ANNEX A TO APPENDIX 16
(WATER/WASTEWATER SYSTEM IMPACTS)
TO THE SOUTH CAROLINA EMERGENCY OPERATIONS PLAN

I. INTRODUCTION

A. Water and wastewater systems provide numerous services including water treatment plants, water supply systems, sewer systems, and/or sewage treatment facilities that collect, treat, and dispose of waste.

  1. Water systems provide clean water to customers for drinking, industrial and commercial needs, and fire suppression.

  2. Wastewater systems provide sanitary sewer services for the collection and treatment of biological waste and often provide a means for transportation for stormwater run-off.

B. The impact of a cyber incident on a water or wastewater system could lead to a failure in these utilities treating, distributing, and/or collecting water. This could have a cascading effect on industry operations, public health, and the environment.

  1. Failure or compromise of a water/wastewater system could result from various types of cyber-related attacks. Examples include ransomware events that encrypt the system's network and render the facility and distribution system unusable or unauthorized access to critical systems via account compromise tactics which could potentially lead to manipulation of dangerous chemical levels being released into water systems.

  2. Additionally, physical damage to water system infrastructure can occur after a significant cyber incident, including damage to pumps, pipes, storage tanks, and treatment facilities.

  3. In some cases, systems may be able to revert to manual operation of critical processes. However, the number of trained operators is limited and could be a resource shortfall.

II. SITUATION

A. The dependency of many community lifeline sectors on water and wastewater systems makes them a target for cyber threat actors.

B. Threat actors can greatly range in type and motivation. Some threat actors include nation-state sponsored actors, cyber criminals, terrorist groups, insider threats, and/or hackers.

  1. Recently, nation-state cyber actors have demonstrated an intent to target water/wastewater systems.

2. In November 2023, the cyber actor group "CyberAv3ngers," which is affiliated with Iranian Government's Islamic Revolutionary Guard Corps, targeted and compromised Israeli-made Unitronics Vision Series programmable logic controllers used at water/wastewater utilities in the United States, including South Carolina.

3. In February 2024, the Cybersecurity and Infrastructure Security Agency (CISA) released an alert regarding "Volt Typhoon," a People's Republic of China (PRC) state-sponsored cyber actor group with a history of targeting U.S. critical infrastructure, including water and wastewater systems in the United States.

III.   DISASTER INTELLIGENCE AND COMMUNICATIONS

A.   See Section VIII (Disaster Intelligence and Communications) of the SCEOP.

B.   Lifeline Sector Analysis

The table below lists possible impacts to the state's lifeline sectors associated with a significant cyber incident to a water or wastewater system. While not all-inclusive, this list assists the SERT's ability to respond effectively by proactively identifying possible areas of concern before impacts occur.

Lifeline	Scope of Possible Impacts
Safety and Security	• Water systems may not be able to provide proper water pressure for fire suppression.
Food, Hydration, Shelter	• Mass care needs will increase each day as more people lack access to clean water. • Production of bottled water may be limited, leading to strain in the bottled water supply chain. • Disruption in agribusiness is likely and includes production, harvest, manufacturing, and retail. This will have cascading impacts on employment, tax revenues, and commerce. • Disruptions in agribusiness may cause loss of availability to human food, animal feed, and non-food agricultural products (including forestry and timber products). • Water systems may be unable to provide sufficient clean water for infant formula and bottle washing.

Health and Medical	• Loss of clean water will lead to degradation of critical medical functions. • Increased rates of illness and other public health impacts are likely due to the potential lack of availability of potable water, clean water for hygiene and sanitation, sanitary food preparation tools (cooking), and other related mechanisms of mitigating ingestion and exposure to pathogens.
Energy (Power & Fuel)	• Any facility requiring water for cooling could lose access to water supply.
Communications	• Any facility requiring water for cooling could lose access to water supply.
Transportation	• No impacts anticipated.
Hazardous Materials	• Any facility requiring water for cooling could lose access to water supply.
Water Systems	• Potential impacts to water systems include decreased water pressure and quality, complete loss of clean water, or water treated with incorrect chemicals. • Impacts to wastewater utilities include discharges of partially treated or untreated sewage. • Even after the cyber incident is resolved, some systems may need to be disassembled before they can be turned back on.

