

**Winter Storm Uri Impacts
to
City of Houston Water & Wastewater System**

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Director, Houston Public Works**

Good morning/afternoon. My name is Carol Haddock and I am the Director of Houston Public Works. Houston Water, that is the City's Water & Wastewater System – or our Combined Utility System is part of Houston Public Works. Nearly 2,000 men and women provide services that run the Utility to serve 2.2 million Houstonians and another 2.4 million people through our wholesale or contract customers in the greater Houston region.

Like more than 1,000 Utilities statewide, Winter Storm Uri had a widespread and significant impact on Houston's Utility and our customers, both retail and contract. The primary location of damage to Houston's infrastructure was in our drinking water system. Our drinking water system has a total of 57 water treatment plants (3 surface water, 54 groundwater), 156,000 valves, and nearly 7,800 miles of water lines.

Houston's water system is primarily surface water treatment of water from Lake Houston and Lake Livingston that provides 80% of our drinking water. Our three surface water treatment plants remained in operation throughout the duration of Winter Storm Uri – though the overall capacity of water treated was reduced because of the colder water. We did have one power disruption at our smallest

surface water treatment plant, but it was resolved with our outside power generator within several hours.

Our groundwater systems, while only about 20% of our water sources, had the most significant challenges on production – particularly related to power reliability and back-up generation. Similarly the distribution system was impacted. Damage was incurred throughout the drinking water system due to the prolonged freezing temperatures that impacted equipment that is not designed to withstand prolonged freezes – which are unprecedented in Houston’s history. While we’ve had similarly low temperatures, we’ve not had them for this long or combined with widespread power outages.

The vast majority of the physical damage incurred in Houston’s utility system was the result of the extreme and prolonged freeze event. The loss in water pressure was a combination of cold temperatures impacting the statewide power grid and also on-site back-up power generation. The equipment in Houston’s drinking water system, from water plants to valves to even our back-up generators are designed to withstand the extreme heat, humidity, and hurricanes that are much more common to Houston’s weather.

Houston issued a Boil Water Notice for our Main Water System due to loss of pressure systemwide overnight Monday, February 15th and into the morning of Tuesday, February 16th. So, the infrastructure and equipment was impacted by the extreme cold, the days began to warm above freezing which exposed both public and private leaks, before plunging back into freezing temps and repeating. Once the infrastructure had been stressed, issues in Houston’s water system from this event were exacerbated by an increase in water loss from leaks

throughout the system during and after the freeze, during a time when the freeze and loss of power also caused a decrease in water production.

This condition was resolved and the City rescinded the Boil Water Notice on Sunday, February 20th mid-afternoon. The City has restored normal operating pressure to the system and continues to make necessary repairs. For Houston Water, Emergency Purchase Orders have been issued to address the immediate repairs necessary to the drinking water system, which have totaled over \$9 million to date. We are in the process of performing FEMA damage assessments to evaluate the totality of damage to both our drinking and wastewater utilities which we expect to be well in excess of \$9M. However, for many Houstonians, there remain insufficient plumbers and parts not only in Houston, but throughout the state, for the necessary private repairs.

And that's just the water system. The wastewater system was similarly impacted, though not as obvious to the majority of the public. At the height of the storm, we had 22 of our 39 wastewater treatment plants with no power at some point during this event. We had hundreds of our lift stations that had no power during the event.

We are routinely asked about cost impacts for power during this storm. Unlike some consumers, Houston Water has a fixed rate contract for its grid-electricity, meaning that we are not subject to the variable pricing based on demand that has been discussed in the news. Reliant/NRG is the retail electricity provider for the City of Houston. Houston Water's facilities are on a fixed rate pricing schedule (billed monthly) that uses generation from 100% renewable sources of power. Houston is the top municipal user of renewable energy in the Country.

Houston did incur additional costs due to providing generator power and necessary fuel while the grid was unable to deliver power for several days, and much of our infrastructure was operating on generator power. This does cost considerably more than operating on grid power. For starters, we have a \$1.3M purchase order for contract generators and additional internal fuel costs for City-owned generators.

We have experienced a significant amount of overtime to support activities during this event. The total amount has not yet been finalized, but is in excess of a half million dollars.

I also want to highlight the spirit of Houston and Houstonians to pull together during Winter Storm Uri. The City was able to stand up three mass distribution events for drive-through water, mask, sanitizer, and food. We distributed more than 10 million bottles of water in three days while under the Boil Water Notice.

Houston Public Works is in the process of creating our after action reports. We have many lessons that we learned and look forward to work with our colleagues around the state to continue to implement more sustainable and resilient solutions in our infrastructure moving forward. Houston has an amazing ability to work together in any circumstance to help each other.