

KUB

Project Help Update

March 14, 2019



Helping KUB Customers Stay Warm

- Established in 1983 by KUB and CAC
- Provides emergency heating assistance for low income customers
- Covers electricity, natural gas, propane, heating oil, wood, and coal
- 501(c)(3) charitable organization governed by a community member Board



Many Ways to Contribute

- Annual campaign with local partners
- Recurring monthly pledge with bill payment
- One-time contributions
 - KUB.org
 - Back of bill stub
 - Events
 - KUB Connections and bill stuffers



SHARE THE WARMTH
GIVE TO PROJECT HELP

PROJECT HELP
SHARE the WARMTH

Last year, hundreds of Knoxville families were kept safe and warm thanks to more than \$100,000 of your donations to Project Help. This year, the need will be even greater. Many who need your help are children and the elderly. Please do something heartwarming this winter and give.

FOUR WAYS TO WARM A HEART THIS WINTER.

1. Purchase a donation coupon at Food City.
2. Make a donation at any Home Federal Bank location.
3. Send a check to:
Project Help
P.O. Box 59017
Knoxville, TN 37950.
4. Check the donation box on your next KUB bill.

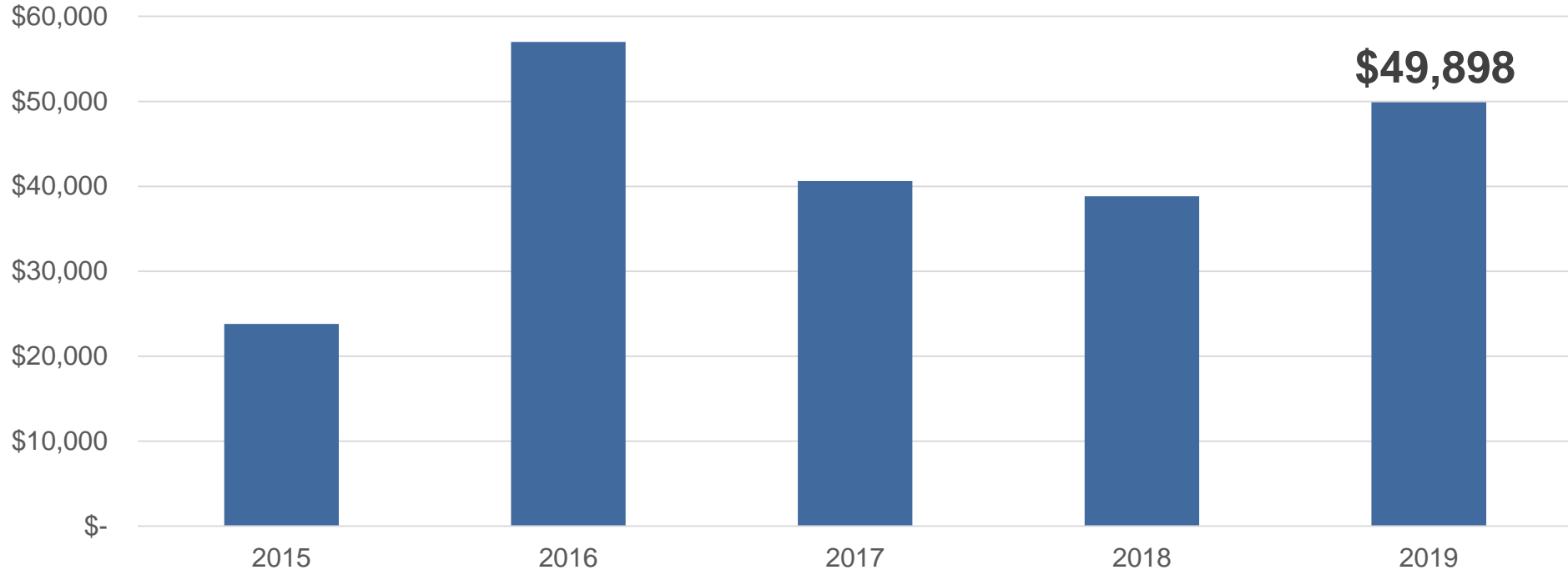
PLEASE GIVE TO PROJECT HELP JANUARY 4-JANUARY 29.



