

# **Appendix L. Coordination with Emergency Response Agencies for Water Delivery**

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# Technical Memorandum

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**To:** Overarching Risk Team, Water Supply Forum Resiliency Project

**From:** Dan Graves and Andrew Graham, HDR

**Date:** June 12, 2018

**Subject:** Task 102.1 – Current Utility Capacity for Provision of Emergency Water Supplies

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## Introduction

As part of the Water Supply Forum (Forum) Resiliency Project, the member utilities of the WSF discussed how utilities and other agencies may coordinate the provision of short-term water supply during a major supply disruption. Besides water utilities, the agencies/organizations that may perform this role in the central Puget Sound region include:

- Each County's designated lead department for emergency response
- Washington State Military Department, Emergency Response Division
- Federal Emergency Management Agency (FEMA)
- American Red Cross, Puget Sound area offices

Members of the Forum joined with many other participants from local, state and federal agencies in the "Cascadia Rising" earthquake response exercise in 2016. That exercise helped to identify the areas of coordination needed in terms of drinking water supply as well as other essential services. The purpose of this subtask of the Forum's Regional Resiliency project is to better understand how water utilities can coordinate their efforts with other public agencies to make emergency supplies of drinking water available to the public on a short-term, temporary basis while the utilities are simultaneously taking actions to restore the overall water supply and distribution systems. This will provide a basis for ongoing communications aimed at improving the overall capacity of drinking water utilities and non-utility agencies working together to meet public needs for water following a major emergency event.

## Methods

The Forum Ad Hoc Committee determined that the best way to understand how the agencies and organizations listed above would participate in short-term delivery of emergency water supplies would be to hold a workshop with them. The workshop was identified towards the end of Phase 2 of the Resiliency Project, so will be addressed as a future action item. However, as a preliminary step to prepare for this event, the Forum utilities responded to the following two questions provided by HDR:

1. What is each regional utility's (or Cascade Member's) understanding of its responsibility and capacity to provide drinking water to the public to meet basic human needs immediately after the emergency event (first 72 hours)? What operational approach do you plan to use in carrying this out? (Note, this may include a wide range of tactics that may differ from utility to utility: watering stations; bleivits; tanker trucks; hardened mains to select hospitals or shelter sites; arrangements with local bottling plants; or other distribution of bottled water; etc.) Will your actions be limited to shelters, or also extend to other sites? Will you supply hospitals?
2. For each regional utility (or Cascade Member), where does the provision of drinking water fit within the prioritization of all planned response actions following the emergency event?

## Findings

This section summarizes the information provided by the Forum utilities on this topic.

### ***Seattle Public Utilities***

SPU will be holding internal discussions about emergency water supply strategies. SPU has 6-sets of bleivits and distribution manifolds, but these are incapable of supplying the potential magnitude of need following a regional disaster. Blevits also require significant staffing and space to operate.

SPU has established an understanding with the Human Service and Logistics branches in the City's Emergency Operations Center (EOC) that water should be supplied as a commodity as soon as possible, using the same supply- and distribution-chains as food and other mass-care needs. The national responsibility for emergency potable water supply is with the Defense Logistics Agency (DLA). They have contracts with national companies to supply palletized water. The DLA uses identified Army and Air Force bases around the country for all of the utilities support. The 3 closest bases to WA are Fairchild AFB (WA), Hill AFB (CO), and Minot AFB (ND). These contracts generally require water supplies to be on the road within 3 days of contract activation by DLA, and delivered within 7 days. SPU also has water bottling and supply contracts with one local, and one national company.

### ***Tacoma Water***

Tacoma Water currently has no formal plan for distribution of drinking water for the first 72 hours after an emergency event. The priority within the first three days will be to stabilize the system, account for the safety of Tacoma Water personnel and their families so that essential staff can return to their duties as quickly as possible, minimize cascading impacts such as flooding, roadway erosion, and property damage, and begin damage assessments, as indicated in the Emergency Operations Plan.

Tacoma Water anticipates setting up an emergency generator at well 6B and utilizing pre-staged equipment to establish a water filling station for the public on site. In a large scale incident, this will not be adequate to supply drinking water to meet the basic human needs of the entire community. This, as well as a lack of a formal plan, has been identified as an operational gap that needs to be filled. Tacoma Water has discussed other options for providing drinking water such as bottling water stored in reservoirs that are equipped with earthquake valves, or blow-off appurtenances in low areas of pipelines.

