD's offer to provide water to the City	Attached as Ex. 10 to ACLU Michigan's November 16, 2015 letter announcing federal lawsuit	www.aclumich.org/article/flint-residents-sue-city-state-over-lead-drinking-water	3/12/16
March 26, 2014	Busch/MDEQ e-mails Shekter Smith and Benzie/MDEQ re: uncertainty on startup requirements for Flint WTP. "... I would like to make sure everyone is on the same page on... what Flint will be required to do in order to start using their plant full time... starting up for continuous operation will carry significant changes in regulatory requirements so there is a very gray area as to what we consider for startup."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
April 9, 2014	MDEQ issues Flint WTP construction permits for full time operation enhancements W141025 and W141026	MDEQ Construction Permits W141025 and W141026	Attachment 9 - MDEQ documentation provided to FWATF Nov. 6, 2015	
April 16, 2014	Flint laboratory and water quality supervisor Michael Glasgow e-mails Adam Rosenthal/MDEQ requesting information. "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"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
April 17, 2014	Glasgow/Flint e-mails Rosenthal, Prysby and Busch/MDEQ. "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 feel we are ready. I will reiterate this to management above me, but they seem to have their own agenda."	Detroit Free Press (February 13, 2016): "E-mails: Flint water plant was rushed into operation" (Egan, Spangler, Shamus)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/12/e-mails-flint-water-plant-rushed-into-operation/80300220/	3/12/16
April 17, 2014	Water service from DWSD officially ends. City of Flint also conducts two separate public forums regarding the use of Flint River water, upgrades to City's water system and overall cost of switch to KWA	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
April 21, 2014	MDEQ approves KWA permit for Intermediate Pump Station	MDEQ Permit 142023	media.wix.com/ugd/60e74e_7126cbc7d5cb453f94d0549a370298d9.pdf	3/12/16
April 23, 2014	Busch/MDEQ e-mails Brad Wurfel/MDEQ re: proposed talking points for the water switch ceremony to be held in two days. Suggests: "While the Department is satisfied with the City's ability to treat water from the Flint River, the Department looks forward to the long term solution of continued operation of the City of Flint Water Treatment Plant using water from the KWA as a more consistent and higher quality source water."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
April 24, 2014	Daugherty Johnson, Flint Utilities Administrator, e-mails Flint colleague Howard Croft and Prysby and Busch/MDEQ requesting concurrence that there is no regulatory requirement for Flint to sign up a back-up agreement with DWSD	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
April 25, 2014	City of Flint officially switches its water source to the Flint River, using Flint WTP for treatment, and hosts "changeover ceremony," public event marking the transition to use of Flint River water. MDEQ information shows that transition complete by May 2015	MDEQ e-mail dated April 28, 2014 describing Flint WTP startup ceremony on April 25. MLive (April 25, 2014): "Closing the valve on history: Flint cuts water flow from Detroit after nearly 50 years" (Adams). City of Flint press release included in Snyder e-mails released Jan. 20, 2016 (p. 15)	Attachment 10 - MDEQ documentation provided to FWATF Nov. 6, 2015. www.MLive.com/news/flint/index.ssf/2014/04/closing_the_valve_on_history_f.html somsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
April 29, 2014	Flint EM Earley notifies Detroit EM that Flint has switched water supply sources to the Flint River. GCDC remains as a non-contract customer of DWSD	Information provided to Flint Water Advisory Task Force		
May 4, 2014	City Council President Scott Kincaid and two other Flint residents file suit re: City of Flint water rates in federal court	MLive (May 13, 2014): "Kincaid, Flint residents take water rate lawsuit to federal court" (Fonger)	www.MLive.com/news/flint/index.ssf/2014/05/kincaid_flint_residents_take_w.html	3/12/16
May 15, 2014	Jennifer Crooks/EPA e-mails colleagues Mindy Eisenberg, Thomas Poy and Tinka Hyde/EPA re: concerns about Flint drinking water expressed by resident Lathan Jefferson. "Flint River quality is not great, but there is a surface water treatment plan producing water that is currently meeting SDWA standards... his doctor says the rash is from the new drinking water... He has no interest in speaking with Mike Prysby; he doesn't trust anyone in MI government."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16

Date	Event	Reference Document	Sources	Accessed
June 2014	Resident complaints intensify re: water quality; Flint WTP operators boost use of lime to address hardness concerns	MLive (June 12, 2014): "City adding more lime to Flint River water as resident complaints pour in" (Fonger)	www.MLive.com/news/flint/index.ssf/2014/06/treated_flint_river_water_meet.html	3/12/16
June 17, 2014	Adam Rosenthal/MDEQ e-mails Mike Glasgow/Flint confirming no orthophosphate monitoring is necessary at Flint WTP, since no orthophosphate is being added	MLive (Feb. 17, 2016): "Flint water crisis unfolds in key officials' emails through the years"	www.MLive.com/news/flint/index.ssf/2016/02/see_flint_water_crisis_unfold.html#4	3/12/16
July 1, 2014	Flint begins first 6-month monitoring period for lead and copper in drinking water	Gov. Snyder's Flint Water timeline (released Jan. 2016) Detroit Free Press (Oct. 11, 2015): "Chemical testing could have prevented Flint's water crisis"	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf www.freep.com/story/news/local/michigan/2015/10/10/missed-opportunities-flint-water-crisis/73688428/	3/12/16
July 16, 2014	MDEQ approves KWA permit for pipeline	MDEQ Permit 142044	media.wix.com/ugd/60e74e_cc139234530f4fca8bbfb876ef25d4a.pdf	3/12/16
July 29, 2014	MDEQ approves KWA permit for 12-mile transmission main	MDEQ Permit 142049	media.wix.com/ugd/60e74e_d1b6e185aad4cb4adba737e9421a96.pdf	3/12/16
August 15, 2014	City of Flint issues boil water advisory due to <i>E. coli</i> bacteria violation (Localized System Boil Water Advisory); City increases flushing of water mains and boosts chlorine disinfectant use. Advisory lifted Aug. 20, 2014	E-mail correspondence and public notifications from MDEQ	Attachment 11 - MDEQ documentation provided to FWATF Nov. 6, 2015	
September 5, 2014	Second boil water advisory is issued due to coliform bacteria detected in drinking water (expanded on Sept. 7, 2015); City boosts chlorine use again. Advisory lifted Sep. 9, 2014	MDEQ e-mail dated September 25, 2014; expansion referenced in MLive (Sep. 7, 2014): "Flint expands boil water advisory area after more positive tests for total coliform bacteria" (Fonger) Detroit Free Press (February 2016): "How Flint's Water Crisis Unfolded" (Dixon)	Attachments 12 & 13 - MDEQ documentation provided to FWATF Nov. 6, 2015. www.MLive.com/news/flint/index.ssf/2014/09/flint_expands_boil_water.html www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
September 10, 2014	MDEQ requests preemptive Operational Evaluation for Disinfection Byproducts - total trihalomethanes (TTHMs)	MDEQ Memo: "Compliance Communication - TTHM Operational Evaluation Requested"	Attachment 12 - MDEQ documentation provided to FWATF Nov. 6, 2015	
October 2014	Genesee County Health Department initially expresses concern to Flint Water re: increased incidence of Legionellosis and possible connection to water supply	MLive (Jan. 16, 2016): "Public never told, but investigators suspected Flint River tie to Legionnaires' in 2014" (Fonger)	www.MLive.com/news/flint/index.ssf/2016/01/documents_show_agencies_knew_o.html	3/12/16
October 1, 2014	Snyder requests and receives a briefing paper from MDEQ re: Flint water issues. The paper blames Sep. 2014 boil water advisories on variety of factors, mostly aging cast iron pipes. No mention of lead issues	Governor's Office Briefing Paper - City of Flint Drinking Water	Attachment 13 - MDEQ documentation provided to FWATF Nov. 6, 2015	
October 13, 2014	GM announces it is switching from City of Flint water system to Flint Township (Lake Huron) water for its Flint Engine Operations facility until KWA connection is complete, citing corrosion concerns. Prysby/MDEQ notes Flint water chloride levels are "easily within" public health guidelines. Annual revenue loss of \$400,000	MLive (Oct. 13, 2014): "General Motors shutting off Flint River water at engine plant over corrosion worries" (Fonger)	www.MLive.com/news/flint/index.ssf/2014/10/general_motors_wont_use_flint.html	3/12/16
October 13, 2014	Prysby/MDEQ e-mails Busch, Shekter Smith and others at MDEQ re: inquiry from Ron Fonger/MLive concerning GM's switch to Lake Huron water. Notes Flint water has elevated chlorides but "although not optimal," it is "satisfactory."	E-mail from Mike Prysby/MDEQ dated October 13, 2014 discussing interview with Fonger	Attachment 14 - MDEQ documentation provided to FWATF Nov. 6, 2015	
October 14, 2014	Valerie Brader, State Deputy Legal Counsel and Sr. Policy Advisor, sends e-mail to Governor's Chief of Staff Dennis Muchmore and other top aides arguing for a return to DWSD because of water quality problems. Michael Gadola, then Gov. Snyder's Legal Counsel, responds agreeing with Brader. Brader and Rich Baird, senior aide to Gov. Snyder, discuss the idea with EM Earley, who maintains water quality problems can be solved and it would be cost-prohibitive to return to DWSD	Detroit Free Press (Feb. 26, 2016): "Top Snyder aides urged going back to Detroit water" (Dolan, Egan)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/26/flint-water-crisis-snyder-detroit/80926138/	
October 17, 2014	Genesee Co. Health Department (GCHD) representatives hold conference call with Glasgow and Wright/Flint DPW re: county's concerns about Legionellosis outbreak and possible connection to city's water system. DPW "acknowledges that the distribution system has areas of concern"	MLive (Feb. 17, 2016): "Flint water crisis unfolds in key officials' emails through the years" - provides screen capture of e-mail describing conference call	www.MLive.com/news/flint/index.ssf/2016/02/see_flint_water_crisis_unfold.html#4	3/12/16
October 21, 2014	Susan Bohm/MDHHS e-mails GCHD officials re: Shekter Smith's concern that Flint water would be publicly linked to Legionellosis outbreak in Flint. "I told her the Flint water was at this point just a hypothesis"	Detroit Free Press (February 9, 2016): "Flint e-mails: CDC voiced concerns over Legionnaires' actions" (Dolan, Anderson, Egan, Wisely)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/09/flint-e-mails-state-city-appear-unable-share-info/80028820/	3/12/16
November 1, 2014	LAN issues Operational Evaluation Report to City of Flint, assessing factors contributing to TTHM levels in Flint drinking water	"Operational Evaluation Report, City of Flint, Trihalomethane Formation Concern," Nov. 2014, prepared by LAN, posted to City of Flint website. Referenced in EPA's Interim Report dated June 24, 2015	www.cityofflnt.com/wp-content/uploads/Operational-Evaluation-Report.pdf	3/12/16
November 1, 2014	Flint DPW increases hydrant flushing to reduce the residence time of water in the distribution system	Flint Water System Timeline, posted on City of Flint website	www.cityofflnt.com/public-works/city-water-system-timeline/	1/31/16
November 7, 2014	City of Flint staff and engineering team meet with MDEQ to discuss quarterly TTHM results	Flint Water System Timeline, posted on City of Flint website	www.cityofflnt.com/public-works/city-water-system-timeline/	1/31/16

Date	Event	Reference Document	Sources	Accessed
November 26, 2014	LAN issues report on cost of reconnection to DWSD	MLive (Jan. 8, 2015): "Flint report says getting water from Detroit is possible but would cost \$4 million just to reconnect" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/01/flint_report_says_going_back_t.html	3/12/16
December 1, 2014	City of Flint begins hydraulic modeling to "help identify locations of bad valves"	Flint Water System Timeline, posted on City of Flint website	www.cityofflnt.com/public-works/city-water-system-timeline/	3/12/16
December 16, 2014	MDEQ notifies Flint of initial quarterly violation of SDWA Disinfection Byproducts (TTHM) requirements	MDEQ Letter: Violation Notice - MCL for TTHM Operational Evaluation - TTHM, 4th Quarter 2014 Monitoring Period	www.cityofflnt.com/wp-content/uploads/City-of-Flint-Violation-Notice-MCL-TTHM-12_16_14.pdf	3/12/16
December 27, 2014	Flint's GM engine plant switches off its water supply from Flint's water system, drawing water instead from neighboring Flint Township	Detroit Free Press (Oct. 11, 2015): "Chemical testing could have predicted Flint's water crisis" (Wisely, Erb)	www.freep.com/story/news/local/michigan/2015/10/10/missed-opportunities-flint-water-crisis/73688428/	3/12/16
December 31, 2014	First 6-month round of lead and copper monitoring (per MDEQ's interpretation of LCR) ends. Results due from City of Flint to MDEQ on January 10, 2015. 100 samples within 90th percentile lead level, 6 ppb; 2 samples above lead action level	MDEQ Letter: City of Flint - Lead and Copper Monitoring of Drinking Water Taps, dated March 30, 2015; MDEQ e-mail dated Feb 27, 2015	Attachment 16 - MDEQ documentation provided to FWATF Nov. 6, 2015	
2015				
January 2015	Officials from Genesee County hospitals, MDHHS, MDEQ, GCHD meet re: Legionellosis outbreak in Flint. MDHHS Director Nick Lyon directs GCHD to conduct and complete its evaluation of causes of the increased cases	Information provided by Flint Water Advisory Task Force		
January 1, 2015	City of Flint begins second 6-month monitoring period for lead and copper in drinking water	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	3/12/16
January 2, 2015	City of Flint issues press release and mails notice to water customers stating the City water system exceeds maximum contaminant level (MCL) for total trihalomethanes (TTHMs), which are disinfection byproducts	Department of Treasury timeline (dated Sep. 28, 2015), included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 93-94/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
January 7, 2015	Michigan Department of Technology, Management and Budget announces installation of water coolers in Flint's State Office Building. "The coolers... will be provided as long as the public water does not meet treatment requirements." Richard Benzie/MDEQ e-mails colleagues re: discussion of Flint water issues with State Representative Sheldon Neely (D-Flint) and others. "...there appears to be a significant (I think they used the word complete) loss of public confidence in the drinking water quality in Flint"	Detroit Free Press (January 29, 2016): "Amid denials, state workers in Flint got clean water" (Egan)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/01/28/amid-denials-state-workers-flint-got-clean-water/79470650/	3/12/16
January 7, 2015	University of Michigan-Flint alerted city officials that it found elevated lead levels in two locations on campus, prompting the school to shut off some drinking fountains and add water filters to others	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
January 9, 2015	Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/		3/12/16
January 12, 2015	DWSD offers to reconnect to Flint and waive \$4 million connection fee	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	3/12/16
January 12, 2015	MDEQ staff (Prysbys, Shekter Smith, Benzie, numerous others) communicate via e-mail re: decision to provide water coolers at Flint's State Office building. Some discussion re: how this decision will affect Flint residents' perceptions of drinking water safety, and how the decision will "make it more difficult... for ODWMA staff"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
January 13, 2015	Gov. Snyder announces that Jerry Ambrose, who previously served as Flint's finance and administration director, will replace Earley as Flint EM	MLive (Jan. 13, 2015): "Jerry Ambrose named Flint's fourth emergency manager as Darnell Earley heads to Detroit" (Adams)	www.MLive.com/news/flint/index.ssf/2015/01/jerry_ambrose_tapped_as_next_e.html	
January 13, 2015	Flint DPW posts water system FAQs re: bacteria and TTHM issues in Flint water, and decision to switch to Flint River as temporary water supply	"City of Flint Water System Questions and Answers," dated January 13, 2015	www.cityofflnt.com/wp-content/uploads/CoF-Water-System-QA.pdf	3/12/16
January 21, 2015	City of Flint holds public meeting re: disinfection byproducts and bacteria; residents attend, bringing containers of water from their taps. LeeAnne Walters shows samples of discolored water taken from her taps on Jan. 15 and Jan. 21, 2015, to EM Ambrose	City of Flint - Public Forum Agenda MLive (Jan. 21, 2015): "Officials say Flint water is getting better, but many residents unsatisfied" (Fonger)	Attachment 17 - MDEQ documentation provided to FWATF Nov. 6, 2015. www.MLive.com/news/flint/index.ssf/2015/01/state_water_officials_tell_fli.html	3/12/16
January 21, 2015	Shekter Smith/MDEQ e-mails colleagues re: Flint water supply. "...when Flint decided to leave Detroit and operate using the River, our role wasn't to tell them our opinion; only what steps would be necessary to make the switch"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
January 23, 2015	Walling says decision to use Flint River water was made by former EM Earley [who later disputes this statement]	MLive (Jan. 23, 2015): "Flint water problems: Switch aimed to save \$5 million -- but at what cost" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/01/flints_dilemma_how_much_to_spe.html	3/12/16
January 27, 2015	GCHD environmental health supervisor James Henry e-mails colleagues re: inability to obtain information from local and state officials needed to investigate connection of Flint water system to Legionellosis outbreak. "Initially the water plant was cooperative, but since the beginning of November they have not responded to multiple written and verbal requests"	Detroit Free Press (Feb. 9, 2016): "Flint e-mails: CDC voiced concerns over Legionnaires' actions" (Dolan, Anderson, Egan, Wisely)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/09/flint-e-mails-state-city-appear-unable-share-info/80028820/	3/12/16

