

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF MARTIN)	CASE NO.
COUNTY WATER DISTRICT FOR AN)	2021-00154
ALTERNATIVE RATE ADJUSTMENT)	

NOTICE OF FILING

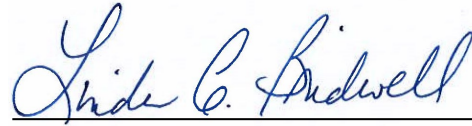
Notice is given to all parties that the following materials have been filed into the record of this proceeding:

- The digital video recording of the evidentiary hearing conducted on May 27, 2021 in this proceeding;
- Certification of the accuracy and correctness of the digital video recording;
- All exhibits introduced at the evidentiary hearing conducted on May 27, 2021 in this proceeding;
- A written log listing, inter alia, the date and time of where each witness' testimony begins and ends on the digital video recording of the evidentiary hearing conducted on May 27, 2021.

A copy of this Notice, the certification of the digital video record, and hearing log have been served upon all persons listed at the end of this Notice. Parties desiring to view the digital video recording of the hearing may do so at <https://youtu.be/MgwJk8vBQxg>.

Parties wishing an annotated digital video recording may submit a written request by electronic mail to pscfilings@ky.gov. A minimal fee will be assessed for a copy of this recording.

Done at Frankfort, Kentucky, this 22nd day of June 2021.



Linda C. Bridwell
Executive Director
Public Service Commission of Kentucky

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BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

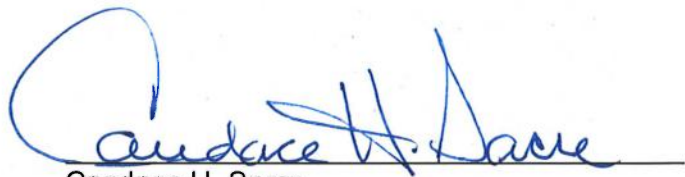
ELECTRONIC APPLICATION OF MARTIN COUNTY)	CASE NO.
WATER DISTRICT FOR AN ALTERNATIVE RATE)	2021-00154
ADJUSTMENT)	


CERTIFICATION

I, Candace H. Sacre, hereby certify that:

1. The attached flash drive contains a digital recording of the Formal Hearing conducted in the above-styled proceeding on May 27, 2021. The Formal Hearing Log, Exhibits, and Exhibit List are included with the recording on May 27, 2021;
2. I am responsible for the preparation of the digital recording;
3. The digital recording accurately and correctly depicts the Formal Hearing of May 27, 2021; and
4. The Formal Hearing Log attached to this Certificate accurately and correctly states the events that occurred at the Formal Hearing of May 27, 2021, and the time at which each occurred.

Signed this 21st day of June, 2021.


Candace H. Sacre
Administrative Specialist III


Stephanie Schweighardt
Notary Public State at Large
Commission Expires: January 14, 2023
ID#: 614400



Session Report - Detail

2020-00154 27May2021

Martin County Water District (Martin District)

Date:	Type:	Location:	Department:
5/27/2021	Public Hearing\Public Comments	Hearing Room 1	Hearing Room 1 (HR 1)

Witness: Steven Boggiano; Stephen Caudill; John Paul Hensley; Jimmy Don Kerr; Amanda LeFevre; Nina McCoy; Craig Miller; Ann Perkins; Anthony Sneed
 Judge: Kent Chandler; Talina Mathews; Michael Schmitt
 Clerk: Candace Sacre

Event Time	Log Event	
9:09:14 AM	Session Started	
9:09:36 AM	Camera Lock Deactivated	
9:09:51 AM	Chairman Schmitt Note: Sacre, Candace	Good morning, On the record in Case No. 2021-000154, the Electronic Application of Martin County Water District for an Alternative Rate Adjustment.
9:10:16 AM	Chairman Schmitt Note: Sacre, Candace	Cumbo present?
9:10:23 AM	Atty Cumbo Martin District Note: Sacre, Candace	In Alliance Office with all witnesses.
9:10:41 AM	Chairman Schmitt Note: Sacre, Candace	My name is Michael Schmitt, Chairman of the Public Service Commission, and will be presiding today. Joining me today via videoconferencing are Vice Chairman Kent Chandler and Commissioner Talina Mathews.
9:11:00 AM	Chairman Schmitt Note: Sacre, Candace	COVID and videoconferencing recommendations. (Click on link for further comments.)
9:13:00 AM	Chairman Schmitt Note: Sacre, Candace	Hearing today for purpose of taking evidence on Martin District application for alternative rate adjustment pursuant to 807 KRA 5:076 and request for emergency rate to be approved by the Commission. This hearing is specifically to take evidence on the issue of an emergency rate.
9:13:25 AM	Chairman Schmitt Note: Sacre, Candace	Burden of proof on applicant, and Commission will be determining whether Martin District credit or operations will be materially impaired or damaged should an emergency rate not be permitted.
9:13:43 AM	Chairman Schmitt Note: Sacre, Candace	Pursuant to KRS 278.190(2), if Commission at any time during the suspension period finds that the company's credit or operations will be materially impaired or damaged by the failure to permit the rates to become effective during the period, the commission may, after any hearing or hearings, permit all or a portion of the rates to become effective under terms and conditions as the commission may, by order, prescribe.
9:14:17 AM	Chairman Schmitt Note: Sacre, Candace	Counsel for parties please introduce themselves, beginning with Martin District.
9:14:29 AM	Atty Cumbo Martin District Note: Sacre, Candace	Brian Cumbo, Martin District.

9:14:34 AM	Chairman Schmitt Note: Sacre, Candace	For MCCC?
9:14:38 AM	Atty Cromer MCCC Note: Sacre, Candace	Mary Cromer, MCCC.
9:14:44 AM	Chairman Schmitt Note: Sacre, Candace	Commission Staff?
9:14:45 AM	Staff Atty Koenig PSC Note: Sacre, Candace	Brittany Koenig and Ariel Miller for Commission Staff.
9:14:53 AM	Chairman Schmitt Note: Sacre, Candace	Public notice given and filed. (Click on link for futher comments.)
9:15:12 AM	Chairman Schmitt Note: Sacre, Candace	Outstanding motions? (Click on link for further comments.)
9:15:22 AM	Chairman Schmitt Note: Sacre, Candace	Public comments. (Click on link for further comments.)
9:16:48 AM	Chairman Schmitt Note: Sacre, Candace	First witness?
9:16:53 AM	Atty Cumbo Martin District Note: Sacre, Candace	Craig Miller.
9:17:13 AM	Chairman Schmitt Note: Sacre, Candace	Witness is sworn.
9:17:28 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Direct Examination. Introduce yourself?
9:17:40 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Background, education, qualifications, certifications?
9:18:20 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Role with Martin District, job title, what mean?
9:19:04 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	When begin work?
9:19:09 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Was date Alliance began contract?
9:19:20 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	What found, what done to address issues?
9:20:29 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Done to address issues?
9:20:39 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Great time to do that, if you would.
9:20:49 AM	SLIDESHOW PRESENTATION Note: Sacre, Candace	ALLIANCE WATER RESOURCES, INC. OPERATIONS UPDATE MARTIN COUNTY WATER DISTRICT MAY 27, 2021
9:54:01 AM	Atty Cumbo Martin District Note: Sacre, Candace	Move into evidence PowerPoint presentation.
9:54:16 AM	Chairman Schmitt Note: Sacre, Candace	Sustained.
9:54:17 AM	APPLICANT HEARING EXHIBIT 1 Note: Sacre, Candace Note: Sacre, Candace	ATTY CUMBO MARTIN DISTRICT - WITNESS MILLER ALLIANCE WATER RESOURCES, INC. OPERATIONS UPDATE MARTIN COUNTY WATER DISTRICT MAY 27, 2021
9:54:20 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Tell Commission what accomplished annual audits?
9:55:18 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Qualifying/licensing staff?
9:56:34 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Challenges faced in transition?

9:59:35 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Cost savings brought to District?
10:02:54 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Pumped to prison, good numbers, some of the best been doing?
10:03:47 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Savings, cost benefits, why need increase?
10:05:29 AM	Atty Cumbo Martin District - witness Miller Note: Sacre, Candace	Reception Alliance received relative Board of Commissioners?
10:07:09 AM	Chairman Schmitt Note: Sacre, Candace	Procedural discussion. (Click on link for further comments.)
10:09:04 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Cross Examination. Prestonsburg check \$10,000, owe \$2,000 to Prestonsburg, explain why?
10:10:45 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Provided monthly water loss reports?
10:10:57 AM	Staff Atty Koenig PSC Note: Sacre, Candace	Submit as PSC Exhibit 1.
10:10:59 AM	PSC HEARING EXHIBIT 1 Note: Sacre, Candace Note: Sacre, Candace	STAFF ATTY KOENIG PSC - WITNESS MILLER JAN 2021 FEB 2021 MAR 2021 APR 2021 MONTHLY WATER LOSS REPORTS
10:13:10 AM	Chairman Schmitt Note: Sacre, Candace	Sustained, let them be filed, but need to get them on screen. (Click on link for further comments.)
10:14:08 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Refer to information filed May 26, Responses to Second Data Request, Question 1, how far past due paying Alliance management fee, listed April 1, April 15, May 1st past due. May 15 also past due?
10:15:19 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Presentation improving matters, theme of application better management and better data?
10:15:45 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Better data that had integrity, internal control?
10:16:06 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Say one big thing billing software, what wrong old billing software?
10:16:49 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	That data created from software PSC worked with in last rate case?
10:17:05 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Data PSC working with not accurate?
10:17:19 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Amounts given, Martin District getting to bottom line, PSC setting rates, PSC relies on data utilities collect. Have been secure data arrived at Martin District, PSC clear picture based on data?
10:18:34 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Billing, staffing situation at District, fully staffed billing office?
10:18:50 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Fully staffed plant operations?
10:18:56 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Compliance with state/ federal regulations staffing levels at treatment plant?
10:19:04 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Distribution operators, too?
10:19:13 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Billing software, only improvement, or published written policies/procedures?

10:19:48 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Rent Collier Center for billing office?

10:20:00 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Rent increase in January?

10:20:28 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Perkins know that?

10:20:39 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Reviewed public comments?

10:20:50 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Spoke about customer education/outreach in application, go into that more?

10:22:37 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace District effort help connect customers trouble paying bills aid during COVID?

10:23:30 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Plan addressing public comments connecting outreach program?

10:24:02 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Educating customers important, mentioned not asking luxuries, rates are covering baseline items in budget required keep utility functioning?

10:24:35 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace When started in Jan 2020, utility in desperate situation?

10:24:52 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Trying to work out of situation, formation Martin County Water District Work Group, describe what group is?

10:26:57 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Have great deal transparency?

10:27:10 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Good thing for district in desperate situation?

10:27:26 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Part of education to public how desperate things are and how climbing out of?

10:27:43 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Attachment 4G Water Loss Plan, staff felt solid, clarify where are what finished, what happening/what will happen master meter?

10:30:21 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Process identifying meters, identified all now, progress, working with master meters now?

10:31:08 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Kentucky Rural Water leak detection, participation in work group, utilizing multiple state agencies, access to groups can use?

10:31:38 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Items mentioned for improvement focused on items you can control, need assistance big ticket items?

10:32:27 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Part of that, identifying when need funds, identified problems in November, work toward applying for rate increase, not paid down debt surcharge funds exhausted, reason emergency rate increase behind on debt service, out of covenants on loans, behind payments to Alliance?

10:33:31 AM Staff Atty Koenig PSC - witness Miller
Note: Sacre, Candace Consider that dire and emergency?

10:33:46 AM Session Paused

10:33:48 AM Session Resumed

10:34:08 AM	Chairman Schmitt - witness Miller? Note: Sacre, Candace	Examination. January 2021 water loss, shows percentage 74.64 percent?
10:34:22 AM	Session Paused	
10:34:24 AM	Session Resumed	
10:34:54 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Water loss 74.64 percent January 2021?
10:35:08 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Mean very 100 gallons water District produces for sale. 75 percent processed but not sold?
10:35:35 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Whatever cost to produce water, most recover was 25 percent of cost?
10:36:02 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Water utility not expect be solvent or operate break-even basis as long as losing 75 percent of water produces?
10:36:30 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	That water loss, ten-fifteen hearings since 2016, problem for many, many years prior to Alliance, water loss 75 percent evidence of system failed operationally, infrastructure failing?
10:37:29 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Absent replacing infrastructure, any hope system ever sustainable operational, financial standpoint?
10:38:46 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Based on your rough estimate, will take millions of dollars?
10:39:30 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	What is the purpose for depreciation?
10:41:08 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	When water company in rates basically put money back reserve infrastructure plan replace pipes, pumps, other equipment before wears out, correct?
10:42:20 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Portion rates accounted for depreciation/reserve replacements/upgrades used for current expenses, what mean keeping/maintaining system as should be?
10:43:21 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Prior management 25 years maintained rates and used depreciation reserve on infrastructure would be in present dire circumstances right now?
10:44:26 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Did not put money aside?
10:44:34 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	If have plan, find out what was?
10:44:41 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	No plan, did not put money aside, lack of management skill or never raising rates, right now, system cost \$55 million fix or replace?
10:45:10 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Customer base is 3500 customers?
10:45:19 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	System no longer, cheaper never had system to start with and put in than work through and repair what is there?
10:45:52 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Emergency rate request, figures seen here from Jan 1 2021 through Apr 30 2021, District net loss \$158,677, disagree?

10:46:39 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	May 25 2021 District owed vendors past due accounts \$732,897.77, disagree?
10:47:28 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Running monthly deficits close to \$200,000 in red this year, cannot make current payments, no money go toward reducing \$732,897 owed for years?
10:48:00 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Going back, 2017, operating loss \$704,302, \$14,000 less than in 2017, cannot at 75 percent 70 or 60 ever make headway?
10:48:46 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Higher and higher, system maintained, debt eliminated?
10:49:00 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Until more money, repairs made by District funds from ratepayers?
10:49:19 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Know District awarded monies from places \$7-8 million infrastructure, projects bid out line replacement, meter replacement Warfield, bids higher than received to undertake?
10:50:04 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Warfield lot of leaks, problems, project on hold until more money available, and approval sought money allotted for something else?
10:50:44 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Based on education training experience, opinion whether District operations damaged if emergency rate not put into effect?
10:52:01 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Pump purchased Tugg Fork to plant?
10:52:18 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Pump repaired, what happened to it?
10:54:58 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	When pump back into operation?
10:55:05 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Have report prepared by Ky Div of Water serious concerns adequacy Crum Reservoir, aware?
10:55:27 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	While pump down, dry weather, reservoir 14 feet below normal pool?
10:55:41 AM	Chairman Schmitt - witness Miller Note: Sacre, Candace	Div of Water estimated May 21 2021 seven to 14 days supply, unless pump in place or rains, county run out of water?
10:56:19 AM	Chairman Schmitt Note: Sacre, Candace	Questions?
10:56:23 AM	Vice Chairman Chandler - witness Miller Note: Sacre, Candace	Examination. Water loss, selling 30 to 35 percent water produced, where currently metering water, where accurately metering water? Able to bypass reservoir?
10:58:04 AM	Vice Chairman Chandler - witness Miller Note: Sacre, Candace	Any metering amount water Tugg Fork take in?
10:58:27 AM	Vice Chairman Chandler - witness Miller Note: Sacre, Candace	Metered at intake at water treatment plant?
10:58:54 AM	Vice Chairman Chandler - witness Miller Note: Sacre, Candace	Crum Reservoir to plant?
10:59:06 AM	Vice Chairman Chandler - witness Miller Note: Sacre, Candace	Meter from treatment plant to distribution system?
10:59:21 AM	Vice Chairman Chandler - witness Miller Note: Sacre, Candace	Number of zone meters on distribution system?

10:59:28 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Inez master meter, master meter at water plant?

10:59:48 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Then three areas, 40 West, Turkey, and 40 East?

10:59:54 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Turkey is last that section?

10:59:58 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace From 40 West, Marcelous-Wells, subbed two areas, those subbed individual areas, 40 East submetered Rockcastle-Buck Creek, (click on link for further comments)?

11:00:31 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace How many meters accurately reading usage?

11:01:20 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Expectation figure out zone meters accurate or not determine where losses prior to service lines, when occur?

11:02:42 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Using zone meters now?

11:02:50 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Individual meters, since lines come on, dozens, tens, how many locations has District found served water unmetered those locations now have meters? Difference in customer count?

11:04:03 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Five, ten?

11:04:16 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Chairman said \$55 million, educated guess upgrades are, did not seem new water treatment plant on list?

11:04:52 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Discussing need for 20 plus years, water treatment plant near end of useful life?

11:05:30 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace New floating aparatus for raw water intake, aware?

11:06:01 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Before that, pump vault Crump Reservoir 2-4 million gallon pumps, problems with sand, aware previous setup?

11:06:52 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Want know current project work better previous ones, you or Caudill?

11:08:07 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Now raw water intake and not doing work line replacements, different situation than both projects fully funded?

11:08:30 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Proposal initially raw water intake and then Warfield?

11:08:40 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Now defer Warfield line replacement use money bid raw water intake higher?

11:08:59 AM Vice Chairman Chandler - witness Miller
Note: Sacre, Candace Proposed better what have now but not same as six months, proposed exclusively raw water at expense of Warfield?

11:10:03 AM Chairman Schmitt
Note: Sacre, Candace Questions?

11:10:14 AM Atty Cromer MCCC - witness Miller
Note: Sacre, Candace Cross Examination. Infrastructure replacement plan 2020, five year capital improvement plan, how immediate needs list match with capital improvement plan?

11:12:23 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Mean \$56 million immediate needs in addition capital improvement plan?
11:12:43 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Still working on capital improvement plan?
11:12:56 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Still working with Bell Engineering?
11:13:15 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	First item, smart meters, Dec 2020 board approved grant feasibility study, done study on that?
11:13:41 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Apply for grant?
11:13:52 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Benefits outweigh costs of smart metering, why believe that?
11:14:54 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Water theft beyond what seen previous years water business?
11:15:14 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	What based on?
11:16:49 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Meter usage not include houses not metered?
11:17:10 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Households stealing water on and off throughout month?
11:17:24 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Found instances happening?
11:17:41 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Have new SMP theft of water sent to PSC for review?
11:18:01 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	June 2020?
11:18:20 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Negative read meters doing meter audit consistent, 41 negative reads, may be instances of theft, what done to see if working, investigate?
11:19:54 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Customer service complaints, District currently maintain log of calls or communications?
11:21:19 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	When did process start?
11:21:56 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Last report in March, included customer service orders, not include complaints, have not seen logging customer calls, customers called, no response.
11:23:06 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Lease issue, customer service rental Collier Community Center and separate Alliance office?
11:23:32 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Possibility combining offices?
11:23:47 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Why necessary Alliance have separate office from District?
11:24:20 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Work for other divisions of Alliance?
11:24:34 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Who are they?
11:24:46 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Not there regularly?

11:24:53 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Customer assistance funding, 240 customers received \$94,000, any customers received funding in 2021?
11:26:17 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Who at District responsible for talking to county?
11:26:36 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	With new judge-executive?
11:26:46 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	When last discussions had?
11:26:55 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Late fees, plan for complying, what done so far?
11:27:37 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Set up end code reduce late fee?
11:27:53 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	District intent charging late fees customers eligible LIHEAP?
11:28:02 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	LIHEAP?
11:28:10 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Water version of LIHEAP, until implemented customers continue to get late fee?
11:28:51 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Payment plans, terms offering?
11:29:21 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Rule part of moratorium no longer in effect, saying continuing?
11:29:40 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Timing, disconnect notice?
11:30:54 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Time period between letter mailed and actual disconnection?
11:31:10 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Five days from mailing?
11:31:40 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	600 disconnect notices in couple of month period, how many disconnected?
11:37:44 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Can you negotiate with the customer to get some kind of a payment?
11:38:57 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Cost for meters within approved budget, what that based on?
11:39:45 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Are meters currently read to tens or thousands?
11:40:31 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Are radio read meters read to tens?
11:40:50 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	All meters read on 20th, why?
11:41:35 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	What are Distict procedures/practices for flushing?
11:42:04 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Flushed system this spring, last year?
11:42:26 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	If you get rate increase, what top three reasons why per cost customer higher than anyone else?
11:44:57 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Where are current cost paid?

11:46:02 AM	Atty Cromer MCCC - witness Miller Note: Sacre, Candace	Repairs being paid, correct?
11:47:18 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Recross Examination. Alliance not charge District for office at Collier center?
11:48:11 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Alliance fronted District money keep things going, submitted amount?
11:48:25 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Approximately \$65,989 Alliance has paid outside contract?
11:48:38 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Not repair costs built in, over and above?
11:48:50 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	Alliance trying to keep things going?
11:49:09 AM	Staff Atty Koenig PSC - witness Miller Note: Sacre, Candace	In response to water reports, comment made water loss has improved since Alliance taken over, but cannot speak to data reports?
11:50:59 AM	Chairman Schmitt Note: Sacre, Candace	Witness excused.
11:51:13 AM	Chairman Schmitt Note: Sacre, Candace	Recess until 1 pm.
11:51:34 AM	Session Paused	
1:03:53 PM	Session Resumed	
1:04:06 PM	Chairman Schmitt Note: Sacre, Candace	Back on the record.
1:04:32 PM	Chairman Schmitt Note: Sacre, Candace	Call next witness.
1:04:34 PM	Atty Cumbo Martin District Note: Sacre, Candace	Anthony Sneed.
1:04:37 PM	Chairman Schmitt Note: Sacre, Candace	Witness is sworn.
1:04:46 PM	Atty Cumbo Martin District - witness Sneed Note: Sacre, Candace	Direct Examination. Introduce yourself?
1:05:01 PM	Atty Cumbo Martin District - witness Sneed Note: Sacre, Candace	Education, training, background, certifications?
1:06:00 PM	Atty Cumbo Martin District - witness Sneed Note: Sacre, Candace	Here today rate adjustment Martin District, opinion in need of emergency rate adjustment?
1:07:11 PM	Atty Cumbo Martin District - witness Sneed Note: Sacre, Candace	Take us through calculations Alliance utilized?
1:15:23 PM	Atty Cumbo Martin District - witness Sneed Note: Sacre, Candace	Analysis as to impact to proposed rate increase?
1:15:55 PM	Atty Cumbo Martin District - witness Sneed Note: Sacre, Candace	Other relevant factors should consider?
1:20:28 PM	Atty Cumbo Martin District - witness Sneed Note: Sacre, Candace	Water loss?
1:23:10 PM	Atty Cumbo Martin District - witness Sneed Note: Sacre, Candace	Why an emergency?
1:26:56 PM	APPLICANT HEARING EXHIBIT 2 Note: Sacre, Candace Note: Sacre, Candace	ATTY CUMBO MARTIN DISTRICT - WITNESS SNEED MARTIN DISTRICT IMPACT OF PROPOSED INCREASE
1:26:57 PM	APPLICANT HEARING EXHIBIT 3 Note: Sacre, Candace	ATTY CUMBO MARTIN DISTRICT - WITNESS SNEED

1:27:10 PM	Note: Sacre, Candace Staff Atty Koenig PSC - witness Sneed Note: Sacre, Candace	MARTIN DISTRICT NET INCOME JAN 2020 - DEC 2020 Cross Examination. Figuring rates at this time lowest percentage, thinking minimum plans improvements cause savings supplement required amount in future?
1:29:35 PM	Staff Atty Koenig PSC - witness Sneed Note: Sacre, Candace	Calculations saying performed cost of service study when calculate rates?
1:30:49 PM	Chairman Schmitt - witness Sneed Note: Sacre, Candace	Examination. Not here in 2018 when Martin District asked for rate increase, problems with records, audits, management, testimony absent money state or federal government situation District not brought into operational situation, true?
1:38:21 PM	Vice Chairman Chandler - witness Sneed Note: Sacre, Candace	Examination. Audits for '17, '18, '19, '20 or '16, '17, '18, '19, '20 outstanding when Alliance arrived?
1:38:43 PM	Vice Chairman Chandler - witness Sneed Note: Sacre, Candace	'16, '17, '18, '19 all completed since Alliance arrived?
1:38:50 PM	Vice Chairman Chandler - witness Sneed Note: Sacre, Candace	How many qualified and unqualified?
1:39:04 PM	Vice Chairman Chandler - witness Sneed Note: Sacre, Candace	Four outstanding completed and 2020 done?
1:40:12 PM	Commissioner Mathews - witness Sneed Note: Sacre, Candace	Examination. Seen increase in revenue?
1:41:17 PM	Commissioner Mathews - witness Sneed Note: Sacre, Candace	Some be folks using less because more expensive?
1:41:46 PM	Commissioner Mathews - witness Sneed Note: Sacre, Candace	Customer count go up people not metered or multiple meters?
1:42:34 PM	Chairman Schmitt Note: Sacre, Candace	Witness excused.
1:42:44 PM	Chairman Schmitt Note: Sacre, Candace	Next witness?
1:42:50 PM	Atty Cumbo Martin District Note: Sacre, Candace	Ann Perkins.
1:43:44 PM	Chairman Schmitt Note: Sacre, Candace	Witness is sworn.
1:43:57 PM	Atty Cumbo Martin District - witness Perkins Note: Sacre, Candace	Direct Examination. Introduce yourself?
1:45:22 PM	Atty Cumbo Martin District - witness Perkins Note: Sacre, Candace	Role with Martin District?
1:45:56 PM	Atty Cumbo Martin District - witness Perkins Note: Sacre, Candace	Role played in improvement administration and practices?
1:51:13 PM	Atty Cumbo Martin District - witness Perkins Note: Sacre, Candace	What about any cost savings?
1:53:16 PM	Atty Cumbo Martin District - witness Perkins Note: Sacre, Candace	Status of audits and how are we qualified?
1:53:42 PM	Atty Cumbo Martin District - witness Perkins Note: Sacre, Candace	Based experience, are there other times you have helped other water districts?
1:55:07 PM	Atty Cumbo Martin District - witness Perkins Note: Sacre, Candace	Should District be awarded rate increase, necessary and an emergency?
1:56:43 PM	Staff Atty Koenig PSC - witness Perkins Note: Sacre, Candace	Cross Examination. Prepare depreciation schedule, chapter 7?

1:58:01 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace How able reconcile accounts receivable for 2020?

1:59:30 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace Elaborate billing software concerns?

2:00:35 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace Reports on other software?

2:00:58 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace Who purchased new billing software, does Martin District owe for the software?

2:02:02 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace Confused, responses DR 2, list of items Alliance paid for but Martin District repay, \$10,000, Alliance not being repaid for whole list?

2:02:55 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace Done before other districts similarly situated?

2:03:33 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace Items purchased for Martin District remain purchases for Alliance retain ownership?

2:04:17 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace Bad debt \$118,530 represents five percent total sales test period, typical level of bad debt?

2:04:42 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace Elaborate on that?

2:05:38 PM Staff Atty Koenig PSC - witness Perkins
Note: Sacre, Candace In experience, seen district and financials in this state?

2:06:14 PM Chairman Schmitt
Note: Sacre, Candace Questions?

2:06:31 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace Cross Examination. Response to DR miscellaneous revenue, answer?

2:07:15 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace Mentioned four fees, did not break down, reason?

2:08:09 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace Possible get those amounts after hearing?

2:08:20 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace Prioritizing debt, what look like?

2:09:43 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace Increasing collection efforts?

2:10:09 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace Making sure whatever customer assistance funding available pushing for more, \$120,000 Healthy at Home fund, been customer assistance funds in 2021, if so, which?

2:11:05 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace Which fund?

2:11:26 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace In communications with Community Action of Kentucky plans for low income funds may be coming?

2:11:53 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace Meter read date, not show actual date, why not been able date on bills?

2:13:01 PM Atty Cromer MCCC - witness Perkins
Note: Sacre, Candace Pretty standard in industry, conclude throughout industry read date not shown on bills?

2:14:56 PM Chairman Schmitt
Note: Sacre, Candace Witness is excused.

2:15:02 PM Chairman Schmitt
Note: Sacre, Candace Another witness?

2:15:06 PM Atty Cumbo Martin District
Note: Sacre, Candace Steven Boggiano.

2:15:31 PM Atty Cumbo Martin District - witness Boggiano
Note: Sacre, Candace Direct Examination. Introduce yourself?

2:16:16 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace Cross Examination. Depreciation schedule, asking see or have in front of you?

2:17:04 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace No additions for calendar year 2020?

2:17:49 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace Capital purchases outside of what Alliance purchased?

2:18:29 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace Not yet placed in service?

2:18:51 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace Determination of reasonableness why included on depreciation schedule?

2:19:51 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace Aware Martin District involved in rate case previously assets attributed depreciable lives?

2:20:14 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace 2018-00017?

2:20:23 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace Staff recommended midpoint, Commission adopted depreciable life in order, feel like enough evidence changes recommendation?

2:21:46 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace Typical assign distribution/transmission mains depreciable life 33 years, standard use?

2:22:39 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace What means not express opinion?

2:23:57 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace After Alliance assumed operations and performed 2020 audit?

2:24:16 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace 2020 audit, compliance findings, material weaknesses not addressed in that audit?

2:24:37 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace Any red flags, weaknesses not material to case?

2:24:53 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace District out of compliance loan covenants reserve accounts?

2:25:07 PM Staff Atty Koenig PSC - witness Boggiano
Note: Sacre, Candace Reserve account required?

2:25:29 PM Chairman Schmitt - witness Boggiano
Note: Sacre, Candace Examination. In 2020 audit, District not paid required amount depreciation/reserve should have been \$66,300?

2:26:08 PM Chairman Schmitt - witness Boggiano
Note: Sacre, Candace Could be deemed in default of loan covenants?

2:26:22 PM Chairman Schmitt - witness Boggiano
Note: Sacre, Candace To accountant means stay clear of any action by lender to call loan due or action deem necessary to protect lenders?

2:27:33 PM Chairman Schmitt - witness Boggiano
Note: Sacre, Candace Noted KRS 65.140 requires purchases paid within 30 days receipt invoice, District not in compliance?

2:28:00 PM	Chairman Schmitt - witness Boggiano Note: Sacre, Candace	District owes vendors close to \$800,000 due for number of years, also correct?
2:28:16 PM	Chairman Schmitt - witness Boggiano Note: Sacre, Candace	In audit of 2019 and 2018, those same findings present?
2:28:29 PM	Chairman Schmitt - witness Boggiano Note: Sacre, Candace	Findings present efore Alliance undertook management of District?
2:29:00 PM	Chairman Schmitt Note: Sacre, Candace	Witness excused.
2:29:30 PM	Chairman Schmitt Note: Sacre, Candace	Recess until 2:40 pm.
2:29:52 PM	Session Paused	
2:43:35 PM	Session Resumed	
2:43:47 PM	Chairman Schmitt Note: Sacre, Candace	Back on record.
2:44:34 PM	Chairman Schmitt Note: Sacre, Candace	Witness is sworn.
2:45:04 PM	Atty Cumbo Martin District - witness Kerr Note: Sacre, Candace	Direct Examination. Name?
2:45:15 PM	Atty Cumbo Martin District - witness Kerr Note: Sacre, Candace	Relationship Martin District?
2:45:23 PM	Atty Cumbo Martin District - witness Kerr Note: Sacre, Candace	Rate adjustment, first contract with Alliance, how Alliance performed since January last year?
2:47:55 PM	Atty Cumbo Martin District - witness Kerr Note: Sacre, Candace	Application for rate increase, why need rate adjustment?
2:50:03 PM	Staff Atty Koenig PSC - witness Kerr Note: Sacre, Candace	Cross Examination. Board meeting on Tuesday, livestreaming on FB, great, board member on end, new board member?
2:51:25 PM	Staff Atty Koenig PSC - witness Kerr Note: Sacre, Candace	Your role day to day changed since Alliance?
2:52:36 PM	Chairman Schmitt - witness Kerr Note: Sacre, Candace	Examination. After 2018 rate case, PSC not award District rate increase requested?
2:53:06 PM	Chairman Schmitt - witness Kerr Note: Sacre, Candace	Both you and expert testified clear District needed more money irrespective of whether management firm hired or not?
2:53:45 PM	Chairman Schmitt - witness Kerr Note: Sacre, Candace	District awarded grant money for Warfield service line/meter replacement, water from river to raw water intake, projects bid once or twice?
2:54:33 PM	Chairman Schmitt - witness Kerr Note: Sacre, Candace	How bids compare with projected costs?
2:55:25 PM	Chairman Schmitt - witness Kerr Note: Sacre, Candace	Problems predated appointment to board, discussed fact spoke with banks loans obtained, unsuccessful?
2:56:02 PM	Chairman Schmitt - witness Kerr Note: Sacre, Candace	Financial status nobody willing to loan money?
2:56:34 PM	Vice Chairman Chandler - witness Kerr Note: Sacre, Candace	Examination. Spoken to anyone since audits complete?
2:57:51 PM	Vice Chairman Chandler - witness Kerr Note: Sacre, Candace	What loan for?
2:58:03 PM	Vice Chairman Chandler - witness Kerr Note: Sacre, Candace	Did commit but not specific terms?