Community Partners Provide Support



Partnerships Lead to Successful Campaigns



2,700 Families Helped in Five Years

	2014	2015	2016	2017	2018
Families Assisted	863	283	667	382	504
Project Help Funds Provided	\$266,398	\$87,743	\$196,878	\$109,397	\$153,005
Average Per Household	\$309	\$310	\$295	\$287	\$304

Project Help Makes a Difference!

“Thank you for helping my family and I. We appreciate it more than you know! Thank goodness for agencies such as yours who still help. It helps the community become a better place.”

“Thank you so much for your helping. It means a lot to me and my two sons Thank you from my family from the bottom of our hearts!”

KUB

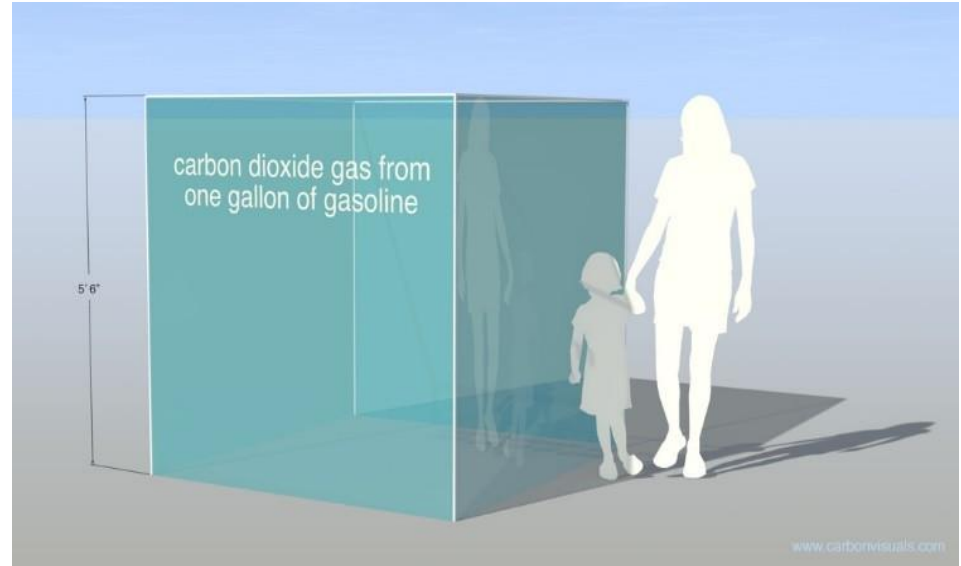
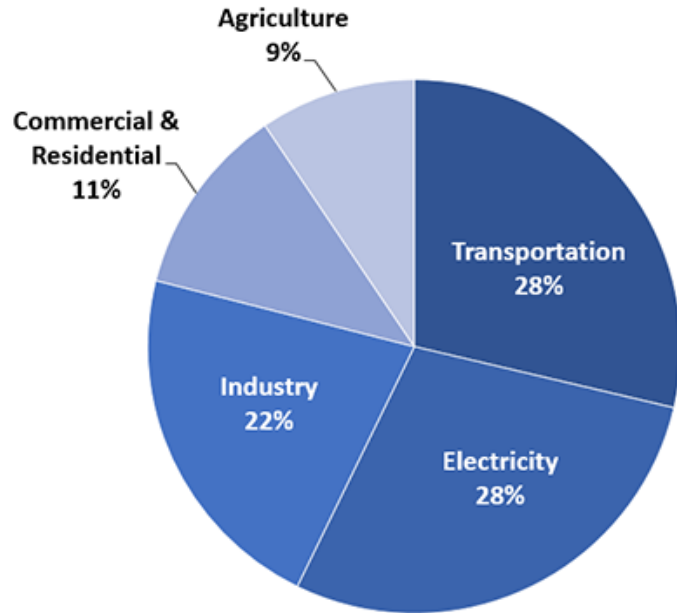
Electric Vehicles (EVs)

March 14, 2019



Transportation is a Major Source of Green House Gas Emissions

Total U.S. Greenhouse Gas Emissions
by Economic Sector in 2016



The average car generates 0.9 pounds of CO₂ for every mile driven

EVs Reduce Emissions



- Replacing a single gasoline vehicle with 100% EV
 - Cuts CO² emissions 4 to 6 tons annually
 - Equal to planting 2,000 trees