Date	Event	Reference Document	Sources	Accessed
January 27, 2015	Shannon Johnson, MDHHS epidemiologist, emails GCHD re: Legionellosis outbreak and investigating possible connection to the Flint water system. "A current map of the municipal water system needs to be obtained and cases' residences mapped in relation to the water system"	Detroit Free Press (Feb. 9, 2016): "Flint e-mails: CDC voiced concerns over Legionnaires' actions" (Dolan, Anderson, Egan, Wisely)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/09/flint-e-mails-state-city-appear-unable-share-info/80028820/	3/12/16
January 29, 2015	Flint EM Ambrose declines DWSD offer to reconnect Flint to Detroit water supply	Gov. Snyder's Flint Water timeline (released Jan. 2016) MLive (Jan. 29, 2015): "Flint emergency manager says there are two big reasons not to reconnect Detroit water" (Fonger)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf www.MLive.com/news/flint/index.ssf/2015/01/flint_extends.html	3/12/16
January 29, 2015	Sygo and Shekter Smith/MDEQ e-mail re: Flint water quality problems. Shekter Smith identifies the problem as corrosion across the distribution system rather than a "premise plumbing" issue	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
January 30, 2015	Brad Wurfel/MDEQ e-mails Dave Murray, Governor Snyder's deputy press secretary, re: Legionella, saying said he didn't want MDEQ Director Wyant "to say publicly that the water in Flint is safe until we get the results of some county health department traceback work on 42 cases of Legionnaires disease in Genesee County since last May"	Detroit News (Feb. 26, 2016): "Legionnaires' fear led staffer to warn against calling water safe" (Oosting)	www.detroitnews.com/story/news/michigan/flint-water-crisis/2016/02/26/flint-legionnaires-safe-water-wyant-snyder/80966744/	3/19/16
February 1, 2015	Briefing memo is prepared for Gov. Snyder on Flint water situation, including info on residents' complaints about water quality, Mayor Walling's call for assistance, and MDEQ "backgrounder" downplaying health risks. Wurfel: "It's not like an imminent threat to public health"	Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 54-62/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
February 2, 2015	City of Flint DPW issues letter to customers offering testing for discoloration, taste and odor	Letter posted to City of Flint website	www.cityofflnt.com/wp-content/uploads/2015_02_02-Water-Test-Letter.pdf	1/31/16
February 3, 2015	Gov. Snyder awards Flint \$2 million to find leaks in city water lines and replace a wastewater incinerator, part of state's \$8 million Distressed Cities program	MLive (Feb. 3, 2015): "Governor Awards Flint \$2 million for Troubled Water System: Mayor Says More is Needed" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/02/governor_awards_flint_2_millio.html	3/12/16
February 4, 2015	Flint resident LeeAnne Walters shows Flint City Council a video documenting rashes on her son's skin, attributed to drinking water	Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
February 6, 2015	Liz Murphy, assistant to Flint EM, and Prysby/MDEQ exchange e-mails re: other Michigan systems that treat river water, and a source water assessment for Flint River	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
February 6, 2015	Flint ABC affiliate (ABC12) posts report on independent testing showing water quality is within EPA limits for TTHMs	ABC12 (Feb. 6, 2015): "What's in your water?" (Elliott)	www.abc12.com/flintwaterworries/headlines/ABC12-Investigates-Whats-in-your-water-291074071.html	3/12/16
February 10, 2015	City of Flint retains Veolia sole-source to provide additional review and recommendations on water system	Press release posted to City of Flint website	www.cityofflnt.com/2015/02/10/flint-hires-international-urban-water-experts-of-veolia-north-america-to-assess-citys-water-issues/	3/12/16
February 10, 2015	GCDC epidemiologist Shurooq Hasan e-mails outside expert about 47 Legionellosis cases diagnosed in Flint in 2014, almost four times the number in 2013. "We... have expanded our investigation to include the city water supply"	Detroit Free Press (Feb. 9, 2016): "Flint e-mails: CDC voiced concerns over Legionnaires' actions" (Dolan, Anderson, Egan, Wisely)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/09/flint-e-mails-state-city-appear-unable-share-info/80028820/	3/12/16
February 16, 2015	City of Flint posts second Flint Water FAQ document, stating that Flint water is safe to drink	"City of Flint Water System Update with Questions and Answers," dated February 16, 2015	www.cityofflnt.com/wp-content/uploads/Water-Sysytem-FAQ-Update-2-16-151.pdf	3/12/16
February 18, 2015	EPA collects additional samples at LeeAnne Walters's home	Referenced in EPA-MDEQ e-mail correspondence dated February 26, 2015	Attachment 18 - MDEQ documentation provided to FWATF Nov. 6, 2015	
February 25, 2015	Mike Glasgow/Flint DPW tests water in LeeAnne Walters's home and finds high lead levels (104 ppb). She contacts Chicago offices of EPA to discuss	Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
February 26, 2015	Initial e-mail correspondence between EPA (Crooks, Del Toral, Poy) and MDEQ (Busch, Prysby) re: elevated lead in sample collected February 18, 2015 at LeeAnne Walters's home. Initial inquiry made re: corrosion control treatment (OCC) at Flint WTP. Crooks: "WOW!!! Did he find LEAD! 104 parts per billion"	EPA/MDEQ e-mails included in chronological compilation of e-mails from FOIA requests, created by Roy/Edwards and posted to Flint Water Study website. E-mail correspondence between Mrs. Walters and City of Flint dated Feb. 19-26, 2015; Consumer Notice of Results; Official Laboratory Report.	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf Attachment 18 - MDEQ documentation provided to FWATF Nov. 6, 2015	3/12/16
February 26, 2015	Busch/MDEQ e-mails colleagues Shekter Smith and Benzie in response to Crooks' email. "As indicated by Mike and Adam the city is meeting 90th percentile. Not sure why region 5 [EPA] sees this one sample as such a big deal"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16

Date	Event	Reference Document	Sources	Accessed
February 27, 2015	In continued e-mail correspondence, Del Toral/EPA voices concern re: possibility that City of Flint's lead sampling protocol (pre-flushing) is biasing lead results toward the low side. Asks again about OCCT at Flint WTP	Chronological compilation of MDEQ e-mails from FOIA requests, created by Roy/Edwards and posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf Attachment 19 - MDEQ documentation provided to FWATF Nov. 6, 2015	3/12/16
February 27, 2015	Busch/MDEQ responds to Del Toral/EPA saying that the City of Flint "Has an Optimized Corrosion Control Program," LeeAnne Walters's house is "not part of the City's established sample site pool" and the residence has PVC plumbing	Chronological compilation of MDEQ e-mails from FOIA requests, created by Roy/Edwards and posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf Attachment 20 - MDEQ documentation provided to FWATF Nov. 6, 2015	3/12/16
March 3, 2015	In response to complaints re: drinking water quality and related health effects, Flint EM Ambrose claims costs will increase \$12 million with return to DWSD service. He provides memo to Deputy State Treasurer Wayne Workman stating reconnection to DWSD will cost the City \$10.1M/year and water could be as high as \$1M/month	MLive (June 5, 2015): "Lawsuit seeks end to Flint River drinking water, return to Detroit" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/06/lawsuit_seeks_end_to_flint_riv.html	3/12/16
March 4, 2015	City of Flint/Veolia Technical Advisory Committee holds its first meeting; 17 members from City, County, State, USEPA, hospitals & universities	List of members posted to City of Flint timeline	www.cityofflint.com/public-works/water-advisory-committees/	3/12/16
March 5, 2015	MDEQ issues second Disinfection Byproducts quarterly violation notice	MDEQ Letter: Violation Notice - MCL for TTHM Operational Evaluation - TTHM, 1st Quarter 2015 Monitoring Period	Attachment 21 - MDEQ documentation provided to FWATF Nov. 6, 2015	
March 5, 2015	Officials in Governor's Office and MDEQ begin discussing providing water filters to Flint citizens	MLive (Feb. 17, 2016): "Flint water crisis unfolds in key officials' emails through the years" - provides screen capture of partial e-mail	www.MLive.com/news/flint/index.ssf/2016/02/see_flint_water_crisis_unfold.html#4	3/12/16
March 5, 2015	Citizens Advisory Committee (CAC), hosted by City of Flint, holds its first meeting; includes 58 members representing various interests	List of members posted to City of Flint timeline	www.cityofflint.com/public-works/water-advisory-committees/	3/12/16
March 9, 2015	Harvey Hollins/Governor's Office meets with Flint EM and DEQ officials to discuss possible solutions to Flint water issues	MLive (Feb. 17, 2016): "Flint water crisis unfolds in key officials' emails through the years" - provides screen capture of e-mail referring to meeting	www.MLive.com/news/flint/index.ssf/2016/02/see_flint_water_crisis_unfold.html#4	3/12/16
March 10, 2015	Crooks/EPA e-mails Busch, Prysby and Benzie/MDEQ saying she has been "inundated" with citizen e-mails referred to her from the White House about Flint water quality problems	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 10, 2015	James Henry/GCHD e-mails Howard Croft/Flint DPW, Prysby/MDEQ, Mayor Walling and others citing the city's and state's lack of cooperation and failure to respond to his requests for information -- and a Jan. 2015 FOIA -- to support county's investigation of potential causes of Legionellosis outbreak in Flint. "This is rather glaring information and it needs to be looked into now, prior to the warmer summer months when Legionella is at its peak and we are potentially faced with a crisis."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 11, 2015	Benzie/MDEQ e-mails colleagues Shekter Smith, Busch and Prysby re: thoughts for a plan of action on Legionellosis response	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 12, 2015	Busch/MDEQ e-mails colleagues Shekter Smith, Prysby and Benzie re: Legionella. "... there is no evidence or confirmation of Legionella coming directly from the Water Treatment Plant or in the community water supply distribution system at this time."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 12, 2015	Veolia issues Water Quality Report to City of Flint/EM Ambrose, an evaluation providing advice primarily on TTHM control and other operational issues in the City's water system. Report states that Flint's water meets state and federal standards for TTHM control, but does not address lead. Also recommends corrosion control at Flint WTP to address iron leaching from pipes - estimated cost \$50,000	"Flint, Michigan Water Quality Report," prepared by Veolia, posted to City of Flint website. Report and accompanying Veolia presentation included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 151-186/274). Referenced in EPA's Interim Report dated June 24, 2015.	Report: www.cityofflint.com/wp-content/uploads/Veolia-REPORT-Flint-Water-Quality-20150312.pdf E-mails: somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
March 13, 2015	Wurfel/MDEQ e-mails Harvey Hollins/Governor's office and Wyant/MDEQ noting uptick in Legionellosis cases, placing responsibility for follow-up on GCHD, and discounting Henry/GCHD's concerns about a possible relationship between uptick in Legionellosis and change in water source	APNewsBreak (Feb. 4, 2016): "Officials warned of water, Legionnaires' link" (Eggert, White) Detroit Free Press (Feb. 4, 2016): "E-mails: Snyder aide was told of Legionnaires' in March" (Egan) - includes link to e-mails	bigstory.ap.org/500a2ef5b57d423d876ef25709af1973 www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/04/apnewsbreak-officials-warned-of-water-legionnaires-link/79828466/#read	3/12/16
March 13, 2015	Busch/MDEQ e-mails Henry/GCHD re: Legionellosis investigation. Implies DEQ has no responsibilities re: Legionella since it isn't regulated by SDWA; says it isn't coming from the WTP but could be associated with main breaks, leaks or repairs to distribution system; reminds Henry that epidemiological investigation is GCHD's job and directs him to MDCH (MDHHS) if they need support	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16

Date	Event	Reference Document	Sources	Accessed
March 17, 2015	Busch/MDEQ e-mails Croft/Flint with instructions to conduct monitoring for <i>Legionella</i> at the WTP tap and in the distribution system	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 18, 2015	Water in LeeAnne Walters's home is re-tested for lead following thorough flushing; results are extremely high (397 ppb). Crooks/EPA e-mails Busch, Prysby and Benzie/MDEQ re: those test results	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 19, 2015	EPA Region 5 calls MDEQ to express concerns about high lead levels found in LeeAnne Walters's home, noting that they suspect lead is coming from service line	Detroit Free Press, "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
March 19, 2015	City of Flint responds to 61 questions posed by CAC in March 5 meeting	"Water Advisory Committee Questions & Answers," posted to City of Flint website	www.cityofflint.com/wp-content/uploads/2015_03_19-Water-Advisory-Committee-Questions-Answers.pdf	3/12/16
March 19, 2015	Henry/GCHD e-mails Busch/MDEQ re: investigation of Legionellosis outbreak in Flint, again requesting MDEQ collaboration and providing documentation of previous requests	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
March 23, 2015	Flint City Council votes 7-1 to end Flint River service and return to Detroit water service; the vote is non-binding since Flint is under EM control. Flint EM Ambrose: "It is incomprehensible to me that... Flint City Council would want to send more than \$12 million a year to the system serving Southeast Michigan, even if Flint rate payers could afford it. (Lake Huron) water from Detroit is no safer than water from Flint."	MLive (March 24, 2015): "Emergency manager calls City Council's Flint River vote 'incomprehensible'" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/03/flint_emergency_manager_calls.html	3/12/16
March 26, 2015	EPA learns that Genesee County Health Department is investigating uptick in Legionellosis in the county, including Flint; an EPA official questions whether it is related to switch to Flint River water	Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
March 27, 2015	LeeAnne Walters's son is tested for blood lead levels; results are above CDC's 5 ug/dl "threshold of concern"	Flint Water Study website (Sep. 30, 2015): "COMMENTARY: MDEQ Mistakes and Deception Created the Flint Water Crisis" (Roy)	flintwaterstudy.org/2015/09/commentary-mdeq-mistakes-deception-flint-water-crisis/	3/12/16
March 30, 2015	MDEQ notifies Flint of results of first 6-month lead and copper monitoring period (July-December 2014) showing 6 ppb result	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	3/12/16
March 31, 2015	Crooks/EPA e-mails Busch, Prysby and Shekter Smith/MDEQ re: EPA conference call on <i>Legionella</i> in Flint. Cites Del Toral's statement that the city's aggressive pre-flushing before lead testing may be contributing to favorable conditions for <i>Legionella</i> in distribution system	As reported in Bridge Magazine (March 1, 2016): "Flint crisis timeline: Part 2"	bridgemi.com/2016/03/flint-crisis-timeline-part-2/	3/12/16
April 3, 2015	MDEQ sends Flint LT2 Surface Water Treatment Rule Letter re: monitoring requirements for <i>Cryptosporidium</i> , <i>E. Coli</i> and turbidity	MDEQ Letter: LT2 ESWTR Rule - 2nd Round of Monitoring Requirements	Attachment 22 - MDEQ documentation provided to FWATF Nov. 6, 2015	
April 6, 2015	Flint proposes installation of Granular Activated Carbon filter media to reduce disinfection byproducts	E-mail from LAN to Busch/MDEQ, cc Croft, dated April 6, 2015	Attachment 23 - MDEQ documentation provided to FWATF Nov. 6, 2015	
April 7, 2015	MDHHS hosts conference call regarding <i>Legionella</i> , but the subject matter and participants are not clear. It was suggested that there was a communication plan in preparation, but no indication that public communication happened as a result	As reported in Bridge Magazine (March 1, 2016): "Flint crisis timeline: Part 2"	bridgemi.com/2016/03/flint-crisis-timeline-part-2/	3/12/16
April 23, 2015	Del Toral/EPA e-mails Cook/MDEQ again to ask re: Flint corrosion control treatment. Cook/MDEQ, in follow-up message to Busch & Prysby/MDEQ: "Other than sampling for Pb/Cu, I don't think Flint is doing anything regarding corrosion control"	EPA-MDEQ e-mail correspondence dated April 23-24, 2015	Attachment 24 - MDEQ documentation provided to FWATF Nov. 6, 2015	
April 24, 2015	MDEQ staff indicates to EPA no corrosion control treatment in place in Flint system	Chronological compilation of MDEQ e-mails from FOIA requests, created by Roy/Edwards and posted to Flint Water Study website Gov. Snyder's Flint Water timeline (released Jan. 2016) Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
April 25, 2015	Del Toral/EPA e-mails Cook/MDEQ to express concern re: Flint's lack of corrosion control treatment, pre-flushing and high lead levels. Says Flint does not appear to meet requirements for OCCT without treatment	E-mail from Del Toral/EPA to Cook/MDEQ dated April 25, 2015	Attachment 25 - MDEQ documentation provided to FWATF Nov. 6, 2015	
April 27, 2015	Del Toral/EPA e-mails Poy/EPA and other colleagues stating that Cook/MDEQ has confirmed the Flint WTP has no corrosion control treatment (CCT), which is "very concerning given the likelihood of lead service lines in the city"	Detroit Free Press (Feb. 2, 2016): "EPA too slow to respond to Flint crisis, critics say" (Spangler)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/02/epa-too-slow-respond-flint-crisis-critics-say/79652928/	3/20/16