Tacoma Water has an emergency operations plan consistent with the Tacoma Municipal Code Chapter 1.10, and the Tacoma Public Utilities Continuity of Operations Plan (COOP). This ensures Tacoma Water's ability to mitigate, prepare for, respond to, and recover from major emergencies caused by natural, technological, and man-made hazards. Tacoma Water coordinates with Tacoma Public Utilities and Tacoma Power as a regular part of business both at the operational and strategic levels.

Much of the Emergency Operations Plan currently is centered on coordination. Tacoma Water would be coordinating with Tacoma-Pierce County Health Department (TPCHD), Pierce County Department of Emergency Management and the City of Tacoma emergency operations center as well as partners and other local jurisdictions. Providing drinking water is critical, but may not be the most immediate priority. One example may be that following a major seismic event, heavy equipment may be needed by the City's Department of Public Works to clear primary roadways to hospitals for life saving services. A collaborative effort will involve establishing priorities as the emergency situation unfolds, and Tacoma Water will support meeting the identified objectives.

### ***Everett Department of Public Works***

After an emergency event such as an earthquake the overriding responsibility of Everett Public Works (EPW) will be to provide water as best as possible for human health and sanitation and for firefighting purposes. This responsibility is achieved by 1) communicating an immediate health advisory and asking for water curtailment efforts and 2) providing emergency water supply for human consumption, human health and firefighting at several reservoir (storage tank) sites.

Supplying drinking water, for human consumption and critical medical facilities, along with establishing public transportation along critical arterials following an emergency event have the highest priority in any and all EPW response plans. Everett recommends citizens keep 14 days of personal water supply at home. Immediately following a major event, EPW will respond to a water supply emergency and initiate an Incident Command System (ICS) command center with Public Works Department (PWD) management, City Administration, Emergency Responders, the City's Public Information Officer (PIO), and if available Washington State Department of Health (DOH) staff and determine the appropriate response for public safety and water supply restoration. A health advisory and water curtailment efforts would be issued as soon as possible following a major event.

Everett has taken steps to harden portions of the water system to make it more resilient to possible emergency scenarios. Systems are in place, and written procedures have been created for water storage, conservation, and delivery under various scenarios. Everett routinely evaluates and updates these procedures. Reservoir isolation and the current capability of Everett's portable water delivery stations at more easily accessible reservoirs have been evaluated recently. Potential backup supply such as ground water wells will be further evaluated in the future. Everett is also looking at its entire water system from the treatment plant to the customer's tap to identify the most critical pipelines and infrastructure to harden with seismic retrofits and earthquake resistant joints and earthquake resistant piping.

Also, all available water tankers will be mobilized and prepared to deliver emergency water to critical hospitals, medical facilities (Kidney Dialysis centers) and public shelters (in the future, dedicated earthquake resistant pipelines or on-site wells will deliver emergency water supply to these facilities).

### ***Cascade Water Alliance***

Each member utility of Cascade maintains its own set of operational procedures and goals during an emergency. Based on responses Members provided to the questions above, all Cascade member utilities consider water distribution to be a high priority task during emergency response. Watering stations, bottled water distribution, and water distributed by tanker truck are the most common distribution methods employed by the member utilities. Bellevue maintains one blivet system that was funded by the federal government and is also available to other utilities regionally. Some Cascade utilities have local resources that may also be able to provide water (e.g. Coca-Cola bottling plant in Bellevue; large number of independent groundwater wells in Sammamish). Common priority locations for water deliveries include hospitals, shelters, and community centers. Members typically estimated a 72-hour period will be needed before alternative supplies can be provided, though some utilities anticipate at least some water to some users can be made available within hours of the emergency event.

## Water Supply Forum Cascade Member Organization Survey

### Bellevue Utilities

1. What is each regional utility's (or Cascade Member's) understanding of its responsibility and capacity to provide drinking water to the public to meet basic human needs immediately after the emergency event (first 72 hours)? What operational approach do you plan to use in carrying this out? (Note, this may include a wide range of tactics that may differ from utility to utility: watering stations; blivets; tanker trucks; hardened mains to select hospitals or shelter sites; arrangements with local bottling plants; or other distribution of bottled water; etc.) Will your actions be limited to shelters, or also extend to other sites? Will you supply hospitals?

