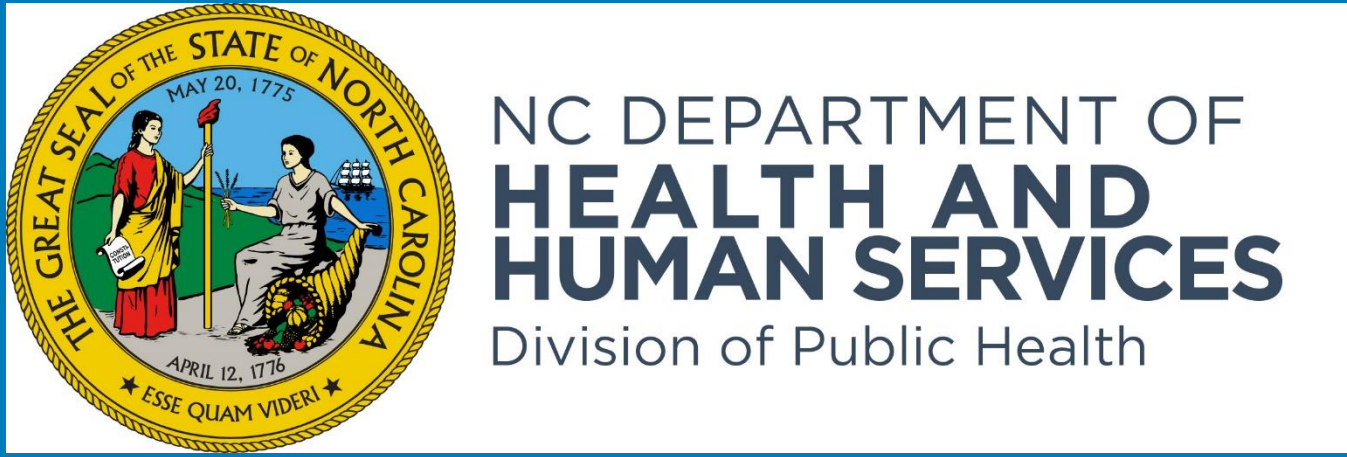


Helene: A Hurricane's Legacy of Loss and Resilience: Response and Recovery in Western North Carolina



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Abstract

Hurricane Helene made landfall in September 2024 as a Category 4 storm, causing widespread flooding and damage across Western North Carolina. The North Carolina Rapid Response Team (NC RRT) was involved in emergency response activities including water safety operations, regional damage assessments, and multi-agency coordination.

The NC RRT initiated this response in accordance with its mission to characterize, investigate, mitigate, and conclude food and feed emergencies as part of a coordinated federal-state-local integrated food safety system. The rapid and successful collaborative response to this public health threat led to the prompt guidance regarding the use of safe water in retail and manufactured food plants and the provision of much needing potable water for those impacted citizens. This response is a result of partnerships and protocols supported by the Rapid Response Team concept.

Background

Hurricane Helene brought devastating impacts to Western North Carolina beginning on September 26, 2024. The storm delivered record-setting rainfall—exceeding 30 inches in some areas—alongside high winds and six confirmed tornadoes. These conditions led to widespread flooding, landslides, and damage to critical infrastructure across communities in the greater Asheville area. There were prolonged disruptions to essential services, compounding the storm's effects on public health and safety. One of the most significant public health challenges was the collapse of potable water infrastructure. Widespread flooding and power outages forced at least 27 public water treatment facilities offline and led to over 160 boil-water advisories across the state. In Asheville alone, more than 100,000 residents were without safe drinking water for up to 53 days. The storm had a significant effect on regulated food manufacturing facilities that depend on municipal water supplies for production, sanitation, and food safety compliance.



Figure 1. Historic flooding from Hurricane Helene in Asheville, NC in Biltmore Village area. Drone footage from WLOS, as seen on Sept. 28, 2024.

Materials and Methods

With water systems offline or compromised facilities were forced to suspend operations or transition to emergency protocols. The loss of potable water directly impacted the ability of manufacturers to maintain regulatory standards, prompting expedited coordination with local, state and federal public health agencies to approve temporary water safety plans and resume critical food production operations. The Helene crisis revealed the susceptibility of aging water systems to extreme weather events and underscored the importance of coordinated emergency planning and regulatory flexibility. NC RRT emergency response efforts focused on water safety, cross-agency collaboration, and identifying lessons to strengthen resilience against future disasters. Specifically, the following activities were initiated by the NC RRT during the Helene activation to address challenges related to potable water:

Strategic Coordination

- Multiple agencies across local, state and federal levels were involved in response to this event.
- Communication plans were activated to ensure timely coordination.

Regional Damage Assessments

- Close to 900 outreach calls for initial damage assessment conducted.
- Strike teams visited impacted areas to document damages and provide assistance on site across 11 counties.

