

December 16, 2009

Kevin Stewart  
Manager, Information Systems and Flood Warning Program  
Urban Drainage and Flood Control District  
2480 West 26<sup>th</sup> Ave., Suite 156-B  
Denver, CO 80211

Re: Revised Proposal of ALERT Gaging System 2010 Maintenance Services

Dear Kevin,

OneRain is pleased to present the following proposal to perform ALERT gaging system maintenance service on behalf of the UDFCD during 2010. The proposal is designed to meet or exceed the District's performance requirements, as always. The accompanying scope addresses two general aspects:

- ◆ Ongoing preventive and proactive maintenance program and problem management.
- ◆ Production use of system performance monitoring and tools for OneRain and the District with Contrail<sup>®</sup> Insight.

The price for completing maintenance services this year is \$195,360. As the Bureau of Labor Statistics Consumer Pricing Index for the Denver / Boulder area has not increased this year, the maintenance pricing per site will be the same as in 2009. We did not increase the pricing of our Contrail<sup>®</sup> Web service from last year.

We continue to take pride in our role as participants in the District's model urban stormwater management program. We look forward to having the opportunity to work with the UDFCD during 2010.

Please contact me with any questions.

Sincerely,



Mike Zucosky  
Manager, Field Integration



HEADQUARTERS

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# Proposal

## **UDFCD ALERT Gaging System 2010 Maintenance Services**

Submitted to:

Kevin Stewart, Manager  
Information Services and Flood Warning Program  
Urban Drainage and Flood Control District  
2480 W. 26th Avenue, Suite 156-B  
Denver, CO 80211

Submitted by:



December 16, 2009

## EXECUTIVE SUMMARY

The Urban Drainage and Flood Control District (the District, UDFCD) functions as Denver area and Front Range regional local governments' highest value flood warning and stormwater decision support system. UDFCD has provided real-time rainfall and related environmental data to users with operational requirements dependent on wet weather runoff for two decades. The District continues to be leveraged as a model for other districts because of their attention to best practices to achieve high functionality and reliability at low cost.

This document presents OneRain's 2010 proposal for real-time environmental monitoring system maintenance services. The proposed scope of work is designed to meet or exceed the District's system performance requirements, as has been OneRain's ongoing goal in serving the District.

The accompanying scope addresses two general aspects:

1. Excellent preventive, proactive maintenance program and problem management
2. Reliable performance tracking with system monitoring services and tools (Contrail<sup>®</sup> Insight)

## Cost

OneRain is strongly committed to the UDFCD's ongoing success. We are honored to have been selected repeatedly as the District's maintenance provider. We look forward to 2010 being a year of partnered growth in procedures, tools and cost-saving measures to achieve a highly functional storm sensing outcome.

The costs are broken into two parts:

- ◆ Preventive Maintenance (\$166,689)
  - 75-day maintenance schedule
  - 149 field sites
  - 4 base stations
- ◆ Predictive Maintenance and Performance Evaluation (\$22,191)
  - Daily performance analysis
  - Weekly reporting
  - Post rain-event analyses
  - Contrail Web data access for all UDFCD and Boulder County sites
  - Enhanced graphical reports available via the Internet (Contrail Insight)
  - Near-real-time sensor performance evaluations (availability statistics)
- ◆ Additional FCC Licensing (\$6,480)
  - Reduce contention on ALERT repeater input channels

The total cost for the fully compliant 2010 maintenance contract is **\$195,360**.

## **ALERT SYSTEM MAINTENANCE**

OneRain will provide all services necessary for the installation, operation, preventative maintenance and end-of-season removal and storage of the ALERT gages and equipment as identified in Exhibit A. All technical work associated with this Proposal will be performed by qualified technicians. Maintenance of ALERT base stations will be limited to radio equipment, data decoders and connecting cables. UDFCD will be responsible for maintenance of base station computers and software; this work is out of the scope of work described in this proposal. Major repairs or replacement of major electronic components are not part of this Scope of Services. Appropriate records will be maintained by OneRain of all activities performed. UDFCD will be provided with copies of all such records. The following briefly identifies the work items with more detailed explanations of each work item contained further on.

Typically, the “Flood Season” is April 30 - October 1. A complete list of UDFCD gaging sites is presented in Exhibit A. Specific descriptions of work items are outlined below.

