PARSONS BEHLE & LATIMER

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M E M O R A N D U M

TO: Robert Thompson, City Attorney, Sandy City
Jeff Robinson, Senior Civil Attorney, Sandy City

FROM: John Cooper
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DATE: May 23, 2019

SUBJECT: Investigation Report: Sandy City Fluoride Overfeed

INVESTIGATION OVERVIEW

As requested, Parsons Behle & Latimer conducted an investigation into Sandy City's operational and regulatory response to the fluoride overfeed event that occurred from February 5, 2019 to February 7, 2019. The investigation of the City's operational response focused on the cause of the event, the actions of the Public Utilities Department to discover, contain, and remediate its impacts, and the communications with City government and the public regarding the event. The investigation of the City's regulatory response focused on whether the City complied with regulatory notice requirements. This investigation was limited to the City's actions between the evening of February 5, 2019, when the fluoride pump malfunctioned, and February 20, 2019, when Public Utilities Director Tom Ward was placed on administrative leave.

As part of the investigation, the City produced thousands of documents and text messages. All of the documents and text messages were reviewed for relevance to the events and analyzed further as required. Relevant documents included emails, text messages, lab reports, public notices, maps, and a variety of other documents. Press conferences related to the event were viewed. Social media posts and news articles were also reviewed. Merrick & Company, an engineering firm, was retained to assess the appropriateness of the City's operational response and the technical response of Public Utilities Director Ward.

Interviews were conducted of the following individuals:

1) Karen Hoagland – Compliance Officer / March 11, 2019.
2) Mike Campbell – Distribution Supervisor / Assistant Operations Manager / March 11, 2019.
3) Virgil Hanson – Water Operator / March 13, 2019.

4) Scott Ellis – Assistant Director / Operations Manager / March 13, 2019.
5) Richard Benham – Engineering Manager / March 15, 2019.
6) Tom Ward – Public Utilities Director / March 20, 2019.
7) Evelyn Everton – Deputy Mayor / March 22, 2019.
8) Eric Richards – Communications Director / March 25, 2019.
9) Kim Bell – Deputy Chief Administrative Officer / April 15, 2019.

Follow-up interviews of the following individuals were conducted:

1) Scott Ellis / Dates: March 22, 2019 and April 8, 2019.
2) Tom Ward / Dates: March 26, 2019 and April 16, 2019.
3) Mike Campbell / Date: April 16, 2019.

Attempts to interview the following individuals were unsuccessful:

1) [redacted] – [redacted] was the first person known to report a problem with his drinking water. [redacted] did not respond to attempts to contact him.
2) Marie Owens – Director, Division of Drinking Water, Utah Department of Environmental Quality. Director Owens was involved in monitoring the City's response to the fluoride overfeed. Director Owens issued an Issuance of Violations and Administrative Order alleging various violations associated with the incident. A representative of the Utah Attorney General's Office responded on her behalf to a request to interview Director Owens. After he was advised of our reasons for wanting to speak with Owens, he indicated someone may call back. However, no further response was received from either Director Owens or the Attorney General's Office.

The City's response was then analyzed under the Utah Safe Drinking Water Act and the Utah Administrative Code governing drinking water (which are generally consistent with requirements under the Federal Safe Drinking Water Act and corresponding USEPA regulations).

The investigation revealed that Sandy's operational response to the fluoride overfeed was generally within normal industry standards, but Sandy failed to comply with technical regulatory notice requirements. This investigation did not reveal that the City hid information from the public. Sandy could have and should have identified, with more specificity and speed, who was impacted by the fluoride overfeed. Sandy could have and should have communicated more information to impacted residents earlier in the event. Had the City followed its emergency response plan more closely, Public Utilities' operational and technical response would have been more organized and may have resulted in a more timely public notification. A notice not to drink the water until residents had completely flushed their home systems delivered to a larger notification area at an earlier time would have alleviated many of the harmful impacts. The stated rationale that City employees wanted to avoid a "panic" was not warranted.

INVESTIGATION SUMMARY

DAILY SUMMARY OF EVENTS

February 5, 2019 (Tuesday)

On February 5, 2019, a significant winter storm impacted Sandy. It is suspected that this storm caused a power outage, or power surge, at the Paradise Valley Well (the "PV Well") located near 1700 East and 11170 South.[1] But the suspected power outage has not been confirmed. Rocky Mountain Power did not report a power outage in the area.[2] At the time of the suspected power outage, the PV Well was not operating and had not been running for more than a year.[3] After the suspected power event, it is believed that the fluoride pump at the PV Well began pumping fluoride into the water system even though the PV Well was not operating.

It was later found that the control for the fluoride pump was left in the "hand" (i.e., manual) position rather than the off position.[4] The hand position is a setting used to calibrate the pump that allows fluoride to be pumped while water is not flowing from the PV Well.[5] In a February 13, 2019 email to Mike Campbell – Public Utilities Distribution Supervisor/Assistant Operations Manager, [redacted] reported: "Here is what I came up with at Paradise Well: When we switched the PLC out on December 19th, the dosing pump got left in hand on SCADA. It was not in hand previously."[6] [7]

Based on data recorded in the SCADA system (a control system used to monitor the PV Well that shows the weight of the fluoride in the tank), it was determined that the fluoride pump began pumping fluoride into the system at approximately 6:00 pm on February 5.[8] However, there is no alarm in the SCADA system that would report the fluoride dosing pump turning on.[9]

Water Operator Virgil Hanson is assigned the responsibility of conducting routine daily checks on the PV Well.[10] A daily inspection of the PV Well—a non-operating well at the time—is expected to include a walk-through to verify that everything looks okay.[11] A non-operating well is generally checked daily on a Monday through Friday basis, excluding holidays, but a day may be missed because of other assignments.[12] Hanson reported that, on February 5, at an

[1] Email, ER51.
[2] Richard Benham, Engineering Manager, reported "We do have a 1st hand account from a resident in the area (1916 Foxmoor Cir.) stating that their microwave was damaged during this time and they assume it was from a power issue." (Email, ER6652.)
[3] Transcript of Richard Benham Interview ("Benham Int.") 53.
[4] Transcript of Interview of Virgil Hanson ("Hanson Int.") 5.
[5] Interview of Mike Campbell ("Campbell Int.") 60–63.
[6] Email, ER51.
[7] The technical cause of the incident is outside the scope of this investigation. We note, however, that it should be possible to wire or control the fluoride pump so that it cannot operate longer than necessary to calibrate the fluoride pump unless the well pump is also operating.
[8] Benham Int. 53; SCADA Tank Weight Chart, attached as Exhibit 1.
[9] Benham Int. 54.
[10] Hanson Int. 14-15; Sandy Public Utilities Emergency Response Plan ("ERP") 66.
[11] Interview of Thomas Ward ("Ward Int") 70–71.
[12] Hanson Int. 15–16; Ward Int. 71.

unknown time but likely in the morning, he checked the PV Well.[13] Hanson reported that, at the time of his check, the fluoride pump was not running.[14] There is a Well Report Log Sheet in the well house to be filled out by the individual conducting the inspection.[15] However, Hanson related that he does not always log his visits to the well house.[16] The PV Well Report does not document Hanson's visit to the PV Well on February 5, so we have not been able to confirm he actually inspected it.[17]

February 6, 2019 (Wednesday)

On the morning of February 6, 2019, the snowstorm continued to impact Sandy. Because of the severe weather, Mayor Kurt Bradburn closed City Hall and non-essential employees were given the day off.[18] Employees not already at work were not expected to come to work.[19] Employees already at work were instructed not to drive around because of the unsafe road conditions.[20] Water Operator Hanson arrived at work before the snow day notification came out.[21] Campbell released Hanson and he left work at around 8:00 am.[22] Neither Hanson nor anyone else checked the Paradise Valley Well on February 6.[23]

At 4:47 pm, the Sandy Fire Department received a call originating from [redacted] in which the complainant, [redacted] reported bad tasting water.[24] [redacted] declined an emergency response. At 4:52 pm, dispatch notified Public Utilities via text message of [redacted] complaint.[25] Text message notifications of water issues are sent to Tom Ward – Public Utilities Director, Scott Ellis – Public Utilities Assistant Director and Operations Manager, and Campbell.[26] Ward initially reported he did not receive this text message notification, possibly because of a recent change of his cell phone carrier.[27] But, during a follow-up interview, Ward related he may have received this notification, and he was later able to determine that he had received this text message.[28]

[redacted] reported that the water tasted "caustic," and speculated that it was because too much sodium hydroxide was being used.[29] [30] But, Sandy does not add sodium hydroxide to the water.[31] Richard Benham, the Public Utilities Engineering Manager, noted that "caustic" water

[13] Hanson Int. 16-17.
[14] *Id.* at 17.
[15] Hanson Int. 16; PV Well Report.
[16] Hanson Int. 16.
[17] PV Well Report.
[18] Ward Text Messages 1; Campbell Int. 38.
[19] Transcript of Interview of Scott Ellis ("Ellis Int.") 55.
[20] Ellis Int. 55; Campbell Int. 37.
[21] Hanson Int. 17.
[22] *Id.*
[23] Hanson Int. 18; Ellis Int. 55.
[24] 911 Recording; NIFRS Dispatch Report.
[25] Benham Text Messages; Benham Int. 6.
[26] Benham Int. 6.
[27] Ward Int. 4.
[28] Second Follow-up Ward Int. 4; Email, ER6662.
[29] Attempts to contact Kuehn for an interview were unsuccessful.
[30] Benham Text Messages.
[31] Benham Int. 4.

suggests water that has an elevated pH, which is the opposite of the problem that was later discovered.[32]

[redacted] was later contacted by telephone by a Public Utilities employee Damien Gutierrez.[33] Gutierrez suggested to [redacted] that his concern could be related to a water softener. However, [redacted] responded that he did not have a water softener and hung up on Gutierrez.[34]

Sandy received no further water complaints before midnight on February 6. Benham emphasized that had Public Utilities been aware of multiple water complaints on Wednesday, they would have responded as they later did on Thursday morning.[35]

February 7, 2019 (Thursday)

At 2:03 am, the Sandy Fire Department was dispatched to [redacted] in response to a complaint of a water problem.[36] [redacted] reported that the water from the tap in the kitchen tasted bad, "like it was too much chemicals or sewage."[37] [redacted] reported that he drank the water but had to "spew it out."[38] The Fire Department responded but was "unable to detect anything wrong with the water by smell and taste" and "instructed the homeowner to contact the water department."[39] The dispatch report also noted: "Homeowner denied any medical issues related."[40]

On the morning of February 7, shortly after Public Utilities employees began arriving at work, they learned of multiple reports of bad tasting water in the same area as the two earlier complaints on [redacted]. and [redacted] [41] Public Utilities received several calls about the taste of the water and people getting sick.[42] Complaints were received from the following addresses: [redacted] [43] [44] Ellis reported that a call was received around 8:30 am from a family whose baby had been sick

[32] *Id.*
[33] Benham Int. 3; Ellis Int. 3.
[34] Benham Int. 3; Campbell Int. 3; Ellis Int. 3.
[35] Benham Int. 29.
[36] NFIRS Dispatch Report 3.
[37] 911 Recording.
[38] *Id.*
[39] NIFRS Dispatch Report 3.
[40] *Id.*
[41] Campbell Int. 4; Ellis Int. 4; Benham Int. 6–7.
[42] Public Utilities Work Orders ("Work Orders"); Ellis Int. 4.
[43] The Work Orders document these seven complaints as being received between 10:00 am and 11:14 am. However, it was generally reported during interviews that these complaints were received earlier, between about 8:00 and 9:00 am. Ellis subsequently affirmed that these complaints were received earlier than the times reflected in the work orders. Ellis explained that the complaints were entered into the reporting system later than they were received and the times on the work orders reflect when those complaints were entered, rather than when received. According to Ellis, the system defaults to the time of entry. Ellis related that the time can be manually changed to the correct time, but that was not done in this case.
[44] Work Orders Nos. 341298–300, 302, 303, 306, 307.

and had gone to the hospital the previous night.[45] According to the Work Order for [redacted] reported:

> LAST NIGHT THE WATER TASTED METALLIC BABY ON FORMULA AND WAS THROWING UP WIFE ALSO AFTER SHE HAD A GLASS OF WATER. HAS CALLED BACK- THIS MORNING THE CHILDREN WHEN THEY PEE IN THE WATER IT'S BLUE RUNNING THE BATH WATER ITS GREEN WILL KEEP THE WATER IN THE TUB.[46]

According to the Work Order for [redacted]., the caller reported: "Water taste odd, rinsed mouth after brushing teeth vomited."[47]

At around 8:00 am, Compliance Officer Karen Hoagland arrived at work and discovered a note from Sam (presumably Chynoweth) of the Fire Department advising of the complaint regarding "funny" tasting water.[48] Hoagland also received a work order from another resident complaining of metallic tasting water.[49] While Hoagland was talking to Campbell about the first complaint, Public Utilities received two more complaints of bad tasting water.[50] By about 9:00 am, water distribution staff were in the area investigating the complaints.[51]

Hoagland first contacted the Metropolitan Treatment Plant (Metropolitan Water District of Salt Lake and Sandy, "Metro"), which supplies Sandy's water, to determine if there was a problem with the water being supplied.[52] Hoagland then went to Metro to pick up water sample bottles and she learned that Metro did not find any issues.[53] After Hoagland picked up the sample bottles, she proceeded to [redacted]. in the area where the complaints originated.[54] Campbell was already in the area waiting to start flushing hydrants until after Hoagland took water samples.[55] Hoagland took samples from two homes on [redacted].[56] Hoagland went to [redacted] because of the report of a sick child at that address.[57] At [redacted] a female reported that the water made her dog sick.[58] Hoagland also took a water sample from the hydrant located near [redacted] [59]

While at one of the residences in the affected area, Campbell tasted the water, which was "horrible."[60] Campbell reported that he swallowed the water because he "didn't want to spit it

[45] Ellis Int. 4.
[46] Work Order No. 341299.
[47] Work Order No. 341300.
[48] Interview of Karen Hoagland ("Hoagland Int.") 3; Hand Written Note, ER6658.
[49] Hoagland Int. 3.
[50] *Id.* at 5–6.
[51] Ellis Int. 4.
[52] Hoagland Int. 7.
[53] *Id.* at 7-8.
[54] *Id.* at 8.
[55] *Id.* at 9.
[56] *Id.* at 9–10.
[57] *Id.* at 9.
[58] Hoagland Int. 10–11.
[59] *Id.* at 11.
[60] Campbell Int. 4.

out in front of the" person who gave him the cup of water.[61] After Hoagland had taken the samples, Campbell started flushing hydrants and he flushed four hydrants until about 1:30 pm.[62] According to Ellis, immediate sampling and flushing is the emergency response protocol when the cause of the problem is not known.[63] Because there had been no calls originating above the PV Well, Campbell contacted the on-call water operator Brian Dunton to verify that the PV Well had not turned on.[64] Dunton verified via the SCADA system that the PV Well had not been turned on.[65] But, during a follow-up interview, Campbell related that SCADA would not have shown if the fluoride pump was running.

While it is not unusual to receive a complaint about bad tasting water, it was unusual to receive this many complaints about taste and illness issues.[66] At 11:03 am, Ellis notified Ward by text message of the water incident.[67] Ward first learned of the incident by this text message.[68] Ellis initially reported that he notified Ward earlier, stating: "I can't remember if I called him beforehand, but I was here that morning talking to him in his office about it."[69] However, during follow-up with Ellis, Ellis explained that he was standing near Ward's office talking to people about the event and he thought Ward was there, but Ward was out of the office that morning.[70]

In that text message, Ellis reported the following:

> We've had some reports of bad tasting water "caustic" from a few homes on a little street call [redacted]). One person reported getting sick. The distribution crew is out sampling and flushing and researching with Metro what it could be. I'll let you know what they find.[71] [72]

During a subsequent exchange of text messages between Ward and Ellis beginning at 12:18 pm, Ellis texted: "No backflow issues as far as the meters are concerned."[73] Ward then provided suggestions for possible causes of the problem, texting:

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[61] *Id.*
[62] *Id.* at 4–5.
[63] Ellis Int. 5.
[64] Campbell Int. 5–6.
[65] *Id.* at 6.
[66] Benham Int. 7–8; Ellis Int. 5.
[67] Ward Text Messages 4; Ellis Int. at 4-5.
[68] Ward Int. 3.
[69] Ellis Int. 5.
[70] During a second follow-up interview, Ward related he did not recall if he was in the office on February 7, 2019. (Ward Second Follow-up Int. 3.) Ward explained that he knew he worked that day, but he did not know if he worked from home or in the office. (*Id.*) An email from Ward to Ellis, Benham, and others indicates that Ward was working from home that day. (Email, ER4818.) In that email, Ward wrote: "I'll be working off/on from home. Cold went from bad to worse. I'll be checking email and can take calls. Truth be told I was going to take a few hours vacation to ski this morning. Darn!" (*Id.*)
[71] Because of the nature of text message communications, where text messages are quoted, not all spelling and grammatical errors are called out.
[72] Ward Text Messages 4.
[73] *Id.*

> Hmmm Have we had an[y] change in acidity / Langlier index from Metro Water? Sluffing of old deposits? Any valve changes with nearby construction? I'm sure you're all going down the list. Lmk when you get sample results back.[74]

Ward also contacted engineering in an attempt to identify the problem.[75] While Campbell was leading the on-scene operation, Benham attempted to gather information from Campbell to put into a water model.[76]

Before leaving the area with the samples, Hoagland flushed a hydrant.[77] Hoagland then left to gather her routine samples to take to the Metro lab along with the samples she had already collected from the area of concern.[78] While collecting her routine samples, Hoagland also conducted internet research related to a possible fluoride overfeed, but was unable to find any helpful information.[79] Hoagland was near the PV Well, so she decided to check it.[80] As soon as Hoagland opened the door to the PV Well, she was able to hear the fluoride pump running.[81] Hoagland disabled the fluoride pump by pulling the plug.[82] Hoagland discovered the fluoride pump was operating at approximately 1:47 pm.[83]

Hoagland notified Campbell and Hanson of the fluoride pump malfunction.[84] In a series of text messages to Campbell, Hoagland wrote: "The fluoride pump was on at on paradise"; "OMG"; "I just came to check it. It was the only thing that made sence (sic)"; and "We overdosed them."[85]

Hanson responded to the PV Well, arriving within five minutes.[86] It was at this point that Hanson discovered the fluoride pump was set in the "hand" (manual) position when it should have been set in the off position.[87] Hanson also determined that 140 pounds of fluoride had been pumped into the system since the pump started running.[88] Hanson shut a valve where the pump injects fluoride into the pipe.[89] Hanson then started backflushing the well at a rate of over 3000 gallons per minute.[90] Backflushing was done to pull the tainted water back out of the system.[91]

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[74] *Id.*
[75] Ward Int. 6.
[76] Benham Int. 8.
[77] Hoagland Int. 11.
[78] *Id.* at 11-12.
[79] *Id.* at 12–13.
[80] *Id.* at 13–14.
[81] *Id.*
[82] *Id.*
[83] Hoagland Text Messages.
[84] Hoagland Int. 15; Hoagland Text Messages.
[85] Hoagland Text Messages.
[86] Hoagland Int. 17.
[87] Hanson Int. 5.
[88] *Id.*; *see* SCADA Weight Tank Chart, Ex. 1.
[89] Hoagland Int. 20.
[90] Hanson Int. 5.
[91] *Id.* at 6–7.

After Hoagland discovered the malfunctioning pump, Campbell notified Ellis.[92] At around 2 pm, Ellis notified Ward.[93] Upon learning of the malfunctioning fluoride pump, Ward reported he was aware that there was "a potentially very serious water quality public health event."[94] Ward identified the emergency response actions taken by the operations crew as follows:

> [B]efore I could ask the things that in my mind, that were of concern, Mike [Campbell] was saying, we're, Mike or Scott [Ellis] were saying, look we're, we've isolated it. We've been getting samples, you know, going around getting, you know, what we call rapid grab samples, you know, on PH and then grabbing fluoride samples to go around and try to figure out the limits of it and knocking door to door telling them we're going to flush. We're doing unidirectional flushings, so that's a term where you try to force the water one way and that was a good thing too, cause my fear is that they would just start opening hydrants and drag contaminated water into areas where it hadn't been. They understood to flush it back towards the well.[95]

Ward also directed Benham to start working on a model to help determine the geographical limits of the contamination.[96] But, Ward related he did not believe the model results were available until the following day.[97] On either February 7 or 8, Benham contacted a consultant to verify the water model results.[98] Benham explained that a later forensic model indicated that all contaminated water had been flushed out of the system by 4 pm.[99]

Now knowing that excess fluoride had been injected into the water, Campbell indicated the number-one priority was to flush the water out of the system.[100] Hanson and others opened various hydrants and Hanson closed valves in various locations in the system so that the flushing from the hydrants would be unidirectional flushing.[101] This was done to pull water from the affected area, which was determined based on the complaints.[102] According to Ward, unidirectional flushing was important in order to prevent over-fluoridated water from being dragged into an area where it hadn't been.[103] Campbell's crew flushed the water from about 2 pm until 4:30 or 5:00 pm.[104] By about 3:30 pm, the water pressure had dropped suggesting that the

[92] Campbell Int. 7–8.
[93] Ward Int. 6.
[94] *Id.* at 7.
[95] *Id.*
[96] *Id.* at 7–8.
[97] *Id.* at 8.
[98] Benham Int. 16–17.
[99] *Id.* at 11. Sandy Public Utilities Internal Water Trace Model, ER4881, is attached as Exhibit 2.
[100] Campbell Int. 9.
[101] Hanson Int. 6–7; Ward Int. 7.
[102] Campbell Int. 9–10.
[103] Ward Int. 7.
[104] Campbell Int. 10.

flushing was effective.[105] It was estimated that somewhere between about 180,000 and 300,000 gallons of water were flushed.[106]

At about 2:15 pm, Hoagland delivered the samples to the Metro lab.[107] [108] Hoagland remained at the lab for about a half hour while the samples were diluted and tested.[109] At that point, Hoagland learned that one sample showed a level of 104 mg/L of fluoride (approximately 25 times the primary MCL of 4 mg/L).[110] Thus, at around 2:45 pm, Public Utilities, through Hoagland, was aware of the fluoride MCL violation. In a February 16 email, Claudia Bauleth, Metro Laboratory Manager, reported that this result was obtained using a "portable operations instrument while the Laboratory instrument was unavailable."[111]

In a text message exchange between Ward and Ellis beginning at 2:28 pm, Ellis reported to Ward that he was "on hold with the water quality bureau [the Salt Lake County Health Department]."[112] In Ward's response, he directed Ellis to call him and also wrote: "Do we have fluoride concentration results? How far away the fluoride concentration it [sic]? Need to flush system ASAP. Have mikes [sic] guys ready to go door to door once we have info."[113] Ward reported that he verified through a conversation with either Ellis or Campbell that they (1) "isolated it," (2) were getting "rapid grab samples" on pH, (3) were obtaining fluoride samples, (4) were performing unidirectional flushing to force the water in one direction, and (5) were "notifying customers."[114] Ward reported: "In many ways, a lot of the things that they should be doing, they were doing text book."[115]

Hoagland returned to the [redacted] area and notified Campbell.[116] A crew of water operators and other employees, approximately 8-9 people, flushed the hydrants again.[117] While part of Campbell's crew was flushing the system, another crew was going door to door notifying people of the excess fluoride and instructing them to flush their homes.[118] Campbell and the water operators determined the area to be notified door-to-door based on the location of the individuals reporting illness.[119] Ellis added that knowledge of the water system, the location of the PV Well's connection to the system, the gravitational flow of the water, and that the water was originating from the treatment plant contributed to the decision.[120] However, Ellis didn't

[105] Hanson Int. 7.
[106] Ellis Int. 10; Benham Int. 14–15.
[107] Ellis was under the impression the samples were taken to the lab at 10:00 am. (Ellis Int. 6.) However, Hoagland actually delivered the samples.
[108] Hoagland Int. 21.
[109] *Id.* at 22.
[110] *Id.*; Ellis Int. 8.
[111] Email, ER4438.
[112] Ward Text Messages 4; Ellis Int. 7
[113] *Id.*
[114] Ward Int. 7.
[115] *Id.* at 7.
[116] Hoagland Int. 22–23.
[117] *Id.* at 23-24.
[118] Campbell Int. 10–11; Hoagland Int. 26–27.
[119] Campbell Int. 13–14.
[120] Ellis Int. 11.

decide the area of notification.[121] It was apparently left to the discretion of the employees on the scene. Ellis explained as follows:

> I didn't decide that. It was an, my involvement in it would have been to ask them for their opinion. They're the experts—the ones that understand the system best and so, in conversations with our engineering staff and looking at the system, and after, after they had been out flushing, isolating—they had shut off some valves. They had opened up hydrants on several different streets, so they'd been interacting with a few residents here and there and kind of explaining what was happening. And so that's, the notification was done that way and then door-to-door knocking on the areas where we knew the water in the house had been highly fluoridated.[122]

Approximately 24 homes were notified.[123] But, during a follow-up interview, Campbell related that no record was kept of who was spoken to and he did not know exactly how many homes were contacted on February 7.

After the flushing, Hoagland took two samples, one from the PV Well and one from a hydrant off of [redacted].[124] This was the extent of the February 7 follow-up sampling.[125] Hoagland field tested these samples at her office, and the results revealed fluoride levels of 0.78 mg/L at the PV Well and 1.04 mg/L at the hydrant.[126] Both of these levels are considered safe, with 0.78 mg/L nearly optimal.[127] [128] By the afternoon of February 7, Ellis felt like the problem had been taken care of.[129]

The Sandy City Public Utilities ERP provides a list of entities to be notified in the event of suspected or detected water contamination.[130] The first two entities listed are (1) "Division of Environmental Quality" and (2) "Salt Lake Valley Health Department."[131] Around 2:15 pm, Ellis notified the Salt Lake County Health Department ("SLCoHD").[132] Ellis did not notify the Utah Department of Environmental Quality ("DEQ"), Division of Drinking Water ("DDW") that afternoon.[133] Ellis explained as follows:

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[121] *Id.* at 12.
[122] *Id.*
[123] Ellis Int. 11.
[124] Hoagland Int. 24.
[125] Fluoride Results Table, ER6669.
[126] Hoagland Int. 24; Benham Int. 14.
[127] During his interview, Ellis noted that a new SLCO Health Department Health Regulation #33, which governs fluoride had gone into effect on February 7, 2019. (Ellis Int. 10.) "The Optimum Fluoride Level shall be 0.7 mg/L as established by the [Salt Lake County Health] Department." Salt Lake County Health Department Regulation #33 Fluoridation in Public Water Supplies, § 4.2. (The Health Department Regulation has been in effect since 2002; it has been amended several times including on Feb. 7, 2019.)
[128] Ellis Int. 9.
[129] *Id.* at 11.
[130] Public Utilities ERP 30–31.
[131] *Id.* at 31.
[132] Ellis Int. 7.
[133] *Id.* at 7.