2:58:51 PM	Chairman Schmitt Note: Sacre, Candace	PSC have to approve loan.
2:59:21 PM	Commissioner Mathews - witness Kerr Note: Sacre, Candace	Examination. Talked to KIA about low-interest loan programs?
3:01:13 PM	Chairman Schmitt Note: Sacre, Candace	Witness excused.
3:01:24 PM	Atty Cumbo Martin District Note: Sacre, Candace	Next witness?
3:01:40 PM	Chairman Schmitt Note: Sacre, Candace	Witness is sworn.
3:01:57 PM	Atty Cumbo Martin District - witness Hensley Note: Sacre, Candace	Direct Examination. Name?
3:02:06 PM	Atty Cumbo Martin District - witness Hensley Note: Sacre, Candace	How affiliated Martin District?
3:02:15 PM	Atty Cumbo Martin District - witness Hensley Note: Sacre, Candace	Member of board?
3:02:23 PM	Atty Cumbo Martin District - witness Hensley Note: Sacre, Candace	How characterize Alliance performance?
3:04:08 PM	Atty Cumbo Martin District - witness Hensley Note: Sacre, Candace	Application for rate increase, emergency?
3:04:51 PM	Staff Atty Koenig PSC - witness Hensley Note: Sacre, Candace	Cross Examination. Treasurer?
3:05:04 PM	Staff Atty Koenig PSC - witness Hensley Note: Sacre, Candace	Perspective how seen things change, listed but maybe don't perform duties?
3:05:37 PM	Staff Atty Koenig PSC - witness Hensley Note: Sacre, Candace	Impressed with Alliance, performing way things should be?
3:06:14 PM	Staff Atty Koenig PSC - witness Hensley Note: Sacre, Candace	Board supportive of Alliance?
3:06:39 PM	Chairman Schmitt - witness Hensley Note: Sacre, Candace	Examination. Note 2020 operating loss of \$690,000, through April this year \$188,657, acknowledge continuing losses put District out of business, rate relief?
3:07:34 PM	Chairman Schmitt - witness Hensley Note: Sacre, Candace	When District operating in red for last ten, twelve months or more, Alliance not been paid 30-45 days, actually carrying expenses and paying for things?
3:08:31 PM	Chairman Schmitt Note: Sacre, Candace	Witness excused.
3:08:44 PM	Atty Cumbo Martin District Note: Sacre, Candace	Concludes case in chief for District.
3:09:01 PM	Staff Atty Koenig PSC Note: Sacre, Candace	Call Amanda LeFevre.
3:09:11 PM	Chairman Schmitt Note: Sacre, Candace	Witness is sworn.
3:09:18 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Direct Examination. Spell name?
3:09:47 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Where employed?
3:09:53 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Business address?
3:10:01 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	How long employed?

3:10:17 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Current position?
3:10:25 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	How long?
3:10:33 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	General duties?
3:11:19 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Highest level of education?
3:11:29 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Testified in PSC hearing before?
3:11:40 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Staff request testimony regarding Martin County Work Group?
3:11:58 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Draft letter to Commission about Work Group on May 26, 2021?
3:12:20 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	How work group started, goals?
3:13:42 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	List of participants EEC, Martin District, Alliance, KRWA, Big Sandy Area Development, University of Kentucky, MCCC, Bell Engineering?
3:14:17 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Meet?
3:14:55 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Any other utility receiving types of resources from DOW or EEC?
3:16:30 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Agencies in different stages assisting Martin District, focused and on same page, realizing different agencies play, DOW inspections different than PSC inspections, come out at meetings?
3:17:57 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Discuss management improved at Martin District?
3:22:15 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Compliance matters, issues during flood and agreed order on disinfectant products?
3:26:36 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Sanitary survey is done every 3 years?
3:27:46 PM	Session Paused	
3:27:52 PM	Session Resumed	
3:28:14 PM	Staff Atty Koenig PSC - witness LeFevre Note: Sacre, Candace	Work group, mentioned helps bidding agencies, but future of group and goals helping Martin District?
3:29:44 PM	Staff Atty Koenig PSC Note: Sacre, Candace	No further questions.
3:29:49 PM	Chairman Schmitt Note: Sacre, Candace	No questions.
3:29:51 PM	Chairman Schmitt Note: Sacre, Candace	Questions?
3:30:05 PM	Atty Cromer MCCC - witness LeFevre Note: Sacre, Candace	Cross Examination. 2016 Agreed Order, said closed, how affects requirements in Order, District develop and implement (inaudible) plan, released when Agreed Order released?
3:30:51 PM	Atty Cromer MCCC Note: Sacre, Candace	No further questions.
3:31:00 PM	Chairman Schmitt Note: Sacre, Candace	Anything further?

3:31:05 PM	Chairman Schmitt Note: Sacre, Candace	Witness excused.
3:31:24 PM	Chairman Schmitt Note: Sacre, Candace	Witness sworn.
3:31:42 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Direct Examination. Name?
3:32:18 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Current employment?
3:33:14 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Relationship with Martin District?
3:34:16 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Position with Martin District?
3:34:44 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Highest level of education?
3:35:00 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Testified at PSC hearing before?
3:35:07 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Staff request testimony?
3:35:16 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Presentation to Commission and filed in record?
3:35:35 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Figure take to put Martin District pump clean water and function financially?
3:36:22 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Present presentation?
3:36:39 PM	SLIDESHOW PRESENTATION Note: Sacre, Candace	WATER SYSTEM IMPROVEMENTS PROJECT STATUS UPDATE MARTIN COUNTY WATER DISTRICT MAY 12, 2021
4:03:14 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Explaining Miller found pipe showed seven clamps on it, PSC Exhibit 2, type of example discussing?
4:04:45 PM	PSC HEARING EXHIBIT 2 Note: Sacre, Candace Note: Sacre, Candace	STAFF ATTY KOENIG PSC - WITNESS CAUDILL PHOTOGRAPH OF 18-INCH PIPE WITH CLAMPS
4:04:56 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Work group, ever seen response to one water district in your experience as an engineer?
4:06:18 PM	Staff Atty Koenig PSC - witness Caudill Note: Sacre, Candace	Anything to add on Alliance or Martin District performance?
4:07:20 PM	Chairman Schmitt - witness Caudill Note: Sacre, Candace	Examination. How evaluate current status of infrastructure of Martin District?
4:09:11 PM	Chairman Schmitt - witness Caudill Note: Sacre, Candace	To make improvements necessary, require funding from sources outside Martin County government and Martin District?
4:10:22 PM	Chairman Schmitt - witness Caudill Note: Sacre, Candace	Until improvements made, when repairs needed and smaller items replaced, only source of funds is ratepayer?
4:10:46 PM	Chairman Schmitt - witness Caudill Note: Sacre, Candace	If District running deficits of \$50,000+ month, not sustainable in terms of operate the District?
4:11:34 PM	Chairman Schmitt - witness Caudill Note: Sacre, Candace	Ultimately, without state/federal funding, ratepayers faced excessive water loss/insufficiencies cause ratepayers pay more than if maintained properly in first place?

4:12:16 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Examination. Proposed fixes water treatment plant, long term or short term?
4:12:51 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Location, age, condition water treatment plant durable beyond ten years?
4:13:19 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Without significant capital improvements beyond ten years?
4:14:28 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	If District build new water treatment plant, size the current one is?
4:14:53 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Like replacement operate significantly less if water loss fixed?
4:15:08 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Unless water loss under control, reduced levels, operating at capacity factor water treatment plant is, healthy to operate all but four hours a day?
4:16:07 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	No room for error?
4:16:39 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Aware of previous attempts raw water intake on Tug Fork?
4:16:57 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Aware of floating apparatus there before?
4:17:17 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Why current proposed project more durable solution to raw water troubles have had?
4:19:38 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	500 kW generator, operate pumps and water treatment plant if power goes out?
4:20:25 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Power quality issues at treatment plant or intake or both?
4:20:55 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Discussed power quality issues with AEP?
4:21:12 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Confident be fixed?
4:21:32 PM	Vice Chairman Chandler - witness Caudill Note: Sacre, Candace	Let us know?
4:22:04 PM	Chairman Schmitt Note: Sacre, Candace	Witness excused.
4:22:19 PM	Chairman Schmitt Note: Sacre, Candace	Present witness?
4:22:39 PM	Atty Cromer MCCC Note: Sacre, Candace	Nina McCoy.
4:22:43 PM	Chairman Schmitt Note: Sacre, Candace	Witness is sworn.
4:22:59 PM	Atty Cromer MCCC - witness McCoy Note: Sacre, Candace	Direct Examination. Name?
4:23:12 PM	Atty Cromer MCCC - witness McCoy Note: Sacre, Candace	Position with MCCC?
4:23:20 PM	Atty Cromer MCCC - witness McCoy Note: Sacre, Candace	How things gone with MCCC past year over COVID?
4:24:04 PM	Atty Cromer MCCC - witness McCoy Note: Sacre, Candace	Concerns about District?
4:24:44 PM	Atty Cromer MCCC - witness McCoy Note: Sacre, Candace	Affordability, how MCCC looked at what rate increase mean?

4:25:14 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace MCCC Exhibit 1, what is?

4:26:18 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Where data came from?

4:26:31 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Why particular concern highest rates?

4:27:37 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace MCCC Exhibit 2, what is this?

4:29:06 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace MCCC Exhibit 4, tell us what this is?

4:31:13 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Rate increase on emergency basis, overall?

4:31:32 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Customer service issues, what been doing push on issue, tell us what you been doing?

4:33:06 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Was the recommendation in a letter?

4:33:51 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Tell us what we are looking at now?

4:35:04 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace And tell us what this is?

4:35:40 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Did we address all the issues?

4:35:53 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace How did Alliance respond to the letters?

4:36:54 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace MCCC Exhibit 9, tell us what this is?

4:37:17 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Did you review this?

4:38:09 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Is this the table you were talking about?

4:38:37 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Were you concerned about any of the results?

4:40:31 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Water quality issues, how is the water at your house?

4:41:33 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace MCCC Exhibit 10, tell us what this is?

4:42:36 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace UK study, they did it, did you have role?

4:43:23 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Talk to people when collect samples?

4:43:43 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace MCCC Exhibit 11, tell us this is?

4:44:53 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Anyone review before distributed?

4:45:25 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Did they sign off on it?

4:45:36 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Tell us what pamphlet shows?

4:46:55 PM Chairman Schmitt - witness McCoy
Note: Sacre, Candace Examination. 12 percent of people with complaint said didn't drink it or 88 percent had complaints don't drink water or 88 percent of customers don't drink water?

4:47:52 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Direct Examination (cont'd). How many houses, how chosen?

4:48:24 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Second page, tell us what this is?

4:49:39 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace What tell us about conclusions of tests?

4:50:18 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace When study conducted?

4:50:36 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Aware of whether District showing problems with disinfectants byproducts at this time?

4:50:57 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Anything else you feel important for Commission to understand?

4:53:20 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Anything about disinfection byproducts issue concerns you?

4:54:15 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace MCCC Exhibit 12, tell us what this is?

4:55:31 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Do you know how many years?

4:55:50 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Not still getting notice, not concern not happening, gone on for so long?

4:57:31 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace MCCC Exhibit 13, tell us what this is?

4:58:26 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Understanding of what based on?

4:59:15 PM Atty Cromer MCCC - witness McCoy
Note: Sacre, Candace Any other general concerns have with rate increase, anything talked about so far?

5:06:53 PM Chairman Schmitt - witness McCoy
Note: Sacre, Candace Examination. Issue about water lines to high school, county government and fiscal court?

5:07:44 PM Chairman Schmitt - witness McCoy
Note: Sacre, Candace Now county judge executive?

5:07:53 PM Chairman Schmitt - witness McCoy
Note: Sacre, Candace Back in early 2000s, management audits, power structure ignores needs of others, whoever controlled water district, problem you have could not have done more damage than if intentionally destroyed water system, problem now last year lost \$690,000, year before \$704,000, this year four months \$188,000, Alliance not paid and have paid \$65,000 on behalf of district, if district can't pay bills it can't provide water to anybody. (Click on link for further comments.)

5:10:31 PM Chairman Schmitt - witness McCoy
Note: Sacre, Candace Question is, if District in death spiral, what option is there other than raise rates until outside money can come in?

5:11:29 PM Chairman Schmitt - witness McCoy
Note: Sacre, Candace Water quality problems, talking \$55 million to fix it, going to take while to do that, wanted Warfield fixed, disappointed bids so high, bad situation, some water bills will go to \$96 and sewer to \$95, it's not just Martin District, solutions you can propose willing to listen, it's going to be a long time to cure it, hope you know have done and will do everything we can.

5:15:00 PM	Chairman Schmitt - witness McCoy Note: Sacre, Candace	Would point out, too, PSC tried to take action on behalf of low-income, eliminating late fees, limited to actual costs, know your senator and representative voted to strip PSC of power?
5:16:02 PM	Chairman Schmitt Note: Sacre, Candace	Questions?
5:16:37 PM	Atty Cromer MCCC Note: Sacre, Candace	Move exhibits into record.
5:16:40 PM	Chairman Schmitt Note: Sacre, Candace	Sustained.
5:16:44 PM	MCCC HEARING EXHIBIT 1 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY 2021 HIGHEST MINIMUM BILLS WATER DISTRICTS AND ASSOCIATIONS
5:16:45 PM	MCCC HEARING EXHIBIT 3 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY HOUSEHOLD INCOME MARTIN COUNTY
5:16:46 PM	MCCC HEARING EXHIBIT 4 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY MINIMUM BILLS SINCE 2018
5:16:47 PM	MCCC HEARING EXHIBIT 6 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY JAN 17 2020 LETTER TO TONY SNEED
5:16:48 PM	MCCC HEARING EXHIBIT 7 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY MAR 19 2021 LETTER MCCC TO MCWD BOARD
5:16:49 PM	MCCC HEARING EXHIBIT 8 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY COMPLAINT SERVICE ORDERS JAN 2020 TO PRESENT
5:16:50 PM	MCCC HEARING EXHIBIT 9 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY AUG 2020 - MAR 2021 COMPLAINT ANALYSIS
5:16:51 PM	MCCC HEARING EXHIBIT 10 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY UK MARTIN COUNTY DRINKING WATER HEALTH PILOT STUDY
5:16:52 PM	MCCC HEARING EXHIBIT 11 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY MARTIN CO DRINKING WATER/HEALTH STUDY BROCHURE
5:16:53 PM	MCCC HEARING EXHIBIT 12 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY DBP WARNING
5:16:54 PM	MCCC HEARING EXHIBIT 13 Note: Sacre, Candace Note: Sacre, Candace	ATTY CROMER MCCC - WITNESS McCOY MAR 28 2018 DOW IDSE RESPONSE
5:17:42 PM	Chairman Schmitt Note: Sacre, Candace	Decision criteria discussed whether failure grant emergency rate increase materially affect operational status of District or credit, subject to true-up not turn out be case in end.
5:18:25 PM	Chairman Schmitt Note: Sacre, Candace	Briefing and procedural discussion. (Click on link for further discussion.)
5:20:24 PM	Chairman Schmitt Note: Sacre, Candace	General comments. (Click on link for further comments.)

5:22:16 PM	Chairman Schmitt Note: Sacre, Candace	Anything else?
5:23:23 PM	Chairman Schmitt Note: Sacre, Candace	Hearing adjourned.
5:23:38 PM	Session Ended	



Name:	Description:
APPLICANT HEARING EXHIBIT 01	ALLIANCE WATER RESOURCES, INC OPERATIONS UPDATE MARTIN COUNTY WATER DISTRICT MAY 27, 2021
APPLICANT HEARING EXHIBIT 02	MARTIN DISTRICT IMPACT OF PROPOSED INCREASE
APPLICANT HEARING EXHIBIT 03	MARTIN DISTRICT NET INCOME JAN 2020 - DEC 2020
MCCC HEARING EXHIBIT 01	2021 HIGHEST MINIMUM BILLS WATER DISTRICTS AND ASSOCIATIONS
MCCC HEARING EXHIBIT 03	HOUSEHOLD INCOME MARTIN COUNTY
MCCC HEARING EXHIBIT 04	MINIMUM BILLS SINCE 2018
MCCC HEARING EXHIBIT 06	JAN 17 2020 LETTER TO TONY SNEED
MCCC HEARING EXHIBIT 07	MAR 19 2021 MCCC LETTER TO MCWD BOARD
MCCC HEARING EXHIBIT 08	COMPLAINT SERVICE ORDERS JAN 1 2020 TO PRESENT
MCCC HEARING EXHIBIT 09	AUG 2020 - MAR 2021 COMPLAINT ANALYSIS
MCCC HEARING EXHIBIT 10	UK MARTIN COUNTY DRINKING WATER HEALTH PILOT STUDY
MCCC HEARING EXHIBIT 11	MARTIN COUNTY DRINKING WATER AND HEALTH STUDY BROCHURE
MCCC HEARING EXHIBIT 12	DBP WARNING
MCCC HEARING EXHIBIT 13	MAR 28 2018 DOW IDSE RESPONSE
PSC HEARING EXHIBIT 01	JAN 2021 FEB 2021 MAR 2021 APR 2021 MONTHLY WATER LOSS REPORTS
PSC HEARING EXHIBIT 02	PHOTOGRAPH OF 18-INCH PIPE WITH CLAMPS

Alliance Water Resources, Inc. Operations Update

Martin County Water District

May 27, 2021

AGENDA



- ▶ Key Accomplishments to Date
- ▶ Disaster Response
- ▶ Water Loss
- ▶ Immediate Needs
- ▶ Discussion/Questions

Key Accomplishments to Date



- ▶ Meter Audits
- ▶ Audits from 2016 - 2020 complete
- ▶ Created 90-day goals
- ▶ New billing software purchased and Implemented
- ▶ QGIS and GEOSYNC CLOUD Implementation.
- ▶ 1300 meters GIS Mapped
- ▶ Leak Mapping on GIS

Key Accomplishments to Date



- ▶ Master Meter Zones Identified
- ▶ Critical Operational Equipment for Regulatory Compliance and Leak Detection
- ▶ Developed Meter Reading and Billing SOP
- ▶ Developed Customer Service SOP
- ▶ Repaired Crum Reservoir monument
- ▶ Installed 2nd pump at Turkey Booster Station
- ▶ Purchased New Trench Box for Safe Excavation



Key Accomplishments to Date

- ▶ Replaced Ceiling Tile and Lighting in Plant Lab
- ▶ Installed New Booster Station Building at Cassell Branch
- ▶ Purchased New Booster Station Building for Big Lick Booster Station
- ▶ 3 Trucks brought from Alliance Water Resources and Provided for District Use
- ▶ Repaired the District Excavator and Purchased New Tracks
- ▶ Repaired District Dump Truck for Use During Leak Repairs

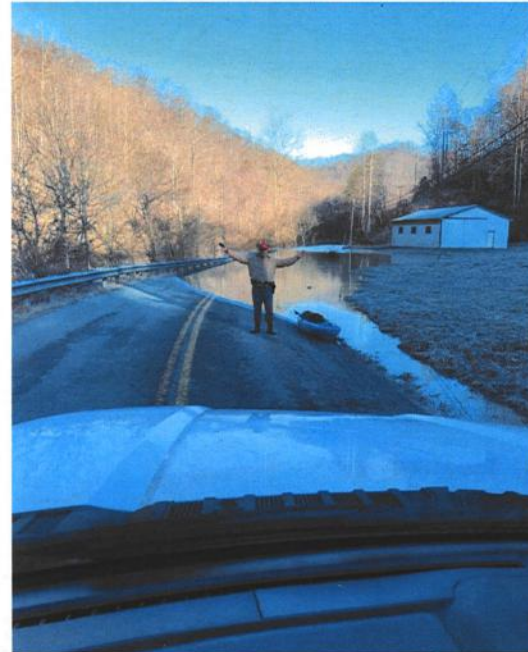
Key Accomplishments to Date



- ▶ **Fixing Hydraulic and System Issues the Right Way**
- ▶ **5 Newly Acquired Licenses in the District**
- ▶ **Developed and implemented a Theft of Water SOP**
- ▶ **Installed a new valve on ST RT 2032 to isolate a problem area in Wolfcreek area**
- ▶ **Inventory Control Program**
- ▶ **Graveled Access Road for Clearwells**

Disaster Response

- ▶ February Ice Storm - Power Lost to Inez Water Treatment Plant, 40 East Booster Station, and 40 West Booster Station.
 - ▶ Power Back at Treatment Plant - Pumping water
 - ▶ 40 East Booster Station Receiving Single Phased Power - Caused the VFD to fail
 - ▶ 40 West Booster Station Power Out
- ▶ Received Generator with Assistance From KRWA for the 40 West Booster Station
- ▶ VFD Moved from 40 West to 40 East to get Pump Station Running

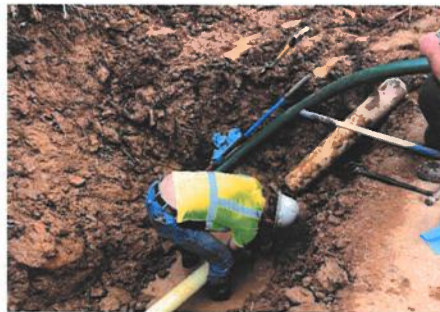


DISASTER RESPONSE



- ▶ Sunday February 28th - Flood
 - ▶ 40 East Booster Station Power Out
 - ▶ Multiple Slips Throughout the System Causing Water Line Failures
 - ▶ Turkey Hill - 6 Different Breaks in Main Line from Slip
 - ▶ 292 Multiple Slips Causing Water Line Failures
 - ▶ Poplar Fork Slip
 - ▶ Power Outages caused VFD Failure on 40 East Booster

DISASTER RESPONSE



- ▶ Alliance Division's in Cape Girardeau, and Lincoln County Responded with Staff and Equipment for Assistance
- ▶ Poplar Fork Repaired with a Temporary Line Installation. Self Restraining Yellowmine was installed by Alliance Staff
- ▶ Turkey Creek Repaired Leaks in 6 different locations. A broken valve in the closed position was found with a 2" bypass.
- ▶ Emergency Connection with Mountain Water District was opened to provide water for customers on the southern side of 292.

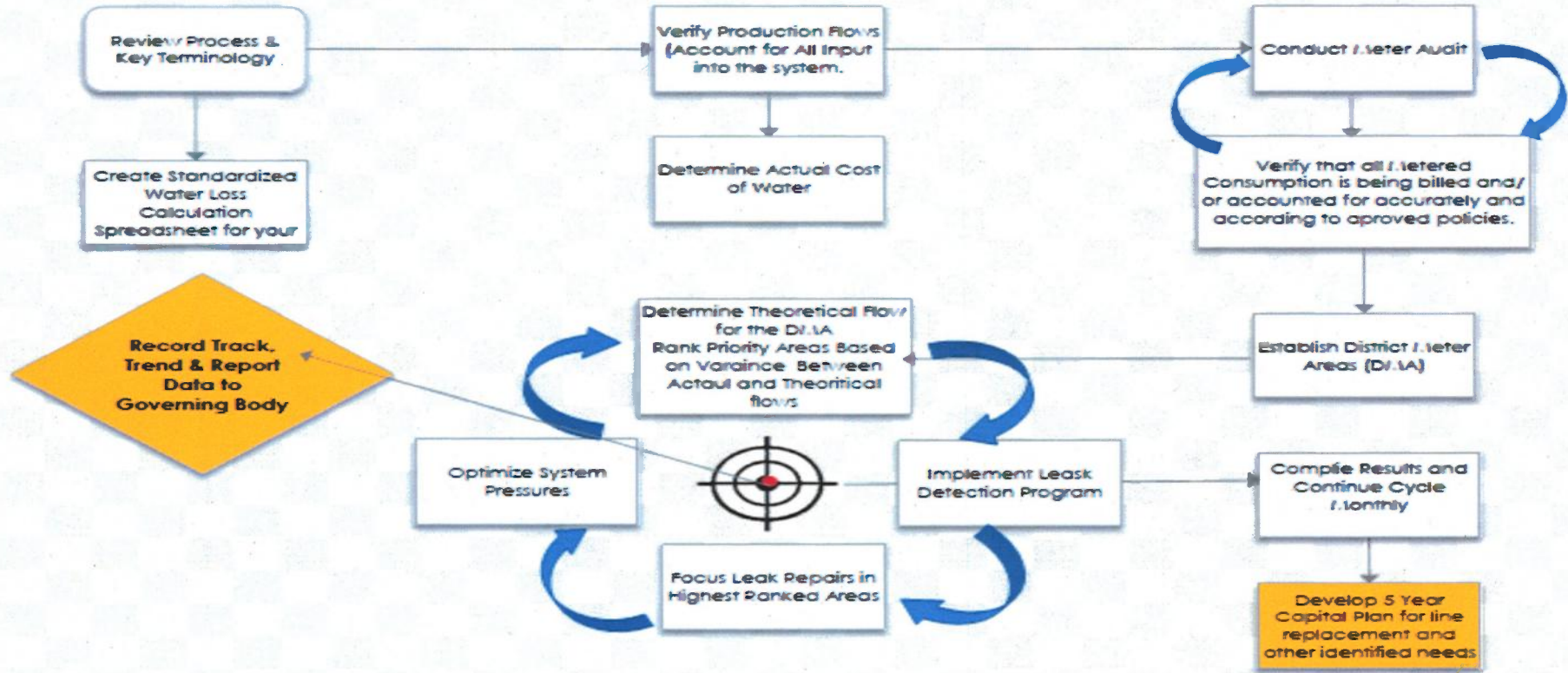
WATER LOSS REDUCTION

- ▶ GIS IMPLEMENTATION
 - ▶ District Master Meter Zones Established
 - ▶ Customer Meter Location
 - ▶ Leak Tracking
 - ▶ Reported Leaks
 - ▶ Active Leaks
 - ▶ Repaired Leaks
 - ▶ Trouble Zones For Replacement
- ▶ Water Loss SOP and M36 Manual
 - ▶ Strategic approach using GIS, PRV's, and District Meters for Leak Detection
 - ▶ Established Leak Detection Team
 - ▶ Water Meter Replacement

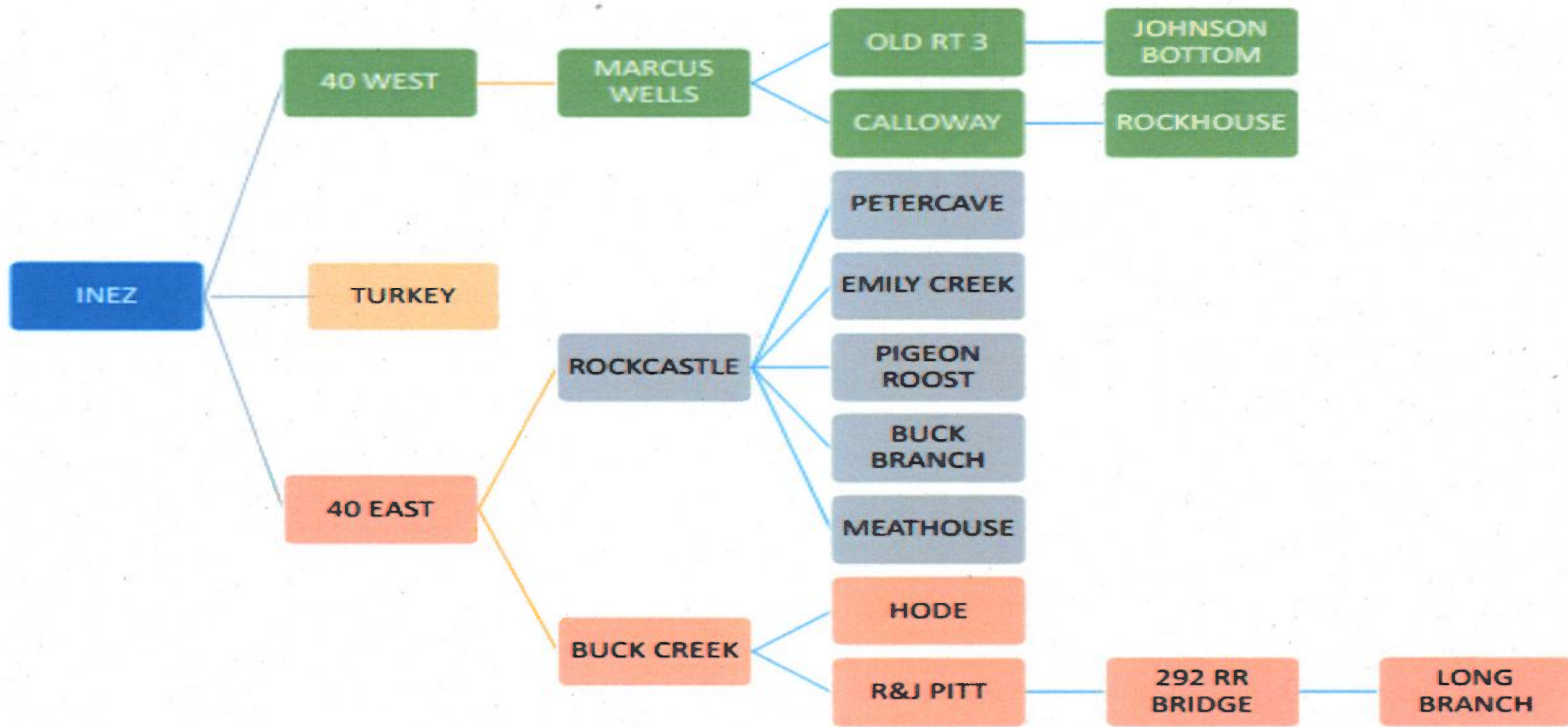
WATER LOSS CONTROL PROGRAM FLOW CHART (FC AWR 09-02)