EVs are Less Expensive to Operate

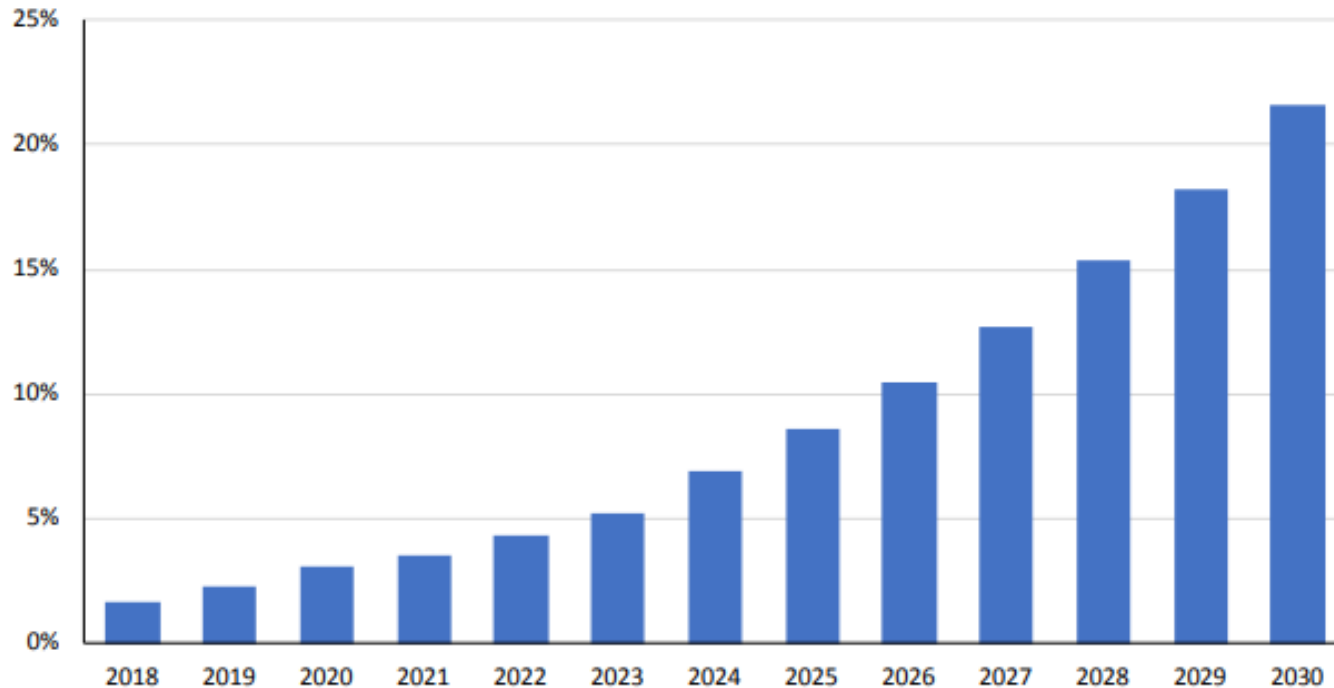
- Fuel cost about 60% less or about \$650 per year fuel savings
- No oil changes
- Significantly less brake wear

Automakers' Plans Support EVs

Automaker	Number of Electrified ¹ Vehicles	Number of All-Electric Vehicles	Year Promised
Audi	20	10	2025
BMW	25	12	2025
Fiat Chrysler	One-half of vehicle lineup	Not specified	2022
Ford	40	16	2022
General Motors	20	Not specified	2023
Honda	Two-thirds of vehicle lineup	Not specified	2030
Jaguar Land Rover	One-half of vehicle lineup	Not specified	2020
Mercedes-Benz	Electrified equivalent of all new vehicles	Not specified	2022
Nissan/Mitsubishi/Renault	Electrified equivalent of all new vehicles	Not specified	2022
Porsche	One-half of global sales volume is plug-in vehicles	Not specified	2025
Toyota (and Lexus)	Electrified equivalent of all new vehicles	Not specified	2025
Volkswagen Group	All models electrified	15	2025
Volvo	Electrified equivalent of all new vehicles	Not specified	2019

EV Sales Expected to Climb

**EEI/IEI Annual EV Sales Forecast, Percent of Total Vehicle Sales
(2018-2030)**



KUB Has Been Adopting EVs



KUB Support of EVs Consistent with Blueprint



Our Vision:

KUB exists to serve its customers, improving their quality of life by providing utility services that are safe, reliable and affordable.

