

Winter Storm URI

BRIDGELAND

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Winter Storm URI

- Inframark Winter Prep
- URI Timeline Review
- URI Facts/Summary
- Triage
- Boil Water Notice
& Communication
- Lessons Learned



Inframark Operations Winter Prep



Freeze Protection Water Treatment Plant Audit Form

Facility or Site: _____ Date: _____

Jobsite Address: _____

Item	Complete	
All Valves	Y	N
Sensor Lines	Y	N
HPT Site Glasses	Y	N
Backflow Preventer	Y	N
Blow-Off	Y	N
Chemical Feed Solution lines	Y	N
Drip Oilers	Y	N
Exposed Water Lines	Y	N
Do Heaters Work?	Y	N
Any and all Items Subject to Freeze	Y	N

*Any items marked No need to be corrected before facility can be considered winterized.

Met with operator to address and complete all freeze protection issues? Y N

Comments: _____

Facility Operator _____ Date _____

Manager/ Lead _____ Date _____

- Winterization program begins in September of each year
- We have a process for both water and wastewater plants:
 1. Initial audit performed by operator
 2. Operator identifies new items that need to be winterized
 3. Operator identifies winterization that needs replacement
 4. Materials are obtained and those items are winterized
 5. Manager then visits the facility and inspects before signing off

Inframark Pre-URI Action item

- Top off fuel tanks
- Isolated nonessential water lines (eye wash stations, etc.)
- Contact suppliers
- Opened drain and drip lines
- Checked lights in HPT
- Doubled checked insulation on all exposed areas.