- Bellevue believes that it has a “duty to serve” (WAC 246-290-106), and for Utilities this equates to providing drinking water to the public to meet basic human needs immediately after the emergency event. In our 2016 Water System Plan, we adopted a Water Shortage Response policy that states the following:

*“The Utility will maintain a local response plan for water supply shortages caused by a drought or supply interruption as part of its Emergency Management Plan for emergency preparedness. The Plan will be consistent with other regional purveyors’ planned response(s), and with contractual agreements. The Plan’s objectives will include ensuring that, to the extent possible, the essential needs of its customers are met.”*

- Our Water System Plan policies require us to retain 24 hours of storage within our local system (not including the regional system). Beyond the 24 hours of local storage, we are dependent on our emergency sources of supply (e.g., groundwater) and the regional system (i.e., SPU's system) to provide water through regional storage, such as the Eastside Reservoir, which is located within our service area.
- Aside from fire fighting, we would perform public outreach requesting that our customers lower their usage (e.g., no irrigation) to reduce the water supply demand during the first 72 hours.
- Utilities owns an Emergency Drinking Water Supply System (EDWSS-Blivet) that it acquired through the Department of Homeland Security (DHS) and 2006 UASI grant. The EDWSS consists of two 3500 gallon bladders, a pump and generator, water bag filling table, 25,000 individual water distribution bags, assorted filling hoses and disinfection equipment. The blivet is

intended for regional emergency water supply. We would position the blivet at or near reservoirs and/or community centers for point-distribution of either treated or untreated water. Chlorine tablets would be provided for disinfection if the water is untreated.

- Utilities owns 4 wells which are approved for emergency use by DOH. We have some work to do to get the wells to a state of readiness for an emergency, and we are in the early planning phases for improvements to the wells. Once the improvements are completed, the wells could be activated to provide point-distribution of untreated (or potentially treated) water. Chlorine tablets would be provided for disinfection, if necessary. We plan to complete our Emergency Water Supply Master Plan in 2019, which will specify improvements to our existing wells and will evaluate the potential to add more wells.
- Utilities does not have arrangements with local bottling plants.
- Utilities does not currently have hardened lines to hospitals or shelter sites. This will likely come out of a recommendation through our Seismic Resiliency Plan (currently in development).

Please circle all that apply or specify others:

- A. Response time: **Response time can be within minutes, depending on the situation.**
- B. Operational approach:
- a. Watering stations **Yes**
  - b. Mobile water treatment plant (Blevits?) **Yes**
  - c. Tanker trucks **No**
  - d. Hardened mains **No**
  - e. Local bottling plants (coke, pepsi, etc) **No contracts in place; coca cola has a bottling plant in Bellevue.**
  - f. Bottled water **No contracts in place**
  - g. Others, please specify
- C. Locations:
- a. Hospitals **Yes**
  - b. Shelters, **Yes**
  - c. Others, please specify

2. For each regional utility (or Cascade Member), where does the provision of drinking water fit within the prioritization of all planned response actions following the emergency event?

The provision of drinking water is at the top of our planned response actions following an emergency event. See above response for further detail of the City's policies.

Water Supply Forum Cascade Member Organization Survey

**Kirkland**

3. What is each regional utility’s (or Cascade Member’s) understanding of its responsibility and capacity to provide drinking water to the public to meet basic human needs immediately after the emergency event (first 72 hours)? What operational approach do you plan to use in carrying this out? (Note, this may include a wide range of tactics that may differ from utility to utility: watering stations; bleivits; tanker trucks; hardened mains to select hospitals or shelter sites; arrangements with local bottling plants; or other distribution of bottled water; etc.) Will your actions be limited to shelters, or also extend to other sites? Will you supply hospitals?

Depending on the severity of the emergency event 3 to 7 days could be realistic but 10 to 14 days if all SPU supply is compromised and we need to rely on tanker trucks from neighboring and/or federal agencies. Bottled and/or tanker supplies, established in advance, will be set up at a number of community locations to serve neighborhoods that are out of distribution system water.

