



Frequently Asked Questions – West Point Treatment Plant Restoration

What caused the flooding in the plant?

Engineering firm CH2M conducted an independent forensic analysis to piece together the sequence of events that occurred at the West Point Treatment Plant when equipment failure and high flows contributed to serious flooding early on February 9, 2017.

An intense storm with heavy rain was sending maximum flows of 440 million gallons per day into the plant.

The problem began with an instantaneous fault in the electrical systems in the effluent pumping station. This caused one of the power feeds to shut down, which led to all the pumps shutting down. These pumps help move treated wastewater -- or effluent-- out of the treatment plant and out into Puget Sound.

During this time, the plant operators were trying to hold flows inside the plant to allow the electricians to restart the pump station and avoid a raw sewage bypass. One of the operators was relying on an automated system that was measuring the level of the water in the primary treatment tanks. When this automated system senses levels are within one foot of the top of the tanks, the raw sewage pumps automatically shut down and the emergency bypass gates automatically open. However, these level sensors, also called float switches, did not work. If they had worked properly, the flooding would not have happened.

The time between when an electrical failure occurred in the effluent pumping station and when the primary tanks first started to overflow was only 12 minutes. The weather did not cause the bypass and flooding, but it contributed significantly largely because at this rate of flow we have so little time to respond to any problem.

We have a theory about why the float switches did not work. They are routinely inspected and cleaned and go through a testing procedure, but we think they may have become bent during maintenance, causing too much friction in the device that prevents them from floating.

We have examined numerous components in the electrical system and have yet to pinpoint the exact piece of equipment that could have caused this fault. We have done extensive testing and investigation of the incoming power. Our attention for several weeks had been focused on a transformer, but the results from transformer oil testing that came in late last Friday did not implicate that piece of equipment. Our attention has now shifted to a relay switch and we will continue to trace through the system until we find the source of the problem.

How much wastewater overflowed during the bypass?

The power outage resulted in a 19-hour emergency bypass in which an estimated 180 million gallons of stormwater and wastewater overflowed during the 19 hours that the plant was offline. In the days after partial wastewater treatment resumed late on Feb. 10, heavy rains prompted two additional emergency bypasses that discharged about 55 million gallons of stormwater and wastewater over 20 hours.

What was the role of the operations crew in the overflow?

The independent forensic analysis clearly points to a combination of electrical system and equipment failure. The operations crew members on duty that night are all highly skilled, trained and licensed professionals with extensive experience and emergency training, and the analysis determined they properly followed procedures to protect the plant and the environment.

How bad was the damage?

Unlike wastewater treatment plants damaged in storms or natural disasters, the infrastructure for secondary treatment remains intact, as do all the lift stations. Mechanical equipment has been salvaged and restored, and electrical wiring and systems can be replaced. A tremendous amount of progress has been made on electrical and mechanical repairs, and our focus now will be restoring the biological process that allows us to treat wastewater to the standard required in our environmental permits.

What is the time estimate for full restoration of the treatment plant?

We have set April 30 as the date to restore our secondary treatment process, and this will take time to accomplish. First, the flood badly damaged the boilers that provide heat at the plant as well as heat to our secondary treatment process microorganisms that live inside digesters, which are heated to 98 degrees and function very similarly to a human digestive system. Without heat since Feb. 9, these micro-organisms have been idle.

Boiler repair will be completed by March 17 and will again be a needed heat source, but our biology experts will need to assess the health of the micro-organisms inside the digester. We have not experienced a situation where our digesters have been dormant for several weeks and the secondary treatment process was in hibernation. Cultivating the microorganisms in the digesters will be a delicate balance of time, testing and biological expertise. It's critical this step is completed properly, or we risk seriously damaging our secondary system and delaying its recovery for several months instead of weeks.

How much will the repairs cost? Who will pay for it?

Restoring the plant to normal operation is our top priority, and we're committed to investing the resources to get it done as quickly and efficiently as possible. Preliminary estimates put this figure at about \$25 million, and we expect insurance to cover a significant portion of the costs.

Has this ever happened before? How often does the plant treat such high flows?

West Point is designed to handle peak flows of 440 million gallons of stormwater and wastewater during the wet winter months. It is normal for the plant to reach this capacity during very heavy rains, which occur several times a year. During severe storms or emergencies, redundancies in our system enable us to send flows to other plants to protect workers and equipment.

What happens if it rains again? Is another bypass likely?

We have restored treatment capacity to about 250 million gallons per day, which is more than twice the capacity needed to treat flows into the plant at this time of year.

Rainfall amounts of one inch or more within several days in Seattle could lead to flow levels that would exceed the plant capacity, and in that situation, a bypass is possible.

If rain is in the weather forecast, West Point plant operators will carefully monitor precipitation levels and flow rates with the goal of avoiding a bypass. The Department of Ecology recently reviewed our temporary wet-weather plan that will enable operators to divert flows other portions of the system, including the Elliott West and Carkeek combined sewer overflow treatment plants.

If a bypass occurs, we will notify the media and the public as quickly as possible, post affected beaches as closed, and inform health and regulatory agencies.

How will you make sure this does not happen again?