Emergency Water Operations Plans

- Initial outreach to food manufacturers in impacted area was conducted by food safety officials to assess needs.
- Review of Emergency Operations Plan (EOP) for affected facilities and technical assistance provided as needed.
- Facilities submitted plans detailing water sourcing, treatment, distribution, and quality control.
- Submissions were reviewed and revised as needed.
- Approved operations verified through in-person inspections as needed.
- All food facilities were impacted by water outages. 40 facilities submitted emergency plans to resume operations prior to water systems restoration.



Figure 2. Helene Impact on agriculture. Apple orchard, Henderson County. Courtesy of WRAL, Sept. 26, 2024

Results and Discussion

Emergency Water Operation Plan

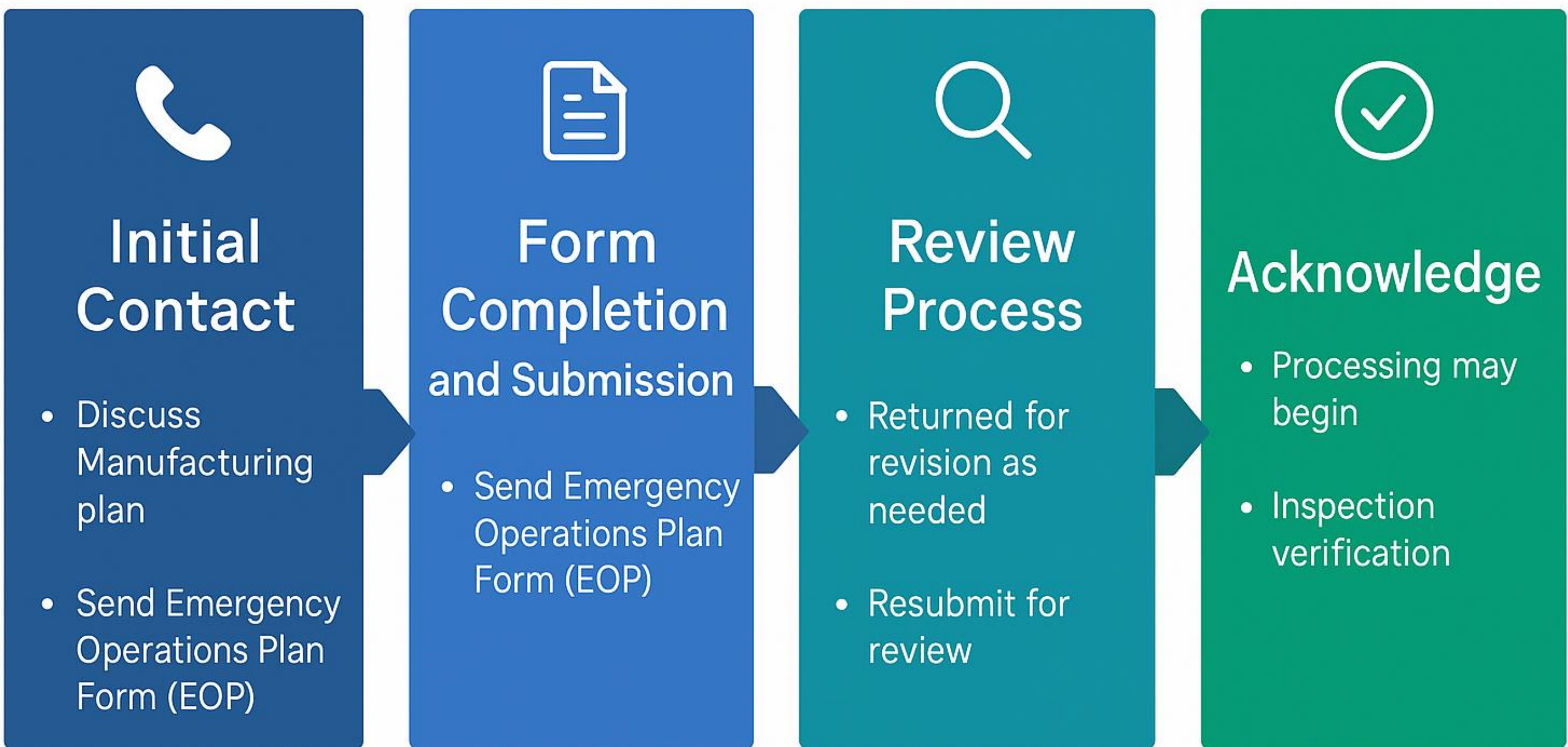


Figure 3. Emergency Water Operations plan flow chart

Emergency Water Production Requirements

- Outreach to facilities initiating production of water for distribution during the emergency to share emergency requirements.
- Technical assistance provided to facilities changing operations to water to ensure safety.
- Specific labeling requirements developed for production of emergency water distribution including: Manufacturer name & address, product named as “Water”, unit of measure and the phrase “Water for emergency use only: not for sale”. A lot code was strongly recommended.
- Distribution time was limited to 90 days from the date the requirements were established (10/4/2024). The need for continuing to provide water distribution would be reassessed after expiration date.