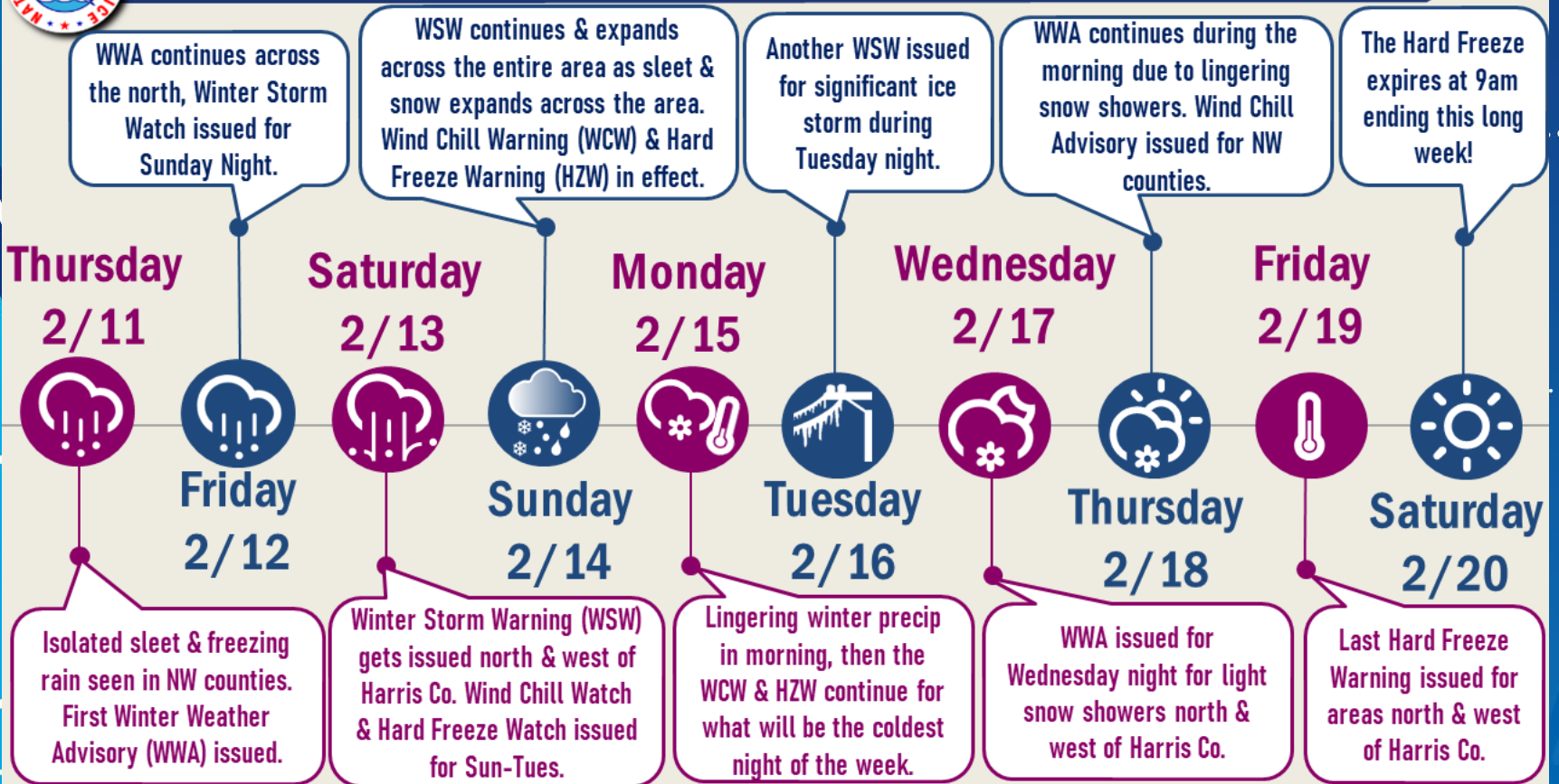
URI Timeline-General Facts



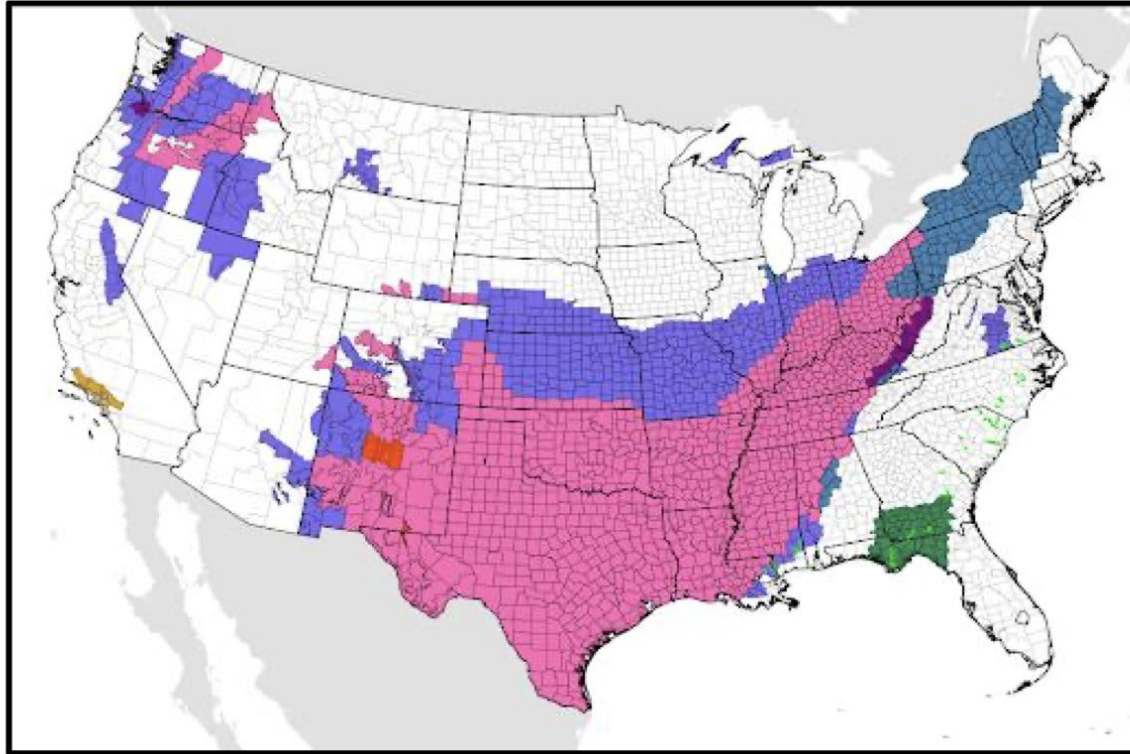
February Winter Outbreak Timeline

NATIONAL WEATHER SERVICE
OCEANIC AND ATMOSPHERIC ADMINISTRATION

Houston, TX



February 14, 2021



Winter Storm Warnings across the entire State of Texas on February 14, 2021.

URI Facts-General

How Does The Cold Over The Last Days Rank Historically?