PROCESS	ANALYSIS COMPLETED BY	DEPARTMENT(S)	DATE COMPLETED
P AWR 09-01	DOO (JAS)	OPS	03/07/2020



MASTER METER FLOW CHART

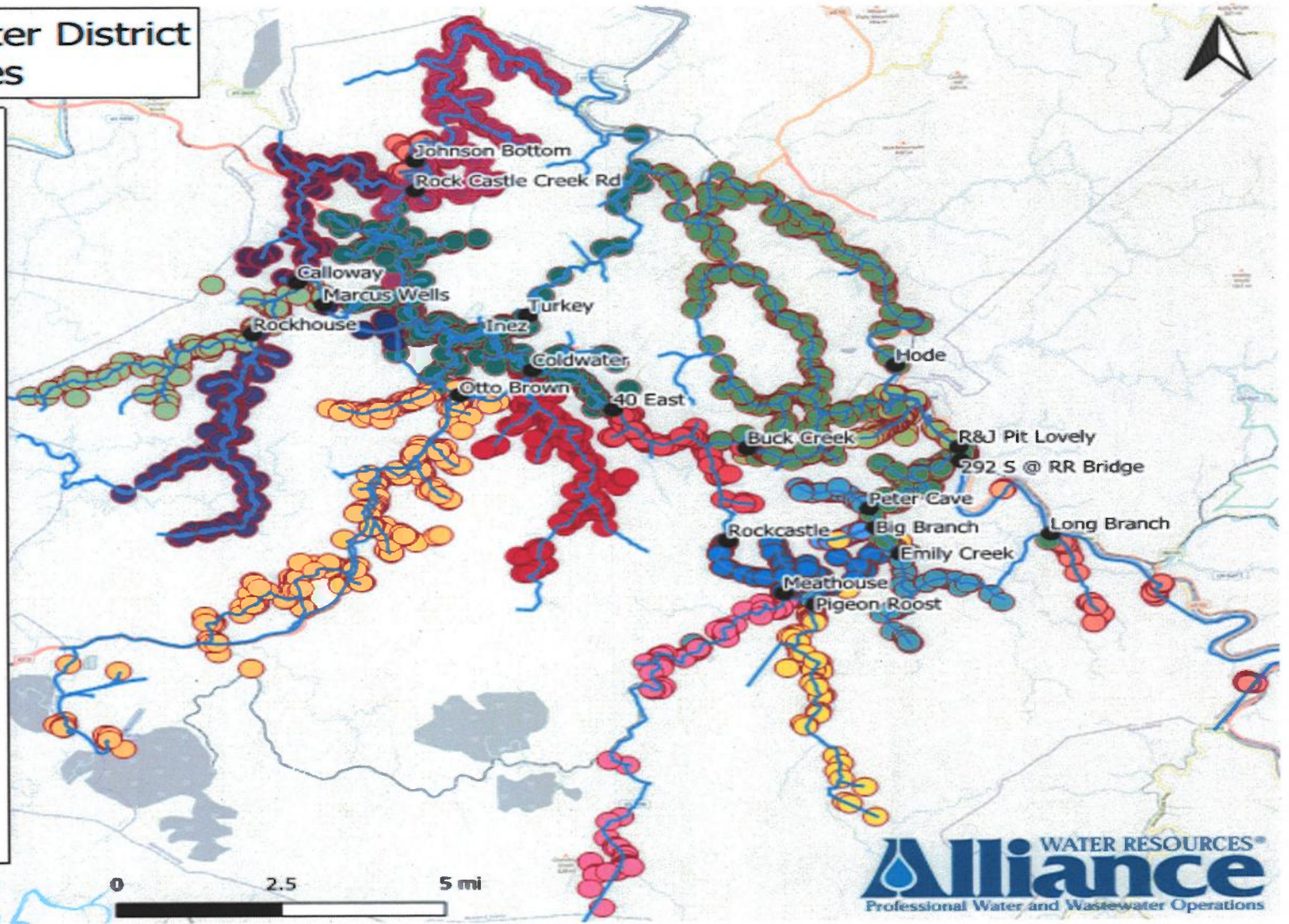


LOCATION	MASTER METER #	BOOK#	ACCOUNT TOTAL	PREVIOUS MONTHS FINAL READ	CURRENT READ	USAGE	CURRENT READ	USAGE	CURRENT READ	USAGE	CURRENT READ	USAGE	MONTHLY USAGE	MONTHLY BILLED CONSUMPTION	DIFFERENCE	BILLED AVG PER AREA
					4/28/2021		5/5/2021		5/12/2021		5/19/2021					
PRODUCTION/INEZ	1506821	1,3	126	628,052,000	639,871,000	8,336,604	651,551,000	8,521,197					16,857,801			133,792
Coldwater	62312310	2	286	582,927,990	583,846,900	918,910	584,686,900	840,000					1,758,910			6,150
Otto Brown	62312309	6	405	15,340,290	15,665,591	325,301	15,929,400	263,809					589,110			1,455
TOTAL SUB METERS			691			1,244,211		1,103,809					2,348,020			3,308
Turkey	82329008001475	4	260	26,895,911	27,370,436	474,525	27,848,180	477,744					952,269			3,663
40 E Pump Station	62312312	5	174	98,169,370	98,169,370	0	98,169,370	0					0			0
Buck Creek	89211330	9,11,17,18	365	7,784,000	8,190,000	406,000	8,844,404	654,404					1,060,404			2,905
Hode	62312235	10	228	421,433,440	422,007,200	573,760	422,525,210	518,010					1,091,770			4,788
292 S @ RR Bridge	70519212	12	74	125,807	125,806	-1	125,806	0					-1			0
R&J Pit	43640193	12		285,287,000	286,006,000	719,000	286,658,000	652,000					1,371,000			#DIV/0!
Long Branch (292)	62312313	16	156	162,054,360	162,054,360	0	162,054,360	0					0			0
TOTAL SUB METERS			997			1,292,758		1,824,414					3,117,173			3,127
Redcastle on 2032	46384882			84,680,200	85,365,100	167,346	85,991,400	188,517					267,863			#DIV/0!
Pigeon Roost	62312242	14	229	2,602,870	2,667,960	65,090	2,776,140	108,180					173,270			757
Peter Cave of Wolf Crk	62312243	13	103	25,086,381	25,088,817	3,436	25,096,245	6,428					9,864			96
Meathouse	62312239	15	96	18,664,159	19,055,748	391,589	19,407,044	351,296					742,885			7,738
Emily Creek	70815637	14		32,120,588	32,157,589	37,001	32,194,540	36,951					73,952			#DIV/0!
Big Branch	72103041	14	0	15,931,325	15,951,763	20,438	15,974,681	22,928					43,366			#DIV/0!
TOTAL SUB METERS			428			517,554		525,783					1,043,337			2,438
40 W Pump Station	60869002	8		62,938,050	64,701,710	1,763,660	66,278,960	1,577,250					3,340,910			
Marcus Wells	87860573	8	400	222,117,000	223,680,000	1,563,000	225,079,000	1,399,000					2,962,000			8,352
Calloway	62045452	8	95	103,427,370	104,573,380	1,146,010	105,569,660	996,280					2,142,290			22,550
Redhouse	62312238	8		93,838,487	93,938,564	101,077	94,034,390	94,826					195,903			
Old It 3	62312241	7	393	2,515,877	3,388,386	872,509	4,131,124	742,738					1,615,247			498
Johnson Bottom	63786120	7	25	9,031,157	9,072,284	41,127	9,111,279	38,995				13	80,122			3,205
TOTAL			913			3,723,723		3,271,839					6,995,562			7,662
TOTALS			3,289			6,778,247		7,203,589					13,981,836			

Martin County Water District Master Meter Zones

Legend

- District Master Meter
 - Water Line
- Addresses by Master Meter Zone
- Inez
 - R&J Pit
 - Rockcastle on 2032
 - 40 W Pump Station
 - Calloway
 - Hode
 - Rockhouse
 - Meathouse
 - Old Rt 3
 - Pigeon Roost
 - Peter Cave of Wolf Crk
 - Otto Brown
 - Coldwater
 - 40 E Pump Station
 - Long Branch (292)
 - Johnson Bottom
 - 292 S @ RR Bridge
 - Emily Creek
 - Big Branch
 - Buck Creek
 - Marcus Wells



IMPORTANT WATER LOSS NOTES

- ▶ February Water Loss **67.7%**, March Water Loss **76.59%**, April Water Loss **65.3%**
- ▶ Plant Has Averaged **1.68 MGD** For the Past 5 Weeks
- ▶ Shutting Plant Down for **4 Hours** Every Other Day
- ▶ Water Pumped to Prison was 3.2 Million for April and on track for 3.5 million in May
- ▶ ***Estimated*** 40 Million Gallons Recovered In the Month of March From Repaired Leaks

IMMEDIATE NEEDS LIST FOR MARTIN COUNTY

- ▶ AMI/AMR METER READING SYSTEM
- ▶ GENERATORS FOR ALL CRITICAL INFRASTRUCTURE
- ▶ PUMP REDUNDENCY
- ▶ SCADA AND TELEMETRY UPGRADES FOR PLANT AND REMOTE SITES
- ▶ WATER LINE REPLACEMENT AT MULTIPLE LOCATIONS
- ▶ HIGH SERVICE PUMP REPAIRS/UPGRADES IN PLANT

- ▶ ALL PROJECTS HAVE BEEN ESTIMATED AND RFQ'S HAVE GONE OUT

Martin County Water and Wastewater Projects

No.	WRIS	Project Description	Amount
1	WX21159013	Meter Replacement	\$ 1,716,000.00
2		Fixed/Portable Generator Project for RWI, 40E & 40W Booster Stations 60 HP Motor Duplex Stations	\$ 429,000.00
3		Telemetry/booster station upgrade at Route 292	\$ 358,000.00
4	WX21159009	SCADA upgrade at WTP with VTScada and Allen Bradley PLC's/System wide Telemetry upgrade, plant equipment/online turbidity meters, CL17, online fluoride meter bench top meter and high service pump VFD replacement	\$ 1,324,000.00
5	WX21159020	Water line replacement at City of Inez, Blacklog Road Line Replacement from Turkey Creek 40E Booser Station, WTP to Turkey Creek, Old Route 3 from Inez to Milo, Coldwater Line Replacement	\$ 36,428,000.00
6		Inez Sewer Line Replacement/lining/smoke testing	\$ 14,915,000.00
7		WTP High Service Pump Replacement	\$ 750,000.00
		TOTAL	\$ 55,920,000.00



Questions?

Martin County Water District (Impact of Proposed Increase)

	Base	\$/1000	AVG Use (1,000 gals)	Total	
Water					
DSS	\$ 2.63			\$ 2.63	
MIS	\$ 4.72			\$ 4.72	6000 Gallon User
Current	\$ 33.32	\$ 8.43	4.00	\$ 57.53	\$ 74.39
Increase	\$ 37.32	\$ 8.68	4.00	\$ 62.04	\$ 79.40
Difference	10.72%	2.91%		\$ 4.51	\$ 5.01
Additional Revenue	Residential Customer Count		3,177	\$ 171,779.12	
% Increase For Avg User				7.83%	6.74%

MCUD Connection Fees			Commercial Customers	
	Residential	Larger Sized Taps		
			<1"	197
Water			1"	19
Current	\$1,000	Actual Cost	1.5"	2
No increase			2"	16
Difference			3"	4
			4"	1
			Government	
			<1"	22
			1"	5
			1.5"	3
			2"	9
			Non Residential	278
			Total Customr Count	3,455

Meter Size	Minimum Usage	Minimum Bill	Increase to Minimum	New Base Bill	
5/8 x 3/4"	2000	\$33.32	\$4.00	\$37.32	\$13,584
1"	5000	\$58.59	\$10.00	\$68.59	\$240
1.5"	10000	\$100.70	\$20.00	\$120.70	\$100
2"	20000	\$184.93	\$40.00	\$224.93	\$1,000
3"	30000	\$269.17	\$60.00	\$329.17	\$240
4"	50000	\$437.63	\$100.00	\$537.63	\$100
Base Bill Additional Annual Revenue Estimate:					\$183,168
Usage Additional Annual Revenue Estimate					\$67,666
Total Additional Annual Revenue Estimate					\$250,834

Martin County Water District

Net Income on a Cash Basis (Snapshot) EXCLUDES DEPRECIATION (format Revised 28 July 20)

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
REVENUE												
Customer Count	3,388	3,369	3,386	3,370	3,390	3,424	3,463	3,481	3,490	3,496	3,501	3,501
Payments Received	\$234,262	\$207,152	\$195,082	\$199,144	\$221,999	\$195,535	\$207,448	\$237,043	\$188,022	\$213,095	\$178,105	\$201,73
EXPENSES												
Operations Account	\$286,613	\$249,774	\$223,121	\$223,319	\$221,129	\$227,410	\$236,598	\$228,784	\$239,610	\$247,224	\$233,190	\$232,0
Transfers for debt serv funding	\$19,150	\$17,800	\$17,800	\$17,800	\$17,800	\$17,800	\$17,800	\$17,800	\$17,800	\$17,800	\$17,800	\$17,800
Payment Plans	\$6,625	\$6,500	\$6,500	\$5,500	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
DSS EXP/ (FUNDING)	(\$8,978)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
MIS EXP / (FUNDING)												
Sub total	\$303,410	\$274,074	\$247,421	\$246,619	\$238,929	\$245,210	\$254,398	\$246,584	\$257,410	\$265,024	\$250,990	\$249,8
NET INCOME												
Cash Basis	-\$69,148	-\$66,922	-\$52,339	-\$47,475	-\$16,930	-\$49,675	-\$46,950	-\$9,541	-\$69,388	-\$51,929	-\$72,885	-\$48,0

Monthly Avg = -\$50,105

Notes:

- 1: **Payments Received** are those received for the full month
- 2: **Expenses** are those planned and presented in the Board Packet for the referenced month
- 3: **Payment Plans** are payments towards outstanding debt not funded by DSS *Current balance= \$277,383 (Some fin charges forgiven & Prestonburg City decreased)*
- 4: **Operations Account Includes** the estimated DSS and MIS transfers (See list of Bills in Board Packet)
- 5: **MIS EXP** estimated funds applied to AWR Invoice (An Operations Account Expense) estimated DSS and MIS transfers
- 6: MIS fund beginning balance January 2020-of \$12,244 applied to AWR fee in June
7. Balance of debt -payments to be funded with unused DSS= **\$502,572**
- 8: **Based on the requirements there will be deposits and subsequent withdrawals in DSS/MIS accounts with a likely sum of zero monthly**

APPLICANT HEARING EXHIBIT 3

**2021 Water Bills for PSC regulated KY Water Districts & Associations
Sorted by Minimum Bill (min + surcharge)**

	Water Districts & Associations	Minimum	Min + surcharge	Average = 4000 gpm + surcharge
1	Martin County % (proposed)	\$37.32	\$44.67	\$63.39
2	Western Mason County %	\$44.60	\$44.60	\$57.56
3	Boone County %	\$18.63	\$43.63	\$49.22
4	Bullock Pen % ¹	\$27.71	\$42.71	\$61.43
5	Martin County % (Current)	\$33.32	\$40.67	\$57.53
6	Jessamine-South Elkhorn %	\$27.48	\$33.98	\$50.16
7	North Hopkins %	\$33.14	\$33.14	\$65.52
8	Cawood %	\$29.53	\$30.65	\$50.57
9	West Carroll %	\$30.33	\$30.33	\$51.77
10	Judy %	\$13.28	\$30.05	\$56.78
11	Parksville %	\$29.75	\$29.75	\$48.65
12	Breathitt County %	\$29.65	\$29.65	\$59.31
13	Black Mountain %	\$25.13	\$29.39	\$46.27
14	Cannonsburg %	\$25.33	\$29.33	\$48.41
15	Cumberland County %	\$29.10	\$29.10	\$44.50

*Southern Water District's non-volumetric rate scheme excluded because all meters were replaced by October 2020, i.e., that rate scheme is no longer in place.

*Northern Kentucky Water District excluded because of difficulties accounting for the applications of the various surcharges.

¹Bullock Pen calculation uses Phase 6 surcharge, which is the highest

Surcharges/mo. Latest Tariff

\$7.35	5/15/15
\$25.00	12/31/20
\$15.00	2/1/20
\$7.35	11/5/18
\$6.50	7/1/19
	4/17/19
\$1.12	4/8/21
	7/1/19
\$16.77	7/1/19
	6/3/15
	7/2/20
\$4.26	11/9/15
\$4.00	5/13/19
	11/8/19

**2021 Water Bills for PSC regulated KY Water Districts & Associations
Sorted by Minimum Bill (min + surcharge)**

	Water Districts & Associations	Minimum	Min + surcharge	Average = 4000 gpm + surcharge
1	Martin County % (proposed)	\$37.32	\$44.67	\$63.39
2	Western Mason County %	\$44.60	\$44.60	\$57.56
3	Boone County %	\$18.63	\$43.63	\$49.22
4	Bullock Pen % ¹	\$27.71	\$42.71	\$61.43
5	Martin County % (Current)	\$33.32	\$40.67	\$57.53
6	Jessamine-South Elkhorn %	\$27.48	\$33.98	\$50.16
7	North Hopkins %	\$33.14	\$33.14	\$65.52
8	Cawood %	\$29.53	\$30.65	\$50.57
9	West Carroll %	\$30.33	\$30.33	\$51.77
10	Judy %	\$13.28	\$30.05	\$56.78
11	Parksville %	\$29.75	\$29.75	\$48.65
12	Breathitt County %	\$29.65	\$29.65	\$59.31
13	Black Mountain %	\$25.13	\$29.39	\$46.27
14	Cannonsburg %	\$25.33	\$29.33	\$48.41
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	5/15/15
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	7/1/19
\$16.77	7/1/19
	6/3/15
	7/2/20
\$4.26	11/9/15
\$4.00	5/13/19
	11/8/19

MCC

Household Income in Martin County, Kentucky



Household Income in Martin County, Kentucky. Data from Census FactFinder 2013-2017 Estimates.

MARTIN COUNTY WATER DISTRICT MINIMUM BILLS JANUARY 2018 TO THE PRESENT

Date	Minimum Rate	Surcharge 1	Surcharge 2	Total Min. bill	% change since last increase	% change overall
1/16/18	\$26.50	\$0.00		\$ 26.50		
3/16/18	\$31.14	\$4.19		\$ 35.33	33%	33%
11/5/18	\$33.32	\$4.19		\$ 37.51	6%	42%
11/15/19	\$33.32	\$4.72	\$2.63	\$ 40.67	8%	53%
5/27/2021 (proposal)	\$37.32	\$4.72	\$2.63	\$ 44.67	10%	69%

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January 17, 2020

James Anthony (Tony) Sneed, PE
Director of Operations, Alliance Water Resources
c/o Martin County Water District
387 E Main Street, Suite 140
Inez, Kentucky 41224

Dear Tony,

I want to again thank you for asking Martin County Concerned Citizens (MCCC) to draft a list of the top five issues that we believe Alliance should focus on during your first few months operating the Martin County Water District.

1. Customer Complaints

Most pressingly, we urge Alliance to develop clear procedures for receiving and responding to customer complaints. Based on communication MCCC has had with the public, many customers feel that their concerns are not taken seriously

This is our top priority because it is an umbrella issue that affects all of the other problems that have been brought to the attention of MCCC. Many customers' frustrations center on the lack of clear, knowledgeable, and respectful communication from the water district. Ensuring that each customer feels that their concerns are being heard and dealt with will allow the District and Alliance to begin rebuilding the trust that has been so damaged over the past couple of decades. Transparency and open communication from Alliance and the District are essential in reestablishing community trust.

We were encouraged that when we met in December, you agreed that it was important to keep a log of customer complaints. We are also pleased that you have agreed to provide that log of complaints and a report on the status of each complaint at the board meetings. For our part, we will make sure to advise all residents to submit concerns directly to the District. If you provide us with your preferred point of contact for customers wishing to make complaints, we will help get the word out.



2. Meter Issues

We are glad to hear that one of Alliance's first priorities is to ensure that meters are read on the same day of each month. We believe that meter reading is an issue causing significant distrust among MCWD's customers. We have talked to many customers whose meters are not read and have not been read in some time. We are often able to verify that just from the state of the meter (i.e., often overgrown or otherwise inaccessible), it is obvious that the meter cap has not been lifted to make a reading. Customers are aware that meters are not being read, yet bills indicate that every meter was read on the 20th of the month.¹

We have also heard a number of complaints that customers' bills for December went up inexplicably. In some instances, it seems that the bill amount increased despite the fact that the meter was not actually read.

We also want to mention that MCCC is also concerned about the long-term issues of meter accuracy and making sure that each household is required to pay the base rate for service. As part of our overarching concern with affordability, we want to ensure that each household is fairly paying its share of the costs of the District. To make sure that the costs are fairly distributed, each household's meter must be accurate.

With regard to locations with multiple households on one meter, we have been told that MCWD originally set up many systems this way. Ideally, each household should have a separate meter, but the meter setting fee of \$1000 is too much for many of the District's customers to pay. We suggest that until grant money is available for meter replacement that could be used to ensure that each household is served by a separate meter, the district should modify its tariff to charge an additional base rate for each household served by the same meter. As with all such changes, the district should be very clear in explaining to customers why this is necessary and raising community awareness before making the change.

3. Water outages and emergency planning

The District needs to have an emergency plan in place for water outages. Customers have been dealing with water outages on a fairly regular basis. We hear from many customers who express frustration with the lack of consistent communication about boil water advisories, where and when bottled water is being provided, and the location and duration of outages. We hope that you will consider creating a one-page emergency plan for water outages that you could include with customers' bills and post at the district office and online.

¹ Page 15 of the current tariff requires that estimated bills must be "distinctly marked as such."



4. Water quality concerns

We hope that Alliance will acknowledge the legitimacy of customer concerns about water quality and will discuss with the public plans to address those concerns. Customers often find that their water is smelly, discolored, or causes rashes or itching when bathing. In addition, customers received notices of disinfection byproducts violations on their water bills consistently between 2004 and 2016.

We are also concerned about current water quality in the system based on the results of the pilot study underway in the county. For that study, Nina and Ricki worked with UK researchers to sample tap water at 100 homes in the county. We plan to present the results to the District and at several public meetings in the county this spring. The results showed that disinfection byproducts continue to be a problem in many areas of the county. In addition, tap water tested positive for bacteria in about 20% of the samples.

We hope that you understand that given the system's violation history, the number of instances of objectionable water coming out of a tap, and the current research on drinking water quality, it is reasonable that most residents of Martin County do not feel that their water is safe to drink. We also hope you understand what a burden this is on the county's residents, who feel that they must buy water whether or not they can afford to do so.

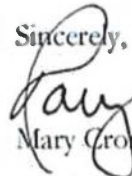
5. Miscellaneous Concerns

And finally, we want to state our support for a couple of disparate issues. First, we hope that the district will take full advantage of the offers of support from Kentucky Water Resources Research Institute. We look forward to working with Alliance, the District, and partners at the University of Kentucky to collaborate on projects aimed at improving the water system.

Second, we encourage Alliance, when possible, to provide educational information to District customers about water quality and management. For example, customer bills could include information about the distribution system and which tank the residence is served by. We would be glad to work together to produce and distribute educational information to customers.

We appreciate your willingness to work with MCCC and the Martin County Water District to improve water quality and management in the county. We look forward to continued collaboration in support of our shared vision for clean and affordable drinking water for all Martin Countians.

Sincerely,



Mary Cromer

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STEPHEN A. SANDERS
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March 19, 2021

Martin County Utility Board Members
387 Main Street, STE 140
Inez, Kentucky 41224

Dear MCUB board members,

I'm writing on behalf of Martin County Concerned Citizens to bring to your attention some of the groups' concerns regarding (1) rate affordability and the use of the customer assistance funds that are being made available, (2) the district's practices during low pressure events and water main breaks of providing emergency notices and issuing boil water advisories, and (3) the district's handling of customer calls and complaints. We greatly value the cooperative relationships between our group and Alliance and members of the Martin County Utilities Board. We ask for time on the agenda at the upcoming board meeting to present these concerns.

Affordability

As you all know, prior to the pandemic and prior to the last rate increase, MCCC and ACLC released a study showing that water was already unaffordable for more than 45% of the county's residents.¹ The last rate increase and the pandemic have only compounded that problem.

And now, the district is ready to ask for another rate increase.

MCCC is aware of how expensive it is to run this district. We know that much of that expense is due to bad decisions and negligent management prior to Alliance's time here. However, there are things that can and should be done to alleviate the real harms that will come with any additional rate increase.

First, the district must do whatever it can to get its debts under control. Specifically, the district should make every attempt to negotiate with its vendors to lower its debts prior to seeking a rate increase. The district is now more than \$1 million in debt. Before seeking more revenues through customer rate increases to cover that huge debt, board members should do everything possible to negotiate lower pay offs for that debt. Many of the vendors to whom the debts are owed are local and know that the residents of this county cannot afford another rate increase to pay off those high debt amounts. MCCC will gladly work with you all to help those vendors better

¹ <https://aclc.org/wp-content/uploads/2020/08/Drinking-Water-Affordability-Crisis-Martin-County-Kentucky-1.pdf>.



understand how important it is to get the past debt paid down quickly so as to minimize any necessary rate increase.

Second, several tranches of federal and state money have been provided for customer assistance, and now FEMA money is likely available that could be used for repairing and rebuilding parts of the system. MCCC would like to work with the district to ensure that as much money as possible goes to help Martin County's residents better afford their water bills and, at the same time, ensure a steady revenue stream for the district. In addition to the FEMA disaster assistance funding, recently the following funds have been announced to help customers pay past due water and wastewater bills:

1. In January 2021, \$38 million was made available for utility assistance. That money is distributed through the Big Sandy Area Development District to units of local government. Those local government units can request up to \$200,000 each to help pay for overdue utility bills in their jurisdiction. We have asked but do not know whether MCUB or the county has requested this funding and what the response has been. More information about this funding can be found at: https://kydlgweb.ky.gov/Articles/16_articleView.cfm?NewsID=706.

2. In February 2021, the \$264 million Healthy at Home Eviction Relief Fund was announced that provides eviction and past due utility bill relief for tenants in Kentucky. Tenants are able to apply for this relief funding online at: teamkyhherf.ky.gov.

3. In December 2020, the appropriations bill allocated an additional \$639 million nationally for customer assistance for water and wastewater bills, but we do not know yet how or when that money will be allocated locally.

4. Finally, the \$1.9 trillion COVID relief bill that just passed added \$500 million to that December 2020 allocation.

We want to help make sure that the water district and its customers are aware of all of these relief funding sources and are taking full advantage of them. MCCC would be happy to work closely with the board and Alliance to ensure that these funding sources are put to full use.

Low Pressure and Line Breaks: Emergency Reporting and Issuance of Boil Water Advisories

As we all know, Alliance has been working feverishly to respond to numerous line breaks and low pressure events throughout the system in recent months. We appreciate how hard Alliance employees have been working to keep water flowing to customers. However, we are concerned that the regulations governing line breaks are not always being carefully followed.

Whenever there is a line break that drops pressure below 20 psi or whenever there is a break that takes more than 8 hours to repair, the district is required to report that to the Division of Water. *See* KDOW Public Water System: Consumer and Boil Water Advisory Guidance, which I attach here. In addition to that reporting, Alliance has agreed that whenever pressure drops below 20psi, whenever repair takes more than 8 hours, or whenever, because of a break, Alliance believes that



pressure somewhere in the system has dropped below 20psi, they should issue a boil water advisory (BWA).

Unfortunately, we've found that the emergency reporting and the BWA issuances aren't always occurring. We have looked at the emergency notification that the district has sent to DOW in the past year, and note that several of the recent outages in Hode, Milo, Big Elk, and Route 292 were not reported. Likewise, BWAs were not always issued related to those outages. Alliance has explained that in some instances there was already a BWA in place, and they did not feel another BWA was necessary. We disagree with this assessment. The point of a BWA is customer notification. A customer in Hode, who did not lose water during an initial BWA would have no reason to know that the former BWA was still in effect and should apply to a more recent water loss or low pressure event. In addition, there have been issues with areas of the county that should be covered not being specifically mentioned in the BWA notice.

We hope and believe these matters will be easy to correct. We want to work with you to make sure that the district properly reports all line breaks to DOW and issues BWAs that make sense and provide good notice from the customer's standpoint.

Customer Complaints

When MCCC first met with Alliance, our primary ask was to make sure that the district had good procedures to ensure that customer calls and complaints were dealt with in a thorough and respectful manner. And, from most reports, customer service has improved dramatically, with customers being treated far more respectfully than they had in the past. We've asked that Alliance develop standard procedures that would ensure that every customer call is logged and follow through is assured. We've also asked that Alliance provide reporting at each board meeting on how many customer calls have been received, what the nature of those calls has been, and what the follow through has been. We are now reiterating that request.

Customer contact is a critical component in getting to a point where Martin County water customers trust the water and trust the water district. We hope that Alliance can develop a process so that each customer call is logged and tracked so that the board and the public can follow what issues the customers are bringing forward and what response they are getting.

Conclusion

MCCC would like the opportunity to discuss these matters at the upcoming board meeting. We ask that these be added to the agenda. Thank you for your assistance, and we look forward to speaking with you all.

Sincerely,

Mary Varson Cromer

Encl.

Kentucky Division of Water Public Water System Consumer and Boil Water Advisory Guidance

Revised February 2014

Background

Consumer advisories provide pertinent, important information to the public regarding their drinking water. Such advisories cover microbiological as well as chemical contamination in addition to other information of concern. In practice, the majority of consumer advisories are “boil water advisories.”

The term “coliform bacteria” refers to a large group of facultative aerobic bacteria common in the environment and generally not harmful. The presence of coliform bacteria, as measured by the total coliform test, is simply an indicator that a problem with the water treatment plant or distribution system exists and that the water may be contaminated. There are two (2) groups of coliform used as measures of drinking water quality in Kentucky:

- Total coliform; and
- *Escherichia coli* (*E. coli*): a sub-group of fecal coliform bacteria

Positive total coliform tests go through a confirmation stage to determine if the coliform bacteria found are of fecal (*E.coli*) origin. Further investigation is necessary, including the collection of additional samples. If fecal coliforms or *E. coli* are **confirmed** in drinking water, then it is likely that disease-causing microorganisms are present.

“Results from a single sample or set of samples are typically not cause for issuing a BWA... Detection or sudden increase of any microbial indicators in a single sample or set of samples is not sufficient grounds to issue a BWA [boil water advisory].” (AWWA M48)

“Boil water advisories require a considerable amount of thought if they are to be carried out in timely fashion. One of the most important aspects of BWAs is determining what circumstances trigger the event ... Customer confidence may be eroded or elevated depending on the timeliness and accuracy of the information they receive. Professional judgment and discretion are necessary in making decisions on the issuance of an advisory ... In situations where microbial results are available and system failures are documented, the decision to issue an advisory should be straightforward.” (AWWA M48) If the problem is isolated to a specific zone or tap, system-wide boil water advisory may not be warranted. The advisory should be issued only for that area.

Boil Water advisories are a safeguard to protect the public. When reasonable doubt exists, the protective decision is to issue the advisory. Public water systems (PWS) should develop BWA standard operating procedures specific to their system, discuss those procedures with their DOW Regional Office and communicate the procedure to all employees.

Regulatory Language

Definitions: 401 KAR 8:010

Consumer Advisory: A notice to the consuming public through radio, television, direct mail, electronic mail, posting, newspaper or other media and that conveys the quickest and most effective manner:

- a) Information that the water provided by a system may cause adverse human health effects if consumed and what action the public is advised to take; or
- b) Other information that the public needs to know about its water.

Boil Water Advisory (BWA): A type of consumer advisory that provides notice to the consuming public through radio, television, direct mail, electronic mail, posting, newspaper or other media and that conveys the quickest and most effective manner:

- a) Information that water provided by a system may cause adverse human health effects due to possible biological contamination if consumed, unless it is first boiled for three (3) minutes at a rolling boil; and
- b) What action to take.

Advisory Regulatory Requirements: 401 KAR 8:020

Public water systems (PWSs) and semipublic water systems **may** issue boil water advisories if the system believes an advisory is warranted.

The Energy and Environment Cabinet **may** direct that a boil water advisory be issued when confirmed positive bacteriological sample results have been received (including E. coli or fecal coliform) or conditions exist within a water system that indicate a possible adverse health effect from the consumption of the water distributed by the system.

The cabinet **may** issue a consumer advisory if conditions exist within a water system that indicate a possible adverse health effect from the consumption of water by the public or when other information of interest to the consumer needs to be communicated.

In addition, a public or semipublic water system is required to **immediately** notify the local health department serving the affected area of a BWA [Section 2(9)(c)(1-2)]. The notification can be made by phone, fax or email during normal business hours or through a mutually agreed-upon manner for after-hours notification. A PWS can also develop a written protocol with the local health department that describes when and how the system shall notify the affected health department if the system issues a boil water advisory or consumer advisory. The protocol shall address:

- a. For which types of advisories the system shall notify the affected health department;
- b. What procedures shall be used to notify and under what circumstances;
- c. How soon after the occurrence the notification shall be made; and
- d. To whom the notification shall be made, during and after business hours.

Line Break Reporting Requirements: 401 KAR 8:150

1. A PWS shall notify the cabinet immediately if it experiences a loss of pressure below twenty (20) pounds per square inch (psi) in the area surrounding the break or if line breaks require more than eight (8) hours to repair. These reports are not required if the loss of pressure or line break occurs in a service line serving a single family residence. The issuance of a BWA is NOT mandated by regulations.

NOTE: The eight hours begin when the system becomes aware of the break.

2. Community and nontransient noncommunity public water systems shall maintain a log of all breaks or ruptures (including single family residential service line breaks) which includes:
 - Location of the break or rupture,
 - Date and time it was discovered,
 - Population affected,
 - Length of time required to repair,
 - Date and time disinfectant residuals are detected,
 - Date and time bacteriological samples are taken, and
 - Results of bacteriological tests.

The log shall be available for inspection by the cabinet. The PWS is NOT required to report all line breaks and ruptures to the cabinet, only those that meet the criteria in #1 above.

Emergency Repairs: 401 KAR 8:150

For line repairs due to breaks or ruptures (including single family residential service line breaks), the system shall thoroughly flush the break area and maintain at least a minimum detectable disinfectant residual (depending upon type of disinfectant used).

Public water systems may leave the line in service before bacteriological sampling and may forgo a boil water advisory if:

- The line can be repaired under pressure (i.e. maintain a minimum of 20 psi in the line under repair);
- The break area is thoroughly flushed; and
- At least the minimum disinfectant residual (depending upon type of disinfectant) is maintained.

The system shall take at least two (2) bacteriological tests, one (1) located before or just upstream of the break or rupture and one (1) located behind or just downstream of the break or rupture, as close to the break or rupture as practical. If necessary, additional samples may be required to be representative of the area affected by the break. The sample bottles shall be clearly labeled as "special" tests and the results submitted to the cabinet clearly identified as "special" samples.

Records of the bacteriological results shall be submitted to the cabinet with the routine monthly compliance bacteriological samples unless the "special" samples are required to lift a boil water advisory. Samples needed to lift boil water advisories shall be submitted to the cabinet as soon as results are known and attached to the Incident in TEMPO. The results of "special" bacteriological samples shall be maintained for one (1) year.

Boil Water Advisory Guidance (other than a main break situation):

Issuing a BWA

A BWA should generally be issued if:

1. High turbidity levels in filtered surface water indicate the potential for pathogen breakthrough and interference with disinfection efficiency. Sustained combined filter effluent turbidity readings greater than 1 NTU for 6 or more hours, OR a confirmed turbidity level greater than 5 NTU shall trigger a boil water advisory unless the turbidity is attributable to other circumstances unrelated to filter malfunction (i.e., iron or manganese particles). A BWA is NOT warranted for iron and manganese problems.
2. The occurrence of a key water treatment plant process malfunction, not immediately repaired, which results in unfiltered surface water OR non-chlorinated water being discharged into the distribution system.
3. There is free chlorine disinfectant residual at the entry point to the distribution system less than 0.2 mg/L or total chlorine disinfectant residual less than 0.5 mg/L for chloraminated systems for more than 4 hours or in situations in which the system has difficulty restoring a chlorine residual after measures to do so have not succeeded;
4. A water main break, pump failure or other water distribution system malfunction results in portions of the system having zero ("0") pressure or with negative pressure zones.
5. There is the occurrence of a cross connection or known back siphon episode with an unapproved water supply in which the microbiological quality of the water may be compromised. Examples: flooded wellhead or treatment plant, water main break in a stream crossing.

