

**TO: Board of Directors – Platte Canyon Water and Sanitation District
Board of Directors – Southwest Metropolitan Water and Sanitation District**

FROM: Scott Hand, Operations Supervisor

THROUGH: Pat Fitzgerald, District Manager

DATE: October 1, 2019

SUBJECT: Maintenance Goals for 2020

The following projected maintenance schedule for 2020 identifies the maintenance levels and the manpower requirements needed to fulfill the proposed maintenance goals for the Platte Canyon, Southwest Metropolitan, Bow Mar and Columbine Water and Sanitation Districts and Valley Sanitation District. These goals have been determined to be necessary for the effective, efficient, and economical operation of the Districts' water distribution and wastewater collection systems.

The maintenance goals prescribe the frequency in which the various infrastructure maintenance activities are performed. For example, all water gate valves are fully exercised or inspected once each year. All fire hydrant maintenance tasks are performed once each year. All sewer mains are televised at least once every four years and re-televised, cleaned, root-cut, or chemically treated for roots on an "as needed" basis. A more detailed description of each maintenance activity is referenced in this memo, as well as in the Districts' maintenance job standards.

The maintenance activities to be performed in 2020 are scheduled throughout the year by considering job standards, manpower requirements, equipment levels and reliability, and expectations of time needed to perform non-routine maintenance activities. Manpower requirements are developed by applying the District's job standards to the maintenance task schedule. By applying the number of man-hours required to complete each maintenance task (job standards) to the number of maintenance tasks to be completed, the total man-hours required to complete the maintenance schedule is calculated. Through several iterations of schedule development, the optimum combination and level of permanent and seasonal labor requirements is calculated.

Maintenance Goals - 2020

Quality Assurance will continue to be the focus and emphasis of maintenance operations in 2020. Quality assurance procedures enable the operations supervisor and foreman to monitor and control the quality of work being produced. For water related activities, completed work orders are submitted by all maintenance employees to the operations supervisor after the activities are completed. The operations foreman inspects randomly selected assets to confirm the assigned work has been completed in accordance with job standards. Then, he documents and assigns any needed follow up maintenance. Deficiencies are reported to the operations supervisor for review and correction and are noted on each employee's monthly productivity report.

Sewer maintenance activities are also monitored by the operations supervisor. Random work orders are compared to the television inspection video produced in the field to ensure the accuracy of the information logged in the work order. The quality and accuracy of these reports are also incorporated into the employees' monthly productivity reports.

The Districts will continue to rely on the Infor computerized maintenance management system (CMMS) to schedule, generate work orders and record all maintenance activities. The CMMS supports the Districts' mobile workforce effort which eliminates paperwork orders and maintenance records. Laptop computers are issued to all operations employees and mounting equipment is installed in all maintenance vehicles. This equipment combined with the Districts' CMMS and Geographic Information System (GIS) has greatly enhanced the efficiency of conducting the various maintenance programs described in detail below.

The procedures for hydraulic root cutting of sewer mains that were implemented in 2006 continue to be very effective. Prior to implementation of revised root cutting procedures, no post-video inspection was conducted. It was discovered that even when cutting equipment was used properly, all roots were not being effectively removed. The revised procedures require television inspection of sewer mains as root cutting is conducted. This provides assurance that all roots are cut and removed from the pipelines. The procedure requires additional manpower but is essential for quality assurance and control.

The projected sewer maintenance schedule now reflects scheduled root treatment activities. Root treatment has been conducted since 2012 with more scheduled for 2020. Staff is currently developing an effective way to amend root cutting activities and incorporate additional root treatment activities into the scheduled maintenance. Vaporooter Sanifoam is a restricted-use pesticide and requires certification from the Colorado Department of Agriculture to purchase and apply the chemical. All five operations staff have "certified applicator" certification. The operations foreman and I are "qualified supervisors". The District must have at least one qualified supervisor to oversee the certified applicators during chemical application.