A look at the average temperature from February 11th - 17th

	City of Houston	Houston Hobby	College Station	City of Galveston
1	29.7° 1895	34.3° 2021	24.6° 1899	31.3° 1895
2	30.1° 1899	41.6° 1958	25.9° 2021	37.6° 1899
3	32.5° 2021	43.7° 1963	29.1° 1895	39.7° 2021
4	38.6° 1905	44.5° 2010	39.4° 1958	40.1° 1905
5	41.6° 1958	45.6° 1981	41.9° 2010	43.3° 1958

URI Facts-IAH



Cold Review – Houston (Bush Int.)

Weather Forecast Office
Houston/Galveston, TX
Issued February 19, 2021 7:57 PM CT

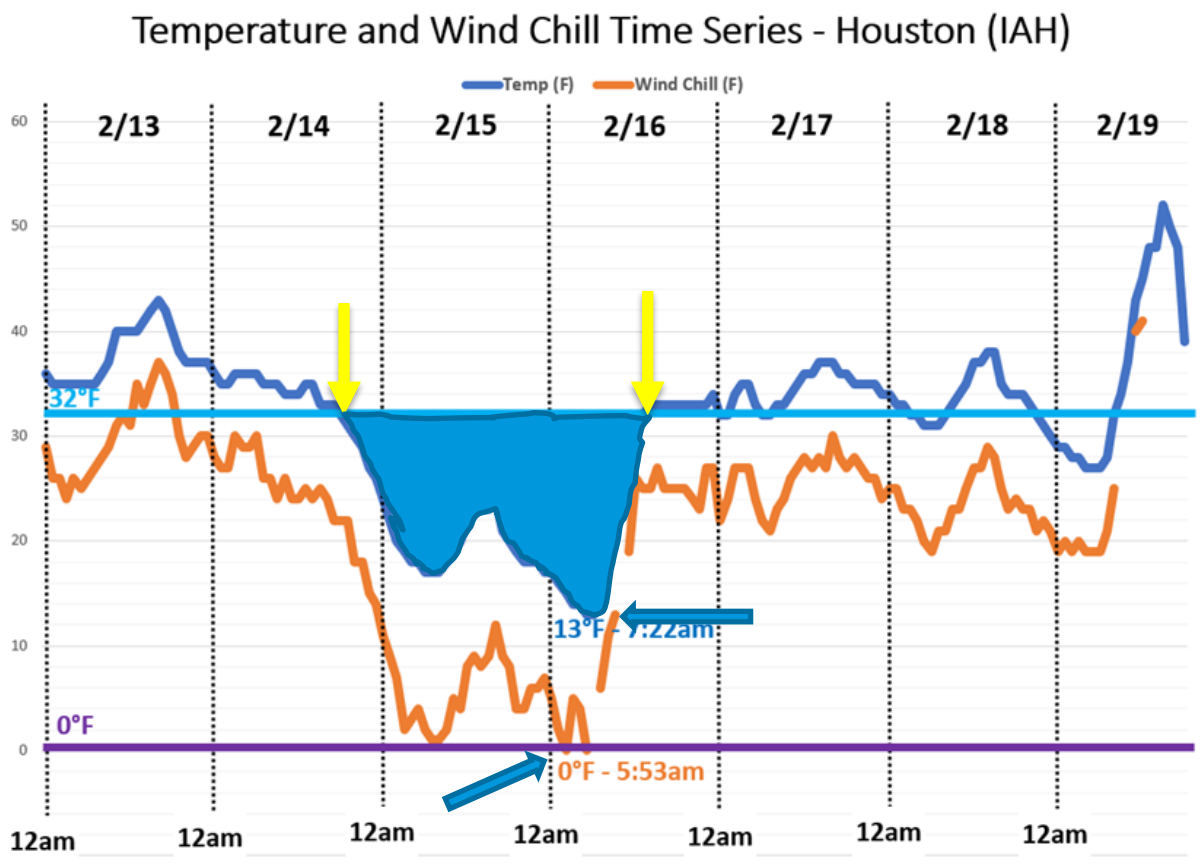


Houston-Bush Cold Stats this Past Week

Coldest Temperature:
13°F at 7:22am on the 16th

Coldest Wind Chill:
0°F at 5:53am on the 16th

Longest Stretch of Freezing Temperatures:
44 consecutive hours from 6:53pm on 2/14 to 1:53pm on 2/16