Date	Event	Reference Document	Sources	Accessed
April 27, 2015	Del Toral/EPA visits LeeAnne Walters's house, inspects plumbing and finds it is lead-free; leaves sample bottles and provides Marc Edwards/Virginia Tech's contact info	Flint Water Study website (Sep. 30, 2015): "COMMENTARY: MDEQ Mistakes and Deception Created the Flint Water Crisis" (Roy)	flintwaterstudy.org/2015/09/commentary-mdeq-mistakes-deception-flint-water-crisis/	3/12/16
April 27, 2015	Cook, Busch and Prysby/MDEQ exchange e-mails re: Del Toral/EPA's question on corrosion control treatment. Busch: "If he continues to persist, we may need Liane or Director Wyant to make a call to EPA to help address his over-reaches." Cook: "I agree, the constant second guessing of how we interpret and implement our rules is getting tiresome."	Detroit Free Press (Feb. 14, 2016): "State MDEQ didn't take Flint water concerns seriously" (Shamus) Also as reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	www.freep.com/story/news/local/michigan/2016/02/13/state-deq-flint-water-concerns/80332954/ bridgemi.com/2016/02/flint-water-disaster-timeline/	3/12/16
April 27, 2015	Laurel Garrison/CDC e-mails GCHD officials re: concern over Legionellosis outbreak in Flint. Indicates that city and state officials allegedly were not supplying needed information for the county's investigation. "We are very concerned about this Legionnaires' disease outbreak... It's very large, one of the largest we know of in the past decade, and community-wide, and in our opinion and experience it needs a comprehensive investigation."	Detroit Free Press (Feb. 9, 2016): "Flint e-mails: CDC voiced concerns over Legionnaires' actions" (Dolan, Anderson, Egan, Wisely)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/09/flint-e-mails-state-city-appear-unable-share-info/80028820/	3/12/16
April 28, 2015	Michigan Office of the Auditor General announces planned performance audit of MDEQ-Office of Drinking Water and Municipal Assistance	Office of Auditor General letter to MDEQ Director Wyant, dated April 28, 2015. Notice of audit posted to OAG website	audgen.michigan.gov/wip/wip761032015.html	3/17/16
April 29, 2015	To resolve an \$8 million accumulated deficit in Flint's General Fund, the State Treasurer and Flint EM, with the concurrence of Flint City Council, sign an emergency loan agreement between the City and Michigan's Local Financial Assistance Loan Board for nearly \$8 million. The loan agreement includes a provision that the city of Flint cannot, without prior state approval, return to DWSD or lower water rates.	Emergency Loan Agreement, signed by EM Ambrose and Treasurer Khouri, dated April 29, 2015	Document provided to FWATF	
April 29, 2015	Gov. Snyder announces control of City of Flint's finances has been returned to Mayor and City Council under supervision of Receivership Transition Advisory Board	Press release: "Gov. Rick Snyder: City of Flint ready to move forward as financial emergency resolved" posted to State of MI website	www.michigan.gov/snyder/0,4668,7-277-57577_57657-353433--00.html	3/12/16
May 2015	LeeAnne Walters's water samples are sent to Virginia Tech for analysis. Average lead level is "2,429 ppb lead, the high was 13,200 ppb, and even after 25 minutes flushing the water never dropped below 200 ppb"	Flint Water Study website (Aug. 24, 2015): "Hazardous Waste-levels of Lead found in a Flint household's water" (Roy)	flintwaterstudy.org/2015/08/hazardous-waste-levels-of-lead-found-in-a-flint-households-water/	3/13/16
May 1, 2015	Cook/MDEQ responds to Del Toral/EPA re: inquiries about Flint corrosion control, indicating MDEQ is delaying decision pending completion of second 6-month monitoring period in June 2015. Says that since Flint will be switching water source in another year, "requiring a [corrosion control] study at the current time will be of little to no value"	E-mail from Cook/MDEQ to Del Toral/EPA dated May 1, 2015, included in chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
May 6, 2015	City replaces service line at 212 Browning with EPA onsite	EPA e-mail to MDEQ dated May 7, 2015	Attachments 26 & 27 - MDEQ documentation provided to FWATF Nov. 6, 2015	
May 7, 2015	Crooks/EPA e-mails MDEQ re: EPA visit to LeeAnne Walters's home to deliver sampling bottles for lead/copper analyses and observe plumbing systems	J. Crooks/EPA e-mail to MDEQ dated May 7, 2015	Attachments 26 & 27 - MDEQ documentation provided to FWATF Nov. 6, 2015	
May 14, 2015	MDEQ approves GDCDC permit for surface water impoundment to feed KWA WTP	MDEQ Permit 151036	media.wix.com/ugd/60e74e_830d3b5098294e78825c8720f155eca.pdf	1/31/16
May 20, 2015	Second meeting of City of Flint/Veolia Technical Advisory Committee. Meeting notes: "Some attention has shifted to lead and copper concerns" - no further mention of lead issue	Meeting summary posted to City of Flint website	www.cityofflint.com/wp-content/uploads/2015-05-20-TAC-Meeting-Summary.pdf	1/31/16
May 26, 2015	EPA/MDEQ e-mail correspondence continues re: results of additional sampling at Walters's home and at 2 additional homes connected to same water service line	EPA e-mail correspondence dated May 26-27, May 28 and June 2, 2015; laboratory reports attached	Attachment 28 & 29 - MDEQ documentation provided to FWATF Nov. 6, 2015	
May 28, 2015	New samples show improved water quality at LeeAnne Walters's residence	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-2/	3/12/16
May 29, 2015	MDHHS produces a report regarding Legionellosis cases in Genesee County in 2014-15; the conclusion is that "the outbreak is over." 42% of the cases had healthcare (hospital) contact; 47% had contact with the Flint water supply	"Summary of Legionellosis Outbreak - Genesee County, June 2014-March 2015," posted to state website	www.michigan.gov/documents/mdhhs/Genesee_Co_Legionnaires_Disease_Investigation_Ex_Summary_FINAL_510722_7.pdf	3/17/16
June 5, 2015	Coalition for Clean Water in Flint and others file lawsuit in Genesee County Circuit Court seeking order for Flint to return to DWSD service	MLive (June 5, 2015): "Lawsuit seeks end to Flint River drinking water, return to Detroit" (Ridley)	www.MLive.com/news/flint/index.ssf/2015/06/lawsuit_seeks_end_to_flint_riv.html	3/12/16
June 8, 2015	Jim Collins/MDHHS e-mails GCHD officials saying he spoke with officials at federal Centers for Disease Control and Prevention that morning about the Legionellosis issue. He then chastises county officials for talking to CDC without state approval	Detroit Free Press (February 9, 2016): "Flint e-mails: CDC voiced concerns over Legionnaires' actions" (Dolan, Anderson, Egan, Wisely)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/09/flint-e-mails-state-city-appear-unable-share-info/80028820/	3/12/16

Date	Event	Reference Document	Sources	Accessed
June 9, 2015	MDEQ issues third Disinfection Byproducts quarterly violation notice	MDEQ Letter: Violation Notice - MCL for TTHMs, 2nd Quarter 2015 Monitoring Period	Attachment 30 - MDEQ documentation provided to FWATF Nov. 6, 2015	
June 10, 2015	Michigan Semi-Annual Conference Call is held with EPA, DNR and MDEQ. EPA recommends that MDEQ offer technical assistance to Flint on managing water quality issues, including lead	J. Crooks/EPA e-mail dated July 1, 2015, with notes from June 10 conference call; notes posted final July 28, 2015. E-mail and notes are included in chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf Attachment 31 - MDEQ documentation provided to FWATF Nov. 6, 2015	3/13/16
June 12, 2015	Michigan Court of Appeals reverses Genesee County Circuit Court dismissal of Kincaid rate lawsuit, claiming City didn't follow the proper process for raising rates and improperly spent the funds collected	MLive (June 12, 2015): "Appeals Court breathes new life into Flint water rebate lawsuit" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/06/appeals_court_sides_with_flint.html	3/13/16
June 15, 2015	Press conference held at UAW Region 1D post with Councilman Kincaid and attorney Val Washington urging City to negotiate on water and sewer rates	MLive (June 15, 2015): "Flint councilman urges city to negotiate end to water rate lawsuit" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/06/flint_councilman_urges_city_to.html	3/13/16
June 23, 2015	U.S. District Judge Stephen J. Murphy III denies Coalition for Clean Water in Flint's motion for the preliminary injunction without prejudice	MLive (June 23, 2015): "Judge won't force Flint to return to buying Detroit water" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/06/judge_says_flint_doesnt_have_t_1.html	3/13/16
June 24, 2015	Del Toral/EPA provides his "Interim Report: High Lead Levels in Flint, Michigan" to his supervisor, Poy/EPA. Report expresses numerous concerns re: lead levels, sampling methodology, and lack of corrosion control treatment at Flint WTP	"Memorandum: High Lead Levels in Flint, Michigan - Interim Report," prepared by M. Del Toral and transmitted to T. Poy. Per Curt Guyette/ACLU (interview with FWATF Dec. 10, 2015), Del Toral provided report to Walters and she provided it to Guyette. Interim report is available on Flint Water Study website. Final report issued Nov. 2015 is also posted to ACLU-MI website	flintwaterstudy.org/wp-content/uploads/2015/11/Miguels-Memo.pdf	3/17/16
June 25, 2016	Rosenthal/MDEQ e-mails Glasgow and Wright/Flint DPW reminding them that 61 more lead and copper samples need to be collected and sent to the lab by June 30, 2015, "and that they are will be [sic] below the AL [action level] for lead. As of now with 39 results, Flint's 90th percentile is over the AL for lead."	Detroit Free Press (Dec. 24, 2015): "State's handling of Flint water samples delayed action" (Egan)	www.freep.com/story/news/politics/2015/12/23/states-handling-flint-water-samples-delayed-action/77367872/	3/20/16
June 30, 2015	EPA e-mails MDEQ as preface to conference call scheduled for July 21, 2015, re: elevated lead and corrosion control; mentions Del Toral report	E-mail from T. Hyde/EPA to L. Shekter Smith/MDEQ dated June 30, 2015, included in chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
June 30, 2015	Second 6-month round of lead and copper monitoring ends. Results due from Flint to MDEQ July 10, 2015	Included in chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
July 1, 2015	Gov. Snyder asks MDEQ and MDHHS about Flint; both report nothing unusual or widespread occurring. Flint complying with LCR, elevated blood levels are seasonal	Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
July 2, 2015	EPA Region 5 Water Division Director Tinka Hyde tells MDEQ that Region 5 is "concerned about the lead situation" but acknowledges second round of monitoring is under way	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16
July 2, 2015	EPA Region 5 Administrator Susan Hedman writes Mayor Walling to say that EPA will work with MDEQ on issues related to lead in water. "It would be premature to draw any conclusions" based on draft EPA memo regarding lead	Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/13/16
July 7, 2015	ACLU reporter Curt Guyette contacts MDEQ regarding Del Toral's draft Interim Report	"Highlights of Marc Edwards FOIA," posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/Virginia-Tech-FOIA-EPA.pdf	3/13/16
July 9, 2015	MDEQ Public Information Officer Karen Tommasulo emails Wurfel/MDEQ as Michigan Public Radio begins picking up on the ACLU reports concerning Flint lead-in-water issue. "Apparently, it is going to be a thing now."	Included in chronological compilation of MDEQ e-mails from FOIA requests, created by Roy/Edwards and posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/20/16
July 9, 2015	ACLU-Michigan reporter Curt Guyette breaks story of concerns about lead in Flint's drinking water by detailing the June 24 EPA-Del Toral memo, reporting the high lead levels in LeeAnne Walters's water, and exposing the lack of corrosion control in Flint drinking water treatment	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website Detroit Free Press (Oct. 22, 2015): "MDEQ e-mails show stunning indifference to Flint peril" (Kaffer)	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf www.freep.com/story/opinion/columnists/nancy-kaffer/2015/10/21/indifference-characterized-state-approach-flint-water/74289430/	3/13/16
July 10, 2015	Susan Hedman/EPA Region 5 (based in Chicago) writes to Flint Mayor Walling to say that EPA will work with MDEQ on issues related to lead in water	The Nation (July 16, 2015): "In Flint, Michigan, Overpriced Water is Causing People's Skin to Erupt in Rashes and Hair to Fall Out" (Guyette)	www.thenation.com/article/in-flint-michigan-overpriced-water-is-causing-peoples-skin-to-erupt-and-hair-to-fall-out/ Attachment 33 - MDEQ documentation provided to FWATF Nov. 6, 2015. flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
July 10, 2015		E-mail from B. Wurfel/MDEQ dated July 9, 2015 is included in chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website		
July 10, 2015		As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/20/16

Date	Event	Reference Document	Sources	Accessed
July 13, 2015	Michigan Radio quotes Wurfel's reassurances in story on EPA memo. "Let me start here – anyone who is concerned about lead in the drinking water in Flint can relax... It does not look like there is any broad problem with the water supply freeing up lead as it goes to homes."	Michigan Radio (July 13, 2015): "Leaked internal memo shows federal regulator's concerns about lead in Flint's water" (Smith)	michiganradio.org/post/leaked-internal-memo-shows-federal-regulator-s-concerns-about-lead-flint-s-water#stream/0	3/13/16
July 14, 2015	MDEQ issues construction permit to Flint for Granular Activated Carbon filter media W151055	MDEQ Construction Permit W151055	Attachment 34 - MDEQ documentation provided to FWATF Nov. 6, 2015	
July 21, 2015	EPA and MDEQ hold conference call re: LCR implementation and Flint; EPA informs MDEQ of its interpretation of LCR. EPA wants corrosion control implemented in Flint, but MDEQ believes this is premature, per e-mail from Shekter Smith/MDEQ to Hyde/EPA later the same day requesting EPA concurrence on MDEQ approach	"Notes on Call with MDEQ on July 21, 2015 - MDEQ Implementation of LCR Rule and Flint Issues," included in chronological compilation of MDEQ e-mails from FOIA requests, created by Roy/Edwards and posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
July 22, 2015	Gov. Snyder's Chief of Staff Dennis Muchmore e-mails MDHHS director Lyon re: community concerns about lead in the water. "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)"	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16
July 23, 2015	Linda Dykema, director of MDHHS Division of Environmental Health, provides detailed response to the Muchmore inquiry via email to MDHHS managers. "DEQ has not seen a change in the city's compliance with the lead rule since switching to the Flint River source... Regarding the EPA drinking water official quoted in the press articles, the report that he issued was a result of his own research and was not reviewed or approved by EPA management. He has essentially acted outside his authority"	Chronological compilation of MDEQ e-mails from FOIA requests, created by Roy/Edwards and posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
July 24, 2015	In response to Muchmore's July 22 e-mail, Wurfel/MDEQ writes, "The bottom line is that the residents of Flint do not need to worry about lead in their water supply, and DEQ's recent sampling does not indicate an eminent [sic] health threat"	Chronological compilation of MDEQ e-mails from FOIA requests, created by Roy/Edwards and posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
July 27, 2015	MDEQ prepares e-mail and draft letter re: Flint 90th percentile lead determination at 11 ppb and City of Flint requirement to add corrosion control treatment	Detroit News (Jan. 7, 2016): "Flint crisis response delayed for months" (Lynch)	www.detroitnews.com/story/news/politics/2016/01/07/flint-emails/78410314/	
July 27, 2015	City provides MDEQ its original LCR report documenting lead levels measured in sampling from 1/1/15 to 6/30/15. LCR report is later "scrubbed" after Flint meets with MDEQ and is released on August 20, with two high lead results excluded	MDEQ e-mail correspondence dated July 20-21, 2015; MDEQ letter to Flint re: Lead and Copper Monitoring dated July 27, 2015	Attachment 36 - MDEQ documentation provided to FWATF Nov. 6, 2015	
July 28, 2015	Cristin Larder/MDHHS e-mails other MDHHS staff indicating blood lead levels were unusually elevated in summer 2014	FOIA'd information on Flint Water Study website, including original and "scrubbed" LCR reports	flintwaterstudy.org/2015/09/commentary-MDEQ-mistakes-deception-flint-water-crisis/	3/13/16
July 28, 2015	Nancy Peeler/MDHHS sends e-mail confirming analysis shows lead levels spiked in July-September 2014, but "that pattern was not terribly different from what we saw in the previous three years"	Flint Water Study website: "Chronology of MDHHS E-mails pertaining to blood lead levels of kids in Michigan, primarily in Flint - Part II" (Roy/Edwards)	flintwaterstudy.org/wp-content/uploads/2016/01/MDHHS-FOIA-II-FINAL-For-Web.pdf	3/12/16
August 4, 2015	MDEQ representatives meet with City of Flint representatives, community activists and pastors, and LeeAnne Walters at Gov. Snyder's office	E-mail correspondence - MDHHS and MDEQ, dated July 22-28, 2015	Attachment 37 - MDEQ documentation provided to FWATF Nov. 6, 2015. flintwaterstudy.org	3/12/16
August 4, 2015	LeeAnne Walters and Melissa Mays meet with MDEQ officials Shekter Smith, Busch and Wurfel to discuss lead in water problems. Walters and Mays report Shekter Smith said "Mr. Del Toral has been handled" and Flint residents would not be hearing from him again	MDEQ e-mail dated August 10, 2014 documenting meeting notes	Attachment 38 - MDEQ documentation provided to FWATF Nov. 6, 2015	
August 7, 2015	Genesee County Circuit Court Judge Hayman issues emergency injunction on earlier Flint water rate increase and orders City to roll back water and sewer rates by 35 percent, repay its water and sewer fund \$15.7 million transferred in 2007 to settle a sewer overflow claim, and immediately stop water disconnections and liens for past-due bills	Flint Water Study website (Sep. 30, 2015): "COMMENTARY: MDEQ Mistakes and Deception Created the Flint Water Crisis" (Roy)	flintwaterstudy.org/2015/09/commentary-mdeq-mistakes-deception-flint-water-crisis/	3/13/16
August 10, 2015	Poy/EPA e-mails Shekter Smith and Busch/MDEQ inquiring re: action on corrosion control in Flint	MLive (Aug. 7, 2015): "Judge orders Flint to cut water rates 35 percent in sweeping injunction" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/08/flint_ordered_to_cut_water_rat.html	3/13/16
August 17, 2015	MDEQ notifies Flint of lead/copper monitoring results from Jan-June 2015 monitoring period, and requires City to install corrosion control for LCR compliance. Indicates Flint has 6 months to fully optimize corrosion control, but recommends starting phosphate treatment as soon as possible	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
		Letter to Wright/Flint from Rosenthal/MDEQ included in chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16