6. A Groundwater source is confirmed under the direct influence of surface water (GWUDI) and the water systems associated with that source has not installed filtration.
7. The presence of other pathogens such as *Giardia* and *Cryptosporidium* is confirmed at a level and under circumstances that the Division of Water and the state epidemiologist deem a risk.

Strong consideration should be given to issuing a BWA in the following cases:

1. Breaks impacting a school (some utilities make this a policy, but prior consultation with the Board of Education involved is recommended);
2. Breaks in remote part of system which cause delay and difficulty finding or isolating the break;
3. Breaks in a low elevation segment of a high relief (hilly) area where some residents will have pressure loss/water outage;
4. Breaks adjacent to older or damaged sewer lines;
5. Breaks in very low flow/demand areas that may have lower disinfectant residuals;
6. An acute bacteriological violation has occurred (confirmed presence of fecal coliforms or E. coli bacteria). Best professional judgment must be used with regard to the scope or severity of the problem, based on the number and location of positive samples in relation to the size of the system. If chlorine/chloramine residuals in the distribution system are greater than the minimums required, the option exists to wait for complete speciation to issue the BWA; and
7. State or local health department officials have confirmed a waterborne disease outbreak directly associated with the public water supply.

Customer Notification Content

PWS shall carefully determine the appropriate area to which it issues the advisory. The area should include only those customers potentially at risk. The PWS should clearly define the boundary of the affected area using local landmarks or roadways (e.g. "James Bickford Road") to provide clear information to customers. Do not place a system wide BWA when the affected area may be isolated. For example, if only three houses on a dead end spur main lack water pressure after a break on that line, then a system-wide BWA is not appropriate.

Affected customers should be notified that:

- A line break has occurred;
- Repairs have been made;

- Customers should flush household pipes/faucets, home automatic icemakers, water fountains, etc.

The notification should state that customers with infants, elderly or immunocompromised individuals in the household, should seek advice about drinking water from their health care providers. This is a standard notification required to be included in each PWS's annual Consumer Confidence Report (Water Quality Report).

The BWA notification is similar to that given customers when a PWS conducts its annual or semi-annual flushing program. The flushing notification, however, does not trigger notification of Health Departments or the requirement of DOW authorization to end the incident (as required of BWAs). The PWS should carefully label notifications to minimize confusion between BWAs, Consumer Advisories and routine flushing. For example, "Water Line Break Notification".

Distribution of the Notification

If a BWA is issued by the water system, then the system shall immediately notify the Division of Water and the local health department via a protocol established between the system and the health department. The Division of Water may check to ensure appropriate local health departments have been contacted by the system and may contact the Division of Local Health, Sanitation Branch for major incidents such as those of system wide impact.

If the Division of Water issues a BWA, the same distribution protocol should be followed as if the system had issued the BWA.

The water system shall notify the affected public via doorknob hangers, newspapers, TV, radio or any other media (such as Facebook, Twitter or emergency ring-down systems) having an immediate public impact. When feasible, door-to-door public notification of an advisory should be conducted, with the advisory placed in plain site of the resident.

The public water system shall notify hospitals, nursing homes and other sensitive populations about the event, if appropriate.

Bacteriological Sampling to Lift the Boil Water Advisory

An adequate number of samples shall be collected and analyzed for total coliform bacteria as follows:

- With regard to an acute Total Coliform Rule violation, the minimum number of total coliform samples to be collected shall follow the normal protocol for repeat sampling pursuant to the Total Coliform Rule.
- With regard to a **system-wide BWA**, it is recommended that the minimum number of samples to be collected should be:

<u>Population Served*:</u>	<u>Minimum # of Samples</u>
25-1000	3
1001-2000	4
2001-3000	5
3001-4000	6
4001-7000	7
7001-10,000	8
10,001-25,000	9
25,001-50,000	10
> 50,000	10 or 10% of required monthly samples (whichever is greater)

*Population is determined as in 401 KAR 8:200 Section 3 by either a service connection multiplication factor, census data or actual population count (if in a small area).

If 10 samples or fewer are collected, all sample results shall be negative for total coliform to remove the BWA. If a system serving a population less than or equal to 50,000 elects to take more than 10 samples, no more than one sample shall be positive for total coliform, but it **must** be *E. coli* negative. NOTE: If any samples are positive, the appropriate resampling shall occur.

If a BWA is restricted to a smaller portion of the distribution system, then the required number of total coliform samples should be proportionally lower.

A consecutive system (purchaser) affected by a BWA from their producing system shall also issue a BWA for the area in their system that receives water from that producer.

- Sampling to lift the BWA in the consecutive system shall occur in conjunction with or after the BWA in the producing system has been lifted and with consultation with the appropriate DOW Regional Office.
- Consecutive system sampling may be based on flow, hydraulic modeling or other means to determine the movement of the potentially contaminated water.
- The number of samples from the consecutive system would be based only upon the population of the area affected.

Lifting a Boil Water Advisory

BWAs remain in effect until DOW or the Department for Environmental Protection's Environmental Response Team (ERT) determines or approves that the advisory may be lifted.

A laboratory certified by the cabinet to perform drinking water analyses shall perform microbiological, chemical and radiological testing.

Analytical results shall be forwarded by the laboratory to the cabinet prior to the cabinet's authorizing the lifting of a BWA issued for public health reasons. Outside of routine working hours, the cabinet will cooperate to authorize lifting a BWA when the laboratory verbally informs the cabinet's designated representative of the results. The representative can be reached through the cabinet's 24-hour reporting line (800/928-2380).

Should the ERT lift a BWA during off-hours, weekends and holidays, the information used to lift the BWA should be forwarded to the appropriate Regional Office on the next business day.

The following criteria must be met:

1. Satisfactory analytical results (bacteriological and/or turbidity) coupled with free chlorine residuals of 0.2 mg/L or greater, or total chlorine residuals of 0.5 mg/L for chloraminated systems, throughout the distribution system;
2. Sufficient flushing has occurred in the distribution system to eliminate water that was or might have been contaminated;
3. Treatment deficiency has been corrected; **or**
4. For a waterborne disease outbreak, the state epidemiologist, local health department and DOW must confirm that the health risk is now minimal.

Consumer Advisories

Consumer advisories (CA) are for those situations that necessitate public notification regarding drinking water contamination events that are not bacteriological in origin. Consumer advisories are typically related to chronic exposure (bacteria present an acute hazard) to a contaminant and can be more restrictive as to water use. A lesser use of a CA would be to provide other information that may affect customer health. Common examples include:

Drinking Water Contamination

1. Elevated turbidity due to the presence of iron or manganese. These chemicals create "color" in the water, not particulates. By boiling water that contains manganese, one could concentrate the metal, resulting in a taste or staining of clothes or plumbing fixtures.
2. Detection of a chemical-based cross-connection.
3. Elevated levels of regulated contaminants (such as arsenic, lead) or non-regulated contaminants such as gasoline or crude oil in the source water or distributed water.
4. Terrorism event

Other Information Pertinent to the Consuming Public

1. Notification of a chemical change at the water plant that would affect how the public would perceive the water or how the water would impact customer health (change in taste, hardness, disinfectant).
2. Distribution infrastructure improvements that could result in the shutting off of water for a period of time (new lines, replacing lines/meters, slip-lining)

Consumer advisory notifications can follow the same guidelines as those for boil water advisories. The advisories should be tailored for each event, providing easy-to-understand information through the quickest and most effective means of communication. Sufficient information should be given to explain the event and its duration, its consequences to the consuming public, actions to be taken during the event and a water system phone number.

Consumer advisories (for those incidents other than boil water advisories) can be issued by the Division or by the water system. If the event involves elevated levels of a contaminant or a terrorism event, the applicable DOW Regional Office shall be notified immediately. The Regional Offices do not need to be notified of those public information advisories that do not involve public health.

Consumer Advisories that involve public health and have been reported to the DOW remain in effect until the DOW determines or approves that the advisory be lifted. Lifting a consumer advisory will be dependent upon the event but will require resolution of the situation that led to the advisory. This may require additional sampling if related to a chemical cross-connection or elevated source water contaminants such as manganese or may simply involve notification that the event has ended (main replacement, new meters).

Resources

American Water Works Association, Manual of Water Supply Practices #M48, "Waterborne Pathogens"; 1st edition 1999 and 2nd edition 2006

Environmental Protection Agency and Centers for Disease Control and Prevention, "Drinking Water Advisory Communication Toolbox"; 2013

APPENDIX A

EXAMPLES

BOIL WATER AND CONSUMER ADVISORIES

Situation	Resolution	BWA? Yes or No
High filtered water turbidity; high filtered water manganese	Turbidity reading is false due to color from the manganese; not true particulate turbidity; optimize treatment; consider flushing system	No
High filtered water turbidity; overdose of permanganate confirmed	Turbidity reading is false due to color from the permanganate; not true particulate turbidity optimize treatment; consider flushing system	No
CFE turbidity at 1.6 NTU for 4 hours	Optimize treatment; consider flushing system	No, not over 6 hours in duration
CFE turbidity spiked at 6.1 NTU for 15 minutes	Optimize treatment; consider flushing system	Yes, greater than 5 NTU regardless of duration
Chlorine cylinder empties and is not caught until operator returns from rounds	Immediately change chlorine cylinder; consider flushing system	Depends on how long residual in plant tap below 0.2 free or 0.5 total –if longer than 4 hours, yes (this is a judgment call on the part of the field)
Upgrades on filters under way Settled water inadvertently sent through an empty filter bed	Immediately valve off the empty filter bed; Consider flushing the system	Yes, as unfiltered water entered the system
On-line chlorine analyzer records a free chlorine residual of 0.15 mg/L for 20 minutes; confirmed that not analyzer/recorder malfunction	Raise chlorine residual; investigate cause of residual loss	No, as entry point chlorine residual was less than 0.2 mg/L for less than 4 hours Refer to 8:150 Section 1(2)(b). This is also a judgment call on the part of the field.
Ice storm knocks off power to the water plant for 1 day Despite conservation efforts, portions of the town are without water	Call power company; investigate backup power sources; when power restored, consider slow flushing to refill pipes	Yes, as portions of the system had no pressure or possible negative pressure
Main break that requires 6 hours to repair	Repair main, conduct bacteriological sampling Report results of sampling Maintain main break log	No, but customers affected should be notified that a break has occurred and to flush water before using. Sensitive populations should seek medical advise
Break on a small line that is repaired under pressure	Repair main; conduct bacteriological sampling; report results of sampling; maintain main break log	No

Situation	Resolution	BWA? Yes or No
Main break that lowers pressure in the area to 13 psi; repaired in 2 hours	Repair main;; conduct bacteriological sampling;; notify cabinet; report results of sampling; maintain main break log	No, but customers affected should be notified that a break has occurred and to flush water before using. Sensitive populations should seek medical advise
Booster pump in remote area burns up; pressure drops from 52 psi to 30 psi	Repair pump to restore pressure	No
Riverbank well for a true GW system is flooded during a record flood event; wellhead protection questionable for this event	Once flooding recedes, inspect wellhead and make necessary repairs	Yes, as this is considered a cross-connection with a non-potable source
Utility receives reports of sewer odors coming from faucets in a subdivision hair-like particles in water	Investigate immediately; check storage tanks (this really happened—dead body in tank)	YES (this would most likely become a Consumer Advisory)
During routine bacteriological sampling, notice a hard-piped cross-connection between water supply and fertilizer	Immediately notify company and utility of cross-connection; disconnect cross-connection; monitor until install approved backflow protection devices	No, as not microbiological contamination; flush system
During a routine inspection, field finds documentation that GW system is considered “under the influence of surface water” and has not yet installed treatment	Enforcement?	Yes, as unfiltered surface water is entering the distribution system
A customer has their water tested for Giardia and the test comes back positive; lab is not certified to test for Giardia; no confirmation was done; no reports of giardiasis in area and no treatment upsets	Consult with medical community; consult with DOW	No, as the Giardia result is suspect and not supported by water plant malfunctions or by disease occurrence
Main break in the middle of a stream crossing during a flood event	Repair main; conduct bacteriological sampling; report results of sampling; maintain main break log	Yes, as the potential is high for contamination from the turbid water

Situation	Resolution	BWA? Yes or No.
Laboratory confirms presence of E.coli in a distribution sample	Consider flushing area. If chlorine residual is low, raise residual in area	Yes—this could become a Consumer Advisory
Laboratory reports a positive total coliform sample; confirmation not done yet; free chlorine residual was 1.7 mg/L		No, as this is not a confirmed sample positive for E.coli or fecal coliform and the free chlorine residual was greater than 0.2 mg/L. Wait for confirmation
Water main break in contaminated soil (i.e. sewage lateral lines, sewer line in same ditch) regardless of repair mechanism or if under pressure	Repair main; conduct bacteriological sampling; report results of sampling; maintain main break log	Yes, as sewage is contaminated. Could issue BWA for localized area.
Contractor breaks water line while excavating petroleum UST with significant free product around line and pressures drop to 13 psi	Repair main; conduct bacteriological sampling; report results of sampling; maintain main break log. Depending upon water main material, may need to replace entire line; hazardous waste cleanup issues	No, as boiling the water would release the petroleum products into the air. This could cause explosions as well as illness. This would be a Consumer Advisory with specific instructions.
System (or inspector) discovers that entire system has no chlorine residual; flushing did not resolve the situation	Check residual at master meters, investigate any sources of chlorine demand, etc. Determine if a chemical issue (i.e. high Mn)	Yes, as no chlorine residual could be an indication of bacteriological contamination; rule out any chemical contamination first Situation may also warrant an NOV
Pressure routinely below 20 psi in the distribution system or below 30 psi on the discharge side of customer meters	Contact DWB for sanction documentation	If the potential for backflow exists, Yes. Base decision on experience with system
Low to no chlorine residual in one area of the distribution system; system is doing HPCs in lieu of chlorine residuals with results less than 500 cfu/ml	Investigate cause of low or no chlorine residual and resolve	No, as water in the distribution system with an HPC count less than 500 cfu/ml is deemed as having “adequate disinfection residual”
Water system will be doing an extensive main relocation in a subdivision	Customers could experience low pressure/see and hear construction work	No, issue a Consumer Advisory

Situation	Resolution	BWA? Yes or No
Water system decides to use booster chlorination in one area of the distribution system	Customers notice slight chlorine smell	No, issue a consumer advisory for that area explaining the situation
Contamination detected in a suburban area not traceable to a cross-connection—possible terrorist event	Work with federal authorities and other responders to determine contaminant then decontaminate the system.	No, as most likely not bacteriological. May need to issue a “Do not drink” notification

NUMBER	ACCOUNT NO#	LOCATION	JOB CODE	STAT	STAFF	REQUESTED BY	JOB DATE	COMPLETION DATE	GROUP ID
374	ORDER	HAS HAD EXTREMELY LOW PRESSURE FOR A WEEK; CHECK FOR ISSUES PRESSURE IS GOOD. HAD ISSUES WITH PRV AT THAT CURRENT TIME	COMPL	COMP		DISTRIBUTIO	7/28/2020	7/28/2020	CS
415	ORDER	WATER KEEPS GOING OUT AND WHEN THEY DO HAVE IT IS A VERY SMALL STREAM. THIS IS ONLY AFFECTING THE CUSTOMER UP ON HILL. THEY ARE ABOUT 7 FAMILIES UP THERE. THIS IS BEEN GOING ON FOR ABOUT A WEEK. PRV WAS OUT OF ADJUSTMENT; NEEDED CLEANED	COMPL	COMP		DISTRIBUTIO	7/30/2020	7/30/2020	CS
463	ORDER	CUSTOMER REPORTED LOW WATER PRESSURE; IT IS STALLING HER APPLIANCES; CHECK FOR ISSUES PRV NEEDED SOME FINAL ADJUSTMENTS	COMPL	COMP		DISTRIBUTIO	8/04/2020	8/04/2020	CS
469	ORDER	HAS NO WATER; IS WORSE THAN BEFORE PRV HAS BEEN REPAIRED	COMPL	COMP		DISTRIBUTIO	8/04/2020	8/04/2020	CS
470	ORDER	NO WATER ON THE PIKE COUNTY SIDE OF THIS LINE BEEN OFF FOR ABOUT 20 MINUTES. NEIGHBORS HAS NONE EITHER LEAK DETECTION TEAM WAS CUTTING VALVE WHILE LEAK DETECTING & FLUSHING LINES	COMPL	COMP		DISTRIBUTIO	8/04/2020	8/04/2020	CS
473	ORDER	NO WATER REPORTED AT 4:05 PM NEIGHBORS DOES NOT HAVE WATER EITHER HAD WATER SHUT DOWN FOR A FEW MINUTES TO REPAIR ANOTHER LINE	COMPL	COMP		DISTRIBUTIO	8/04/2020	8/04/2020	CS
482	ORDER	WATER PRESSURE IS GOOD UNTIL LATER IN THE EVENING AND IT GOES DOWN TO A VERY LITTLE AMOUNT. THIS HAS BEEN GOING ON FOR ABOUT 3 DAYS LEAK IN METER BOX SMALL NEEDS NEW REGULATOR AND BOX REPLACEMENT. REPORTED POSSIBLE GAS LEAK @ 23 POPLAR FORK ON WAY TO WORK ORDER TO SUSPECTED LEAK IN CREEK BOTTOM LEFT SIDE OF BRIDGE. CALLED IN LEAK 10-23 -20TB,	COMPL	COMP		DISTRIBUTIO	8/05/2020	8/05/2020	CS
483	ORDER	HAS NOT HAD ANY WATER SINCE SATURDAY CAME ON DOWNSTAIRS LONG	COMPL	COMP		CUST SERV	8/05/2020	8/05/2020	CS

NUMBER	ACCOUNT NO#	LOCATION	JOB CODE	STAT	STAFF	REQUESTED BY	JOB DATE	COMPLETION DATE	GROUP ID
		ENOUGH TO SHOWER YESTERDAY MORNING THAN WENT OFF. HAD AIR IN THE LINE HE IS AT A VERY HIGH ELEVATION							
570	ORDER		COMPL	COMP	DISTRIBUTIO		8/13/2020	8/14/2020	CS
		THE SHUT OFF IS NOT WORKING AND HE HAS CALLED IN TWICE CAN NOT GET HIS PLUMBING WORK ON WITHOUT IT REPLACED.WATER IS RUINING HIS FLOORS; THIS HOME INSTALLED SHUT OFF ON SETTER							
574	ORDER		COMPL	COMP	CUST SERV		8/13/2020	8/13/2020	CS
		SHE STILLS HAS LOW WATER PRESSURE PRV IS ALMOST ALL THE WAY IN MIGHT NEED TO CHANGED THE REGULATOR OUT							
645	ORDER		COMPL	COMP	CUST SERV		8/20/2020	8/25/2020	CS
		CUSTOMER IS COMPLAINING THAT READERS ARE REMOVING COMPLETE LID WHILE READING, WHICH IS CAUSING GRAVEL TO FALL IN AND LEAVING LID LOOSE; WHICH IS A SAFETY ISSUE FOR HER HORSES AND GRAND CHILDREN MAKE WORK ORDER TO PUT FLAT LID ON BOX							
647	ORDER		COMPL	COMP	CUST SERV		8/20/2020	8/27/2020	CS
		LOW PRESSURE IT HAS BEEN THAT WAY FOR A WHILE. THEY CAN'T EVEN SHOWER 30 PSI ON CUSTOMER SIDE							
795	ORDER		COMPL	COMP	DISTRIBUTIO		8/28/2020	9/08/2020	CS
		HE CALLED AND SAID HE FIXED HIS LEAK. BUT HE IS HAVING A LOT OF PROBLEM WITH LOW PRESSURE HE CHECK WITH NEIGHBORS AND ALL HAVE VERY LOW PRESSURE.. HE IS GETTING A LOT OF AIR THRU HIS LINE ALSO INVESTIGATED 9-4-20; PRESSURE VERIFIED "GOOD" ON 9-8-20 THERE WAS A LEAK ON MAIN BELOW HIS HOUSE. CUSTOMER NOW HAS 77PSI ON HIS WATER SPIKOT OUTSIDE.							
826	ORDER		COMPL	COMP	DISTRIBUTIO		8/31/2020	8/31/2020	CS
		LOW PRESSURE STARTED WEDNESDAY AND NOW SOMETIMES IT IS GOING ALL THE WAY OUT OF THE NIGHT. CUSTOMER HAS OVER 100PSI ON SETTER CUSTOMER HAS ISSUES ON THEIR SIDE							
850	ORDER		COMPL	COMP	DISTRIBUTIO		9/02/2020	9/02/2020	CS
		CHECK PUMP STATION; CUSTOMER HAS NO WATER							

NUMBER	ACCOUNT NO#	LOCATION	JOB CODE	STAT	STAFF	REQUESTED BY	JOB DATE	COMPLETION DATE	GROUP ID

		POWER OUTAGE							
859	ORDER	CUSTOMER HAS LOW PRESSURE; PRESSURE IS LOW ON UPPER ALPHA BRANCH; ; CUSTOMER HAS HAD THESE ISSUES FOR YEARS, WHENEVER WATER IS TURNED ON OR OFF, THE PRESSURE BLOWS THEIR LINES BECAUSE THEY ARE LOCATED AT THE END OF THE LINE; CUSTOMER WAS CHARGED A SERVICE FEE FOR CALLING IN ISSUE INVESTIGATED BY 9-4-20; PRESSURE VERIFIED "GOOD" ON 9-8-20 BY	COMPL	COMP	CUST	SERV	9/04/2020	9/08/2020	CS
861	ORDER	HAS HAD LOW PRESSURE FOR 2 WEEKS; SINCE NEIGHBOR HAD LEAK REPAIRED 160 PSI AT SETTER 60 PSI AFTER REGULATOR	COMPL	COMP	CUST	SERV	9/04/2020	9/04/2020	CS
867	ORDER	CUSTOMER REPORTED LOW WATER PRESSURE; PLEASE CHECK FOR ISSUES; THIS METER IS YARD 80 PSI AT METER; LEAK INDICATOR WAS TURNING; READING	COMPL	COMP	CUST	SERV	9/08/2020	9/08/2020	CS
884	ORDER	CUSTOMER HAS HAD LOW PRESSURE FOR WEEKS READING ; 90 PSI AT BOX; NOTHING IS TURNING	COMPL	COMP	CUST	SERV	9/08/2020	9/08/2020	CS
886	ORDER	CUSTOMER WANTS LEAK REPAIR SITE CLEANED UP; ALSO NEEDS TO KNOW IF GAS LINE WAS HIT DURING REPAIR; PLEASE CONTACT CUSTOMER AT 3" REPAIR CLAMP, WASN'T A GAS LINE WHERE WE FIXED THE MAIN AT	COMPL	COMP	DISTRIBU	TIO	9/08/2020	9/08/2020	CS
908	ORDER	SAME PROBLEMS STARTED YESTERDAY EVENING ABOUT 1 IT STARTED AGAIN NO PRESSURE. ALSO LEFT A HOLE WHERE THE METER IS ABOUT A FOOT DEEP OVER 100PSI ON SETTER CUSTOMER HAS ISSUES ON THIER SIDE	COMPL	COMP	DISTRIBU	TIO	9/10/2020	9/10/2020	CS
913	ORDER	CUSTOMER IS UPSET ABOUT BILL; HAVE DONE A REREAD AND TAKEN A	COMPL	COMP	CUST	SERV	9/11/2020	9/11/2020	CS

NUMBER	ACCOUNT NO#	LOCATION	JOB CODE	STAT	STAFF	REQUESTED BY	JOB DATE	COMPLETION DATE	GROUP ID

PICTURE; CUSTOMER IS STILL NOT SATISFIED AND WANTS TO SPEAK TO THE MANAGER									
923	ORDER	NEEDS PUMP RESET WHERE POWER WENT OFF POWER OUTAGE	COMPL	COMP	CUST SERV		9/14/2020	9/14/2020	CS
928	ORDER	COMPLAINING THAT METER IS LOOSE METER IS NOT SPINNING, READING 0	COMPL	COMP	DISTRIBUTIO		9/14/2020	9/14/2020	CS
935	ORDER	NO WATER ALL WEEKEND THIS HAS BEEN GONE ON FOR ABOUT 3 WEEKS NOW. TR WAS THERE. CUSTOMER HAS OVER 100PSI EVERYTIME WE CHECK IT. WE HAVE IT RECORDED. CUSTOMER HAS PROBLEMS ON THEIR SIDE.	COMPL	COMP	DISTRIBUTIO		9/14/2020	9/14/2020	CS
954	ORDER	NO WATER ALL DAY POWER OUTAGE- FLUSHED AND RESTARTED PUMP	COMPL	COMP	DISTRIBUTIO		9/14/2020	9/14/2020	CS
1040	ORDER	NO WATER PRESSURE HAS BEEN THIS WAY FOR A WEEK. NEIGHBORS SAID THEY HAVE NO WATER PRESSURE EITHER. AFRAID IT IS GOING TO BURN WASHER UP 48 PSI AT HOUSE	COMPL	COMP	DISTRIBUTIO		9/21/2020	9/21/2020	CS
1119	ORDER	CUSTOMER CAME IN AND IS DISPUTING HER SEWER CHARGES FOR THE LAST COUPLE MONTHS, SHE SAID HER SEWER WASN'T WORKING RIGHT AND HAD BEEN MESSED UP FOR MONTHS. SHE SAID THEY DID COME OUT AND FIX IT LAST WEEK, BUT SHE HAD TALKED TO ABOUT IT AND HE WOULD TAKE CARE OF IT, WANTS SOMEONE TO CALL HER AND EXPLAIN WHY NO THINGS BEEN DONE.	COMPL	COMP	CUST SERV		9/25/2020	9/25/2020	CS
1120	ORDER	CUSTOMER CALLED IN WANTING TO SPEAK TO A SUPERVISOR, SHE HAD A WORK ORDER TO HAVE A METER SET AT THIS RESIDENCE, BUT SHE COULDN'T LOCATE THE METER, SHE HAD	COMPL	COMP	CUST SERV		9/25/2020	9/25/2020	CS

NUMBER	ACCOUNT NO#	LOCATION	JOB CODE	STAT	STAFF	REQUESTED BY	JOB DATE	COMPLETION DATE	GROUP ID
		SOMEONE COME OUT AND FIND IT FOR HER, BUT BY THAT TIME THERE WEREN'T ANY METERS LEFT. WE INFORMED HER THAT THEY WOULD HAVE TO GO TO THE PLANT AND GET HER ONE							
1162	ORDER		COMPL	COMP	CUST SERV		9/29/2020	9/29/2020	CS
		CUSTOMER CALLED IN, SAID SHE HAS NO WATER, HAS HAD LOW WATER PRESSURE THE LAST COUPLE DAYS BUT NOW SHE DOESN'T HAVE ANY FLUSHING LINES ON BIG BRANCH							
1185	ORDER		COMPL	COMP	DISTRIBUTIO		9/30/2020	9/30/2020	CS
		CUSTOMER HAS REALLY LOW WATER PRESSURE 36 PSI							
1198	ORDER		COMPL	COMP	DISTRIBUTIO		10/02/2020	10/02/2020	CS
		THEY ARE SAYING NO WATER AGAIN.WE NEED TO CHECK AND IF IT STILL HAS THE PRESSURE AT METER PLEASE TALK TO CUSTOMER TO TRY TO HELP THEM SOLVE THE ISSUE THEY KEEP HAVING. HAS BEEN CHECKED MULTIPLE TIMES HAS OVER 120 PSI ON SETTER PROBLEM IS ON CUSTOMER SIDE. ADD FEE 40.00.							
1209	ORDER		COMPL	COMP	DISTRIBUTIO		10/05/2020	10/05/2020	CS
		THE MAN HOLE IS LEAKING AND MESSING IS YARD UP BACK. HE SAID HE HAD BEEN PATIENCE AND STILL NOTHING HAD BEEN YET. WANTED TO TALK TO REPLACED VALVES AND FITTINGS IN PRV PIT							
1224	ORDER		COMPL	COMP	DISTRIBUTIO		10/05/2020	10/05/2020	CS
		CUSTOMERS WATER WAS MILKY JUST NEED THE LINE FLUSHED. FLUSHED HYDRANT FOR 15 MINUTES							
1228	ORDER		COMPL	COMP	DISTRIBUTIO		10/06/2020	10/06/2020	CS
		WOULD LIKE FOR THE WATER COMPANY TO CHECK PRESSURE AT METER. HE SAID THERE WAS WAY TO MUCH PRESSURE AND WAS BLOWING HIS HOT WATER PLUG OUT. CUSTOMER'S PLUMBER TOLD HIM THERE WAS TOO MUCH PRESSURE AT THE METER, HE DOES HAVE A PRESSURE REGULATOR AT HIS HOME THIS IS NOT A HIGH PRESSURE AREA; CUSTOMER NEEDS TO ADJUST THEIR REGULATOR; PHONE NUMBER IS NOT VALID; CANNOT CONTACT CUSTOMER FOR UPDATE							
1231	ORDER		COMPL	COMP	DISTRIBUTIO		10/06/2020	10/06/2020	CS
		CUSTOMER HAS NO WATER AT ALL							

NUMBER	ACCOUNT NO#	LOCATION	JOB CODE	STAT	STAFF	REQUESTED BY	JOB DATE	COMPLETION DATE	GROUP ID
		110 PSI ON SETTER; CURRENT READING TALKED TO ; INSTRUCTED THEM TO GET A PRESSURE REGULATOR AND ONE WAY CHECK VALVE ON CUSTOMER SIDE							
1257	ORDER	NO WATER ON SUNDAY CUSTOMER HAD A LEAK UNDER THEIR HOUSE. ADD FEE AFTER HOURS	COMPL	COMP	DISTRIBUTIO		10/12/2020	10/12/2020	CS
1262	ORDER	REGULAR WATER RUNNING SMELLS LIKE PURE SEWER, BEEN SMELLING LIKE THAT FOR WEEKS. FRED FLUSHED LINE OUT GOOD WATER LOOKED GOOD HAD GOOD PRESSURE GOT VIDEO	COMPL	COMP	DISTRIBUTIO		10/12/2020	10/12/2020	CS
1265	ORDER	SAID THEY CAME OUT AND FIXED A LEAK WITHIN THE LAST COUPLE WEEKS BUT EVER SINCE THEN THEYVE HAD SUPER LOW WATER PRESSURE. ITS BARELY RUNNING OUT NOW HAS A 50PSI AT SETTER CURRENT READING	COMPL	COMP	DISTRIBUTIO		10/13/2020	10/13/2020	CS
1270	ORDER	HAS VERY LOW PRESSURE, MENTIONED TALKING TO , SAID THEYVE ALREADY CHECKED AND COULDN'T FIND ANY LEAKS ON THEIR SIDE. SAID A LINE WAS REPLACED DOWN THE RAOD IN THE PAST COUPLE MONTHS AND ITS BEEN LOW EVER SINCE He as 180 PSI after Regulator got video and pictures. Reading was	COMPL	COMP	CUST SERV		10/14/2020	10/14/2020	CS
1295	ORDER	CUSTOMER SAYS THAT SINCE THEY WORKED ON THE LINE LAST WEEK THERE'S STILL A LOT OF AIR IN THE LINE, IT SPITS AND SPLATTERS EVERY TIME YOU TURN IT ON AND ITS BEEN VERY WHITE AND MILKY SINCE THEN TOO. BLOWED OFF LINE UNTIL NO AIR CAME OUT AND WATER LOOKED GOOD.	COMPL	COMP	DISTRIBUTIO		10/16/2020	10/16/2020	CS
1398	ORDER	THE WATER'S BEEN OFF FOR ABOUT AN HOUR AND THEY WERE CHECKING TO SEE IF THEY WERE STILL WORKING ON THE LINES FIXED A MAIN 4" LEAK. WATER WAS SHUT OFF	COMPL	COMP	DISTRIBUTIO		10/21/2020	10/21/2020	CS

NUMBER	ACCOUNT NO#	LOCATION	JOB CODE	STAT	STAFF	REQUESTED BY	JOB DATE	COMPLETION DATE	GROUP ID
1420	ORDER		COMPL	COMP	DISTRIBUTIO		10/23/2020	10/23/2020	CS
		NEED TO FLUSH LINES WATER IS LOOKING MILKY LIKE. FLUSHED LINE FOR 15 MINUTES							
1444	ORDER		COMPL	COMP	DISTRIBUTIO		10/26/2020	10/26/2020	CS
		HAS HAD REALLY LOW PRESSURE ALL DAY, SHE KNEW THAT THEY HAD BEEN WORKING ON IT BUT SHE WANTED TO MAKE SURE THERE WASN'T ANYTHING ELSE WRONG MAIN REPAIR ON THIS DATE.							
1450	ORDER		COMPL	COMP	DISTRIBUTIO		10/27/2020	10/27/2020	CS
		SAYS SHE HASN'T HAD GOOD WATER IN YEARS. IT LEAVES A SANDY GRITTY RESIDUE IN HER TOILET. THIS IS THE FIRST TIME SHE HAS CALLED INTO THE OFFICE ABOUT IT. DIDN'T KNOW IF WE COULD FLUSH HER LINES OR WHAT WE COULD DO BLOWED OFF LINE AT THE END OF 292							
1455	ORDER		COMPL	COMP	DISTRIBUTIO		10/28/2020	10/28/2020	CS
		VERY LOW PRESSURE. THIS IS A HIGH PRESSURE AREA AND WE DO FURNISH THE S-BAR REGULATOR IN THIS AREA. HE'S GOT 60PSI AT SETTER NEED CHECK VALVE REPLACED							
1458	ORDER		COMPL	COMP	DISTRIBUTIO		10/28/2020	10/28/2020	CS
		MS. WILLIAMS CALLED AND HER WATER IS VERY MILKY YELLOW COLOR. MIGHT NEED TO FLUSH LINES. IT WAS LIKE THIS WHEN IT CAME BACK ON. FLUSHED LINE FOR 15 MINUTES							
1463	ORDER		COMPL	COMP	DISTRIBUTIO		10/28/2020	10/28/2020	CS
		CUSTOMER SAYS SHE NEEDS A NEW METER BOX. THAT WHEN COUNTY CAME UP THERE WORKING ON THE ROADS THEY BUSTED HER BOX. HER NUMBER IS CUT BOX OFF AND PUT NEW LID ON							
1467	ORDER		COMPL	COMP	DISTRIBUTIO		10/29/2020	10/29/2020	CS
		SHE NEEDS THEM TO COME TO HER HOUSE AND GET THE AIR OFF HER LINES AHE HAS A FIRE HYDRANT AT HER HOUSE THE AIR IS SO BAD IT IS GOING TO BLOW HER COMMODE OFF. BLEW OFF LINE MADE SURE AIR STOPPED AND WATER CLEAR BEFORE SHUTTING IT OFF							
1476	ORDER		COMPL	COMP	DISTRIBUTIO		10/29/2020	10/29/2020	CS
		WATER DIDN'T COME BACK ON AFTER THEY WORKED ON THE LINES.							