> Just cause we were in a frenzy. I mean, I knew it needed, that the fluoride is regulated by the Health Department, and I knew that that was the first call we had to make. At that point, we were in emergency response mode and I was pulled away. To be honest with you, I thought that Mike [Campbell] had called the DDW that . . . afternoon. It turns out he called them the next morning. But, in my mind, I was calling the County and he was calling the State.[134]

At 4:48 pm, Ellis reported the following information to Jeff Hicken of the SLCoHD by text message:

> Fluoride overdose in Sandy
> Jeff,
> Preliminary sample results indicate about 104 mg/L
> 148 times the .7 ppm normal level
> All affected residents have been contacted and are doing well.
> The baby that went to the doctor yesterday is doing good today.
> I'll talk to you tomorrow with more information.[135]

By the end of the day, Ward's concern was to make sure that they had "gotten to every home."[136] Ward was informed by Campbell that they had "gone to every home."[137] But, at this point, the zones had not yet been identified. Moreover, as previously noted, no record was kept of who was contacted on February 7.

Ward reported that, on February 7, Mayor Bradburn was out of town and he was unable to get ahold of Matt Huish, Chief Administrative Officer.[138] Ward also reported that he attempted to contact City Attorney Bob Thompson by phone.[139] Eventually, at around 5:28 pm, Ward made contact with Chase Parker, a city attorney in risk management to notify him of the water incident.[140] At 9:00 pm, Ward sent a status update of the event to Huish and Eric Richards (Communications Director).[141] In that text message, Ward reported the following:

> Hi Matt just an update we identified what the problem was, isolated it and flushed out our pipes. It was a small pump mechanical failure that overdosed Fluoride into a very small area just south of [redacted] Our staff went door to door to tell people to flush their taps for a couple minutes and let them know the water is safe now. If after flushing they have taste or odor concerns they can call us.

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[134] *Id.* at 7–8.
[135] Ellis Text Messages.
[136] Ward Int. 8.
[137] *Id.*
[138] Ward Int. 81; Ward Follow-up Interview 17-18.
[139] *Id.* at 9; *Id.* at 18.
[140] Ward Follow-up Int. 17–18; Ward Text Messages 12.
[141] Ward Text Messages 1.

> Eric Richards just received a message asking if there was fluoride problem. Since it was a very small area (couple blocks at most) The water is safe and the only people in that locally area need to flush their tabs [sic] for a couple minutes but they should've been notified and done that already.

February 8, 2019 (Friday)

According to Benham, no new complaints about the water were received.[142] There were no additional Public Utilities work orders provided for water complaints for this date.

Ward reported that he arrived at work on February 8, 2019, between 9 and 10 am.[143] During a conversation with Ward following his second interview, Ward expressed concern that the fact he was backcountry skiing before work on the morning of February 8, 2019 would be misconstrued.[144] Ward emphasized that this did not impact his response to the events, explaining that he was in communication with staff about the response before his arrival at the City. Ward further explained that he was up very early working on this matter, even before heading out to ski, and the activity allowed him to clear his head and think more clearly about the issues. Ward added that he probably worked about 16 hours that day. Whether Ward's possible absence from the office on February 7 and late arrival time on February 8 adversely impacted the City's response could not be conclusively determined.

On February 8, 2019 at about 8:30 am, Campbell notified Ryan Dearing of DDW of the fluoride overfeed event, including that approximately 15 gallons of fluoride had been pumped into the system.[145] Ward reported that Ellis "told me at one point that he understood or had been told by the health department that they were notifying the State on Thursday but then he told me that he had notified the State himself, either he or Mike had, on Friday, the 8th."[146] As previously described, there was an apparent misunderstanding between Ellis and Campbell about the DDW notification.

In any event, the Division of Drinking Water was notified because there was a phone conference at around 9 to 9:30 am, with Marie Owens (Director of the Division of Drinking Water), Rachael Cassady, and Dearing of DDW. During this call, Campbell was informed that Sandy needed to notify the public of the event, but that DDW would prepare the public notice and get the notice to Sandy by 1:30 pm.[147] DDW also directed Campbell to continue flushing the system, which was done, and to conduct continued sampling.[148] Samples taken on Feb 8 showed slightly elevated levels of fluoride, around 1 to 1.2 mg/L, but Ellis stated: "We felt like . . . with continued flushing we would be able to get it back down to normal."[149]

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[142] Benham Int. 40.
[143] Ward Follow-up Int. 5.
[144] Ward Text Message 4.
[145] Campbell Int. 15.
[146] Ward Int. 23.
[147] Campbell Int. 16–17.
[148] Campbell Int. 17; Ellis Int. 12–13.
[149] Ellis Int. 13.

On the morning of February 8, Ward began looking into the State regulations.[150] Ward identified this as a Tier 1 event, the highest level of notice, and he was aware of a regulation requiring notice to the public within 24 hours of the event. (*Id.*) Ward stated:

> This is a Tier 1, you know, highest kind of category of notice. So I'm pulling that up and wanting to get the notice out because, less important that there's a regulatory requirement. More important, there's people out there. Now this is a real public health risk. I mean, if I have to prioritize the state regulat[ion] these are both very high, but people are drinking something potentially, that is causing them harm. I'd rather do the latter, you know, take care of the public health [then] deal with the regulations the second.[151]

Then, at about 11:00 am, Ward spoke with Owens about the public notice and was advised by Owens that DDW was working with the SLCoHD to prepare the notice for Sandy.[152]

Ward was contacted by a KSL reporter who inquired about going to the "pump station."[153] Ward did not recall the reporter's name.[154] Ward related that he checked with City administration for approval, which he received, and by the time he got back to the reporter, the reporter was no longer interested in going to the pump station.[155] At 12:48 pm, in a text message exchange between Ward, Mayor Bradburn, and others, Ward texted: "My delay worked out, the [sic] moved to a prop 3 story and said they're not running our story now and would call if they change mind."[156] Mayor Bradburn responded with "Well done!"[157] Ward explained that he "wasn't delaying on purpose."[158] Ward explained that the delay occurred because he was "actually booked all day" and he also needed to get the noted approval.[159] Ward stated that he would not "do tongue-in-cheek" in text anymore."[160]

During the late morning, a conference call was held involving representatives from Sandy, DDW, and the SLCoHD.[161] From Sandy, Ward, Ellis, Benham, Campbell, and possibly Abi Holt participated.[162] From DDW/DEQ, Owens, Ying Ying McCauley, and possibly Ryan Dearing participated.[163] Participants from SLCoHD possibly included Royal Delegge (Environmental Health Director), Jorge Mendez, and Jeff Hicken.[164] During this call, Owens indicated she wanted the notification area expanded beyond the 54 homes identified by Sandy.[165]

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[150] Ward Int. 8.
[151] *Id.*
[152] *Id.* at 8–9.
[153] Ward Int. 75; Ward Text Messages 15.
[154] Ward Second Follow-up Int. 3.
[155] Ward Int. 75; Ward Text Messages 15.
[156] Ward Text Messages 15.
[157] *Id.*
[158] Ward Int. 75.
[159] *Id.*
[160] *Id.*
[161] Ellis Int. 14–15.
[162] *Id.* at 14; Benham Int. 18.
[163] *Id.* at 14–15.
[164] Ellis Int. 14–15.
[165] Ellis Int. 16; Benham Int. 19.

Owens directed that the area be expanded by three times.[166] [167] According to Ellis, the area was expanded from 54 to about 83-85 homes.[168] Ward did not dispute that Owens directed that the notification area be expanded to three times its size.[169] But, Ward explained that he was under the impression the affected area was a couple dozen homes, maybe 25-30, and that they expanded the notification area to about 90 homes, which was about three times that.[170] However, in retrospect, Ward believes Owens wanted the notification area to be three times the 90-home area (270 homes) and that they probably should have enlarged the area to what was later identified as Zone 2.[171] Ward explained as follows:

> [W]hat I think she was thinking is, you know, we had thought, you know, what I'm hearing from Mike and, and Scott's team is, you know, it's a, it's a, just a couple dozen homes so 25, 30, homes and I'm thinking okay we're making it a lot bigger for a buffer area and so, and it ends up being about 90, about three times as big. What I hear Marie saying is she wants it three times as big but I think in her mind she was thinking from already 90 times three, right?
>
> That's—I haven't had a chance to talk to her. In the end, as we know, we probably should have gone to the, to the—like much larger. What ended up being Zone 2 after we got more information.[172]

Because no record was kept of the households notified during the initial notification on February 7, an exact number was not known and there was confusion about how many homes were visited, with estimates from one dozen, to two dozen, and up to around 60. At 2:05 pm, in an email from Ward to Owens and Dearing with a map included, Ward wrote: "We notified all the people in the shaded blue area door to door as noted."[173] The "shaded blue area" included 60 parcels.[174] There was also confusion regarding the size of the impacted area with reports of 25-30, 54, and 90 homes. At this point, there was no consensus on the size of the impacted area. As noted below, the February 8 Notice ultimately went out to an area later identified as Zone 1, which included 93 parcels / 85 homes.[175]

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[166] Campbell disputes that they were given this direction. (Campbell Int. 30.) Ellis also indicated he does not recall Owens specifying the amount of the increase in size of the notification area. (Ellis Int. 16.) Ellis stated: "There was no conversation of three times or double or a certain specific number. It was just expand it." (*Id.* at 20.) Benham also reported he did not recall direction from Owens to expand the are by three times its size, but Benham was not present for the entire conversation. (Benham Int. 18–20.)

[167] Ward Int. 19; DEQ Administrative Order ("DEQ AO") 3.

[168] Ellis Int. 20.

[169] Ward Int. 19.

[170] *Id.*

[171] *Id.*

[172] *Id.*

[173] Email, ER83, February 7 Notification Area Map attached as Exhibit 3; Fluoride Overfeed Map, DEQ AO, attached as Exhibit 4.

[174] *Id.*

[175] Ellis Int. 18; Ward Int. 21.

Also during this conference call, Owens reported that she expressed concerns about potential on-going metals contamination due to corrosion.[176] Benham did not recall this concern being raised during the call, only that Dearing sent information about this, which he received after this conference.[177] However, Benham noted that he was not present for the entire conversation.[178] Ward recalled that Owens reported these concerns, but that no direction was given to do any sampling.[179] Ward added that the response would have been the same—notify people to flush.[180] Ward explained as follows:

> She [Owens] mentioned that but she didn't mention to do any sampling or anything else. And, as I thought about that night and a couple times since and then many times after this whole thing, what, you know, what would I do—and this was my frame of mind, you know, as—okay, so what are we going to do if there's metals? Tell people to flush. As soon as I remove the, you know, as soon as I remove the acid, the fluoride, I don't have any corrosion. If I don't have any corrosion then I don't have any ongoing, you know, contribution of metals. So the, so the actions that we were doing even though we didn't have, you know, analytical data, lab data that said metals, what would we have done, you know, this is—I went quickly through my mind and I've gone through it many times before, the actions were the same. Tell people to flush their system. Period. That's, that's end of story. I mean, there's, there's no—now I didn't know, you know, I'm an a, I'm an engineer; I'm a water manager; I have water operators; I'm not a chemist; I'm not a public health official. So she didn't say anything else other than that's a concern. So, in my mind I'm thinking as an engineer, you know, okay, well, I remove the acid by flushing. The fluoride's gone. The acid's gone. And any metals that were residual, I flushed those out of the system also. So the public health issue has been resolved. What she didn't say and, maybe reading how she's talked about it since, what she should have said is let's tell them all about the metals or let's start sampling for the metals on these other areas. Now, in her defense, she was expecting to get the sample back sooner than she did . . . .[181]

Ward stated, "I do know that if a pipe is not exposed to corrosion anymore it's not going to continue to leach out metals."[182] Ward agreed that the over-fluoridation of the water could have

[176] DEQ AO 2.
[177] Benham Int. 20–21.
[178] *Id.*
[179] Ward Int. 35.
[180] *Id.*
[181] *Id.*
[182] *Id.* at 36.

caused leaching of metals during the time frame of the event, but the system had been flushed.[183] Ward specifically stated:

> So, so when she [Owens] mentions that it's—she's trying to give herself cover for what she didn't say. I want you to sample for—or I want, or it's a public health risk. What, what she actually said was, you know, that the—it could have caused leaching of, of metals during that timeframe. Well, I agree. But we've flushed the system. So I don't—if she wanted me to do something she should have asked me to do it. That's my point.[184]

Ward's understanding was that once the acidic condition was removed, the corrosion would stop and flushing the system would resolve the problem.[185] Ward believed Owens was possibly confusing the impact to home plumbing and appliances with the concern of metals being leached from the plumbing, explaining as follows:

> In hindsight, and I'll tell you in hindsight what should have happened. If she [Owens] would have just simply said, hey, let's do a notice and say you might also have, you know, in the original notice on the 8th? Let's put this paragraph in here. Let's, let's not—for some reason I think she was confusing impact to home plumbing and appliances. What she really should have put in is it may have also leached metals into to your drinking water supply for this short time period but flushing will not only address the fluoride and acidic issues but will—should flush out these metals.[186]

Ward related that the State did not ask Sandy to put information in the notice "about the leaching and public health risk."[187] Ward explained that DDW only included language about the claimed home plumbing issue in the notice but what should have been said was "[t]hat the high acidic levels from the fluoride may have corroded lead, copper and other metals to become soluble enter your home plumbing, you need to flush your systems."[188]

Based on when the malfunctioning fluoride pump was discovered, the 24-hour deadline for the public notice was about 2:00 pm on February 8, 2019.[189] Public Utilities, Ward and Ellis, did not receive the draft public notice from DDW until 4:36 pm.[190] The draft public notice was titled: "**DRINKING WATER WARNING**." Among other things, the Notice included: (1) a subheading: "DO NOT INGEST WARNING," (2) a paragraph warning of possible damage to home water systems caused by corrosive water (that can stem from the introduction of excessive

[183] *Id.*
[184] *Id.*
[185] Ward Int. 37.
[186] *Id.* at 38.
[187] *Id.* at 39.
[188] *Id.*
[189] Ward Int. 9.
[190] Email, ER81; Ward Int. 9.

fluoride into the system), and (3) health effects language regarding the acute health risk associated with high doses of fluoride.[191] During a later phone conversation at around 5:00 pm, Owens gave instructions that they could add to the notice but could not delete anything.[192] Ellis' understanding was the they could add to the notice but could not take anything out without notifying Owens.[193] Ward reported that his understanding was that they could use Sandy's own header for the document.[194] Ward stated:

> [S]he [Owens] says you guys can have your own, you know, as I heard it, your own header, and, and that's . . . what I was hearing. I don't know what her actual words were. So, as we were doing the Sandy Public Utilities in the tagline, in my mind I thought that was in my real estate.[195]

Several modifications were made to the notice, including the following two notable changes.[196]

First, the following language was removed from the notice: "Corrosive water may cause damage or irreparable impacts to the water system in your home including: pipes, hot water tanks, filters, and water softeners."[197] Ward acknowledged responsibility for this change to the notice, explaining his decision was "I'm going to take that out. Send it to me."[198] But, Campbell, Ellis, Benham, and Ward all reported being involved in and agreeing to the decision to remove this language.[199] Concerns were expressed that this language was unnecessarily alarming to people, premature, and may have gone beyond the scope of the regulatory requirement.[200] Benham indicated that because of the limited duration of the over fluoridation event, corrosion possibly causing damage to pipes was not anticipated to be a significant problem, if residents flushed their pipes as directed.[201] Benham emphasized that the corrosion issue did not apply to a discreet overfeed of fluoride.[202] Furthermore, Benham explained:

> If this corrosion is actually—if it is happening, which we don't believe it is, it's not an immediate thing. It's not like tomorrow that all their pipes are going to disintegrate and so we can come, we can follow-up if, if we do the study, we corrod[e]—whatever, then we can follow-up and say hey, we think we might have damaged your pipes. even if corrosion did occur, which was not believed to be a concern, this would not have caused immediate harm to pipes.[203]

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[191] February 8 Draft Public Notice ("Draft Public Notice"), attached as Exhibit 5.
[192] Ward Int. 14.
[193] Ellis Int. 26.
[194] Ward Int. 14.
[195] *Id.*
[196] Drinking Water Notice Redline.
[197] February 8 Draft Public Notice 2.
[198] Ward Int. 10.
[199] Campbell Int. 21; Ellis Int. 25; Benham Int. 27–28; Ward Int. 10.
[200] Ellis Int. 25, 61; Ward Int. 12.
[201] Benham Int. 22–25.
[202] *Id.* at 59.
[203] *Id.* at 26–27.

Because the notice was already 2-3 hours late from the State, Ellis felt the notice needed to be delivered as soon as possible.[204] Ellis emphasized that changes to the notice were not made to hide information or to deceive anyone.[205] Ellis stated:

> I want to say with regards to the information that was taken out of that public notice that—it—not Tom, nor I, nor Mike, nor Richard had any intention of hiding any information. The conversation was explicit in that, in that meeting. We addressed the fact they didn't—we would have to deal with this. We would have to notify the public once we had the accurate information. But this just was pre—this was premature at this point. We felt like this was unnecessarily alarming to everybody. There was never any intention to hide anything. Tom certainly did not have any intention and this was not Tom's decision on his own. We were all part of it. And Tom did the best, he did the best thing he could. It's the same—you looking back on it I wish we would have made a different decision but I still feel like the, the decision was a good one. And that might sound stupid to say but my point is we were . . . not trying to deceive anybody or disobey anybody or hide anything. It was just, you know, . . . in that moment with the set of circumstances in front of us that seemed like the best decision for us.[206]

Ward explained that household plumbing is designed to prevent corrosion and because of the limited duration of the exposure to the over-fluoridated water, it was "very unlikely" corrosion was going to be a problem.[207] Ward also noted that the State rules emphasize public health language.[208] Ward explained that his goal was to have the notice out by noon and now it was a little bit after 5:00 pm, and during that time people were using the water for washing, drinking, and preparing food.[209] Ward explained that he did not think the language about corrosion to plumbing should be included in the notice because: "(1) it's not public health, (2) I think it's wrong, (3) I think it's actually beyond the scope and authority of the Director of Drinking Water."[210] Ward expressed concerned about a further delay in getting the notice out if he were to engage in a debate with DDW about the language.[211] Ward expressed reluctance about including language he believed to be erroneous stating:

> So, my thought process is, look, . . . as I read the rule and, and I need to get this out for public health right now, even if I'm wrong, I would rather take a 5, 10, $20,000 fine for some, something there than put out what I very strongly believe is erroneous information

[204] Ellis Int. 26–27.
[205] *Id.* at 61–62.
[206] *Id.*
[207] Ward Int. 10.
[208] *Id.*
[209] *Id.*
[210] *Id.*
[211] *Id.*

> that would invite people to think that their home plumbing for 100 homes that we're gonna send this out to is all got to be redone.[212]

Ward explained that, secondary to public health responsibilities, he has "a fiduciary responsibility to . . . the other 100,000 people that . . . pay their water bill."[213] Ward expressed concern about the possible costs related to replacing home plumbing systems stating: "So if I'm gonna go in writing a bill for 20, 40, $50,000 for every home, we're talking seven figures, by sending out a notice saying I'm responsible for your plumbing."[214] Ward decided to remove the corrosion language, reasoning that if there was a plumbing issue created by the event, it could be dealt with at a later date.[215] Ward was upset because in his view, "the State had put people at risk, our Sandy residents."[216]

Second, the heading of the notice was changed. The headings "Drinking Water Warning" and "Do Not Ingest Warning" were removed from the public notice and replaced with "Notice of Recent Drinking Water Quality Event."[217] Ellis did not recall the removal of the do not ingest warning.[218] At the time, Benham was also not aware of this change to the public notice.[219] However, Benham explained that the notice was not intended to be a "do not drink" notice, instead its purpose was to tell people to flush their systems.[220]

Ward did not know when this language was removed, stating that it "was an oversight."[221] Ward related he "probably would have asked to tweak the language a little bit anyway," but the omission of the do not drink language was "not intentional."[222] Ward related the change was made by either him or his staff.[223] But, Ward acknowledged that he did the final proof of the notice and was responsible for the change.[224] Ward also explained that this was part of the header, which was within Public Utilities' purview to change.[225] Ward further explained that this was not intended to be a "do not drink" order, but instead a notice to flush home plumbing before drinking, stating: "we're doing a notice to flush your home and then drink your water not, not doing a 'do not drink' order to people."[226] Ward stated that, in hindsight, he would rewrite the language as "do not ingest until you've flushed your home."[227]

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[212] *Id.*at 11.
[213] Ward int. 11.
[214] *Id.*
[215] *Id.* at 10.
[216] *Id.* at 11.
[217] February 8 Public Notice ("February 8 Notice"), attached as Exhibit 6; Draft Public Notice 2.
[218] Ellis Int. 27.
[219] Benham Int. 27.
[220] *Id.* at 27.
[221] Ward Int. 12.
[222] *Id.* at 12.
[223] *Id.* at 13.
[224] *Id.*
[225] Ward Int. 14–15; *see supra* p. 18.
[226] *Id.* at 15.
[227] *Id.*

The health effects language in the notice addressed the effects of acute fluoride ingestion.[228] The public notice was sent out with the health effects language provided by DEQ.[229] The notice included the following health effects language:

> High doses of fluoride can cause abdominal pain, nausea, vomiting, excessive saliva, and muscle spasms. Of the homes potentially affected, 5 people reported one or more symptoms consistent with a high dose of fluoride.[230]

The February 8 Notice also included the following language related to flushing:

> If you have not already, for homes in the impacted area, we recommend that homeowners flush their system by running all taps for 30 minutes and purging all service lines and any appliances with water storage, including ice trays in refrigerators and water used for all pets.

The public notice with the changes incorporated was sent back to Owens and SLCO at 5:37 pm.[231] In the email with the revised notice, Ward wrote: "Here is our message being had [sic] delivered tonight to the larger area we discussed."[232] At 6:05 pm, Owens responded: "Thank you, Tom. I still need those field sample results sent to us so that I have documentation for why I didn't make it a current issue instead of notification of a past one. We all have someone higher than us."[233] Owens made no mention of the changes to the public notice. There were no other written communications between DDW and Sandy about the changes to the notice. According to Ward, Owens later said she thought the public notice "was a cover letter."[234] At 6:00 pm, Ward also sent the public notice to the City administration.[235]

The amended public notices were distributed to the area now known as Zone 1, which included 93 parcels / 85 homes.[236] The public notice was hand delivered during the evening to occupants of 68 of the 85 homes.[237] At the remaining 17 homes where nobody answered the door, the notice was left near the door.[238] The distribution of the notices was completed around 7:30 pm.[239] Ward reported: "when I sent the notice, you know, I made [it] explicit we need to be talking to every single person making sure that, you know, I need affirmative contact with every single household in this area [Zone 1]."[240] Ward related that his expectation was "that they would

[228] Ward Follow-up Int. 1–2.
[229] *Id.* at 2.
[230] February 8 Notice.
[231] Email, ER77; Ward Int. 18.
[232] Email, ER77.
[233] Email, ER4706.
[234] Ward Int. 12.
[235] *Id.* at 17; Email, ER503.
[236] Ellis Int. 18; Ward Int. 21; Map of Zone 1, ER97, 611, attached as Exhibit 7.
[237] Ellis Int. 20.
[238] *Id.* at 21.
[239] Campbell Int. 18.
[240] Ward Int. 23.

talk with every single household."[241] Also, before sending the notice out, Ward attempted to use the computer water model to assist with determining the notification area, but Benham was unable to get results from the model.[242] With regard to the water model results, Ward reported:

> I'm like, Richard . . . tell me where's the model, tell us we have a water quality model. He's like I can't get it to tell me anything. It says there's no results. I'm like well that's wrong, you know. He's like well, I can't get it to, to do that. I'm like well, okay, I'm going to talk to Scott and Mike 'cause that—I'm throwing that out until, until you give me model results that—there should be some results.[243]

Without being able to use model results, Ward relied on information from the team in the field regarding sample data and door to door contacts checking for water complaints, as well as reported illnesses and reports of taste and odor issues, to determine the size of the notification area.[244]

On February 8, Mayor Bradburn had returned and Ward attempted to contact him at his office a couple times, once in the morning and once in the early afternoon.[245] Ward was unsuccessful in contacting Mayor Bradburn until around 4:15 or 4:20 pm.[246] Ward had a brief conversation with Mayor Bradburn, as the Mayor was leaving.[247] Ward notified him of the events, describing the notification as follows:

> I spent probably no more than five minutes just like Mayor, we had potentially a super major disaster. We have, you know, we think a, a dozen or two dozen homes that got, you know, high levels of fluoride. Your water crews performed amazingly in terms of textbook just getting it identifying and containing it, flushing it out and by 4:30 yesterday afternoon we had the water system back close to normal levels. It could have been a major disaster. We're working with the State and the health department on the next phase is monitoring and flushing and notifying and stuff like that. Good to go. Anything else, you know, I'll let you know if anything changes. I mean it was—he was getting—heading out the door. I needed to get back down and see where the heck my notices from the State.[248]

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[241] *Id.*
[242] *Id.* at 18–19.
[243] *Id.*
[244] *Id.* at 19–20.
[245] Ward Int. 9, 80.
[246] *Id.*
[247] *Id.*
[248] *Id.* at 9.