Date	Event	Reference Document	Sources	Accessed
August 17, 2015	Genesee County Circuit Court places preliminary injunction on prior Flint water rate increase	MLive (Aug. 17, 2015): "Judge signs order for lower Flint water rates, \$15.7 million payback" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/08/judge_certifies_class_action_i.html	3/13/16
August 20, 2015	"Scrubbed" LCR report for City of Flint is provided to ACLU-MI in reponse to FOIA request	Flint Water Study website (Sep. 30, 2015): "COMMENTARY: MDEQ Mistakes and Deception Created the Flint Water Crisis" (Roy)	flintwaterstudy.org/2015/09/commentary-mdeq-mistakes-deception-flint-water-crisis/	3/12/16
August 23, 2015	Marc Edwards/Virginia Tech notifies City of Flint and MDEQ that VT has begun collecting samples for a water quality study in Flint	E-mail from M. Edwards to MDEQ/Flint dated August 23, 2015 is included in chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
August 25, 2015	Shekter Smith/MDEQ e-mails Ms. Walters updating her on findings related to questions at the community meeting and summarizing lead sampling / results at 212 Browning	E-mail from Shekter Smith to Ms. Walters is included in chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
August 27, 2015	Edwards/VT reports findings of elevated lead levels in its Flint water study; EPA Region 5 reports to MDEQ that VT study is finding elevated lead levels. 52% of first 48 samples analyzed were at or above 5 ppb "which suggests a serious lead in water problem"	Flint Water Study website (Aug. 27, 2015): "Analysis of water samples from 48 Flint homes to date for lead are worrisome" (Roy)	flintwaterstudy.org/2015/08/analysis-of-water-samples-from-48-flint-homes-to-date-for-lead-are-worrisome/	3/13/16
August 27, 2015	Mike Brown, Gov. Snyder's senior federal policy representative, e-mails Wurfel/MDEQ to inquire about discrepancy in lead levels measured in water in LeeAnne Walters' home. Wurfel replies: "This person is the one 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... (!)t's been rough sledding with a steady parade of community groups keeping everyone hopped-up and misinformed"	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
August 28, 2015	Poy/EPA e-mails Shekter Smith/MDEQ re: VT lead testing results in Flint: "...they are finding lead at levels above five parts per billion and some above 15 parts per billion"	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
August 28, 2015	Concerned Pastors announce water giveaway in Flint	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16
August 31, 2015	EPA and MDEQ hold conference call: second 6-month monitoring test results for January-July 2015 indicate 90th percentile at 11 ppb. It is determined that CCT is needed and implementation steps are delineated	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
August 31, 2015	Wurfel/MDEQ e-mails Busch, Shekter Smith, Prysby and Director Wyant/MDEQ, copying Gov. Snyder aides Muchmore, Hollins, Murray and Sara Wurfel. Raises concerns about Edwards/VT's tests and accompanying media coverage	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/12/16
August 31, 2015	Genesee County Circuit Court certifies class in class action lawsuit on Sept. 2011 water rate increase	MLive (Aug. 31, 2015): "Judge OKs class action lawsuit for Flint water customers against city" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/08/judge_certifies_class_action_i.html	3/13/16
August 31, 2015	Mayor accepts petition calling for return to DWSD service. Administration statements cite TTHM compliance. "Water from the treatment plant is significantly better now and comparable with Detroit's" - Henderson	MLive (Aug. 31, 2015): "Flint mayor accepts petitions but not call to end use of Flint River" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/08/flint_mayor_accepts_petitions.html	3/13/16
August 31, 2015	Edwards/VT reports on corrosive lead levels	MLive (Sep. 2, 2015): "Lead leaches into 'very corrosive' Flint drinking water, researchers say" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/09/new_testing_shows_flint_water.html	3/13/16
September 1, 2015	City of Flint announces projected loss from disconnect moratorium and new water rates in compliance with Court order; begins sending bills with reduced rates as mandated by Judge Hayman	MLive (Sep. 1, 2015): "Unpaid Flint water bills creating \$500,000 budget hole, officials say" (Fonger) / "Typical Flint water bill dropping \$18 after ruling on improper rates"	www.MLive.com/news/flint/index.ssf/2015/09/post_436.html www.MLive.com/news/flint/index.ssf/2015/09/typical_flint_water_bill_will.html	3/13/16
September 2, 2015	VT researchers report elevated lead levels in Flint water, communicating that the corrosiveness of Flint water is causing lead to leach into residents' water through pipes. "...the current Flint River water leaches 12X more lead to the water than Detroit water"	Flint Water Study website (Sep. 2, 2015): "Flint River water is very corrosive to lead, and causing lead contamination in homes" (Roy)	flintwaterstudy.org/2015/09/flint-rivers-water-is-very-corrosive-to-lead-and-causing-lead-contamination-in-homes/	3/13/16

Date	Event	Reference Document	Sources	Accessed
September 2, 2015	Wurfel/MDEQ issues press release disputing Edwards/VT's test results and conclusions about corrosion and lead leaching. "(W)e want to be very clear that the lead levels being detected in Flint drinking water are not coming from the treatment plant or the city's transmission lines... The issue is how, or whether, and to what extent the drinking water is interacting with lead plumbing in people's homes."	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
September 2, 2015	MDEQ notifies Flint of return to compliance on Disinfection Byproducts (TTHM)	Letter to B. Wright (Flint) from Rosenthal & Prysby (MDEQ)	Attachment 43 - MDEQ documentation provided to FWATF Nov. 6, 2015	
September 2, 2015	Anonymous company donates 1,500 kitchen water filters to Concerned Pastors for distribution to Flint residents, as documented in Hollins e-mail to Gov. Snyder	Gov. Snyder's e-mails (released Jan. 20, 2016)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
September 3, 2015	Prysby/MDEQ e-mails Benzie/MDEQ stating that City administration said there will be no funding restrictions for installing corrosion control	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
September 3, 2015	Croft/Flint DPW e-mails state and local officials announcing that Flint is in compliance with MI SDWA / report 160+ lead samples since switch, remain within EPA standards. Note expect optimization plan within 4 months by 1/1/2016 (faster than other cities)	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
September 3, 2015	MLive reports on compliance with TTHM issues but also notes lead concerns	MLive (Sep. 3, 2015): "Lower TTHM levels put Flint in compliance with Safe Drinking Water Act" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/09/lower_tthm_level_s_moves_flint.html	3/13/16
September 8, 2015	Edwards/VT publishes full results to date of his Flint water testing. "FLINT HAS A VERY SERIOUS LEAD IN WATER PROBLEM. Forty percent of the first draw samples are over five parts per billion... Several samples exceeded 100 ppb and one sample collected after 45 seconds of flushing exceeded 1000 ppb."	Flint Water Study website: "Lead testing results for water sampled by residents" (Edwards, Roy, Rhoads). Includes link to lead data for all 271 residences sampled at that point	flintwaterstudy.org/information-for-flint-residents/results-for-citizen-testing-for-lead-300-kits/	3/13/16
September 8, 2015	Edwards/VT e-mails Mayor Walling re: lead in water issue. "I have no idea what MDEQ's agenda is, but based on their press releases and actions to date, protecting the public and following Federal laws, does not seem to be a priority."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/12/16
September 9, 2015	MDHHS begins to develop educational program regarding reducing the risk of lead exposure for children, in response to media coverage of Edwards/VT's test results	From MDHHS e-mails posted online	somcsprod2govm001.usgovcloudapp.net/files/dhhs.pdf	3/19/16
September 9, 2015	Wurfel/MDEQ e-mails Fonger/MLive re: Edwards's test results. Virginia Tech researchers "only just arrived in town and (have) quickly proven the theory they set out to prove... offering broad, dire public health advice based on some quick testing could be seen as fanning political flames irresponsibly"	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
September 10, 2015	Michelle Bruneau/MDHHS e-mails Kory Gretsch/MDHHS: "if we're going to take action it needs to be soon before the Virginia Tech University folks scandalize us all"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/12/16
September 10, 2015	Crooks/EPA e-mails Shekter Smith/MDEQ with notes from Aug. 31, 2015 conference call re: lead in water; includes action plan. "EPA acknowledged that to delay installation of corrosion control treatment in Flint would likely cause even higher levels of lead over time as Flint's many lead service lines are continuously in contact with corrosive water"	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
September 10, 2015	State Senator Ananich and Representatives Neeley and Phelps send questions re: Flint lead-in-water issue to Wyant/MDEQ	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
September 11, 2015	Dr. Mona Hanna-Attisha contacts Dr. Lawrence Reynolds with concerns re: children's blood lead levels in light of Edwards/VT's findings. She convenes Hurley Medical Center (HMC) Research Team. Dr. Reynolds contacts MDHHS Childhood Lead Poisoning Prevention Program (CLPPP) with data request for Flint EBLLs, and contacts MDEQ staffer who states MDEQ is awaiting a letter from MDHHS regarding health issues and action	Information provided by Dr. Lawrence Reynolds	Dr. Lawrence Reynolds's timeline	
September 11, 2015	Robert Scott/MDHHS obtains Edwards/VT's grant proposal to the National Science Foundation for funding for his Virginia Tech / Flint Water Study and forwards it to MDHHS colleagues Peeler, Lishinski and Priem. "Sounds like there might be more to this than what we learned previously. Yikes!"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/12/16
September 11, 2015	Crooks/EPA sends e-mail to MDEQ confirming that EPA did not directly transmit the draft June 24, 2015 Interim Report memo to MDEQ	E-mail from J. Crooks to MDEQ	Attachment 44 - MDEQ documentation provided to FWATF Nov. 6, 2015	

Date	Event	Reference Document	Sources	Accessed
September 11, 2015	Busch/MDEQ, in reply to request from Fonger/MLive (forwarded by Wurfel/MDEQ), e-mails that City has until end of 2015 to make a recommendation for corrosion control treatment and are planning to have it in place by January 2016. Shekter Smith replies that the City has not yet applied for a construction permit to install corrosion control treatment and "the ball's in their court"	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
September 11, 2015	Poy/EPA sends MDEQ a draft response to Congressman Kildee's Sep. 9 letter posing questions about drinking water quality in Flint. Says EPA is evaluating Flint's compliance with LCR	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
September 15, 2015	MLive reports on Edwards/VT's statement that results of Flint's lead tests cannot be trusted - that the City's results amount to "smoke and mirrors" due to flawed testing procedures. "Flint is the only city in American that I'm aware of that does not have a corrosion-control plan in place to stop this kind of problem." Wurfel's response, quoted in the article: "The problem isn't new. It's just news (now, and) a knee-jerk reaction would be an irresponsible response."	MLive (Sep. 15, 2015): "Virginia Tech professor says Flint's tests for lead in water can't be trusted" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/09/virginia_tech_rese-archer_says.html	3/13/16
September 15, 2015	Dr. Reynolds discusses MDHHS graph for 0-16 yoa children with Flint mailing addresses and ELLs with two GCHD Board of Health (GCHD) members (chair Kay Doer and member Dr. Laura Carravallah) and management staff – Mark Valacak, Director; Dr. Gary Johnson, Medical Director; and John Henry, Environmental Hygiene – in an informal meeting. GCHD chair reads GCHD mission aloud. GCHD Director's response: staff and resources to access MCIR data registry for lead levels are not available; also says it is Flint DPW's responsibility to issue a health advisory, not GCHD's	Information provided by Dr. Lawrence Reynolds		
September 17, 2016	Wyant/MDEQ responds to state lawmakers' questions (September 10, 2015) stating that MDEQ "does not receive or review draft memos" from EPA	Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/12/16
September 20, 2015	Edwards/VT alleges in e-mail to EPA officials that Flint's lead sampling techniques are seriously flawed. "They do not have an approved lead sampling pool. Only 13 of the lowest lead sampled homes from 2014 were resampled in 2015. The homes sampling high in 2014 were not asked to be resampled. At best, their program is sending out sampling bottles at random across the city"	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
September 21, 2015	Meeting with Congressional representatives, legislators, EPA and MDEQ to discuss issues with water quality in Flint	MDEQ and EPA Briefing on Flint Water - meeting agenda	Attachment 45 - MDEQ documentation provided to FWATF Nov. 6, 2015	
September 21, 2015	Greater Flint Health Coalition (GFHC) views presentation by Dr. Hanna-Attisha and passes resolution requesting health advisory for City of Flint. At noon, members of GFHC meet with then-mayor Walling, administrator Henderson and DPW director Crump requesting action on the resolutions, HMC research and VA Tech research. Administrator's response: Flint cannot change water sources because of cost, and the water leaving the plant meets MDEQ standards	Information provided by Dr. Lawrence Reynolds		
September 22, 2015	Meeting/conference call is held with MDHHS, GCHD, and MDEQ to discuss lead education/outreach	E-mail summarizing call discussion, dated September 24, 2015	Attachment 46 - MDEQ documentation provided to FWATF Nov. 6, 2015	
September 22, 2015	Genesee County Medical Society (GCMS) passes resolution requesting health advisory for City of Flint	Information provided by Dr. Lawrence Reynolds		
September 22, 2015	Dr. Hanna-Attisha contacts Robert Scott/MDHHS to request access to the state's childhood blood lead level testing data	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 23, 2015	Mayor Walling indicates he will issue "an advisory and promote ways to minimize residents' exposure to lead" ... He and others in Flint Admin advise Dr. Hanna-Attisha & Dr. Reynolds "that a return to purchasing water from Detroit would bankrupt the city"	MLive (Sep. 24, 2015): "Elevated lead found in more Flint kids after water switch, study finds" (Fonger) Detroit News (Sep. 24, 2015): "Doctors warn Flint of high lead levels in tap water" (AP)	www.MLive.com/news/flint/index.ssf/2015/09/study_shows_twice_as_many_flint.html www.detroitnews.com/story/news/local/michigan/2015/09/24/flint-plans-advisory-curbing-exposure-lead/72725736/	3/13/16
September 23, 2015	Nancy Peeler/MDHHS, director of state's Childhood Lead Poisoning Prevention Program (CLPPP), corresponds with Scott/MDHHS to consider re-running the analysis conducted in July, and asking for formal epidemiologic help. Later that day, MDHHS official Mikelle Robinson reports that the Governor's Office briefing maintains that Flint water does not represent an "imminent public health problem"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16

Date	Event	Reference Document	Sources	Accessed
September 24, 2015	In the absence of a response by Flint City Administration or Genesee County Health Department, a press conference is called by HMC and GFHC members to advise the community of a health emergency. In press conference, Dr. Mona Hanna-Attisha presents HMC's findings of elevated blood levels in Flint children, followed by remarks by the GCHD Director Mark Valacak. The city administrator attends. Wurfl/MDEQ calls Hurler findings "unfortunate" and says water controversy is becoming "near-hysteria"; "Flint's drinking water is safe in that it's meeting federal and state standards"	"Pediatric Lead Exposure in Flint, MI: Concerns from the Medical Community," presentation posted to Flint Water Study website US News & World Report (Sep. 25, 2015): "Did This Michigan Town Poison Its Children?" (AP) Additional information provided by Dr. Lawrence Reynolds	flintwaterstudy.org/wp-content/uploads/2015/09/Pediatric-Lead-Exposure-Flint-Water-092415.pdf www.usnews.com/news/articles/2015/09/25/flint-michigan-children-show-high-levels-of-lead-in-blood	3/13/16
September 24, 2015	Robert Scott/MDHHS e-mails colleague Nancy Peeler saying he has attempted to "recreate Hurler's numbers" and sees "difference between the two years... but not as much difference as (Hurler) did." ""I'm sure this one is not for the public"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 24, 2015	Debbie Baltazar/EPA, chief of Region 5 Water Division's State and Tribal Programs Branch, e-mails colleagues re: use of Drinking Water State Revolving Fund funding for water filters in Flint. "Perhaps she [Hedman] knows all this, but I'm not so sure Flint is the community we want to go out on a limb for. At least without a better understanding of where all that money went"	Vox (Mar. 15, 2016): EPA email: "I'm not so sure Flint is the community we want to go out on a limb for" (Nelson)	www.vox.com/2016/3/15/11239438/flint-epa	3/15/16
September 24, 2015	Edwards/VT e-mails Scott/MDHHS re: difficulty in obtaining state blood-lead records. "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 been asking to see your data since MDEQ first sent it to reporters back in August, and I count 10 email that I sent responding to all your questions. As of yet, you have given me nothing in response"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 25, 2015	Scott/MDHHS drafts response to Edwards/VT but does not send to him; sends to Peeler/MDHHS for review who recommends changes. Scott: "I agree that his statements are inappropriate; there are plenty of things I'd LIKE to say in response, but won't"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 25, 2015	GCHD and City of Flint issue lead advisory for residents to be aware of lead levels in drinking water; City of Flint holds press conference at City Hall regarding drinking water	Lead Advisory press release; MDEQ e-mails; City of Flint - DPW Public Information Plan MLive (Sep. 25, 2015): "Flint makes lead advisory official, suggests water filters and flushing" (Fonger)	Attachment 48 - MDEQ documentation provided to FWATF Nov. 6, 2015. www.MLive.com/news/flint/index.ssf/2015/09/flint_makes_lead_advisory_offi.html	3/13/16
September 25, 2015	G. Lasher/MDHHS e-mails Governor's Office and MDEQ with update on Flint drinking water issue minimizing findings from Dr. Hanna-Attisha's "data"; attaches MDHHS talking points to support claim that elevated blood lead levels in Flint in 2014 are consistent with seasonal changes	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 74, e-mail; pp. 79-82, MDHHS study results and talking points)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
September 25, 2015	Scott/MDHHS responds to email from colleagues about Kristi Tanner/Detroit Free Press's interest in lead issue. Tanner has looked at DHS blood lead data between 2013-2014 and concludes the increase "is statistically significant." Scott: "While the trend for Michigan as a whole has shown a steady decrease in lead poisoning year by year, smaller areas such as the city of Flint have their bumps from year to year while still trending downward overall." Peeler: "My secret hope is that we can work in the fact that this pattern is similar to the recent past."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 25, 2015	Chief of Staff Dennis Muchmore e-mails Gov. Snyder an update on Flint water issues. "I can't figure out why the state is responsible except that Dillon did make the ultimate decision so we're not able to avoid the subject. The real responsibility rests with the County, city and KWA, but since the issue is the health of citizens and their children we're taking a proactive approach putting MDHHS out there as an educator"	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 71/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
September 26, 2015	Chief of Staff Dennis Muchmore e-mails Gov. Snyder an update on Flint water issues. "Now we have the anti everything group turning to the lead content... 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"	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 73/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
September 28, 2015	MDEQ and MDHHS directors brief Gov. Snyder on potential scope and magnitude of the issue. MDHHS continues to review blood lead data. Briefing documents support claim that blood lead levels are consistent with seasonal changes	Briefing documents included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 87-91)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16