Figure 5. Breweries canning emergency water in aftermath of Helene. Courtesy of NoDa Brewing

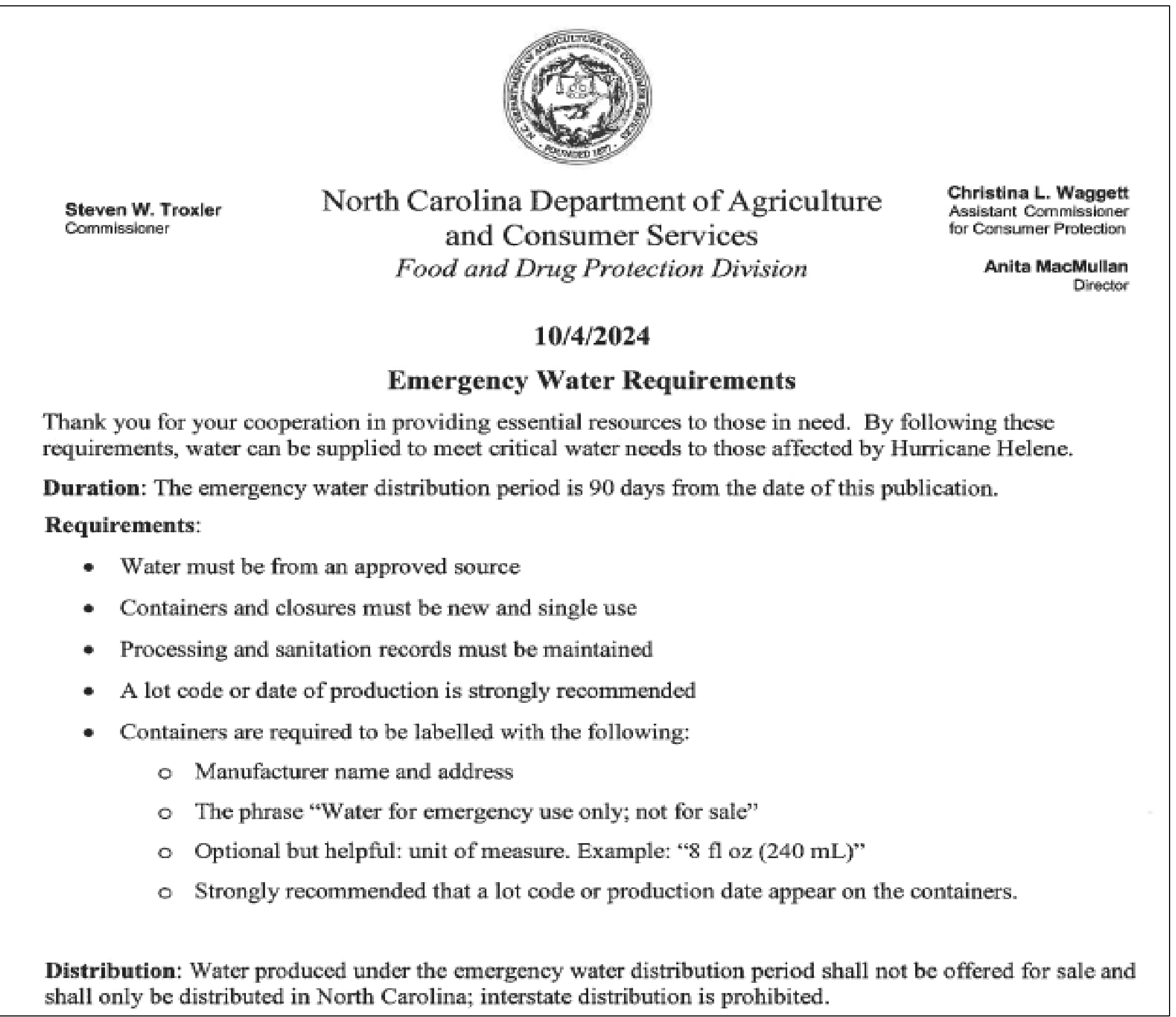


Figure 4 Emergency Water Requirements for manufacturing emergency water. NCDA&CS, October, 2024

Conclusion

Lessons Learned

- Need for established emergency water operation plan for industry to continue operations during emergency water disruptions of extended length.
- Need for development of new standard operating procedures for Food and Drug Protection Division to regulate emergency water production during response and recovery phase.

Contact Information

For additional information regarding this response or to connect with the North Carolina Rapid Response Team (NC RRT) , please contact:

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