Ward also later related that his immediate supervisor is Huish and he would generally first notify Huish.[249] As previously noted, Ward notified Huish by text message on February 7, 2019 at 9:00 pm.[250]

On February 8 at 5:34 pm, Dearing, DDW Environmental Scientist/Emergency Response, emailed Ward a copy of a report of a hyperfluoridation accident in Connecticut.[251] Then, at 11:00 pm, Dearing sent another email to Ward in which he referenced the "report of a kid peeing in a toilet and the water turning blue."[252] Dearing wrote "As in the attached report, my thought is that it is from copper that was stripped from the interior plumbing. This is why ongoing metals testing is important. The affected homes could have elevated levels of lead and copper."[253]

February 9-10, 2019 (Saturday–Sunday)

On February 9, 2019, Ward forwarded Dearing's emails to Ellis, Benham, and Campbell with the following included in the text of the email:

> Fyi. See Ryan's [Dearing's] notes below. This may be an action item we need to follow up on.
>
> Also on the issue of residential plumbing corrosion. I have started mapping out our action items to follow up on. Please jot down a list that we can review together. I am planning a event review late this week or early next, depending on what you all think. We can discuss when, attendees at staff meeting.[254]

When questioned about Dearing's email related to concerns about possible elevated levels of lead or copper as a secondary result of the over fluoridation of the water, Ward explained that the State was sending lots of information, but not giving him direction as to how to proceed.[255] As Ward received new information, he assessed whether it changed what need to be done.[256] Ward stated:

> [S]o at the time . . . what we had happening is they were sending us all kinds of information but not telling us what to do. I mean, if they wanted us to sample, if they wanted us to do X or Y, they weren't telling us, you know, anything different to do until that Thursday we got the lab results. I said oh, let's go monitor for lead and copper. . . . So, you know, as I'm reading Ryan's emails each of them I'm thinking how does it change what we're doing, right? So, he's talking about potential co—I read the one about, you

[249] *Id.* at 81.
[250] Ward Text Messages 1.
[251] Email, ER65.
[252] *Id.*
[253] *Id.*
[254] *Id.*
[255] Ward Int. 41–42.
[256] *Id.*

> know, copper and, and, you know, the one child peeing blue. I'm like, okay, that's not good. Okay, was that, was that copper, was that fluoride? Well, what do—I'm not sure. The State's not telling me what to specifically do but what I am doing is we're having them flush their systems, don't drink, flush the system, and we've restored the City system and if we restored and flushed theirs they should have clean drinking water. And any, anything that's causing the problems whether it's fluoride, copper, whatever should be gone. So, and, and if you look at the CDC action item lists and things like that we followed all of those. So I'm not getting any further direction. I'm getting information from the State but not telling me what to do with it. But I am thinking about that . . . I'm thinking, okay, what would I do differently? Well, I'm flushing the systems. I'm, I'm removing the public health risk and we're notifying them. When we got new information that we needed to go broader, we went broader.[257]

Benham reported that he took Dearing's comments seriously.[258] Benham also related they were taking the actions described in the articles sent to them by Dearing, stating; "That's exactly what the stuff he's sending us, we did exactly what it said to do."[259]

No additional sampling or flushing was conducted on February 9 or 10.

Campbell, who was listed as the contact on the public notice, received two calls on February 9 and one call on February 10 with questions related to the fluoride overfeed, but no reports of illness or bad tasting water.[260] Campbell related that the gist of the calls was to ask "if the water's safe to drink, you know, what's going on? Basically stuff like that."[261] Campbell added that one caller threatened a lawsuit about getting fluoride removed from "the water completely."[262] But, Campbell stated: "There were no more sick calls."[263]

At an unspecified time on February 9, Ward sent a text message to Ellis seeking to confirm contact with all residents.[264] Ward wrote: "Did we confirm contact w all residents to see if they're ok and they flushed service line?"[265] Ellis responded: "Yes."[266] With regard to this text message, Ward stated, "I sent a text to Scott, you know, I talked with Scott and what I'm trying to do here is clarify we had a miscommunication in terms of what getting fliers out to everybody and notice."[267] Ward explained as follows:

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[257] *Id.*
[258] Benham Int. 58.
[259] *Id.*
[260] Campbell Int. 22; Ellis Int. 23.
[261] Campbell Int. 22.
[262] *Id.* at 23.
[263] *Id.*
[264] Ward Text Messages 4; Ward Follow-up Int. 16–17.
[265] Ward Text Messages 4.
[266] *Id.*
[267] Ward Follow-up Int. 16.

> And the language I was using and what I was thinking in my head is, you need to talk to everybody. I mean, we have, and, so, so my, my text to Scott, did we confirm contact with all residents to see if they're okay and they flush service line. His answer, yes. So, I think, you know from the administration, the Mayor and the public, you know, means that, it seemed like, okay we didn't, well we did, we didn't, we left door fliers on doors when people weren't there. My point on this one is, I knew from day one we needed to make sure we talked to everybody. And we had a breakdown in our, you know, communication. Either Scott thought the same as I and staff were communicating it differently, or, um, and I think it's more the latter, I don't know. I haven't had a chance to talk with Scott or Mike or the staff. Um, but that, the way I justify as the manager, I'm like, okay, I knew what I wanted I, I was explicit but their condition for 30 years, you know, sending out fliers, they just leave them on the door. And, um, I'm not happy with it, but there you go.[268]

However, Ward reported he "was pretty clear, we need to talk to everybody."[269] Ward later stated he was "really upset they didn't go door to door."[270]

February 11, 2019 (Monday)

No new complaints were received about the water.[271] Public Utilities was still awaiting lab results for metals in the February 7, 2019 samples.

Ward reported that he checked with Campbell to verify that they got "ahold of everyone."[272] Ward related that Campbell's "answer was yeah."[273] However, Ward later learned that personal contact was not made at every home. Ward explained:

> But, and I don't know, to be honest, I . . . still don't even know if, if he was thinking the same as me and it was his staff that actually oh, no, we just left a flyer or he knew that they were just leaving flyers. I don't, I don't know at what level that miscommunication occurred. [274]

At 1:00 pm, there was another conference call with Sandy representatives, Owens, and SLCoHD.[275] During that call, Owens "instructed representatives of Sandy City to conduct 12 to 24 field analysis [sic] for fluoride and pH daily until the pending metals results returned from the

[268] *Id.* at 17.
[269] *Id.*
[270] *Id.*
[271] Benham Int. 40.
[272] Ward Int. 24.
[273] *Id.*
[274] *Id.*
[275] DEQ AO 3; Ellis Int. 30.

lab."[276] Ellis reported they complied with Owens' instructions, taking 12, or possibly more, samples.[277] Campbell also reported they took twelve to twenty samples a day, stating: "So we did. Every day. Twelve to twenty samples that whole week."[278] Benham also reported that, based on direction from SLCoHD, more flushing and sampling was conducted.[279] Hoagland was responsible for collecting samples.[280] Sandy's Fluoride Results table documented 9 samples on February 11, 12 samples on February 12, 11 samples on February 13, and 12 samples on February 14.[281]

February 12, 2019 (Tuesday)

Ward reported that, on February 12 in the morning, at a cabinet meeting, he had his first interaction with Mayor Bradburn since the February 8, 2019 notification.[282] At that point, Ward reported that the incident "was a bad event for the people involved but it could have been a lot bigger and we're monitoring it and . . . hopefully everything will work out."[283]

In the evening, at the City Council meeting, [redacted], who lives inside Zone 1, spoke during the public comments.[284] [redacted] reported that her neighbor, now known as [redacted] who resides just outside Zone 1, had suffered an illness and also had not received a notice.[285] [redacted] subsequently reported her complaints in an email the following day.[286]

February 13, 2019 (Wednesday)

At 6:57 am, Ward texted Benham and asked him to run the water model with specific parameters.[287] Ward wrote: "Richard – some questions came up last night. I need you to run model 1st thing this am. Put 100% dosing pump flow at the well pipe connection to T in [redacted] and show map with concentration plume at 12, 24 and 48 hrs."[288] Benham refined the model and reported that "I could see where some, some got out here, maybe over here and so we expanded it based off of that and based off of that complaint."[289] The water model run on February 13, 2019, showed fluoride concentrations exceeding 20 ppm may have reached to near the western boundary of what later became known as Zone 2, and some locations in Zone 3 (which had not yet been designated) may have experienced fluoride concentrations of 2 to 4 ppm (mg/L).[290]

[276] DEQ AO 3; Ellis Int. 31–32.
[277] *Id.*
[278] Campbell Int. 23.
[279] Benham Int. 15.
[280] Ellis Int. 32.
[281] Fluoride Results Table, ER6669.
[282] Ward Int. 80.
[283] *Id.*
[284] Ward Int. 24; Benham Int. 40.
[285] Ward Int. 24–25.
[286] Email, ER602.
[287] Ward Text Messages 12; Benham Int. 41.
[288] Ward Text Messages 12.
[289] Benham Int. 41.
[290] Email, ER599; Water Model Screenshot, ER600, attached as Exhibit 8.

Additional water model results were also received from Ridley Griggs of Hansen, Allen & Luce, Inc., ("Hansen Allen"), an engineering consultant.[291] First, at 11:56 am, Benham received an email from Griggs with a video of a water model simulating the fluoride event.[292] In Griggs' email, Griggs provided the following information regarding the model:

> Attached is a video from the model we made simulating the fluoride event that took place last week. The model begins just after midnight, early on Tuesday morning. It introduces the fluoride at the 16th hour of the simulation (4:00 PM on Tuesday) and stops at the 58th hour of the simulation (2:00 PM on Thursday). The simulation continues to hour 96 (late Friday night). I started the video at hour 16, right when the fluoride pump turns on. The video shows the concentration of fluoride in the system over time, and includes a legend that shows the concentration, with breaks representing the different MCLs we discussed.
>
> I will note that the model does not simulate any flushing that the city may have done after the problem was discovered, so results after hour 58 will not be accurate if the city flushed after this time. I did not attempt to model any flushing activity, because I am not aware of any specific details regarding how much flushing the City did, or did not, do.

Then, at 5:14 pm, Benham received an email from Griggs with an updated water model video simulation attached.[293] In this second email, Griggs reported that Hansen Allen "updated the hydraulic model to match the flow conditions and PRV settings during the time of the event" as discussed with Benham.[294] Griggs wrote: "This resulted in some fairly significant changes to the way water was moving in the system."[295]

At about 7:00 am, Ward had a conversation with Campbell about the distribution of the public notice.[296] Ward reported that he learned that personal contact had not been made at all residences, stating, "if someone wasn't there they left it [notice] on the door and didn't keep track of that."[297] As previously noted Ward related that, at some level, there was a miscommunication regarding what was expected of the notification process.[298]

Ward called [redacted] who resided at [redacted], just outside the Zone 1 notification area.[299] [redacted] reported that she drank copious amounts of water later "became

[291] Emails, ER4784, 4799.
[292] Email, ER4799.
[293] Email, ER4784.
[294] *Id.*
[295] *Id.*
[296] Ward Int. 23.
[297] *Id.*
[298] *See supra* p. 24–25.
[299] Ward Int. 25–26; Email, ER602.

bloated and experienced GI distress which lasted for 3 days."[300] Ward noted that [redacted] had continued to drink the water and she was now healthy again.[301]

Ellis related that "[t]he impact at one house is not the same as the impact at another house," and [redacted] reported drinking a lot of water, whereas others reported gagging and throwing up after just rinsing their mouths out.[302] Ellis reported that he estimated the fluoride levels at [redacted] home "were probably in the 4 to 10 parts per million range," rather than the 100 parts per million range found on [redacted][303] Ward related the State and CDC (Centers for Disease Control and Prevention) provide "guidance for different exposures and things like that, or sampling results, if you're below what they call a secondary level, the four milligrams per liter, the 2, you know, they actually say you can wait a long time before you notify anyone."[304] Ward explained that therefore:

> [W]e weren't . . . in an acute notification mode necessarily but we needed to let people know . . . to flush their systems also. But I wasn't in the . . . state of okay, these people are in a, in dire, dire health threat, however, I was in a mode of we've got to get these notices out right now in a larger area and so that was our modus operanda [sic] for, was that Wednesday, the 13th of February?[305]

In part, because of the reported illness just outside Zone 1, Ward decided they needed to double the size of the notification area and Zone 2 was created.[306] Ellis reported that Zone 2 included about 430 homes and related "in our minds this was way worst-case scenario if we go from [10980] to 114th to 17th to 20th East we are double or triple what could possibly have gotten any contaminant."[307] Ward acknowledged that, in hindsight, Owens was correct in suggesting a larger notification area.[308] Notices were distributed door to door in Zone 2.[309] Ward also reported that a primary purpose of the notification was "people that did not get notified in area one need to get notified by the media release and go door-to-door again with more (inaudible), you know, getting me a map, showing me on a map that you talked to Mr. Jones, that sort of thing."[310] Ward further explained this door to door notification had "cleaned up instructions made crystal clear you haven't done your job unless you've talked to somebody, right? Keep it on a map."[311]

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[300] Email, ER602; Ward Int. 25.
[301] *Id.* at 26.
[302] Ellis Int. 36–37.
[303] *Id.*
[304] *Id.* at 27.
[305] *Id.*
[306] Ward Int. 25–27; Campbell Int. 31; Ellis Int. 35; Benham Int. 41; see Maps of Zone 2, ER411, 612, attached as Exhibit 9.
[307] Ellis Int. 37–38.
[308] Ward Int. 40.
[309] *Id.* at 44.
[310] *Id.*
[311] *Id.*

At 5:13 pm, a reverse 911 notification went out to Zones 1 and 2.[312] The reverse 911 notification included the following message:

> This is a message from Sandy City Public Utilities. Following a power outage last Tuesday, a fluoride input device malfunctioned, causing an overfeed of fluoride into the water system in the small area from 10900 South to 11400 South, and 1700 East to 2000 East.
>
> Sandy City water is safe at this time; however, homeowners in this area should turn on their hot and cold water for 30 minutes each, to flush the water from their homes. For more information go to the Sandy City Public Utilities Department website. If anyone in your home has experienced nausea, vomiting, or diarrhea, please contact Poison Control at 800-222-1222.[313]

846 calls were made, with up to 2 attempts per number.[314] 253 successful calls were reported.[315]

Also in the morning, there was a meeting attended by Ward, Ellis, Chase Parker (Risk Manager), Robert Thompson (City Attorney), Robert DeKorver (Fire Department Battalion Chief), Jeff Mulcahy (Emergency Manager), Kim Bell (Deputy Chief Administrative Officer), Eric Richards (Communications Director), and others.[316] During that meeting, Richards suggested they consider getting the media involved.[317] But, no decision to make a press release was made in the meeting.[318] Richards did not think this decision could be made without Mayor Bradburn, Everton, and Huish (CAO), who were not in attendance.[319] Richards described the conclusion reached in that meeting as follows:

> The . . . decision was made that . . . as far as I knew, that Public Utilities was going to continue with their efforts, the personal contact, the letters, the expanded area. And then I was gonna work on, with the help of Kim, maybe what, a boilerplate, you know, media release would look like if we needed it, and some talking points. Just so that we were ready in the wings if we in fact were gonna have to have something ready to go, so.[320]

Richards, with assistance from Bell, worked on the release through the middle of the day.[321]

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[312] 911 Activation Summary Report No. 1, ER3180.
[313] Email, ER3180.
[314] 911 Activation Summary Report No. 1; Email, ER3213.
[315] 911 Activation Summary Report No. 1.
[316] Richards Int. 5–6.
[317] *Id.* at 5.
[318] *Id.* at 6.
[319] *Id.* at 7.
[320] *Id.* at 6.
[321] *Id.*

Ward reported that he wanted to make a media announcement but that it was not his decision not to do a media release, stating: "In my mind I wanted to send it out. It wasn't my call."[322] Ward related that it was his understanding that, throughout the day, staff was working on preparing a release and getting it out.[323] According to Ellis, Ward suggested they should make a media announcement, but the result of a meeting, which Ellis was not a part of, was that no media announcement would be made.[324]

Ward related that, around 4:00 pm, he was notified, possibly by Bell, that a decision not to make a media announcement came down from Deputy Mayor Everton.[325] Ward stated: "So, I mean, ultimately the media thing was not my call and I didn't feel like it was my authority to overturn the Deputy Mayor on that, so."[326] Ward further explained:

> I mean, they're . . . working on it and I . . . trust that they're, you know, and I . . . trust Evelyn's judgment. She's a very—she's a sharp person, understands media and politics and things like that. So I—and she's higher on the food chain than me so if the call comes from her then I'm gonna follow that.[327]

Ward stated: "The, the boss's deputy says we're not gonna do it. So, I, I don't know how else to say this. I'm not gonna trump my Mayor and his deputy on something like that."[328]

At 5:58 pm, Ward sent an email to the City Administration and others providing a status update on the incident and the day's events.[329] Included in the email Ward wrote:

> Members of City administration, Communications, Fire and Legal met today with Public Utilities to review additional outreach. We coordinated also with Utah Division of Drinking Water and Salt Lake County Health. We are focusing efforts on communicating directly with citizens in both the area that we know was directly impacted, as well as a newly expanded area. We discussed today the possibility of a broad media announcement, and decided to cancel that effort in order to avoid triggering panic beyond the impacted area. [330]

When questioned about concerns regarding creating a panic, Ward referenced this email and explained:

> My language there about we looked at doing a media release and decided not to, I should have let Evelyn write that. I was trying to

[322] Ward Int. 28–29.
[323] *Id.* at 28, 32.
[324] Ellis Int. 66–67.
[325] Ward Int. 28; Ward Follow-up Int. 11.
[326] Ward Int. 28.
[327] *Id.* at 31.
[328] *Id.* at 32.
[329] Email ER595.
[330] *Id.*

> give them cover and maybe I shouldn't have wrote the word panic but I wasn't—I was trying to get in their head why they didn't send it out. In my mind I wanted to send it out. It wasn't my call. So I don't—while I wrote the email to brief everybody on what's going on, my call would have been to get the media release out. So, in hindsight I'm like, oh, if I'm the Mayor, I'm saying like Tom, you could have choosen [sic] better words to frame what you did and yeah, but in the end I think you have to ask what Evelyn and others that made the call what they were thinking. I, you know, I, I can make an argument either way . . . you see what I'm saying? I can see, well, that's what I—that's what came down to me. Is didn't want to, you know, didn't want to send it out to the whole valley and have everyone, yeah.[331]

Ward later further explained:

> If someone were to rewrite it they might rewrite it differently and part of it was to say okay, I wasn't gonna write we—the other way I could have drafted this I could have said we wanted to send it out and the Deputy Mayor said no. No, that wasn't, I mean I'm the—part of my job as a team is just to, you know, okay, . . . to give them some cover and say.
>
> [Y]ou know, convey the truth but, but give, you know, part of how I operate is as a team is . . . not trying to stick any one person out there, you know?[332]

Ward related that, some later time–possibly February 18, Mayor Bradburn acknowledged that Ward was getting blamed for not making a media release even though it was not his decision, stating: "the mayor acknowledged that I was taking a lot of heat for something that in terms of the media release on Wednesday, you know, I was getting blamed for that when it was not my call."[333] Ward stated: "[The Mayor] says, hey, look, I understand on Wednesday, and you guys prepared a press release and the decision was made in my office, you know, with Evelyn, I'm not sure why, but made the call not to send that out."[334] Ward related that he was "not assigning blame," and that Everton was not making decisions in a void.[335] Ward also indicated he did not strongly protest the decision, stating: "[S]he [Everton] has the final call and the sensibility towards the broader media market and so, she makes the call and I'm supporting her in that. So, I'm not saying I was stomping my feet don't do that."[336]

Richards communicated with Everton by text message about the possible press release. According to Richards, Everton was concerned about creating widespread panic, but also wanted

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[331] Ward Int. 29.
[332] *Id.* at 33.
[333] Ward Int. 82; Ward Follow-up Int. 11.
[334] Ward Follow-up Int. 11.
[335] *Id.*
[336] *Id.*

to make sure that all those affected were notified.[337] Everton related that she questioned why a press release would be made if everyone in the affected area had been notified.[338] Everton related that she asked Richards "have we notified everyone in that area and he said yes, I think we have."[339] Everton related she did not tell Richards they were not going to send out the release, only that she stated, "why would we."[340] Everton stated: "I said I'll do whatever you guys want but if we've notified everyone directly do we need to send out a press release was my question."[341]

Communications between Everton and Richards were recorded in text messages. Everton wrote: "Have we communicated everything completely to residents who were affected?"[342] Richards responded: "We are in a meeting now to address this very thing. Thanks."[343] Richards followed that text with: "Might be good to be proactive and have them send out a press release to have media help get message out. We are crafting talking points."[344] The next text message was sent from Everton to Richards at 12:04 pm.[345] At that time the following text message exchange took place:

> Everton: Let me know. I'm not sure I want to make more press aware of it if we don't have to
>
> Richards: Ok, I will pass that along.
>
> Richards: We found that it may have impacted 390 homes. Before anything goes out, I will have Tom touch base with you.
>
> Everton: Ok. I'm open to whatever but it seems to me as long as we are communicating with those affected we don't need to create additional news stories
>
> Richards: Tom said he'd call you to update.[346]

Everton related that Ward did not call her.[347] Richards explained that, at the time of his text messages with Everton, he was with Bell, who was communicating with Ward and told Richards that Ward would contact Everton with an update.[348] Richards did not hear anything else about the press release that day.[349]

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[337] Richards Int. 7; Everton Text Messages.
[338] Everton Int. 4–5.
[339] Everton Int. 4.
[340] *Id.* at 5.
[341] *Id.*
[342] Everton Text Messages.
[343] Everton Text Messages.
[344] *Id.*
[345] *Id.*
[346] Everton Text Messages.
[347] Everton Int. 5.
[348] Richards Int. 9.
[349] *Id.* at 12.

Bell reported that, during her phone conversation with Ward, she told him it was her understanding there was not going to be a press release at this time.[350] Bell related that Ward thought there should be a press release.[351] Bell related she suggested that Ward should contact either Huish (CAO) or Everton directly and Ward responded that he would do that.[352] However, to Bell's knowledge, Ward did not reach out to either Huish or Everton.[353]

Everton related that, at the time of her communications with Richards, she did not know if this was an emergency situation.[354] Everton reported she did not know that anyone had gotten sick or of the 911 calls.[355] Everton explained her understanding was that only a small area was affected and that everyone in that area had been notified.[356] Everton reported she received a copy of the draft press release in an email but did not respond.[357] Everton did not recall if she read the draft press release.[358] Everton related that, in hindsight, she would have asked many more questions before making a decision.[359] Everton reported that she did not consult with the Mayor about the press release.[360]

On February 13, 2019, Sandy distributed a notice, with substantially the same content as the February 8 Public Notice, to a larger area, Zone 2.[361] In a February 13, 2019 email, Ward reported to Owens that the February 13 Notice was delivered door to door in the "larger area" [Zone 2] and included "revisiting the smaller area that we notified last Friday [Zone 1]."[362] Relatively minor changes were made to the February 8 Notice, including language specifying that both hot and cold taps should be flushed and that the County Health Code required Sandy to add fluoride to the water.[363]

In an earlier email to Owens, Ward attached the updated notice, as well as maps showing notification areas, and wrote "we are also taking a copy of last weeks [sic] flyer which you approved to the expanded notice area, with the addition to run all hot water taps for 30 minutes, then all cold water taps for 30 minutes."[364] In an email to Ward one half hour later, Owens did not mention the language that had been removed from the February 8 Notice and remained out of the February 13 Notice, but she did raise an issue regarding the notification area reflected in the map dated February 8 writing:

> Then is the second map with the yellow/green line dated 2/8 the zone that received the public notification on Friday. If so I am

[350] Interview of Kim Bell ("Bell Int.") 2.
[351] *Id.*
[352] *Id.* at 2–3.
[353] *Id.* at 3.
[354] Everton Int. 5.
[355] *Id.* at 13.
[356] *Id.*
[357] Everton Int. 4.
[358] Everton Int. 6.
[359] *Id.* at 14.
[360] *Id.* at 5.
[361] Email, ER592.
[362] Email, ER590.
[363] Email, ER592; February 13 Public Notice, ("February 13 Notice") attached as Exhibit 10.
[364] Email, ER610.

> somewhat confused because I thought I directed you to deliver it so [sic] that area shown on the first map.[365]

At some point, early on in events, it was decided that Campbell would be the point of contact for Public Utilities and Dearing would be the point of contact for DDW.[366] However, Ward reported that, on February 13, Owens was still upset that DDW had not received sample results.[367] Ward reported that he directed Campbell and Dearing to work out the communication issues.[368]

February 14, 2019 (Thursday)

On February 14 at 1:38 pm, Hoagland and Campbell received the Chemtech-Ford Laboratories ("Chemtech") report showing elevated levels of lead and copper in water samples taken on February 7, 2019.[369] Samples taken from [redacted]. and [redacted] showed elevated levels of lead and copper.[370] In the DEQ AO, Owens reported:

> Samples collected on February 7,2019, show lead levels ranging from 18.0 ug/L to 394 ug/L and copper levels ranging from 3,040 ug/L to 28,800 ug/L. These exceed the Lead and Copper Rule 90th Percentile Action Level of 15 ug/L for lead and 1300 ug/L for Copper.[371]

The Chemtech lab report confirms the noted ranges of lead and copper levels.

Campbell reported there was a delay in getting the lab results back for these metals because there was a mercury spill at the lab and the Metro lab employee who runs the metal samples was out of work due to a death in the family.[372] The Metro lab needed to send the sample to Chemtech to be analyzed.[373] However, the Chemtech lab report was not formatted correctly.[374] Elevated metal levels are normally flagged as red in color, but this report did not have the elevated levels in red.[375] As explained by Ellis, "Either the colors are right and the numbers are wrong or the numbers were wrong and the colors were right."[376] Hoagland reported she contacted Claudia Bauleth at the Metro lab, who confirmed the report was not formatted properly and then reached out to ChemTech.[377]

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[365] Email, ER3216; see Map of Zone 1, Ex. 7; Maps of Zone 2, Ex. 9.
[366] Ward Int. 50.
[367] *Id.*
[368] *Id.*
[369] Email, ER4471; Chemtech Lab Report, WO-19B0426.
[370] Chemtech Lab Report, WO-19B0426.
[371] DEQ AO 4 ¶ 11.
[372] Campbell Int. 23; Ellis Int. 31.
[373] *Id.*
[374] Hoagland Int. 36; Campbell Int. 23; Ward Int. 47-48.
[375] Hoagland Int. 36; Campbell Int. 23.
[376] Ellis Int. 33.
[377] Hoagland Int. 37–38.

