



**Joint Meeting of Water System Advisory Committee (WSAC)
and Creeks, Drainage, and Wastewater Advisory Committee (CDWAC)**

**November 18, 2015 Meeting Notes
Seattle Municipal Tower, 700 Fifth Avenue
Room 4901
5:30 pm – 7:30 pm**

Committee Members & CAC Staff	Present?	SPU Staff & Guests	Role
WSAC		Alex Chen	SPU Water Planning and Program Manager
Tom Grant	N	Madeline Goddard	SPU Drainage and Wastewater Deputy Director
Chelsea Jefferson	N	Bill Heubach	SPU Water Planning and Program Management Division
Kelly McCaffrey	Y	Andrew Doss	Guest
Kyle Stetler	N	Melissa Levo	Guest
Rodney Schauf	Y	Ann McKinney	Guest
		Faon O'Connor	Guest
CDWAC		Evan Osborne	Guest
Kendra Aguilar	N	Teresa Stern	Guest
Marilyn Baylor	Y		
Suzie Burke	Y		
Chris Clark	Y		
C'Ardiss Gardner Gleser	N		
Schylar Hect	Y		
Patrick Jablonski	Y		
Kaifu Lam	Y		
Seth McKinney	Y		
Noel Miller	Y		
Devin O'Reilly	Y		
Heidi Fischer, CAC Program Support	Y		
Joan Kersnar, WSAC Acting Policy Liaison	N		
Sheryl Shapiro, CDWAC Policy Liaison and CAC Program Manager	Y		

Regular Business

- Committee Members, SPU staff, and guests introduced themselves.
- CDWAC/WSAC October meeting notes are not yet ready for Committee review. They will be distributed in advance of the December meeting.
- Sheryl, the CDWAC Liaison and CAC Program Manager, will be sending out a 2016 draft workplan discussion document.
- We will wait to plan the Committees' meeting schedule until learning Julie's (the WSAC Liaison's) schedule (which we will know soon).
- We will soon be having discussion about whether CDWAC and WSAC will continue to have joint meetings, and if so, what regular meeting day they will have.

Water Supply Update, Alex Chen, Water Planning and Program Manager

- We've transitioned quickly from drought management to flood management.
 - Alex referred to a graph that showed that cumulative precipitation is now above normal, bringing our reservoir storage (shown on another graph) back up to normal conditions.
- The 2015 water year (which ended in September) left us about 15- inches short of normal precipitation.
 - Along with Everett and Tacoma, we activated our water shortage plan and asked our customers to voluntarily reduce their water usage by 10%.
 - Our customers met and exceeded this goal.
- Sometimes we don't get fall rains until December or January, and the current El Nino pattern had storms coming close to us, but then splitting to go north and south of us.
 - But things have changed.
 - We've had lots of rain in the last couple of weeks: 10 inches around Halloween in 3 days, then another 10 inches last weekend.
 - Now our reservoir storage is above normal, and we are in flood management.
 - To minimize floods, we want to have room in the reservoirs to catch and store rain, and then let it out after the storm passes.
 - To do this, we keep reservoir storage down by about 10-15 billion gallons (compared to maximum storage levels).
- People often ask why we got such hot weather and low snow pack in 2014, and what will we do if it happens again.
 - Some possible explanations are:
 - Ocean conditions led to a high-pressure ridge forming off the NW coast. This prevented mixing of cool bottom ocean water with warmer surface water, which led to The Blob (high-temp areas of water). The Blob in turn caused higher temperatures here in the Pacific Northwest.
 - However, the Super El Nino weather pattern that is also currently active could lead to lower pressures and more mixing off of the Pacific NW Coast. This may "destroy"

the Blob by allowing more typical mixing of colder bottom ocean water with the warmer surface water.

- Right now we may not see the full effects of the Super El Nino until after January 1.
 - The forecast for 2016 is for more precipitation and lower temperatures than 2015.
 - The Sea Surface Temperature Forecast for April, May, and June calls for some cooler than normal water developing and some reduction in the warm water areas.
 - The precipitation forecast for January, February, and March (months when we are typically in flood management) is drier than usual.
 - The precipitation forecast for April, May, and June (months when we are refilling our reservoirs for the summer) is a bit wetter than usual.
 - But if conditions and/or forecasts change, we will refill the reservoirs early, like we did 2015.
- ❖ Committee Member Question: So we will be saving water sooner if predictions change?
- Answer: Definitely. Dynamic is a key word for us. The less precipitation that we see and that's forecasted, the earlier we will refill the reservoirs.