### **Startup Maintenance, Electronic Testing, Field Installation, System Activation and FCC Licensing**

- a. OneRain will inspect and test all equipment pertinent to remote gaging station operation including radio transmitters, antennas, cables, connectors, tipping buckets, pressure transducers, shaft encoders, weather sensors and batteries. OneRain will prepare a punch list of any deficiencies observed and recommend additional equipment and services not included in this Scope of Services.
- b. OneRain will perform all preliminary equipment preparation necessary to ensure complete operation of each gaging station. This work will include battery charging, battery replacement, calibration checks and other electronic adjustments as needed.
- c. OneRain will test all electronics packages and perform minor adjustments as needed in accordance with manufacturer’s RF specifications and Federal Communications Commission (FCC) requirements.
- d. OneRain will install required hardware at each ALERT gaging station. This work will include installing electronics packages; connecting antenna and battery cables; leveling and calibrating tipping buckets; painting standpipes, weather housings and other parts subject to corrosion; physical securing of site including antenna mounts, clamps, cables, conduits and sensors; general cleaning of site including funnel, screen and pressure transducer orifices; replacement or repair of defective pressure transducers and signal conditioning boards; and any other items deemed necessary to meet the terms of existing license agreements, land use permits or varying field conditions. Specific activities performed will be site dependent. Station IDs, RF turn-on times, analog event and time mode switches, and other station configuration programming will be set per specifications approved by UDFCD and as required to ensure proper repeater operation. Serial

numbers will be recorded. Test transmissions will be performed to check that gage transmitters are operating according to factory specifications and the repeaters are receiving and re-transmitting the signal. Watt meter readings will be recorded. Minor RF adjustments and field calibrations will be made as needed.

- e. OneRain will complete minor adjustments and testing of all repeater stations. OneRain will maintain all power supplies including solar panels, voltage regulators and batteries.
- f. OneRain will provide all services necessary to ensure proper radio and data decoder operation at the ALERT base station. This work will include testing radio receivers and data decoders and verifying data collection by the base station computer. OneRain will not be responsible for maintenance or repair of computer hardware or software. All antennas, connectors and cables will be inspected and repaired as needed. Major repairs or replacement of major electronic or software components will be approved by UDFCD and funded separately from this Agreement, prior to such action.

### **Scheduled Routine Inspections and Data Analysis**

- a. OneRain will conduct a physical inspection of all remote gaging stations. The mechanical functions of each site will be tested to ensure proper operation. Minor mechanical and calibration adjustments will be made as needed. Minor parts such as cables, connectors, mounting hardware and batteries will be replaced as needed. Routine inspection of rain gages will occur at 75-day intervals, unless known site problems warrant a more frequent inspection cycle.
- b. OneRain will remove the top section of each ALERT rain gage standpipe assembly to clean the screen, funnel and tipping bucket. This work will include leveling tipping buckets; painting standpipes and other appurtenances to protect against corrosion and vandalism; physically securing site including antenna mounts, clamps, cables, conduits and sensors; general cleaning of site; inspecting antennas and connecting cables; and any other items deemed necessary to meet the terms of existing license agreements or varying field conditions. Test transmissions will be performed to ensure that gage reports are being received by ALERT base stations. Pressure transducer (PT) orifices and protective housings will be checked and maintained free of mud and debris.
- c. Pressure tests will be performed on all accessible PTs. Transmitted data will be recorded and compared with calibration tables. Defective PTs or signal conditioning boards will be repaired or replaced as needed, using available spare parts. Calibration adjustments will be made as needed. Specific activities performed will be site dependent.
- d. OneRain will conduct general inspection of repeater sites and test batteries to ensure proper performance. Solar panels will be cleaned and voltage regulators adjusted as needed. Suspected problems will be reported immediately to the UDFCD.

- e. OneRain will evaluate ALERT rain and stream gage data reliability following precipitation events that accumulate an inch or more of precipitation at 10 or more rain gages within 7 consecutive days. Based on the analysis results, any equipment suspected faulty will be scheduled for service in accordance with this Agreement. OneRain will provide the UDFCD with a brief written summary of the system status and recommended remedial actions following each data analysis.
- f. OneRain will provide daily system performance monitoring. The findings from this daily analysis will be provided to the UDFCD on a weekly basis. If site or system malfunctions are discovered during daily analysis, OneRain will notify the UDFCD immediately upon verification and effect repairs in accordance with Section 2.3.