Campbell was reluctant to forward the report with the incorrect format to DEQ because Dearing previously questioned him about fluoride results that had been submitted on a form for chlorine.[378] Campbell explained as follows:

> And so Ryan Dearing—and one of the reasons I didn't want to send them in is because I sent a fluoride—some fluoride results that we had taken in the field to Ryan Dearing—I think it was on the 13th . . . and the sheet we were using Karen had just scratched out chlorine at the top and put fluoride underneath so they'd know—well, obviously we were testing for fluoride because that's what the dang thing was. So, Ryan Dearing sends me an email and he says I'm assuming these are fluoride because she didn't scratch the thing out and write fluoride, she just—it said chlorine at the top and I go well, yeah, they're for fluoride just like all the rest of them I've sent you for the whole week.[379]

Benham reported that there is no copper or lead in the City's pipe system.[380] Benham further reported that the source of copper and lead in the water would be a home's plumbing system.[381]

February 15, 2019 (Friday)

At 9:57 am, Campbell sent the lab results showing elevated levels of lead and copper to Dearing via email.[382] The results were sent even though the discrepancy between the color and the numbers had not yet been resolved.[383] Campbell explained: "So, we get to the . . . metal sample and I, I told Karen, I says Karen I got to turn this in. I'm just going to send what I have."[384] These results were for samples taken on February 7. But, there was also a follow-up sample taken on February 15 from one of the affected homes, [redacted], that was found to have an elevated level of lead.[385] [386] Also attached to Campbell's email to Dearing, were, among other documents, (1) the results of February 13 pH testing, which showed pH levels for 12 locations ranging from 6.7 to 7.2, (2) fluoride residual sample results for February 13 for 11 locations ranging from 0.59 mg/L to 1.07 mg/L, and (3) fluoride residual sample results for February 14 from 12 locations ranging from 0.68 mg/L to 1.02 mg/L.[387]

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[378] Campbell Int. 25.
[379] *Id.*
[380] Benham Int. 59.
[381] *Id.* at 60.
[382] Email, ER276; Campbell Int. 26–27.
[383] Ellis Int. 33; Ward Int. 49.
[384] Campbell Int. 25.
[385] Ellis Int. 51; Chemtech Lab Report, WO-19B0739.
[386] In the DEQ Administrative Order, lab results for metals from samples taken on February 7, 2019 were incorrectly identified as being from water samples taken on February 15, 2019. (DEQ AO 4 ¶ 12; Chemtech Lab Report, WO-19B0739.)
[387] Email, ER276, pH Testing Results, ER280, [redacted] Fluoride Samples, February 14, 2019, ER282, [redacted] Fluoride Samples, February 13, 2019, ER283.

Ward reported that he did not learn until February 15 that they had received results showing elevated levels of metals.[388] At that point, Ward was aware that Sandy needed to make a notification about the metals exceeding the contaminant level.[389] Ward related that, unfortunately, they "didn't have results back saying that it'd since been cleaned."[390] Ward explained as follows:

> That would have been the best thing on that day. The 7th it was bad but then by the evening of the 7th it was good. It would have been really nice to have had and . . . I think . . . the State knew that but they hadn't communicated that's, you know, in hindsight that's where we should have been lining up in anticipation of the results. So, if we get high metals results it'd be really good to have results showing things are good right afterwards. That hadn't happened.[391]

Ward explained further:

> So, Friday we have now high results. We have to notify the public that we had those samples so we met and we did agree, and we had the health department that was there saying look, do we have a public health risk? Do we agree these are the results from before flushing the system on the 7th? Everything since then we don't have. We do not have new illness reports. We do not have new taste and odor complaints. All of our pH and fluoride sampling has shown everything's good so we don't have a immediate public health risk. So this is the conversation on Friday. However, So we're going to do a notification (1) to let people know that they have this—these other metals of concern. Second, the mayor was really concerned and at—well, he was upset. He was like you mean another thing's changed on me? You know. And justifiably so, right? And I, I guess, you know, in our world we—he was saying well I don't want to have any more changes. And I'm like, mayor, I can't guarantee that. He's like I don't want any more surprises. I'm like, well, okay, we're gonna do a notification and I'm going to make it super broad. It's going to be bigger than Zone 2 because I—he says I don't want to have anyone that had any exposure whatsoever of any fluoride or anything else. Now, so by that time we had a model that was getting better and better. The water quality model. Showed that you might have had a little bit of like a 2 to 4 part per million, which is a reportable event into east of 13th East. And that's a whole new pressure zone and kinda flows downhill so I'm like okay, mayor if you're wanting me to be really conservative and we're just doing a notice to flush and be

[388] Ward Int. 46.
[389] *Id.* at 49.
[390] *Id.* at 50.
[391] *Id.* at 50–51.

> aware let's go all the way down to 7th East of 114th to 106th, right?[392]

This new larger area was identified as Zone 3.[393]

According to Ward, the State agreed there was not an immediate public health threat, but did "point out" Sandy didn't "have results since then confirming that things are good. Specifically on metals."[394] Ward also related that according to the health department and Poison Control, there was almost no health risk associated with low level fluoride exceedances.[395] Ward stated: "So, we don't have an imminent health threat. We have a notification requirement under rule because now we're aware of it so we're dealing with that. Public Utilities was dealing with a notice requirement under the rule rather than an imminent health threat." *Id.* at 52–53.

At 1:20 and 1:25 pm, Hoagland collected follow-up samples from [redacted] and [redacted] respectively.[396]

At about 1:30 pm, in response to the results showing elevated levels of lead and copper, there was a meeting at Sandy City attended by Ward, Ellis, Campbell, Owens, Dearing, and possibly Abi Holt.[397] During the meeting, Owens indicated that she had not received various information.[398] Campbell contended that he had already sent the requested info to Dearing, who admitted he had not opened all his emails.[399] During this meeting Owens also indicated that Public Utilities had failed to increase the notification area to three times its previous size as requested.[400] Campbell disputed whether they were given this specific instruction.[401]

During the meeting, it was determined to expand the notification area and there was also discussion about holding a press conference.[402] According to Campbell and Ellis, Owens indicated she did not want to work on the holiday (President's Day weekend) and it was agreed to wait through the holiday weekend to receive the results and possibly make a press release.[403] However, a public notice needed to go out and Ellis initially reported it was distributed on Friday afternoon.[404] Ellis reported that, at about the same time the public notice was going out to Zone 2, "we got word from the DDW that a press release needed to happen immediately and that we had until 6:00 to do it ourselves. If we didn't do it ourselves . . . by 6:00 then the State was going to do it."[405] However, during a follow-up interview, Ellis reported that, according to his notes, there was no additional public notice distributed on February 15.

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[392] *Id.* at 51.
[393] *Id.*
[394] Ward Int. 51.
[395] *Id.* at 52.
[396] Chemtech Lab Report, WO-19B0739; Ellis Int. 50–51.
[397] Campbell Int. 27, 33; Ellis Int. 38–39.
[398] Campbell Int. 27.
[399] Campbell Int. 27; Ellis Int. 40; Emails, ER49, 276.
[400] Campbell Int. 30; DEQ AO 3.
[401] Campbell Int. 30.
[402] Ellis Int. 39–40.
[403] Campbell Int. 29; Ellis Int. 40–41.
[404] Ellis Int. 41.
[405] *Id.* at 42.

Ward reported that Owens told him the State wanted to do a press conference.[406] At about 5:30 pm, Mayor Bradburn, Ward, and Owens all participated in the press conference at Sandy City Hall.[407] During the press conference the following information was delivered: (1) water sample results from the previous Thursday showed high lead and copper levels, (2) it was believed that lead and fluoride were back within a safe range; (3) residents in the affected area, 106th South to 114th South and 20th East to 7th East, should flush their household water systems by flushing all hot and cold water taps for 30 minutes; and (4) information about the short and long term health effects of fluoride consumption. At 5:32 pm, DEQ posted the following message on its Twitter feed:

> BREAKING: High levels of lead and fluoride are present in Sandy City municipal drinking water in the aftermath of last week's storm. Efforts are being taken to mitigate the situation. For media contact @deqdonna.[408]

This was posted at about the same time as the press conference was occurring.[409] Ward reported he did not know about the content of this Tweet until the next morning, but described it as "misplaced" and "inaccurate."[410] Ward further described this Tweet as follows:

> And what they said, high levels of lead and copper in Sandy's drinking water! And I can't remember what else but it was like, okay, that's what they said. After we had agreed, you know, and I'm going to call that a [tweet] error because it was—it's not in the drinking water. It was in the drinking water for Zone 1, right? Maybe Zone 2.[411]

Ward stated: "The State screwed up in terms of—and they weren't willing to back away from their tweet."[412] Ward related that, during the press conference, DEQ Executive Director Alan Matheson left a voice message for him informing him of the tweet that the State sent out.[413] Ward described this as being "ex post facto" and stated: "I don't think I got the message until Friday or Saturday morning. Well, it was probably late Saturday when things—'cause things got, you know, boiled up and then down and."[414]

After the press conference, Water Operator Hanson noticed an immediate impact on the water supply caused by people flushing their home plumbing.[415] Hanson explained:

> Yeah, this is me looking at the Southeast tank, in particular, because that's the water tank that's feeding this water pressure

[406] Ward Int. 53.
[407] Ward Int. 54; Press Conference.
[408] DEQ Twitter Page, Feb. 15, 2019.
[409] Ward Int. 53.
[410] *Id.* at 53–54.
[411] *Id.*
[412] *Id.* at 54.
[413] *Id.* at 58.
[414] *Id.*
[415] Hanson Text Messages; Hanson Int. 21.

> zone. And I can see as soon as people in the media say to do something, everybody does it. And so it's kind of funny, like, well there it is. The public just, everybody's just, listened to exactly, you know what the media says, and everybody's just, everybody's flushing, and I can see the trending based on previous days' usage to that particular evening. I'm like, wow, there they go.
>
> . . .
>
> Yeah, and it's pretty immediate with our SCADA system. I can show, like the tank, it would be dropping like .12 feet per hour. All of a sudden, it's dropping like half a foot an hour. And it's within a 15 minute window. It's like everybody's watching the news. Everybody listened to the press conference. Everybody opens up their taps. It's just like all follows suit.[416]

Partially in response to concerns expressed by Mayor Bradburn and improved results from the water model, Ward decided to expand the notification area substantially to include Zone 3.[417] Campbell related the creation of Zone 3 was unnecessary, describing it as "just totally ridiculous" and stating: "We knew it wasn't … down there."[418] Benham related he learned of the expansion to Zone 3 after the fact and did not understand why the notification area was expanded to that size considering the location of pressure reducing valves and the natural dilution of the fluoride.[419] Benham stated: "[N]o model, no, no way, no how, could we ever get water down to this area."[420] Benham explained as follows:

> Some of these—this PRV right here is completely turned off, shut off. There are P—there are valves over here that open up as—and let water down through there as demands, but there's also water coming in this way and water coming in this way. So, a couple of these valves could have opened up but to travel from here to here with all the branches of the pipes it's diluted. In fact, I ran—when we ran the model up front, in another day after the, the event happens, all the fluoride dissipates without us even flushing.[421]

Later sampling revealed two locations in Zone 3 with elevated lead levels, [redacted] and [redacted] [422] But, in a February 21, 2019, email, Dave Gayer, Laboratory Director – Chemtech, wrote: "I think it's worth pointing out that even though these 2 locations have elevated lead levels, it's likely they have nothing to do with the Sandy incident."[423]

At 9:23 pm, a reverse 911 call was put out with the following message:

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[416] Hanson Int. 21.
[417] Ward Int. 51; *see supra* p. 36–37.
[418] Campbell Int. 30.
[419] Benham Int. 45–46.
[420] *Id.* at 46.
[421] *Id.*
[422] Email, ER1217.
[423] *Id.*

> This is a follow-up announcement about last week's fluoride incident in Sandy City.
>
> 1) Sandy City's water system is safe.
>
> 2) However, if you live between 700 E to 2200 E (Highland) and 10600 S to 11400 South and have not flushed your water system since Feb. 7th, please do so now.
>
> 3) Recently received lab results from last week's samples show that elevated levels of lead and copper were also present during the fluoride incident on Feb. 7th.
>
> 4) To flush your water system, start with running all hot water taps for 30 minutes, then run all cold-water taps for 30 minutes.
>
> 5) For more information please go to the Sandy City Public Utilities website.[424]

2,862 calls were made, with up to 2 attempts per number.[425] 988 successful calls were reported.[426]

February 16, 2019 (Saturday)

On the morning of February 16, 2019, Ward received a text message notification from DEQ Executive Director Matheson expressing concerns about the content of the message in the previous evening's press conference.[427] Matheson wrote:

> The Governor's Office and DEQ are concerned, however, with the message sent in the press conference and in the media that you believe the lead and copper levels have dropped and the water is safe. We understand that, in fact, there have been no test results confirming current levels of heavy metals. After changes in the water chemistry, such as occurred when the fluoride spiked, heavy metals can remain elevated for some time. The overriding consideration now is ensuring members of the public are not exposed to unhealthy water.
>
> Have you notified the schools in the area so the parents know the students may have been exposed to high levels of metals? Did the information you provided to the 600 homes clearly state that you don't know yet whether the water is safe? If not, and unless you have data confirming lead and copper levels meet drinking water

[424] Email ER3497; 911 Activation Summary Report No. 2.
[425] 911 Activation Summary Report No. 2.
[426] *Id.*
[427] Ward Text Messages 14.

> standards, you need to make it clear to affected residents that their water may still not be safe for consumption. If you don't, the state feels an obligation to do so. We stand ready to help in any way.[428]

Ward responded:

> We were thinking same thing this morning. Sandy City is preparing a press update we would like to share with you and deq before you send anything out so our message is coordinated. I will send our final copy within the hour so the state has it and we can coordinate.
>
> We hope to get confirmation lab results today. I'm waiting on an ETA. we agree a message would update is appropriate either way.
>
> After late night consultation with drinking water quality experts I want to emphasize is the home plumbing is the greatest concern as as our main pipe system does not have lead and copper while home plumbing does
>
> Agree lab results are what we need to confirm.
>
> Can you check if the state lab is able to expedite additional sample testing and provide sample bottles?
>
> We are starting home sampling today. We also started reaching out to schools last night.[429]

Ward related he disagreed that a do not drink order was needed and added: "We all disagreed yesterday, the health department. But I'm not going to sit here as a little peon in Sandy City and stand up next to the State and say you're full of them, you know, what gives? And maybe they know something we don't know."[430] According to Everton, Mayor Bradburn, Everton, Ward, Huish, and Thompson met, and a decision was made to issue a do not drink order.[431] Ward reported that Kim Bell worked closely with Eric Richards and Everton to get the no drink order out to the three zones.[432] Ward related that he only briefly reviewed the notice when requested.[433] In the morning, Ward also had communications with Mayor Bradburn, but Ward speculated Mayor Bradburn was "also hearing from Allan Matheson and others."[434]

The Emergency Operations Center ("EOC") was initiated and was in operation by late morning.[435] Water distribution stations and an emergency call center were established. Ward

[428] *Id.*
[429] *Id.*
[430] Ward Int. 57.
[431] Everton Int. 9–10.
[432] Ward Int. 59.
[433] *Id.*
[434] *Id.* at 81.
[435] Ward Int. 59.

related that his primary roles in the EOC related to managing sampling and communicating with the State and County.[436] One of the priorities was to get samples from schools in the area.[437] Ward related that he also wanted to have some training for the staff so there was some dependability in the sampling.[438] Ward related that he and Mayor Bradburn wanted samples taken from every home in the three zones.[439] Also, on this date, Ward assigned Tyler Shelley, Sandy Chief Engineer, to work with McCauley, DDW's head of engineering, to assure DDW received everything they needed or were required to get under the rules.[440]

Police officers and fire fighters were used to assist with going door to door notifying people.[441] Owens reported: "On February 16 ,2019, the Director worked directly with System representatives to create an updated public notice advising residents of the health effects of lead, copper, arsenic, manganese, aluminum and iron exposure."[442] Among other information, the notice included (1) a statement advising against drinking the water "until further notice," (2) health effects language for acute exposure to lead and copper, and short-term arsenic exposure, (3) information about effects of other metals found at high levels including manganese, iron, and aluminum, and (4) a statement that corrosive water may cause damage to a home water system.[443] But, hand delivery of the February 16 Notice was not completed until February 18, 2019.[444]

In a February 18 email from Bell to Owens, Bell wrote: "With respect to providing the hand delivered public notice from February 16, 2019 to homes within zones 1 and 2, this was completed today."[445] Bell verified that this was her understanding of when delivery of the February 16 Notice was completed.[446] Bell reported that the February 16 Notice was not finalized until late at night on February 16 and that it was not distributed on February 17, 2019.[447] At 10:19 pm, Bell sent an email to Owens with the notice attached.[448] Then, at 10:24 pm, Owens approved the notice, replying as follows: "Thank you, I have reviewed this and approve it as meeting your current public notice requirements when delivered to residents in Zones 1, 2, and 3. I acknowledge and authorize additional language after poison control has reviewed."[449]

Ellis was responsible for coordinating sample collection.[450] Ellis sent Campbell, Hanson, and Hoagland out to collect samples.[451] A training was also developed for city employees and

[436] *Id.* at 60.
[437] *Id.*
[438] *Id.*
[439] *Id.* at 60–61.
[440] Ward Int. 68.
[441] *Id.* at 59.
[442] DEQ AO 4 ¶ 14.
[443] February 16 Public Notice ("February 16 Notice"), attached as Exhibit 11.
[444] Email, ER215.
[445] *Id.*
[446] Bell Int. 6–7.
[447] *Id.* at 5–6.
[448] Email, ER352.
[449] Email, ER1233.
[450] Ellis Int. 49.
[451] *Id.* at 47.

volunteers for how to take samples.[452] Campbell was able to get ahold of the person who runs the Chemtech lab and arranged for the lab to open on Saturday to receive the samples.[453] Hanson assisted with sampling, including three public schools in the area, to test for lead and copper.[454] Campbell was also involved in collecting samples from February 16 through 18.[455] On the morning of February 16, 28 samples were taken across all three zones and provided to Chemtech that day.[456] Later in the evening, all of these samples came back negative for elevated levels of fluoride, copper, and lead.[457] At 11:06 pm, Hoagland received the initial lab report with results via email.[458]

At 2:30 pm, Campbell and Hoagland received an email notification with the lab results showing a high level of fluoride in a sample taken on February 7, 2019 as 151.5 mg/L.[459] At 5:37 pm, Campbell forwarded the email with the results to Shelley, who Ward had assigned to assure DDW received required information.[460] Hoagland reported she did not talk to anyone about these results because she "didn't have to."[461] Hoagland explained she "had already taken a zillion samples of the same house" and those samples were within the acceptable range.[462] Hoagland stated: "Once we flushed, and the fluoride was shut off and we flushed, everything was almost back to normal. By the end of that day."[463] Benham reported that the Public Utilities' response would be the same, whether the high level of fluoride was 104 mg/L or 151.5 mg/L.[464] Benham also pointed out that the average of the fluoride samples that yielded the high level of 151.5 mg/L was around 104 mg/L.[465]

Ellis learned of the fluoride result after it was forwarded to him by Campbell.[466] Ellis stated:

> I saw it, brought it to Mike's attention. And he . . . forwarded something. I was asking for a fluoride results, he forwarded it, and

[452] *Id.* at 49.
[453] Campbell Int. 35; Ellis Int. 49.
[454] Hanson Int. 11.
[455] Campbell Int. 52.
[456] Ellis Int. 52–53; Campbell Int. 35; Chemtech Lab Report, Amended WO–19B0748; Sandy City Fluoride Incident Response Map, ER1224, attached as Exhibit 12.
[457] Campbell Int. 35; Ellis Int. 52–53; Chemtech Lab Report, WO-19B0748; Amended Chemtech Lab Report, WO-19B0748. On February 18, 2019, Chemtech issued an amended lab report for these 28 samples. Chemtech reported the following changes to the report: (1) "The original report had some duplicate reporting of certain metals because multiple metals panels were logged in, and many metals existed in two different panels, sometimes using different methodology. This report removes the redundancy by removing the result from the technology that had the higher detection limit." and (2) "This report also lists the addresses of the homes sampled rather than simply the number on the bottle as was reported originally." (Amended Chemtech Lab Report, WO-19B0748.) Neither report included any flagged high level results.
[458] Email, ER4411; Chemtech Lab Report, WO-19B0748.
[459] Email, ER4438; MWDSLS Lab Report.
[460] Email, ER5699.
[461] Hoagland Int. 42.
[462] *Id.*
[463] *Id.*
[464] Benham Int. 35.
[465] *Id.* at 38.
[466] Ellis Int. 60.

> when I saw it, I asked him about it. And he said, what, I never even saw that. So that's when it was conveyed to . . . the State.[467]

Ellis related that "it's totally understandable that [Campbell] missed that email," explaining that Campbell and Hoagland "were in the busiest time of their careers, and 1,000 emails flying around everywhere."[468] DEQ reported that it did not receive this fluoride sample result until February 23, 2019.[469]

Ward related that on the weekend of February 16, everyone was busy responding to the event.[470] Ward related he "would give [Campbell] a little bit of a pass" because of the other issues they were dealing with.[471] Ward explained as follows:

> That timeframe my staff was tied up doing what was most important and so if Mike, you know, cleaning things up the following week didn't get that out 'til later that's okay. On the 6th—on the 20th that Wednesday, the reason for getting together at the health department, my staff, Tyler Shelley, the one that I assigned to do this, is to start creating a list of things that needed to get done, you know, and back to my level of priorities that I explained to you, number—now, not to say that regulatory isn't important but if I have to choose between taking care of public health versus regulatory, I'm gonna do the public health first if I had to make that choice and that's what we did that weekend, and then we sta—resurrected the regulatory stuff on that Wednesday, the 20th.[472]

On February 16, 2019, the lab results for the follow-up samples taken the previous day at [redacted] and [redacted] were received.[473] The sample from [redacted] showed an elevated level of lead, but not copper.[474] The sample from [redacted] was below the MCL for both lead and copper.[475]

February 17, 2019 (Sunday)

The EOC continued operation. Ward related that the sample results looked good, supporting that the no drink order could be lifted.[476] Ward had a conversation with Mayor Bradburn informing him that the data indicated things were looking good and that Ward thought the order should be lifted.[477] Then, there was a meeting with the EPA, DEQ, SLCoHD, and

[467] *Id.*
[468] *Id.*
[469] DEQ AO 4.
[470] Ward Int. 68–69
[471] *Id.* at 68.
[472] *Id.* at 69.
[473] Ellis Int. 50.
[474] Ellis Int. 51; Chemtech Lab Report, WO-19B0739.
[475] Chemtech Lab Report, WO-19B0739.
[476] Ward Int. 59–60.
[477] *Id.* at 61.

Mayor Bradburn.[478] At this meeting, there was a long dialogue about lifting the no drink order for Zone 3.[479] "[R]esults from 28 samples showed results below levels of concern."[480] The meeting included a discussion about the expectation that when lead and copper are sampled in home plumbing, it is anticipated that about 8 to 10% of the systems will show high levels.[481] Ultimately, a decision was made to lift the no drink order for Zone 3.[482]

On the morning of February 17, 2019, the "Do Not Drink Order" was lifted for Zone 3.[483] At 11:37 am, a reverse 911 call went out notifying residents that the no drink order for Zone 3 was lifted.[484] The reverse 911 call delivered the following message:

> This is a message from Sandy City Public Utilities. The No Drink Order is lifted for the area between 700 East to 1700 East and 10600 South and 11400 South; the area between 1700 East and 2000 East and 10600 South and 11400 South remains under a No Drink Order at this time.[485]

3,173 calls were made, with up to 2 attempts per number.[486] 1220 successful calls were reported.[487]

Public Utilities continued heavy sampling in Zones 1, 2, and 3, even though the no drink order for Zone 3 had been lifted.[488] A total of 192 sample results were received from Saturday's sampling, including the 28 previously mentioned.[489] One sample, from [redacted] in Zone 2, showed an elevated lead result.[490] As previously noted, Ward reported that it is expected that about 8 to 10% of samples will show high results.[491] At 6:46 pm in an email to Ward and Mayor Bradburn, Owens wrote: "Based on our review of this attached data I am comfortable with removing the Do Not Drink order for Zones 1 and 2 in Sandy City, effective immediately."[492] The remaining no drink order was lifted at around 7:00 pm.[493]

At 8:08 pm, another reverse 911 call went out notifying residents that the no drink order for Zones 1 and 2 was lifted.[494] The reverse 911 call delivered the following message:

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[478] *Id.*
[479] *Id.*
[480] DEQ AO 4 ¶ 15; Amended Chemtech Lab Report, WO-19B0748.
[481] Ward Int. 61.
[482] *Id.*
[483] DEQ AO 4 ¶ 15.
[484] 911 Activation Summary Report No. 3
[485] Email ER3497.
[486] 911 Activation Summary Report No. 3.
[487] *Id.*
[488] Ellis Int. 53.
[489] Ellis Int. 53–54; Chemtech Lab Reports, WOs 19B0748, 750–753; Sandy City Fluoride Incident Response Map, ER1190, attached as Exhibit 13.
[490] Ward Int. 63; Chemtech Lab Report, WO-19B0752.
[491] Ward Int. 61.
[492] Email, ER530.
[493] Ellis Int. 54.
[494] 911 Activation Summary Report No. 4.

> This is an update from the Sandy City Public Utilities Department. The No Drink Order is lifted for the area between 1700 East and 2000 East and 10600 South and 11400 South. This area encompasses approximately 600 homes. This decision was made in consultation with the DEQ and the EPA. For questions and latest updates go to the Sandy City Public Utilities website. The city's call center will be open Monday, Feb 18, 9 am-5 pm, at 801-352-4421.[495]

3,074 calls were made, with up to 2 attempts per number.[496] 1,132 successful calls were reported.[497]

At 8:32 pm, in an email to Bell in reference to the February 16 Public Notice, Owens wrote:

> Please note that although you were required to post the version I approved last night on your website you were also required to deliver it to the residents. If it was not hand delivered (and left if no one answered) then you still need to make sure that happens to all residents in Zone 1 and 2. I would also like to see you leave it prominently posted on your website for a few weeks.[498]

February 18, 2019 (Monday)

On February 18, 2019, a lengthy debriefing meeting was held to prepare for the town hall meeting that night.[499] Ward related that Mayor Bradburn, Everton, Thompson, Jeff Robinson (Senior Civil Attorney), CAO Huish, Ellis, and Ward attended the meeting.[500] As previously noted, Ward related that, while preparing for the town hall meeting, Mayor Bradburn told him that his understanding was that a press release had been prepared on Wednesday, but that the decision from Everton in his office was not to send out the press release.[501]

Hand delivery of the public notice from February 16, 2019 was completed to the homes within Zones 1 and 2.[502]

At 7:00 pm, a Water Quality Town Hall Meeting was held at Mt. Jordan Middle School, during which Ward presented a description of the event and Sandy's response.[503] The public expressed various complaints at this meeting regarding Sandy's response to the event.[504]

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[495] Email ER3497.
[496] 911 Activation Summary Report No. 4.
[497] *Id.*
[498] Email, ER 1233.
[499] Ward Int. 62.
[500] *Id.*
[501] *See supra* p. 31; Ward Follow-up Int. 11.
[502] Email, ER215.
[503] Water Quality Town Hall Meeting Minutes.
[504] *Id.*

February 19, 2019 (Tuesday)

On February 19, 2019, Ward worked with his staff and prepared a presentation regarding the events.[505] Ward hoped to present at the City Council meeting in the evening, but he was not given time to speak by the Council Chair.[506]

Water Model Results from Hansen, Allen & Luce Inc., for a February 19, 2019 run date, are attached as Exhibit 14.[507]

February 20, 2019 (Wednesday)

At about 7:00 am, Ward had a telephone conversation with Owens regarding responding to inquiries about the event.[508] Ward recognized that, even though the no drink order had been lifted, they were still in the monitoring phase.[509] Ward arranged a meeting with SLCoHD staff, McCauley (DDW), and Shelley (Sandy Chief Engineer) to review the questions they were receiving from the media and the public.[510] Ward worked on preparing a list of action items and attempted to arrange a meeting with Mayor Bradburn and CAO Huish.[511]

Ward was placed on administrative leave. After being placed on administrative leave, Ward had no further involvement in events.[512]

Additional Information

A Sandy City Fluoride Incident Response Map, which maps lab results as of February 22, 2019 at 4:30 pm, is attached as Exhibit 15.