Date	Event	Reference Document	Sources	Accessed
September 28, 2015	Sen. Ananich sends letter to Gov. Snyder requesting assistance in Flint - transition to safe water supply, corrosion control treatment, filters, infrastructure	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 85/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
September 28, 2015	MDHHS Director Nick Lyon e-mails staff in his department for help refuting VT/HMC blood lead level data. "I need an analysis of the Virginia Tech/Hurley data and their conclusions. 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. GERALYN (Lasher) is working on this for me but she needs someone in public health who can work directly with her on immediate concerns/questions."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 28, 2015	Valacek/GCHD e-mails Rashmi and Travis/MDHHS requesting confirmation that blood lead levels have not shown significant increase since switch to Flint River water supply -- asks again the following day	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 28, 2015	Gov. Snyder is copied on a briefing re: Flint lead issue that states the water system is in compliance. Briefing document under-states lead sampling results, downplays problems and emphasizes the high cost of replacing lead service lines	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 29, 2015	Wurfel/MDEQ states in National Public Radio interview that Del Toral's draft report was the work of a "rogue employee"	NPR (Sep. 29, 2015): "High Lead Levels In Michigan Kids After City Switches Water Source" (Hulet)	www.npr.org/2015/09/29/444497051/high-lead-levels-in-michigan-kids-after-city-switches-water-source	3/13/16
September 29, 2015	Detroit Free Press publishes their own analysis of state's blood lead level data, saying the state's data actually support the HMC findings	Detroit Free Press (Sep. 29, 2015): "State data confirms higher blood-lead levels in Flint kids" (Tanner, Kaffer)	www.freep.com/story/opinion/columnists/nancy-kaffer/2015/09/26/state-data-flint-lead/72820798/	3/13/16
September 29, 2015	Executive Director to the Governor Allison Scott e-mails Snyder aides Muchmore, Agen, Clement, Wyant/MDEQ and Lyon/MDHHS re: meeting to discuss emergency management approach for Flint situation	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 29, 2015	Lasher/MDHHS circulates to colleagues an advisory from Genesee County that demands fresh analysis of state blood level data and threatens to seek third-party analysis of the state data MDHHS has consistently used to suggest no elevated blood lead levels due to the Flint water. "I understand that we are still reviewing the data -- but the county has basically issued a ransom date that they want this information by tomorrow"	From MDHHS e-mails posted online	somcsprod2govm001.usgovcloudapp.net/files/dhhs.pdf	3/13/16
September 29, 2015	Lasher/MDHHS e-mails Peeler, Eden Wells (state CMO), Scott/MDHHS requesting blood lead data for children under age 6, to compare with other evaluations. Response from Linda Dykema to Corinne Miller, Sara LyonCallo and Eden Wells discourages "data war"	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
September 29, 2015	Dr. Hanna-Attisha e-mails Wells/MDHHS with updated findings on blood lead levels correlated to water supply switch; Wells asks when Hanna-Attisha is going public with the results. Hanna-Attisha: "...when we noticed our findings and the glaring correlation to elevated water lead levels in the same locations and learned that corrosion control as never added to the water treatment, we ethically could not stay silent. In addition, your annual elevated blood level percentage supports our findings -- annual decrease (as seen nationally) and then an increase post-water switch. We also knew that releasing our data would only incite a data war; however, the more we dig, the more alarming the results."	From MDHHS e-mails posted online	somcsprod2govm001.usgovcloudapp.net/files/dhhs.pdf	3/13/16
September 29, 2015	Gov. Snyder receives a detailed timeline for Flint water issues prepared by Treasury	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 102/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
September 29, 2015	Genesee County issues its own public health advisory for people using water supplied by Flint system	MLive (Sep. 29, 2015): "Genesee County joins city in issuing health advisory on lead in Flint water" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/09/genesee_county_also_issues_pub.html	3/13/16
September 30, 2015	Mayor Walling forwards Wyant/MDEQ an e-mail from Fr. Phil Schmitter that states: "You delayed your action on this issue for an inordinate amount of time. People were told over and over that it was all fine... I no longer trust the city on this issue. And that we have now a lead problem for babies and children is unconscionable." Walling: "I don't know what more I could have done given the guidance coming from EPA and DEQ and subsequently city staff but this major health issue did come up anyway and our community is paying a huge price."	As reported in Bridge Magazine (Feb. 4, 2016): "Disaster Day by Day: A detailed Flint crisis timeline"	bridgemi.com/2016/03/flint-crisis-timeline-part-3/	3/13/16
October 2015	City of Flint issues Quarterly Water Quality Report	Posted to City of Flint website	www.cityofflint.com/wp-content/uploads/Quarterly-Water-Quality-Report_Oct-15.pdf	3/13/16

Date	Event	Reference Document	Sources	Accessed
October 2015	Michigan Office of the Auditor General begins formal review of MDEQ, ODWMA	Michigan Radio (Oct. 20, 2015): "Auditor general looking into state agency responsible for monitoring Flint water" (Carmody)	audgen.michigan.gov/wip/wip761032015.html michiganradio.org/post/auditor-general-looking-state-agency-responsible-monitoring-flint-water#stream/0	3/13/16
October 1, 2015	State CMO Wells confirms HMC blood lead level data (showing greatly increased blood lead levels in some Flint neighborhoods). "After a comprehensive and detailed review down to the zip code level, we have found that the state analysis is consistent with that presented by Hurley."	"Blood Lead Levels in Flint Talking Points," dated Oct. 5, 2015, from MDHHS e-mails posted online	somcsprod2govm001.usgovcloudapp.net/files/dhhs.pdf	3/13/16
October 1, 2015	Genesee County Board of Commissioners and GCHD issue "Do Not Drink" Advisory for Flint water using the Flint River as a source; news conference. GCHD declares Public Health Emergency. Flint Mayor Walling issues statement on advisory saying Flint Water customers should filter their water before drinking it	Public Health Emergency Declaration for People Using the Flint City Water Supply with the Flint River as the Source MLive (Oct. 1, 2015): "Don't drink Flint's water, Genesee County leaders warn" (Johnson)	Attachment 49 - MDEQ documentation provided to FWATF Nov. 6, 2015. www.MLive.com/news/flint/index.ssf/2015/10/genesee_county_leaders_warn_do.html#incart_river_mobile	3/13/16
October 1, 2015	Private and public sources donate \$105,000 to fund 5,000 water filters for Flint residences; to be distributed to "highest risk populations first"	MLive (Oct. 1, 2015): "More than 5,000 in Flint to get lead water filters following donation" (Adams)	www.MLive.com/news/flint/index.ssf/2015/10/more_than_5000_in_flint_to_get.html	3/13/16
October 1, 2015	MLive reports that Flint Water stores service line records on index cards, making it difficult to identify highest-risk locations for lead pollution	MLive (Oct. 1, 2015): "Flint data on lead water lines stored on 45,000 index cards" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/10/flint_official_says_data_on_lo.html	3/13/16
October 1, 2015	Greater Flint chapter ACLU joins petition urging EPA to order Flint to reconnect to DWSD system	MLive (Oct. 2, 2015): "Petition launched for EPA intervention in Flint water crisis" (Emery)	www.MLive.com/news/flint/index.ssf/2015/10/greater_flint_aclu_holds_meeti.html	3/13/16
October 1, 2015	DWSD provides proposal for reconnecting Flint to DWSD system	Referenced in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 97/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
October 2, 2015	Governor's Office, EPA Region 5, City of Flint, MDEQ and MDHHS hold press conference announcing Governor's Flint 10-point Action Plan to address water system, \$1 million for water filters, and anti-corrosion treatment. Governor's press release also says the water leaving Flint's system is safe to drink but families with lead plumbing in their homes could have higher lead levels	Press release - "Gov. Rick Snyder: Comprehensive action plan will help Flint residents address water concerns"; press conference announcement	www.michigan.gov/som/0,4669,7-192-29701-366287--,00.html Attachment 50 - MDEQ documentation provided to FWATF Nov. 6, 2015	3/13/16
October 2, 2015	Gov. Snyder requests "clear side by side comparison of health benefits and cost of GLWA vs. a more optimized Flint system" in e-mail to Muchmore	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 102/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
October 2, 2015	GCHD school screening water samples are collected for lead analysis	Flint Community Schools Testing Results - Initial Screening	Attachment 51 - MDEQ documentation provided to FWATF Nov. 6, 2015	3/13/16
October 6, 2015	E-mails indicate Wyant/MDEQ Director will update Gov. Snyder daily on Flint water action plan announced Oct. 2	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 102/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
October 7, 2015	State Budget Director John Roberts outlines \$10.4 million in state aid to implement the action plan of October 2	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 102/274)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
October 8, 2015	Gov. Snyder holds press conference: Flint to reconnect to Great Lakes Water Authority/Detroit Water and Sewerage Department	Press release - "Gov. Rick Snyder: Move back to Detroit water provides best protection for public health in Flint"	Attachment 52 - MDEQ documentation provided to FWATF Nov. 6, 2015	3/13/16
October 8, 2015	City of Flint develops its plan to reconnect to Detroit Water and Sewerage Department	As reported in a timeline produced by the Michigan Auditor General in December 2015		
October 8, 2015	Wyant/MDEQ briefs Gov. Snyder on Flint water issues; affirms elevated test results for lead in water at Flint schools	Briefing materials included in Gov. Snyder's e-mails released Jan. 20, 2016 (p. 116-121)	somcsprod2govm001.usgovcloudapp.net/files/snyder%20emails.p df	3/12/16
October 8, 2015	Detroit paper publishes editorial criticizing causes of/response to Flint water crisis	Detroit Free Press (Oct. 8, 2015): "Flint water crisis: An obscene failure of government" (Editorial Board)	www.freep.com/story/opinion/editorials/2015/10/08/flint-water-crisis-obscene-failure-government/73578640/	3/13/16
October 11, 2015	Detroit Free Press publishes article with details on corrosivity of Flint River water, based on VT's study. "The tests showed Flint Water without added phosphates corroded the lead at 19 times the rate of Detroit water. Even when phosphates were added, it corroded at 16 times the rate of the Detroit water." (DFP 10-11-15)	Detroit Free Press (Oct. 11, 2015): "Chemical testing could have predicted Flint's water crisis" (Wisely, Erb)	www.freep.com/story/news/local/michigan/2015/10/10/missed-opportunities-flint-water-crisis/73688428/	3/13/16
October 13, 2015	MDEQ announces plans for statewide lead education campaign focused on schools	Detroit Free Press (Oct. 13, 2015): "Michigan to launch lead education effort statewide" (Higgins)	www.freep.com/story/news/local/michigan/2015/10/13/lead-water-flint-michigan-testing/73871480/	3/13/16
October 14, 2015	State Legislature authorizes \$9.35 million to help City of Flint pay for return to DWSD water system, water filters, and staff at schools to gauge lead exposure (signed by Gov. Snyder Oct. 15). C.S. Mott Foundation pledges another \$4 million and City of Flint will provide additional \$2 million	Detroit Free Press (Oct. 14, 2015): "Michigan House OKs \$9.35M to aid in Flint water crisis" (Gray)	www.freep.com/story/news/local/michigan/2015/10/14/michigan-house-oks-915m-aid-flint-water-crisis/73932980/	3/13/16
October 16, 2015	DWSD and City of Flint execute water supply contract, and City of Flint is reconnected to DWSD system	LAN01-#394270-v1-Executed Flint Water Agreement DWSD.PDF, Letter to B. Wright (Flint) from Rosenthal & Prysby (MDEQ), e-mail from MDEQ confirming disinfection testing of transmission main	MDEQ info: Attachment 53 - MDEQ documentation provided to FWATF Nov. 6, 2015	
October 16, 2015	First weekly coordination meeting held between City of Flint and state agencies	Information provided by MDEQ to Flint Water Advisory Task Force		

Date	Event	Reference Document	Sources	Accessed
October 16, 2015	MDEQ meets with Flint Schools Superintendent and Genesee County Health Department	Information provided by MDEQ to Flint Water Advisory Task Force		
October 16, 2015	EPA announces formation of Flint Safe Drinking Water Task Force to provide technical expertise to MDEQ and City of Flint	EPA press release - "EPA Establishes Safe Drinking Water Task Force to Provide Technical Expertise to MDEQ and City of Flint"	yosemite.epa.gov/opa/admpress.nsf/0/A92DE629DB86E66685257EE000579593	3/13/16
October 16, 2015	Edwards/VT e-mails Wyant/DEQ, state legislators and Flint residents Walters and Mays citing inaccuracies in lead sampling and communication	Chronological compilation of MDEQ e-mails from FOIA requests (Roy/Edwards) posted to Flint Water Study website	flintwaterstudy.org/wp-content/uploads/2015/10/MDEQ-USEPA-Final.pdf	3/13/16
October 16, 2015	MDEQ approves GCDC Water Supply System permit for new 30-mgd WTP	MDEQ Permit W151099	media.wix.com/ugd/60e74e_dc3d45b23fd5418fbb6ec65d0ad97413.pdf	3/13/16
October 18, 2015	MDEQ Director Dan Wyant issues statement saying his office was mistaken in how it interpreted federal rules governing corrosion control for water systems the size of Flint; also says ODWMA chief Shekter Smith is being reassigned to help with FOIA requests, and is being replaced by interim chief Jim Sygo	Detroit News (Oct. 19, 2015): "Michigan DEQ vows changes in Flint water crisis" (Lynch) MLive (Oct. 19, 2015): "DEQ chief says state used wrong federal water rules in Flint for 17 months" (Fonger) MLive (Oct. 19, 2015): "DEQ replaces water official after state acknowledges 'mistake' in Flint" (Fonger)	www.detroitnews.com/story/news/environment/2015/10/18/deq-mistakes/74198882/ www.MLive.com/news/flint/index.ssf/2015/10/state_deq_flint_s_hould_have_be.html www.MLive.com/news/flint/index.ssf/2015/10/top_state_water_official_repla.html	3/13/16
October 21, 2015	U.S. Rep. Dan Kildee, D-Flint, and state Senate Minority Leader Jim Ananich, D-Flint, issue separate letters to Gina McCarthy, EPA Administrator, requesting federal review of MDEQ's oversight of water treatment	MLive (Oct. 21, 2015): "Kildee, Ananich call for federal investigation into Flint water crisis" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/10/kildee_ananich_call_for_federa.html	3/13/16
October 21, 2015	EPA's Flint Safe Drinking Water Task Force provides MDEQ with technical comments on Draft School Sampling Protocol	Posted to EPA website	www.epa.gov/mi/flint-safe-drinking-water-task-force-activities	3/13/16
October 21, 2015	Gov. Snyder announces formation of Flint Water Advisory Task Force to complete an After-Action Review	Press release - "Gov. Rick Snyder announces Flint Water Task Force to review state, federal and municipal actions, offer recommendations" Detroit Free Press (Oct. 21, 2015): "Task force appointed to examine Flint water controversy" (Gray)	michigan.gov/snyder/0,4668,7-277--367761--,00.html www.freep.com/story/news/politics/2015/10/21/task-force-appointed-examine-flint-water-controversy/74342628/	3/1/16
October 22, 2015	Detroit paper publishes column on MDEQ's "stunning indifference" to Flint water crisis	Detroit Free Press (Oct. 21, 2015): "MDEQ e-mails show stunning indifference to Flint peril" (Kaffer) FOIA'd information is also provided on Flint Water Study website	www.freep.com/story/opinion/columnists/nancy-kaffer/2015/10/21/indifference-characterized-state-approach-flint-water/74289430/	3/13/16
October 23, 2015	EPA's Flint Safe Drinking Water Task Force provides MDEQ technical comments on Flint Corrosion Control Plan	Included on Safe Drinking Water Task Force list of activities, posted to EPA website	www.epa.gov/mi/flint-safe-drinking-water-task-force-activities	
October 26, 2015	Former Flint EM Earley issues statement to MLive claiming decision to switch to Flint River as supply source was "a local decision made by local civic leaders"	MLive (Oct. 26, 2015): "Ex-emergency manager says local leaders made decision to use Flint River water" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/10/ex-emergency_manager_says_loca.html	3/13/16
October 28, 2015	MDEQ issues construction permit for additional corrosion control treatment W151104	MDEQ Construction Permit W151104	Attachment 54 - MDEQ documentation provided to FWATF Nov. 6, 2015	
October 30, 2015	MDEQ notifies Flint regarding corrosion control treatment operation	Letter from Prysby/MDEQ to Glasgow/Flint	Attachment 55 - MDEQ documentation provided to FWATF Nov. 6, 2015	
October 30, 2015	EPA's Flint Safe Drinking Water Task Force provides MDEQ technical comments on Flint Corrosion Control Permit and cover letter	Included on Safe Drinking Water Task Force list of activities, posted to EPA website	www.epa.gov/mi/flint-safe-drinking-water-task-force-activities	3/13/16
October 31, 2015	Flint sends letters to parents providing recommendations of GCHD and MDHHS	MLive (Oct. 31, 2015): "Letters to be sent to Flint parents with information on lead testing" (Emery)	www.MLive.com/news/flint/index.ssf/2015/10/letters_to_be_sent_to_flint_pa.html	3/13/16
November 2, 2015	MI National Action Network (NAN) calls for special court for offenders who consumed water contaminated by lead poisoning in Flint. Governor's Office notes work of Flint Water Advisory Task Force	MLive (Nov. 2, 2015): "Al Sharpton group wants new Flint court for possible lead poison victims" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/11/al_sharpton_group_wants_specia.html	3/13/16
November 3, 2015	EPA to conduct "full review of actions taken to address drinking water quality issues in Flint," with results by end of week of Nov. 2nd (MLive). EPA also will audit MDEQ's drinking water program, which "will take several months" (EPA press release)	EPA Region 5 press release: "EPA Region 5 to Audit State of Michigan's Drinking Water Program" MLive (Nov. 3, 2015): "U.S. EPA will conduct 'full review' of Flint water crisis" (Fonger)	yosemite.epa.gov/opa/admpress.nsf/a5792a626c8dac098525735900400c2d/9e26559c4478e1cb85257e9f9006171831OpenDocument www.MLive.com/news/flint/index.ssf/2015/11/us_epa_tells_kild ee_it_will_ca.html	3/13/16
November 3, 2015	EPA releases memo indicating differing possible interpretations of the LCR with respect to how OCCT procedures apply to this situation (new water source/new water treatment)	"Lead and Copper Rule Requirements for Optimal Corrosion Control Treatment for Large Drinking Water Systems," posted to EPA website	www.epa.gov/sites/production/files/2015-11/documents/occt_req_memo_signed_pg_2015-11-03-155158_508.pdf	3/13/16
November 3, 2015	Karen Weaver defeats incumbent Dayne Walling in Flint mayoral election; takes office November 9, 2015	MLive (Nov. 3, 2015): "Karen Weaver unseats Dayne Walling to win Flint mayor" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/11/karen_weaver_makes_history_ele.html	3/13/16