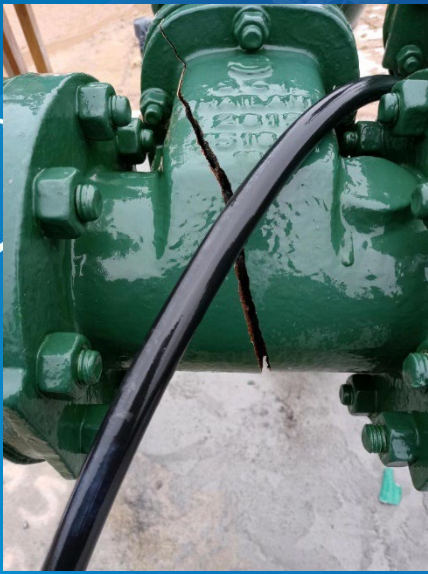




URI SUMMARY- General

The Winter Outbreak that occurred on Valentine's Week 2021 brought not only snow, sleet, and freezing rain to Southeast Texas, but also extreme cold temperatures that lasted for several days. This was one of the most impactful winter events in recent history that brought multiday road closures, power outages, loss of heat, broken pipes, and other societal impacts for the region. While the damage is still being assessed, this will likely go down as the first billion-dollar disaster of 2021 globally, and potentially the costliest weather disaster for the state of Texas in history, surpassing even Hurricane Harvey from 2017.

Bulverde, TX, 16 Feb, 2021



Average snow depth front yard
2/15/21 @ 7am CST
SA, TX





Triage- Bridgeland

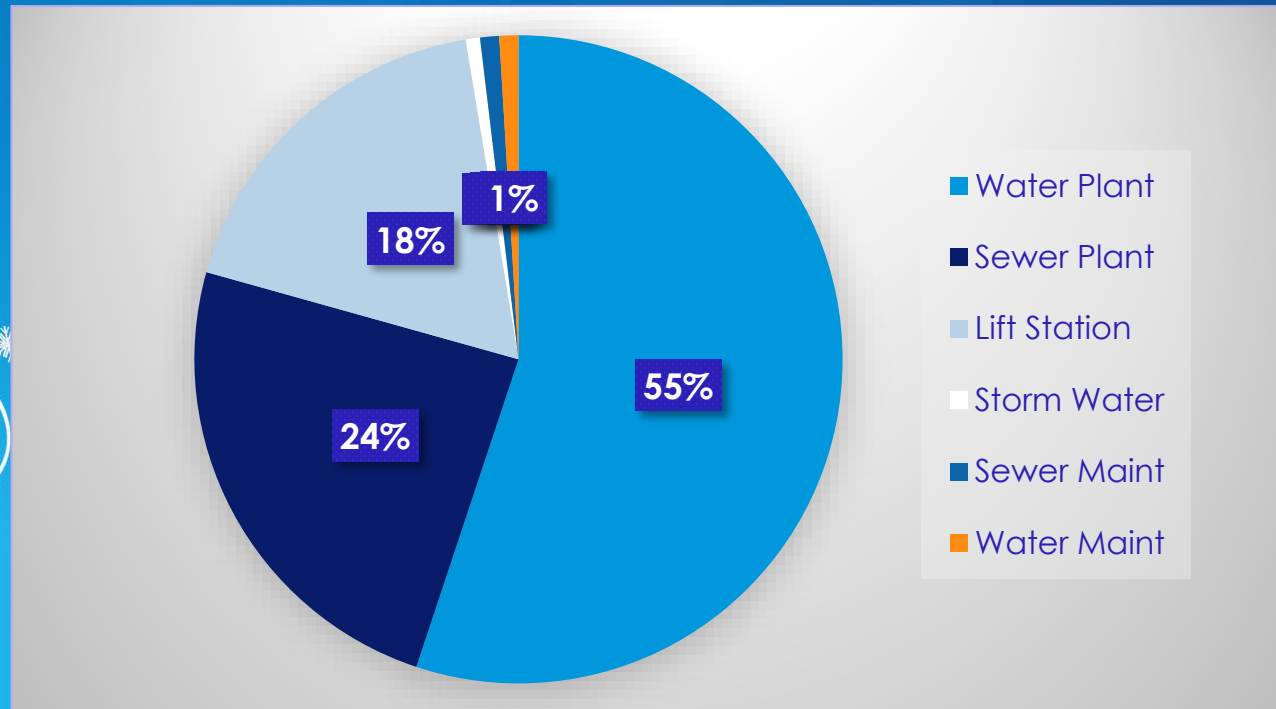
- Hotel room during event for all staff to take rest periods
- Multiple employees in rotation in field
- Every three hours a Bridgeland facility walk through was performed:
 - Operator checked hose bibs, valve casings, HPTs, etc.