As of February 22, 2019, Sandy was tracking the following addresses in relation to high sample results: (1) [redacted] (Zone 1) - fluoride, lead, copper, and other metals, (2) [redacted] (Zone 1) – fluoride, lead copper, and other metals, (3) [redacted] (Zone 2) – lead, (4) [redacted] (Zone 3) – lead, and (5) [redacted] (Zone 3) – lead.[513] [514] DEQ reported that, as of February 23, 2019, Sandy City "submitted to the Director over fifty (50) laboratory reports containing approximately 1,544 sample results, collected from a combination of 1,509 homes and schools. The Director has identified five homes that need further monitoring and or mitigation based on their sample results being above regulatory thresholds."[515]

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[505] Ward Int. 64.
[506] *Id.*
[507] Hansen Allen Luce Calibrated Water Model, ER319, 4881.
[508] Ward Int. 65–66.
[509] *Id.*
[510] *Id.* at 66.
[511] *Id.*
[512] Ward Int. 66.
[513] High Results Tracker, February 22, 2019, ER5910.
[514] Sandy also identified [redacted] as having other metals results exceeding MCLs, but those elevated results did not include fluoride, lead, or copper, and [redacted] as approaching the action level for lead. (High Results Tracker, February 22, 2019, ER5910.)
[515] DEQ AO 4 ¶ 18.

INVESTIGATION FINDINGS – SANDY CITY

I. OPERATIONAL RESPONSE

While a confluence of unusual circumstances may have delayed the discovery of the malfunctioning fluoride pump until the morning of February 7, 2019, the operational response of Sandy Public Utilities "to the fluoride overfeed and subsequent high lead and copper readings was generally within normal industry standards." (*See* Merrick & Company Memorandum Re: Assessment of Operational and Technical Response by Sandy, Utah Fluoride Overfeed Event in February 2019 ("Merrick Report"), attached hereto as Addendum 1, at 5.) However, the initial public notice efforts, if deemed part of the operational response, could have been improved.

As a result of a suspected power issue related to a severe storm, the fluoride pump began pumping fluoride around 6 pm on February 5. Then, because of the snowstorm, non-essential City employees were given the day off on February 6. Water Operator Hanson, whose responsibility it was to conduct daily checks of the PV Well, was released and did not conduct a check of the PV Well on February 6. Had that check been conducted, it is likely Hanson would have discovered that the fluoride pump was malfunctioning a day earlier than Public Utilities employees became aware of the malfunction.

The Merrick Report includes the following:

> It could be said that the initial response was reaction based and did not fully follow the ERP [Sandy Public Utilities Emergency Response Plan]. It is our opinion that if the Emergency Response Plan had been followed more closely, the operational and technical response by the City of Sandy would have been more organized, which could have identified issues quicker and notified the public in a more timely manner. Increased sampling in areas surrounding the initial area could have reduced the need for confusion on the number of zones affected, the notification procedure, and communication within the utility. This, in conjunction with timely results from the water model, would have narrowed the focus area, and potentially reduced confusion to the public, utility staff, and the state.
>
> It is a concern that there was delay in getting notification out to the affected households for a "Do Not Ingest" warning, particularly when there were confirmed reports of the acute illnesses resulting from the fluoride overfeed. No reverse 911 calls were made in the initial response and the "Do Not Ingest" warning was removed from the initial public notice.[516]

For more details regarding the assessment of the City's operational response, refer to the attached Merrick Report.

[516] Merrick Report 5–6.

II. REGULATORY RESPONSE – NOTICE REQUIREMENTS

A. Regulatory Background: Public Notice Tiers and Maximum Contaminant Levels.

Rule R309-220 Monitoring and Water Quality: Public Notification Requirements of the Utah Administrative Code ("UAC"), titled Monitoring and Water Quality: Public Notification Requirements, sets forth the public notification requirements for public water systems for rule violations, including maximum contaminant level ("MCL") violations. "Public notice requirements are divided into three tiers, to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved."[517] A Tier 1 public notice—the highest level of public notice in the three tiers—is "required for UPDWR[518] violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure."[519] UPDWR violations include violations of the MCL.[520]

The primary MCL for fluoride is 4.0 mg/L.[521] Exceedances of the primary MCL can have human health effects. The secondary MCL for fluoride (which addresses the aesthetic quality of the water) is 2.0 mg/L.[522] Exceedances of the secondary MCL are characterized as "likely [to] cause consumer complaint."[523]

Typically, a violation of a primary MCL for fluoride would trigger Tier 2 notice obligations.[524] Tier 2 Public Notices must be provided "as soon as practical, but no later than 30 days after the system learns of the violation."[525] Notably, violation of the secondary MCL for fluoride would trigger a special notice obligation.[526]

Certain MCL excursions (not related to fluoride) can trigger a Tier 1.[527] Tier 1 notification is also required if the circumstance has "significant potential to have serious adverse effects on human health as a result of short-term exposure, as determined by the [DDW] Director either in its rules or on a case-by-case basis."[528] A Tier 1 notice must be provided "as soon as practical but no later than 24 hours after the system learns of the violation."[529]

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[517] UAC R309-220-4(2).
[518] "'UPDWR' means Utah Public Drinking Water Rules (R309 of the UAC)." (UAC R309-110-4.)
[519] UAC R309-220-4(2)(a).
[520] UAC R039-220-4(1).
[521] *See* UAC R309-200-5(1).
[522] *See* UAC R309-200-6.
[523] *Id.* at Table 200-7.
[524] *See* UAC R309-220-6 (indicating all violations of the MCL require Tier 2 notices unless those violations are characterized as Tier 1).
[525] *Id.*
[526] *See* UAC R309-220-11 (establishing if there is an exceedance of the secondary MCL but the quality is still less than the primary MCL, the notice must follow the general obligations for Tier 3, be provided as soon as practical but no later than 12 months from the day the water system learns of the exceedance and include the specific health effects language identified in the rule for excursions of the secondary MCL).
[527] *See generally* UAC R309-220-5(1).
[528] *Id.*
[529] *Id.*

There are no MCLs for lead and copper. Lead and copper are governed by action levels that, if exceeded, trigger compliance obligations.[530] The action levels are characterized as exceedances of specified values (15 parts per billion lead and 1300 parts per billion copper) in more than 10 percent of the samples for which monitoring is required (referred to as the 90th percentile).[531] The monitoring obligations are also specific and generally apply at the tap; corrosion control is integral to compliance with the lead and copper rule.[532] There are consumer notice obligations for all water sample results (even if the results do not constitute more than 10 percent of the samples for which monitoring is required). For example, DDW maintains that, if there are exceedances of the action level at a single location, the system must notify consumers at that location of the results within 72 hours of learning of them.[533] DDW provides specific consumer notice forms for use by public water systems.[534] System noncompliance can require, among other things, detailed public education and supplemental monitoring requirements.[535]

B. Tier 1 Notice Was Required.

Here and in the context of the reported illnesses, Public Utilities has not disputed that the fluoride overfeed triggered a Tier 1 public notice.[536] On February 7, 2019, a preliminary lab test of a water sample taken from the area of the event revealed a fluoride concentration of 104 mg/L. A subsequent lab report for four samples taken on February 7, 2019 revealed fluoride levels ranging from 43.2 mg/L to 151.5 mg/L. People reported illnesses connected to the fluoride overfeed, indicating a "significant potential to have serious adverse effects on human health as a result of short-term exposure." Moreover, Ward identified this as a Tier 1 event and Director Owens, during consultation with Ward and other Public Utilities employees, required "a specific

[530] DDW has alleged (in the Administrative Order issued on March 4, 2019) that certain samples exceeded MCLs including those for arsenic, iron, manganese and aluminum. Those issues are not further addressed in this report since it is our understanding that the primary focus of the response effort and, correspondingly, this investigation, was on fluoride MCL exceedances and the lead and copper action level exceedances.

[531] UAC R309-200-5(1).

[532] *See generally* UAC R309-210-6.

[533] The exact time frame for reporting noncompliant lead results to the user associated with the sample location is identified on a flow chart linked from the DDW webpage and was not specifically located in the rule provisions. In turn, the consumer notice form appended to the DEQ AO (which differs from the form posted on the DDW website) states that system-wide exceedances of the action level (the 90th percentile result) must be reported to the consumer at the sampling locations within 48-hours.

[534] (*See* https://documents.deq.utah.gov/drinking-water/rules-implementation/lead-and-copper-rule/DDW-2017-003258.pdf.) The lead and copper information on the DDW website was updated on or around February 25, 2019; this information reflects website content that post-dates those updates.

[535] *See generally* UAC R309-210-6(7) and R309-220-15(28) (standard health effects language for lead).

[536] The circumstances suggested that the reporting obligations are covered by at least two of the Tier 1 thresholds. First, the identification of the illnesses has been presumed to be sufficient to concur that Tier 1 notice was triggered (although technically that notice may not be mandatory unless the water quality-related effects on human health were deemed as significant "in the short-term"). Second, the Tier 1 reporting requirements are also tripped by "a chemical spill . . . into the source water that significantly increases the potential for drinking water contamination." (UAC R309-220-5(1)(g).)

written public notification . . . to be delivered to impacted residents within 24 hours."[537] Accordingly, this event was appropriately deemed to trigger a Tier 1 public notice.

C. Regulatory Background: Tier 1 Notice - Content, Timing, and Delivery.

1. Tier 1 Notice Content Requirements

UAC Rule R309-220-8(1) sets forth the following required contents of a public notice:

> (1) When a public water system violates a UPDWR or has a situation requiring public notification, each public notice must include the following elements:
>
> > (a) A description of the violation or situation, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);
> >
> > (b) When the violation or situation occurred;
> >
> > (c) Any potential adverse health effects from the violation or situation, including the standard language under paragraph (4)(a) or (4)(b)[538] of this section, whichever is applicable;
> >
> > (d) The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;
> >
> > (e) Whether alternative water supplies should be used;
> >
> > (f) What actions consumers should take, including when they should seek medical help, if known;
> >
> > (g) What the system is doing to correct the violation or situation;
> >
> > (h) When the water system expects to return to compliance or resolve the situation;
> >
> > (i) The name, business address, and phone number of the water system owner, operator, or designee of the public water system as a source of additional information concerning the notice; and
> >
> > (j) A statement to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under paragraph (4)(c) of this section, where applicable.

[537] DEQ AO 2–3 ¶ 5(b)(iv).

[538] Subsection 4(a) provides: "Standard health effects language for MCL or MRDL violations, treatment technique violations, and violations of the condition of a variance or exemption. Public water systems must include in each public notice the health effects language specified in R309-220-14 [actually 15] corresponding to each MCL, MRDL, and treatment technique violation and for each violation of a condition of a variance or exemption."

UAC Rule R309-220-8(3), which governs "[p]resentation of the public notice" provides in part:

> (a) Each public notice required by this section:
>
> (i) Must be displayed in a conspicuous way when printed or posted;
>
> (ii) Must not contain overly technical language or very small print;
>
> (iii) Must not be formatted in a way that defeats the purpose of the notice;
>
> (iv) Must not contain language which nullifies the purpose of the notice.

Additional content requirements are set forth in Rule R309-220-8(4), which provides in part:

> (a) Standard health effects language for MCL or MRDL violations, treatment technique violations, and violations of the condition of a variance or exemption. Public water systems must include in each public notice the health effects language specified in R309-220-14 [health effects language is actually found in R309-220-15] corresponding to each MCL, MRDL, and treatment technique violation and for each violation of a condition of a variance or exemption.
> . . .
>
> (c) Standard language to encourage the distribution of the public notice to all persons served. Public water systems must include in their notice the following language (where applicable): "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."

The standard health effects language for an exceedance of the MCL for fluoride is found in Rule R309-220-15(27), which provides:

> Fluoride. Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL or more may cause mottling of children's teeth, usually in children less than nine years old. Mottling, also known as dental fluorisis, may include brown staining and/or pitting of the teeth, and occurs only in developing teeth before they erupt from the gums.

Finally, Rule 309-220-05(2) includes additional notice requirements for Tier 1 public notices. R309-220-5(2)(c) provides:

> *Comply with any additional public notification requirements* (including any repeat notices or direction on the duration of the posted notices) *that are established as a result of the consultation with the Director.* Such requirements

may include the timing, form, manner, frequency, and content of repeat notices (if any) and other actions designed to reach all persons served. (Emphases added.)

2. Tier 1 Notice Timing Requirements.

Rule 309-220-5(2) sets forth the timing requirements for a Tier 1 public notice and notice to DDW. Rule 309-220-5(2) provides in part:

> (a) Provide a public notice as soon as practical but no later than 24 hours after the system learns of the violation;
>
> (b) Initiate consultation with the Director as soon as practical, but no later than 24 hours after the public water system learns of the violation or situation, to determine additional public notice requirements.

3. Tier 1 Notice Form and Manner Requirements.

Tier 1 public notice. For a Tier 1 violation, "[p]ublic water systems must provide the notice within 24 hours in a form and manner reasonably calculated to reach all persons served."[539] Rule 309-220-5(3) further provides:

> The form and manner used by the public water system are to fit the specific situation, but must be designed to reach residential, transient, and non-transient users of the water system. In order to reach all persons served, water systems are to use, at a minimum, one or more of the following forms of delivery:
>
> (a) Appropriate broadcast media (such as radio and television);
>
> (b) Posting of the notice in conspicuous locations throughout the area served by the water system;
>
> (c) Hand delivery of the notice to persons served by the water system; or
>
> (d) Another delivery method approved in writing by the Director.

D. <u>February 8 Public Notice.</u>

1. Content Requirements - February 8 Public Notice.

The Public Notice issued on February 8, 2019 likely did not meet the regulatory notice content requirements primarily because it did not comply with "additional public notification requirements . . . established as a result of the consultation with the Director."[540] Director Owens included a "Do Not Ingest Warning" in the draft public notice, which was removed despite her

[539] UAC R309-220-5(3).
[540] *See* UAC Rule R309-220-5(2)(c).

instructions that information could only be added to the draft notice, not deleted. This change altered the tenor and principal message approved in the draft notice.

Director Owens provided a draft public notice titled: "**DRINKING WATER WARNING**." Owens gave instructions that information could be added to the draft notice, but not deleted. Ward's erroneous understanding was that changes could be made to the heading of the document. Public Utilities made several changes to the notice. Despite Owens' instructions, information was deleted from the notice, including two notable deletions: (1) the removal of the "drinking water warning" and "do not ingest warning" language, and (2) the removal of the paragraph warning of possible damage to home water systems. Each of these changes will be addressed in turn.

First, with regard to the removal of the do not ingest and drinking water warnings, it was unclear who actually removed this language, but Ward acknowledged responsibility for these changes. Ward reported that the removal of this language "was an oversight" and "not intentional." Ward also explained that they were "doing a notice to flush your home and then drink your water . . . not doing a do not drink order to people."

Regardless, the "Drinking Water Warning" and "Do Not Ingest Warning" were replaced with "Notice of Recent Drinking Water Quality Event" and a description of the affected area and date range. The removal of this language from the title and subheading and replacement with the noted language substantially changed the character of the notice. Moreover, the removal of this language may have, at least partially, nullified the purpose of the notice, as prohibited by Rule R309-220-4(3)(a). At minimum, the purpose of the notice was to warn people not to ingest until they had flushed their home plumbing. Considering Director Owens' instructions and the impact the removal of this language had on its principal message, it would have been appropriate to consult with Owens before removing this language as it had essentially been set forth as a public notification requirement by Owens.

Second, the following sentence was removed from the notice: "Corrosive water may cause damage or irreparable impacts to the water system in your home including: pipes, hot water tanks, filters, and water softeners." Ward and his staff, Ellis, Benham, and Campbell, all agreed on the removal of this language from the notice. Ward, Ellis, and Benham identified several reasons for the removal of this language.[541] Ward also essentially explained that he believed Owens may have been confusing concerns related to the damage to home plumbing caused by corrosive water addressed by this sentence with potential health effects associated with the leaching of metals from pipes caused by the corrosive water. Ward related that the State did not ask Sandy to put information in the notice "about the leaching and public health risk."[542]

Owens was not consulted about this change because of concerns about a continued delay in getting the notice distributed. The 24-hour deadline for distributing the public notice had already passed and Ward was concerned that people were continuing to use water that may not have been flushed out of their home plumbing systems. Ward decided to remove this language

[541] *See supra* Investigation Summary 18–20.
[542] *See supra* Investigation Summary 17.

reasoning that, if there was an issue with damage to home plumbing, it could be dealt with in the next week or two.

The decision to remove this sentence may be mitigated somewhat by the reasoning behind the decision to remove it. The sentence does not warn of the risk of secondary contamination of lead, copper, or other metals due to leaching and the associated health effects. The sentence warns of "damage or irreparable impacts to the water system in [an affected] home." Even so, based on Owens' direction, it would have been a better approach to consult with her before removing this sentence rather than removing it without further consultation.

Ward did not dispute that there was a valid concern about metals such as copper and lead being leached from home plumbing—a concern which was borne out by lab results received a week later showing elevated levels of these metals in the samples from February 7. Accordingly, it would have been prudent to include language warning of additional contaminants of concern in the public notice. However, DDW did not include any language warning of this concern in the draft notice it provided. Nor did Sandy Public Utilities include any language warning of this concern in the February 8 Public Notice that was distributed. Under UAC Rule R309-220-14(1), the DDW Director is allowed to "give the notice required by this rule on behalf of the owner and operator of the public water system if the Director complies with the requirements of this rule." However, "[t]he owner or operator of the public water system remains responsible for ensuring that the requirements of this rule are met."[543]

In mitigation of Ward's failure to comply with Owens' instructions by failing to consult with her before sending out the revised public notice, the revised notice was sent by email to Owens about an hour after the draft was provided to Public Utilities. About 30 minutes later, Owens responded simply "Thank you, Tom," and renewed a request for field sample results. In that response, Owens did not express any disapproval of the changes made to the notice.

Finally, as previously noted, the February 8 Notice included health effects language regarding the acute health risk associated with high doses of fluoride. The notice specifically stated:

> High doses of fluoride can cause abdominal pain, nausea, vomiting, excessive saliva, and muscle spasms. Of the homes potentially affected, 5 people reported one or more symptoms consistent with a high dose of fluoride.

This health effects language was left in the notice unchanged from that provided by DDW. Notably, the health effects language provided by DDW did not include the required standard health effects language specified in Rule 309-220-15(27). This discrepancy was not discussed with Owens, nor was the health effects language altered. Presumably, this standard health effects language was omitted because it is tailored to address long term fluoride exposure, rather than an acute exposure to water with a high concentration of fluoride. Thus, even though the health effects language does not comport with the Rule's requirement, DDW—the regulatory agency—provided the language that was used and did not take issue with that part of the public notice.

[543] UAC R309-220-14(2).

2. Timing of February 8 Public Notice.

Sandy's notice to DDW complied with the timing requirements because DDW was notified within 24 hours of when Sandy learned of the fluoride MCL violation. Sandy's public notice did not technically comply with the 24-hour deadline for a Tier 1 public notice, but the non-compliance is mitigated somewhat by the delay Sandy endured while waiting for the draft notice from DDW. Moreover, in the DEQ AO, the regulatory agency, did not specifically issue a violation for the timing of Sandy's February 8 Notice.

By about 2:45 pm on February 7, 2019, Public Utilities was aware of the fluoride MCL violation. DDW was notified via phone by Campbell on February 8, 2019 at around 8:30 am. Then, sometime around 11:00 am, Ward and Ellis participated in a conference call with Owens and other representatives of DDW and the SLCO Health Department. During that conversation, Ward and Ellis were informed that DDW would provide the draft notice that needed to be delivered that day. However, the draft notice was not received by Ward and Ellis until 4:36 pm. A revised notice was sent back to Owens about an hour later. Distribution of the notice was completed around 7:30 pm. Thus, the phone conference with DDW representatives, including Owens, on the morning of February 8, 2019 was within 24 hours of when Sandy learned of the fluoride MCL violations. But, the distribution of the public notice, which was not completed until 7:30 pm was outside the 24-hour time requirement. At least some of this delay is attributable to DDW's failure to provide the draft notice to Sandy before the 24-hour deadline at 2:45 pm.

3. Delivery of Feb 8 Public Notice.

The delivery of the February 8 Notice likely did not satisfy the form and manner requirements set forth in Rule R309-220-5. Here, while one of the required forms of delivery was used (hand delivery of the notice), the February 8 Notice fell short of the form and manner requirements because the notification area failed to encompass all persons affected by the fluoride overfeed and because of deficiencies in the hand delivery.

On February 8, 2019, during consultation with DDW, Owens directed Sandy Public Utilities to expand the size of the original notification area. While there is some dispute as to the specific direction Owens gave regarding the size of the expanded area, Owens reported that she "instructed Sandy to expand its notification area to 3 times the area identified on the initial map provided by Sandy City . . . as the area impacted." The map referenced by Owens included an area with about 69 homes. Ward does not dispute that Owens instructed them to increase the notification area to three times its size. But, Ward interpreted Owens as wanting the notification area expanded to three times the 25–30 homes notified on February 7, 2019, and the notices were distributed door to door in an area, later identified as Zone 1, that included only 93 parcels / 85 homes.[544]

Because there was no record kept of households contacted during the door-to-door notification on February 7, 2019, before the distribution of the formal Tier 1 notice on February 8, 2019, it is difficult to ascertain to what degree the notification area was actually expanded.

[544] *See supra* Investigation Summary 15, 21.

Ward explained that because the water model was not yielding results, the notification area was determined using reported illnesses and taste and odor issues; information from the team in the field, such as sample data and door to door contacts checking for water complaints; and the location of pipes. But, based on the subsequent report of a water related illness by [redacted]—a resident who resided just outside of Zone 1—the notification area was not expanded sufficiently to encompass all residents affected by the fluoride overfeed. Had the direction Owens reports she gave been understood and used to determine notification boundaries, [redacted] residence would have been included in the February 8, 2019 notification area.

Moreover, Ward later discovered, on February 13, 2019, that there were deficiencies in the distribution of the public notice. No personal contact was made at 17 homes where the notice was left near the door. Even though Ward reported that he was "explicit" that they needed "to be talking to every single person" and that he needed "affirmative contact with every single household in this area," no personal contact was made at some of the residences and the notice was simply left at those residences. Because personal contact was not made at all residences on February 8, 2019, an additional form of delivery, such as broadcast media, may have been appropriate at that time. Backing up hand delivery with a media announcement would have provided more support for the argument that the form and manner of the notice was reasonably calculated to reach all affected persons served by the system.

E. <u>February 13 Public Notice.</u>

1. Content Requirements - February 13 Public Notice.

The February 13 Notice suffers from the same deficiencies in the regulatory notice content requirements as the February 8 Notice. On February 13, 2019, Sandy distributed a notice with substantially the same content as the February 8 Notice to a larger area, Zone 2. Relatively minor changes were made to the notice, including language specifying that both hot and cold taps should be flushed and that the County Health Code required Sandy to add fluoride to the water. Accordingly, the February 13 Notice fails to satisfy the content requirements of a Tier 1 public notice for the same reasons as the February 8 Notice.

Notably, five days had passed since the distribution of the February 8 Notice. There were no reported communications with DDW about the removal of the do not ingest warning or the plumbing corrosion language from the notice during that time period. Moreover, in a February 13, 2019 email to Owens and Gray of DDW, Ward referred to the February 8 Notice as the "flyer which you approved," suggesting that even if the notice was not in compliance with all facets of the UAC, Ward's understanding was that the content of the notice had been approved by DDW.[545]

2. Timing of February 13 Public Notice.

Due to the failure to expand to the area requested by Owens because of an apparent misunderstanding and misjudgment of the affected area, the February 13 Notice was distributed to affected residents in Zone 2 for the first time. The February 13 Notice notified residents of the

[545] *See supra* Investigation Summary 33.

same elevated level of fluoride that was discovered on the afternoon of February 7. Accordingly, if the homes in Zone 2 were affected, the notice should have been distributed to Zone 2 within 24 hours of the original discovery of the event on February 7.

But, the decision to expand the notification area to Zone 2 was made, in part, based on the report of an illness reported just outside of Zone 1 and updated water model results. Thus, the City was responding to new information. The new illness was first reported through a third-party at the City Council meeting on the evening of February 12. Ward followed-up with [redacted] (the person who suffered the illness) the next day and the notice was distributed later that same day, February 13. Thus, if the report of a new illness is viewed as a new event triggering a Tier 1 notification requirement, the February 13 Notice complied with the 24-hour Tier 1 notice requirement. Even so, issues related to the timing of this notice could have been avoided by better communication with DDW regarding the required size of the February 8 notification area because DDW's reported required size for the notification area would have included Zone 2.