It may be necessary to hire seasonal temporary employees to accommodate preventive water maintenance. For the past several years, maintenance goals have been accomplished with current

operations staff. Should a new or extended task arise, seasonal temporary employees would be considered to accomplish the maintenance goals.

In order to maintain high quality, effective water and sanitary sewer operation and maintenance programs, it is strongly recommended that current maintenance schedules and job standards be retained. The following Exhibits A, B, and C reflect current maintenance schedules, job standards, and proposed man-hours.

The Hourly Labor Distribution Table (Exhibit A) depicts the actual man-hours utilized for maintenance activities between 2015 and 2018, estimated man-hour allocations for 2019, and projected 2020 man-hour requirements necessary to complete maintenance tasks listed in Exhibit C. The Proposed 2020 Maintenance Schedule (Exhibit B) summarizes actual scheduled maintenance activities for 2019, estimated year end maintenance accomplishments, and 2020 proposed maintenance activities for Platte Canyon, Southwest Metropolitan, Bow Mar, Columbine and Valley. Exhibit C, Projected 2020 Maintenance, breaks down maintenance activities by month and district and allocates manpower requirements based on job standards for each activity.

Following is a brief description of the work to be completed for each maintenance activity.

Hydraulic Sewer Cleaning

Sewer television inspections have identified sewer problem areas that require periodical cleaning on a regularly scheduled basis. Maintenance crews hydraulically clean only those sewer runs that are known to be problem areas as determined by television inspections or previously reported deficiencies. The job standard for hydraulic sewer cleaning is 3,750 feet per day.

Root Cutting

Sewer television inspections have identified sewer problem areas that require periodical root cutting on a regularly scheduled basis. Maintenance crews mechanically cut only those sewer runs that are known to be problem areas as determined by television inspections or previously reported deficiencies. The job standard for root cutting is 2,250 feet per day.

Root Treatment

Sewer television inspections have identified sewer problem areas that require chemical applications to kill and reduce root growth intruding into the sewer mains through pipe joints, broken pipes, and customer's service laterals. Maintenance crews apply the chemical only to those sewer runs that are known to be problems area as determined by television inspections or previously reported deficiencies. The job standard for root treatment is 2,500 feet per day.

Television Inspections

The District has adopted a plan to televise every sewer reach on a four year rotating cycle. In addition, television inspections occasionally identify sewer reaches that require inspection at more frequent intervals. A sewer main rating system is used to determine future scheduling for all sewer maintenance activities. The rating is based on the observed structural integrity and root content of each reach compared to the rating condition standards. Each sewer reach is prioritized for future maintenance as follows:

Condition <u>(Priority, condition 5 being highest)</u>	Re-Televise Schedule <u>(According to Condition)</u>
1	4 year intervals
2	2 year intervals
3	1 year interval
4	6 month intervals
5	3 month intervals

The job standard for television inspections is 3,500 feet per day.

General Scheduled Maintenance

General scheduled maintenance activities include those that are performed on a recurring daily, weekly, or monthly basis. These activities include:

- ➡ Pump stations inspection and maintenance
- ➡ Lift station inspection and maintenance
- ➡ Vehicle maintenance
- ➡ Staff and safety meetings
- ➡ Pressure monitoring

General Unscheduled Maintenance

General unscheduled maintenance activities include those that are performed on an “as needed” basis, but are necessary tasks requiring significant man-hours. These activities include:

- ➡ Customer service
- ➡ Utility locations
- ➡ Building and landscape maintenance
- ➡ New water and sewer service inspections
- ➡ Warranty inspections
- ➡ Messenger service
- ➡ General maintenance of facilities
- ➡ Corrective maintenance
- ➡ Overlay operations
- ➡ Maintenance administration
- ➡ Water and sewer emergencies

The Jefferson County Street Overlay Program is an unscheduled maintenance item which is projected into the maintenance schedule and may impact scheduled activities and manpower requirements. A schedule from the County will not be available until the first of the year. These overlay programs usually require an additional two man crew from the district.