Shared Values:

- We value the safety and well-being of our customers and employees.
- We value fairness, and try always to make decisions that provide the greatest good for the most people.
- We are in a position of trust and hold ourselves to high ethical standards.
- We improve the value of our services through efficiency, innovation and communication.
- We value the commitment and hard work of our employees.
- We are environmentally responsible in our operations and support the sustainability of our communities' natural resources.
- We participate in the communities we serve.

Our Mission:

Our mission is to act as good stewards of our communities' resources: utility assets, customer dollars, and the environment. We work to safeguard those resources and enhance their value for the people of the communities we serve and generations to come.

We Measure Our Success by:

Customer Satisfaction

System Performance

Financial Performance

Safety Performance

Keys to Success:

Managing Our Utility System Infrastructure

Electric

Natural Gas

Water

Wastewater

Improving The Customer Experience

Managing Our Finances Effectively

Meeting Or Exceeding Regulatory Standards

Investing in A Skilled, Diverse Work Force

Partnering For Economic Development

Being Environmentally Responsible

- Enhances the environment
- Helps maintain affordable rates
- Supports economic development

KUB a Participant in Statewide EV Adoption Coalition

DRIVE ELECTRIC TENNESSEE STAKEHOLDERS

The following Key Contributors and participating organizations attended events and developed & reviewed key deliverables over the past several months.

Key Contributors:



Participants:

- Atlas Public Policy
- City of Knoxville
- GRIDSMART
- Southern Alliance for Clean Energy (SACE)
- Bridgestone
- City of Chattanooga
- Local Motors
- Southeast Energy Efficiency Alliance
- BYD
- Cummins Filtration
- Nissan
- Stantec
- CDE Lightband
- Draft Agency
- Schneider Electric
- Tennessee Automotive Association
- ChargePoint
- General Motors
- Sierra Club
- University of Tennessee – Knoxville
- City of Nashville
- Greenlots
- SoftServe
- Vanderbilt University
- Volkswagen

EV Range Anxiety

- 84% drive less than 50 miles per day
- Only 1% of trips exceed 70 miles
- Yet most say public charging is needed for range confidence

Types of EV Chargers



- **AC Level 1 (L1) 120v Standard** found in every U.S. home or office. Adds range of 5-7 miles per hour charging.



- **AC Level 2 (L2) 240v** Often used to power home clothes dryers. Adds 20 to 30 miles of range in an hour.



- **DC Fast Charging (DCFC) 480v** Often called Level 3. Charge EV in just 40 minutes.

New DC Fast Chargers at Walmart



Studying Additional EV Adoption Ideas

- Time-of-Use rates
 - Encourages system beneficial EV charging
 - Helps EV charging cost
- EV Charger Rebates

Change can Happen Very Fast

1900



Spot the car

1913



Spot the horse

KUB

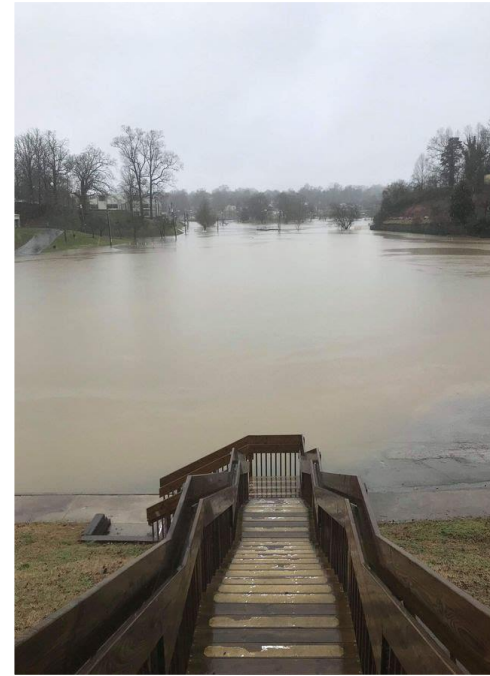
Impact of February Flood Event

March 14, 2019



Record-Setting Rainfall

- 2018 4th wettest fall on record
- Already more than 21 inches of rain in 2019
- Rainiest February on record
 - 13 inches of rainfall
 - 7.5 inches over 5-day period (February 19-23)
 - 5 inches on February 23 – twice the prior record
- Widespread flooding lasted for days
- Impacted waterways, public infrastructure, homes and businesses, plus utilities across the region