NUMBER	ACCOUNT NO#	LOCATION	JOB CODE	STAT	STAFF	REQUESTED BY	JOB DATE	COMPLETION DATE	GROUP ID
1478	ORDER		COMPL	COMP	DISTRIBUTIO	PAUL	10/30/2020	10/30/2020	CS
		CUSTOMER CALLED BACK IN. SHE DOESN'T HAVE WATER AGAIN TODAY, HAD VERY LOW WATER PRESSURE LAST NIGHT AND DOESN'T HAVE ANY TODAY TURNED PRV UP SO THEY NOW HAVE WATER							
1488	ORDER		COMPL	COMP	DISTRIBUTIO		11/02/2020	11/02/2020	CS
		WATER PRESSURE IS VERY LOW TO NONE AT SOME POINTS. STARTED ABOUT LAST WEDNESDAY, WAS OFF SEVERAL DAYS LAST WEEK AND THEN TODAY IT BARELY HAS ANY PRESSURE WHEN THEY DO HAVE WATER HAD TO TURN PRV UP SO THEY HAVE WATER							
1494	ORDER		COMPL	COMP	CUST SERV		11/03/2020	11/03/2020	CS
		SAYS WATER PRESSURE IS TOO HIGH AND ITS BLOWING THROUGH HIS REGULATORS AND MESSING WITH HIS FRIDGE. SAYS ITS MESSING WITH HIS HOT WATER HEATER AND THE PRESSURE IS JUST TOO HIGH, WANTS SOMEONE TO COME OUT AND CALL HIM WHEN THEY COME, HIS NUMBER REPLACED REGULATOR, NOW HAS 80PSI AFTER REGULATOR. GOT VIDEO AND SENT TO							
1504	ORDER		COMPL	COMP	DISTRIBUTIO		11/04/2020	11/04/2020	CS
		WHEN WATER CAME ON LAST NIGHT NO PRESSURE. AND THAN THIS MORNING WAS OFF AGAIN WE HAD WATER OFF, TURNED IT BACK ON AFTER WORK ORDER WAS MADE							
1505	ORDER		COMPL	COMP	DISTRIBUTIO		11/04/2020	11/04/2020	CS
		THEY HAVE NO PRESSURE SINCE WATER CAME BACK ON THEY HAVE WATER NOW							
1521	ORDER		COMPL	COMP	DISTRIBUTIO		11/05/2020	11/05/2020	CS
		THEY STILL DON'T HAVE WATER TURNED UP PRESSURE ON THE PRV, WATER SERVICE RESTORED							
1537	ORDER		COMPL	COMP	DISTRIBUTIO		11/06/2020	11/06/2020	CS
		IS WATER IS RUNNING VERY DARK COLOR WAS WANTING TO KNOW IF							

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WE WERE WORKING ON A LEAK OR ANYTHING REMOVED METER AND BLEW OFF LINE; METER WAS CLOGGED									
1562			COMPL	COMP	CUST	SERV	11/11/2020	11/13/2020	CS
ORDER		PRESSURE IS EXTREMELY LOW; TODAY THE PRESSURE HAS BEEN WORSE THAN BEFORE CALLED AND SPOKE WITH SOMEONE AT THE RESIDENCE, THEY SAID PRESSURE WAS BACK TO NORMAL							
1583			COMPL	COMP	DISTRIBUTIO		11/13/2020	11/18/2020	CS
ORDER		CUSTOMER WANTS ENOUGH GRAVEL TO COVER MESS THAT WAS MADE AND DRIVEWAY IS SOLID, HE SAID THAT 2 BUCKETS OF GRAVEL WAS PLACED ON MESS AND IT IS SOFT AND SINKING UP PUT 1 1/2 TON OF GRAVEL ON DRIVEWAY. DRIVEWAY WAS IN GOOD SHAPE WHEN WE GOT THERE. SHOULD HAVE ZERO COMPLAINTS.							
1587			COMPL	COMP	DISTRIBUTIO		11/16/2020	11/16/2020	CS
ORDER		FOR THE LAST 3 DAYS IT HAS BEEN DROPPING MORE LOW PRESSURE. GOT 43 PSI ON SETTER. NO LEAKS PRESSURE HAS BEEN VERIFIED. MINIMUM IS 40 PSI AND THEY HAVE 43							
1719			COMPL	COMP	DISTRIBUTIO		11/24/2020	11/24/2020	CS
ORDER		SAYS THE WATER SMELLS HORRIBLE IN THE HOUSE, SAYS ITS BEEN THAT WAY FOR ABOUT A MONTH. SHE SAID YOU WOULD ALMOST THINK ITS SEWER IT SMELLS SO BAD. LINE WAS FLUSHED AT METER ON DEC 1, 20. CUSTOMER SAID THE SMELL IS GONE.							
1729			COMPL	COMP	DISTRIBUTIO		11/30/2020	11/30/2020	CS
ORDER		NO WATER OF THE DAY BUT JUST A TRICKLE AND AT NIGHT IT IS A LITTLE BETTER BUT STILL NOT UP TO WHAT THEIR MOSTLY IS. TURNED PRV UP TO 50							
1742			COMPL	COMP	DISTRIBUTIO		12/03/2020	12/04/2020	CS
ORDER		THEY STILL DON'T HAVE ANY WATER PUMP WAS RESET							
1750			COMPL	COMP	CUST	SERV	12/04/2020	12/04/2020	CS
ORDER		CUSTOMER IS COMPLAINING OF MILKY WATER; WE ADVISED THAT IT							

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		ABLE TO COME BACK OUT UNTIL MONDAY OF THE NEXT WEEK. THEN SAID THAT HE WANTED TO BE UNHOOKED FROM THE SEWER. THAT HE WANTED TO HOOK BACK UP TO SEPTIC, AND IF THEY DIDN'T COME UNHOOK HIM HE WOULD TAKE A BACKHOE AND DIG IT UP HIMSELF. DUG UP AND REPLACED BOX AND ALL							
1841			COMPL	COMP	DISTRIBUTIO		12/14/2020	12/14/2020	CS
	ORDER	CUSTOMER HAD REQUESTED GRAVEL BE SPREAD IN ORDER TO CLEAN UP LEAK REPAIR SITE; MRS. STATED THAT 2 - 5 GALLON BUCKETS OF GRAVEL WAS DELIVERED BY MCWD, AND HER DRIVEWAY IS STILL A MUDDY MESS; SHE IS REQUESTING TO HAVE DRIVEWAY FIXED PROPERLY MORE GRAVEL WAS APPLIED. DRIVE WAY IS IN GOOD SHAPE							
1849			COMPL	COMP	CUST SERV		12/15/2020	12/15/2020	CS
	ORDER	CUSTOMER CALLED TO COMPLAINING ABOUT HER USAGE; SHE WISHES TO SPEAK WITH THE MANAGER; HER COMPLAINT IS THAT HER METER IS NEVER ACTUALLY READ, SHE IS THE ONLY ONE IN HER HOME AND SHE IS BEING BILLED FOR HIGH USAGE; SHE IS GOING TO CALL THE PSC IF WE DO NOT CONTACT HER; SHE IS NOT PHYSICALLY ABLE TO GET DOWN AND CHECK HER METER READING; PLEASE CALL BEFORE MRS WAS SHOWN AND UNDERSTANDS THAT WE ARE READING HER METER. SHE WAS SATISFIED THAT HER METER IS BEING READ							
1929			COMPL	COMP	CUST SERV		12/21/2020	1/07/2021	CS
	ORDER	HAS LOW WATER PRESSURE. HAS CHECKED THE METER TO MAKE SURE NOTHING IS TURNING. CAN'T FIND ANY SIGNS OF A LEAK ON HIS SIDE. IF SOMEONE CAN CALL WHEN THEY COME OUT HE WOULD APPRECIATE IT. NUMBER IS 120 PSI AT SETTER							
1959			COMPL	COMP	CUST SERV		12/28/2020	1/06/2021	CS
	ORDER	NO WATER SINCE ALL THE PROBLEM WITH OLD RT3 OR VERY LOW PRESSURE WATER PRESSURE IS BACK TO NORMAL							
1964			COMPL	COMP	DISTRIBUTIO		12/29/2020	1/04/2021	CS
	ORDER	CUSTOMER HAS HAD LOW PRESSURE FOR TWO WEEKS; IT IS DOWN TO A TRICKLE TODAY THIS ISSUE AROSE FROM THE PRV ON INEZ HILL; IT HAS BEEN RESOLVED TO THE BEST OF MY KNOWLEDGE							

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1979	ORDER		COMPL	COMP	CUST SERV		1/04/2021	1/06/2021	CS
<p>WATER HAS BEEN OUT SINCE THURSDAY AND THEY WAS SUPPOSED TO RUN A NEW LINE ON HER HOUSE. THEY SAID THEY WERE TOLD THEY WOULD BE OUT FIRST THING THIS MORNING.</p> <p>OR</p> <p>WATER HAS BEEN RESTORED TO CUSTOMER; OUTAGE WAS DUE TO LEAK</p>									
2003	ORDER		COMPL	COMP	CUST SERV		1/06/2021	1/06/2021	CS
<p>MARTIN COUNTY ROAD DEPT IS CLEANING DITCHES ON THIS HOLLOW; CUSTOMER BEGAN HAVING EXTRMELY LOW PRESSURE AFTER THEY BEGAN; CHECK FOR ISSUES</p> <p>PRESSURE ISSUE WAS CHECKED BY OUR CREW; NO PROBLEMS WERE FOUND; CUSTOMER HAD ADEQUATE PRESSURE AT METER</p>									
2004	ORDER		COMPL	COMP	CUST SERV		1/06/2021	1/06/2021	CS
<p>CUSTOMER'S WATER WENT OFF AND THEN CAME BACK ON TO A TRICKLE; CHECK FOR ISSUES</p> <p>READING</p> <p>CUSTOMER HAD 70 PSI AT METER</p>									
2028	ORDER		COMPL	COMP	DISTRIBUTIO		1/11/2021	1/11/2021	CS
<p>HER WATER HAS BEEN COMPLETELY OFF SINCE SUNDAY. WOULD LIKE FOR SOMEONE TO COME CHECK IT AND LET HER KNOW WHAT IS GOING ON. HAS ANOTHER WORK ORDER IN</p> <p>STAFF FLUSHED CUSTOMER'S LINE.</p> <p>CUSTOMER STATED THAT SHE NOW HAS GOOD WATER PRESSURE.</p>									
2030	ORDER		COMPL	COMP	CUST SERV		1/11/2021	1/11/2021	CS
<p>LOW PRESSURE CANNOT RUN A WASHER AND TAKE A BATH AT SAME TIME. HE HAS CHECK FOR A LEAK NO LEAK NOTHING MOVING ON METER. CANNOT RUN DISHWASHER AT ALL. THIS HAS BEEN GOING ON FOR THE LAST WEEK.</p> <p>PRESSURE ISSUE SEEMS TO HAVE BEEN RESOLVED WITH FLUSHING OF MAIN WATER LINE; CUSTOMER NOW REPORTS GOOD PRESSURE</p>									
2034	ORDER		COMPL	COMP	DISTRIBUTIO		1/11/2021	1/11/2021	CS
<p>NO WATER SINCE YESTERDAY VERY UPSET THEY CANNOT GET THEIR WATER WHERE THEY CAN USE IT BEEN GOING ON FOR ABOUT A MONTH</p> <p>CUSTOMER NOW HAS WATER; PRV WAS MAINTENANCED</p>									

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2039	ORDER		COMPL	COMP	CUST SERV		1/11/2021	1/11/2021	CS
		CUSTOMER CALLED TO NOTIFY THAT THEY HAD NO WATER. I FLUSHED THE HYDRANT AT THE MOUTH OF BRANCH AND THE CUSTOMER HAS REPORTED TO HAVE GOOD WATER PRESSURE							
2041	ORDER		COMPL	COMP	DISTRIBUTIO		1/11/2021	1/11/2021	CS
		CUSTOMER HAS NO WATER. STATED THAT HER HUSBAND HAD CHECKED THEIR METER AND IT'S NOT BROKEN. WOULD LIKE SOMEONE TO COME OUT ASAP. THIS RESIDENCE HAD 48 PSI WHEN CHECKED WITH PRESSURE GAUGE AT METER							
2049	ORDER		COMPL	COMP	DISTRIBUTIO		1/12/2021	1/12/2021	CS
		NO WATERS WENT BACK OFF LAST NIGHT PRESSURE HAS RETURNED TO NORMAL AFTER CLEANING PRV ON INEZ HILL							
2069	ORDER		COMPL	COMP	DISTRIBUTIO		1/14/2021	1/14/2021	CS
		CUSTOMER CALLED IN AND STATED THEY HAD NO WATER. UPON INSPECTION OF STATION, PUMP WAS RUNNING AND CUSTOMER REPORTED THAT WATER WAS NOW NORMAL PRESSURE							
2073	ORDER		COMPL	COMP	DISTRIBUTIO		1/14/2021	1/14/2021	CS
		CUSTOMER CALLED TO LET US KNOW THAT THEY POWER BLINKED OFF AND NOW THEY HAVE NOT WATER. TURNED THE PUMP STATION BACK ON							
2077	ORDER		COMPL	COMP	CUST SERV		1/14/2021	1/14/2021	CS
		POWER WENT OFF NEED METER RESET PUMP WAS RESET DUE TO ELECTICITY GOING OFF							
2160	ORDER		COMPL	COMP	CUST SERV		1/22/2021	1/29/2021	CS
		NO WATER; CUSTOMER DID SPECIFY THAT THE COUNTY IS CLEANING DITCHES OUT AT FROG POND ISSUE HAS BEEN RESOLVED, CUSTOMER NOW HAS SATISFACTORY PRESSURE							

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2431	ORDER		COMPL	COMP	DISTRIBUTIO		2/01/2021	2/01/2021	CS
<p>BARELY HAS ANY WATER, SOME OF THE TIME DOESN'T HAVE ANY, AND WHEN SHE DOES HAVE WATER THERE ISN'T ANY PRESSURE ITS JUST A LITTLE STREAM, SAYS ITS BEEN AN ISSUE FOR WEEKS, SAYS IT CAME BACK ON FOR A COUPLE DAYS AFTER THE LEAK WAS FIXED DOWN FROM THEM. CUSTOMER WOULD LIKE SOMEONE TO TALK TO HER ABOUT IT PLEASE. PHONE # IS CALLED TO VERIFY IF THEY HAD WATER 11:33 03/24/21 NO ANSWER . CALLED BACK AND STILL HAS WATER ISSUES WOULD LIKE SOMEONE TO PLEASE CALL HIM BACK. 03/24/21 11:50 WATER WAS OFF DUE TO ISSUE WITH 40 WEST PUMP STATION; CUSTOMER IS UNDER BWA; CUSTOMER HAD PRESSURE RESTORED ONCE PUMP STATION WAS BACK ON LINE</p>									
2442	ORDER		COMPL	COMP	DISTRIBUTIO		2/02/2021	2/02/2021	CS
<p>CUSTOMER SAID THAT HE HASN'T HAD GOOD WATER PRESSURE FOR MONTHS AND THE WATER IS STILL MILKY AS WELL. POSSIBLY NEEDS FLUSHED. CHECK IF CUSTOMER HAS AN S BAR REGULATOR. CHECKED PRESSURE AT METER,PRESSURE IS GOOD EXPLAINED TO CUSTOMER THAT MILKY/CLOUDY WATER WAS A RESULT OF AIR IN LINES</p>									
2537	ORDER		COMPL	COMP	DISTRIBUTIO		2/05/2021	3/26/2021	CS
<p>THE WATER AT IS BROWN AND CUSTOMER SENT PIC TO SHOW COLOR WATER WAS DISCOLORED DURING OUTAGES FROM STORM; VERIFIED WITH CUSTOMER THAT THIS IS NO LONGER AN ISSUE</p>									
2547	ORDER		COMPL	COMP	CUST SERV		2/08/2021	2/08/2021	CS
<p>CUSTOMER HAS NO WATER; PLEASE CHECK FOR ISSUES RESET PUMP; BREAKER WAS KNOCKED DUE TO ELECTRICAL OUTAGE; WATER WAS RESTORED</p>									
2563	ORDER		COMPL	COMP	CUST SERV		2/08/2021	3/09/2021	CS
<p>CUSTOMER SAID SHE HAS HAD THE METER TURNED OFF SINCE DEC 21ST; CUSTOMER HAD 33,000 GALLONS USAGE; HER NEIGHBOR GAVE A READING OF , WHICH WOULD BE 90,510 GALLONS SINCE LAST BILLING; CUSTOMER IS IN FLORIDA; CHECK FOR ISSUES THIS METER HAD BEEN CHANGED OUT BUT INFO WAS NEVER REPORTED; SENT INFO ON 3-9-21; METER CHANGE SERVICE ORDER WAS ISSUED TO RECORD THE INFORMATION; BILL WAS ADJUSTED AND CUSTOMER WAS CONTACTED TO INFORM THEM OF THE</p>									

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CORRECTED BILL									
2572	ORDER	CUSTOMER SAID WATER IS CLOUDY; PLEASE FLUSH LINE CUSTOMER REPORTED THAT WATER IS MUCH BETTER THAN IT BEFORE	COMPL	COMP	CUST	SERV	2/09/2021	2/09/2021	CS
2632	ORDER	CUSTOMER HAS NO WATER WATER WAS OFF DUE TO WINTER STORM; WATER HAS BEEN RESTORED AND CUSTOMER VERIFIED THAT WATER WAS RESTORED	COMPL	COMP	CUST	SERV	2/16/2021	2/16/2021	CS
2633	ORDER	CUSTOMER HAS NO WATER WATER WAS OFF DUE TO WINTER STORM; WATER HAS BEEN RESTORED JD	COMPL	COMP	CUST	SERV	2/16/2021	2/19/2021	CS
2634	ORDER	CUSTOMER HAS NO WATER WATER WAS OFF DUE TO WINTER STORM; WATER HAS BEEN RESTORED TO AREA; CUSTOMER CONFIRMED WATER WAS RESTORED; AREA IS UNDER BWA	COMPL	COMP	CUST	SERV	2/16/2021	2/19/2021	CS
2635	ORDER	CUSTOMER HAS NO WATER WATER WAS OFF DUE TO WINTER STORM; WATER HAS BEEN RESTORED TO AREA AFTER GENERATOR WAS INSTALLED TO 40 WEST PUMP STATION; AREA IS UNDER BWA	COMPL	COMP	CUST	SERV	2/16/2021	2/19/2021	CS
2636	ORDER	CUSTOMER HAS NO WATER WATER WAS OFF DUE TO WINTER STORM; WATER HAS BEEN RESTORED TO THIS LOCATION DUE TO THE INSTALLATION OF GENERATOR ON 40 WEST PUMP STATION; AREA IS UNDER BWA	COMPL	COMP	CUST	SERV	2/16/2021	2/19/2021	CS
2642	ORDER	CUSTOMER HAS NO WATER WATER WAS OFF DUE TO WINTER STORM; LOCATION IS UNDER BWA DUE TO OUTAGE; DISTRICT HAS RESTORED WATER TO AREA	COMPL	COMP	CUST	SERV	2/17/2021	2/17/2021	CS

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2655	ORDER	SAID THEY DONT HAVE ANY WATER WATER HAS BEEN RESTORED TO CUSTOMER; AREA IS STILL UNDER BWA	COMPL	COMP	DISTRIBUTIO		2/18/2021	2/18/2021	CS
2686	ORDER	CUSTOMER HAS HAD LOW PRESSURE FOR AN HOUR; CHECK FOR ISSUES; CUSTOMER IS LOCATE ON CUSTOMER VERIFIED THAT HE NOW HAS WATER; AREA IS STILL UNDER BWA	COMPL	COMP	DISTRIBUTIO		2/19/2021	2/19/2021	CS
2702	ORDER	CUSTOMER HAS BEEN EXPERIENCING LOW PRESSURE FOR 3 DAYS, PRESSURE IS CONSISTANTLY GETTING WORSE PRESSURE RETURNED ONCE 645 PUMP STATION WAS TURNED BACK ON DUE TO ELECTRICITY FLASHING	COMPL	COMP	CUST SERV		2/22/2021	2/22/2021	CS
2709	ORDER	THERE IS A LEAK ON OUR SIDE OUT BY THEIR METER AND WATER IS RUNNING INTO THEIR YARD FROM IT THIS HAS BEEN CONFIRMED AS A LEAK; PLACED LISTENER ON SETTER, CAN HEAR LEAK GOOD, RUNNING 90 PSI ON LISTENER; 811 HAS BEEN CALLED IN ON THIS LOCATION EX/MAR19 TICKET #	COMPL	COMP	DISTRIBUTIO		2/23/2021	3/03/2021	CS
2714	ORDER	NEEDS SOMEONE TO COME TURN HER WATER OFF, SHE HAS A LEAK AND DOESN'T HAVE ANYONE WHO CAN DO IT FOR HER, I MADE HER AWARE THERE MAY BE A FEE AND SHE SAYS SHE STILL NEEDS IT DONE CUSTOMER STATED THAT THEY HAD SOMEONE SHUT METER OFF FOR THEM; DO NOT ADD SERVICE FEE	COMPL	COMP	CUST SERV		2/23/2021	2/24/2021	CS
2716	ORDER	CUSTOMER HAS HAD LOW PRESSURE FOR 3 DAYS; HIS MOTHER'S FUNERAL IS TODAY AND HE HAS NO WATER; PLEASE CHECK FOR ISSUES THIS WAS FULL OF AIR; FLUSHED LINE; ALSO HAD A MAIN BREAK AND WATER MAIN WAS VALVED OFF; WATER PRESSURE HAS BEEN	COMPL	COMP	CUST SERV		2/23/2021	2/24/2021	CS

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RESTORED TO CUSTOMER; AREA IS STILL UNDER BWA									
2728			COMPL	COMP	CUST	SERV	2/24/2021	2/24/2021	CS
ORDER		HAS NO WATER SINCE YESTERDAY, PUMP MAY NEED RESET CUSTOMER WAS CONTACTED AFTER PUMP WAS RESET; PRESSURE HAS BEEN RESTORED							
2730			COMPL	COMP	CUST	SERV	2/24/2021	3/03/2021	CS
ORDER		CUSTOMER HAS NO WATER PUMP WAS RESET DUE TO ELECTRICAL OUTAGE; CUSTOMER REPORTED SHE NOW HAS WATER							
2731			COMPL	COMP	CUST	SERV	2/24/2021	2/24/2021	CS
ORDER		LOW PRESSURE ALL DAY NOTIFIED THAT CUSTOMER HAD A LEAK ON THEIR SIDE; METER IS SPINNING BAD CURRENT READ							
2802			COMPL	COMP	DISTRIBU	TIO	2/27/2021	2/27/2021	CS
ORDER		CUSTOMER CALLED THE PLANT AND HAD A COMPLAINT OF NO WATER THIS PERSON HAD A LEAK ON THEIR SIDE; WE NEED TO MAKE SURE TO CHARGE THEM A SERVICE FEE							
2803			COMPL	COMP	DISTRIBU	TIO	2/27/2021	2/27/2021	CS
ORDER		CUSTOMER CALLED WITH COMPLAINT OF NO WATER CREW WAS CALLED OUT, THE PROBLEM WAS ON CUSTOMERS SIDE. ADD SERVICE FEE							
2810			COMPL	COMP	CUST	SERV	3/03/2021	3/03/2021	CS
ORDER		CUSTOMER SAID THEY ARE STILL OUT OF WATER CALLED 3/24/21 11:18- HAS GOOD WATER PRESSURE AND HAS REPORTED NO ISSUES NOW							
2835			COMPL	COMP	DISTRIBU	TIO	3/04/2021	3/04/2021	CS
ORDER		THE WATER WAS OFF ALL NIGHT LAST NIGHT, HAD THE LITTLEST BIT THIS MORNING BUT NOW ITS BACK OUT AGAIN.							

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THIS WATER WAS AFFECTED BY VALVING OFF TO BUILD UP CLEARWELL TANK ON TURKEY. BWA IN EFFECT									
2836	ORDER		COMPL	COMP	DISTRIBUTIO		3/04/2021	3/04/2021	CS
HASN'T HAD WATER FOR DAYS, SINCE IT STARTED FLOODING HIS HAS BEEN OUT A JUMPER WAS INSTALLED TO GET CUSTOMER BACK IN WATER. NEED WORK ORDER TO FIX THE LINE CORRECTLY. BWA IN EFFECT									
2847	ORDER		COMPL	COMP	DISTRIBUTIO		3/05/2021	3/05/2021	CS
CUSTOMER IS LOCATED BEFORE THE BREAK; WATER HAS BEEN OFF FOR AT LEAST 5 DAYS; CUSTOMERS WATER HAS BEEN RESTORED, CHECKED VIA PHONE CALL. BWA IN EFFECT									
2849	ORDER		COMPL	COMP	DISTRIBUTIO		3/05/2021	3/05/2021	CS
WATER HAS NOT HAVE WATER; NEIGHBORS ON DO NOT HAVE WATER EITHER; CUSTOMER HAS WATER, VERIFIED VIA PHONE. BWA IN EFFECT									
2852	ORDER		COMPL	COMP	DISTRIBUTIO		3/05/2021	3/05/2021	CS
CUSTOMER IS EXPERIENCING EXTMEY LOW PRESSURE WATER WAS OFF DUE TO ROAD BREAK THAT CAUSED A BREAK IN THE WATER LINE. CUSTOMER NOW HAS WATER. BWA IN EFFECT									
2858	ORDER		COMPL	COMP	CUST SERV		3/05/2021	3/05/2021	CS
WATER IS NOT ON, CUSTOMERS ON BOTH SIDES OF HER HAS IT; THIS CUSTOMER ALWAYS HAS TO HAVE METER TAKEN OUT AND AIR BLEW OFF DUE TO VAPOR LOCKING SHE NOW HAS WATER. SHE POSTED ON FB THANKING THE CREW									
2866	ORDER		COMPL	COMP	DISTRIBUTIO		3/08/2021	3/08/2021	CS
HAS VERY LITTLE WATER PRESSURE. . PLEASE CALL CUSTOMER WHEN ITS CHECKED AND LET HER KNOW. PHONE NUMBER IS CUSTOMER WAS CONTACTED AND THE ISSUE WAS ON THE CUSTOMERS SIDE									
2869	ORDER		COMPL	COMP	CUST SERV		3/08/2021	3/08/2021	CS
CUSTOMER HAS HAD EXTREMELY LOW PRESSURE FOR 2 WEEKS; NOW IT									

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		IS COMPLETELY OFF WHEN NEIGHBOR USES WATER; CHECK FOR POSSIBLE LEAK OR ISSUE							
		CALLED AND SPOKE TO CUSTOMER AND CUSTOMER HAS GOOD WATER PRESSURE NOW							
2875			COMPL	COMP	DISTRIBUTIO		3/08/2021	3/08/2021	CS
	ORDER	CUSTOMER HAD REALLY GOOD PRESSURE UNTIL 45 MINUTES AGO; NEIGHBORS STILL HAVE GOOD PRESSURE;							
2876			COMPL	COMP	DISTRIBUTIO		3/08/2021	3/08/2021	CS
	ORDER	HAS NO WATER, HASN'T HAD IT IN 3 DAYS, HAS CHECKED EVERYTHING ON HER SIDE. THIS HOUSE IS THE ONLY HOUSE ON THE LINE COMING FROM WHAT WE BELIEVE IS . THE WATER WAS TURNED BACK ON AND THEY HAVE GOOD PRESSURE							
2886			COMPL	COMP	CUST SERV		3/08/2021	3/08/2021	CS
	ORDER	CUSTOMER HAS HAD LOW PRESSURE SINCE SUNDAY CUSTOMER HAD A LEAK ON HER SIDE; SHE HAS REPAIRED LEAK AND APPLIED FOR A LEAK ADJUSTMENT							
2888			COMPL	COMP	CUST SERV		3/08/2021	3/08/2021	CS
	ORDER	THE WATER PRESSURE HAS GONE IN AND OUT SINCE HIS WATER CAME BACK ON, AND ITS' REALLY LOW AGAIN CHECKED VIA CALL AND HAS GOOD WATER PRESSURE NOW. HAS AIR IN LINE ONLY WHEN SHE USES THE HOT WATER TOLD HER SHE MAY NEED TO FLUSH HER HOT WATER TANK							
2922			COMPL	COMP	DISTRIBUTIO		3/10/2021	3/10/2021	CS
	ORDER	HAS NO WATER FOR THE LAST COUPLE HOURS CALLED AND VERIFIED WITH CUSTOMER AND THEY DO HAVE WATER NOW- 10:35 3/24/21							
2923			COMPL	COMP	CUST SERV		3/10/2021	3/10/2021	CS
	ORDER	WATER HAS NEVER CAME BACK ON; CHECK FOR ISSUES; THIS IS LOCATED ACROSS FROM CUSTOMER VERIFIED THEY NOW HAVE WATER							

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2950	ORDER		COMPL	COMP	CUST SERV		3/11/2021	3/11/2021	CS
SEVERAL MONTHS THEY HAVE LEFT THE TOP OFF THEIR METER BOX WHEN IT WAS READ. THEY HAVE SEVERAL KIDS AND THEY ARE AFRAID THEY WILL FALL IN THE METER BOX. REPLACED LID ON METER BOX									
2957	ORDER		COMPL	COMP	CUST SERV		3/12/2021	3/12/2021	CS
CUSTOMER HAS NOT HAD WATER SINCE THE FLOODING; PLEASE CHECK FOR ISSUES CHECKED PLACE THEY HAVE WATER PUMP NEEDS GAGE ON IT.									
2959	ORDER		COMPL	COMP	CUST SERV		3/12/2021	3/12/2021	CS
WATER HAS BEEN OFF SINCE THE LEAK WAS REPAIRED ON TURKEY; CHECK FOR ISSUES FIXED BIG LEAK ON TURKEY NEAR ROAD BREAK ON RIGHT AT POLE ON DOWN SIDE OF TURKEY MOUNTAIN									
2961	ORDER		COMPL	COMP	CUST SERV		3/12/2021	3/12/2021	CS
JUST GOT WATER BACK DAY BEFORE, BUT WAS TOLD AT THE PLANT THAT THEY WOULD COME BACK AND FLUSH HIS LINES BECAUSE HIS WATER IS VERY DARK. PULLED HIS METER FLUSHED LINE FOR SEVERAL MINUTES; WATER WAS CLEAR UPON INSPECTION									
2965	ORDER		COMPL	COMP	DISTRIBUTIO		3/15/2021	3/15/2021	CS
HAS VERY LOW WATER PRESSURE, AND ANOTHER NEIGHBOR ACROSS THE ROAD ARE EXPERIENCING AS WELL CALLED 3/26/21 2:00 HAS GOOD WATER PRESSURE NOW AND SO DOES NEIGHBORS									
3010	ORDER		COMPL	COMP	CUST SERV		3/17/2021	3/17/2021	CS
HAS NO WATER CUSTOMER HAS REPORTED HAVING WATER NOW									
3016	ORDER		COMPL	COMP	CUST SERV		3/18/2021	3/18/2021	CS
HAS NO WATER, HAD SOMEONE COME AND LOOK AND THE METER ISN'T									