ARS Triage

Fuel Deliveries

- Inframark had (2) 5,000-gallon bobtail fuel tanker trucks
- 60 ARS scheduled fuel deliveries were made to Inframark facilities. No ARS supported facilities went down due to lack of fuel
- Over 28,000 gallons of diesel delivered
- Bridgeland generators did not run out of fuel

ARS Freeze Work Order Analysis-421 Work Orders



ARS Triage

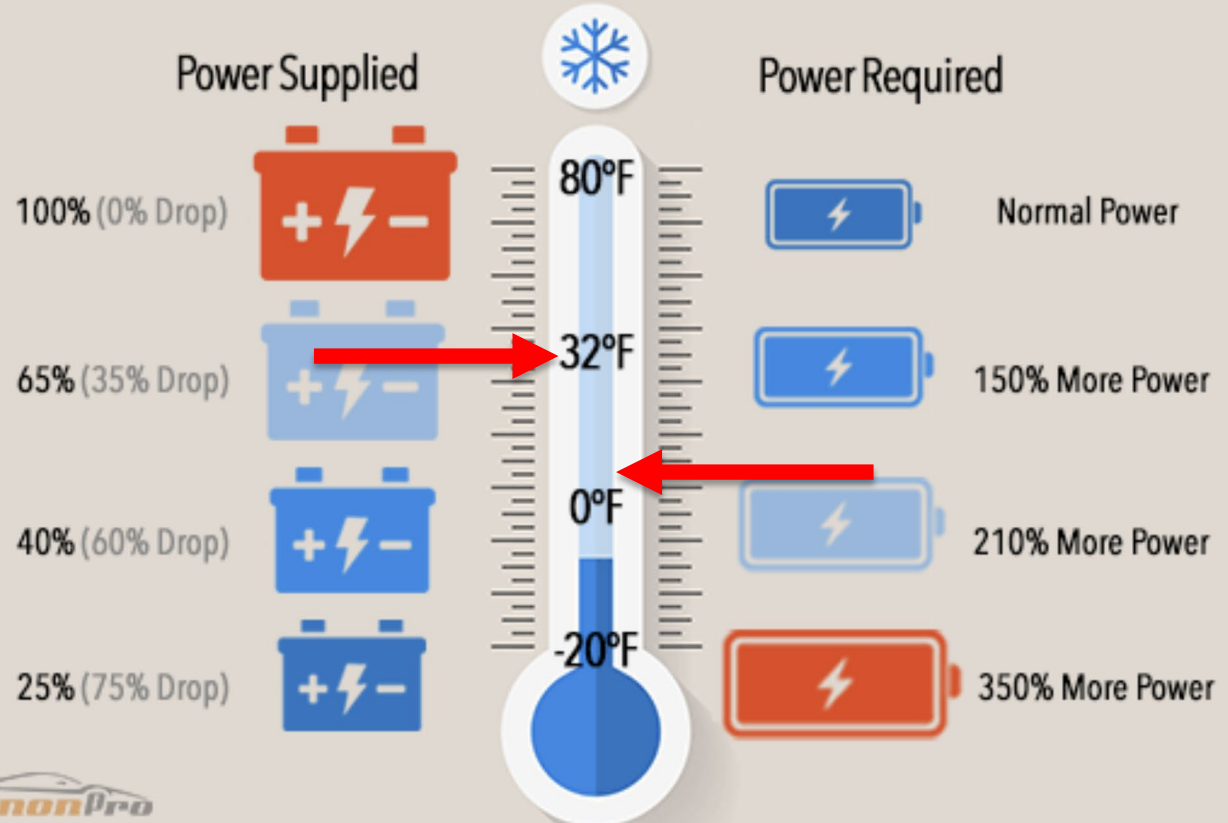
Types of Work Performed

- Frozen sensor lines
- Frozen analog level/PSI transducers
- Frozen intake lines on non-potable water systems
- Frozen discharge lines on submersible water wells
- Frozen cracked pump housing
- Frozen valves
- Control power issues
- Generator issues –
 - Waterplant #1-
 - LOST COOLANT LONE FROM GENSET RADIATOR.
 - ATS-FLUCUATION IN AC POWER CAUSED THE SWITCH TO NOT OPERATE IN AUTO PROPOERLY

Batteries and cold weather

Understanding Cold Cranking Amps (CCA)

Power supplied by the battery drops quickly together with the temperature, requiring more cranking power to get a vehicle started.