### **Unscheduled Service Calls**

Upon notification by the UDFCD, or determination of potential problems from the data analysis, OneRain will make unscheduled service calls necessary to ensure full system operation during the flood season. OneRain will respond to UDFCD requests for service or other problem confirmation within three (3) working days of notification or confirmation of a remote sensor or transmitter failure, within forty-eight (48) hours of notification or confirmation of repeater failure and within seventy-two (72) hours of notification or confirmation of radio failure at an ALERT base station. In the event of minor part failure, OneRain will effect immediate repairs and provide appropriate minor replacement parts. In the event of a major part failure, OneRain will install available spare parts and return failed units to the lab or factory for repair. Major repairs or replacement of major electronic components will be approved by the UDFCD prior to such action.

### **End-of-Season Field Equipment Removal, Testing and Storage**

- a. OneRain will remove electronics packages, tipping buckets and other appropriate equipment from the ALERT gaging stations not specified by UDFCD for year-round operations. Pressure transducers and associated cables and conduits will be secured on-site. Electronic and mechanical deficiencies will be identified and either remedied immediately or recommended for future repair. Serial numbers will be checked and recorded. General cleaning of each site will be performed and all parts secured for the off-season period. This work will include physically securing the site; painting of standpipes, weather housings and other parts subject to corrosion; and any other items deemed necessary to meet the terms of existing license agreements or varying field conditions. Specific activities will be site dependent.
- b. OneRain will service all repeater batteries and solar panels and conduct general site inspection and testing. All repeaters will be maintained in working condition for continuous year-round operations.
- c. OneRain will test each electronics package prior to off-season storage. Any units needing factory service or parts will be repaired as soon as possible to ensure readiness for the following flood season.

- d. OneRain will provide equipment storage area for all electronics packages, batteries, tipping buckets and other equipment in a manner acceptable to the UDFCD. All batteries will be maintained in properly charged condition according to manufacturer's specifications. All equipment will be available for inspection or access within seventy-two (72) hours of notification by the UDFCD. OneRain will provide adequate casualty insurance coverage for all UDFCD-owned equipment being stored.
- e. OneRain will provide the District with an end-of-season report by Wednesday, December 31, 2010. The report will include a description of system performance and problems encountered, recommendations for the upcoming season and copies of maintenance records.

### **New Installation and Radio Licensing**

Any new gaging stations, repeater stations and base stations will be installed per below guidelines. Specific installation requirements for new sites will be determined by the UDFCD during final design. The UDFCD will provide all major components to be installed and OneRain will provide all other parts and materials necessary to complete construction. Installation fees will be negotiated with OneRain prior to construction based on professional service fees as identified in Table 3.

- a. As a basis for the time and cost estimate, OneRain will prepare a master project plan that clearly outlines the tasks to be completed and a project-specific scope of work describing all deliverables and responsibilities.
- b. OneRain will inspect all equipment pertinent to ALERT station operation. OneRain will prepare a punch list of any deficiencies observed and recommend additional equipment and services not included in this Scope of Services.
- c. OneRain will perform all preliminary equipment preparation necessary to ensure complete installation and operation of the remote gage, repeater or base station.
- d. OneRain will test all electronics packages and perform minor adjustments as needed in accordance with manufacturer's RF specifications and FCC requirements.
- e. OneRain will provide the UDFCD with a list of serial numbers for all new equipment received.
- f. An initial field inspection of each site will be conducted. Preliminary site design and layout recommendations will be provided to the UDFCD by OneRain. The UDFCD will approve of the final design prior to installation.
- g. OneRain will install all hardware necessary for station operation. This work will include: installing standpipe tower assembly; securing all hardware; installing electronics packages, antenna, battery and solar panel; level tipping bucket; painting standpipe and other parts subject to corrosion; securing appurtenant supports; securing pressure transducer, PT housing, cables, connectors and conduit in a manner to protect against vandalism; general cleaning of site; and any other items deemed necessary to meet the terms of existing license



agreements, easements or existing field conditions. Specific activities performed will be site dependent.