Distribution System Flushing

In order to maintain high quality drinking water, it is necessary to flush and test water quality at dead end water mains at least once a year. This is accomplished by opening a blow-off valve or fire hydrant and flushing that main line until the water runs clear. Crews will then perform water quality testing at each site, meeting the criteria set forth by Denver Water for chlorine residual and temperature. The entire system is flushed and tested annually. The job standard for distribution system flushing is 30 units per day.

Fire Hydrants – Service Cycle

Fire hydrant service cycle maintenance consists of exercising the branch valve, operating the hydrant, oiling and greasing the operating mechanisms, recording static pressure reading, and checking for leaks and proper drainage of the hydrant. These activities are performed biennially. The job standard for fire hydrant servicing is 25 units per day.

Fire Hydrants – Inspection Cycle

Fire hydrant inspection cycle maintenance consists of inspecting the branch valve, operating the hydrant, oiling and greasing the operating mechanisms, recording static pressure reading, and checking for leaks and proper drainage of the hydrant. These activities are performed biennially. The job standard for fire hydrant inspections is 30 units per day.

Fire Hydrants – Painting Cycle

Fire hydrant painting cycle consists of removing dirt and grease from the hydrant, which sometimes requires the use of sand blasting equipment. Paint is applied using pneumatic spraying equipment. The hydrants are painted biennially on the Service – Inspection Cycle. The job standard for fire hydrant painting is 50 units per day.

Valves – Exercise Cycle

Water valves are exercised biennially by completely operating the valve and counting the turns based on valve size. The valve box is painted to identify the opening direction, as well as the position of the valve. The job standard for valve exercising is 30 units per day.

Valves – Inspection Cycle

Water valves are inspected biennially by placing a valve key on the valve nut and confirming position of the valve. The valve box is painted to identify the opening direction, as well as the position of the valve. The job standard for valve inspections is 40 units per day.

Pressure Reducing Valves

P.R.V.'s are maintained and inspected annually. The valves which isolate the P.R.V. are exercised and painted. Flushing of all the plumbing is performed and well as confirmation of proper operation. Upstream and downstream pressures are taken and recorded. These valves are used to reduce pressure between hydraulic zones. These valves are critical for the proper and efficient operation of the Districts' water systems. The job standard for pressure reducing valve maintenance is 5 units per day.

Air-Vacuum Valves

Air-vacuum valves are inspected biannually, once in the winter months to wrap the standpipe to prevent freezing, and then again in the spring to remove the wrapping from the standpipe. During each visit the hand valves are exercised and the assemblies are flushed to confirm proper operation and system tightness. The valves are used to allow air to enter water mains during isolation procedures and also to allow air to exit the water mains during filling. The job standard for air-vacuum valve maintenance is 10 units per day.

EXHIBIT A

Hourly Maintenance Labor Distribution (2015-2020)

DISTRICT	2015	2016	2017	2018	2019 ¹	2020 ²
Platte Canyon Maintenance						
Regular Full-time	3,635	3,845	3,887	3,775	3,324	4,158
Regular Overtime	150	96	108	207	88	135
Temporary – Seasonal	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Hours	3,785	3,941	3,995	3,982	3,412	4,293
Southwest Metro Maintenance						
Regular Full-time	7,657	7,237	7,524	7,230	7,661	7,241
Regular Overtime	201	159	138	140	223	181
Temporary – Seasonal	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Hours	7,858	7,396	7,662	7,370	7,884	7,422
Bow Mar Maintenance						
Regular Full-time	214	542	360	397	180	468
Regular Overtime	12	15	19	17	9	13
Temporary – Seasonal	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Hours	226	557	379	414	189	481
Columbine Maintenance						
Regular Full-time	237	367	354	372	368	378
Regular Overtime	15	9	4	10	22	14
Temporary – Seasonal	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Hours	252	376	358	382	390	392
Lochmoor Maintenance						
Regular Full-time	63	19	35	30	134	0
Regular Overtime	0	0	0	0	04	0
Temporary – Seasonal	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Hours	63	19	35	30	138	0
Valley Maintenance						
Regular Full-time	559	486	464	586	675	563
Regular Overtime	22	19	38	31	19	22
Temporary – Seasonal	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Hours	581	505	502	617	694	585
Regular Hours	12,365	12,496	12,624	12,390	12,342	12,808
Seasonal Hours	0	0	0	0	0	0
Overtime Hours	<u>400</u>	<u>298</u>	<u>307</u>	<u>405</u>	<u>365</u>	<u>365</u>
TOTAL HOURS	12,765	12,794	12,931	12,795	12,707	13,173