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		TURNING BUT SAID IT LOOKED LIKE HER TANK IS DRY SO SHE'S NOT SURE HOW LONG SHE HASN'T BEEN GETTING WATER WE PULLED METER HAD WATER AT THE BOX. METER WAS CHECKED ISNT SPINNING. CUSTOMER HAD NO LEAK. NO ISSUE ON DISTRICT SIDE							
3021			COMPL	COMP	DISTRIBUTIO		3/18/2021	3/18/2021	CS
	ORDER	CUSTOMER STATED THAT HAVE HAD LITTLE TO NO PRESSURE FOR TWO WEEKS. HAD A TRICKLE YESTERDAY AND NOW TODAY IT IS COMPLETELY OFF. RESET PUMP DUE TO POWER OUTAGE. CUSTOMER HAS REPORTED HAVING WATER NOW. BWA IN EFFECT							
3022			COMPL	COMP	CUST SERV		3/18/2021	3/18/2021	CS
	ORDER	CUSTOMER HAS NO WATER RESET PUMP DUE TO POWER OUTAGE. CUSTOMER HAS REPORTED HAVING WATER NOW. BWA IN EFFECT							
3023			COMPL	COMP	DISTRIBUTIO		3/19/2021	3/19/2021	CS
	ORDER	NO WATER SINCE YESTERDAY MORNING 03-18-21. WAS WONDERING WHAT IS GOING ON. THIS LEAK WAS FIXED WHEN MAIN LINE WAS FIXED ON TURKEY. CUSTOMER NOW HAS WATER. BWA IN EFFECT							
3027			COMPL	COMP	DISTRIBUTIO		3/19/2021	3/19/2021	CS
	ORDER	NO WATER SINCE EARLEY THIS MORNING. VERIFIED BY PHONE THAT CUSTOMER DOES HAVE WATER NOW AND GOOD WATER PRESSURE AS WELL KK							
3043			COMPL	COMP	DISTRIBUTIO		3/22/2021	3/22/2021	CS
	ORDER	HAS NOT HAD BUT A TRICKLE OF WATER FOR THE LAST 5 DAYS.PHONE # RESET PUMP DUE TO POWER OUTAGE. CUSTOMER HAS REPORTED HAVING WATER NOW. BWA IN EFFECT							
3047			COMPL	COMP	DISTRIBUTIO		3/22/2021	3/22/2021	CS
	ORDER	NO WATER BUT A TRICKLE SINCE THURSDAY EVENING. SEVERAL NEIGHBORS DOES NOT HAVE IT ALSO.PHONE # THERE WAS AN OUTAGE DUE TO A LINE BEING HIT. CONTACTED 3/26/21 1:58 AND CUSTOMER DOES HAVE WATER NOW. BWA IN							

NUMBER	ACCOUNT NO#	LOCATION	JOB CODE	STAT	STAFF	REQUESTED BY	JOB DATE	COMPLETION DATE	GROUP ID

EFFECT									
3052	ORDER		COMPL	COMP	DISTRIBUTIO		3/22/2021	3/22/2021	CS
		NOT MUCH WATER SINCE THE BIG FLOOD. AND NO WATER ALL WEEKEND. PHONE # CUSTOMER VERIFIED THEY HAVE WATER AND GOOD PRESSURE							
3058	ORDER		COMPL	COMP	DISTRIBUTIO		3/23/2021	3/23/2021	CS
		HAS NO WATER, CHECKED WITH ANOTHER NEIGHBOR AND THEY ALSO DON'T HAVE WATER LOWE'S TRUCK BROKE THE 3" MAIN WATER LINE GOING UP RD; REPAIRED AND HAS CUSTOMER BACK IN SERVICE							
3071	ORDER		COMPL	COMP	CUST SERV		3/24/2021	3/24/2021	CS
		LOW WATER PRESSURE- REPORTED BY GOT 160PSI AT SETTER							
3075	ORDER		COMPL	COMP	DISTRIBUTIO		3/24/2021	3/24/2021	CS
		HAS NO WATER CUSTOMER VERIFIED THAT WATER IS BACK ON AND PRESSURE IS GOOD							
3097	ORDER		COMPL	COMP	CUST SERV		3/26/2021	3/26/2021	CS
		SAYS WATER HAS BEEN MILKY FOR A FEW WEEKS NOW, NOT SURE IF IT'S JUST AIR BUT HAS BEEN GOING ON FOR AWHILE, MAY NEED TO FLUSH THE LINES TALKED TO THEM VIA PHONE 03/31/21 AT 10:20 AM SAID THEY NO LONGER HAD ANY PROBLEMS WITH THE WATER BEING MILKY.							

TOTAL PRINTED: 149

**** TOTALS BY GROUP ****

GROUP	TOTAL COMPLETED	TOTAL OUTSTANDING	TOTAL NEW	TOTAL PENDING	TOTAL VOID
CS	149	0	0	0	0
TOTAL ALL GROUP	149	0	0	0	0

**** TOTALS BY STAFF ****

STAFF	TOTAL COMPLETED	TOTAL OUTSTANDING	TOTAL NEW	TOTAL PENDING	TOTAL VOID
DISTRIBUTION	92	0	0	0	0
CUST SERV	57	0	0	0	0
TOTAL ALL STAFF	149	0	0	0	0

**** TOTALS BY JOB ACTION ****

JOB ACTION	TOTAL COMPLETED	TOTAL OUTSTANDING	TOTAL NEW	TOTAL PENDING	TOTAL VOID
I - METER INFORMATION	148	0	0	0	0
X - MISCELLANEOUS	1	0	0	0	0
TOTAL ALL ACTIONS	149	0	0	0	0

**** TOTALS BY JOB CODE ****

JOB CODE	TOTAL COMPLETED	TOTAL OUTSTANDING	TOTAL NEW	TOTAL PENDING	TOTAL VOID
COMPL - COMPLAINTS	149	0	0	0	0
TOTAL ALL CODES	149	0	0	0	0

SELECTION CRITERIA

ZONE: < All Zones >
SERVICE ORDERS: 00 THRU 999999
JOB DATES: 1/01/2020 THRU 99/99/9999
CREATION DATES: 1/01/2020 THRU 99/99/9999
COMPLETION DATES: 1/01/2020 THRU 99/99/9999
REPORT SEQUENCE: SO Number
STATUS: ALL
JOB CODES: Include:
GROUP: All
STAFF: All
PRINT ORDER NOTES: YES
PRINT COMPLETION NOTES: YES
PRINT CURRENT METER INFO: NO
LINE SPACING: DOUBLE

**** END OF REPORT ****

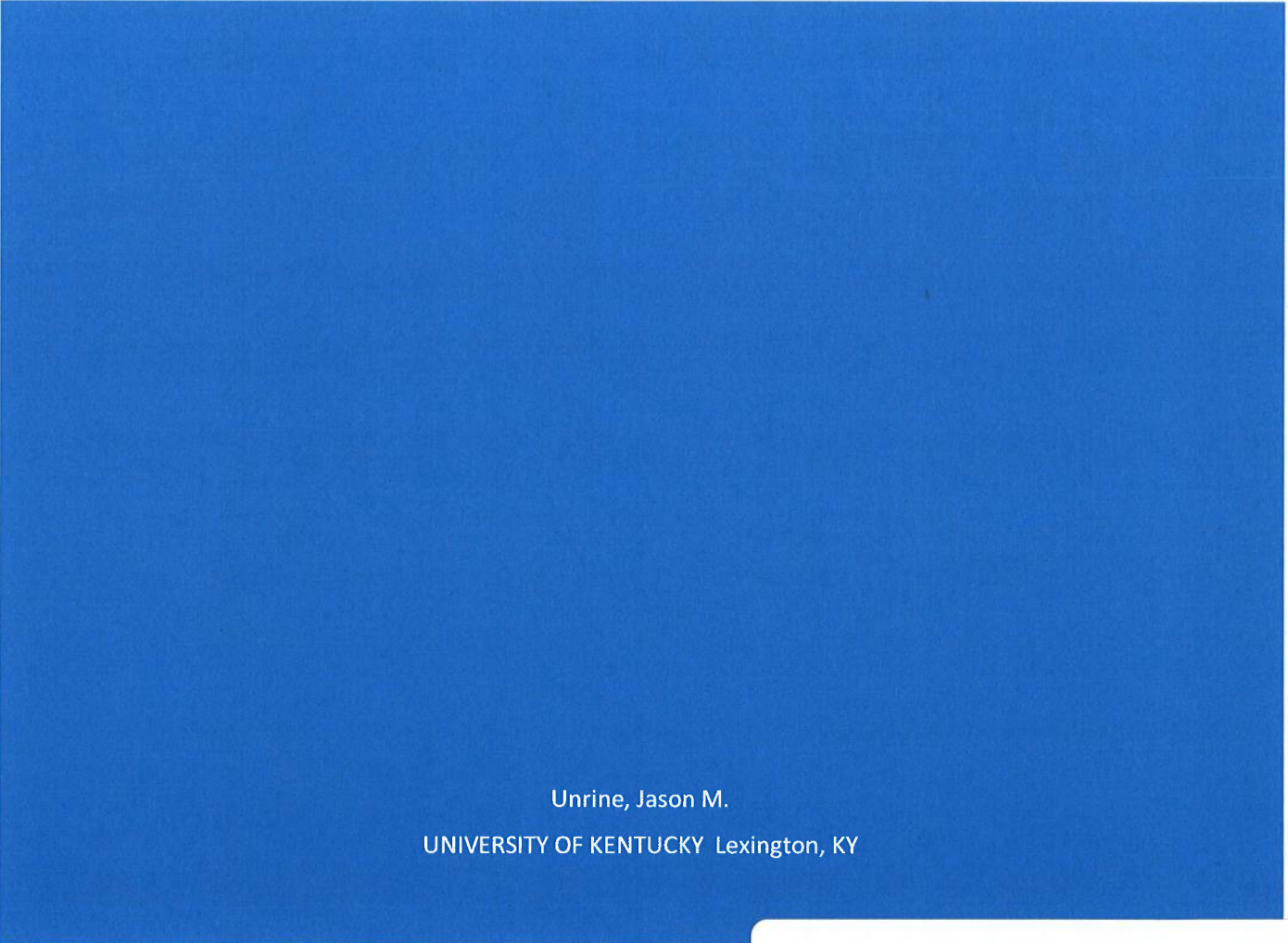
Martin County Water District/ Alliance Water Resources Customer complaints / Service Order Status Report

Complaints	Total #	No Water	Low Pressure	High Pressure	Bad Water	Workers	Bills
Aug. 2020	12	4	6	0	0	1	0
Sep. 2020	17	3	6	1	0	2	2
Oct. 2020	25	5	4	3	3	2	0
Nov. 2020	11	2	5	1	5	1	1
Dec. 2020	15	2	3	0	0	0	1
Jan. 2021	13	7	2	0	0	0	0
Feb. 2021	23	12	5	0	2	0	0
Mar. 2021	33	21	10	0	2	1	0
TOTAL	149	25	41	5	12	7	4

Resolutions	Alliance Repaired	PRV	Flushed Lines	Blew off line	Pump reset/ Power outage	Problem on Customer side	No resolution/ Resolved itself
Aug. 2020	7	2	0	0	0	2	2
Sep. 2020	4	0	0	0	0	4	7
Oct. 2020	12	5	3	3	0	5	5
Nov. 2020	7	3	1	1	0	0	4
Dec. 2020	4	0	2	0	1	1	6
Jan. 2021	9	2	3	0	2	0	5
Feb. 2021	5	0	2	0	8	4	4
Mar. 2021	13	0	2	0	4	2	15
TOTAL	61	12	13	4	15	18	48



**Preliminary Technical Report:
The Martin County Kentucky Community-Engaged
Drinking Water Health Pilot Study**



Unrine, Jason M.

UNIVERSITY OF KENTUCKY Lexington, KY

Preliminary Technical Report:
The Martin County Kentucky
Community-Engaged Drinking Water Health Pilot Study

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July 27, 2020

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Executive Summary

In response to concerns expressed about drinking water quality in Martin County Kentucky, the University of Kentucky Center for Appalachian Research in Environmental Sciences (UK-CARES) funded a pilot study to evaluate drinking water quality and community health concerns. The objectives of the study were to determine the spatial and temporal patterns of concentrations of certain drinking water contaminants (disinfection byproducts, trace-elements, coliform bacteria, and chlorine residuals) as well as basic water quality parameters (pH, conductivity, and temperature). Working with citizen scientists from the community and based on community input, the study team designed and implemented a population-based study involving visits to 97 households in Martin County, Kentucky, over the course of one calendar year to collect water samples for chemical analysis and to administer a survey aimed at evaluating community health concerns over the course of one calendar year (2018-2019).

Overall, 47 percent of samples had at least one contaminant that exceeded at least one U.S. EPA maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL). There were frequent exceedances of MCLs for two classes disinfection byproducts (DBPs) in participants' tap water, total trihaloacetic acids (HAA5) and total trihalomethanes (TTHMs). The MCLs are enforceable drinking water standards based on potential health impacts. Ten percent of samples exceeded the MCL for HAA5 and 29 percent of the samples exceeded the MCL for total trihalomethanes TTHMs. It is important to note that drinking water utilities are regulated for DBPs based on a running annual average of concentrations from a small number of sampling sites (two in the case of Martin County). As a result, the Martin County Drinking Water district was in compliance with DBP regulations during the time we sampled according to the U.S. EPA Safe Drinking Water Information System. These DBPs are associated with certain types of cancer and birth defects in laboratory animal and epidemiological studies. Some epidemiological studies have shown associations with these health effects at similar exposure concentrations to those we observed in Martin County. We found that aluminum exceeded the SMCL in ten percent of the samples. The SMCLs are non-enforceable standards which are not based on health concerns, such as taste, odor, or appearance. We also found exceedance of the SMCL for iron in two samples. We did not observe exceedances for chlorine residuals, total dissolved solids, pH, or other trace elements (including potentially toxic trace-elements such as chromium, cadmium, selenium, arsenic, lead, mercury, or uranium). We also found the presence of coliform bacteria in 13 percent of the samples, indicating the possible presence of harmful bacteria, but we did not detect the presence of *Escherichia coli*, which is the strongest indicator of fecal contamination. Five samples had inadequate free chlorine to ensure disinfection of the water (less than or equal to 0.2 mg/L). We found that 99 percent of respondents reported concerns with drinking water, including problems with odor, appearance, taste, and water pressure. Only 12 percent of respondents reported using tap water for drinking water.

Drinking water analyses indicated that DBPs were the primary health concern. Overall, we observed no obvious spatial pattern to the concentrations of TTHMs; however, HAA5 concentrations tended to be higher with increased distance from the drinking water treatment plant. There was a strong seasonal pattern for both classes of DBPs, with concentrations of DBPs and total coliform being elevated and frequently exceeding MCLs in the summer and early autumn in contrast to lower winter and spring concentrations. The DBP concentrations could be reasonably well predicted based on water temperature, conductivity and free chlorine content. Of the other measured variables, the TTHM concentrations were strongly correlated with conductivity, while HAA5 concentrations were correlated with temperature and distance from the treatment plant. Seasonal changes in discharge of the Tug Fork River (the source water which is pumped into the Crum drinking water reservoir), may explain changes in the conductivity of the drinking water. It is possible that conductivity is a correlate of total organic carbon (TOC) content in the source water rather than a driver of DBP formation; however, this study did not measure source water chemistry and TOC from the source water would have been largely removed during the treatment process in contrast to dissolved ions.

The overarching conclusion of the study is that DBPs and coliform bacteria are the most significant health concerns of the studied contaminants in the Martin County Drinking Water system. Factors that predict DPB concentrations include distance from the treatment plant, free chlorine content, temperature, and conductivity. Future efforts at reducing DBP exposure could address seasonal changes in source water chemistry and how adjustments to the treatment process might be made to reduce formation of DBP compounds. Low discharge in the Tug Fork River, and associated changes in water chemistry of the Crum reservoir, during the summer and autumn months, are likely to increase TTHM formation, so it is possible that special care may need to be taken during these periods. In addition, repairing leaks in the system and maintaining optimal water pressure and water residence times (water age) throughout the distribution system may also help reduce the occurrence of coliform bacteria and HAA5.

Analyses are ongoing to determine if there are correlations between observed acute non-cancer health effects and contaminant concentrations. The design and scope of the pilot study will not enable robust association of contaminant exposures with chronic health effects such as cancer given the small sample size and short study duration; however, the data will inform the design of follow-up studies.

Background

In May 2017, a Stakeholder Advisory Board member for the UK Center for Appalachian Research in the Environmental Sciences (UK-CARES) informed the Center's Community Engagement Core (CEC) that the group Martin County Concerned Citizens (MCCC) was concerned about local drinking water quality. MCCC shared that, for more than a decade, Martin County residents had regularly received notifications in water bills that DBP levels had exceeded EPA MCLs. MCCC also shared legacy concerns about potential trace-element contamination from a 2000 spill that released 1.16 billion liters of coal slurry into nearby waterways. The slurry contained high concentrations of arsenic and mercury and buried drinking water intakes along Tug Fork. Both the spill and questions about its clean-up contributed to local distrust of water quality. In the years since, residents have frequently observed soil/sediment in the drinking water and experienced low water pressure^{1,2}.

To address MCCC's concerns, UK-CARES formed a response team that included Unrine (PI), Sanderson, Christian, Pennell, Fuchs and Ormsbee. MCCC began meeting with university scientists in September 2017 to discuss potential collaborative research opportunities. In February 2018, UK-CARES CEC staff separately conducted key informant interviews with additional local residents who expressed a number of water quality concerns, including presence of DBPs in drinking water, metals and other potential contaminants from coal slurry, water that appeared milky or muddy, chlorine or sulfur smells, effervescence, and feeling sticky and smelly after showers. Residents' health concerns included cancers (kidney, throat, lymphoma, colon, and GI cancers); rashes and burning; diarrhea; lower GI pain; rectal bleeding and *H. pylori*; kidney and bladder infections; dementia; fatty tumors; and growths on the hands and feet. Residents also voiced concerns about water district management, along with mistrust of the water district and government officials.

Data from both MCCC discussions and key informant interviews guided the objectives and design of a pilot study to analyze household water samples for DBPs, trace-element composition, total dissolved solids, chlorine residuals, pH, total coliform, and *E. coli*. A previously validated health questionnaire was modified to incorporate additional local health concerns that the survey had not previously covered. Our sampling strategy was informed by stakeholder statements that portions of the drinking water grid near the communities of Warfield and Lovely, which are located further from the treatment plant, had experienced more water quality issues than other areas.

UK-CARES worked jointly with local citizen scientists and affiliates of MCCC to develop the sampling design and recruitment strategy, as well as to formulate the hypotheses and questionnaire. We also worked jointly to carry out sampling and data collection between December 2018 and December 2019.

Methods, materials, and participants

Eligibility and participant enrollment procedures

This study (and the initial key informant interview study) was approved by the University of Kentucky Institutional Review Board. Informed consent was obtained in writing from all study participants. We used a stratified random sampling design to select households for the study. The study population included households served by the Martin County Municipal Water District (MCMWD). Individuals who were over the age of 18, residents of Martin County, customers of the MCMWD, and could speak English were eligible to participate in the study. Although minors were not eligible for the study, the consenting adult member of the household answered questions about medical history for all household members.

We obtained a list of the service addresses of all customers within the MCMWD. The list was then divided into households within four discrete categories of distance from the water treatment plant (Fig. 1). For each day of home visits, we focused on one distance category and rotated the distance categories. If the randomly selected resident was not home when we visited, we went to the next home on the street until we found a resident at home. We also left letters with contact information allowing the residents who were not at home to schedule an appointment at their convenience.

Questionnaire and sample collection

During the home visit, we administered an in-person questionnaire (Appendix 1) that asked questions about demographics, socioeconomic status, water quality perception, and household medical histories. The questions were read to the participants and the responses were recorded on paper. The questionnaire was based on questionnaires previously validated in other studies³. We also collected spatial coordinates of the residence using the Global Positioning System and a smartphone.

Citizen scientists were trained by the PI to perform all sample collections and in-home measurements. As noted below, quality control measures were performed for all sample collections and analyses. All sample collection, preservation, handling and analyses were conducted according to U.S EPA methods unless otherwise noted. After the participant identified the main faucet used for drinking water (typically the kitchen), two citizen scientists per household used a clean hands-dirty hands technique, where one individual only touched the sampling containers and the other individual performed all other tasks. Both citizen scientists wore powder-free nitrile gloves. First, they disinfected the faucet, focusing on the aerator, using alkyldibenzylammonium chloride. They then obtained a first-catch sample for trace-elements, by opening the cold water tap and collecting a 50 mL sample into a trace metal-clean polypropylene

sample vial. For practical reasons, we could not follow the EPA lead and copper rule methods precisely by allowing the water to stagnate overnight in the plumbing system. Obtaining a first catch more

Figure 1. Map of Martin County, KY showing distances from the drinking water treatment plant.

Martin County water system

From water treatment plant:

— 1-mile network buffer

— 2-mile network buffer

— 4-mile network buffer

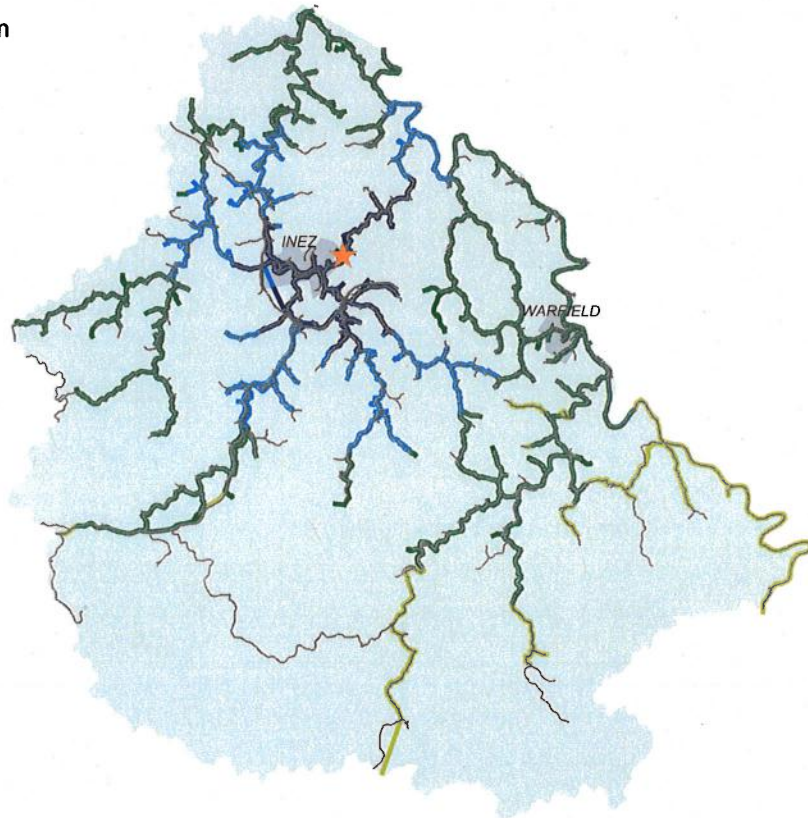
— 8-mile network buffer

★ Water treatment plant

— Streets & roads

— City boundaries

— County boundaries



closely adhered to that rule relative to flushing the plumbing system. Additionally, the faucet aerators were left in place to most closely adhere to the copper and lead rule (leaving aerators in place is a requirement). This also more accurately measures actual exposure concentrations for this health study.

Trace-element samples were preserved with 1% v/v concentrated ultra-pure nitric acid (VWR Aristar Ultra) and kept refrigerated or on ice at the University of Kentucky Cooperative Extension in Martin County until analysis. After the trace-element sample was obtained, we allowed the water to run until a constant temperature was observed, indicating that the household plumbing system had been flushed, and temperature was recorded. We then collected samples into pre-preserved, 100 mL, sterile collection containers (Colilert sample containers, IDEXX)

using aseptic technique. We then collected samples for TTHM and HAA5 in pre-cleaned, pre-preserved 35 mL amber glass vials with Teflon septa (TTHM) or 500 mL pre-cleaned, pre-preserved amber glass jars (HAA5). Finally, we collected samples for conductivity measurement in 50 mL polypropylene vials. We determined pH and chlorine residuals at the home as described below. Metals samples were analyzed within 28 d, and DBP samples were extracted within 14 d according to U.S. EPA guidelines. Field blanks for coliform analysis were collected by pouring sterile deionized water into the sample containers. Field blanks for TTHMs and HAA5 were collected by opening an amber glass vial containing ultra-pure water for about one minute and closing it. Field blanks for trace-element analysis were collected by pouring 18.2 M-Ohm resistivity ultra-pure water into sample containers.

Sample analysis

We determined trace-element concentrations in water samples by inductively coupled plasma mass spectrometry (ICP-MS; Agilent 7500cx or Agilent 7900, Santa Clara, CA, USA) according to U.S. EPA method 200.8⁴. Because the samples were low in total dissolved solids (TDS), we used the direct injection method. Analytical batches included field and laboratory blanks, inter-calibration verification, continuing calibration verification, continuing calibration blanks, spike recovery samples, and standard reference materials (SRM; NIST 1643f, trace elements in water; National Institute of Standards and Technology, Gaithersburg, MD, USA).

We determined most probable number (MPN) for total coliform and *Escherichia coli* using the Colilert- Quanti-tray/2000 system (IDEXX Laboratories, Westbrook, ME, USA; U.S. EPA method 9223 B-2004)⁵. Briefly, samples were transported to the laboratory on ice the same day as collection. Culture medium containing indicator dyes was added to the samples and mixed. The samples were then transferred to Quanti-trays and sealed. They were incubated at 37° C for approximately 24 hours and scored by counting the number of cells with color change for total coliform counts and the number of cells, which fluoresced under ultraviolet light, for *Escherichia coli* counts. Lookup tables provided by IDEXX were used to determine MPN. Negative controls using sterile, autoclaved, water and positive controls containing live *E. coli* were used to validate the procedures.

Analysis of DBPs, including TTHMs and HAA5 was performed by Pace Analytical Services (Madisonville, KY, USA) by purge and trap gas chromatography mass spectrometry (TTHMs) or derivatization and gas chromatography with electron capture detection (HAA5), following U.S. EPA methods 524.2 revision 4.1⁶ and 552.2 revision 1⁷, respectively.

We determined conductivity using a 5-ring conductivity cell and conductivity module (model 865, Metrohm, Herisau, Switzerland), which was calibrated to a NIST-traceable conductivity standard.

We determined pH, total chlorine and free chlorine content during the home visits. We determined pH using phenol red as a pH indicator and a hand-held colorimeter (model DR300, Hach, Loveland, CO, USA). We determined free and total chlorine concentrations using the N,N-diethyl-p-phenylenediamine (DPD) method and the Hach DR300 pocket colorimeter (U.S. EPA method 330.5)⁸.

External data sources

We obtained data on discharge of the Tug Fork River from the U.S. Geologic Survey (USGS), National Water Information System from December 15, 2018-January 15, 2020 from USGS station 03213700 at Williamson, WV. Air temperature and precipitation data were obtained over the same time period from the National Climate Data Center for the Inez, Kentucky, Global Historical Climatology Network ID USC00154138.

Data analysis and mapping

We performed regression analyses (single and multiple) and calculated descriptive statistics using SPSS version 26 (IBM, Armonk, NY). For multiple regression analyses we used backward model selection. In all statistical analyses the level of statistical significance was considered to be $\alpha = 0.05$. We conducted global Moran's *I* analyses in GeoDa (<https://geodacenter.github.io>) software to detect spatial clustering of similar values for TTHMs and HAA5, using spatial weights based on each participating household's four nearest neighbors. We analyzed all TTHM and HAA5 values regardless of season, as well as values for each season separately, though there were too few Spring samples ($n = 6$) for meaningful analysis.

Results

Study participants

We recruited 97 study participants between 12/26/2018 and 12/19/2019. The demographics of the study participants and home characteristics are shown in Table 1. Two thirds of the study participants were female, which was higher than the general population (U.S. census population is 44.8 % female and 55.2% male in Martin County) and tended to be older than the general population (62 years vs. the census median age of 39.3 years). All study participants were white, reflecting the majority race/ethnicity of the county (census population is 93.5% white, 5.3% African American, 0.9% Native American and 0.3 % other groups). While our study participants were older with more likely to be female than the general population, they provided information for the entire household.

Table 1. Study participant demographics and home characteristics.

Characteristic	Number (%)
Home Type	
single family	78 (80.5)
multiple unit	1 (1.0)
mobile home	17 (17.5)
Other	1 (1.0)
Median Home Age	35 years
Median Participant Age	61 years
Sex	
Male	31 (32.0)
Female	66 (68.0)

Temperature, pH, conductivity, and chlorine residuals

Table 2 shows the descriptive statistics for chlorine residuals, pH, conductivity, temperature, and total dissolved solids estimated from conductivity measurements.

Table 2. Temperature (C), pH, Conductivity (mS/cm), total dissolved solids (TDS; calculated from conductivity; mg KCl/L); total and free chlorine (mg/L) from municipal drinking water samples collected from homes in Martin County Kentucky between December 2018 and December 2019.

	N	Minimum	Maximum	Mean	Std. Deviation
Temperature	96	3.8	28.4	18.0	7.3
pH	96	6.0	8.5	7.4	0.4
Conductivity	96	0.177	0.828	0.436	0.210
TDS	96	88.5	414.0	218.0	104.8
Total chlorine	96	0.2	3.6	1.6	0.6
Free chlorine	95	0.1	2.5	1.4	0.53

Disinfection byproducts

We observed 28 exceedances of the EPA MCL for TTHMs (0.08 mg/L) and 10 MCL exceedances for HAA5 (0.06 mg/L). Descriptive statistics for DBP concentrations are summarized in Table 3.

Table 3. Descriptive statistics for disinfection byproducts in Martin County Kentucky, December 2018-December 2019. HAA5 =total haloacetic acids; TTHM = total trihalomethanes.

	N	Minimum	Maximum	Mean	Std. Deviation	Number of Exceedances
HAA5 (mg/L)	95	0.003	0.073	0.035	0.017	10
TTHMs (mg/L)	96	0.010	0.155	0.065	0.034	28

Visual inspection of the geographic and seasonal distribution of TTHMs (Fig 2; Fig 3) suggested significant seasonal variation in concentrations but no obvious strong spatial clustering. Exceedances of the MCL for TTHMs occurred exclusively from June to November. Spatial autocorrelation analysis revealed significant, but weak, clustering during the summer but not in the winter or fall (Table 4). Multiple regression analysis (Table 5) revealed that free chlorine, temperature and conductivity were significantly associated with TTHMs but distance and pH were not. Day of the year was not entered into the models because of the strong collinearity with temperature. Temperature is the driver of chemical and biological processes and a function of day of the year, so it is the appropriate variable to enter into the model. Overall the model was highly significant and predictive of TTHM concentrations ($F_{3,92} = 135.3, p < 0.001, R^2 = 0.82$). Conductivity and temperature had a positive correlation with TTHMs and free chlorine had a negative correlation (Table 5).

Visual inspection of the seasonal and geographic distribution of HAA5 showed a strong seasonal variation that differed from TTHMs, with the peak concentrations occurring in the summer rather than the early fall (Fig 4; Fig 5). HAA5 exceedances primarily occurred in July. However, in the case of HAA5, the highest concentrations tended to occur at locations that were further from the treatment plant. Spatial autocorrelation analysis revealed stronger spatial clustering across all seasons for HAA5 than for TTHMs (Table 4). Note that we did not have enough samples in the spring for spatial autocorrelation analysis. Multiple regression analysis revealed that the most important factors associated with HAA5 were temperature, pH, conductivity, and distance, although pH was not statistically significant (Table 6). The absolute value of the coefficient for temperature was more than double the absolute values of the other coefficients. It is notable that the coefficient for conductivity for HAA5 was negative while it was positive for TTHMs. Overall the model for HAA5 was less predictive than the TTHM model, but still statistically significant ($F_{3,92} = 23.08, p < 0.001, R^2 = 0.57$).

Figure 2. Distribution of total trihalomethane (TTHM) concentrations in Martin County, Kentucky from Winter 2018-Winter 2019.