- h. Transmitter configurations will be set per specifications approved by the UDFCD. Test transmissions will be performed to verify that data transmitters are operating according to factory specifications and that the repeaters are receiving and re-transmitting the signal. Watt meter readings will be taken and recorded. Minor RF and calibration adjustments will be made as needed.
- i. A final field inspection will be conducted. A punch list will be prepared and OneRain will correct any deficiencies noted.
- j. OneRain will prepare all correspondence and technical materials necessary for obtaining required FCC radio station licenses. This work will include all coordination activities required by the Federal Interagency Hydrologic Radio Frequency Coordination Group.
- k. Any new base stations will be tested to verify that all components perform properly including the antenna, receiver, data decoder, connecting cables, uninterruptible power supply and computer. The UDFCD will be responsible for the computer hardware, ALERT software maintenance, database management and database calibration for all base stations (except DIADvisor Client applications, which are self-maintaining with regular connection to OneRain).
- l. OneRain will provide the UDFCD with a final installation report documenting pertinent site data, sensor IDs, serial numbers, model numbers, cable lengths, access requirements and other pertinent information. Photographs of new stations and sensor locations will be included.
- m. OneRain will bear the risk of any and all loss or damage of equipment or property, which are the subject matter of this Agreement, during the course of construction of the facilities. Upon acceptance of the installation by the UDFCD, OneRain will automatically be relieved of such risk.

### **Spare Transmitters, Spare Sensors and Maintenance Equipment**

- a. OneRain will be responsible for the maintenance, storage and use of all UDFCD-owned electronics packages, radio transmitters and receivers, sensors, battery chargers, battery dischargers, remote station testers, spare parts and all other system maintenance equipment provided by the UDFCD.
- b. Appropriate care will be taken in the use of all UDFCD-owned equipment and such use will be limited to ALERT system maintenance activities conducted in accordance with this Agreement.
- c. All UDFCD-owned equipment will be available for inspection by the UDFCD.
- d. The UDFCD will provide OneRain with a current inventory of all spare parts and maintenance equipment. OneRain will maintain a separate inventory of equipment and assist the UDFCD with reconciling differences. OneRain will notify the UDFCD when spare equipment is placed in-service and when inventoried equipment is discarded or otherwise determined inoperable.



- e. OneRain will have no responsibility to provide casualty insurance coverage for UDFCD-owned equipment located at gaging station sites. However, OneRain will bear the risk of any and all loss or damage of equipment or property, which are the subject matter of this Agreement, during the course of transporting equipment and maintaining facilities.

### Repair and Replacement of Equipment

- a. OneRain will replace, without reimbursement, missing or failed minor equipment such as: site antennas, cables, connectors, housings, mountings, batteries and other items valued at less than \$100.
- b. OneRain will provide cleaning, adjustments, calibration, tuning and minor repairs on all parts and equipment such as transmitters, repeaters, pressure transducers and sensors as part of the regular preventative maintenance services.
- c. OneRain will analyze failed equipment costing more than \$100 and make recommendations to the UDFCD concerning replacement or repair of such components including supplier options and estimated costs. The UDFCD is responsible for the costs of repair or replacement of such equipment. On approval by the UDFCD, OneRain will oversee repairs, including the return of equipment to factory and testing of equipment after repair. OneRain may, at OneRain's discretion, provide the UDFCD with quotations for the repair of equipment by OneRain as one option.

## MAINTENANCE PLAN

Regularly scheduled maintenance, or preventive maintenance (PM), is a crucial part of sustaining field deployed monitoring systems. PM also helps the system operator or owner to maintain a degree of confidence in the system's function. There are many tests field technicians perform that can identify problems that would be difficult if not impossible to distill from transmitted data. Tests that will not be replicated by the data analysis processes include:

- ◆ Pressure transducer calibration
- ◆ Precise tipping bucket calibration
- ◆ Radio path verification
- ◆ Radio frequency deviation
- ◆ Visual inspection for site damage

If a site stops reporting altogether, a service call or breakdown maintenance visit is required. In some cases the technician will be able to discern the most likely failure mode from the data prior to a breakdown visit. However, if the site simply stops reporting, a site visit requires the technician to take diagnostic tools and assumed replacement parts for the repair.

In addition to the preventative maintenance, OneRain will use predictive maintenance techniques to help keep reliability high while minimizing preventive maintenance activities.

