



STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
GRAND RAPIDS DISTRICT OFFICE



RICK SNYDER  
GOVERNOR

C. HEIDI GREYER  
DIRECTOR

October 3, 2018

**CERTIFIED MAIL**

Mr. Marcus Muhammad, Mayor  
Mr. Darwin Watson, City Manager  
City of Benton Harbor  
200 Wall Street  
Benton Harbor, MI 49022

**SIGNIFICANT DEFICIENCY VIOLATION NOTICE**  
WSSN: 00600

Dear Sirs:

**SUBJECT:** City of Benton Harbor (City) - Water System Sanitary Survey and Significant Deficiency Violation Notice – Financial and Managerial Capacity

This letter will confirm meetings with Benton Harbor staff on multiple dates in 2017 and 2018; representing the Department of Environmental Quality (DEQ), Drinking Water and Municipal Assistance Division (DWMAD), and summarize the subsequent review and discussion of the water supply facilities serving the City of Benton Harbor (City). The purpose of these meetings and subsequent review is to evaluate the water system with respect to the requirements of the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399). **Findings from the survey, listed below, have led to the determination the water supply currently lacks the financial and managerial capacity to meet all the requirements of Act 399.** Findings of significant deficiency have been identified as having the potential to introduce contamination to the public water supply and must be addressed within 120 days or be outlined in a corrective action plan and schedule approved by this office.

Since the previous sanitary survey in 2015, staff at the City of Benton Harbor have made significant efforts to maintain and improve the historically neglected water system. The distribution pipe network alone represents \$124 million in replacement value, according to the 2017 asset management program by Abonmarche. Along with the City's complex treatment plant, this represents a significant challenge for the City in terms of maintenance costs. Proper care and maintenance of the system is necessary to protect the health of all customers.

The major findings below indicate a number of areas needing immediate attention by the City, many of which have the potential to impact public health by allowing or introducing contamination to the water supply. Of utmost importance, a review of financial information finds the City presently lacks an adequate financial mechanism to conduct necessary improvements or hire necessary staff to properly maintain and operate the water system. **We strongly advise the City to work with a qualified financial consultant to identify the revenue necessary to support operation and maintenance and to implement effective revenue collection methodologies.** Investment from the City's rate payers is essential for resolving the below (significant) deficiencies and for ensuring the long term vitality of the water system assets.

The following table summarizes our findings from our survey of the water system:

Survey Element	Findings
Source	<b>Deficiencies Identified</b>
Treatment	<b>Significant Deficiencies Identified</b>
Distribution System	<b>Significant Deficiencies Identified</b>
Finished Water Storage	<b>Deficiencies Identified</b>
Pumps	Recommendations made
Monitoring & Reporting	<b>Significant Deficiencies Identified</b>
Management & Operations	<b>Significant Deficiencies Identified</b>
Operator Compliance	Recommendations made
Security	No Deficiencies or Recommendations
Financial	<b>Significant Deficiencies Identified</b>
Other	<b>Significant Deficiencies Identified</b>

**The following significant deficiencies are violations of Act 399 with the potential to allow or introduce contamination to the public water supply, and must either be resolved within 120 days or be included in an approved corrective action plan.**

- D1. Our review included the City's asset management program, submitted in December 2017, as well as the bill payment and collections process. Current revenues are not sufficient to cover capital improvement costs, and necessary improvements identified in this survey are likely to increase operations and maintenance costs beyond the current revenues. In addition, the current water bill collection process is inadequate and creates a significant drain on staff resources and time, which would be better spent towards resolution of significant deficiencies and performance of routine maintenance activities. **In order to maintain the required financial capacity to operate a public water supply, the City must:**
- a. Conduct a rate study with a qualified professional consultant, and implement findings to generate sufficient revenue to cover costs.
  - b. Implement a consistent and equitable program to minimize the number of unpaid bills, and streamline the collections process.
- D2. An increasing trend in the number of violations of Act 399 in the past year indicates the need for increased managerial oversight of the water supply. In addition, maintenance of the water plant and distribution system components is severely lacking. The lack of separate designated distribution and plant managers prevents staff from spending adequate time and energy on managing the water system. **In order to maintain the managerial capacity to operate the public water supply and meet the requirements of Act 399, the City must hire separate certified operators to oversee the distribution system and the water treatment facility.**

D3.R 325.11008 (2) requires a sufficient primary coagulant dose shall be added to create a settleable or filterable floc at all times. Currently the City adds coagulant to an injection point in the raw water influent pipe rather than the engineered rapid mix basins in the new plate settler building. It has become apparent, through a near violation of turbidity standards in February of 2018, as well as an ongoing treatment technique violation of R 325.10610c, this coagulation practice is not acceptable to meet the requirements of Act 399. Lack of proper mixing also impacts the pathogen removal credit awarded to properly operated conventional treatment facilities. **Adequate rapid mix for the primary coagulant must be installed.**

The current raw water pH of Lake Michigan is above the optimum operating range of the City's current coagulant, aluminum sulfate. At these elevated pH ranges, iron based coagulants, such as ferric sulfate or ferrous sulfate may be more suited for creating a settleable or filterable floc. The City should hire a consultant to explore the steps necessary to explore a switch of the primary coagulant.