	• Any disruption to potable water sources for human and animal consumption, and access to clean water to use for appropriate sanitation and hygiene is a critical issue for public health, animal health, and food supply chains. • Impacts to private and non-community water systems that are not connected to a community public water system are not expected.

IV.   ORGANIZATION AND ASSIGNMENT OF RESPONSIBILITIES

A.   See the SCEOP, Section IX (Organization and Assignment of Responsibilities) for the general roles and responsibilities of County, State, and Federal agencies in preparation, response, and recovery from a disaster impacting the State.

B.   Responsibilities

1.   ESF-3 (Public Works and Engineering)

a.   South Carolina National Guard (Coordinating Agency)

(1)   Maintain situational awareness on status of water/wastewater systems.

(2)   Provide technical assistance as needed to affected water/wastewater systems.

b.   South Carolina Rural Water Association

(1)   Maintain situational awareness on status of water/wastewater systems.

(2)   Provide technical assistance as needed to affected water/wastewater systems.

c.   South Carolina Water/Wastewater Agency Response Network

(1)   Coordinate the delivery of material assistance as requested.

2.   ESF-4 (Firefighting)

South Carolina Department of Labor, Licensing, and Regulation (Coordinating Agency)

Provide tankers for fire suppression and movement of water as requested.

3.   ESF-5 (Emergency Management)

South Carolina Emergency Management Division (Coordinating Agency)

    a.   Support locally established Commodity Points of Distribution (CPODs) for bottled water distribution.

    b.   Contract potable water tankers for movement of water.

4.   ESF-7 (Finance and Administration)

South Carolina Emergency Management Division (Coordinating Agency)

    Assist in procuring parts and equipment that may have been damaged as needed.

5.   ESF-8 (Health and Medical Services)

South Carolina Department of Public Health (Coordinating Agency)

    a.   Monitor hospitals and other medical facilities for loss of clean water.

    b.   Coordinate movement of patients to facilities with clean water as needed.

    c.   Develop surveillance procedures to monitor public health status and for identification of disease and epidemic control.

6.   ESF-10 (Environmental and Hazardous Material Operations)

South Carolina Department of Environmental Services (Coordinating Agency)

    a.   Provide technical assistance in operations of drinking water and wastewater facilities.

    b.   Advise on hazardous material issues and sanitation guidelines for the public. This includes guidance on how to determine if the public water supply in an area may be contaminated as well as how to purify bacteria contaminated water.

7.   ESF-13 (Law Enforcement)

South Carolina Law Enforcement Division (Coordinating Agency)

    Provide security at CPODs as requested.

8.   ESF-15 (Public Information)

South Carolina Emergency Management Division (Coordinating Agency)

Develop a public information campaign to increase awareness of health hazards associated with water/wastewater systems disruption.

9.   ESF-17 (Agriculture and Animals)

Clemson University Livestock Poultry Health (Coordinating Agency)

Coordinate resources to support requests for assistance with animal, plant, and/or public health and agricultural issues associated with water/wastewater system disruption.

10.   ESF-18 (Donated Goods and Volunteer Services)

South Carolina Department of Administration (Coordinating Agency)

Coordinate donations of bottled water.

11.   ESF-19 (Military Support)

South Carolina National Guard (Coordinating Agency)

a.   Assist with staffing at CPODs.

b.   Provide tankers for movement of water as requested.

12.   ESF-24 (Business and Industry)

South Carolina Department of Commerce (Coordinating Agency)

Coordinate with ESF-18 for private sector donation of water.