3. Delivery of February 13 Public Notice.

The delivery of the February 13 Notice likely satisfied the UAC form and manner requirements related to delivery of a Tier 1 notice. The Feb 13 Notice was reported to have been distributed door to door within Zone 2, which included revisiting Zone 1. By this point, Ward was aware of the shortcomings in the door to door distribution of the February 8 Notice and he reported he made it "crystal clear" that the job was not done unless there was personal contact and it needed to be tracked on a map. The notice was posted on the Sandy website and the Nextdoor social network. In addition, there was a reverse 911 call put out to Zone 2 (which encompasses Zone 1) notifying residents of the fluoride overfeed and to flush the water from their homes. While a media announcement would likely have reached additional people and a reverse 911 call has limitations related to cell phones, this three-layered approach, which includes one of the required forms of delivery, arguably satisfies the requirement that the notice be "reasonably calculated to reach all persons served."

Even so, a broader media release at this point would likely have been appropriate. Ward recognized deficiencies in the February 8 Notice and he wanted to put out a media announcement. However, a decision was made not to make an announcement. Ward's understanding was that this decision came down from Deputy Mayor Everton. Deputy Mayor Everton reported that she questioned the need to make a media announcement, but she did not make the decision that a media announcement should not go out. Regardless, this apparent misunderstanding, or miscommunication, resulted in a broader media release not being made.[546] The broad distribution of the February 13 Notice achieved through a media release may have alleviated later complaints from residents.

[546] *See supra* Investigation Summary 29-33.

F. February 15-16 Public Notice.

1. Content Requirements - February 15-16 Public Notice.

Sandy's February 16 Notice likely complied with the regulatory notice content requirements. But, DEQ was not satisfied with the content of the February 15 Public Notice made via press conference despite the participation of Director Owens in the press conference.

With regard to the February 15 Public Notice broadcast through a press conference, the following information was broadcast: (1) water sample results from the previous Thursday showed high lead and copper levels, (2) it was believed lead and fluoride levels were back in a safe range, and (3) information about the short and long-term health effects of fluoride consumption. Director Owens participated in the press conference and made a statement, but the listed information was provided by Ward. The next morning Ward received a text message from DEQ Executive Director Matheson expressing the Governor's Office and DEQ's concerns about the message delivered in the press conference that "you believe the lead and copper levels have dropped and the water is safe," and that this message was delivered despite the lack of any test results confirming current levels of heavy metals. Executive Director Matheson also wrote: "unless you have data confirming lead and copper levels meet drinking water standards, you need to make it clear to affected residents that their water may still not be safe for consumption." After this communication, a decision was made to issue a "Do Not Drink Order."[547]

The February 16 Notice followed the "Do Not Drink Order" and the updated notice was created working directly with Director Owens. Owens approved the content of the February 16 Notice, which included, among other information, a statement advising not to drink the water and health effects language.[548] Accordingly, this notice complied with any additional notification requirements imposed by Owens.

2. Timing of February 15-16 Public Notice.

Sandy's notice to DDW complied with the UAC timing requirements because DDW was notified within 24 hours of when Sandy learned of the lead and copper MCL violations. However, the timing of the February 15-16 Notice likely did not comply with the 24-hour deadline for a Tier 1 public notice.

Sandy received the elevated lead and copper results on February 14, 2019 at 1:38 pm and these results were sent to DEQ via email on February 15, 2019 at 9:57 am. Then, at about 1:30 pm, representatives of Sandy Public Utilities, including Ward, and representatives of DDW, including Director Owens, met in response to the elevated metals results. While there was some delay in forwarding these lab results to DDW because of formatting issues in the lab report, the results were sent to DDW within the 24-hour time frame and a consultation with Owens occurred thereafter.

[547] *See supra* Investigation Summary 40–41.
[548] *See supra* Investigation Summary 42.

With regard to the 24-hour public notice requirement, the press conference was held around 5:30 pm on February 15, 2019, which was beyond the 24-hour time limit. Some of this delay may have been caused by attempts to address the issues with the format of the lab report and subsequent consultation with DDW the next day. But, door to door delivery of the Feb 16 Notice was not completed until three days later on Monday, February 18, 2019. Some of the delay in distributing the notice can be attributed to finalizing the language in the notice, which was not completed until late in the evening of February 16. Nevertheless, hand delivery of the February 16 Notice was not completed until February 18—4 days after Sandy learned of the lead and copper MCL violations.[549]

3. Delivery of February 15-16 Public Notice.

Other than failing to provide the public notice within the required 24-hour time frame as described above, the delivery of the February 15–16 Notice satisfied the form and manner requirements set forth in the UAC. The February 15-16 Notice was initially made using broadcast media via a televised press conference, which was also posted on social media. The press conference was subsequently followed up with door to door, hand delivery of the February 16 Notice. The combination of these efforts constituted notice "reasonably calculated to reach all persons served."

G. <u>Other Notice Issues.</u>

1. Delayed DDW Notification of High Fluoride Level.

In the Issuance of Violations letter accompanying the DEQ AO, Sandy was notified of a violation for delayed submission of a high fluoride result. On February 16, 2019 at 2:30 pm, Campbell and Hoagland received a lab report showing a high level of fluoride from a February 7, 2019 sample as 151.4 mg/L. Later that day, Campbell forwarded the email with the results to Shelley, who Ward reported he had assigned to assure DDW received required information. But, DEQ Reported that it did not receive this fluoride sample result until February 23, 2019.

The initial delay from when the sample was submitted on February 7 to when the results were received on Feb 16 was attributed to issues at the lab. The secondary delay from February 16, 2019 to February 23, 2019 was essentially attributed to an oversight because of how busy Public Utilities staff was due to responding to the overfeed event and the voluminous communications related to the event. The initial high fluoride result of 104 mg/L obtained on February 7 was reported to DDW within the 24-hour time period on February 8 and Benham reported that the Public Utilities response would have been the same at either level.

Under UAC R309-105-16(1)(a), a supplier is required to report to DDW "the analysis of water samples which fail to comply with the Primary Drinking Water Standards of R309-200." This "report shall be submitted within 48 hours after the supplier receives the report from his lab."[550] Accordingly, here, where Sandy did not report the high fluoride sample result until February 23, 2019, it failed to comply with the 48 hour reporting requirement.

[549] *See supra* Investigation Summary 42.
[550] UAC R309-105-16(1)(a).

2. No Media Announcement Until February 15, 2019.

No media announcement was made related to the fluoride overfeed event until the press conference on February 15, 2019. This did not occur until more than one week after the initial discovery of the high levels of fluoride on February 7. Moreover, the press conference was only held after the receipt of the lab results confirming high levels of lead and copper in water samples from February 7. Many of the issues related to Sandy's technical non-compliance with the notice requirements and complaints raised by the public could likely have been avoided through an earlier media announcement.

No media announcement was made when the February 8 Notice was distributed. Then, on February 13, 2019, a determination was made to expand the notification area to Zone 2. At that point, Ward thought a media release should be made. Both Ellis and Bell reported that Ward supported making a press release. Yet despite Ward's position and because of concerns about creating additional news stories or causing panic outside the affected area, a decision was made not to do a press release. Ward's understanding was the matter was decided by Deputy Mayor Everton. But, Deputy Mayor Everton reported that she only indicated she did not see the need for a press release if those affected were being notified. An anticipated follow-up conversation between Ward and Everton regarding a possible press release did not occur and as an apparent result of this lack of communication, Ward proceeded based on his understanding that it had been decided not to make broad media announcement. Ward wrote as much in an email sent to the City administration and many others later that evening.[551] While Ward indicated he could have pushed harder for a media release, based on the statements of Ellis and Bell, as well as communications form Deputy Mayor Everton,[552] it is unlikely that Ward was the impetus behind the decision not to make a press release on February 13.

Not until February 15, 2019, after Sandy received the high lead and copper results did Sandy hold a press conference at the behest of the State. Even then, the State deemed the information provided in this press conference insufficient to address the water contamination issue.

Had Sandy made a media announcement after the initial high level of fluoride was discovered, it could have avoided some of the issues discovered in the wake of the event. Concerns regarding creating additional news stories and causing panic were raised by Deputy Mayor Everton and mentioned in an email from Ward to the City Administration. Ward explained that he could have used a different word than "panic," but that he was trying to understand the decision not to make a media release because he wanted to send it out. Foregoing a press release directing affected residents not to drink water until after they flushed their home plumbing because of concerns about an extreme overreaction by those residents to that information was not warranted. On February 15, when a media announcement was made, the residents simply complied with the notice and flushed their home plumbing.[553]

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[551] *See supra* Investigation Summary 30.
[552] *See supra* Investigation Summary 30–33.
[553] *See supra* Investigation Summary 38–39.

In addition, concerns regarding the sufficiency of the door to door distribution of the February 8 Notice would likely have been alleviated by a media announcement, which would have reached more people. The reported miscommunication between Owens and Public Utilities staff regarding the size of the notification area may have been mitigated by a media release that reached more people. Public complaints about a lack of transparency or a perceived downplaying of the event by Sandy may have been alleviated by an earlier media announcement. In sum, concerns about an overreaction by the public to a media announcement likely did not outweigh the importance, from both a public health and communications standpoint, of assuring all relevant information about the water contamination event was provided to the public as soon as practical via a media announcement.

III. RECOMMENDATIONS – REGULATORY NOTICE REQUIREMENTS

In light of the City's failure to comply with technical regulatory notice requirements, the following recommendations are made to increase the likelihood of compliance with those requirements should a future similar event occur:

1) Involve the Media in Public Notification Early in the Event.

   In order to assure compliance with the requirement that public notice be in a form and manner reasonably calculated to reach all persons served, the City should use broadcast media, including the internet, in combination with the door to door distribution of public notices at the outset of the event. Involving broadcast media earlier in this event may have gotten information about the fluoride overfeed out to more impacted residents at an earlier time and limited public dissatisfaction with Sandy's communication.

2) Establish a Comprehensive Public Notification System.

   The City can also take steps to encourage its residents to opt in to public notification systems. To the extent possible, Sandy should encourage residents to opt into a reverse 911 emergency notification to their cell phones. Sandy can also investigate the possibility of creating an email register to allow notification of its residents of emergencies via email.

3) Create A Pre-Approved Public Notice Template.

   Sandy can work with DDW to create a public notice template that complies with the regulatory notice content requirements to be used for a future event, should one occur. This could eliminate some of the back and forth between Sandy and DDW that resulted in discrepancies between the information DDW required in the public notice and the information that ultimately was included in the notice.

4) Centralize Reporting of Water Taste, Odor, or Illness Complaints.

   To the extent not already in place, it should be mandated that an individual within Public Utilities is notified of all water related illness, taste, or odor complaints. This could

expedite recognition of a pattern of complaints concentrated in a specific neighborhood, improve response time, and result in an earlier public notice of a water contamination event

5) Update the Public Utilities Emergency Response Plan to Include More Specific Direction About Notice of a Water Contamination Event and Communications Related to Non-Compliance.

Sandy should update its emergency response plan to include specific direction about requirements for conducting a door to door notification of a water contamination event. The ERP can be drafted to include a mandate to track homes where personal contact is made and to establish an accepted protocol for leaving the notices at a home where employees receive no response.

As with centralized reporting of water complaints, there should be a streamlined, well-documented process for communications from the City to (1) the State and SCLoHD relative to noncompliance, (2) the media (including reverse 911 notifications) regarding water contamination events, and (3) the laboratory regarding sample results. The responsibility hierarchy for communications with these entities must be very clear to ensure efficient, consistent, accurate, and effective lines of communication.

In addition, "[i]t is recommended that the Emergency Response Plan be updated to include other events besides malevolent and natural disasters and updated with current information (while the emergency contacts were up to date, the references to named individuals in the text were not)."[554] "The development of a specific Distribution System Contamination Response Procedure, as recommended by EPA, should be initiated immediately and be included in the ERP.[555]

IV. CONCLUSION

Sandy failed to fully comply with the technical notice requirements set forth in the Utah Administrative Code, including that the February 8 Notice did not fully comply with the requirements established by DDW Director Owens. Sandy's technical non-compliance with regulatory notice requirements involved shortcomings related to content, timing, and delivery of the notices. These shortcomings contributed to some Sandy residents' dissatisfaction with the City's communications with them about the incident. The City's communications with residents about the incident could have been improved by (1) complying with all technical regulatory notice requirements, (2) tracking homes that were notified from the start of the incident, (3) an earlier and more accurate assessment of the impacted area, which would have led to a broader distribution of the initial public notice, and (4) an earlier media announcement.

In addition to the City's technical non-compliance with regulatory requirements, the totality of the circumstances revealed by this investigation suggest that the City may have either underestimated or downplayed this event. Several miscommunications or misunderstandings

[554] *See* Merrick Report 6.
[555] *Id.*

were discovered. These miscommunications and other decisions essentially resulted in reduced communication to the public, delayed notifications, or the dissemination of information that lessened the impact of the event. For example:

1) A misunderstanding resulted in DDW not being notified until the day after the fluoride overfeed was discovered.

2) A miscommunication regarding the size of the area to be notified resulted in the February 8 Notice being distributed to a smaller area than DDW Director Owens wanted and was insufficient to encompass all impacted homes.

3) The "Do Not Ingest Warning" and language related to damage to home plumbing due to corrosion was removed from the February 8 Notice.

4) No information about concerns of possible secondary metals contamination caused by the fluoride overfeed was included in the notice.

5) A misunderstanding about requirements for the door-to-door delivery of the February 8 Notice resulted in deficiencies in the distribution of that notice.

6) A misunderstanding about whether a final decision was made not to do a press release on February 13 resulted in no press release being made.

7) An error in the formatting of the lab report showing elevated lead and copper levels delayed its communication to DDW.

8) A misunderstanding about the message to be conveyed in the February 15 press conference resulted in a message delivered during the conference that did not satisfy the State because it did not make clear to residents that, in the absence of test results, the water may still not have been safe for consumption.

9) An oversight resulted in lab results showing a high level of fluoride that were received on February 16 not being forwarded to DDW until February 26.

The City's operational response "to the fluoride overfeed and subsequent high lead and copper readings was generally within normal industry standards."[556] Once Public Utilities' employees were aware of the multiple water complaints in the same area, including complaints of illness, they responded promptly and worked diligently to follow-up on those complaints. **For additional conclusions regarding the City's operational response refer to the Merrick Report.**

Finally, this investigation did not reveal that Ward, Mayor Bradburn, or the City Administration hid information from the public. Ward and other employees acknowledged that, in hindsight, some decisions could have been made differently. But, Ward and other Sandy City employees did not have the benefit of hindsight as they were making decisions in real time based

[556] *See* Merrick Report 5.

on the information presently available to them. Ward generally conveyed thoughtfulness about his decisions, provided his reasoning for those decisions, and accepted responsibility for Public Utilities' response. All Sandy employees interviewed, from Water Operator Hanson to Public Utilities Director Ward and Deputy Mayor Everton, conveyed a sense of commitment to serving Sandy residents and concern that they were making correct decisions and taking appropriate actions to best serve those residents.

PERSONNEL INVESTIGATION FINDINGS – TOM WARD

I. OPERATIONAL ACTIONS

Ward had limited involvement in the initial operational response to the fluoride overfeed. Public Utilities' operational response began around 8:30 am after employees learned of multiple water complaints. Ward was not notified until about 11 am that there were reports of bad tasting water and an illness in a localized area and that a distribution crew was out investigating the problem. It is unclear whether Ward was in the office or working from home on February 7.[557] Then, on February 8, 2019, he arrived at work between 9 and 10 am after backcountry skiing in the early morning. Ward expressed concern that the fact he was backcountry skiing before work on the morning of February 8, 2019 would be misconstrued. Ward emphasized that this did not impact his response to the events, explaining that he was in communication with staff about the response before his arrival at the City.

We do not fault a public employee for taking time off for personal recreation, particularly one who apparently works well beyond a "nine-to-five" workday on a regular basis. We also recognize that he was not totally out of communication with his staff and our investigation did not determined that Ward's absence from the office negatively impacted the operational response. Nonetheless, we think it showed bad judgment on the part of Ward to go skiing when faced with a potential "super major disaster," the scope of which was yet to be determined.

Ward's operational actions and technical response are analyzed in more detail in the Merrick Report. The Merrick Report concludes that Public Utilities' operational response, which included Ward's actions, in response to the fluoride overfeed and subsequent high lead and copper readings "was generally within normal industry standards."[558] But the Merrick Report notes several shortcomings and areas where improvement is needed, and we agree.

II. REGULATORY ACTIONS: NOTICE REQUIREMENTS

Ward's actions related to regulatory notice requirements are detailed in the Investigation Summary and addressed in the Regulatory Response – Notice Requirements section, where shortcomings in those notices related to content, timing, and delivery are also described. Ward was the person ultimately responsible for the changes to the February 8 Notice including the removal of the "do not ingest warning" language and the sentence related to potential corrosion of home plumbing systems. The February 8 notification area designated by Public Utilities was later found to be insufficient to cover the impacted area. Ward conferred with State and SLCoHD regulators throughout the event. But, as already described, there were multiple misunderstandings and miscommunications with DDW and internally at the City. Ward, as Public Utilities Director, bears ultimate responsibility for the City's failure to comply with regulatory notice requirements, including those arising from the various misunderstandings.

[557] *See supra* Investigation Summary 7.
[558] *See* Merrick Report at 6.

III. TECHNICAL RESPONSE

Merrick assessed Ward's technical response in its memorandum. Refer to the Merrick Report, Addendum 1, for details.

IV. GENERAL COMMUNICATION

A. Communication with City Administration

Ward's communications with City Administration were generally sufficient. Ward attempted to keep City Administration appraised of new information as he became aware of it. But, he did not notify them of the concerns of possible secondary lead and copper contamination arising from the fluoride overfeed. Other deficiencies in Ward's communications with the City Administration, which may have led to a lack of complete understanding of the incident or its magnitude on the part of City Administration, likely arose from Public Utilities' assessment of the area of impact, which was smaller than DDW's recommended notification area, rather than a lack of communication.

Ward reported that he first notified Mayor Bradburn of the incident in the afternoon on February 8. Ward reported that, when there were changes, he would immediately reach out to Mayor Bradburn or CAO Huish. The following is a summary of reported communications between Ward and the City Administration:

1) On February 7, because Mayor Bradburn was out of town, Ward first attempted to contact Huish and City Attorney Thompson. At about 5:28 pm, Ward eventually made contact with Chase Parker, city attorney in risk management, and notified him of the incident.

2) On February 7 at 9:00 pm, Ward sent a text message to Huish and Richards (Communications Director) updating each of them about the incident. In that notification, Ward provided a brief description of the cause of the event and Public Utilities' response. Ward reported that the problem was confined to a very small area and the water was safe.

3) On February 8 at around 4:15 to 4:20 pm, Ward had a brief conversation with Mayor Bradburn during which he notified Mayor Bradburn of the incident. Ward had also attempted unsuccessfully to contact Mayor Bradburn by visiting his office a couple of times earlier in the day. Ward described his conversation with Mayor Bradburn as follows:

> I spent probably no more than five minutes just like Mayor, we had potentially a super major disaster. We have, you know, we think a, a dozen or two dozen homes that got, you know, high levels of fluoride. Your water crews performed amazingly in terms of textbook just getting it identifying and containing it, flushing it out and by 4:30 yesterday afternoon we had the water system back close to normal levels. It could have been a major disaster. We're working with the State and the health department on the next phase is monitoring and

> flushing and notifying and stuff like that. Good to go. Anything else, you know, I'll let you know if anything changes. I mean it was—he was getting—heading out the door. I needed to get back down and see where the heck my notices from the State.

At 6:00 pm, Ward sent an email to Mayor Bradburn and the City Administration summarizing the event.

4) On February 12 in the morning, Ward communicated with Mayor Bradburn at a cabinet meeting. At this point, to Ward's knowledge, there had been no significant changes since his Friday report to Mayor Bradburn.

5) On February 13, Ward's understanding was that Mayor Bradburn was aware of what was occurring because of the work being done on the public notice. However, Ward did not communicate with Mayor Bradburn directly and did not know if Huish or Everton talked to Mayor Bradburn.

   At 5:58 pm, Ward sent an email status update on the event and the current plan of action to Mayor Bradburn and the City Administration.

6) On Friday February 15, after learning of the high metal levels, Ward communicated with Mayor Bradburn about the new information.

7) On Saturday February 16 in the morning, Ward again communicated with Mayor Bradburn about the event, but speculated that, by that point, Mayor Bradburn was also hearing from DEQ Executive Director Matheson.

In Ward's Feb 8 conversation with Mayor Bradburn, he notified Mayor Bradburn that only one or two dozen homes were affected by the fluoride overfeed and that the water system was back close to normal levels. Moreover, there is no indication that Ward advised Mayor Bradburn of concerns that the fluoride overfeed may have resulted in secondary metals contamination prior to February 15—the day after the lab results confirming elevated levels of lead and copper were received. Accordingly, until [redacted] report of an illness outside of the Zone 1 notification area on February 13, based on Ward's initial communications with the City Administration, Mayor Bradburn's knowledge of the event was likely limited to that it was confined to a small number of homes and had been resolved.

Beginning on Saturday February 16, Mayor Bradburn and other members of City Administration were involved in the operation of the EOC. Then, on February 18, Ward participated in a lengthy debrief meeting that with City Administration that was also attended by Mayor Bradburn.

Ward communicated regularly with the City Administration and provided updates as he received new information. But, Ward's failure to notify the City Administration of concerns regarding possible secondary metals contamination before the lab results were received and initial under assessment of the area of impact may have contributed to the City Administration's lack of a complete understanding of the incident.

B. Ward Did Not Intentionally Withhold Information.

The investigation did not reveal that Ward intentionally withheld information from the City Administration, DDW, or the public. While Ward was ultimately responsible for changes to the February 8 Notice that failed to comply with the regulatory requirements and in the notices, underestimated the initial notification area, and misunderstood instructions given by Director Owens, it does not appear that Ward was intentionally withholding information. We also note that Ward could have reasonably assumed that Owens had no objections to the changes in the notice based on her email response after receiving the document and her lack of any objections in the days following, including when the notice was later distributed to a broader area.

Ward's communications with the City Administration are detailed in the preceding section. Ward's approach was to notify the City Administration when he received new information. Ward did not report concerns about secondary metals contamination in advance of receiving lab results. But, after the results were received, the City Administration was notified.

Ward communicated with DDW throughout this event, via email, conference calls, and meetings. Public Utilities complied with notice requirements to DDW on February 8. Then, after changes were made to the February 8 Notice, Ward sent the revised notice to Director Owens. On February 13 when an updated public notice was distributed to a larger area, Ward again notified Director Owens. When the elevated lead and copper results were received, these were communicated to DDW within the required time frame and later a press conference was held with Director Owens involved. There was a delay in submitting the high fluoride results received on February 16 to DDW. But, Ward did not receive these results. These results were received by Campbell and Hoagland during the midst of the EOC operations. Campbell forwarded them to Shelley (Engineering Manager) and the results were later sent to DDW after Ward was put on administrative leave.

While Ward made changes to the draft February 8 Notice provided by DDW before it was distributed to the public, as detailed in the Investigation Summary, it does not appear the removal of this language was done to withhold information from the public.[559] With regard to the removal of "do not ingest" language, Ward's position, which was supported by Benham, was this language did not convey the intended message of the notice, which was actually to flush home plumbing before drinking. With regard to language related to damage to home plumbing systems, Ward and the other Public Utilities managers disagreed with this statement, which was not health effects language, being included in the notice for several reasons.[560] The language removed from the notice did not warn of the possible leaching of metals from home plumbing and the associated health risk. Because this language related to damage to plumbing systems rather than public health, Ward, Ellis, and Benham thought it could be addressed at a later time if it was found to be an issue. Ellis specifically reported: "Tom certainly did not have any intention [to hide anything] and this was not Tom's decision on his own."

[559] *See supra* Investigation Summary 17-21.
[560] *See supra* Investigation Summary 17-21.

Furthermore, while a press release was not done on February 13, Ward reported that he supported making a press release at that time. Both Ellis and Bell affirmed Ward's statement. While Ward could perhaps have pushed harder for a press release, it does not appear he was attempting to withhold information from the public.

Ward and Director Owens both participated in the February 15 press conference notifying the public of the elevated lead and copper results in the samples that were returned the previous day. Then, on the next day, when Ward learned the State was dissatisfied with the message delivered in the press conference, even though he disagreed with issuing a "do not drink order," he participated in the decision to issue such an order and supported Mayor Bradburn's initiative to sample all homes in Zones 1, 2, and 3.

In sum, while there were some shortcomings in Ward's communications with the City Administration and DDW, in addition to technical non-compliance with public notice requirements, the totality of the circumstances do not support that Ward was intentionally withholding information.

V. CONCLUSION

Ward failed to ensure Sandy's full compliance with the technical notice requirements set forth in the Utah Administrative Code, including that the February 8 Notice did not fully comply with the requirements established by DDW Director Owens. Sandy's technical non-compliance with regulatory notice requirements involved shortcomings related to content, timing, and delivery of the notices. These shortcomings contributed to some Sandy residents' dissatisfaction with the City's communications with them about the incident. Ward could have improved the City's communications with residents about the incident by (1) assuring compliance with all technical regulatory notice requirements, (2) directing that the initial door-to-door notification involved tracking of the households notified, and (3) identifying a larger area of impact until sampling proved otherwise, which would have led to a broader distribution of the initial public notice.

While a media announcement could have been made prior to February 15, on February 13 when Ward learned that the area of impact extended beyond what he previously believed, Ward supported making a media announcement. Yet, despite Ward's position a decision was made not to do a press release. While Ward indicated he could have pushed harder for a media release, based on the statements of Ellis and Bell supporting Ward's claimed position, as well as communications from Deputy Mayor Everton opposing a media release, it is unlikely that Ward was the impetus behind the decision not to make a press release on February 13.

In addition to technical non-compliance with regulatory requirements, the totality of the circumstances revealed by this investigation suggest that Ward may have either underestimated the impact of or downplayed this event. Several miscommunications or misunderstandings were discovered during this investigation. Ward was involved in some of those miscommunications and other decisions that resulted in reduced communication to the public, delayed notifications, or the dissemination of information that minimized the impact of the event. For example:

1) A miscommunication regarding the size of the area to be notified resulted in the February 8 Notice being distributed to a smaller area than DDW Director Owens wanted and was insufficient to encompass all impacted homes.

2) The "Do Not Ingest Warning" and language related to damage to home plumbing due to corrosion was removed from the February 8 Notice.

3) No information about concerns of possible secondary metals contamination caused by the fluoride overfeed was included in the notice.

4) A misunderstanding about performance requirements and documentation for the door-to-door delivery of the February 8 Notice resulted in deficiencies in the distribution of that notice.

5) A misunderstanding about whether a final decision was made not to do a press release on February 13 resulted in no press release being made.

