

Urban Drainage and Flood Control District

ALERT Network 2017 End of Year Report



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1. Introduction

This report summarizes the field maintenance activities conducted in 2017 by Water and Earth Technologies, Inc. (WET) under contract to the Urban Drainage and Flood Control District (District) for the Real-Time Flood Detection System.

The maintenance records are generated from the maintenance software Fast Field Forms and are provided in appendix A.

2. Monitoring Network

Through 2017 WET maintained four stations in the UDFCD network which included Arvada Blunn Reservoir (10022), Weir Gulch (10032), Brantner Gulch (10041) and Big Dry Creek at Thorncreek (10042).

The system was inspected and activated in March and was operational from April 1 to November 9. The rain and stage stations were shut-down and winterized in early November with the Weir Gulch (10032) transmitter being stored at the WET office.

3. Maintenance Activities

Full maintenance activities are performed during each visit. The top section of each ALERT rain gage standpipe assembly is removed to clean the screen, funnel, and tipping bucket. The tipping buckets are leveled; standpipes and other appurtenances are painted to protect against corrosion and vandalism; antenna mounts, clamps, cables, and conduits are secured; and each site is inspected to meet the terms of existing license agreements or varying field conditions. The radio and antenna system are tested. The battery is checked. Test transmissions are performed to assure that gage reports are being received by ALERT base stations. Pressure transducer (PT) orifices and protective housings are checked and maintained free of mud and debris. Pressure tests are performed on all accessible PTs. Transmitted data are recorded and compared with calibration tables. All defective equipment is repaired or replaced as needed using available spare parts. Calibration adjustments are made as needed.

A summary of maintenance work performed at each location is provided in the following sections. Detailed maintenance records are provided in the appendix.

3.1 Arvada Blunn (ID: 10022)

The radar at Arvada Blunn is left running year-round to monitor the water level at Blunn Reservoir. The station was inspected on March 29th. All equipment was checked, cleaned and tested. All equipment was in working order.

Mid-season inspections were conducted on June 7th and August 15th. All equipment was checked, cleaned and tested. All equipment was in working order.

Since there is only a radar at this station, the station is left running year-round.



Figure 3-1: Arvada Blunn (10022) radar

Table 3-1: Arvada Blunn Maintenance Summary

Sta. No.	Station Name	Date	Battery Voltage			Solar Regulator		Radio		
			Quiet	Load	Delta	Output Voltage	Output Current	FWD	REF	SWR
			(V)	(V)	(V)	(V)	(mA)	(W)	(W)	
10022	Arvada Blunn Reservoir	3/29/2017	13.61	13.10	0.51	13.26	53	5.00	0.10	1.0408
		6/7/2017	13.65	13.13	0.52	13.02	50	5.00	0.00	1.00
		8/15/2017	13.58	13.26	0.32	13.65	100	3.75	0.00	1.00

3.2 Weir Gulch (ID: 10032)

The station at Weir Gulch was activated on March 29th. All equipment was checked, cleaned and tested. All equipment was in working order.

Mid-season inspections were conducted on June 7th and August 15th. All equipment was checked, cleaned and tested. All equipment was in working order.

On November 9th, winter shut-down activities were performed. All equipment was checked, cleaned and tested. The transmitter was removed, and the PT was pulled up into its winter position. All equipment was in working order.



Figure 3-2: Weir Gulch Station

Table 3-2: Weir Gulch Maintenance Summary

Sta. No.	Station Name	Date	Battery Voltage			Solar Regulator		Radio		
			Quiet	Load	Delta	Output Voltage	Output Current	FWD	REF	SWR
			(v)	(V)	(V)	(V)	(mA)	(W)	(W)	
10032	Weir Gulch	3/29/2017	13.26	13.11	0.15	14.42	631.00	4.80	0	1.00
		6/7/2017	13.67	13.46	0.21	13.79	642.00	5.00	0	1.00
		8/15/2017	13.88	13.70	0.18	13.84	101	4.75	0.15	1.43

3.3 Brantner Gulch (ID:10041)

The station at Brantner Gulch was activated on January 13th. All equipment was checked, cleaned and tested. All equipment was in working order.

Mid-season inspections were conducted on April 19th and June 7th. All equipment was checked, cleaned and tested. All equipment was in working order.

On November 9th, winter shut-down activities were performed. All equipment was checked, cleaned and tested. The PT was pulled up into its winter position. All equipment was in working order.



Figure 3-3: Brantner Gulch near Syracuse St

Table 3-3: Brantner Gulch near Syracuse St Maintenance Summary

Sta. No.	Station Name	Date	Battery Voltage			Solar Regulator		Radio		
			Quiet	Load	Delta	Output Voltage	Output Current	FWD	REF	SWR
			(v)	(V)	(V)	(V)	(mA)	(W)	(W)	
10041	Brantner Gulch	4/19/2017	14.06	13.83	0.23	13.40	254.00	5.00	0.00	1.00
		6/7/2017	14.13	13.73	0.40	13.91	198.00	4.25	0.20	1.0988

3.4 Big Dry Creek at Thorncreek (ID: 10042)

The station at Big Dry Creek at Thorncreek was activated on March 29th. All equipment was checked, cleaned and tested. All equipment was in working order.

Mid-season inspections were conducted on June 7th and August 15th. All equipment was checked, cleaned and tested. All equipment was in working order.

On November 9th, winter shut-down activities were performed. All equipment was checked, cleaned and tested. The PT was pulled up into its winter position. All equipment was in working order.



Figure 3-4: Big Dry Creek at Thorncreek Golf Course

Table 3-4: Big Dry Creek at Thorncreek Golf Course Maintenance Summary

Sta. No.	Station Name	Date	Battery Voltage			Solar Regulator		Radio		
			Quiet	Load	Delta	Output Voltage	Output Current	FWD	REF	SWR
			(v)	(V)	(V)	(V)	(mA)	(W)	(W)	
10042	Big Dry Creek at Thorncreek	3/29/2017	13.96	13.60	0.36	14.44	169.00	5.20	0	1.00
		6/7/2017	13.87	13.60	0.27	14.15	336.00	4.90	0	1.00
		8/15/2017	13.66	13.45	0.21	13.20	120	4.50	0	1.00

4. Conclusion

All UDFCD sites are up to date and working correctly. These stations will be visited for maintenance three times during the 2018 season: March start-up and two mid-season maintenance visits.

5. Recommendations

WET recommends making periodic manual streamflow measurements at these locations in 2018 to supplement the theoretical ratings.

6. Appendix A. Site Specific Maintenance Records

