



Flood water, contaminants, and your health: Additional information and resources

Background:

Flooding in South Park during the December 2022 king tide event raised community concerns about possible chemical contaminants and sewage from backups or CSOs in the flood waters. At the request of community members, Seattle Public Utilities (SPU) collected flood water samples for lab analysis on December 28th.

What was tested?

Bacteria in indoor flood water: Two homes were tested for E.coli bacteria in basement flood water and one home's tap water. E. coli bacteria live in the intestines of all warm-blooded animals, including people, dogs, geese, and ducks, and are present in feces. We test for unusually high levels of E. coli bacteria to predict the risk of getting sick from germs that might be in the water. There are many different types of germs that can come from feces (bacteria, viruses, parasites, etc.), and it is not possible to test for each one. Instead, we test for one group of bacteria that is easy to measure and is commonly used to predict the overall risk of getting sick.

Contaminants in outdoor flood water: Two water samples were collected by SPU and assessed for the presence of Polychlorinated Biphenyls (PCBs), heavy metals, and diesel and motor oil range hydrocarbons. These contaminants are known to be present in the Duwamish waterway sediment, and more widely in urban and industrial stormwater.

Where were samples collected?

Flood waters in the area began to go down within 2 hours after the peak of the king tide. When SPU staff arrived in South Park to collect samples the following day, flood water had mostly drained from the streets leaving flood water only in low areas. SPU collected samples at four locations:

- 1. Chemical Sample 1:** A puddle on the SW corner of S Austin St/S Riverside Drive
Site characteristics: The puddle was a slow draining area, near an area with industrial use and suspected PCBs in building material. SPU is tracing PCB sources in this area, which will allow SPU to then work with industrial sites in the area to prevent or reduce PCB releases into the environment.
What was found: Copper, zinc, PCBs, motor oil, and diesel were detected. The copper, zinc, motor oil, and diesel are commonly found in stormwater runoff associated with road traffic in urban areas.
- 2. Chemical Sample 2:** A storm drain in the SW corner of 8th Ave S/S Chicago St
Site characteristics: This storm drain is where flood water from the neighborhood was confirmed to have drained into, and was nearest to the impacted homes. This storm drain has a compartment, called a catch basin, designed to collect garbage, sediment, oil, and other debris, where flood water had pooled.
What was found: Copper, zinc, and motor oil were detected.



3. **Bacteria Sample 1:** Three samples taken from the basement of a residence near S Kenyon St and 8th Ave S.
Site characteristics: Two samples taken from pooled water on the floor of the basement and a sample of tap water from a sink tap in a bathroom.
What was found: Sample taken from basement bedroom floor had elevated *E. Coli*, while basement hallway floor sample and tap water did not find *E. Coli* present.

4. **Bacteria Sample 2:** Two samples taken from the basement unit of a residence near S Chicago St.
Site characteristics: One sample taken from kitchen floor puddle and another from a crawl space in the lower residential unit.
What was found: Elevated *E. Coli* found in both samples.