Chilhowee Park

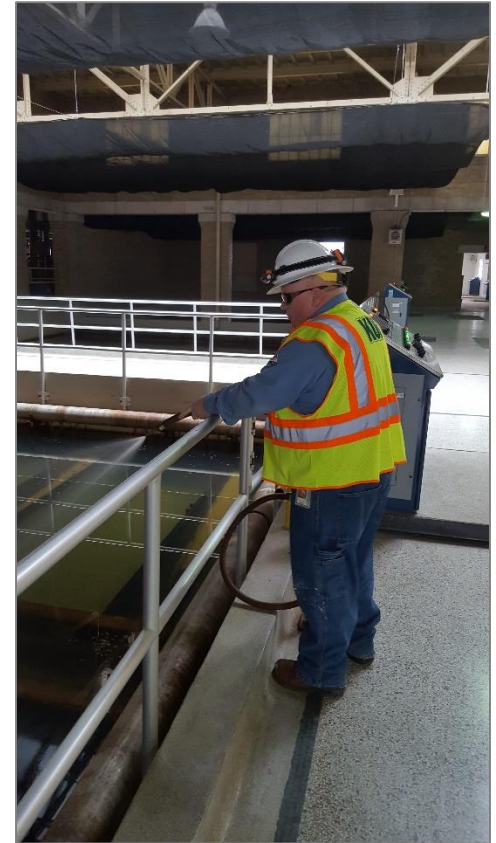
Limited Impact to Gas System

- Meters in low-lying areas were replaced
- Piping on bridge crossings were inspected



Water System Performed Well

- No drinking water quality issues
- High turbidity in river - about 10x normal level
 - Doubled coagulant use
 - No filtration issues
 - No overtime required
- No increase in main breaks



Increased Outages on Electric System

- 23,297 customers out at peak (noon February 24)
- Outages from early February 23 through late February 24
- Customer Minutes of Interruption (CMI) up 35% vs average February
- Response times were slowed due to floods



Sinkhole at Cherokee Trail Substation

- Sinkhole developed on Monday
- Substation partially switched out of service
- Evaluating extent of sinkhole and potential remediation methods this week



Widespread Flooding Significantly Impacted Wastewater System

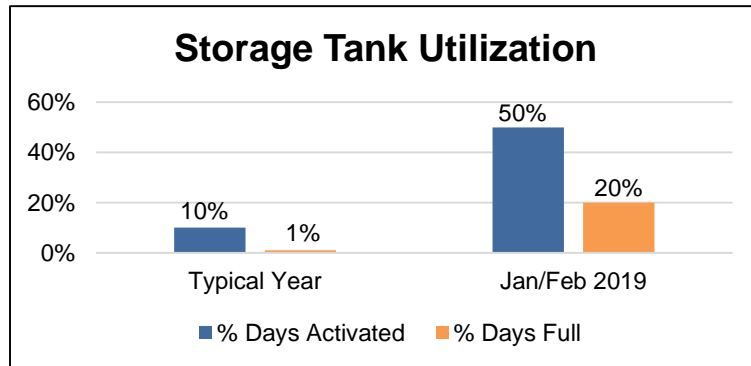
Third Creek Greenway



Fountain City: Knox Road at Fair Drive (behind Kroger)

Significant Impact on Collection System

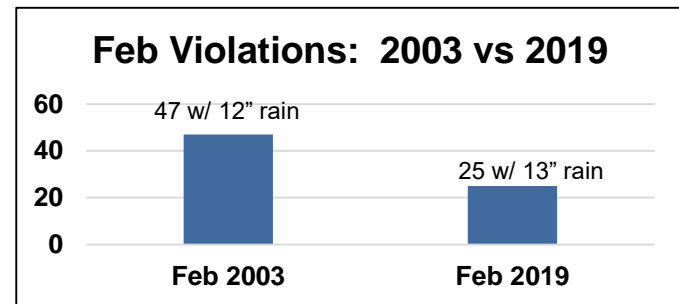
- Wastewater facilities located in low-lying areas
- 53 wet weather SSOs in February
- 3 pump stations flooded
- All 6 storage tanks filled at 34 MG