SPU Post Earthquake Water System Performance Goals, Bill Heubach, SPU Water Planning and Program Management Division

- Bill is here to introduce the concept of post-earthquake performance goals for the water system.
- Bill referred to a power point presentation, and began by discussing some examples of how specific earthquakes have impacted the water system.
 - Loma Prieta (60 miles from San Francisco), 1989
 - M6.9 (epicenter 60 miles south/southeast of San Francisco)
 - Approximately 1000 watermain breaks
 - Water system damage mostly in areas of poor soils
 - Water outage durations usually less than a few days
 - Fire suppression water was an issue in Marina District
 - Northridge (Los Angeles), 1994
 - M6.7 (previously unknown fault)
 - Over 1000 water main breaks
 - Over 100 fires
 - Water system damage mostly in areas of poor soils
 - Outage durations over 8 to 13 plus days
 - But it took 6 years to restore the water system to 99% of its pre earthquake functionality.
 - The system operated, but with no redundancy.
 - Water coming out of the tap does not mean that the system is fully functional.
 - Kobe (Hyogo-Ken Nanbu), Japan, 1995

- Over 1700 Pipe Breaks Just in Kobe
 - 109 Kobe Fire Ignitions Immediately After Earthquake (Another 88 in Surrounding Cities)
 - 60 Days Plus for Restoration of Service
 - Christchurch, New Zealand, 2011
 - 1645 Water main Breaks (February 2011 Earthquake) in Christchurch
 - Limited Number of Fire Ignitions
 - 45 Days Plus for Restoration of Service
 - Tohoku, East Japan, 2011
 - Included a giant tsunami
 - Water systems of over 180 municipalities affected
 - 345 fire ignitions
 - 45 days + for substantial restoration of service
 - Special earthquake resistant pipe that is used in some areas in Japan had zero failures. However, this kind of pipe is more expensive. Other areas use different kinds of pipe, and of those, there were over 500 failures.
- Then Bill reviewed the three kinds of earthquakes that can occur in the Puget Sound area.
 - 1) Shallow fault earthquakes
 - Because these are so close to the surface, even moderately-sized (e.g., magnitude 6.0) earthquakes can cause lots of damage.
 - The Seattle Fault, which is actually a mile plus wide zone of shallow faults, runs directly through Seattle and Bellevue. The last major earthquake on the Seattle Fault occurred 1100 years ago. The discovery that the Seattle Fault zone is active has been a game changer for seismic planning, as we now know that big and destructive earthquakes from shallow faults do occur in this region.
 - 2) Subduction zone
 - The largest earthquakes ever recorded are subduction zone quakes. Here, the Juan de Fuca plate (in the ocean) subducts below the North American plate. Subduction earthquakes occur here every 500 years or so, on average, and the last one was 300 years ago. This kind of quake could be as large as a magnitude 9.0 and would likely result in a tsunami along the Washington coast.
 - 3) Deep earthquakes
 - These occur deep below the earth's surface in the Juan de Fuca plate where it is being subducted below the North American plate. These occur about every 30 years, and the last one was the 2001 Nisqually quake.
 - The 2001 Nisqually Earthquake resulted in 19 pipe breaks, but minimal to moderate impact on SPU facilities, and no effect on the water system functionality.
- SPU has taken numerous steps to assess our water system's vulnerability in an earthquake.