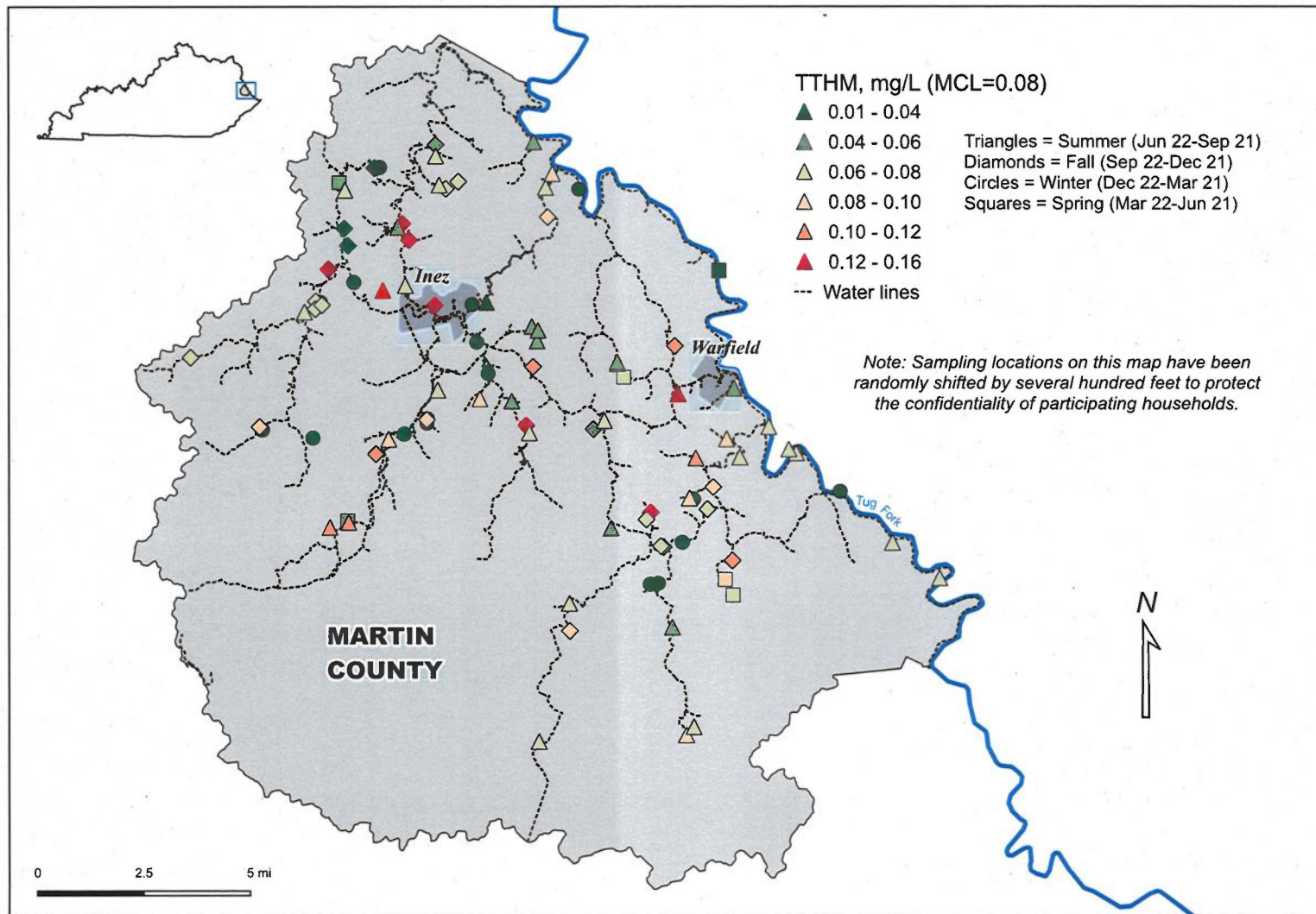


Figure 3. Total trihalomethane (TTHM) concentrations in drinking water from households in Martin County Kentucky as a function of date. Red line indicates the U.S. EPA maximum contaminant level (0.08 mg/L for TTHM).

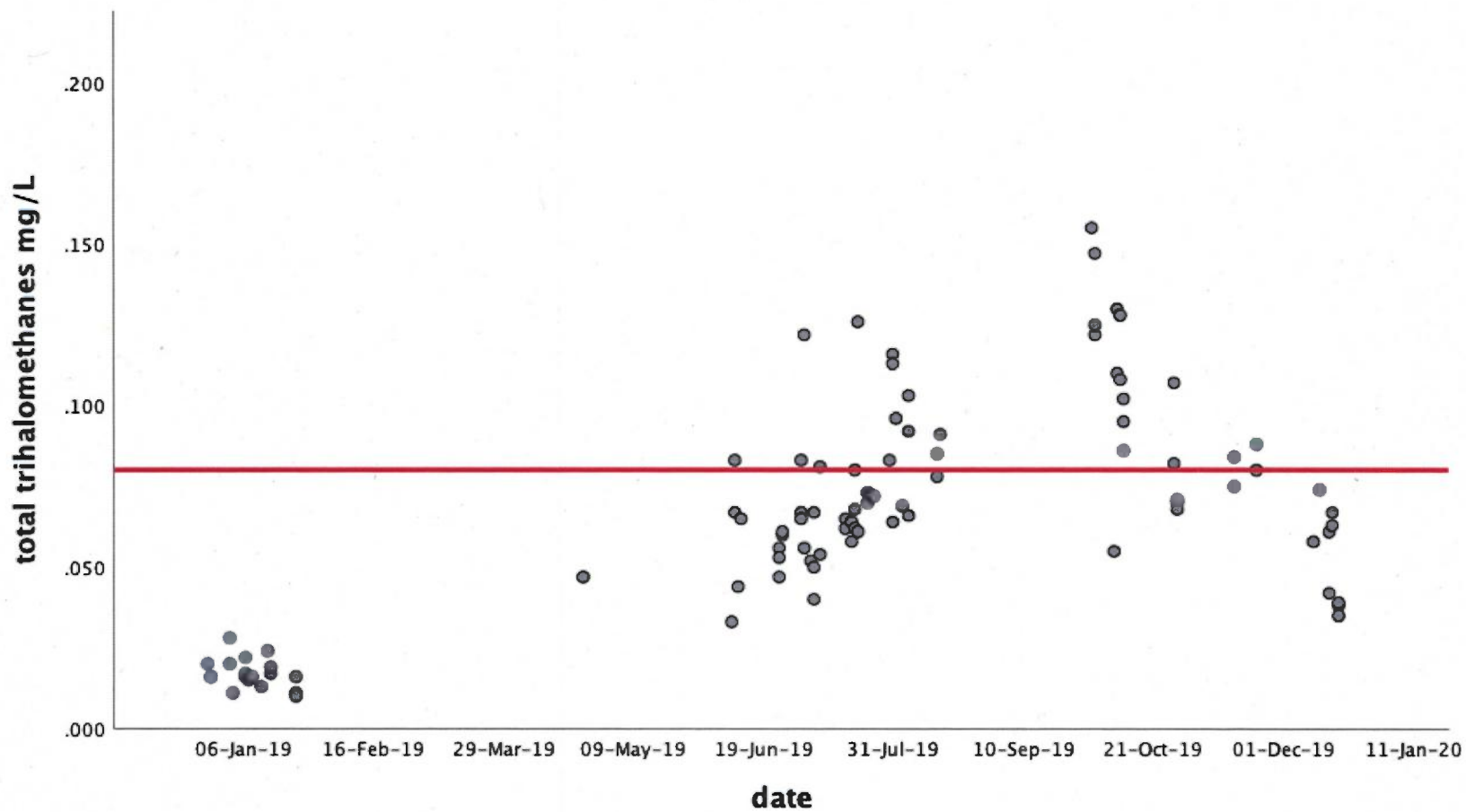


Figure 4. Distribution of total haloacetic acid concentrations (HAA5) in Martin County, Kentucky from Winter 2018-Winter 2019.

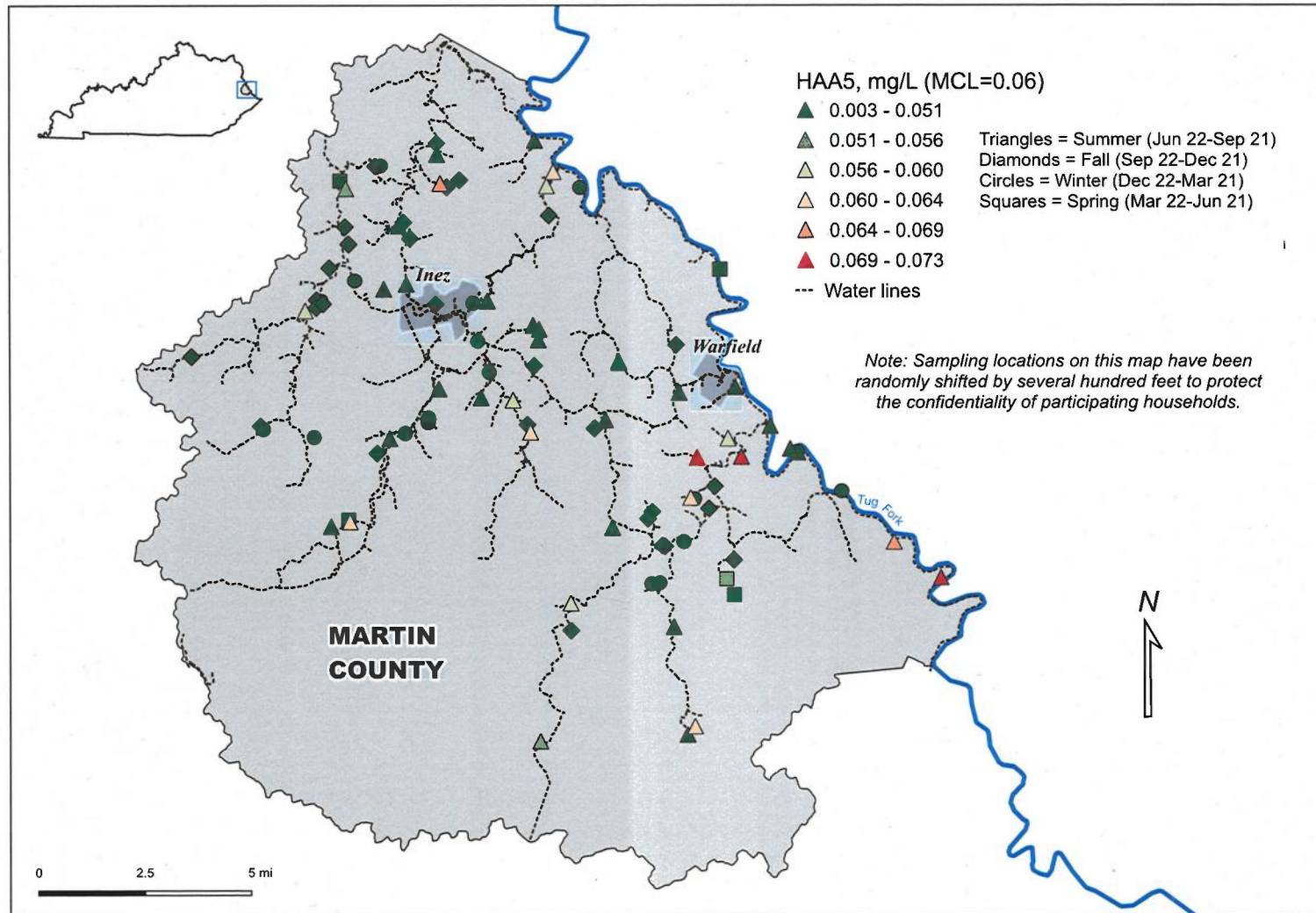


Table 4. Spatial autocorrelation of total trihalomethanes and haloacetic acids in water samples from Martin County, KY (Dec 2018- Dec 2019). Higher I-value and slope indicates more clustering of like values. Pseudo p-value < 0.05 indicates statistical significance.

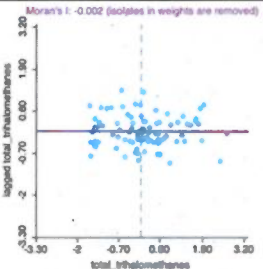
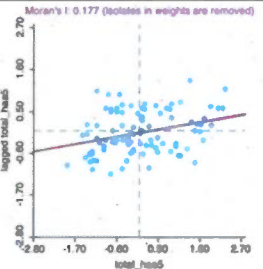
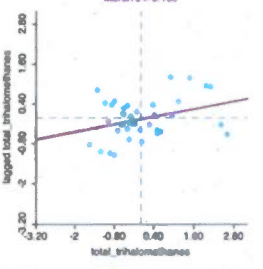
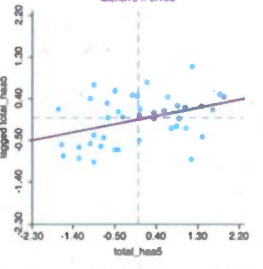
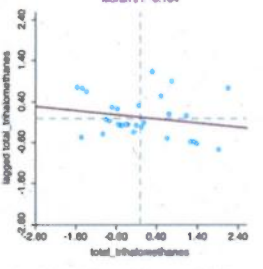
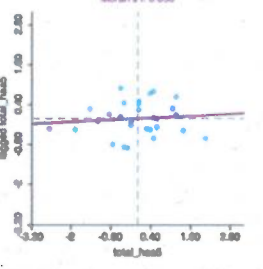
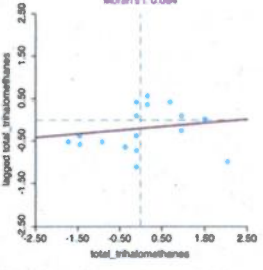
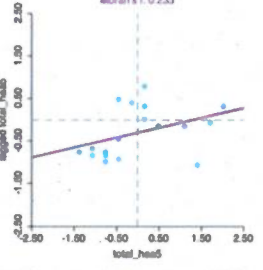
	Total Trihalomethanes (TTHM)	Haloacetic Acids (HAA5)
All seasons (n=97)	 <p>$I=-0.002$; No clustering of like values (pseudo p-value=0.435)</p>	 <p>$I=0.177$; Some clustering of like values (pseudo p-value=0.005)</p>
Summer (n=42)	 <p>$I=0.189$; Some clustering of like values (pseudo p-value=0.015)</p>	 <p>$I=0.193$; Some clustering of like values (pseudo p-value=0.023)</p>
Fall (n=30)	 <p>$I=-0.104$; No clustering of like values (pseudo p-value=0.298)</p>	 <p>$I=0.050$; No clustering of like values (pseudo p-value=0.177)</p>
Winter (n=18)	 <p>$I=0.084$; No clustering of like values (pseudo p-value=0.140)</p>	 <p>$I=0.233$; Some clustering of like values (pseudo p-value=0.036)</p>
Spring (n=6)	Not enough observations	Not enough observations

Table 5. Multiple regression coefficients for total trihalomethanes (TTHMs).

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value
	B	Std. Error	β		
(constant)	0.023	0.008		2.753	0.007
free chlorine	-0.022	0.003	-0.351	-7.082	0.000
temperature	0.002	0.000	0.439	9.241	0.000
conductivity	0.085	0.008	0.527	11.209	0.000

Table 6. Multiple regression coefficients for total haloacetic acids (HAA5).

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	β		
(Constant)	-0.057	0.035		-1.620	0.109
pH	0.009	0.005	.229	1.709	0.091
temperature	0.002	0.000	.690	9.841	0.000
conductivity	-0.026	0.011	-.321	-2.406	0.018
distance	0.001	0.000	.281	3.976	0.000

The negative correlation with free chlorine likely results from more chlorine being consumed as TTHMs and other chlorinated compounds form (i.e. as chlorine demand goes up, free chlorine concentration goes down). The relationships between TTHM concentrations and day of the year are shown in Fig 3. Concentrations peaked in late summer and early fall, where most of the exceedances of the EPA MCL occurred. The relationship between TTHM concentrations, temperature and conductivity are shown in Fig 6. Peak conductivity of drinking water occurred at the minimum discharge of the Tug Fork River (Fig 7). This coincided with the peak in TTHM concentrations (Fig 3), and a period of drought during the month of September 2019 (Fig 8). In contrast, the peak concentrations of HAA5 (Fig 5) coincided with the peak observed air temperature in Martin County (Fig 8). It was during this period that exceedances of the EPA MCL for HAA5 occurred, but these exceedances occurred primarily in locations remote from the treatment plant (Fig 4).

Figure 6. Relationship between total trihalomethane concentrations (TTHMs), temperature and conductivity (top) and total haloacetic acid concentrations (HAA5), temperature, and conductivity (bottom).

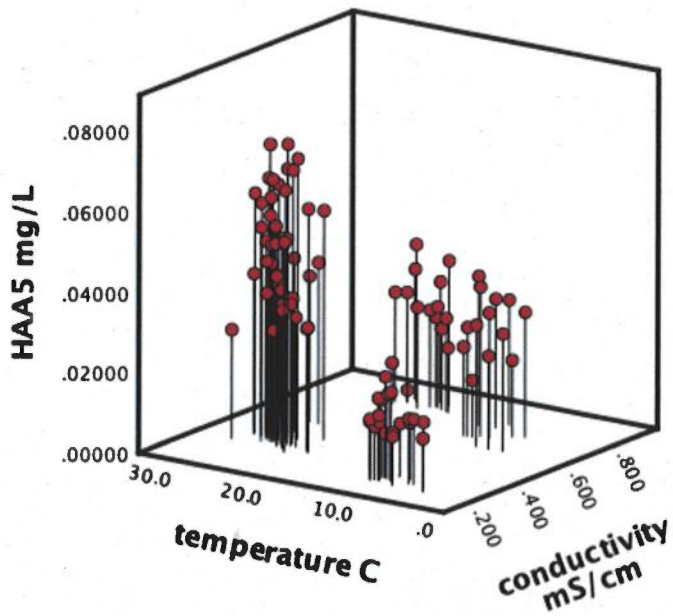
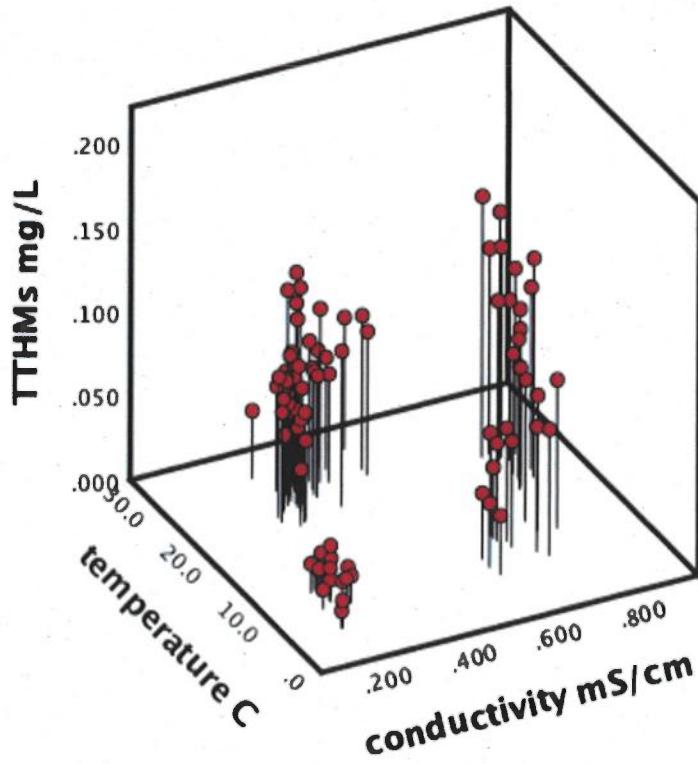


Figure 7. Relationship between discharge of the Tug Fork River at Williamson, WV and conductivity of drinking water in Martin County, KY.

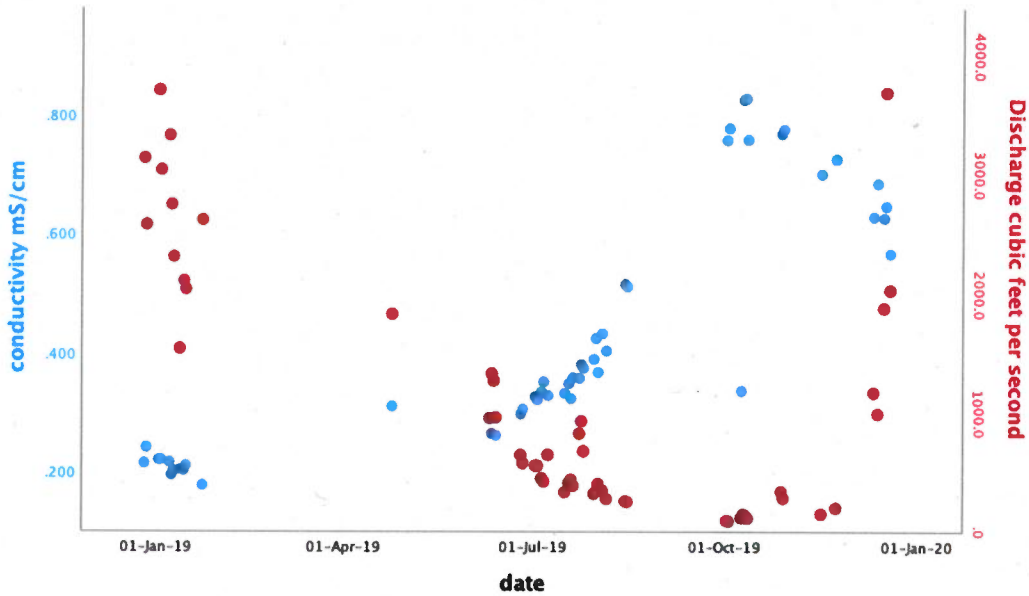
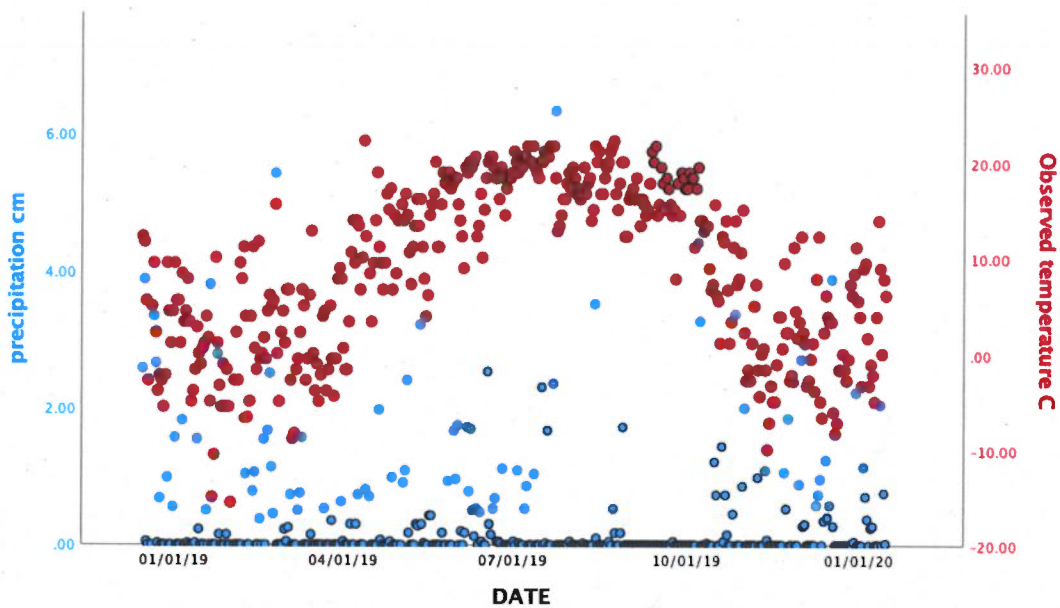


Figure 8. Precipitation and observed air temperature at Martin County, KY from December 2018 to January 2020.



Trace element concentrations

Descriptive statistics for trace-element concentrations are shown in Table 7. Note that only samples with concentrations above the method detection limits (MDLs) are included. For some elements, such as mercury and cadmium, the vast majority of samples had non-detectable concentrations using the most sensitive analytical technique available (ICP-MS). One set of samples was not analyzed for iron or strontium due to an operator error. We only observed exceedances of secondary maximum contaminant levels (SMCLs) for aluminum and iron. The SMCLs are non-enforceable guidelines based on water aesthetics (cloudiness or staining of fixtures), or cosmetic effects (hair or tooth discoloration). We observed one exceedance for iron and ten exceedances for aluminum. We observed no exceedances for any maximum contaminant level (MCLs). The MCLs are set by U.S. EPA based on health concerns.

Table 7. Descriptive statistics for trace element concentrations in municipal drinking water in Martin County, Kentucky collected from December 2018-December 2019. N = number of samples for which concentrations were above the method detection limit. Statistics were calculated using only concentrations over the method detection limit. Some samples were not analyzed for iron or strontium. Concentrations are presented in µg/L. Maximum contaminant limit (MCL) or secondary maximum contaminant limit (SMCL) presented in µg/L if one has been established by the U.S. EPA.

	N	Minimum	Maximum	Mean	Std. Deviation	EPA MCL or *SMCL	Method detection limit
aluminum	96	0.56	528	82.57	82.6	*50-200	1
vanadium	91	0.03	0.24	0.08	0.04	NA	0.02
chromium	40	0.03	0.30	0.12	0.07	100	0.02
manganese	80	0.06	46.1	2.46	6.23	NA	0.05
iron	53	0.40	1002	45.65	149.9	300	0.3
cobalt	84	0.04	1.16	0.14	0.18	NA	0.03
nickel	95	0.57	75.8	5.77	10.8	NA	0.5
copper	95	0.57	120	17.83	23.42	*1000	0.5
zinc	96	0.44	2659	232.42	442.39	*5000	0.4
arsenic	95	0.15	1.18	0.44	0.14	10	0.02
selenium	94	0.22	1.37	0.61	0.28	50	0.2
strontium	66	0.94	897	286.03	130.63	NA	0.05
molybdenum	42	0.02	0.70	0.36	0.21	NA	0.01
cadmium	21	0.01	0.39	0.08	0.11	5	0.005
antimony	64	0.02	0.16	0.08	0.04	6	0.005
barium	96	0.001	98.7	44.79	20.78	2000	0.004
mercury	5	0.8	0.55	0.21	0.19	2	0.07
lead	91	0.03	7.79	0.66	1.36	15	0.02
uranium	88	0.01	1.46	0.27	0.35	30	0.004

Coliform bacteria

We observed the presence of coliform bacteria in 12 samples with MPN ranging from 1 to 36.4. We didn't detect *E. coli* in any of the samples. Typically, we observed the presence of coliform bacteria during the summer and autumn months (9 out of 12 positive results), but there was no clear spatial pattern to the occurrence of positive coliform test results (Fig 9). We observed free chlorine concentrations less than or equal to 0.2 mg/L in six locations during the summer and fall months (Fig 10). However, these occurrences did not coincide spatially with positive total coliform results.

Study participant observations and reported water usage.

A large proportion of study participants reported various problems with drinking water quality and availability. Only 1% of respondents indicated that they had observed no problems with the water. Problems reported included: low water pressure (74.0%), excessive bubbles/fizz/foam (66.7%), bad odor (65.6%), discoloration (51.0%), particle/cloudiness in water (43.8%), bad taste (36.5%), irritated or burned skin (24.0%), oil/grease in water (16.7%), skin has odor after bathing or showering (14.6%), high water pressure (13.5%), water feels sticky or oily (8.3%), and other (28.1%). We did not observe discoloration or visible defects in the collected water samples, but these problems may be sporadic.

Additionally, only twelve respondents (12.4%) reported using municipal drinking water for drinking water at home, but nearly all (96%) relied primarily on bottled water. Only 55.7% of residents reported using municipal water for cooking, with the majority of the remainder using bottled water for cooking. However, the majority of residents (99%) reported using municipal drinking water for other purposes such as cleaning, toilet flushing, and bathing.

Figure 9. Occurrence of total coliform bacteria in Martin County Kentucky, between December 2018 and December 2019.

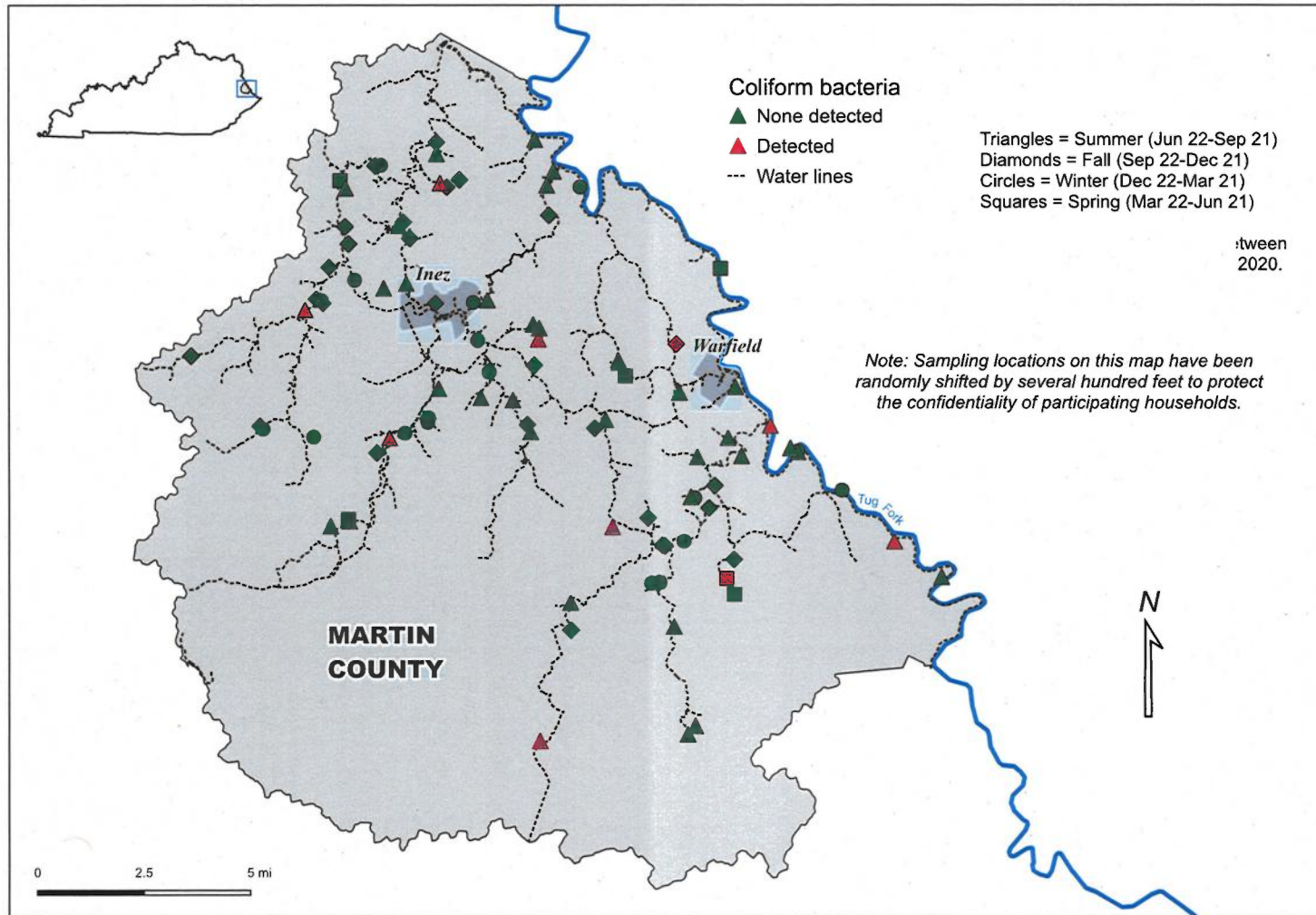
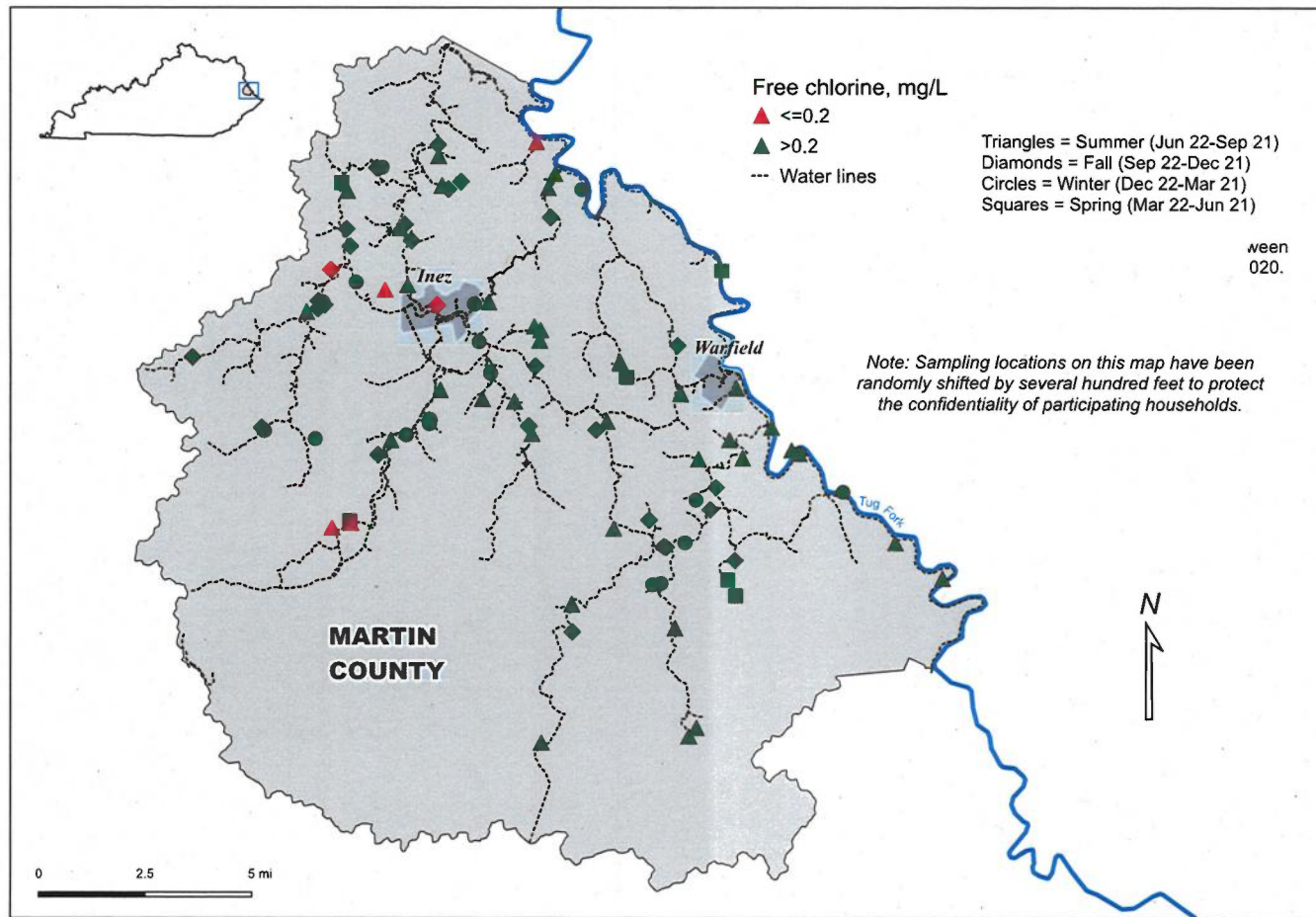


Figure 10. Occurrence of free chlorine concentrations less than or equal to 0.2 mg/L in Martin County, Kentucky between December 2018 and December 2019.