### Daily Data Analysis, Reporting and Performance Assessment

OneRain provides the District with daily system analysis. The query-based tools that OneRain uses today have already provided insight into battery problems, charging system failures, over-reporting sensors, plugged tipping bucket funnels and other issues. These e-mail based reports are automatically delivered to District and OneRain staff each day. The reports cover daily, weekly and monthly performance criteria. Each day OneRain's staff goes through each report and looks for exceptional site and sensor behavior. As unwelcome trends or urgent problems emerge, these issues can be added to the breakdown queue.

### Scheduling and the Breakdown Queue

Exhibit A lists OneRain's detailed recommendations for scheduled preventive maintenance. As with last year, we propose that the rain only sites, and known trouble sites will have preventive maintenance visits during an abbreviated third round.

### Preventive Maintenance Schedule

Table 1 outlines the schedule for traditional preventive maintenance services. This schedule takes into account the required 75-day return cycle as well as the more frequent visits to sites with known power consumption, calibration or clogging issues.

**Table 1: Preventive maintenance schedule, approximately 75-day frequency**

Description of Service	2010 Schedule
Supplementary Round USGS shared sites along South Platte River	January
Round 1 Startup – install sites after winter maintenance	Prior to April 1
Round 2 Weather, stage, and trouble sites	Jun 1-15
Round 3 Supplementary round for rain only sites and sites with known issues.	July 5-15
Round 4 Weather, stage, and trouble sites	August 1-15
Round 5 Shutdown – sites in for winter maintenance	October 1-15

**Cost Summary with System Enhancements**

Table 2 outlines the pricing structure for both the normal maintenance activities and system enhancements for the 2010 season. Note Contrail Web pricing remains the same as last year.

In addition to the normal maintenance activities, the output frequency of approximately 50 sites in the system will be changed in order to reduce contention on the input repeater channels for both ALERT and ALERT2. We have included pricing below to cover the costs associated with updating the FCC licensing of these sites.

**Table 2: Pricing structure for normal maintenance activities, predictive maintenance service and Contrail® Web data access**

Description of Service	2010 Price
Preventive Maintenance	\$166,689
Data Analysis and QA/QC Services	\$17,969
Contrail Web	\$4,222
Additional FCC Licensing	\$6,480
Total Price	\$195,360

Preventative Maintenance Pricing breakdown

Type	Name	Site Quantity	Unit Price	Total Price
Wx	Weather station	13	\$1,803	\$23,439
WxS	Combo weather/stage	1	\$2,297	\$ 2,297
P	Rain gage	51	\$ 767	\$39,117
S	Stage gage	16	\$1,028	\$16,448
PS	Combo rain/stage	56	\$1,261	\$70,616
PS2	Combo rain/dual stage	3	\$1,754	\$ 5,262
RP	Repeater w/rain gage	2	\$1,231	\$ 2,462
R	Repeater w/o rain gage	4	\$ 998	\$ 3,992
B	Base Station	4	\$ 359	\$ 1,436
STX	Spare Transmitter	8	\$ 180	\$ 1,440
RPTR	Spare Repeater	1	\$ 180	\$ 180
	TOTAL			\$166,689

**Table 3: Pricing structure for Professional Services for the 2010 maintenance year.**

<b>Level /Category</b>	<b>Hourly Fee</b>
Level 1: Technical Field Services	\$90
Level 2: Software Services	\$120
Level 3: Project Management Services	\$150
Level 4: Sr. Engineering/Consulting Services	\$180

**EXHIBIT A – UDFCD ALERT GAGES AND PREVENTIVE MAINTENANCE SCHEDULE**

(F=FULL SERVICE, L=LOW IMPACT SERVICE)