Kirkland water system does not currently supply any hospitals but it will be important for the City to coordinate with Northshore Utility District who does serve Fairfax Mental Hospital and Evergreen Hospital.

Kirkland maintains a document called the *2004 Emergency Response Plan, Section 5 - Action Plan* that outlines emergency severity levels and water supply timelines, as well as alternative sources as part of Kirkland’s complete water system emergency plan. This needs to be updated but is a base reference document for Kirkland’s water system.

Please circle all that apply or specify others:

- D. Response time: 72 - 240 Hrs.
- E. Operational approach:
  - a. Watering stations
  - b. Mobile water treatment plant (Blevits?)
  - c. Tanker trucks **Yes**
  - d. Hardened mains
  - e. Local bottling plants (coke, pepsi, etc)
  - f. Bottled water **Yes**
  - g. Others, please specify

F. Locations:

- a. Hospitals
- b. Shelters, **Yes**
- c. Others, please specify

**Peter Kirk Community Center, North Kirkland Community Center, Salt House Church, Kirkland Fire Stations, Kirkland Public Works Maintenance Center, Northwest University**

4. For each regional utility (or Cascade Member), where does the provision of drinking water fit within the prioritization of all planned response actions following the emergency event?

**Drinking water supply will be the top priority along with determining shelter safety and structural integrity.**

Water Supply Forum Cascade Member Organization Survey  
**Redmond**

5. What is each regional utility’s (or Cascade Member’s) understanding of its responsibility and capacity to provide drinking water to the public to meet basic human needs immediately after the emergency event (first 72 hours)? What operational approach do you plan to use in carrying this out? (Note, this may include a wide range of tactics that may differ from utility to utility: watering stations; blivits; tanker trucks; hardened mains to select hospitals or shelter sites; arrangements with local bottling plants; or other distribution of bottled water; etc.) Will your actions be limited to shelters, or also extend to other sites? Will you supply hospitals?

We are interested in watering stations that could be set up at Redmond well sites or off the Sammamish River or Lake Sammamish. We don’t believe tanker trucks are useful as equipment assets in our fleet, they would sit most of the year, however rental tankers would assist if they could be filled at those stations and then water delivered to hilltop residential community sites. We do have a hospital nearby (Evergreen) which is served by Northshore Utility with triple redundancy however, if the main Tolt line is down it will not function. We may need to support by trucking water to hospital. We do have shelter sites needing water services including a regional shelter site that King County will manage at Marymoor Park and it will most likely serve Redmond residents as well.

We have a Costco and other large business facilities that may be helpful and we are near the Coca-Cola bottling site in Bellevue (not far from Redmond). We have multiple breweries in our city and expect they may be useful for some support.

Please circle all that apply or specify others:

G. Response time: \_\_\_\_ Hrs.

H. Operational approach:

- a. Watering stations **Yes**
- b. **Mobile water treatment plant (Blivits?)**
- c. **Tanker trucks (rental) – we have (3) large educator (Vactor) trucks that can haul water. One is not sanitized and serves wastewater.**
- d. Hardened mains
- e. **Local bottling plants (coke, pepsi, etc)**

- f. Bottled water – Costco and we are installed rain barrels at our mtc. Center. May install more.
  - g. Others, please specify
  
- I. Locations:
  - a. Hospitals **Yes**
  - b. Shelters, **Yes**
  - c. Others, please specify
  
- 6. For each regional utility (or Cascade Member), where does the provision of drinking water fit within the prioritization of all planned response actions following the emergency event?

Provision of drinking water is high priority and fits within the Public Works Emergency Response Plan for our Water Division. We are drilling water division emergency events and including working with Drone pilots to evaluate our reservoir on Tolt Hill.