Boil Water Notice

- **Definition**
- **Notification**
 - **Beginning**
 - **Rescind**
- **Consecutive System**

When is a BWN issued?

- When a violation poses an acute health threat to the customers of the PWS **30 TAC, subchapter F, Section 290.122(a)**
 - ***E. coli***: If a PWS exceeds the Microbial *E. coli* Maximum Contaminant Level (EMCL) and receives a violation [**30 TAC 290.109(b)(1)(A-D)**]. An EMCL violation can occur when:
 - Collects a sample that is total coliform positive and any of the required repeat samples are positive for *E. coli*.
 - Collects a sample that is *E. coli* positive and any of the required repeat samples positive for either total coliform or *E. coli*.
 - Fails to collect all required repeat samples after an *E. coli* positive routine sample.
 - Fails to test for *E. coli* when any repeat samples test positive for total coliform.
 - **Turbidity**: High turbidity levels indicate a severe failure in filtration and possibly other treatment processes at the plant [**30 TAC 290.46(q)(4)**].
 - a conventional water treatment plant has a finished water (combined filter effluent) turbidity level above 5.0 Nephelometric Turbidity Unit, or;
 - a plant with membrane filters has a finished water turbidity level of above 1.0 NTU (for systems that treat surface water or groundwater under the direct influence of surface water).

Groundwater systems that experience high turbidity should contact TCEQ as soon as possible to determine if there is a threat to public health and if a BWN is necessary.

- Any event where conditions at a PWS are such that public health protection is compromised or potentially compromised [**30 TAC 290.46(q)**]
 - Low pressure (i.e., below 20 pounds per square inch) ←
 - Water outages
 - Disinfectant residual levels below the required minimum (i.e., 0.2 mg/L free and 0.5 mg/L total) ←
 - Line breaks or repairs (construction)
 - Storage problems
 - Well problems
 - Mechanical equipment problems ←
 - Power outages ←
 - Treatment facility problems
 - Natural disasters ←

What is a proper BWN notice?

The BWN must be issued as soon as possible, but in no case later than 24 hours after the violation or condition occurs. The PWS must use the mandatory language for issuing a BWN and use one or more of the following methods of delivery.

Delivery options by type of water system

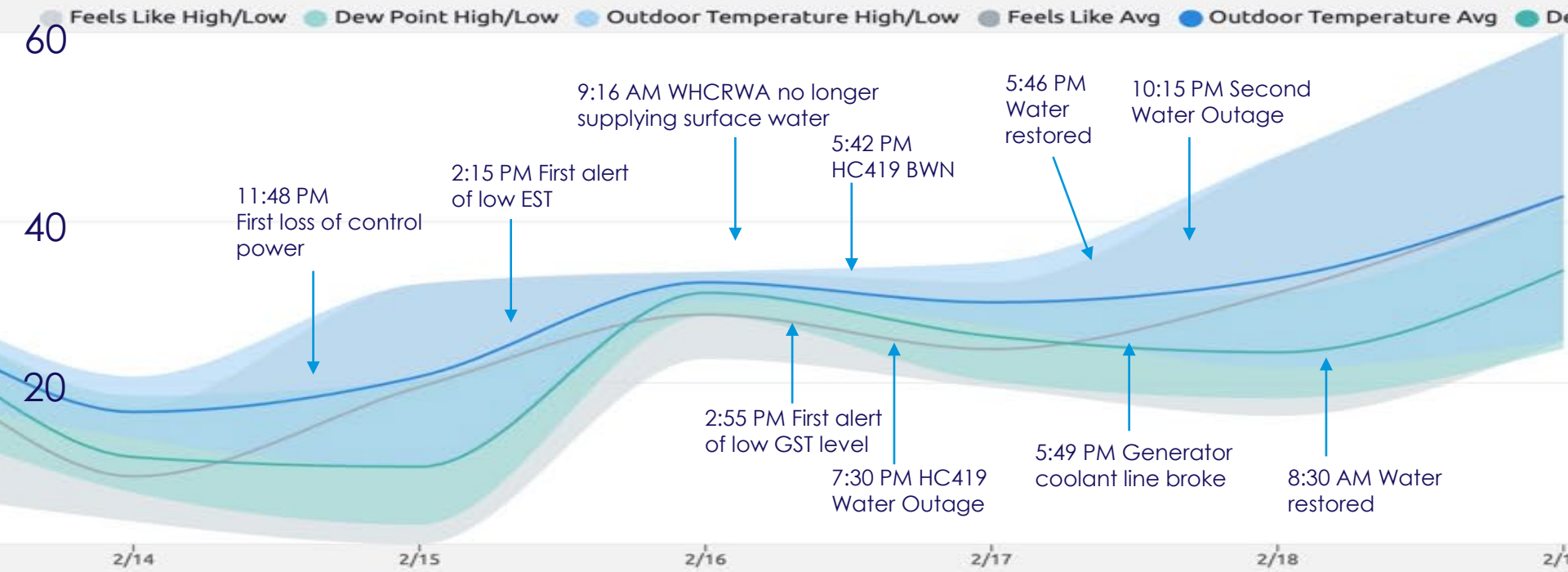
System Type	Delivery Options
Community	<ul style="list-style-type: none">• Furnish copy to Radio/TV in the service area ←• Publication in a local, daily newspaper• Direct delivery or continuous posting• Electronic delivery or alert systems (e.g. reverse 911) ←
Non-community	<ul style="list-style-type: none">• Direct delivery or continuous posting• Electronic delivery or alert systems (e.g. reverse 911)