Site ID	Site Name	Type	Jan Suppl.	Apr Round 1	Jun Round 2	Jul Round 3	Aug Round 4	Oct Round 5
100	Carr St	PS		F	F		F	F
110	Ralston Res	PS		F	F		F	F
120	Westwoods (Croke Pump Station)	PS		F	F		F	F
130	Simm St	S		F	F		F	F
140	Blue Mountain	Wx		F	F		F	F
150	Nott Creek	P		F		L		F
200	Leyden Reservoir	PS		F	F	L	F	F
210	Leyden Confluence	PS		F	F		F	F
220	Upper Leyden (new screen, monitor)	P		F	L	L	L	F
300	Van Bibber Park	P		F		L		F
310	Guy Hill Ranch	P		F		L		F
320	Sports Complex	PS		F	F		F	F
330	Van Bibber @ SH93	PS		F	F		F	F
400	Montview Park	PS		F	F		F	F
410	Kelly Dam	PS		F	F		F	F
420	Expo Park	PS		F	F		F	F
430	Utah Park	PS		F	F		F	F
440	Aurora FS#7	P		F		L		F
500	Havana Park	PS		F	F		F	F
510	Virginia Court	P		F		L		F
520	Jewell Detention	P		F		L		F
530	Denver FS #19	P		F		L		F
540	Parker & Mississippi	P		F		L		F
600	Harvard Gulch Park	PS		F	F		F	F
610	Harvard/Jackson	PS		F	F		F	F
620	Quincy/Highline	P		F		L		F
630	Temple Pond	PS		F	F		F	F
640	Goldsmith at Eastman	PS		F	F		F	F
650	Iliiff Pond	PS2		F	F		F	F
700	Tollgate at 6 <sup>th</sup>	PS	F	F	F		F	F
710	Horseshoe Park	PS		F	F	L	F	F
720	Confluence Pond	PS2		F	F	L	F	F
730	No Name @ Quincy	PS		F	F		F	F
740	Smoky Hill	RP		F	F		F	F
750	Quincy Reservoir	Wx		F	F		F	F
760	Mission Viejo Park	P		F		L		F
800	Sable Ditch	PS		F	F		F	F
810	Grandby Ditch	PS		F	F		F	F
820	ETG @ Buckley	PS		F	F		F	F
830	Side Creek Park	P		F		L		F

# UDFCD

# 2010 ANNUAL GAGE MAINTENANCE

Site ID	Site Name	Type	Jan Suppl.	Apr Round 1	Jun Round 2	Jul Round 3	Aug Round 4	Oct Round 5
840	Aurora FS #12	P		F		L		F
850	Flying J	PS		F	F		F	F
860	Sand Creek @ Colfax	PS		F	F		F	F
870	Murphy Creek	PS		F	F		F	F
900	Aurora Reservoir	Wx		F	F		F	F
940	Aurora Regional Pond	PS		F	F		F	F
950	Piney Creek @ Liverpool	PS		F	F		F	F
1000	Maple Grove Reservoir	PS		F	F		F	F
1010	Denver West	P		F		L		F
1020	Lena @ Nolte Pond	S		F	F		F	F
1030	NREL/SERI	P		F		L		F
1040	Lena @ Hwys 6 & 40	PS		F	F		F	F
1050	Fairgrounds	P		F		L		F
1060	Apex Gulch	P		F		L		F
1100	Louisville Drainageway "D"	PS		F	F		F	F
1110	Gunbarrel	PS		F	F		F	F
1200	Broomfield #3207	PS		F	F		F	F
1300	Hidden Lake	PS		F	F		F	F
1310	Little Dry Creek @ 64 <sup>th</sup>	PS		F	F		F	F
1320	SPR @ 3 <sup>rd</sup> Avenue	PS		F	F		F	F
1330	Roslyn	P		F		L		F
1340	Sanderson Gulch	PS		F	F		F	F
1350	Chatfield Dam	P		F		L		F
1360	Denver Zoo	P		F		L		F
1370	FS# 13	P		F		L		F
1380	Ferril Lake	S		F	F		F	F
1400	Upper Sloan Detention	PS		F	F		F	F
1420	Diamond Hill	Wx		F	F		F	F
1440	Elbert	Wx		F	F		F	F
1460	Stapleton	Wx		F	F		F	F
1480	DIA @ Third Creek	PS2		F	F		F	F
1500	Powers Park	PS		F	F		F	F
1520	Marston Lake	WxS		F	F		F	F
1530	Bear Creek @ Lowell	PS		F	F		F	F
1550	Lakewood Country Club	P		F		L		F
1560	Lakewood Gulch @ 10 <sup>th</sup> Avenue	S		F	F		F	F
1600	Englewood Dam	PS		F	F		F	F
1610	Holly Dam	S		F	F		F	F
1620	Slaughterhouse Detention	PS		F	F		F	F
1630	S Platte @ Dartmouth	S		F	F		F	F
1640	SPR at Union Avenue	PS	F	F	F		F	F
1650	SPR at 19th Street	S	F	F	F		F	F
1660	SPR at Henderson	PS	F	F	F		F	F
1700	Cherry Creek @ Champa	PS	F	F	F		F	F
1710	Shop Creek	P		F		L		F
1720	Cherry Creek/Steele	PS		F	F		F	F
1800	Sand Creek Park	PS		F	F		F	F
1810	Sand Creek @ Mouth	PS	F	F	F		F	F