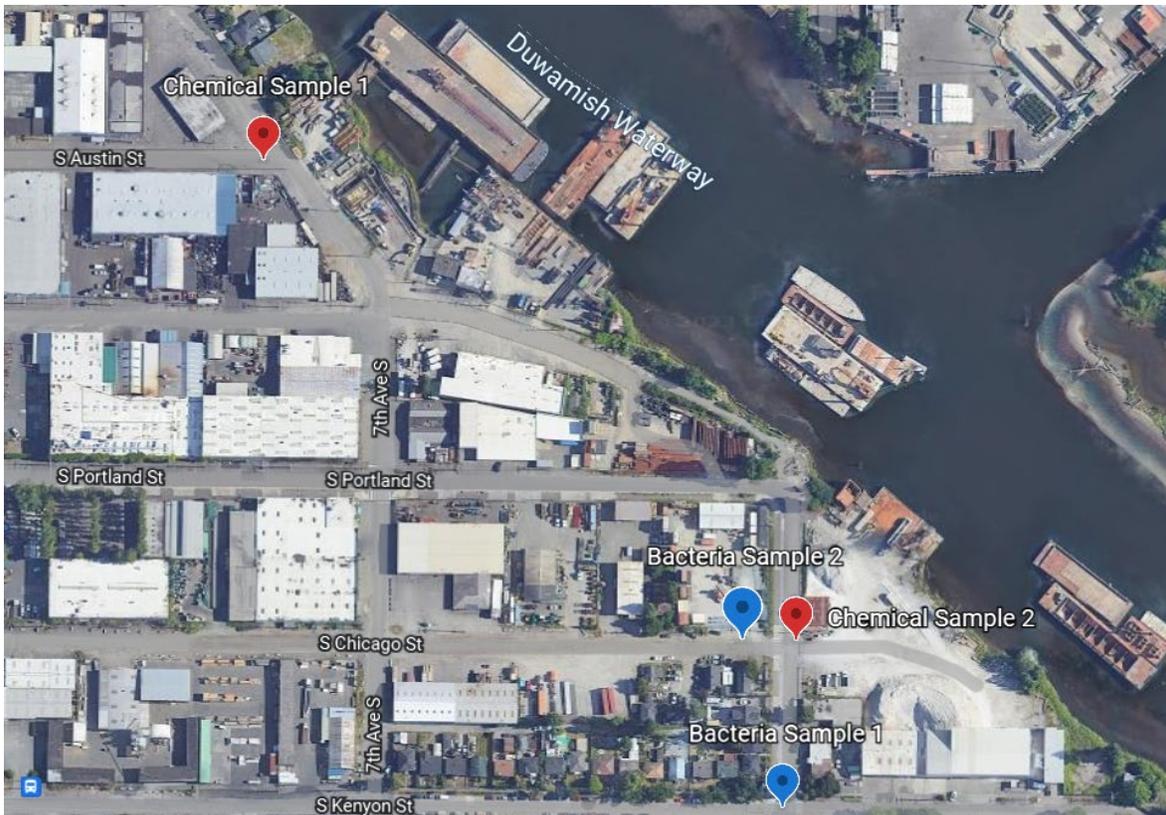


Image 1. Map of water sample collection sites.



What was detected in the water samples?

Chemical tested	Notes	Detected - Sample 1 Near industrial area	Detected - Sample 2 Near homes	Detected – Bacteria 1, near S Kenyon St	Detected - Bacteria 2, near S Chicago St
PCBs	Found in waterway sediment, associated with electrical transformers, hydraulic equipment, and older building materials	Yes	No	N/A	N/A
Metals	Found in waterway sediment, associated with roads and stormwater, naturally found in soil and water				
Copper		Yes	Yes	N/A	N/A
Zinc		Yes	Yes	N/A	N/A
Hydrocarbons	Associated with roads and use of vehicles				
Diesel range		Yes	No	N/A	N/A
Motor oil		Yes	Yes	N/A	N/A
E. Coli Bacteria	Found in human and animal wastes, associated with wastewater systems, encampments, and sewage contamination of soil and water	N/A	N/A	Yes	Yes

What does this data tell us?

- **Bacteria were at levels that indicate potential presence of animal or human feces:** The elevated levels of *E. coli* found in some samples of flood water in homes is a potential indicator of animal or human feces in the flood water. However, one home had samples that had no detectable *E. coli* in one location, but detectable counts in another room. It is difficult to know where the *E. coli* counts came from as the flood waters could be contaminated with *E. coli* from pets in the home, flood waters that came out of the home toilet, sewage in the flood waters, and human and animal waste picked up from the land that the flood waters moved through.
 - **Health risks based on bacterial measures:** *E. coli* counts are an indicator that additional microbes may be present in the flood water that could be harmful for health, requiring cleaning and removal of materials affected by flood water.
 - Professional cleaning, post-flood mitigation services, and bacterial testing were offered to all homes impacted by flooding, and have been completed for all homes that requested the services. Please call Seattle Public Utilities at (206) 684-0912 with any questions.



- If you are exposed to water contaminated by *E. coli* bacteria, symptoms can include: fever, headache, body aches, tiredness, nausea, vomiting, abdominal cramping, and diarrhea. Talk to your healthcare provider if you have symptoms after potential exposure to flood water.
- If you do not have a healthcare provider contact the Community Health Access Program (CHAP) at 1-800-756-5437, or email chap@kingcounty.gov

Chemicals found at low levels. Testing showed that chemical contaminants found in the water samples were at low levels.

- **Touching water:** Testing showed that chemical contaminants found in the water samples were far below screening levels for potential health risks from exposure through skin contact with flood water.
- **Swallowing small amounts of water:** If you swallowed some of the flood water by splashing or touching your mouth, the amount would be small and chemicals present are not at levels that would cause health effects. As with humans, pets are not likely to have health effects from exposure to the flood water. Talk to your veterinarian if you have any concerns about your pet.
- **Inhaling chemicals from the water:** The metals detected in the flood water do not move from water to the air. PCBs and some motor oils and diesel can evaporate, but the concentrations detected in the flood water were very low and would not measurably contribute to normal levels in the air that come from boats, cars, and other industrial sources in the area.

What we don't know:

While the chemical data give us a general idea of potential conditions in flood water, there are uncertainties we acknowledge.

- The sampled water may be different from the flood waters people were exposed to in their homes.
- People were exposed to flood waters for varying times. For testing purposes, we assumed that people were exposed to flood water by skin contact for up to a total of 10 hours. This exposure was compared to a level of chemicals that would cause health risks. While this is a longer period than what most residents experienced, even if exposure was twice as long (20 hours), the chemical levels in the flood waters were so low that we do not expect any risk of health effects.
- Chemicals analyzed (PCBs, metals, and oils) were chosen because they are commonly found across urban and industrial areas and in the Lower Duwamish Waterway Superfund site. It is not possible to test for every possible industrial chemical and other chemicals found in household hazardous materials. These may or may not have been present in flood waters.