6) A misunderstanding about the message to be conveyed in the February 15 press conference resulted in a message delivered during the conference that did not satisfy the State because it did not make clear to residents that, in the absence of test results, the water may still not have been safe for consumption.

The City's operational response to the fluoride overfeed, which included Ward's operational actions, was generally within normal industry standards.[561] But, Ward did not activate the EOC as required for this type of event under the Sandy Public Utilities Emergency Response Plan.[562] For further details regarding Ward's operational and technical response, refer to the Merrick Report.

In sum, although this report is critical of certain of Ward's actions and omissions, we acknowledge it is not uncommon for complex human actions to fail to completely withstand a careful investigation done with the benefit of hindsight, particularly when the actions under investigation were in response to an emergency situation. Ward candidly acknowledged that, in hindsight, some decisions could have been made differently and better. Our investigation did not reveal that Ward hid information from the public or that he acted in any way in bad faith. Ward generally conveyed thoughtfulness about his decisions, provided his reasoning for those decisions, and accepted responsibility for Public Utilities' actions. Ward conveyed a sense of commitment to serving Sandy residents and concern that he was making correct decisions based on the information available to him at the time and taking appropriate actions to best serve those residents.

[561] *See* Merrick Report 5.
[562] *Id.*

Addendum 1

MERRICK®

MEMORANDUM

DATE: MAY 22, 2019

TO: JOHN COOPER, PARSONS BEHLE & LATIMER

FROM: LISA J. VOYTKO, PE, CWP 

CC: FILE – MERRICK PROJECT NO. 65420268

RE: ASSESSMENT OF OPERATIONAL AND TECHNICAL RESPONSE BY SANDY, UTAH FLUORIDE OVERFEED EVENT IN FEBRUARY 2019

Introduction

Merrick & Company was engaged by Parsons Behle & Latimer on May 10, 2019 to address the appropriateness of the City of Sandy's operational response and the Public Utilities Director technical response to the Fluoride overfeed event that occurred in February 2019.

The Investigation Summary (Draft), various Exhibits, and Sandy's Emergency Response Plan were reviewed as part of this process. The regulations regarding response from the state of Utah and Salt Lake County Department of Health were also reviewed. Personal experience as operator-in-responsible-charge for a medium (similar size as Sandy) water utility in Colorado where the water system feeds fluoride was incorporated when reviewing the events.

Background

On February 6 and 7, 2019, it was noted that the Sandy, Utah water system experienced customer complaints of bad water quality and illness, seemingly as a result of an overfeed of fluoride into the water distribution system at the Paradise Valley (PV) well. The well was not online, however the fluoride feed pump was in "hand" mode, and pumping into the system, and was not logged in the city's SCADA system or otherwise noticed by employees. This memo does not address the technical aspects of the fluoride addition, just that the fluoride overfeed occurred.

The water distribution system operators responded to the water quality complaints through a series of interviews, sampling and flushing of the distribution system, confined to that area of concern. In addition, communication with the State Department of Drinking Water and County Department of Health occurred.

Likely as a result of the elevated fluoride levels (fluoride is an acid, and has low pH), elevated metals levels of lead and copper were detected in homes within the affected areas and beyond.

Professional Opinion of Operational Response

The review of the Investigative Summary (draft) prepared by Parsons Behle & Latimer, and review of the Sandy Emergency Response Plan (ERP) dated July 2013, led to the following opinions on the operational response of the Utility and the Public Utility Director (PUD). The remarks below also reflect opinions regarding the emergency response to water contamination protocol in general, as should be construed as part of any operational response.

Generally, the first steps in responding to a potential drinking water contamination event is the investigation by the utility:

- Customer complaints were received in the morning on February 7, 2019 and work orders written, with crews dispatched to the subject areas for flushing and sampling. No sampling protocol was given in the Investigative Summary. Sampling occurred at several hydrants in the area as well, but not in any other parts of the distribution system. There should have been other sampling performed outside the small localized area to ensure the extents of the affected area.
- While Campbell recognized that the initial complaints were within an area that could have been impacted by the Paradise Valley (PV) well operation, operator on duty said that the SCADA system did not indicate that the PV well was operational. However, there is no mention of the fluoride day tank weight that is available on SCADA, but apparently is not alarmed. The day tank showed a rapid decrease in weight, indicating that fluoride was being injected into the system. There was no dispatch to the PV well, until Hoagland decided to check it and found the feed pump operating.
- Fluoride was then identified as the water contamination threat, although the levels were not known until around 2:45 pm February 7, 2019. The high levels of fluoride (up to 25 times the primary MCL of 4 mg/L) and corresponding customer complaints of illness confirmed a water contamination incident with high public health risk. This knowledge then defines that the utility continue with their operational response, as outlined in the ERP and noted in the Salt Lake County Department of Health Fluoride Regulation #33.

Once a utility has confidence and associated risk in the water contamination event, then operational response continues. This includes isolation, flushing, risk communication and use restriction.

- Per the ERP, this incident would have been categorized as a Level 3 Emergency, where contamination of a single zone of the distribution system is involved. This was apparent by the number of the complaints received within a relatively short period of time on the morning of February 7, 2019, and within close proximity.
- Per the ERP, Level 3 Emergency, the Emergency Operations Center (EOC) should have been opened immediately. It was not opened until February 16, 2019, 9 days after the initial event. The Investigative Summary information indicates that the EOC was opened as a result of heavy metals (lead and copper) levels results from household sampling, rather than in a response to illness as noted by complaints on February 7, 2019. It should be an immediate concern to the utility that when illness complaints are isolated to an effective

area, and within a relatively short time frame (hours), then concern about water contamination is high and should be addressed as a Level 3 threat.

- As a result of the EOC opening, there would have been an EOC Incident Commander (the Public Utilities Director (PUD), with backup by the Operations Manager, who would have followed the requirements set forth in the ERP for the incident. From the results of the Investigative Summary, it did not appear that the responsibilities of the IC were carried out in a timely and organized manner.
- The utility was already flushing and sampling the area known as Zone 1 where the initial complaints were initiated. Valves were closed in various locations in the system by the distribution operations staff in attempt to isolate and provide unidirectional flushing.
- Sampling of the well and a hydrant confirmed that the fluoride levels were reduced. No other sampling was indicated by Hoagland, although PUD indicated that pH and fluoride sampling was continuing. It appears that the extent of the fluoride sampling locations was limited to sites reported by Hoagland.
- The water distribution crew on scene were determining the area of notification. This should have been verified and come from the PUD and/or Operations Manager. No record of public notification was kept. Reliance on water distribution crews, without clear communication of flushing areas, sampling areas and public notifications should be documented and directed by the IC of the EOC, in this case the PUD.
- The EOC would have had water system maps and involved the Engineering Manager, who could have initiated the information for the water model. The data from the fluoride levels and well were available. Combined with additional sampling outside the zone where the initial contamination was found, a better zone of influence map could have been developed for notifying and sampling in a more efficient manner. The utility had this information available. Potentially if additional sampling occurred outside the immediate area, then additional high fluoride levels may have been noticed, and therefore the zone of influence, flushing, and notification could have been increased.
- Communication with the DDW and County took place within the 24-hour time requirement, and the state developed a public notice for Sandy to use, with specific instructions not to delete anything from the notice. The Utility, under the direct supervision of the PUD, deleted specific health advisories and such from the notice. The state did not make notice of these deletions and did not advise otherwise, with the exception to ensure that additional fluoride and pH sampling should continue to occur. The key point was that the “Drinking Water Warning” and “Do Not Ingest Warning” were removed from the public notice by Sandy. It is unclear why these were removed, especially given the complaints of illness. The sampling had clearly defined a fluoride overfeed of 25 times the maximum contaminant level, so the removal of such a statement is unwarranted.
- The public notices were hand delivered to homes within the areas identified by the state and Sandy. No one kept track of whether personal contact was made, and there are discrepancies noted in the Investigative Summary as to how many homes were notified. The use of reverse-911 for a potential water contamination event is warranted, and indeed, Sandy used this method to notify the public at a later date about the lead and copper issues. It is not known and likely should have been recommended or at least discussed that a

similar notification should have occurred during the high fluoride period. The state and county did not recommend this mode of notification.

Following the Operational Response and Notification, the next step in a response procedure for water system contamination is remediation and recovery. This includes the characterizing the short-term and long-term effects of the contaminant on water quality of the distribution system. Remediation planning, decontamination and finally clearance follows in this stage. Remediation activities include characterizing the nature and extent of contamination, implementing further response activities as additional information is gathered, planning and implementing a decontamination strategy, clearing the system for return to service, and continuously updating the public and customers with information on progress.

- The state indicated that sampling for fluoride and pH should continue until metals analyses could be made. While fluoride testing continued on February 11, after no testing February 8, 9, and 10, there was no pH testing until February 13, 2019. Fluoride and pH were within regulatory limits at those samples taken after February 7 at the locations noted in the Investigative Summary There are discrepancies noted in the Summary as to when metals analyses were ordered (by who, and when) and what the entire suite of analyses were done on the samples collected by Hoagland and the distribution crews during the event.
- Concern by the state over the corrosiveness of the fluoride to the home plumbing was not heeded by the utility, including PUD and other managers. That information in the first public notice was removed, despite the state emphasizing no changes should be made to the notice.
- There was unclear information about the effects of fluoride in the water, even if the system had been flushed. The health effect of the metals concentration was not realized until after 1 week (due to lab time for analysis), yet results were significantly over the MCLs for lead and copper. No action was taken by the PUD until the next day and a press conference was held (February 15, 2019). No “Do Not Drink” advisory was ordered until February 16, 2019, as a result of the high lead and copper samples. At this time, the EOC was activated. Additional sampling occurred but no further flushing by the utility, although households in the affected areas were notified to flush their home plumbing systems.
- The system must go through clearance before it can return to normal operation. Clearance involves additional sampling and analysis throughout the contaminated areas of the distribution system to verify that clearance goals have been met. The state and county health departments played a lead role in assessing if the goals have been achieved and providing final clearance, including lifting the “do not drink order” from all zones.
- Additional monitoring was required and performed by the utility. The City continues to provide lead and copper monitoring and subsequent results on their web site. It is assumed that the water system has been operating as normal.

Operational and Technical Response of the PUD to the Event

The review of the Public Utilities Director's response was made using information from the Investigative Summary.

Some of the items below are described in more detail in the Operational Response section above.

- The PUD did not open the EOC immediately as described above. The EOC opening is part of the Level 3 Emergency Response in the ERP. It is our opinion that following the ERP including the EOC and the fundamental requirements of the Incident Commander (in this case the PUD with backup from the Operations Manager) would have mitigated the issues that have arisen from the event. While the ERP would not have eliminated the fluoride pump overfeeding fluoride into the water distribution system, the outcome of the response would likely have been different, and likely more positive for the customers of the utility.
- While it is not necessary for the City of Sandy to have all the technical answers for the response to the water quality, the state and county should provide direction as to warnings for ingesting the water and also further sampling that may indicate the effects of the fluoride overfeed. The state did require fluoride and pH sampling as well as metals analyses, while the PUD did not initially believe that metals would be an issue. It is the requirement of state regulations to understand and follow state direction during violations and emergency situations.
- The PUD statements reported in the Investigative Summary were in conflict at times with the state and county. The PUD should rely on the state and county to advise as to response and health risks. The state response may not have been clearly defined, but the PUD should have been more insistent on receiving detailed directions.
- The PUD relied on the subject matter experts (water distribution crews) initially when defining the affected areas. Subsequently the PUD expanded the area using more data, model runs, discussions with the Engineering Manager and crews to ensure that the contamination event and its resultant effects were covered in all areas.
- Changing the public notice to delete important health related issues was done without the state or county's knowledge.

Conclusions

The operational response by the Utility to the fluoride overfeed and subsequent high lead and copper readings was generally within normal industry standards. It could be said that the initial response was reaction based and did not fully follow the ERP. It is our opinion that if the Emergency Response Plan had been followed more closely, the operational and technical response by the City of Sandy would have been more organized, which could have identified issues quicker and notified the public in a more timely manner. Increased sampling in areas surrounding the initial area could have reduced the need for confusion on the number of zones affected, the notification procedure, and communication within the utility. This, in conjunction with timely results from the water model, would have narrowed the focus area, and potentially reduced confusion to the public, utility staff, and the state.

It is a concern that there was delay in getting notification out to the affected households for a “Do Not Ingest” warning, particularly when there were confirmed reports of the acute illnesses resulting from the fluoride overfeed. No reverse 911 calls were made in the initial response and the “Do Not Ingest” warning was removed from the initial public notice.

Improvements to the overall operation of the water system is beyond the scope of this memo. It is recommended that the Emergency Response Plan be updated to include other events besides malevolent and natural disasters and updated with current information (while the emergency contacts were up to date, the references to named individuals in the text were not). The development of a specific Distribution System Contamination Response Procedure, as recommended by EPA, should be initiated immediately and be included in the ERP. In addition, the Fluoride Health Regulation #33 from the County was from 2004, and the county updated the regulation last on February 7, 2019.

EXHIBIT LIST

1) SCADA Fluoride Weight Tank Graph
2) Sandy Public Utilities Internal Water Trace Model
3) February 7 Notification Area Map
4) Fluoride Overfeed Map
5) February 8 Draft Public Notice
6) February 8 Public Notice
7) Map of Zone 1
8) Water Model Screenshot
9) Map of Zone 2 and Map of Zone 2 w/Lot Count
10) February 13 Public Notice
11) February 16 Public Notice
12) Sandy Fluoride Incident Response Map (02-17-19 / 1035 hours)
13) Sandy Fluoride Incident Response Map (02-17-19 / 1950 hours)
14) Hansen, Allen, Luce Calibrated Water Model
15) Sandy Fluoride Incident Response Map (02-22-19 / 1630 hours)

Day Tank weight Dropping

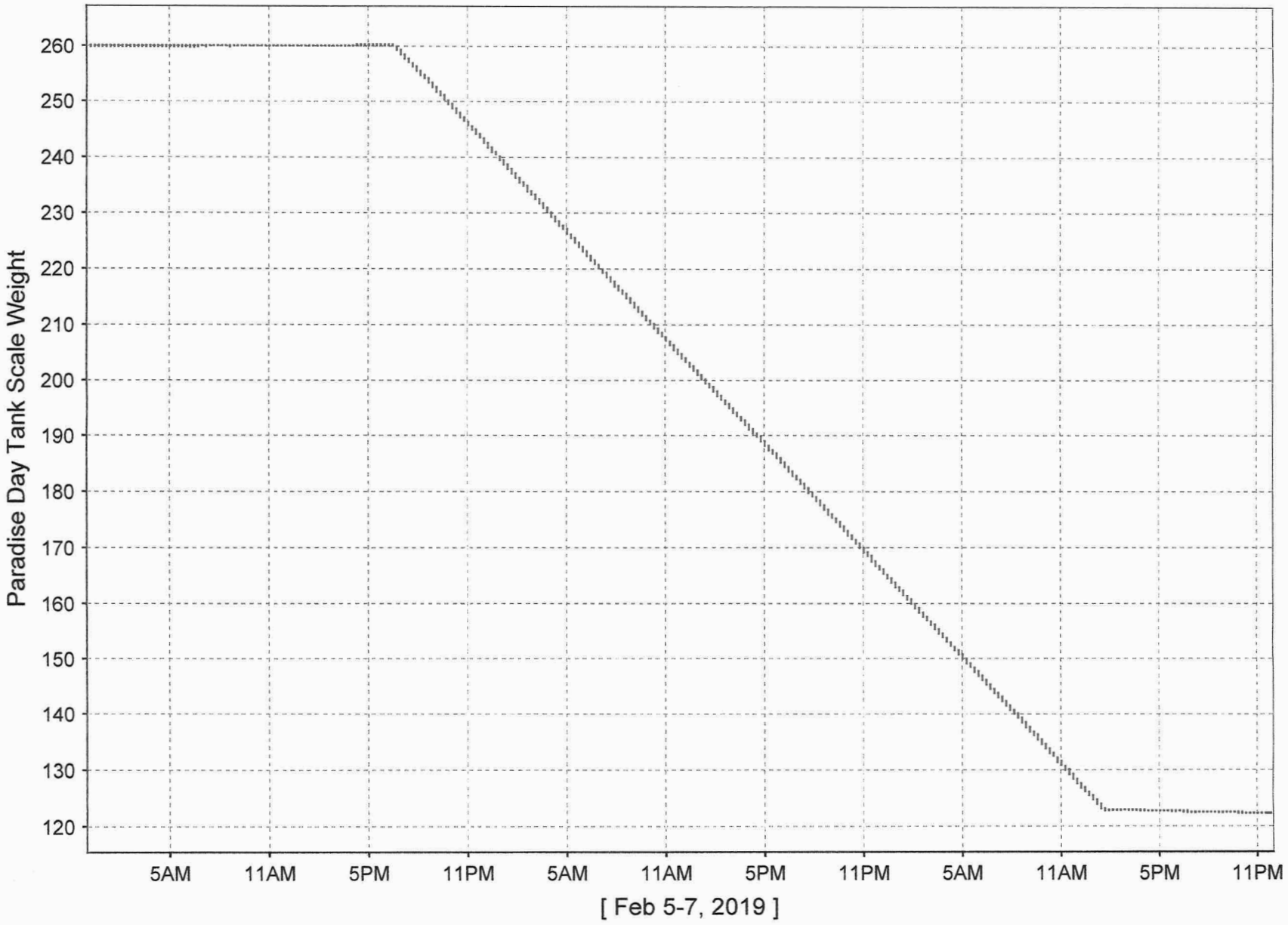
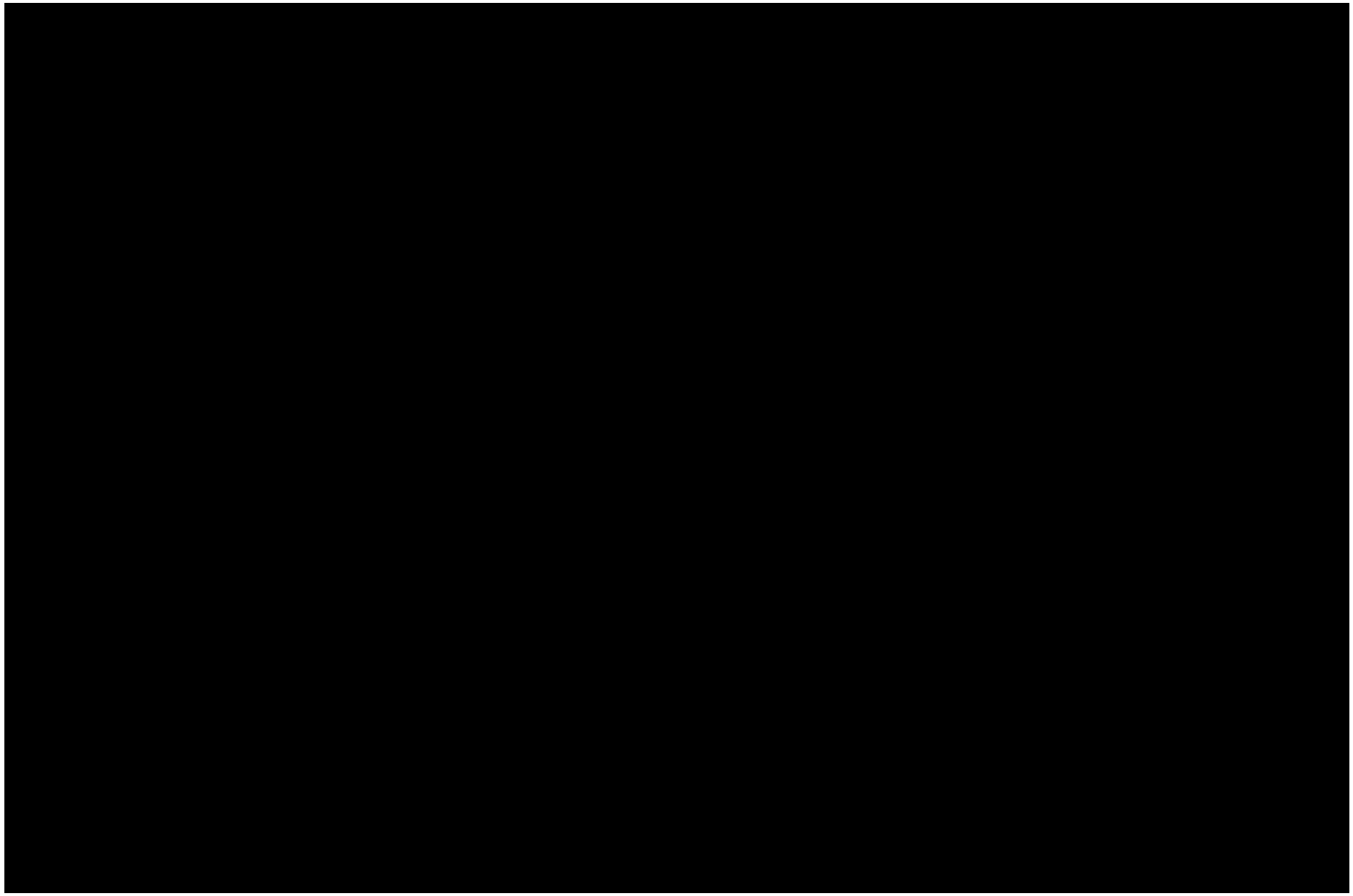


Exhibit 1



Sandy Public Utilities Internal Water Trace Model, Ran 2/7/19

Exhibit 2

From: Tom Ward
Sent: Friday, February 8, 2019 2:05 PM
To: 'Marie Owens';rdearing@utah.gov
Cc: Mike Campbell;Scott Ellis
Subject: FW: Map of Fluoride Samples at overfeed location

Marie, Ryan,
The figure below shows the investigation samples that indicated the initial high concentrations of Fluoride at 104 ppm (red), and post flushing sample results (green). Our water model shows that the water is flowing from south to north and east to west, pulling water past the well (off) site to the east and then north on Ryan Park Ave. The complaints were on Ryan Park Ave and folks on the areas to the south did not detect, consistent with the model results. We notified all the people in the shaded blue area door to door as noted.

After I spoke with you Mike told me that he talked to Rachel (?) who is sending us a draft notice that we can add our narrative. We will get you something for final review so we can get those out today.

Thanks!

From: Scott Ellis <sellis@sandy.utah.gov>
Sent: Friday, February 8, 2019 10:17 AM
To: Tom Ward <tward@sandy.utah.gov>
Subject: Map of Fluoride Samples at overfeed location

Exhibit 3
Page 1 of 3

[redacted]

Scott Ellis
Assistant Director and Operations Manager

9150 South 150 East | Sandy, UT 84070
o: 801.568.7193 | m: 801.201.2029
sellis@sandy.utah.gov

sandy.utah.gov

Exhibit 3
Page 2 of 3

Sent: Friday, February 8, 2019 10:17 AM
To: Tom Ward <tward@sandy.utah.gov>
Subject: Map of Fluoride Samples at overfeed location

Scott Ellis
Assistant Director and Operations Manager

9150 South 150 East | Sandy, UT 84070
o: 801.568.7193 | m: 801.201.2029
sellis@sandy.utah.gov

sandy.utah.gov

fluoride over feed 2/7/2019

pubutils.PU.SampleTaps

Laterals

Fire line laterals

Hydrant laterals

Meter Laterals

Unknown

Valve not found

washout

Washout

Not Found Washout

Distributin mains

Sandy City

Midvale Water

Jordan Valley Water

Private Owner

0 0.02 0.04 0.07 mi

0 0.03 0.06 0.12 km

Exhibit 4

Web AppBuilder for ArcGIS

Aero-Graphics |

Instructions for Maximum Contaminate Level (MCL) Notice for Fluoride

Template has been provided

If the Division of Drinking Water has designated a Maximum Contaminate Level (MCL) Fluoride exceedance as a Tier 1 violation R309-220-5(1)), you must provide public notice to persons served within 24 hours after it has been designated Tier 1 (R309-220-5(2)). Fluoride violations are Tier 2 by default, but may be elevated to Tier 1 by the Division of Drinking Water. In addition, violations are automatically elevated if you are unable to consult with the Division of Drinking Water (801-536-4200) within 24 hours. **In such cases, you must issue a notice within the next 24 hours.** You may elevate the violation to Tier 1 yourself as well. You should also coordinate with your local health department. One or both agencies should tell you whether to instruct consumers to boil water. You must use one or more of the following methods to deliver the notice to consumers (R309-220-5(3)):

- ✓ Radio
- ✓ Television
- ✓ Hand or direct delivery
- ✓ Posting in conspicuous locations

You may need to use additional methods (e.g., newspaper, delivery of multiple copies to hospitals, clinics, restaurants, or apartment buildings), since notice must be provided in a manner reasonably calculated to reach all persons served. If you post or hand-deliver, print your notice on letterhead, if you have it.

The notice on the reverse is appropriate for hand delivery or a newspaper notice. However, you may wish to modify it before using it for a radio or TV notice or posting. If you modify the notice, you must leave the health effects language in italics on the template provided unchanged. **This language is mandatory (R309-220-8(4)).**

Population Served
Make sure it is clear who is served by your water system--you may need to list the areas you serve.

Corrective Action
In your notice, describe corrective actions you are taking.

Source of the Problem
Explain it in your notice the source of the problem.

After Issuing the Notice
Send a copy of each type of notice and a certification that you have met public notice requirements to the Division of Drinking Water (PO Box 144830, SLC, UT 84414-4830) within ten days after you issue the notice (R309-105-16(3)). It is a good idea to issue a problem corrected notice when the violation is resolved.

It is recommended that you notify health professionals in the area of the violation. People may call their doctors with questions about how the violation may affect their health, and the doctors should have the information they need to respond appropriately. In addition, health professionals, including dentists, use tap water during their procedures and need to know of potential microbiological contamination so they can use bottled water.

DRINKING WATER WARNING

Sandy City Water System discovered extremely high acute Fluoride levels

DO NOT INGEST WARNING

Sandy City Water System routinely adds fluoride to the drinking water. On the afternoon of Tuesday February 5th 2019, the fluoride chemical feed system malfunctioned and an excessive amount of chemical was added to the drinking water at one location. The affected area is limited and includes your household. Immediately upon discovery of the equipment malfunction, Sandy City started flushing the drinking water lines and notified customers in the area.

While the malfunction has been corrected and fluoride levels at the affected areas are again within the range required by Salt Lake County Health Regulation, it is important that potentially affected residences flush their home's water system to ensure the over-fluoridated corrosive water is removed. For assistance with flushing your specific home, contact Sandy City Public Utilities at 801-301-8018.