# UDFCD

# 2010 ANNUAL GAGE MAINTENANCE

Site ID	Site Name	Type	Jan Suppl.	Apr Round 1	Jun Round 2	Jul Round 3	Aug Round 4	Oct Round 5
1900	Niver Detention	PS		F	F		F	F
1920	Brighton	Wx		F	F		F	F
2190	Squaw Mountain	Wx		F	F		F	F
2210	Hiwan GC	Wx		F	F		F	F
2220	Evergreen Lake	S		F	F		F	F
2230	Bear Creek below Cub	PS		F	F		F	F
2240	Cold Spring Gulch	PS		F	F		F	F
2250	Rosedale	PS		F	F		F	F
2260	Brook Forest	P		F		L		F
2270	Cub Creek below Blue	PS		F	F		F	F
2280	Kinney Peak	P		F		L		F
2310	Genesee Village	P		F		L		F
2320	Choke Cherry Reservoir	RP		F	F		F	F
2330	Morrison	PS		F	F		F	F
2340	El Rancho	P		F		L		F
2350	Idledale	P		F		L		F
2360	Indian Hills	P		F		L		F
2370	Red Rocks Park	PS		F	F		F	F
4010	Crescent	P		F		L		F
4020	Rio Grande	P		F		L		F
4030	Red Garden	P		F		L		F
4040	Martin Gulch	P		F		L		F
4050	Walker Ranch	P		F		L		F
4060	Lakeshore	P		F		L		F
4070	Bear Peak	P		F		L		F
4080	Twin Sisters	P		F		L		F
4090	Magnolia	P		F		L		F
4100	Filter Plant	P		F		L		F
4110	Betasso	P		F		L		F
4130	Swiss Peaks	P		F		L		F
4140	Logan Mill	P		F		L		F
4150	Gold Hill	P		F		L		F
4160	Sunshine	P		F		L		F
4170	Pinebrook	P		F		L		F
4210	Lee Hill Repeater	R		F	F		F	F
4240	Sunset	P		F		L		F
4360	Justice Center	P		F		L		F
4370	Gross Reservoir	S		F	F		F	F
4380	Eldorado Springs	S		F	F		F	F
4390	Boulder Falls	S		F	F		F	F
4400	Orodell	S		F	F		F	F
4410	Fourmile at Salina	S		F	F		F	F
4420	Bridge	S		F	F		F	F
4530	Winiger Ridge	P		F		L		F
4540	Louisville Repeater	R		F	F		F	F
4570	St. Antons	P		F		L		F
4580	Broadway	S		F	F		F	F
4590	Green Ditch	S		F	F		F	F



**UDFCD**

**2010 ANNUAL GAGE MAINTENANCE**

Site ID	Site Name	Type	Jan Suppl.	Apr Round 1	Jun Round 2	Jul Round 3	Aug Round 4	Oct Round 5
4710	Ward C-1 (Hills Mills)	Wx		F	F		F	F
4730	Sugarloaf	Wx		F	F		F	F
4750	Lafayette	Wx		F	F		F	F
4770	CalWood Ranch	Wx		F	F		F	F
4810	Shanahan Ridge	P		F		L		F
4820	Doudy Draw	P		F		L		F
4830	SBC @ San Souci	PS		F	F		F	F
4840	SBC @ Canon Ditch	PS		F	F		F	F
8000	West Repeater (Blue Mountain)	R		F	F		F	F
8015	Gold Hill Repeater	R		F	F		F	F
	UDFCD Base station	B		F				F
	FPC Base station	B		F				F
	Lena base station (Consolidated water)	B		F				F
	Denver WMD base station	B		F				F