Water Supply Forum Cascade Member Organization Survey  
**Sammamish Plateau Water**

1. What is each regional utility’s (or Cascade Member’s) understanding of its responsibility and capacity to provide drinking water to the public to meet basic human needs immediately after the emergency event (first 72 hours)? What operational approach do you plan to use in carrying this out? (Note, this may include a wide range of tactics that may differ from utility to utility: watering stations; bleivits; tanker trucks; hardened mains to select hospitals or shelter sites; arrangements with local bottling plants; or other distribution of bottled water; etc.) Will your actions be limited to shelters, or also extend to other sites? Will you supply hospitals? **SPWSD supplies around 80-90% of its water supply through its independent groundwater well supplies, and receives approximately 10-20% of its water from the regional system. SPWSD has a redundant system. In early 2018, SPWSD Water Operations developed some “strawman” estimates of emergency levels of service goals below:**

<b>Sammamish Plateau Water – Estimated Emergency Level of Service Goals</b>							
<b>System Component</b>	<b>Service Provided</b>	<b>Immediately After</b>	<b>24 hours</b>	<b>72 hours (3 days)</b>	<b>7 days</b>	<b>14 days</b>	<b>1 month</b>
<b>Water supply</b>	Supply transmission systems from Tolt via Bellevue and Issaquah. 12 operating wells. Reservoir for filling water trucks.	Windshield Surveys - Damage assessments initiated.					
	Quantity	BIP out of service. 100% AWD	BIP out of service. 100% AWD	BIP out of service. 100% AWD	BIP out of service. 100% AWD	BIP in service. 100% AAD	BIP in service. 100% AAD
	Quality	Water non-potable to potable.	Water non-potable to potable.	Water quality potable.	Water quality potable.	Water quality potable.	Water quality potable.

Transmission to end points		BIP out of service. Plateau wells functioning at AWD at 100% AWD	Plateau wells operating at 100% ADD	Plateau wells operating at 100% ADD			
Transmission/supply to major regional essential services	Service to essential customers.	All assisted living facilities and designated shelters 100% AWD.	100% AWD	100% AWD	100% AWD	100% ADD	100% ADD

Please circle all that apply or specify others:

A. Response time: Staff response time is estimated to be between 1 to 2 hours, but this will vary due to the severity of incident, highway and road access to our facility and staff availability. Many of our staff members have to travel long distances to get from their homes to our headquarters facility. The SPWSD Operations Department is looking at options to secure faster staff response times if possible.

B. Operational approach:

- a. Watering stations: SPWSD has a water table with 12 spigots made out of 2 ½” PVC pipe, with an inlet to connect a 100 foot 2 ½” fire hose that staff can attach to a fire hydrant.
- b. Mobile water treatment plant (Blevits?): SPWSD could utilize the blivet system and an emergency hose reel system that Bellevue purchased using federal grant funding, if it is available. The assets are stored in Bellevue, but they are considered to be regional assets as a contingency of the grant funding and are available to anyone in the region who needs them during a water emergency. The blivet system is a water distribution table utilizing a large water bladder, or blivet. Bellevue’s blivets are four separate bladders that can fit in the beds of 5-yard dump trucks. Seattle Public Utilities also has a large blivet bladder on a semi-truck flatbed trailers that may also be available to SPWSD during emergencies.
- c. Tanker trucks: SPWSD is investigating options with the Washington Department of Health and potable water truck vendors regarding the use of the trucks for emergency water distribution.
- d. Hardened mains: SPWSD conducted seismic studies in 2014 and 2017 to identify and address vulnerabilities in our system, especially those facilities and pipelines within the liquefaction areas. In 2017, SPWSD

installed an earthquake valve on our 7 MG tank that shuts off automatically (with manual backup) during a seismic event. The District is also reassessing alternatives to utilize seismically resistant supply pipe to the 650 zone.

- e. Local bottling plants (Coke, Pepsi, etc.) SPWSD is aware of the Coca Cola bottling plant in Bellevue. SPWSD may consider further investigation of access to bottled water through this company for emergency use.
- f. Bottled water: SPWSD is looking into securing bottled water sources from Costco in Issaquah and other local vendors during emergency incidents.
- g. Others, please specify

C. Locations:

- a. Hospitals: There are no hospitals in the SPWSD service area. There is one skilled nursing facility (Providence Marionwood) that could serve as a hospital during a major emergency. SPWSD has identified all critical facilities within our service territory, and we intend to prioritize service restoration to these facilities.
- b. Shelters: The City of Sammamish is responsible for setting up and staffing shelters. SPWSD will prioritize water service restoration to these facilities.
- c. Others, please specify

- 2. For each regional utility (or Cascade Member), where does the provision of drinking water fit within the prioritization of all planned response actions following the emergency event? SPWSD is a special purpose district that only provides water and sewer services to its customers. SPWSD prioritizes water service over sewer service during emergency incidents.

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