- We've done several studies, beginning in 1990.
- We've identified areas of the system that are most vulnerable.
 - Bill referred to a map that showed the Puget Sound region color coded by liquefaction susceptibility. The map also showed areas that are known or potential landslides, as well as the Seattle fault lines. SPU's water system transmission pipelines are then drawn over this map.
 - Some supply lines from the Tolt and Cedar run over areas that are highly susceptible to liquefaction, and some run through active fault zones.
- If a Seattle fault earthquake occurred today that resulted in 6-7 feet of movement, we estimate that our water system's performance would be similar to Kobe and Christchurch.
 - We expect a loss of at least the Cedar System, and possibly the Tolt, more than a thousand distribution breaks, reservoirs drained, and water pressure loss.
 - It will take 3-7 days for partial restoration, approximately 14 days to get 50% of the system back online, and 1-2 months for substantial restoration.
- Having water to fight fires is a big concern after an earthquake. Fires after an earthquake are a concern, especially if water lines break, and water is not available to extinguish them.
- In a 7.9 magnitude San Andreas Fault earthquake, authorities estimate that they could restore basic water supply function in a month, but water would be rationed for 15 months after the earthquake while additional repairs were made.
- When we've surveyed stakeholders about their expectations for post-earthquake water system performance, there seems to be a disconnect between expectations and reality.
 - No water utility has been able to restore the system in 3 days following a major earthquake, though this is often what people expect.
- We want to have specified, realistic performance goals so that people can plan accordingly.
 - Actions required to meet performance goals will cost money, and we want to be clear about what our ratepayers will get for their investment.
 - These goals will define water availability and water service restoration time after an earthquake, so that we can establish acceptable water system post-earthquake performance, define seismic program objectives, and provide others with expected system performance so they know what to expect and prepare for.
 - The Fire Department needs to know that water will be available to fight fires in an earthquake.
 - We may plan to provide water to them at specified locations.
 - As a sample, San Francisco's Public Utility has established the following goals:
 - "The basic "Level of Service" criterion shall be to deliver winter day demand (WDD) of 215 million gallons per day (MGD) (February 2030 demand) within 24 hours after a major earthquake.
 - Deliver WDD to at least 70% of SFPUC wholesale customers' turnouts within each of the three customer groups (Santa Clara/Alameda/South San Mateo County, Northern San Mateo County, and City of San Francisco).

- Achieve a 90% confidence level of meeting the above goal, given the occurrence of a major earthquake.
 - East Bay Municipal Utility District in California has also established some performance goals.
 - They plan to restore impaired water service to 90% of customers in 3 days (unless it's a major earthquake, in which case the goal is minimum service to 70% of customers within 10 days).
 - Oregon also has some performance goals:
 - They plan to restore the system's components to 50-60% operational power in 1-3 days, 80-90% operational power in 1-2 weeks, and 6-12 months to restore the system to where it was before the earthquake.
- SPU is soliciting comments from stakeholders (including CDWAC and WSAC) about what our post-earthquake performance goals should be.
 - We've met with the Mayor's Emergency Executive Board, the Fire Department, and other groups. We are also seeking input through a survey of the public and our direct service customers, from the operating boards of our wholesale customers, from city leadership, and from the SPU Water Line of Business staff.
 - This is an iterative process.
 - People may be surprised at the cost required to prepare the system to meet certain performance goals. If the cost is prohibitive, we may need to wait and revisit this issue at a later date.
 - Bill will be coming back to CDWAC and WSAC at a later date to formally ask for comments.
- Bill showed tables with draft SPU performance goals for 2035 and 2065.
 - It's unrealistic to replace a lot of distribution lines with earthquake resistant pipe in 20 years. This will happen slowly, over time.
 - In 2035, in a surface fault or Cascadia subduction event, the draft goal is to have drinkable water available at normal levels for most customers within one month (non-drinkable water would be available to 50% or more customers sooner).
 - By 2065, the goal would be to supply drinkable water at normal levels within 14 days for most customers.
- The schedule going forward is:
 - Consultant and Stakeholder Review
 - May 1, 2015 through October 31, 2016
 - Development of Mitigation Options/Costs to Meet Performance Goals
 - June 1, 2016 through July 31, 2016
 - Modification of Performance Goals to be Consistent with Seismic Study Findings
 - July 1, 2016 through September 30, 2016
 - Final Performance Goals
 - November 1, 2016

- ❖ Committee Member Question: How did SPU come up with these numbers? Was it based on a formula or on specific scenarios, like we will need 75% of the water supply?
- Answer: It was based on a combination of both. We considered our understanding of our system's vulnerability and the available resources. We thought about the damage that would likely occur and what we could do under those circumstances. We know we will have to isolate some areas of the distribution system so they don't damage other areas. We also based our goals on what other utilities have done and on consultations with our field personnel. We used some analysis and some engineering judgement.