The completed forensic analysis has already prompted internal review of our operation and maintenance procedures. Going beyond this, we have also commissioned an independent review to be completed by the civil engineering firm Woodard and Curran to take a deeper look at our operational practices, on and before Feb. 9. The firm has extensive expertise in public utilities, water and wastewater infrastructure, utility operations and maintenance as well as permitting and compliance. The findings will be made available to the Department of Ecology, and could potentially be used to inform how we carry out any recommendations or enforcement actions that we expect will be coming from them.

What level of wastewater treatment is occurring at West Point?

We are treating at a limited primary level, which means incoming wastewater is screened of trash and debris, some organic solids are settled out and removed, and the remaining water is disinfected, dechlorinated and returned to Puget Sound through a deep-water outfall that is about three-quarters of a mile offshore.

Normally at West Point, this water goes through a secondary treatment process where micro-organisms feed on soluble and solid organic that wasn't removed during the primary treatment stage. Secondary treatment is a high level of treatment that is required under our state and federal permits, and it is why we are working so hard to restore our secondary treatment process units.

Will King County get fined?

We reported the incident to the state Department of Ecology immediately and continue to update the agency about operational conditions and permit compliance. DOE is a regulatory agency responsible for enforcing the permit conditions under which we operate. We expect DOE will pursue enforcement action, which could include penalties such as fines.

Where does money go when King County pays fines?

Fines and penalties typically go into water quality enforcement programs, but the Department of Ecology can answer that question.

What were the public health and water quality impacts of the bypasses?

While bypass flows are highly diluted, with as much as 90 percent being stormwater, the bacteria and pathogens in raw sewage can make people sick. As a precaution, we posted nearby Puget Sound beaches as closed to protect human health. Beaches were reopened as soon as daily water-quality testing indicated there was no longer any risk to human health. When it comes to the environment, the temporary discharge of undisinfecting, diluted wastewater from the emergency bypass outfall will not pose long-term harm to wildlife or aquatic health, but we are working with scientists inside and outside the county on plans for additional monitoring to gain better understanding of potential water quality impacts.

How did the bypasses impact fish and wildlife?

In general, the temporary discharge of undisinfecting wastewater from the emergency bypass outfall is not expected to result in significant adverse effects to fish, other aquatic organisms, or wildlife in Puget Sound. The large volume of water and significant tidal exchange and current in the vicinity of the West Point outfall result in rapid dispersion of the wastewater.

While a temporary release of highly diluted wastewater is not expected to have adverse environmental effects, we recognize the bypasses do not meet the stringent requirements of our permits, and we take our commitment to environmental stewardship very seriously.

We are highly regulated by the State Department of Ecology and have a strong reputation of meeting and exceeding permit requirements. Prior to this event, we were on our 14th consecutive year of 100 percent permit compliance at West Point. We will continue to work hard to bring our operations back to normal as quickly as possible. And we are continuing to coordinate closely with the Department of Ecology to address our full response to the West Point incident.

Why are bypassed flows 85-90 percent stormwater and 10-15 percent sewage?

In Seattle, like many older cities, sewer pipes carry both wastewater (used water and sewage that goes down the drain in homes and businesses) and stormwater (rain or snow that washes off streets and parking lots) to a sewage treatment plant. In many parts of Seattle, the mixed wastewater and stormwater flow together in a single pipe. This "Combined Sewer System" flows to West Point for treatment.

What triggers a beach closure?

In the event of a sewage overflow or emergency bypass, King County notifies health and regulatory agencies and posts warnings to avoid contact with the water at public beaches and access points when an overflow event occurs.

Warning signs stay posted at beaches and docks until [Public Health- Seattle & King County](#) reviews lab results and approves removal. Washington State Department of Ecology establishes [swimming beach water quality standards](#). WTD posts [incident updates](#) to give people choices about recreating in waters where an overflow occurred.

According to Public Health Seattle & King County, bacteria levels at sample sites must be below 100 colony forming units per liter of water three days in a row in order for a beach to be reopened.

Information on how King County works to protect people during wastewater overflows on our blog: <https://kingcountywtd.com/2017/02/13/when-the-unexpected-unfolds-protecting-people-after-wastewater-overflows/>

Can I enter the water if there's a bypass?

Beach closure signs would be posted at public access points and beaches where water quality may be affected by a bypass. When closure signs are posted, it is recommended people and pets stay out of the water.

Signs are taken down when water quality data returns to background levels.

Please visit our incident response page for the latest water quality data:

<http://www.kingcounty.gov/depts/dnrp/wtd/response/incident-response.aspx>

Are you monitoring water quality?

Yes. In the normal course of our business, we do routine water quality monitoring in Puget Sound. If a bypass occurs, we will do additional monitoring.

When an overflow happens, King County's Environmental Lab samples affected waters and tests for bacterial contamination. The bacteria and other pathogens that go into marine waters after an overflow event do not thrive well in a cold, salty marine environment and die off within about 48 hours.

How are you keeping everyone up-to-date on this issue?

We are striving to be as open and transparent as possible with our regulators, the public, the media, and employees. We are reporting facts when we know them and informing agencies or groups that may be affected as soon as possible – including tribes, local agency health and parks departments, beach-goers and others.

Where can I get the most recent information about West Point?

- **Visit www.kingcounty.gov/wtd**
- **Follow us on social media:**
 - Twitter: <https://mobile.twitter.com/kingcountyWTD>
 - Facebook: <https://m.facebook.com/kingcountywtd>
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- **Contact us via phone or email at: 206-477-5371 or website.wtd@kingcounty.gov**

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