

Springdale Water Utilities

AR0022063, AFIN#72-00003

Leaks in Equalization Basins

Over 20 inches of rainfall was recorded at Springdale's WWTF in October and November 2019 with even higher amounts recorded within Springdale Water Utilities' sewer service area. The ground was saturated for over 8 weeks resulting in widespread flooding and other problems. The largest rainfall event, over 10 inches at the WWTF and over 12 inches nearby in less than 24 hours, was considered to be between a 200 and a 500-year flood event. Despite long-term, aggressive, and comprehensive efforts to reduce inflow and infiltration in SWU's collection system, substantial flows were seen at the WWTF during that time. As a result, over 200 million gallons of wastewater were treated in October and November in excess of the more normal amount treated in August, much of which came to the plant in large volumes at once. As is common practice at many WWTFs, excess water is stored in equalization basins to be treated later. So much flow came in for such an extensive time that every empty clarifier, process train, and equalization basin was completely filled. Extreme flow clarifiers were then put into service where incoming water following screening, grit, and grease removal is treated with alum, settled, and mixed with the wastestream at the head of the chlorine contact basin for chlorination, dechlorination, and oxygenation prior to discharge. These "extremes" were only used twice before this year, but were put into use three times over the course of October and November.

On October 30, 2019, staff observed small amounts of particulate matter in the south EQ basin flowing slowly toward a couple of expansion joints just under the water surface. This movement was indicative of water seeping through the joint in some unknown amount. The south basin, constructed in around 1991, has an underdrain structure below it that discharges groundwater from a pipe that emerges on the east side of the basin and keeps the basin from floating when it is empty. This drain is outside the WWTF fence but on SWU property. Typically, a trickle of groundwater is discharged through the pipe all of the time with a large amount being discharged when it is rainy. The water from the pipe flows downhill for a short distance and disappears underground on the property. Some discoloration and the odor of sewage were observed in the water flowing from the underdrain on this date.

Continued rainfall required the EQ basins to remain in full or partial service until November 17, 2019. Observations through that time showed some odor and discoloration of the water being discharged. When the south basin was completely emptied and cleaned, the water being discharged cleared up, substantiating the suspicion of leakage. There is no real way to estimate the amount of water lost from the cracks as it commingled with groundwater from under the basin before going back underground. From the flow rate in the underdrain pipe, a maximum of 260,000 gallons was discharged over 18 days, and then went back underground.

An additional leak was suspected and ultimately verified in the north wall of the northwest EQ basin, built in 1986. Water was flowing out of the ground and down to a drainage ditch that runs through the WWTF and ultimately discharges into Spring Creek to the north of the WWTF. Discharge started on November 7, 2019 and also ceased by November 17, 2019 when the basin was empty. A substantial crack was found when the basin was cleaned, which was immediately repaired. Based on the flow to the drainage ditch, up to 11,500 gallons were lost, with some of that amount possibly being rainwater.

Mr. Richard Healey, Enforcement Branch Manager, Office of Water Quality, ADEQ, was contacted on November 21, 2019 concerning the leaks. He indicated that they should be reported as an "upset",

although we consider it more of an “equipment failure”. He requested a detailed narrative follow up in writing, and waived the 5-day time frame for a written report.

No known adverse environmental impact was observed from the leaks. Considerable time and money had been spent in the past to repair cracks and expansion joints in structures at the WWTF as problems have arisen. The EQ basin cracks and joints have been or are in the process of being repaired in-house as quickly as weather conditions allow, as they must cure in above freezing temperatures and remain dry for the curing process. The northwest basin has been repaired, both the substantial crack and any minor cracking seen. The northeast basin was repaired by an outside contractor last year, and does not appear to have any leaks at this time. Repairs on the newest (south) basin are over halfway complete and should be closer to 75% complete by the end of the week, with the focus being placed on the cracks and joints that look the worst. In addition to normal daily observation, a thorough visual inspection of all basins has been added as an annual preventive maintenance item in our Maintenance Management System. Any problems observed during that inspection or any other time will be repaired as soon as possible.

Attached with this report you will find a photo of groundwater and wastewater commingling in the underdrain pipe from the south basin and an aerial photo of the WWTF with tabs marking the location of that underdrain and the path of the leak from the northwest basin to Spring Creek to provide a visual perspective to this report. Any questions or requests for further information can be directed to Jennifer Enos, Wastewater Facilities Director, 479-756-3657 or jenos@springdalewater.com .



From: Jennifer Enos <jenos@springdalewater.com>
To: Healey, Richard; Brown, Christina
Cc: Heath Ward; Loren Sharp; Brad Stewart
Subject: Written follow up to reported EQ basin leaks - AR0022063, AFIN#72-00003

Sent: Thu 12/5/2019 11:05 AM

Message Leaks in EQ basins - 120319.docx (16 KB) EQ basin underdrain - 2019.JPG (2 MB) Aerial wwtf (2 MB)

Dear Mr. Healey:

Attached please find the written follow up to our conversation on November 21, 2019 concerning the two leaks that were found in EQ basins at Springdale's WWTF. As requested, I have copied Ms. Christina Brown. Please feel free to contact me if you need any additional information.

Sincerely yours,

Jennifer E. Enos
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