- ❖ Committee Member Question: When the draft performance goals indicate that 50% of service will be restored, what constitutes 50%?
- Answer: Of the total number of SPU's retail customers, the goal would be to supply water to 50% of them.

- ❖ Committee Member Comment: For me, as a user of the water system, having a goal of supplying water to 50-60% of customers is not very meaningful. What would be more helpful is hearing SPU's strategies, like, when X happens, we will do Y. Perhaps a plan similar to what Seattle City Light has for power outages. Percentages of customers served are good motivation for the public to get their emergency kits ready.
- Response: Another part of our plan is to concentrate on critical facilities. The Tolt and Cedar Systems will be our highest priorities. We also hope to quickly repair the distribution system. Seattle City Light is a good analogy.

- ❖ Committee Member Comment: More information would be helpful, with more maps about where you can expect the heaviest damage.

- Madeline Goddard, the Drainage and Wastewater Deputy Director, explained that the water system is all connected. In an earthquake, we will close valves to isolate leaks, and then identify critical customers (like hospitals) and work first to restore their service.

- ❖ Committee Member Question: Is there automatic shutoff at reservoirs in an earthquake?
- Answer: That is one of the solutions we are considering. But it's not as simple as it might seem. We need water to fight fires. We can shut the reservoirs down at half full but it's not automatic. Some buildings have sprinkler systems. The Fire Department noted that we should consider whether we shut down reservoirs at 50% or 75%.

- ❖ Committee Member Comment: One good way of communicating with the general public about earthquake preparedness is to let them know we have these goals.
- Response: Yes. Based on survey results there's a disconnect between expectations and what's realistically possible, and we need to address this, like we are in this meeting.

- ❖ Committee Member Comment: With regard to the awareness/action disconnect, there needs to be some sort of effort to motivate the public.
- Alex Chen, Water Planning and Program Manager, noted that we can take the results of our studies and use them to inform the public and help them understand.
- Bill explained that there are ways to get drinkable water to people when the system isn't working.
 - For example, Japan drives out giant water balloons to communities in emergencies.
 - There's also tank connection faucets and plastic bag backpacks to carry home.
 - We will be considering these options as part of our emergency plan.
- Sheryl Shapiro, the CDWAC Liaison and the CAC Program Manager, noted that the Committees will need follow up information on emergency preparation. She recently sent out a link to members for "Alert Seattle", and will send out additional emergency preparedness links.
- Bill noted that he heard the Committees' suggestions to refine how we present our goals and to use more maps.
- Bill will be back to get input from the Committees in a month or two. Members can contact him with any questions.

South Park Sewer Back-up Protection, Madeline Goddard, Drainage and Wastewater Director

- Madeline explained that she is here to ask for the Committees' input on providing sewer backup protection for the South Park neighborhood.
- South Park's terrain puts some properties at risk for flooding and sewer backups. SPU will install a new pipe to increase capacity to convey stormwater and sewage in the South Park neighborhood. The pipe will run under 14th Avenue South, between South Concord and South Donovan streets, and west under South Donovan Street to 12th Avenue South. SPU is also building a pump station and a water quality facility in South Park.
- However, these improvements will not completely address the problems.
 - SPU has identified 33 properties that are and will continue to be at risk for sewer backups.
 - So far, 9 backups have been reported.
 - Other backups have likely occurred but were not reported to SPU.
 - Some of the properties identified are occupied by renters rather than homeowners.
- Madeline is seeking the Committees' input in how to address the sewer backup vulnerabilities in these 33 properties.
- SPU can either:
 - Take no action, or
 - Install or reimburse the property owner for installing a backflow valve, ejector pump, or internal plumbing modification.
 - SPU initially considered 17 options, but selected these three as the most viable for further evaluation.
 - A backflow valve is the only option that operates during a power outage.