Date	Event	Reference Document	Sources	Accessed
November 4, 2015	EPA issues "Final Report: High Lead at Three Residences in Flint, Michigan"; includes information June 24 Interim Report, with personal ID/health info redacted	"Final Report: High Lead at Three Residences in Flint, Michigan"; transmittal from T. Hyde/EPA to J. Sygo/MDEQ, posted to ACLU-MI website	www.aclumich.org/sites/default/files/Redacted%20EPA%20memo.110415.pdf	3/13/16
November 4, 2015	DEQ authorizes a permit for installation of corrosion control at Flint WTP	MLive (Feb. 17, 2016): "Flint water crisis unfolds in key officials' emails through the years" - provides screen capture of e-mail referring to permit authorization	www.MLive.com/news/flint/index.ssf/2016/02/see_flint_water_crisis_unfold.html#4	3/12/16
November 9, 2015	MDEQ releases water testing data from nearly 400 homes and businesses as well as schools; press release says tests indicate lead problem is related to individual buildings or faucets, not system-wide	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 200-206/274)	somsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
November 10, 2015	EPA announces intent to audit State of Michigan's drinking water program; will examine MDEQ's implementation of SDWA and related rules on lead and copper, total coliform, nitrates and ground water	EPA Region 5 press release: "EPA Region 5 to Audit State of Michigan's Drinking Water Program" MLive (Nov. 10, 2015): "EPA to audit Michigan drinking water program following Flint lead crisis" (Fonger)	yosemite.epa.gov/opa/advpress.nsf/a5792a626c8dac098525735900400c2d/9e26559c4478e1cb85257ef9006171831?OpenDocument www.MLive.com/news/flint/index.ssf/2015/11/epa_says_it_will_audit_michiga.html#incart_story_package	3/13/16
November 10, 2015	EPA's Flint Safe Drinking Water Task Force meets in Flint with Rep. Kildee and City of Flint officials to discuss technical issues with optimization of corrosion control	Included on Safe Drinking Water Task Force list of activities, posted to EPA website	www.epa.gov/mi/flint-safe-drinking-water-task-force-activities	3/13/16
November 12, 2015	MLive publishes article indicating City of Flint certified that most water samples came from homes at high risk for lead, but other records indicate most did not - potentially leading the city and state to underestimate for months the extent of lead pollution in tap water	MLive (Nov. 12, 2015): "Documents show Flint filed false reports about testing for lead in water" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/11/documents_show_city_filed_fals.html#incart_story_package	3/13/16
November 13, 2015	Flint families file federal lawsuit accusing 14 state and local officials of intentional negligence	Detroit Free Press (Nov. 13, 2015): "After Flint Water Crisis, Families File Lawsuit" (Bethencourt)	www.freep.com/story/news/local/michigan/2015/11/13/after-flint-water-crisis-families-file-lawsuit/75744376/	3/13/16
November 13, 2015	Genesee Co. Dept. of Health and Michigan MDHHS announce they are providing resources to educate Flint residents and primary care providers about lead and what people should do to protect themselves	MLive (Nov. 13, 2015): "County Health Department, state partner to educate Flint area on lead" (Johnson)	www.MLive.com/news/flint/index.ssf/2015/11/county_health_department_state.html#incart_story_package	3/13/16
November 13, 2015	MI Board of Canvassers rejects petition filed by Angelo Scott Brown of Detroit to recall Gov. Snyder, alleging he is responsible for Flint water crisis	MLive (Nov. 13, 2015): "Board rejects petition seeking to recall Michigan Gov. Rick Snyder" (Oosting)	www.MLive.com/lansing-news/index.ssf/2015/11/board_rejects_petition_to_reca.html#incart_river_index	3/13/16
November 13, 2015	Class action lawsuit is filed against Gov. Snyder, State of Michigan and various city and state employees on behalf of Melissa Mays and other Flint residents	Case is filed in U.S. District Court, Eastern District of Michigan	flintwaterclassaction.com	3/13/16
November 16, 2015	ACLU Michigan, NRDC and Concerned Pastors for Social Action announce intended federal lawsuit against City and State officials over the Flint water crisis	Press release and notice posted to ACLU-MI website. MLive (Nov. 16, 2015): "ACLU, national activists intend to sue Gov. Snyder, Flint over lead in water" (Fonger)	www.aclumich.org/article/flint-residents-sue-city-state-over-lead-drinking-water www.MLive.com/news/flint/index.ssf/2015/11/nrdc_aclu_file_notice_to_sue_s.html#incart_river_index	3/13/16
November 16, 2015	Howard Croft resigns as Flint DPW director	MLive (Nov. 16, 2015): "Howard Croft, Flint official responsible for water oversight, resigns" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/11/howard_croft_flint_official_re.html#incart_river_index	3/13/16
November 17, 2015	MDEQ provides Flint drinking water Q&A to Flint Water Advisory Task Force	Q&A document dated Nov. 16, 2015 included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 217-235/274)	somsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
November 18, 2015	Elected officials and activists testify before USEPA National Drinking Water Advisory Council regarding Flint water crisis	MLive (Nov. 18, 2015): "Story of Flint water crisis, 'failure of government,' unfolds in Washington" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/11/story_of_flint_water_crisis_fa.html#incart_story_package	3/13/16
November 19, 2015	MDHHS releases data on October 2015 blood lead levels; 24 of 963 adults and children tested had elevated blood lead levels in October	E-mail from MDHHS to Governor's Office, press release and talking points included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 207-216/274)	somsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
November 22, 2015	Detroit Free Press reports on Governor's office's involvement in decisions to approve KWA and to use Flint River water for City of Flint water supply	Detroit Free Press (Nov. 22, 2015): "Flint water mystery: How was decision made?" (Egan) Detroit Free Press (Nov. 21, 2015): "Answers prompt more questions in Flint water crisis" (Kaffer)	www.freep.com/story/news/politics/2015/11/21/snyders-top-aide-talked-flint-water-supply-alternatives/76037130/ www.freep.com/story/opinion/columnists/nancy-kaffer/2015/11/21/flint-water-crisis/7606708/	3/13/16
November 23, 2015	Flint City Council approves \$907,650 contract extension for engineering company LAN to prepare Flint WTP for treating Lake Huron water from KWA pipeline	MLive (Nov. 23, 2015): "Engineer gets \$907,000 contract add-on to prepare Flint for KWA water" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/11/engineer_gets_907000_contract.html	3/13/16
November 23, 2015	EPA's Flint Safe Drinking Water Task Force releases comments on Flint's residential lead and copper sampling instructions; agrees with Del Toral that pre-flushing should be removed	Comments posted to EPA website	www.epa.gov/mi/flint-safe-drinking-water-task-force-comments-flints-residential-drinking-water-lead-copper	3/13/16
November 25, 2016	EPA's Flint Drinking Water Task Force releases Preliminary Assessment, with recommendations on sampling protocol, operating procedures, corrosion control and outreach during transition to KWA pipeline	"Lead in Drinking Water - Preliminary Assessment," posted to EPA website	www.epa.gov/mi/flint-safe-drinking-water-task-force-draft-lead-drinking-water-preliminary-assessment	3/13/16

Date	Event	Reference Document	Sources	Accessed
November 25, 2015	Hearing held on whether City has violated Genesee County Circuit Court order to reduce water and sewer rates	MLive (Nov. 25, 2015): "Flint water customers say no change in bills, despite court order" (Ridley)	www.MLive.com/news/flint/index.ssf/2015/11/flint_residents_testify_on_wat.html	3/13/16
December 2015	City of Flint in talks with state and federal regulators to determine how long Flint will be required to practice treating water from a new pipeline before selling it to customers	MLive (Dec. 11, 2015): "Flint in talks with regulators over length of test run with KWA water" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/12/flint_in_talks_with_regulators.html#incart_story_package	3/13/16
December 2, 2015	Dr. Edwards makes presentation at Hurley Medical Center stating that Flint's water is still not safe to drink without filtration in some areas; Mayor Weaver presents him with a Certificate of Appreciation	MLive (Dec. 2, 2015): "Flint water still unsafe without lead filters, professor says" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/12/lead_levels_in_flints_water_st.html	3/13/16
December 3, 2015	MI Board of Canvassers again rejects petition filed by Angelo Scott Brown of Detroit to recall Gov. Snyder; Brown says he will try again	Detroit Free Press (Dec. 3, 2015): "Push to recall Snyder over Flint water crisis stalls" (Egan)	www.freep.com/story/news/local/michigan/2015/12/03/election-board-rejects-latest-snyder-recall-petition/76712410/	3/13/16
December 4, 2015	State reports that blood lead levels in Flint children have dropped, with the rate falling to 3% of children under 6, based on results from 1,361 children. Dr. Hanna-Attisha: the most recent data does not capture past exposure, so it provides limited information on the population's real exposure	Detroit Free Press (Dec. 4, 2015): "State says blood-lead levels in Flint kids have dropped" (Erb)	www.freep.com/story/news/local/michigan/2015/12/03/flint-kids-lead-levels/76746474/	3/13/16
December 4, 2015	EPA's Flint Drinking Water Task Force releases comments on MDHHS residential drinking water sampling protocol	Posted to EPA website	www.epa.gov/sites/production/files/2016-01/documents/ftf-4_task_force_comments_on_mdhhs_residential_sampling_protocol_12-4-15.pdf	3/13/16
December 4, 2015	James Henry/GCHD recapped events over several months in an e-mail to other county health officials and singled out a specific state health department official he said had sabotaged their <i>Legionella</i> investigation	Detroit Free Press (Feb. 9, 2016): "Flint e-mails: CDC voiced concerns over Legionnaires' actions" (Dolan, Anderson, Egan, Wisely)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/09/flint-e-mails-state-city-appear-unable-share-info/80028820/	3/13/16
December 5, 2015	Tamara Brickey, GCHD public health division director, e-mails other county health officials that "the state is making clear they are not practicing ethical public health practice" re: Legionella outbreak. "Now evidence is clearly pointing to a deliberate cover-up... In my opinion, if we don't act soon, we are going to become guilty by association."	Detroit Free Press (Feb. 9, 2016): "Flint e-mails: CDC voiced concerns over Legionnaires' actions" (Dolan, Anderson, Egan, Wisely)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/09/flint-e-mails-state-city-appear-unable-share-info/80028820/	3/13/16
December 7, 2015	FWATF sends letter to Gov. Snyder recommending project coordination framework for Flint water crisis mitigation, with single-point management, goals, timeline, responsibility assignments, contingency planning and communication	Letter posted online by MLive	media.MLive.com/newsnow_impact/other/FWATF%20letter%20to%20Governor%20Snyder.pdf	1/31/16
December 8, 2015	Testimony continues in hearing on whether City has violated Genesee County Circuit Court order to reduce water and sewer rates	MLive (Dec. 8, 2015): "Daughter's piggy bank makes appearance in Flint water rate hearing" (Ridley)	www.MLive.com/news/flint/index.ssf/2015/12/daughters_piggy_bank_makes_app.html	3/13/16
December 8, 2015	Mayor Weaver holds first Town Hall meeting; Flint City Administrator Henderson announces plan to start independent testing for lead in City of Flint water supply	MLive (Dec. 9, 2015): "Flint administrator says city plans to add third-party water testing" (Fonger) MLive (Dec. 10, 2015): "Flint will pay for independent water tests, added phosphate treatment" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/12/flint_administrator_says_city_1.html#incart_river_index www.MLive.com/news/flint/index.ssf/2015/12/flint_will_pay_for_independent.html	3/13/16
December 9, 2015	City of Flint starts adding supplemental phosphates to water purchased from City of Detroit in an effort to rebuild protective coating in transmission lines	MLive (Dec. 9, 2015): "Flint officials say they've boosted corrosion control agents in water" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/12/flint_officials_say_theyre_boob.html#incart_river_index	3/13/16
December 10, 2015	MDEQ issues report finding lead in plumbing system at Brownell STEM Academy - one of three school buildings that tested above federal limits for lead. Includes quotes from Wurfel attributing high lead levels to "old faucets and drinking water fountains"	MLive (Dec. 10, 2015): "More lead in plumbing found at Flint's Brownell school, state report says" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/12/state_report_identifies_more_1.html#incart_river_index	3/13/16
December 11, 2015	MDHHS releases latest results from blood lead testing conducted in Flint since Oct. 1. 39 of 1,386 adults and children had elevated blood lead levels since Oct. 1, 2015	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 246-247/274)	michigan.gov/snyder/0,4668,7-277--367761--,00.html	3/12/16
December 11, 2015	Former Flint Mayor James Sharp calls for federal investigations into Flint water controversy	Detroit Free Press (Dec. 11, 2015): "Former Flint mayor wants feds to probe lead in water" (Egan)	www.freep.com/story/news/local/michigan/2015/12/10/former-flint-mayor-wants-feds-probe-lead-water/77088024/	3/13/16
December 14, 2015	Flint Mayor Weaver declares state of emergency in Flint -- the first step in pursuing a federal disaster declaration. Declaration says the damage done to Flint children by lead exposure is irreversible, creating need for increased spending on special education, mental health and juvenile justice	MLive (Dec. 15, 2015): "Read Flint mayor's state of emergency declaration on water crisis" The Guardian (Dec. 15, 2015): "Flint mayor declares 'manmade disaster' over lead-tainted water supply"	www.MLive.com/news/flint/index.ssf/2015/12/read_flint_mayor_karen_weavers.html#incart_river_index www.theguardian.com/us-news/2015/dec/15/michigan-mayor-declares-manmade-disaster-lead-tainted-water-supply	3/13/16

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December 14, 2015	FEMA sends 28,000 liters of water to Food Bank of Eastern Michigan, for distribution to partner agencies to serve Flint residents	MLive (Dec. 14, 2015): "FEMA sends 28,000 liters of bottled water to Flint amid lead troubles"	www.MLive.com/news/flint/index.ssf/2015/12/fema_sends_thou_sands_of_cases.html	3/13/16
December 15, 2015	Gov. Snyder issues response to FWATF's Dec. 7 letter, naming Harvey Hollins, director of Office of Urban Initiatives, to lead Flint water crisis response, with Chris DeWitt supporting communications	Letter dated Dec. 15, 2015 posted online by MLive MLive (Dec. 17, 2015): "Read letters from governor, task force on Flint water crisis" (Fonger)	media.MLive.com/newsnow_impact/other/15.12.15%20Flint%20Task%20Force%20Letter.pdf www.MLive.com/news/flint/index.ssf/2015/12/read_letters_from_governor_tas.html#incart_river_index	3/13/16
December 16, 2015	EPA's Flint Drinking Water Task Force releases recommendations on Flint drinking water treatment prior to switching to KWA source	Press release described in MLive (Dec. 17, 2015): "Governor's task force on Flint water crisis releases early recommendations" (Fonger)	www.epa.gov/mi/flint-safe-drinking-water-task-force-recommendations-regarding-flint-drinking-water-treatment	3/13/16
December 17, 2015	FWATF issues press release re: letter to Gov. Snyder and response	MSNBC - Rachel Maddow Show (Dec. 19, 2015): "Flint toxic water tragedy points directly to Michigan Gov. Snyder" The Guardian (Dec. 17, 2015): "Flint's 'toxic soup' polluted water worse for children than thought, doctor says"	www.MLive.com/news/flint/index.ssf/2015/12/state_task_force_on_flint_wate.html#incart_river_index	3/13/16
December 17, 2015	National media coverage of Flint water crisis - e.g.: MSNBC's Rachel Maddow Show report on Flint water crisis places blame on Governor's Office and "radical, anti-democratic policies"; The Guardian (US edition) article describes interview with Dr. Hanna-Attisha	MSNBC - Rachel Maddow Show (Dec. 19, 2015): "Flint toxic water tragedy points directly to Michigan Gov. Snyder" The Guardian (Dec. 17, 2015): "Flint's 'toxic soup' polluted water worse for children than thought, doctor says"	www.msnbc.com/rachel-maddow-show/watch/toxic-water-tragedy-points-directly-to-snyder-588635715518 www.theguardian.com/us-news/2015/dec/17/flint-polluted-water-toxic-lead-children-at-risk	3/13/16
December 17, 2015	Genesee County Board of Commissioners Chairman Jamie Curtis sends letter to Mayor Weaver saying he is authorized to forward Flint's request for disaster declaration to the Governor's Office	MLive (Dec. 18, 2015): "Genesee County chairman says he can send Flint disaster request to governor" (Fonger)	www.MLive.com/news/flint/index.ssf/2015/12/genesee_county_board_chair_say.html#incart_story_package	3/13/16
December 17, 2015	City of Flint's Emergency Operations Center (EOC) is activated to begin to coordinate relief efforts	Announced on City of Flint website	www.cityofflnt.com/2015/12/17/emergency-operations-center-activated/	3/13/16
December 21, 2015	American Journal of Public Health publishes results of further study of blood lead levels by Dr. Hanna-Attisha et al. New research further details the rise in elevated blood levels that was documented in the initial study released Sep. 24	"Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response," available via AJPH website. Described in MLive (Dec. 21, 2015): "Newly published study gives more evidence of elevated lead in Flint kids" (Fonger)	ajph.aphapublications.org/doi/abs/10.2105/AJPH.2015.303003 www.MLive.com/news/flint/index.ssf/2015/12/health_journal_publications_blood.html#incart_story_package	3/13/16
December 22, 2015	Genesee County Circuit Court Judge Hayman rules city can continue shutting off water to customers who haven't paid their water bill since September 2015 - not others. Also says City must apply 35% rate rollback to service charges as well as water commodity rates	MLive (Dec. 22, 2015): "Questions over emergency manager law arise in Flint water rates lawsuit" (Emery)	www.MLive.com/news/flint/index.ssf/2015/12/questions_arise_regarding_publ.html#incart_story_package	3/13/16
December 22, 2015	Continued national media coverage of Flint water crisis - e.g., Rachel Maddow show reports on Flint water crisis; CBS News reports on Dr. Hanna-Attisha's refined study of blood lead levels	CBS News (Dec. 22, 2015): "New study links tainted water, high lead levels in kids in Flint, Mich."	www.cbsnews.com/news/tainted-water-high-lead-levels-kids-flint-michigan/	3/13/16
December 23, 2015	Auditor General issues responses to questions from Sen. Ananich re: Flint water crisis. Notes no "major infractions" committed by MDEQ but also notes mistakes - corrosion control treatment should have been initiated with switch to Flint River as primary water supply, Tier 1 sample sites not verified, etc.	Included in Gov. Snyder's e-mails released Jan. 20, 2016 (pp. 250-264/274)	michigan.gov/snyder/0,4668,7-277--367761--,00.html	3/13/16
December 29, 2015	FWATF issues letter to Gov. Snyder and press release re: initial findings from its work; puts primary blame for Flint water crisis on MDEQ but indicates more to come in final report	Link to letter posted in Free Press article (see below)	www.scribd.com/doc/294248389/Flint-Water-Advisory-Task-Force-letter-to-Snyder	3/13/16
December 29, 2015	Gov. Snyder issues apology for Flint water crisis via press release	Press release posted on michigan.gov	www.michigan.gov/snyder/0,4668,7-277-57577_57657-372335--,0	3/13/16
December 29, 2015	MDEQ Director Wyant and Director of Communication Brad Wurfel submit their resignations	Detroit Free Press (Dec. 29, 2015): "Snyder apologizes, Wyant resigns in Flint water crisis" (Egan). MLive (Dec 29-30, 2015): "Director Dan Wyant resigns after task force blasts MDEQ over Flint water crisis" (Lawler); "MDEQ spokesman also resigns over Flint water crisis, says city 'didn't feel like we cared'" (Lawler)	www.freep.com/story/news/local/michigan/2015/12/29/deq-director-wyant-resigns-over-flint-water-crisis/78027052/ www.MLive.com/lansing-news/index.ssf/2015/12/deq_director_dan_wyant_resigns.html#incart_river_index www.MLive.com/lansing-news/index.ssf/2015/12/deq_spokesman_also_resigns_ove.html#incart_river_index	3/13/16