What should I do?

- For homes in the impacted area, we recommend that homeowners flush their system by running all taps for 30 minutes and purging all service lines and any appliances with water storage, including ice trays in refrigerators and water used for all pets.

- The Fluoride chemical used was mixed with drinking water creating an ACUTE high level exposure to Fluoride and a decrease in pH levels due to the highly corrosive properties.

- High doses of fluoride can cause abdominal pain, nausea, vomiting, excessive saliva, and muscle spasms. Of the homes potentially affected, 5 people reported one or more symptoms consistent with a high dose of fluoride.

- Corrosive water may cause damage or irreparable impacts to the water system in your home including: pipes, hot water tanks, filters, and water softeners.

- If you or someone in your household is experiencing symptoms, see your health care provider or contact Utah Poison Control at 1-800-222-1222.

What is being done?

Sandy City operators have collected water quality samples in the distribution system and have corrected the equipment malfunction to ensure this will not happen again. Sandy City is confident the excessive Fluoride levels have returned to normal and will continue to monitor our drinking water for any impacts. More information about the quality of

your drinking water can be found at our website Sandy.utah.gov on our Water Quality Report.

For more information, please contact
name
phone/email
address

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.

This notice is being sent to you by Sandy City Water System
Water System ID#: UTAH18028.
Date distributed on:_____

NOTICE OF RECENT DRINKING WATER QUALITY EVENT

Sandy City Water System discovered extremely high acute Fluoride levels

WHERE: Small area from 11026 to 11126 South and 1850 East to 1950 East
WHEN: FEBRUARY 5TH THROUGH 7TH

Sandy City Water System routinely adds fluoride to the drinking water. On the afternoon of Tuesday February 5th through 2pm Thursday February 7th, a fluoride chemical feed system malfunctioned, and an excessive amount of chemical was added to the drinking water at one location. The affected area is limited and may include your household. Immediately upon discovery of the equipment malfunction, Sandy City closed valves to isolate the area, flushed the drinking water lines and notified customers in the area.

While the malfunction has been corrected and fluoride levels at the affected areas are again within the range required by Salt Lake County Health Regulation, it is important that potentially affected residences flush their home's water system to ensure the over-fluoridated corrosive water is removed. For assistance with flushing your specific home, contact Sandy City Public Utilities at 801-509-1062, or 801-301-8018.

What should I do?

- If you have not already, for homes in the impacted area, we recommend that homeowners flush their system by running all taps for 30 minutes and purging all service lines and any appliances with water storage, including ice trays in refrigerators and water used for all pets.
- The Fluoride chemical used was mixed with drinking water creating an ACUTE (short term) high level exposure to Fluoride and a decrease in pH levels due to the highly corrosive properties.
- High doses of fluoride can cause abdominal pain, nausea, vomiting, excessive saliva, and muscle spasms. Of the homes potentially affected, 5 people reported one or more symptoms consistent with a high dose of fluoride.
- If you or someone in your household is experiencing symptoms, see your health care provider or contact Utah Poison Control at 1-800-222-1222.

What is being done?

Sandy City operators have collected water quality samples in the distribution system and have corrected the equipment malfunction to ensure this will not happen again. Sandy City is confident the excessive Fluoride levels have returned to normal and will continue to monitor our drinking water for any impacts. More information about the quality of your drinking water can be found at our website https://sandy.utah.gov/departments/public-utilities on our Water Quality Report.

For more information, please contact: Mike Campbell 801-509-1056 (cell)

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.

Exhibit 6

This notice is being sent to you by Sandy City Water System
Water System ID#: UTAH18028.

Date distributed on: February 8, 2019

Exhibit 8

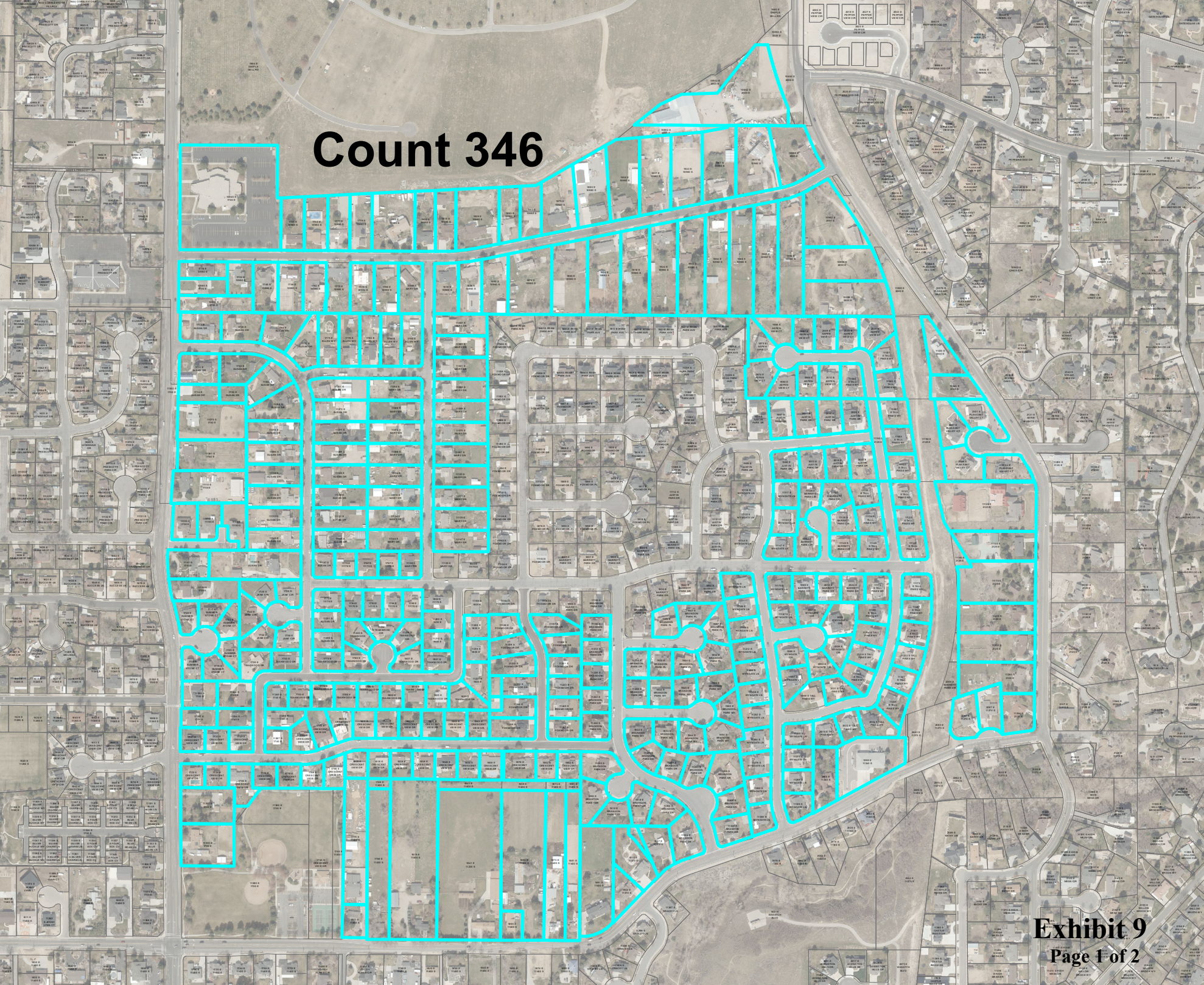


Exhibit 9

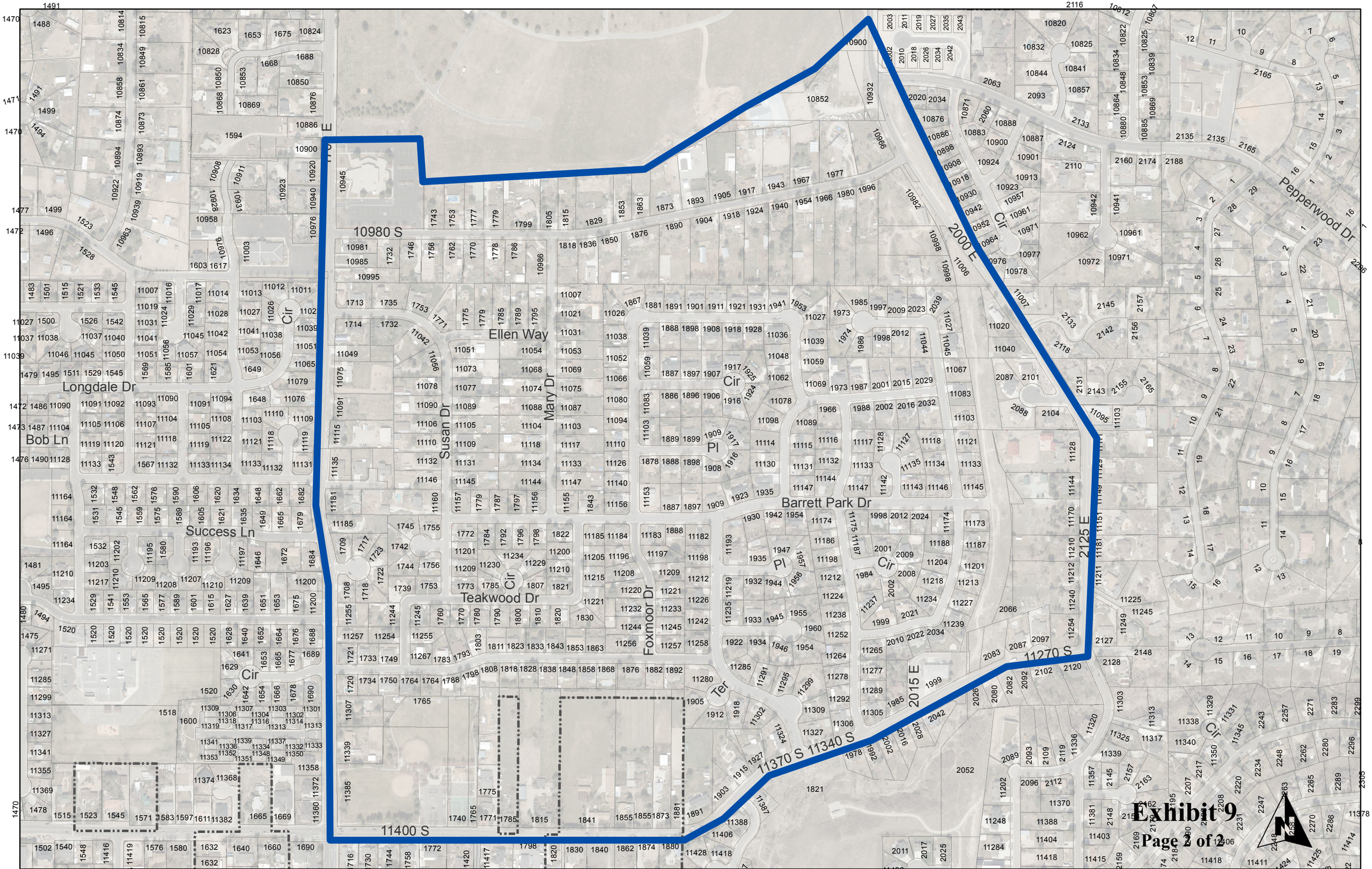

10980 S
Ellen Way
Mary Dr
Susan Dr
Foxmoor Dr
Teakwood Dr
Longdale Dr
Bob Ln
Success Ln
Barrett Park Dr
Pepperwood Dr
2000 E
2015 E
2125 E
11400 S
11370 S
11340 S
11270 S
Cir
Pl
Ter

Exhibit 9

NOTICE OF RECENT DRINKING WATER QUALITY EVENT

Sandy City Water System discovered extremely high acute Fluoride levels

WHERE: Small area from 11026 to 11126 South and 1850 East to 1950 East
WHEN: FEBRUARY 5TH THROUGH 7TH

Sandy City Water System routinely adds fluoride to the drinking water as required by County Health code. On the afternoon of Tuesday February 5th through 2pm Thursday February 7th, a fluoride chemical feed system malfunctioned, and an excessive amount of chemical was added to the drinking water at one location. The affected area is limited and may include your household. Immediately upon discovery of the equipment malfunction, Sandy City closed valves to isolate the area, flushed the drinking water lines and notified customers in the area.

While the malfunction has been corrected and fluoride levels at the affected areas are again within the range required by Salt Lake County Health Regulation, it is important that potentially affected residences flush their home's water system to ensure the over-fluoridated corrosive water is removed. For assistance with flushing your specific home, contact Sandy City Public Utilities at 801-509-1062, or 801-301-8018.

What should I do?

- If you have not already, for homes in the impacted area, we recommend that homeowners flush their system by running all Hot taps 30 minutes and Cold taps 30 minutes to purge all service lines and any appliances with water storage, including ice trays in refrigerators, and water used for pets.
- The Fluoride chemical used was mixed with drinking water creating an ACUTE (short term) high level exposure to Fluoride and a decrease in pH levels due to the highly corrosive properties.
- High doses of fluoride can cause abdominal pain, nausea, vomiting, excessive saliva, and muscle spasms. Of the homes potentially affected, 5 people reported one or more symptoms consistent with a high dose of fluoride.
- If you or someone in your household is experiencing symptoms, see your health care provider or contact Utah Poison Control at 1-800-222-1222.

What is being done?

Sandy City operators have collected water quality samples in the distribution system and have corrected the equipment malfunction to ensure this will not happen again. Sandy City is confident the excessive Fluoride levels have returned to normal and will continue to monitor our drinking water for any impacts. More information about the quality of your drinking water can be found at our website https://sandy.utah.gov/departments/public-utilities on our Water Quality Report.

For more information, please contact: Mike Campbell 801-509-1056 (cell)

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.

Exhibit 10

This notice is being sent to you by Sandy City Water System
Water System ID#: UTAH18028. Date distributed: February 8th and 13th, 2019

Public Notice for Sandy City, February 16, 2019

PUBLIC NOTICE FEBRUARY 7 AND 15, 2019

Last week, due to a storm and resultant power outage, a fluoride pump malfunctioned at one of Sandy City's wells near 1700 East and 11170 South. Initial models and resident contacts indicated fluoride entered the water system impacting approximately 50 homes. Once the city's Public Utilities Department discovered the failed equipment on Thursday, February 7 at 2pm, they immediately closed valves to isolate the area (approximately 11026 South to 11125 South and 1850 East to 1950 East). Crews flushed the drinking water line, notified the State of Utah and Health Department, and went door-to-door to notify and instruct customers to flush their water system.

Corrective Action

Sandy City plans to test 600 homes through the weekend ending February 19, 2019. We will continue to test up to 3,000 homes in the area notified. We have communicated through social media channels, news media, city web site, door to door contact, direct phone calls and reverse 911 to notify our citizens about the fluoride overfeed. These residents have been instructed to flush their water system for a total of 60 minutes (30 minutes each; all taps concurrently; hot then cold water). Additionally, we have instructed these residents to empty ice trays and pet water dishes. If any Sandy City resident requests additional testing of their water system at their home, Sandy City will certainly do so.

Source of the Problem

By that afternoon, at approximately 4pm, the city's water systems were back to normal fluoride levels. Since last week, the city has been monitoring the situation and discovered other homes outside the initial designated affected area may have also been impacted. Additionally, lab test results from last Thursday's sample of a few homes came back yesterday indicating high levels of copper and lead; subsequently we also identified elevated levels of arsenic, aluminum, manganese, and iron. We expanded the affected area flush order on Friday night to ensure the absolute safety of the residents. That area includes 10600 South to 11400 South and 700 East to 2000 East.

DRINKING WATER WARNING

Due to the corrosive potential of the fluoride chemical that was overfed, there may be long term impacts to the pipelines. Utah's hard water usually adds scale deposits to the pipes. This helps protect the pipes in your home from corrosion. The fluoride chemical fed malfunction may have stripped the scale from the pipelines leaving them vulnerable to corrosion of lead and copper and other metals.

Based on Sandy City's sample results, this incident caused levels that require public notice and ongoing monitoring of lead, copper, arsenic, aluminum, iron, and manganese in the drinking water. The recent samples show that all of those except lead have returned to safe levels and one lead sample was still above the action level.

The following table shows the Drinking Water standards or levels compared to the data found so far in Sandy City's water system. All units except for pH are listed in parts per billion or ppb.

	Action Levels	Worst Level from Samples Taken February 7, 2019	Worst Level from Samples Taken February 15, 2019
Lead	15 ppb	394 ppb	21.4 ppb
Copper	1,300 ppb	28,800 ppb	381 ppb
pH	6.5 – 8.5 pH units	3.46	7.2 (2/13/19)
Arsenic	10 ppb	34.1 ppb	1.6 ppb
Iron	300 ppb	3,850 ppb	250 ppb
Manganese	300 ppb	469 ppb	4.1 ppb
Aluminum	200 ppb	2,700 ppb	50 ppb

What should I do?

- Sandy City recommends flushing your cold and hot water taps for a minimum of 30 minutes and purging all service lines including any appliances with water storage, including ice trays in refrigerators and water used for all pets. If you have completed this step, then continued flushing may not resolve the problem until the pipes develop a protective hard water scale.

- We advise against drinking the water in the areas identified in the notice until further notice. However, you may use the water for showering and other non-ingesting tasks. Avoid using the water for preparing food and brushing teeth.

- Sandy City is continuing to collect samples and is looking at the corrosive potential of the water to determine what further steps to take. Please continue to check (www.sandy.utah.gov) for updates on what to do.

What are the effects?

- The lead and copper results from February 7, 2019 show acute high level exposure to lead and copper. Health effects from acute lead exposure can include dullness, restlessness, irritability, poor attention span, headaches, muscle tremor, abdominal cramps, kidney damage and hallucinations. Health effects from acute exposure to copper can include gastrointestinal bleeding, headache, nausea, and vomiting.

- The arsenic results from February 7, 2019 show levels of arsenic over the Maximum Contaminant Level. Health effects from short term arsenic exposure include vomiting, abdominal pain, diarrhea, and possible numbness of the extremities.

- The manganese results from February 7, 2019 show levels of manganese over the health advisory level. The EPA has not established a National Primary Drinking Water Regulation for manganese, so no action is required by Federal regulation. However, this result exceeds EPA's 10-day Health Advisory value for infants younger than 6 months (300 µg/L). Therefore, near-term actions to address public health concerns, particularly for formula-fed infants may be warranted. This result also exceeds EPA's chronic (lifetime) Health Advisory value (300 µg/L).

- The secondary standards for iron and aluminum were exceeded in the February 7, 2019 results. However, there are no health effects from exceeding secondary standards, as those are not health based standards. High levels of iron, aluminum, and manganese cause discoloration and odor in the water.

- Corrosive water may cause damage or irreparable impacts to the water system in your home including: pipes, hot water tanks, filters, and water softeners.

- If you or someone in your household is experiencing symptoms, see your health-care provider or contact Utah Poison Control at 1-800-222-1222.

What is being done?

- Sandy City has set up a staging area in a parking lot across from Fire Station 34, located at 10765 South 70 East, to hand out bottled water and has an emergency operations command center at City Hall.

- Sandy City will continue to provide all data results to the public. Check (www.sandy.utah.gov) for the most recent sampling results.

- Ongoing samples will be taken and public notifications will continue until all test results are returned within safe levels.

- For updated information on this incident please refer to the (www.sandy.utah.gov).

For more information, please contact
Poison Control
1-800-222-1222

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.

This notice is being sent to you by Sandy City Water System

Water System ID#: UTAH18028.
Date distributed on: 2-16-2019

SANDY CITY FLUORIDE INCIDENT RESPONSE MAP

as of February 17, 2019, 10:35 am

* All sample results received on Saturday, February 16, 2019 meet safe drinking water standards

LEGEND

- Location of Samples Taken on February 16, 2019
- (#) Sample ID Number (listed in the lab report)
- Zone 1: Initial area of contamination identified on February 7, 2019 based on fluoride samples and sickness reports.
- Zone 2: Notification area of potential contamination expanded on February 13, 2019.
- Zone 3: Potential contamination area expanded on February 15, 2019 based on model predicted potential exposure to 2-4 ppb fluoride. All metals and flouride results taken on February 15, 2019 were below action levels and Maximum Contaminant Level (MCL).
- Water Pressure Zone Boundary Line

Zone 3

Zone 1

Zone 2

Water Pressure Zone 2B

Altara Elementary School

Alta High School

Sunrise Elementary School

Exhibit 12

Note: Samples were not taken in the upper Water Pressure Zone 2B because water cannot enter the zone east of 2000 East

SANDY CITY FLUORIDE INCIDENT RESPONSE MAP

as of February 17, 2019, 7:50 PM

*Refer to certified lab report for test results

LEGEND

- Location of Samples Taken on February 16, 2019
- Samples on February 16, 2019 (results February 17, 2019)
- Latest Sample Exceeds Drinking Water Standards
- Zone 1: Initial area of contamination identified on February 7, 2019 based on fluoride samples and sickness reports.
- Zone 2: Notification area of potential contamination expanded on February 13, 2019.
- Zone 3: Potential contamination area expanded on February 15, 2019 based on model predicted potential exposure to 2-4 ppb fluoride. All metals and flouride results taken on February 16, 2019 were below action levels and Maximum Contaminant Level (MCL).
- Water Pressure Zone Boundary Line

Zone 3

Water Pressure Zone 2B

Zone 1

Zone 2

Altara Elementary School

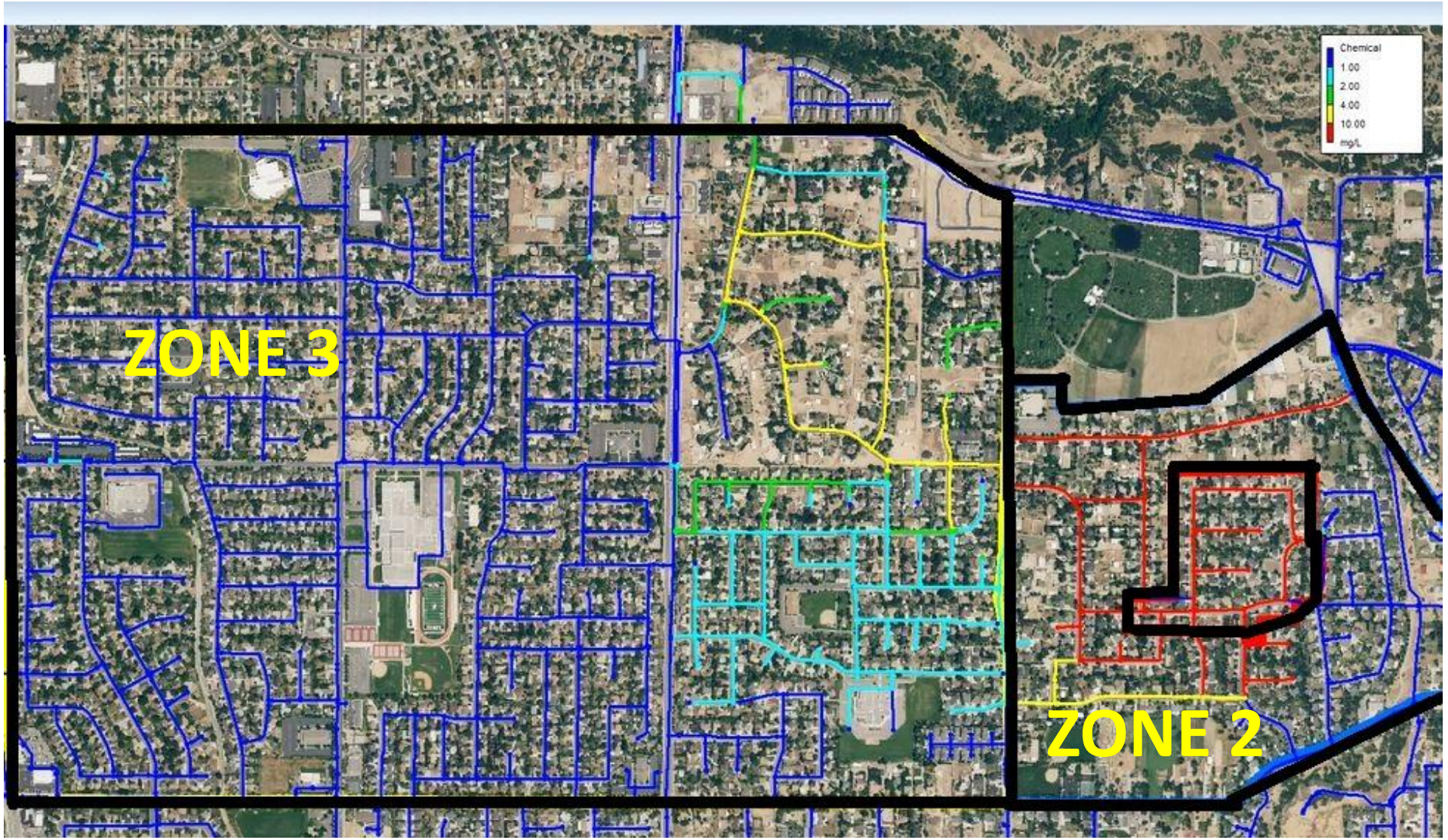
Alta High School

Sunrise Elementary School

Exhibit 13

Note: Samples were not taken in the upper Water Pressure Zone 2B because water cannot enter the zone east of 2000 East

Areas where acidic conditions might have occurred 2/5 to 2/7



Consultant Calibrated Model to Estimated System Conditions for Thursday, Feb.7th
Prior to Flushing - Model Run Date: 2/19/2019

Exhibit 14

SANDY CITY FLUORIDE INCIDENT RESPONSE MAP

as of February 22, 2019, 4:30 PM

* Refer to certified lab reports for test results

LEGEND

- Samples Below Lead Action Level and Allowed Fluoride Limit
- Samples That Exceeded Lead Action Level or Allowed Fluoride Limit
- Zone 1: Initial area of contamination identified on February 7, 2019 based on fluoride samples and sickness reports.
- Zone 2: Notification area of potential contamination expanded on February 13, 2019.
- Zone 3: Potential contamination area expanded on February 15, 2019 based on model predicted potential exposure to 2-4 ppm fluoride. All metals and flouride results taken on February 16, 2019 in this zone were below action levels and Maximum Contaminant Level (MCL).
- Water Pressure Zone Boundary Line

Water Pressure Zone 2B

Note: Samples were not taken in the upper Water Pressure Zone 2B because water cannot enter the zone east of 2000 East

Exhibit 15