Chapman Highway Pump Station

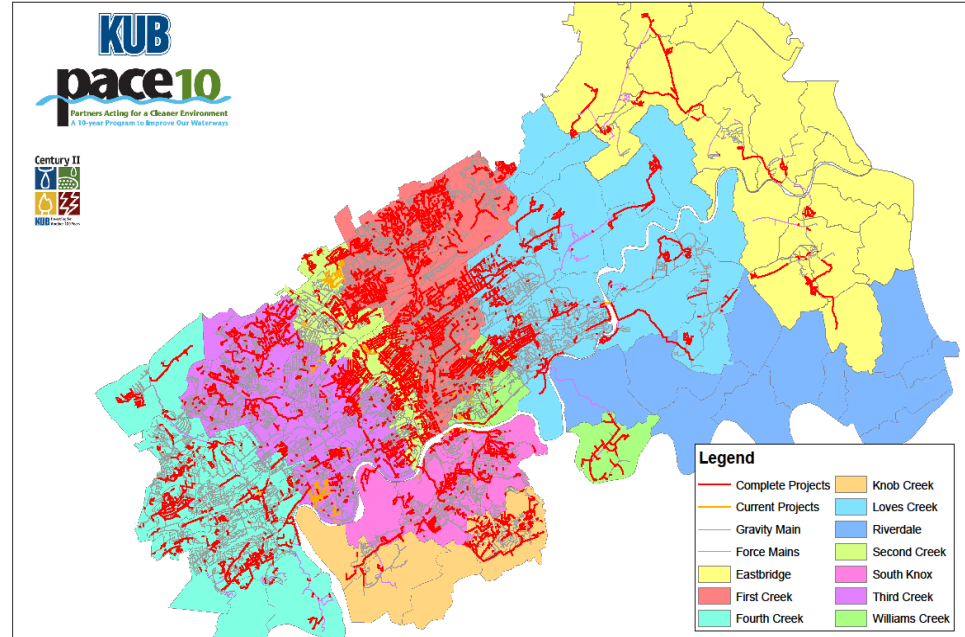
Wastewater Treatment Plants Affected

- Kuwahee treated 55% more flow than an average February
- Total production of all four wastewater plants set #2 and #3 records
- 25 total permit violations in February at all treatment plants



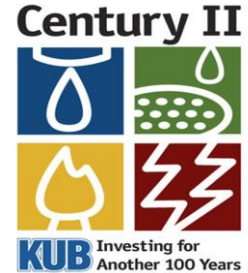
Sewer Rehabilitation on Target

- Replaced average 25 miles per year
 - 375 miles to date
 - 30% of system
- Nearly \$600M invested to date
- Continue to evaluate and prioritize ongoing improvements



Maintaining Consent Decree Goals

- Increase pace of improvements
- Reduce overflows
- Eliminate blending at Kuwahee & Fourth Creek WWTPs
- Ensure sustainable programs to achieve positive results



“KUB has shown tremendous progress in controlling unpermitted discharges since entering into the consent decree...Each program, as presented, met or exceeded requirements outlined in the CD... [EPA] recommends continuing implementation as planned.” - **EPA Inspection Report, November 28, 2018**

KUB Employees Responded

- Dozens of employees worked through peak rainfall weekend
 - Overhead Construction
 - Underground Construction
 - Station Management Services
 - Wastewater Plants
- Over 2600 hours of overtime



Ellis Road Pump Station

Final Results

- State of Tennessee declared an emergency
- KUB estimates impact of ~ \$500,000
- FEMA assessment underway
- KUB systems nearly back to normal

Quotes

“It’s been an unusual rain event for the entire region - you are responding well and doing what you can...appreciate your efforts.” **Tim Hill, Environmental Protection Specialist, TDEC**

After months of saturation, Knoxville received widespread rainfall that exceeded the 50-year, 24-hour storm and in at least one watershed, the 100-year event. KUB has aggressively and effectively responded...” **David Hagerman, PE, City Stormwater Engineer**

“It probably goes without saying...extenuating circumstances are recorded ...specifically , the storm and durations. Sounds like you all have been inundated with rain lately...EPA does not consider (stipulated penalties) for SSOs that would not have occurred had it not been for extreme weather events such as KUB has experienced.” **Dennis Sayre, Acting Chief, Municipal and Industrial Enforcement Section, EPA Region 4**

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