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December 29, 2015	Continued national media coverage of Flint water crisis	MSNBC Rachel Maddow (Dec. 29, 2015): "Michigan governor apologizes for Flint water" (Kildee interview). The Guardian (Dec. 30, 2015): "Governor Rick Snyder 'very sorry' about Flint water lead levels debacle" (Felton). Reuters/Huffington Post (Dec. 29, 2015): "Michigan Gov. Rick Snyder Apologizes For Flint's Water Crisis" (Klayman). AP/Wall Street Journal (Dec. 29, 2015): "Michigan's Top Environmental Regulator Resigns Over Flint Water Crisis"	www.msnbc.com/rachel-maddow/show/watch/michigan-governor-apologizes-for-flint-water-593269827585 www.theguardian.com/us-news/2015/dec/30/michigan-governor-rick-snyder-very-sorry-about-water-supply-debacle www.huffingtonpost.com/entry/rick-snyder-flint-water-lead-poisoning_56830314e4b014efe0d9814f www.wsj.com/articles/michigans-top-environmental-regulator-resigns-over-flint-water-crisis-1451432226	3/13/16
December 30, 2015	Mayor Weaver meets with Genesee County Board of Commissioners Chairman Curtis and others involved in emergency planning to discuss the City's Incident Action Plan	Press release posted to City of Flint website	www.cityofflint.com/2015/12/30/mayor-meets-with-county-chair-over-incident-action-plan/	3/19/16
December 30, 2015	Gov. Snyder reassigns Michigan DNR Director Keith Creagh as interim MDEQ Director, effective January 4, 2016	Press release posted on State of Michigan website	www.michigan.gov/snyder/0,4668,7-277-57577_57657-372399--,00.html	3/13/16
2016				
January 1, 2016	Newsweek puts Flint water crisis atop list of "nastiest cases of toxic discharge" in 2015	Newsweek (Jan. 1, 2016): "The Year in Pollution" (Schlanger)	www.newsweek.com/year-pollution-here-are-nastiest-cases-toxic-discharge-2015-410766	3/13/16
January 4, 2016	Genesee County Commission declares state of emergency	Gov. Snyder's Flint Water timeline (released January 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16
January 5, 2016	Gov. Snyder declares state of emergency for Genesee County, activating the State Emergency Operations Center	Press release and proclamation on State of Michigan website	www.michigan.gov/deq/0,4561,7-135-3313_3675_73946-372653--,00.html www.michigan.gov/documents/snyder/2016-01-05_Flint_Water_Governors_Declaration_Final_509966_7.pdf?20160105162343	3/13/16
January 5, 2016	Gina Balaya, spokeswoman for the U.S. Attorney's Office in Detroit, said Tuesday her office is working with the U.S. Environmental Protection Agency on an investigation of the Flint water situation	Detroit Free Press (Jan. 15, 2016): "Snyder declares emergency as feds probe Flint water" (Egan)	www.freep.com/story/news/local/michigan/2016/01/05/us-attorneys-office-investigating-lead-flint-water/78303960/	3/13/16
January 6, 2016	State of Michigan launches Joint Information Center (JIC) to coordinate public information from the State Emergency Operations Center, set up to help with health and safety issues caused by lead in the city of Flint's drinking water	Press release - "State of Michigan Joint Information Center Now Operational"	www.michigan.gov/deq/0,4561,7-135-3313_3675_73946-372766--,00.html	3/13/16
January 6, 2016	Continued national media coverage: NBC News, MSNBC	NBC News (Jan. 6, 2015): "Drinking water crisis in Flint, Michigan prompts federal investigation" MSNBC Rachel Maddow (Jan. 6, 2015): "Flint toxic water draws federal scrutiny"; "State dismissed Flint bad water test concerns"; Guyette interview	www.nbcnews.com/nightly-news/video/drinking-water-crisis-in-flint--michigan--prompts-federal-investigation-597142595942 www.msnbc.com/rachel-maddow/watch/flint-toxic-water-draws-597142595942 www.msnbc.com/rachel-maddow/watch/state-dismissed-flint-bad-water-test-concerns-597320259868	3/13/16
January 7, 2016	Michigan's chief medical executive, Dr. Eden Wells, says Flint residents should either use lead filters or drink bottled water until further notice	Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/13/16
January 7, 2016	Genesee County Sheriff Robert Pickell deploys work detail and staff to deliver water and filters to homes	MLive (Jan. 7, 2016): "Genesee County Sheriff uses work detail to distribute filters in Flint" (Acosta)	www.MLive.com/news/flint/index.ssf/2016/01/work_detail_used_by_genesee_co.html	3/13/16
January 7, 2016	Continued national media coverage criticizing state's failure to provide bottled water and water filters	MSNBC Rachel Maddow (Jan. 7, 2016): "Water donations run dry in Flint, no action from Governor Snyder"	www.msnbc.com/rachel-maddow/watch/flint-water-donations-run-dry--no-state-plan-598134339963	3/13/16
January 7, 2016	Gov. Snyder and Mayor Weaver announce formation of an inter-agency group to work with State Emergency Operations Center on taking action to improve the situation	MLive (Jan. 7, 2016): "Flint Mayor, Gov. Rick Snyder to provide city with 'suite of services' following water crisis" (Lawler)	www.MLive.com/lansing-news/index.ssf/2016/01/flint_mayor_gov_rick_snyder_to.html	3/13/16
January 8, 2016	Gov. Snyder and Mayor Weaver meet to discuss collaboration	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16
January 9, 2016	MSP Emergency Management Division announces water resource sites established in Flint with bottled water, filters and testing kits	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16
January 11, 2016	Gov. Snyder signs Executive Order to create Flint Water Interagency Coordinating Committee to work on long-term solutions to the Flint water situation	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16
January 12, 2016	Gov. Snyder requests FEMA's assistance in coordinating an inter-agency plan and activates Michigan National Guard to help with water resources distribution	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16

Date	Event	Reference Document	Sources	Accessed
January 13, 2016	Gov. Snyder and MDHHS announce a spike in Legionellosis in Flint between June 2014 and Mar 2015, which may be linked to switch to Flint River. Spike included 87 cases, with 10 deaths, in 18 months. This is the first public notification, 10 months after MDEQ notified Hollins the outbreak coincided with switch to Flint River water	MLive (Jan. 13, 2016): "87 cases, 10 fatal, of Legionella bacteria found in Flint area; connection to water crisis unclear" (Al Hajjal); also reported nationally on CNN, ABC, Washington Post	www.MLive.com/news/detroit/index.ssf/2016/01/legionnaires_dis_ease_spike_disc.html	3/13/16
January 14, 2016	Gov. Snyder requests Presidential declaration of major disaster and emergency and requests federal aid	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16
January 15, 2016	Michigan Attorney General Bill Schuette announces he has opened an investigation of Flint water crisis	Detroit Free Press (Feb. 2016): "How Flint's Water Crisis Unfolded" (Dixon)	www.freep.com/pages/interactives/flint-water-crisis-timeline/	3/13/16
January 16, 2016	President Obama approves declaration of emergency and request for federal aid, and declines request for declaration of major disaster	Gov. Snyder's Flint Water timeline (released Jan. 2016)	mi.gov/documents/snyder/FlintWaterTimeline_FINAL_511424_7.pdf	1/31/16
January 16, 2016	MLive reports that Genesee County Health Dept. officials expressed concern re: increase in Legionellosis in Oct. 2014 in meeting with Flint Water	MLive (Jan. 16, 2016): "Public never told, but investigators suspected Flint River tie to Legionnaires' in 2014" (Fonger)	www.MLive.com/news/flint/index.ssf/2016/01/documents_show_agencies_knew_o.html	3/13/16
January 19, 2016	Gov. Snyder delivers State of the State address; apologizes for Flint water crisis, announces release of his own e-mails regarding Flint water, and commits another \$28 million in short-term for more filters, bottled water, school nurses, intervention specialists, testing and monitoring	New York Times (Jan. 20, 2016): "Gov. Rick Snyder of Michigan Apologizes in Flint Water Crisis" (Bosman, Smith)	www.nytimes.com/2016/01/20/us/obama-set-to-meet-with-mayor-of-flint-about-water-crisis.html?_r=0	3/13/16
January 19, 2016	Flint Mayor Weaver meets with President Obama in Washington, DC	Detroit Free Press (Jan. 19, 2016): "Obama meets Flint mayor, responds to lead crisis" (Spangler)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/01/19/flint-mayor-meet-white-house-officials/79001256/	3/13/16
January 19, 2016	Class action lawsuit is filed against City of Flint and various city and state employees on behalf of Melissa Mays and other Flint residents	Case filed in Genesee County Circuit Court		
January 20, 2016	Gov. Snyder voluntarily posts his e-mails regarding Flint water to his website (Governor's office is exempt from Michigan FOIA)	Posted to Gov. Snyder's webpage at www.michigan.gov/snyder	somsprod2govm001.usgovcloudapp.net/files/snyder%20emails.pdf	3/12/16
January 20, 2016	Gov. Snyder asks President Obama to reconsider denial of federal disaster declaration	US News & World Report (Jan. 20, 2016): "Michigan Gov. Rick Snyder is asking President Barack Obama to reconsider his denial of a federal disaster declaration to address the drinking water crisis in Flint, saying its severity poses an 'imminent and long-term threat' to residents" (Eggert/AP)	www.usnews.com/news/us/articles/2016-01-20/michigan-governor-on-flint-water-i-let-you-down	3/13/16
January 20, 2016	State budget office asks legislature for \$28 million to aid in Flint water crisis; House approves; heads next week to Senate	MLive (Jan. 20, 2016): "Michigan House approves \$28M in immediate assistance for Flint" (Lawler)	www.MLive.com/news/index.ssf/2016/01/michigan_house_approves_28m_in.html	3/13/16
January 20, 2016	EPA's Flint Safe Drinking Water Task Force provides recommendation that all samples for lead analysis be collected using wide-mouth sample bottles	Documented posted to EPA website	https://www.epa.gov/mi/flint-safe-drinking-water-task-force-recommendations-regarding-wide-mouth-sampling-bottles	3/18/15
January 20, 2016	CBS Evening News interviews Gov. Snyder	CBS News (Jan. 20, 2016): "Michigan gov.: We don't want people to assume Flint water is safe"	www.cbsnews.com/news/michigan-gov-at-least-100-kids-affected-by-lead-in-flint-water/	3/13/16
January 21, 2016	President Obama announces \$80 million in financial aid for water infrastructure projects in Michigan, including Flint. Money is being provided for state's revolving loan fund, not as an appropriation	Detroit News (Jan. 21, 2016): "Obama gives \$80 million to Michigan for Flint" (Burke) MLive (Jan. 23, 2016): "\$80 million announced in connection with Flint water is revolving loan fund"	www.detroitnews.com/story/news/politics/2016/01/21/stabeno-w-obama-gives-million-flint/79134306/ www.MLive.com/news/kalamazoo/index.ssf/2016/01/80_million_announced_in_connec.html	3/13/16
January 21, 2016	EPA Region 5 Director Susan Hedman resigns, effective Feb. 1, 2016	NBC News (Jan. 21, 2016): "EPA Administrator quits over Flint water crisis" (Seville/Helsel)	www.nbcnews.com/storyline/flint-water-crisis/epa-administrator-quits-amid-flint-water-crisis-n501561	3/13/16
January 21, 2016	EPA issues SDWA Emergency Order saying authorities in Michigan failed to properly respond to Flint water crisis and prescribing various actions for the City and MDEQ. PA will begin testing the city's water; order a range of data collection, plans and reports from the City and MDEQ; and form an Independent Advisory Panel of drinking water / treatment experts and community members to recommend next steps. EPA Administrator Gina McCarthy also asks EPA inspector general to conduct independent review of Region 5's oversight of public water systems	Order posted to EPA website	www.epa.gov/sites/production/files/2016-01/documents/1_21_sdwa_1431_emergency_admin_order_012116.pdf	3/13/16
January 22, 2016	MDEQ Director Creagh responds to EPA by saying they will comply, but questioning McCarthy/EPA's legal authority to direct MDEQ in Flint response, and stating MDEQ has complied with all EPA's recent demands	Detroit News (Jan. 22, 2016): "Michigan questions legality of EPA directive on Flint" (Oosting) (includes letter response)	www.detroitnews.com/story/news/politics/2016/01/22/michigan-questions-legality-epa-directive-flint/79202618/	3/13/16
January 22, 2016	MDHHS releases data showing 70% of people who contracted Legionellosis in the Flint outbreak were exposed to Flint water 2 weeks before their symptoms began	Detroit Free Press (Jan. 22, 2016): "Legionnaires' expert blames spike in cases on Flint water" (Tanner, Anderson)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/01/22/legionnaires-expert-blames-spike-cases-flint-water/79203614/	3/13/16

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January 22, 2016	FWATF sends letter to Gov. Snyder calling for him to engage experts versed in LCR requirements, including Del Tora/EPA, and a work group including Edwards/VT; various other recommendations re: lead sampling and control		www.gongwer.com/public/fwatf-letter.pdf	1/31/16
January 22, 2016	Two MDEQ staffers are suspended without pay pending an investigation. The employees are not named in the press release but soon are identified as Stephen Busch and Liane Shekter Smith	Press release posted to Gov. Snyder's webpage	www.michigan.gov/snyder/0,4668,7-277-57577-374565--,00.html	3/13/16
January 22, 2016	Gov. Snyder returns additional executive powers to Flint's mayor. "Mayor Weaver will now have the authority to appoint the city administrator and all department heads. Today's action is the next step in transitioning to full, local control in Flint"	Press release posted to Gov. Snyder's webpage	www.michigan.gov/snyder/0,4668,7-277-57577_57657-374556--,00.html	3/13/16
January 22, 2016	Detroit Free Press reports that hacker group Anonymous has launched a Flint operation and is calling for Gov. Snyder to be charged with manslaughter	Detroit Free Press (Jan. 22, 2016): "State on high cyber alert after Anonymous threat" (Egan)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/01/22/activist-hacker-group-anonymous-starts-flint-campaign/79157780/	3/13/16
January 25, 2016	Michigan AG Schuette names Todd Flood (defense attorney and former Wayne County assistant prosecutor) and former Detroit FBI bureau chief Andy Arena to lead investigation into potential misconduct in office concerning Flint water crisis. State Rep. LaTanya Garrett (D-Detroit) files petition with U.S. AG Loretta Lynch to remove Schuette's office from Flint water investigation citing conflicts of interest	The State (Jan. 26, 2016): "Ex-prosecutor to spearhead investigation into Flint water crisis" (Eggert, Householder)	www.thestate.com/news/nation-world/national/article56583968.html	3/13/16
January 27, 2016	ACLU Michigan, NRDC and Concerned Pastors for Social Action file federal lawsuit against city and state officials seeking to force owners and operators of Flint's water system to comply with SDWA	Filed in U.S. District Court, Eastern District of Michigan		
January 31, 2016	Pastor Edwin Anderson, Aline Anderson and Beatrice Boler file federal lawsuit against city and state officials seeking compensatory and punitive damages over Flint water crisis	Filed in U.S. District Court, Eastern District of Michigan		
February 1, 2016	Michigan Attorney General Schuette says his office "likely" can't defend the seven MDEQ workers being sued over Flint water crisis; asked federal judge to decide	Detroit Free Press (Feb. 1, 2016): "State might not defend MDEQ workers in Flint water suit" (Baldas)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/01/31/deq-workers-need-find-own-lawyer-flint-lawsuit/79608504/	3/13/16
February 2, 2016	FBI joins federal investigation of Flint water crisis, which also involves U.S. Attorney's office, US Postal Inspection Service and EPA Criminal Investigation Division	NBC News (Feb. 2, 2016): "FBI Investigating Flint's Poisoned Water Crisis" (Connor)	www.nbcnews.com/storyline/flint-water-crisis/fbi-investigating-flint-s-poisoned-water-crisis-n509686	3/13/16
February 2, 2016	\$100 million lawsuit is filed against McLaren Flint Hospital and State of Michigan over Flint Legionellosis cases, on behalf of four who contracted the disease	Detroit Free Press (Feb. 2, 2016): "Fieger files \$100-million suit over Flint Legionnaires' disease cases" (Wisely, Dixon)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/02/fieger-flint-lawsuit-mclaren-water-crisis/79704852/	3/13/16
February 3, 2016	House Committee on Oversight and Government Reform holds hearing where Beauvais/EPA, Creagh/MDEQ, Edwards/VT and Flint resident Walters testify re: Flint water crisis; former Flint EM Earley declines to appear. Edwards: "I am personally shamed that the profession I belong to, the drinking water industry in this country, has allowed this to occur."	Detroit News (Feb. 5, 2016): "Lawmakers spar on state's blame for Flint water" (Burke, Lynch) NBC News (Feb. 3, 2016): "House Panel Accuses Officials of Covering Up Flint Water Crisis" (Schuppe)	www.detroitnews.com/story/news/michigan/flint-water-crisis/2016/02/03/flint-water-congressional-hearing/79728072/ www.nbcnews.com/storyline/flint-water-crisis/house-panel-chair-vows-hunt-down-official-behind-flint-water-n510411	3/13/16
February 3, 2016	Snyder proposes \$30 million in state funds to offset a portion of Flint residents' water bills. Approved by Michigan Senate Feb. 4, by House Feb. 17	Detroit News (Feb. 3, 2016): "Snyder pitches \$30 million for Flint water bill refunds" (Livengood, Carah, Oosting)	www.detroitnews.com/story/news/michigan/flint-water-crisis/2016/02/03/snyder-water-bills/79735564/	3/13/16
February 5, 2016	Gov. Snyder announces that Shekter Smith/MDEQ, head of ODWMA, is fired	Press release posted to Gov. Snyder's webpage	www.michigan.gov/snyder/0,4668,7-277-57577_57657-376028--,00.html	3/13/16
February 5, 2016	U.S. Small Business Administration approves Gov. Snyder's request to aid businesses in Flint and Genesee County affected by Flint water crisis. SBA will provide access to federal Economic Injury Disaster Loans for small businesses	MLive (Feb. 5, 2016): "Businesses affected by Flint water crisis can seek disaster loans from SBA" (Emery)	www.MLive.com/news/flint/index.ssf/2016/02/businesses_affected_by_flint_w.html	3/13/16
February 5, 2016	EPA's Flint Safe Drinking Water Task Force provides recommendations on MDEQ's Draft Sentinel Site Selection	Documented posted to EPA website	www.epa.gov/flint/flint-safe-drinking-water-task-force-recommendations-mdeqs-draft-sentinel-site-selection	3/18/16
February 7, 2016	Democratic presidential candidate Hillary Clinton visits Flint	Detroit Free Press (Feb. 7, 2016): "Hillary Clinton: What happened in Flint is immoral" (Gray, Stafford)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/07/hillary-clinton-flint-campaign-stop/79902530/	3/13/16
February 8, 2016	Luke Waid and Michelle Rodriguez file federal lawsuit over 2-year-old daughter's lead poisoning	Filed in U.S. District Court, Eastern District of Michigan		
February 9, 2016	Flint issues boil water advisory due to broken water main	Detroit Free Press (Feb. 9, 2016): "Flint issues boil advisory after water main break" (Bethencourt)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/09/flint-residents-asked-boil-their-filtered-water/80086916/	3/18/16
February 10, 2016	Gov. Snyder proposes state budget for FY 2017 that includes \$195 million to address Flint water crisis	MLive (Feb. 10, 2016): "Gov. Rick Snyder proposes \$195M for Flint water as protesters call for his removal" (Lawler)	www.MLive.com/news/index.ssf/2016/02/gov_rick_snyder_proposes_195m.html	3/18/16