Discussion

Disinfection byproducts

The measurement of disinfection byproducts in Martin County drinking water was one of the primary aims for the study. We found widespread occurrence of TTHMs and HAA5, sometimes at concentrations exceeding the EPA MCLs. Martin County Drinking Water District was in compliance with DBP regulations during the time we sampled according to the U.S. EPA Safe Drinking Water Information System. In contrast to our study, which evaluated DBPs at a wide range of locations at many time points, DBPs typically are regulated based on quarterly sampling at a very limited number of locations⁹, which in the case of Martin County is two per quarter given that the service population is <9,999. Compliance is determined based on a running annual average (RAA). The locations are based on a complex set of criteria that consider water residence time in the distribution system (i.e. the time between water entering the distribution system and consumption) and assumptions about how maximum DBP concentrations relate to both residence times and population density⁹. The procedures for selecting these locations also assume that the residence time at particular locations is known, which may or may not be the case in a leaky system. Previous studies have observed spatial patterns of TTHM concentrations that differ from what we observed. For example, research on a system in Cyprus found that household TTHM levels increase with increasing distance from the chlorination point²³. Increased residence time also is positively correlated with TTHM concentrations^{10, 11}. These conclusions are consistent with our HAA5 findings, but differ from our TTHM findings, where distance from the chlorination point was not an important factor. Seasonal variation also has been previously and most closely linked with water temperature and organic matter concentrations^{10, 12-14}. Our finding that conductivity is a predictor of TTHM concentrations is relatively novel and needs to be further investigated to determine the relationship among conductivity, TOC and specific UV absorbance (SUVA) in the source water, and DBP concentrations in finished tap water. Fortunately, temperature and conductivity are extremely easy and inexpensive to measure by citizen scientists, in contrast to TOC, and allow for reasonable predictions of DBP concentrations. Taken together, results will be useful for helping the Martin County drinking water utility to determine the best sampling locations and times. However, from a public health perspective, it calls into question whether quarterly samples at two locations can accurately characterize exposure in such a dynamic system. For example, peak HAA5 and TTHM concentrations occurred in different locations at different times, with considerable spatial and temporal variability in the measurements. It is important to note that the occurrence of DBPs in drinking water is not restricted to Martin County or Eastern Kentucky. It is a problem of national and global significance¹⁵.

The EPA MCLs take into account multi-route exposure from drinking water (ingestion, dermal, inhalation) as well as exposure from other sources. A number of considerations including animal

studies, epidemiological data, economic feasibility, and economic analyses are used to set the MCLs. However, a number of recent epidemiological studies have identified an array of health effects associated with DBP exposure at concentrations at or below the concentrations we observed in Martin County. Average concentrations of TTHMs (0.065 mg/L) were comparable to many epidemiological studies that showed correlations with adverse health outcomes. For example Villanueva et al. observed increased risk of bladder cancer when concentrations of TTHMs exceeded 0.056 mg/L¹⁶. Wright et al. showed increased odds of atrial and ventral septal defects (ASDs and VSDs) in newborns with mothers exposed to TTHMs in excess of 0.023 mg/L¹⁷. Median exposure concentration in our study was similar to the 75th percentile of exposure in the Wright et al., study (0.065 mg/L)¹⁷. A recent study in Massachusetts showed a significant correlation between stillbirth and HAA5 exposure in the upper quartile of exposure concentrations (0.032 mg/L), which is similar to the mean HAA5 concentration in this study (0.035 mg/L)¹⁸. Another study that found increased risk of fetal growth retardation had slightly higher mean HAA5 concentrations (0.042 mg/L)¹⁹. Thus, our findings warrant further investigation of the associations between DBPs and urinary tract cancers, and birth defects and their complications in the region.

Trace-elements

Iron and aluminum were the only trace-elements studied for which we found exceedances of U.S. EPA regulatory guidelines. Both of these elements have secondary maximum contaminant levels (SMCLs) which are non-enforceable guidelines designed to ensure satisfactory aesthetics (e.g. cloudy appearance), taste (e.g. metallic taste) or cosmetic effects (e.g. changing hair coloration). Of these elements, we found that aluminum most frequently exceeded these guidelines, possibly explaining why 43.8% of participants reported cloudiness or particles in the water. Depending on the pH, temperature, and conductivity, aluminum hydroxide could precipitate in the drinking water, causing cloudiness. Because aluminum is very poorly absorbed via the gastrointestinal route from drinking water, exposure is typically not a major concern except at very high doses that are far greater than what is expected from the observed concentrations²⁰. The source of aluminum in the drinking water is unknown, but it could originate from soil particles, plumbing components, or more likely, alum used as a flocculant during drinking water treatment. It is possible that Al could originate from coal mining wastes; however, of the remaining trace-elements for which U.S. EPA has established MCLs, we did not find exceedances, including for elements such as As and Pb which are associated with coal mining waste²¹. These results are similar to those of a recent study that measured trace-element concentrations in more than 350 households in southeastern Kentucky which examined both private wells and municipal drinking water sources and found concentrations that were almost always below the MCLs²².

Coliform bacteria and chlorine residuals

We frequently detected total coliform bacteria, but not *E. coli*, in drinking water during the summer and fall months. While not all coliform bacteria are harmful, they are an indicator that harmful organisms may be present. It is unlikely that these coliform bacteria resulted from contamination of the aerators or exterior faucet surfaces since we took precautions to disinfect exterior surfaces. Also, we primarily detected bacteria in the summer months, which suggests environmental factors such as soil or water temperature. Since most positive coliform results had low bacterial MPN and *E. coli* were not detected, it is unlikely that extensive contamination of the drinking water with sewage was present. These coliform bacteria could have resulted from the introduction of soil particles under low pressure conditions or they could originate from biofilms present within the distribution network. It is important to note that positive results for coliform bacteria did not co-occur with concentrations of free chlorine considered inadequate for disinfection (<0.2 mg/L). There are many mechanisms by which bacteria can survive chlorination, including attachment to surfaces or formation of biofilms²³.

Study limitations

The study participants were older and more female than the census population of Martin County, potentially influencing questionnaire results. We also had temporal gaps in drinking water sampling and may have missed some changes in concentrations of contaminants.

Conclusions

In summary, DBPs and coliform bacteria are the most significant water contaminants in the Martin County Drinking Water system from a health perspective. We did not find evidence of elevated concentrations of trace-elements in drinking water including those associated with coal slurry such as As, Se or Pb. We identified factors that predict DPB concentrations: distance, free chlorine content, temperature, and conductivity. Future efforts at reducing DBP exposure could address seasonal changes in source water chemistry and how adjustments to the treatment process might be made to reduce formation of DBP compounds. Low discharge in the source water during the summer and autumn months are likely to promote conditions favorable to TTHM formation, so it is possible that special care may need to be taken during periods of low discharge. Repairing leaks in the system and maintaining optimal water pressure and residence times (water age) throughout the distribution system may reduce the occurrence of coliform bacteria and HAA5. We also found that nearly all residents reported problems with the appearance, odor, taste, or pressure of the drinking water, likely contributing to the vast majority of residents not relying on Martin County water as a drinking water source. Although few residents reported drinking Martin County water, it is important to note that exposure to DBPs

can result from inhalation of compounds volatilized during cooking, washing, and bathing. These visible water quality problems may be linked to inadequate water pressure and to some extent excessive aluminum. The study team is working to examine these issues more in depth in Martin County and regionally and to develop technical tools to help water utilities address the problems that have been identified.

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APPENDIX 1- Questionnaire

Martin County, Kentucky

Water Quality – Health Survey

Participant Instructions: As a participant in our study, we are interested in asking some general demographic and health information about you, your home, and the water you drink. Your answers are very important to us, so please try to answer every question. If you don't know how to answer a question, the person asking you the questions can help explain. Your responses to this survey will be completely confidential. Any report or document that is published using the data from this survey will not contain personal information that could be used to identify you. Participation is voluntary. You may skip any question you don't feel comfortable answering. This survey is supported by the National Institute for Environmental Health Sciences/National Institute for Health and conducted by the University of Kentucky. The purpose of survey is to evaluate characteristics of your water supply and to evaluate associations with potential health effects

If you have any questions, you may contact:

Wayne T. Sanderson, PhD, CIH

Address: Room 226 Bowman Hall
151 Washington Avenue
University of Kentucky
Lexington, Kentucky 40506-0059

Telephone: 859-218-2227

E-mail: wsa223@uky.edu

Or

Jason Unrine, PhD

Address: N212-N Agricultural Sciences Center North
1100 Nicholasville Road
University of Kentucky
Lexington, Kentucky 40546-0091

Telephone: 859-257-1657

E-mail: jason.unrine@uky.edu

Household Identification Number (HIN): _____

Address: _____

GIS Locator: _____

Date of Interview: _____

Type of Home: Single family Multiple Unit Mobile Home

Other _____

What is the approximate age of the home: _____ yrs _____ months

Do you own or rent your home: Own Rent

How many bedrooms are in this home: _____

How many bathrooms are in this home: _____

Does this home have a humidification system: No Yes

NOTE: from the County Assessors Office the property tax appraised value of the house:

\$

Water:

What is the source of **drinking water** for this home (check all that apply):

Martin County Water System Private Well Spring Bottled Water

Rainwater into tank/cistern Water trucked into tank/cistern Other _____

What is the source of **cooking water** for this home (check all that apply):

Martin County Water System Private Well Spring Bottled Water

Rainwater into tank/cistern Water trucked into tank/cistern Other _____

What is the source of **water for other uses** for this home (check all that apply):

Martin County Water System Private Well Spring Bottled Water

Rainwater into tank/cistern Water trucked into tank/cistern Other _____

Do you have any type of water treatment system for your home water? **Check all that apply**

System	Drinking Water	Cooking Water	All Other Usages
Filters			
Carbon filters			
Reverse Osmosis			
Chlorination			
Softener			
Other:			

Can you estimate the amount of your total water usage? _____ gal/day _____ gal/month

If your source of water is the Martin County Water District, what is your approximate water bill per month? \$ _____

If the water provided to your home has been provided by the Martin County Water District (MCWD) what problems have you experienced with your water supply? **Check all that apply**

Check	Problem
	Bad taste—describe taste
	Bad odor—describe odor:
	Discolored—describe color:
	Particle/cloudiness in water
	Irritated or burned skin
	Skin has odor after bathing or showering—describe odor
	Oil/grease in water
	Excessive bubbles/fizz/foam
	Low water pressure
	High water pressure
	Water feels sticky or oily
	Other Problem:
	Other Problem:
	Other Problem:

Have you noticed any of the following problems with water in local restaurants, schools, churches, or public places? **Check all that apply**

Problem	Restaurants	Schools	Churches	Public Places
Bad taste—describe taste				
Bad odor—describe odor:				
Discolored—describe color:				
Particle/cloudiness in water				
Irritated or burned skin				
Skin has odor after bathing or showering—describe odor:				
Oil/grease in water				
Excessive bubbles/fizz/foam				
Low water pressure				
High water pressure				
Water feels sticky or oily				
Other Problem				
Other Problem				
Other Problem				

We would like to start by asking some basic information about yourself and your household. If at any time you do not understand the question, have trouble hearing the question, or would like to read the questions with me, please let me know.

Household Member	Age (yrs)	Gender: F = female M = male	Years in House	Race W = white B = Black A = Asian N = native M = Mixed Race	Occupation
Self (1)					
2					
3					
4					
5					
6					
7					
8					
9					

Co-Morbidities									
Diabetes									
High blood pressure									
Anemia									
Dementia/Memory loss									
Weight loss									
Chronic fatigue									
Other Health Concerns Not Asked About									

Lifestyle Factors

Household Member	Ever Smoke Cigarettes		If Yes, Number of Years	Use Dip or Snuff		If Yes, Number of Years	Alcohol Consumption, Drinks per day
	Y = Yes	N = No		Y = Yes	N = No		
Self (1)							
2							
3							
4							
5							
6							
7							
8							
9							

Next, we would also like to ask you some questions about your thoughts and knowledge of water quality.

- In the community, what are the most important issues to you? How important is water quality to you?
- How knowledgeable do you feel about water quality in this area?
- What do you think about water quality in Martin County?
- Where do you go to get your information about water quality?
- Tell me about the messages that you have received about water quality in the past (letters, reports, boil notices). What do you think of these messages?
- What do you believe are the best ways to communicate with the public about water quality issues?
- Is there anything else you would like to add?

Survey on household issues with water:

99% of respondents reported issues with their tap water. Top reported issues include:



Household Tap Water Usage: Drinking



Household Tap Water Usage: Cooking



This project was supported by UK-CARES through Grant P30 ES026529. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIEHS. This project was also supported by the EPA Environmental Justice Small Grants Program in collaboration with Livelihoods Knowledge Exchange Network (LKEN).

Martin County

Drinking Water and Health Study

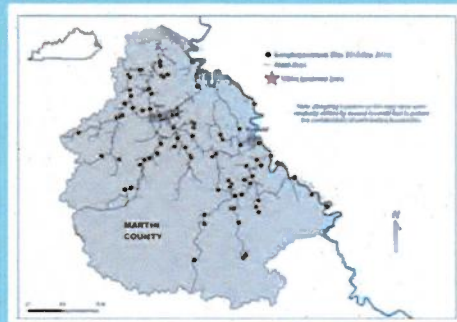


Photo by Mary Runyon.

Martin County Concerned Citizens (MCCC) is dedicated to giving the citizens of Martin County, KY a voice in getting a fair price for water that is clean, safe, and dependable. The Concerned Citizens are represented by the Appalachian Citizens' Law Center.

The Study

Responding to community concerns about drinking water quality in Martin County, Kentucky, the University of Kentucky and Martin County Concerned Citizens collaborated on a drinking water testing and health study.



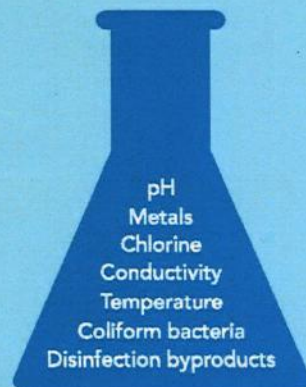
Map: Martin County with dots representing houses tested

From December 2018 to December 2019, researchers tested the tap water and administered a health survey at 97 randomly selected households throughout the county.

The study aimed to answer the following questions:

- What is in the tap water?
- Are there certain parts of Martin County that have more issues with water quality?
- What issues are people experiencing with their tap water?

What we tested for:



Testing Results

47% of samples had at least one contaminant that exceeded the Safe Drinking Water guidelines.

DBPs:

The major issue of concern was disinfection byproducts. 35% of houses had levels of DBP that were higher than the allowable limit. DBP levels were higher in Summer and early Fall.

What are disinfection byproducts?



Disinfection byproducts are contaminants in drinking water that form when chlorine used to kill bacteria reacts with organic matter (like leaves, sewage, or algae) in the water. Disinfection byproducts are the most common water quality violation in the United States. Harmful effects of disinfection byproducts can occur through ingestion or inhalation.

Possible health effects of disinfection byproducts:

- Bladder cancer
- Cardiac birth defects
- Liver, kidney or central nervous system problems

Metals:

- Out of 19 metals tested, only iron and aluminum were found above the limit. One house was above the level for iron, and ten houses were above the level for aluminum.
- Iron and aluminum do not threaten human health but can affect the color and taste of water.

Coliform bacteria:

- 13% of houses had coliform bacteria, mostly in summer and fall.
- Some coliform bacteria can cause illness, but not all bacteria are harmful.
- E. coli was not found in any samples, so there was no evidence of sewage contamination in the homes tested.

Conclusions

It is more important than ever that Martin County residents continue to work together through the Martin County Concerned Citizens. **Together, we can hold the water district and state regulators accountable to make sure that our water system is fixed once and for all.**

- Disinfection byproducts and coliform bacteria are the major water quality concerns in Martin County
- Contamination is higher in summer and early Fall
- No particular area of the county had higher levels of contamination
- The study did not find any heavy metals from coal slurry in the water
- Fixing the issues with Martin County's water system is a long process. Citizens, scientists, civil engineers, and policy makers must work together to ensure safe, affordable water for all county residents

Read the full "Preliminary Technical Report: The Martin County Kentucky Community-Engaged Drinking Water Health Pilot Study" here: https://pss.ca.uky.edu/sites/pss.ca.uky.edu/files/martin_county_report_final.pdf.

Report Issues

Having issues with your drinking water quality, service, or billing?

First, call the Martin County Water District (606) 298-3885. Make sure to write down the date and time you call, who you talk to, and what was said.

If you don't receive an adequate response from the Water District:

- Message us on Facebook at Martin County Concerned Citizens. We are here to help.
- Report the issue to the Public Service Commission by calling 1-800-772-4636 or emailing psc.info@ky.gov. Provide your full name and place of residence in the body of the e-mail. **Make sure to reference case number 2020-00154.**

Notice by Martin County Water District – System ID#: KY0800273

Our water system recently violated a drinking water standard. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did (are doing) to correct this situation.

We routinely monitor for the presence of drinking water contaminants. Testing results from 7/1/2014 through 9/30/2014 show that our system exceeds the standard, or maximum contaminant level (MCL), for trihalomethanes (THM) and haloacetic acids (HAA). The standard for THM is 0.080 mg/L and the standard for HAA is 0.060 mg/L. These are determined by averaging all samples collected at each sampling location for the last 12 months. The level of THM averaged at one of our system's locations for 7/1/2014 to 9/30/2014 was 0.101 mg/L and HAA was 0.081 mg/L.

- There is nothing you need to do. You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.
- If you have a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at increased risk and should seek advice from your health care providers about drinking this water.

Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

We are working to minimize the formation of trihalomethanes and haloacetic acids while ensuring we maintain an adequate level of disinfectant. We have taken additional steps to change disinfectant levels, remove natural organic matter, and increased flushing of water lines to determine if our efforts have been effective. We are also monitoring water storage tank levels and water flow patterns within the distribution system. We anticipate resolving the problem within the next quarter but the compliance calculation is based upon annual averages and it may be several quarters before compliance is achieved.

For more information, please contact John Mills at 606-298-3885 or 387 E Main St. Suite 140, Inez, KY 41224.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.



RECEIVED APR 02 2018

MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

**ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

AARON B. KEATLEY
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

March 28, 2018

Mary Cromer
Appalachian Citizens Law Center, Inc.
317 Main Street
Whitesburg, Kentucky 41858

RE: Martin County Water District 2016 IDSE change for PWSID: KY0800273

Dear Ms. Cromer,

Please see the below information about your inquiry dated March 8, 2018 on behalf of the Martin County Concerned Citizens (MCCC) regarding the Martin County Water District (PWSID KY0800273). In that correspondence you requested information regarding changes to Initial Distribution Systems Evaluation (IDSE) monitoring for the Stage 2 Disinfection Byproducts Rule (DBPR) submitted by Martin County Water District (MCWD) in May, 2016.

On July 6, 2015, MCWD sent a letter (attached) to the Division of Water (the division) requesting a change to the population served in accordance with 401 KAR 8:200 Section 3. The previous population was recorded as 10,843 persons, and the letter requested a change to a population of 9,504 based on 3,533 service connections.

On May 26, 2016, the division received a revised IDSE Report for Standard Monitoring (attached) in accordance with 401 KAR 8:150 and 40 CFR 141.621. DBPR sampling requirements are based on the population, as established in accordance with the microbiological monitoring requirements in 401 KAR 8:200. Specifically, MCWD requested to reduce the number of samples required by the DBPR from four (4) to two (2) based on serving a population below 10,000. The request was approved by the division by changing the sampling schedule in SDWIS and was effective April 1, 2016. (SDWIS schedule changes are required to be effective at the beginning of the quarter.)

The two DBPR sites that were chosen for monitoring were justified by MCWD as follows:

"SM8 – Highest TTHM LRAA (0.099) potentially travels through/by four tanks. High residence time with low customer base."



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MCCC HEARING EXHIBIT 13

SM7 – Highest HAA5 LRAA (0.069) of all sites other than the two listed above. Is influenced by drain fill cycles of two storage tanks and one pumping station.”

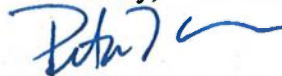
The division approved these DBPR sampling sites, changing the IDSE in SDWIS effective April 1, 2016.

As to your request to independently verify the population served by MCWD, 401 KAR 8:200 establishes that the population served by a water system shall be determined by one of four methods: 1) using the recent decennial census from the United States Census Bureau; 2) using the serviceable population established by the Water Resources Information System (WRIS) database; 3) multiplying the number of service connections by 2.69; or 4) using a method mutually agreed upon by a community or semipublic water system and the cabinet. MCWD appropriately provided the request to change the population served to the division. The division therefore sees no compelling reason to question the validity of the data provided and declines this request.

I appreciate the continued interest of MCCC in the MCWD's compliance with the various rules and requirements of the Safe Drinking Water Act. Following the technical assistance provided by the division and Kentucky Rural Water Association personnel, MCWD has optimized the flocculation of total organic (TOC) and moved the point of disinfection from the rapid mix to above the filters. These changes reduced the mass of TOC interacting with disinfectant and has resulted in a sustained reduction of disinfection by-products generated at the water treatment plant and occurring in the distribution system. MCWD has been in compliance with the DBPR for the past three (3) quarters. The division continues to closely monitor MCWD's progress in regards to disinfection by-products.

If you have any question, please do not hesitate to contact me at Peter.Goodmann@ky.gov or at (502) 782-6956.

Sincerely,



Peter T. Goodman, Director
Division of Water

MARTIN COUNTY WATER DISTRICT

387 East Main Street Suite 140
INEZ, KY 41224

606-298-3885 OFFICE

606-298-4913 Fax

July 6, 2015

Kentucky Division of Water
ATTN: Brian Chitti, Supervisor
Compliance & Technical Assistance Section
200 Fair Oaks Lane, 4th Floor
Frankfort, KY 40601

RE: Population/TCR Schedule Changes
PWSID: KY1190061

Dear Mr. Chitti,

In accordance with 401 KAR 8:200 Section 3, Martin County Water District respectfully requests that our population be changed to 9,504 by multiplying our current number of service connections (meters = 3,533) by the factor 2.69.

Upon changing the population, Martin County requests that the monitoring schedule for the Total Coliform Rule be modified to reflect the population reduction. According to Drinking Water Watch our current population is listed as 10843, which requires 12 samples per month under the Total Coliform Rule. With the population of reduction our monitoring requirement would be 10 samples per month. Martin County will continue to collect 12 samples per month until we are officially notified of the monitoring schedule approval.

Additionally this reduction in population also changes our category for routine Stage 2 monitoring. The requirement in 40 CFR 141.621 is 2 samples per quarter. Please advise how we are to update our IDSE report to make this transition.

If you have any questions, please contact me at (606) 298-3885.

Sincerely,

John Mills
General Manager

RECEIVED
MAY 26 2016

IDSE Report for Standard Monitoring Page 3 of 10
V. PEAK HISTORICAL MONTH AND STAGE 2 DBPR COMPLIANCE MONITORING SCHEDULE

A. Peak Historical Month* August KY0800273

B. Is Your Peak Historical Month the Same as in Your IDSE Standard Monitoring Plan?

Yes No

If no, explain how you selected your new peak historical month (attach additional sheets if needed)

C. Proposed Stage 2 DBPR Compliance Monitoring Schedule*

Stage 2 Compliance Monitoring Site ID	Projected Sampling Date (date or week) ¹			
	period 1	period 2	period 3	period 4
SM7	2 / 2016 4th week	5 / 2016 4th week	8 / 2016 4th week	11 / 2016 4th week
SM8	2 / 2016 4th week	5 / 2016 4th week	8 / 2016 4th week	11 / 2016 4th week

¹ period = monitoring period. Complete for the number of monitoring periods from Section II.C.

Attach additional copies of this sheet if you need more room.

MARTIN COUNTY UTILITY BOARD

387 East Main Street Suite 140
INEZ, KY 41224

606-298-3885 OFFICE

606-298-4913 Fax

May 20, 2016

Kentucky Division of Water
ATTN: Kellee Husband, Stage 2 DBP Rule
Compliance & Technical Assistance Section
200 Fair Oaks Lane, 4th Floor
Frankfort, KY 40601

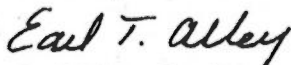
RE: IDSE Change
PWSID: KY0800273

Dear Mr. Chitti,

In accordance with 401 KAR 8:510 and 40 CFR 141.621 Martin County Water District respectfully requests that their monitoring requirement be reduced to 2 samples per quarter. The change is being requested because Martin County's population has fallen below 10,000 customers. Please find a revised page 8 for the IDSE, enclosed page 8.

Your approval and processing of these documents is greatly appreciated. We are scheduled to collect our routine samples next week. If you have any questions, please contact me at

Sincerely,



Earl T Alley, Chief Treatment Operator
Martin County Water District

PUBLIC SERVICE COMMISSION

Monthly Water Loss Report

Water Utility: Martin County Water District

For the Month of: January Year: 2021

LINE #	ITEM	GALLONS (Omit 000's)
1	WATER PRODUCED AND PURCHASED	
2	Water Produced	57,350
3	Water Purchased	
4	TOTAL PRODUCED AND PURCHASED	57,350
5		
6	WATER SALES	
7	Residential	10,800
8	Commercial	1,470
9	Industrial	
10	Bulk Loading Stations	
11	Wholesale	
12	Public Authorities	1,398
13	Other Sales (explain)	
14	TOTAL WATER SALES	13,668
15		
16	OTHER WATER USED	
17	Utility and/or Water Treatment Plant	878
18	Wastewater Plant	
19	System Flushing	
20	Fire Department	
21	Other Usage (explain)	
22	TOTAL OTHER WATER USED	878
23		
24	WATER LOSS	
25	Tank Overflows	
26	Line Breaks	26,336
27	Line Leaks	16,468
28	Excavation Damages	
29	Theft	
30	Other Loss	
31	TOTAL WATER LOSS	42,804
32		
33	Note: Line 14 + Line 22 + Line 31 MUST Equal Line 4	
34		
35	WATER LOSS PERCENTAGE	
36	(Line 31 divided by Line 4)	74.64%

PUBLIC SERVICE COMMISSION

Monthly Water Loss Report

Water Utility:

For the Month of: Year:

LINE #	ITEM	GALLONS (Omit 000's)
1	WATER PRODUCED AND PURCHASED	
2	Water Produced	49,582
3	Water Purchased	
4	TOTAL PRODUCED AND PURCHASED	49,582
5		
6	WATER SALES	
7	Residential	10,303
8	Commercial	2,253
9	Industrial	
10	Bulk Loading Stations	
11	Wholesale	
12	Public Authorities	2,715
13	Other Sales (explain)	
14	TOTAL WATER SALES	15,271
15		
16	OTHER WATER USED	
17	Utility and/or Water Treatment Plant	744
18	Wastewater Plant	
19	System Flushing	
20	Fire Department	
21	Other Usage (explain)	
22	TOTAL OTHER WATER USED	744
23		
24	WATER LOSS	
25	Tank Overflows	
26	Line Breaks	28,407
27	Line Leaks	5,160
28	Excavation Damages	
29	Theft	
30	Other Loss	
31	TOTAL WATER LOSS	33,567
32		
33	Note: Line 14 + Line 22 + Line 31 MUST Equal Line 4	
34		
35	WATER LOSS PERCENTAGE	
36	(Line 31 divided by Line 4)	67.70%

PUBLIC SERVICE COMMISSION

Monthly Water Loss Report

Water Utility: Martin County Water District

For the Month of: March Year: 2021

LINE #	ITEM	GALLONS (Omit 000's)
1	WATER PRODUCED AND PURCHASED	
2	Water Produced	53,292
3	Water Purchased	877
4	TOTAL PRODUCED AND PURCHASED	54,169
5		
6	WATER SALES	
7	Residential	9,300
8	Commercial	2,378
9	Industrial	
10	Bulk Loading Stations	
11	Wholesale	
12	Public Authorities	154
13	Other Sales (explain)	
14	TOTAL WATER SALES	11,832
15		
16	OTHER WATER USED	
17	Utility and/or Water Treatment Plant	848
18	Wastewater Plant	
19	System Flushing	
20	Fire Department	
21	Other Usage (explain)	
22	TOTAL OTHER WATER USED	848
23		
24	WATER LOSS	
25	Tank Overflows	
26	Line Breaks	40,788
27	Line Leaks	701
28	Excavation Damages	
29	Theft	
30	Other Loss	
31	TOTAL WATER LOSS	41,489
32		
33	Note: Line 14 + Line 22 + Line 31 MUST Equal Line 4	
34		
35	WATER LOSS PERCENTAGE	
36	(Line 31 divided by Line 4)	76.59%

PUBLIC SERVICE COMMISSION

Monthly Water Loss Report

Water Utility:

For the Month of: Year:

LINE #	ITEM	GALLONS (Omit 000's)
1	WATER PRODUCED AND PURCHASED	
2	Water Produced	50,239
3	Water Purchased	
4	TOTAL PRODUCED AND PURCHASED	50,239
5		
6	WATER SALES	
7	Residential	10,631
8	Commercial	2,439
9	Industrial	
10	Bulk Loading Stations	
11	Wholesale	
12	Public Authorities	3,416
13	Other Sales (explain)	
14	TOTAL WATER SALES	16,486
15		
16	OTHER WATER USED	
17	Utility and/or Water Treatment Plant	911
18	Wastewater Plant	
19	System Flushing	
20	Fire Department	
21	Other Usage (explain)	
22	TOTAL OTHER WATER USED	911
23		
24	WATER LOSS	
25	Tank Overflows	
26	Line Breaks	18,237
27	Line Leaks	14,605
28	Excavation Damages	
29	Theft	
30	Other Loss	
31	TOTAL WATER LOSS	32,842
32		
33	Note: Line 14 + Line 22 + Line 31 MUST Equal Line 4	
34		
35	WATER LOSS PERCENTAGE	
36	(Line 31 divided by Line 4)	65.37%

49m · 🌐

3 wraps, piece of galvanized pipe, and 4 hose clamps on a 18 inch piece of service line.



PSC HEARING EXHIBIT 2

*Martin County Water District
387 East Main Street, Suite 140
Inez, KY 41224

*Craig Miller
Martin County Water District
c/o Alliance Water Resources, Inc.
1402 East Main Street
Inez, KY 41224

*Cassandra Moore
Martin County Water District
c/o Alliance Water Resources, Inc.
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*Brian Cumbo
Attorney at Law
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*Mary V. Cromer
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317 Main Street
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