- A further consideration with internal plumbing modifications is whether they should address more than one bathroom in the home.
 - SPU also needs to consider:
 - Whether installation should be done on private property or in the public right-of-way
 - A backflow valve can be installed in either the public right-of-way or on private property.
 - An ejector pump and internal plumbing modifications both must be installed on private property.
 - Once installed, whether SPU or the property owner will own and maintain the installed equipment.
 - Madeline referred to a graph listing the installation and operating and maintenance (O&M) costs of each option.
 - She noted that SPU has numerous methods of calculating these costs. The graph uses a simple method.
 - Installation costs for each option are similar. O&M costs vary from \$200 to \$930.
- Any action needs to meet SPU's goals of:
 - Protecting public health (here, by preventing sewer backups)
 - Delivering equitable service levels
 - Customers across SPU's service area should receive the same level of service during storm events and/or power outages, as well as protection against rodent intrusion.
 - Therefore, the action taken to address sewer backups in South Park will create an obligation for SPU to address similar problems for all SPU customers.
 - The potential cost of this obligation must be considered when electing an action.
 - Delivering cost effective solutions for ratepayers, and here, for the property owners and renters involved.
- SPU is considering the following criteria in selecting an action:
 - Ease of access
 - Ease of administration
 - Construction risk
 - Future liability risk
 - Equity
- SPU is also considering the following criteria from the customer's perspective:
 - Social equity/Ability to pay
 - Benefit from early installation (the inverse is customer's risk if action is delayed)
 - Level of service from backflow prevention
 - Backup response risk
 - Response risk
 - Construction risk
 - Shared side sewer - Risk of disagreement over costs to install and/or maintain

- One Member noted that the area map Madeline had shown indicated a cluster of houses in the north identified as vulnerable to sewer backups, and asked if it was possible to do one thing to address all of those houses, rather than individual equipment for each.
 - Madeline responded that the cost to do that would be extremely high.
- One Member asked about the program's estimated cost.
 - Madeline reported that SPU has so far projected about one million dollars. However, if we go through the South Park neighborhood, we will likely identify more homes vulnerable to sewer backups. For equity's sake, we must address those homes in the same way. That's why we are asking CDWAC and WSAC to weigh in on this important decision.
- One Member noted that there are areas in South Park where SPU has caused some of the sewer backup problems.
- Madeline noted that the Broadview program was implemented in response to some problems caused by SPU. However, it was only a pilot program, and three participants reported that the equipment failed. Some people forgot to turn it on or maintain it.
- A guest commented that if SPU's system is causing the problem, and the cost is similar, then perhaps it would be best if SPU could fix the larger system rather than involving individual customers' properties.
 - Madeline responded that a capacity upgrade to the larger system is cost prohibitive.
- One Member commented that a pump can add pressure, which may simply move the problem down the line, whereas a backflow valve in the public right-of-way wouldn't do that, and would be part of a regular city inspection program.
 - Another Member agreed, and added that SPU should maintain the backflow valves. He thought the group felt similarly.
 - Another Member noted that while there may still be failures, backflow valves placed as near as possible to the SPU sewer was a good choice.
- Madeline asked whether the Members would differentiate between properties occupied by owners and renters.
 - One Member responded that she would not, if SPU caused the sewer backflow problem.
- Madeline thanked the Committees for their input.

Joint CAC Debrief and CAC Website Discussion, Sheryl Shapiro, CDWAC Liaison and CAC Program Manager

- SPU is working on a redesign of our website.
 - At the October 27th Joint CAC Meeting, Members gave input on topics they would like included on the SPU home page.
- Sheryl asked the Committee Members to think about topics they would like to see on the CAC homepage, as well as the CDWAC and WSAC home pages.
 - Members took a few minutes to write down their ideas individually.

- Then the group brainstormed together, and came up with the following suggested topics for the CAC homepage:
 - Highlights of topics covered at Committee meetings (e.g. Thornton Creek study)
 - Links to each of the Committees
 - Outline of activities of the Committee
 - What's happening at neighborhood level of issues
 - Blog feature
 - Purpose of CACs: relationship to SPU, City
 - Accomplishments
 - Actions
 - Contact information
 - Archived presentations
 - Member bios-
 - Member statements
 - Upcoming topics/workplans
 - Upcoming opportunities for public to interact with SPU
 - Upcoming CAC meetings
 - Recruitment: Highlight geographic representation of members and openings
 - Extend opportunity to to the public to provide input on selected topics

Meeting adjourned, 7:25pm.