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February 10, 2016	Mayor Weaver, Dr. Hanna-Attisha, Yanna Lambrinidou and others address House Democratic Steering and Policy Committee in D.C. Gov. Snyder was invited but declined due to concurrent state budget proposal	MLive (Feb. 10, 2016): "Flint mayor, superintendent ask for short and long-term water crisis help" (Acosta)	www.MLive.com/news/flint/index.ssf/2016/02/flint_mayor_superintendent_ask.html	3/18/16
February 10, 2016	U.S. House of Representatives passes H.R. 4470, which specifies notification requirements for lead action level exceedances in public water systems	Act posted to congress.gov website	www.congress.gov/bill/114th-congress/house-bill/4470/text	3/18/16
February 10, 2016	U.S. Small Business Administration opens Flint Business Recovery Center to aid entrepreneurs and business owners affected by Flint water crisis	MLive (Feb. 10, 2016): "Help center opens for small businesses impacted by Flint's water crisis" (Adams)	www.MLive.com/news/flint/index.ssf/2016/02/help_center_opens_for_small_bu.html	3/19/16
February 11, 2016	U.S. District Judge John Corbett O'Meara grants request by state attorneys to withdraw from representing 7 MDEQ employees who are being sued over Flint water crisis, due to conflict of interest. State lawyers noted the MDEQ employees will still get lawyers paid for by the state	Detroit Free Press (Feb. 11, 2016): "AG's office freed from MDEQ workers in Flint water case" (Baldas)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/11/ags-office-freed-deq-workers-flint-water-case/80257552/	3/19/16
February 11, 2016	Obama administration officials tell Democratic members of Congress they anticipate providing a Medicaid expansion that will cover lead blood-level monitoring, behavioral health services and nutritional support for children and pregnant women in Flint as a result of water crisis	Detroit Free Press (Feb. 12, 2016): "Obama administration to offer more benefits in Flint" (Spangler)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/12/obama-administration-offer-more-benefits-flint/80298130/	3/19/16
February 12, 2016	Gov. Snyder calls U.S. House Oversight and Government Reform Committee chair Chaffetz to offer his testimony on Flint water crisis	Detroit Free Press (Feb. 27, 2016): "Snyder to testify before Congress on Flint crisis" (Spangler, Dolan)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/12/snyder-wants-testify-congress-flint/80290232/	3/19/16
February 12, 2016	MDEQ announces plan to regularly test water from 400 Flint addresses for lead over next 8 weeks; public should be able to track the results through a map of the sites on www.michigan.gov/flintwater	Detroit Free Press (Feb. 12, 2016): "Flint water tests to track change in lead levels" (Allen)	www.freep.com/story/news/local/michigan/2016/02/12/flint-water-tests-track-lead-levels/80282428/	3/19/16
February 12, 2016	State of Michigan activates website containing numerous e-mails related to Flint water crisis	Department of Environmental Quality-Part 1 (381MB PDF) Part 2 (206MB PDF) Part 3 (185MB PDF) Part 4 (227MB PDF) Department of Technology, Management and Budget (2.38MB PDF) Department of Health and Human Services (6.51MB PDF) Department of Agriculture and Rural Development (33KB PDF) Department of Treasury (12.5MB PDF)	Links published in Detroit Free Press (Feb. 12, 2016): "State releases trove of e-mails related to Flint water" (Egan): www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/12/flint-water-crisis-emails/80278914/	3/19/16
February 12, 2016	Lawsuit is filed against LAN, alleging professional negligence in preparing Flint WTP for full-time operation	NBC25 News (Feb. 12, 2016): "Engineering firm hired to fix Flint water plant now facing multi-million dollar lawsuit" (Moore)	nbc25news.com/news/local/engineering-firm-hired-to-fix-flint-water-plant-now-facing-multi-million-dollar-lawsuit	3/19/16
February 14, 2016	Gov. Snyder asks for expanded Medicaid support for about 15,000 Flint residents in the wake of Flint water crisis	Detroit Free Press (Feb. 14, 2016): "Snyder asks for more Medicaid support for Flint" (Bethencourt)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/14/snyder-asks-more-medicaid-support-flint/80382696/	3/19/16
February 15, 2016	U.S. Surgeon General Vivek Murthy visits Flint and meets with 150 local doctors, social workers and students; says "trusted voices" need to impart critical nutrition and education to Flint residents	Detroit Free Press (Feb. 15, 2016): "U.S. surgeon general to Flint's trusted voices: Speak up" (Allen)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/15/us-surgeon-general-flint-crisis-dr-vivek-murthy/80431666/	3/19/16
February 15, 2016	NAACP announces it will invite "disruptive civil disobedience" in Flint if Gov. Snyder does not produce a plan within 30 days for replacing the city's water pipes	Detroit Free Press (Feb. 15, 2016): "NAACP threatens civil disobedience over Flint pipes" (Allen)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/15/naacp-president-flint-outrage/80416032/	3/19/16
February 16, 2016	Food & Water Watch releases report showing Flint residents were being charged more for water than any other customers in the nation's 500 largest community water systems	Report posted to Food & Water Watch website MLive (Feb. 16, 2016): "Flint water rates highest in country, study claims" (Ridley)	www.foodandwaterwatch.org/news/lessons-flint-and-price-water-privatization www.MLive.com/news/flint/index.ssf/2016/02/flints_water_rates_highest_in.html	3/19/16
February 16, 2016	Detroit Free Press publishes Google map of Flint homes that have tested with dangerously high lead levels. "666 addresses with levels of more than 15 parts per billion of lead found the water. That's out of 9,940 tests taken from September through Feb. 13"	Detroit Free Press (Feb. 16, 2016): "Flint map: See 666 homes where lead levels too high" (Allen)	www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/16/flint-lead-water-map/80445272/	3/19/16
February 16, 2016	Congressional Research Service issues report stating EPA did not respond to Flint's water crisis as soon as it could have	2-page report posted online MLive (Feb. 18, 2016): "EPA didn't respond to Flint's water crisis as soon as it could have, report says" (Emery)	www.fas.org/sgp/crs/misc/N10446.pdf www.MLive.com/news/flint/index.ssf/2016/02/epa_didnt_respond_to_flints_wa.html	3/19/16
February 16, 2016	Governor's Office announces it has contracted with Rowe Professional Services to update a recent analysis of Flint's water pipes, beginning the work required to replace lead service lines.	MLive (Feb. 16, 2016): "Effort to replace lead water pipes underway in Flint" (Williams)	www.detroitnews.com/story/news/michigan/flint-water-crisis/2016/02/16/lead-water-pipe-replacement-flint/80478866/	3/19/16
February 17, 2016	Federal class action lawsuit is filed on behalf of Angela McIntosh and other Flint water crisis victims. While other lawsuits have been filed, no case has yet been granted class action status by any state or federal court	PR Newswire (Feb. 17, 2016): "Class action law firm and personal injury Super Lawyer filed lawsuit on behalf of thousands of Flint victims"	www.prnewswire.com/news-releases/class-action-law-firm-and-personal-injury-super-lawyer-filed-lawsuit-on-behalf-of-thousands-of-flint-victims-300221443.html	3/19/16

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February 18, 2016	Mayor Weaver counters state lead replacement plan with Flint Fast Start Plan, working with Lansing employees; Gov. Snyder announces grant of \$2M to help with pipeline replacement	RT.com (Feb. 18, 2016): "Flint water crisis: Mayor, governor spar over timeline to replace lead pipes" Detroit Free Press (Feb. 17, 2016): "State signs agreement for Flint pipe testing" (Dolan) MLive (Feb. 18, 2016): "Flint gets \$2 million from state to start lead service water replacements" (Fonger)	www.rt.com/usa/332817-flint-water-pipe-replacement-pfcs/ www.freep.com/story/news/local/michigan/flint-water-crisis/2016/02/17/state-agreement-flint-pipe-testing/80470524/ www.MLive.com/news/flint/index.ssf/2016/02/governor_says_2-million_grant.html	3/19/16
February 18, 2016	U.S. DHHS Secretary Sylvia Burwell visits Flint; announces her agency will provide an additional \$500,000 to help mitigate potential lead damage in Flint children	MLive (Feb. 18, 2016): "Additional \$500,000 in federal money to fight lead damage in Flint children" (Johnson)	www.MLive.com/news/flint/index.ssf/2016/02/us_department_of_health_announ.html	3/19/16
February 19, 2016	Rev. Jesse Jackson's Rainbow PUSH Coalition and Concerned Pastors for Social Action organize a march from Metropolitan Baptist Tabernacle to Flint WTP	MLive (Feb. 19, 2016): "Flint water crisis march with Jesse Jackson draws thousands" (Acosta)	www.MLive.com/news/flint/index.ssf/2016/02/flint_water_crisis_march_with.html	3/19/16
February 20, 2016	Mark Pollins/EPA sends letter to MDEQ and Flint officials saying they are not doing enough to comply with SDWA emergency order on lead contamination	Letter posted to EPA website	www.epa.gov/sites/production/files/2016-02/documents/epa_letter_to_mdeq_and_city_of_flint_w_attachments_2.19.16.pdf	3/19/16
February 22, 2016	Board of State Canvassers approves petition to recall Gov. Snyder over Flint water crisis, submitted by David Bullock	MLive (Feb. 22, 2016): "Petition to recall Gov. Rick Snyder over Flint water crisis clears Michigan panel" (Lawler)	www.MLive.com/news/index.ssf/2016/02/petition_to_recall_gov_rick_sn.html#incart_river_index_topics	3/19/16
February 22, 2016	Dr. Marty Kaufman/University of Michigan-Flint says in press conference that it is still unknown what types of pipes are running to 13,000 properties in Flint. Thus far, 4,376 locations with lead pipes have been identified; records do not exist for more than 10,000 properties	MLive (Feb. 22, 2016): "Work still needed to identify service lines to 13,000 Flint properties" (Acosta)	www.MLive.com/news/flint/index.ssf/2016/02/work_still_needed_to_identify.html#incart_river_index_topics	3/19/16
February 22, 2016	MLive reports some test sites still exceed federal limit for lead in water	MLive (Feb. 22, 2016): "Latest Flint water tests show 1 in 10 sites still exceed federal lead limit" (Fonger)	www.MLive.com/news/flint/index.ssf/2016/02/latest_flint_water_testing_sho.html#incart_river_index_topics	3/19/16
February 22, 2016	Gov. Snyder announces his office will release e-mails his staff sent or received dating back to 2011 re: Flint water supply switch and subsequent contamination	Detroit News (Feb. 22, 2016): "Snyder: Office will release staff emails on Flint water" (Livengood)	www.detroitnews.com/story/news/michigan/flint-water-crisis/2016/02/22/snyder-office-release-staff-emails-flint-water/8071952/	3/19/16
February 22, 2016	Congressional delegation led by U.S. Rep. Dan Kildee, D-Flint Township, visits Flint	MLive (Feb. 22, 2016): "Six takeaways on Flint water crisis from Congressional delegation" (Acosta)	www.mlive.com/news/flint/index.ssf/2016/02/six_takeaways_on_flint_water_c.html#incart_river_index_topics	3/19/16
February 23, 2016	Michigan CMO Wells announces MDHHS has requested Assessment of Chemical Exposure from U.S. DHHS to assess skin rashes reported during Flint water crisis	CBS Detroit (Feb. 23, 2016): "Federal Officials To Probe Rashes Amid Flint Water Crisis" (AP)	detroit.cbslocal.com/2016/02/23/federal-officials-to-probe-rashes-amid-flint-water-crisis/	3/19/16
February 23, 2016	State lawmakers announce they have created a joint committee to begin formally reviewing Flint's ongoing water crisis	MLive (Feb. 23, 2016): "Flint water crisis to get fresh probe by state lawmakers" (Ridley)	www.MLive.com/news/flint/index.ssf/2016/02/state_lawmakers_form_committee.html#incart_story_package	3/19/16
February 24, 2016	Ruth Mott Foundation dedicates \$1 million to go toward short- and long-term needs of Flint residents exposed to lead	MLive (Feb. 24, 2016): "Ruth Mott Foundation gives \$1M to aid in Flint water crisis" (Adams)	www.mlive.com/news/flint/index.ssf/2016/02/ruth_mott_foundation_gives_1m.html#incart_river_index_topics	3/19/16
February 26, 2016	Gov. Snyder signs \$30 million bill to provide water bill relief for Flint residents	MLive (Feb. 26, 2016): "Gov. Snyder signs \$30 million water relief bill for Flint" (Johnson)	www.mlive.com/news/flint/index.ssf/2016/02/snyder_signs_30_million_water.html	3/19/16
February 28, 2016	#JUSTICEFORFLINT benefit show is held at The Whiting in Flint, raising more than \$150,000 to benefit Flint residents	MLive (Mar. 1, 2016): "Justice for Flint benefit show raises \$156,000 for water crisis relief" (Acosta)	www.mlive.com/news/flint/index.ssf/2016/03/justice_for_flint_benefit_show.html	3/19/16

APPENDIX VI: Abbreviations and Acronyms

Abbreviation	Definition
ACLU	American Civil Liberties Union
AG	Attorney General
AJPH	American Journal of Public Health
AWWA	American Water Works Association
CAC	Citizens Advisory Committee
CCT	Corrosion control treatment
CDC	Centers for Disease Control and Prevention
CLPPP	Childhood Lead Poisoning Prevention Program
Cu	Copper
DBPs	Disinfection byproducts
DEQ	Department of Environmental Quality
DHHS	Department of Health and Human Services
DNR	Department of Natural Resources
DPW	City of Flint Department of Public Works
DWSD	Detroit Water and Sewerage Department
EBLL	Elevated blood lead level
EFM	Emergency financial manager
ELL	Elevated lead level
EM	Emergency manager
EPA	U.S. Environmental Protection Agency
FAQs	Frequently Asked Questions
FOIA	Freedom of Information Act
FWATF	Flint Water Advisory Task Force
FWICC	Flint Water Interagency Coordinating Committee
GCBOH	GCHD Board of Health
GCDC	Genesee County Drain Commission
GCHD	Genesee County Health Department
GCMS	Genesee County Medical Society
GFHC	Greater Flint Health Coalition
GM	General Motors
HMC	Hurley Medical Center
KWA	Karegnondi Water Authority
LAN	Lockwood, Andrews, & Newnam, Inc.
LCR	Lead Contaminant Rule
LSL	Lead service line
MCIR	Michigan Care Improvement Registry
MCL	Maximum Contaminant Level
MDCH	Michigan Department of Community Health
MDEQ	Michigan Department of Environmental Quality
MDHHS	Michigan Department of Health and Human Services
mgd	Million gallons per day
NAN	National Action Network

NDWAC	National Drinking Water Advisory Council
NRDC	National Resources Defense Council
OAG	Office of the Auditor General
OCCT	Optimal Corrosion Control Treatment
ODMWA	Office of Drinking Water and Municipal Assistance
O&M	Operations and maintenance
Pb	Lead
ppb	Parts per billion
SDWA	Safe Drinking Water Act
TAC	City of Flint/Veolia Technical Advisory Committee
TTHMs	Total trihalomethanes
TYJT	Tucker, Young, Jackson, Tull Inc.
UAW	United Auto Workers Union
µg/l	Micrograms per liter
VT	Virginia Tech (Virginia Polytechnic Institute and State University)
WTP	Water Treatment Plant