If continuous posting is used, it must remain in place for as long as the violation exists or seven days, whichever is longer. If demographics indicate a need for multilingual notification, the system is required to issue the notice in all appropriate languages.

Water Plant Breakdown

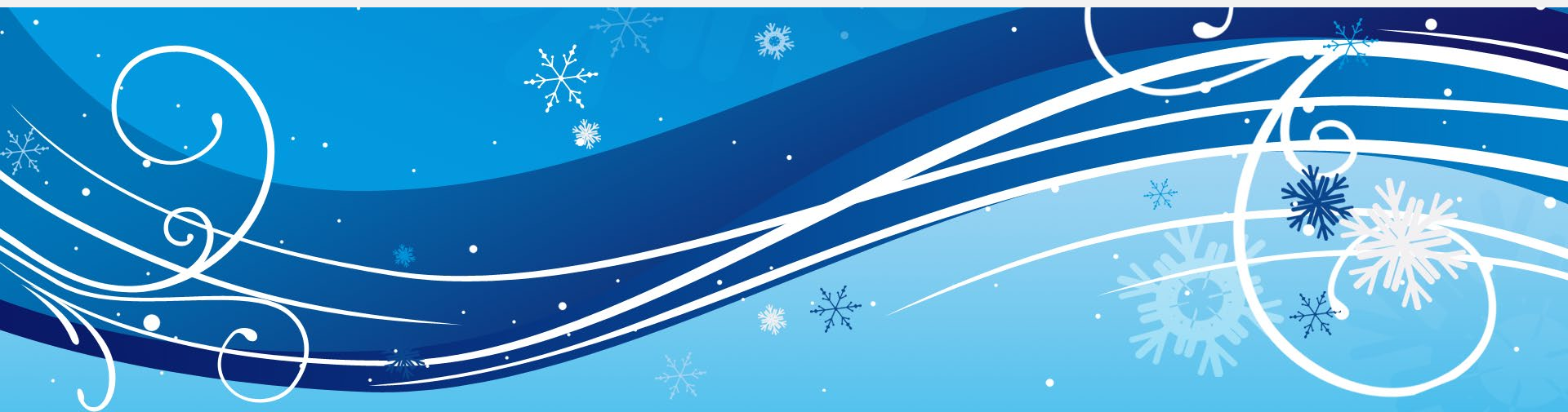
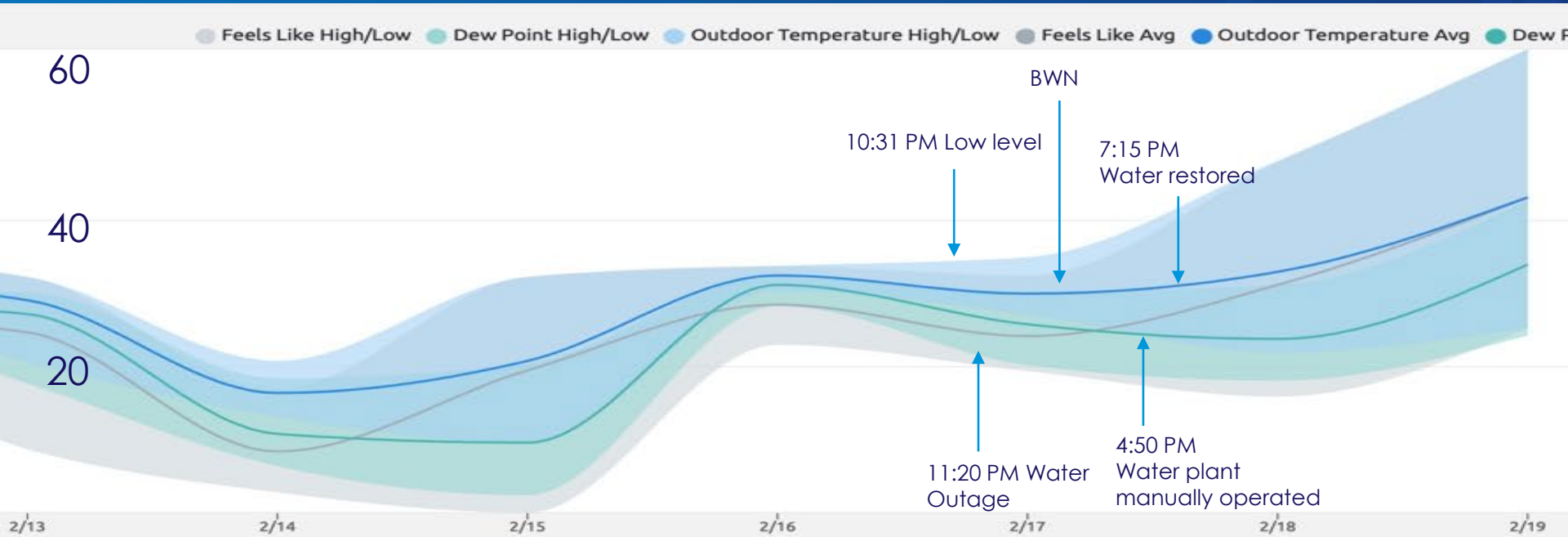
- Water Plant #1 services HC419
- Water Plant #2 services HC489 and portions of HC419
 - 419 Sections include:
 - Bedias Creek
 - Madison Midway
 - Bullard Creek
 - Cancy Creek
 - Busy Bee
 - Cibolo Creek
 - Tapalcomes Dr
 - Highland Country
 - Fort Leaton
 - Copper Lantern
 - Barton Creek
 - Blueberry Cedar
 - Blackcap Viero
 - Hays Spring
 - Ladybird Lake
 - Brickelbush Lake
 - Maravillas Cove
 - Cedar Creek
 - Maifest
 - Texas Lancer
 - Covey Trail
 - Trinity River
 - Astin Mansion

Timeline: Water Plant #1



- Surface water returned 2/22/2021
- HC419 BWN rescinded 2/22/2021

Timeline: Water Plant #2



Lessons Learned



- ❖ Enhanced/Extreme Winterization of plant equipment
- ❖ Install heat trace tape, insulate and wrap all piping & valves



- ❖ Install heat lamps in areas that could possibly freeze
- ❖ Insulate HPT dog houses
- ❖ Install heat jacket on pumps and flow control valves



- ❖ Install heaters in water supply/ chlorine feed rooms with thermometer (FZ can monitor)
- ❖ Drain and isolate eyewash stations

Lessons

- Water Well #3 not on generator power
- Water plant #2 generator only runs 2 booster pumps
 - *New generator is on site waiting to be tied in*
- Water well #3 has sound attenuator. Best case scenario would be a day to get it off.



Steps moving forward

- Encourage a more unified BWN system that is controlled via the state or the county.
- Encourage a CoH communication protocol that would alert RWA of potential outages to prevent BWN from RWA participants.
- Encourage a community wide education platform to inform end users about BWN.
- Encourage Districts to consider signage.
- Push notifications.
- Communication Protocol.
- Evaluate extreme winterization options.

Questions??

Thank you

Inframark, LC
Texas MUD Leadership Team