D4.R 325.10720 (3) requires continuous monitoring for residual disinfectant at an entry point to the distribution system (EPTD) on a continual basis, and requires the minimum to be recorded for each day. The chlorine analyzer at the City's EPTD was reading less than 0.2 mg/L, the minimum required residual under R325.10611a(2)(b). The readings were identified as unreliable by the operator, and are not recorded as required above. Moreover, plant staff were not familiar with the operational setpoints necessary to achieve sufficient disinfection. **Accurate chlorine analyzer must be in place, minimum levels recorded daily and reported to the DEQ, and connected to SCADA with callout alarms in the event of low residual.**

D5.R 325.11404 requires a water supply to develop a comprehensive control program for the elimination and prevention of all cross connections. The program must include education, inspection, preventer testing in all customer sectors including residential. In addition, an annual report summarizing activities must be submitted to the DEQ. The City has insufficient staff to conduct any activities for the last few years, as evidenced by the lack of annual reporting. **The City must dedicate a trained staff person to implement this program or obtain a contract with a qualified professional company to implement the program.**

D6.R325.11108 requires a water supply to have sufficient valves in the distribution system to minimize interruptions in service and minimize sanitary hazards during construction or repairs. In addition, R 325.11111 requires adequate records be maintained on the distribution system components including hydrants and valves. The City has struggled to conduct necessary inventory and maintenance on valves in the system. **A plan for valve inventory and maintenance must be submitted, approved and implemented consistently.**

D7.R 325.11105 requires a water supply distribution system to maintain a minimum pressure of 20psi throughout the system during emergencies such as firefighting, and allows the department to prohibit installation of fire hydrants in areas where fire flow is not sufficient. From our discussion with staff and through the hydrant flow testing activities conducted during the reliability study, a number of hydrants in town have no flow or zero flow. This may be related to closed valves in the system, which significantly impacts public safety should an emergency occur. **A plan for hydrant inventory and maintenance must be submitted,**

**approved and implemented consistently.**

- D8. The water plant's supervisory control and data acquisition (SCADA) system is in need of upgrades to achieve the following requirements:
- a. Storage and access to regulatory data such as EPTD chlorine residuals (R 325.10720), plant flow, and individual filter turbidity profiles (R10720a).
  - b. Alarming capabilities to call out during unstaffed hours for low chlorine residual, low tower level, high turbidity at the filter confluence point and other undesirable conditions.
  - c. Automation of water plant operations may be enhanced to allow staff to focus on maintenance activities.

**The following deficiencies are also violations of Act 399, and must be resolved to return to compliance with Act 399.**

- D9. Install finished water meters at the water plant to facilitate accurate calculations and reporting of chemical treatment, calculation of non-revenue water, and more accurate calculation of CT.
- D10. Significant amounts of unlined cast iron water main are in need of replacement. With funding in place, the City must prioritize replacement of old water main that is unreliable and undersized.
- D11. The monthly operating report must accurately reflect the data collected at the water plant. For example, treated water has been estimated using raw water meters, and chlorine at the plant tap should be the minimum recorded for the day from the EPTD continuous analyzer as opposed to bench top analysis.
- D12. Conduct a professional inspection on the elevated tank, including necessary maintenance and cleaning. This may be facilitated by installing variable frequency drive(s) on high service pumps, which would allow operating on pressure rather than on tower level.

If you have any information you would like us to consider regarding the significant deficiencies identified in this Significant Deficiency Violation Notice, please provide it in a written response by November 2, 2018.

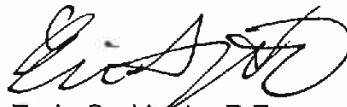
**Representatives from the City and DEQ met on September 14, 2018 to discuss preliminary findings of the sanitary survey, and to begin discussion of a corrective action plan such as an administrative consent order (ACO), to return to compliance. It is understood that a significant amount of time will be required to address many of these issues. Therefore, we recognize that this ACO contains a schedule, which is both systematic and flexible, to bring the City back into compliance with the SDWA and providing a safe and reliable source of drinking water to its residents. Upon hearing from the City of its desire to move forward with an ACO, we will forward a draft ACO for the City's review and comment. At that time, DEQ staff will be available to meet with City officials to discuss the ACO in an attempt to execute it prior to the 120 day deadline.**

Mr. Marcus Muhammad, Mayor  
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Page 5  
October 3, 2018

A reliable supply of quality drinking water is critical to the growth and strength of any community. We are committed to working with the City to improve the water distribution system and treatment plant. With a strong commitment and swift effort from the City, we believe these deficiencies can be resolved and lead to long term water system sustainability.

We anticipate and appreciate your cooperation in resolving this matter. If you have any questions regarding this Significant Deficiency Violation Notice, please contact me by telephone at 616-307-0261; by e-mail at [sarkipatoe@michigan.gov](mailto:sarkipatoe@michigan.gov); or DEQ-DWMAD, 350 Ottawa Avenue NW, Unit 10, Grand Rapids, Michigan 49506.

Sincerely,



Ernie Sarkipato, P.E.,  
Surface Water Treatment Specialist  
Drinking Water and Municipal Assistance Division

Enclosure

cc: Berrien County Health Department  
cc/enc: Mr. Mike O'Malley, Operator in Charge, City of Benton Harbor  
Mr. Eric Oswald, Director, DEQ (via email)  
Ms. Sue Maul, Enforcement Specialist, DEQ (via email)  
Mr. Jon Bloemker, Engineering Unit Supervisor, DEQ (via email)