¹Estimated actual hours worked

² Hours necessary to complete maintenance tasks listed in Exhibit C

EXHIBIT B

Proposed 2020 Maintenance Schedule

	<u>Platte Canyon</u>	<u>Southwest Metro</u>	<u>Bow Mar</u>	<u>Columbine</u>	<u>Lochmoor</u>	<u>Valley</u>	<u>Totals (feet)</u>
Sewer Maintenance							
<i>Television Inspection</i>							
2019 Proposed	69,383	243,648	0	19,472	5,514	25,388	363,405
2019 Actual (est.)	74,856	244,436	0	19,472	5,514	21,329	365,607
2020 Proposed	120,305	186,144	12,959	18,317	0	40,855	378,580
<i>Hydraulic Cleaning</i>							
2019 Proposed	29,165	43,241	206	3,517	802	10,701	87,632
2019 Actual (est.)	79,237	221,867	206	8,950	802	32,514	343,576
2020 Proposed	38,545	196,126	10,057	9,858	0	31,320	285,906
<i>Root Cutting</i>							
2019 Proposed	34,837	6,123	0	0	700	5,181	46,841
2019 Actual (est.)	51,852	8,034	0	1,854	700	8,609	71,049
2020 Proposed	32,890	3,364	9,161	2,276	0	6,490	54,181
<i>Root Treatment</i>							
2019 Proposed	17,752	1,287	361	1,026	0	1,196	21,622
2019 Actual (est.)	17,752	1,287	361	1,026	0	1,196	21,622
2020 Proposed	16,742	883	760	339	680	4,427	23,831
<i>Grease Interceptors</i>							(Units)
2019 Proposed	136	412	--	12	--	--	560
2019 Actual (est.)	136	412	--	12	--	--	560
2020 Proposed	140	412	--	12	--	--	564

EXHIBIT B (continued)
Proposed 2020 Maintenance Schedule

	<u>Platte Canyon</u>	<u>Southwest Metro</u>	<u>Bow Mar</u>	<u>Columbine</u>	<u>Lochmoor</u>	<u>Valley</u>	<u>Totals (feet) (units)</u>
Water Maintenance							
<i>Valves</i>							
2019 Proposed	1,166	3,157	135	--	--	--	4,458
2019 Actual (est.)	1,180	3,293	134	--	--	--	4,607
2020 Proposed	1,160	3,171	134	--	--	--	4,465
<i>Fire Hydrants (Service)</i>							
2019 Proposed	491	1,546	59	--	--	--	2,096
2019 Actual (est.)	491	1,557	59	--	--	--	2,107
2020 Proposed	491	1,557	59	--	--	--	2,107
<i>Fire Hydrants (Paint)</i>							
2019 Proposed	266	699	0	--	--	--	965
2019 Actual (est.)	266	685	0	--	--	--	951
2020 Proposed	225	878	59	--	--	--	1162
<i>Distribution System</i>							
<i>Flushing</i>							
2019 Proposed	148	494	3	--	--	--	645
2019 Actual (est.)	185	608	3	--	--	--	796
2020 Proposed	148	494	3	--	--	--	645
<i>Pressure Regulating Valves</i>							
2019 Proposed	11	19	--	--	--	--	30
2019 Actual (est.)	11	19	--	--	--	--	30
2020 Proposed	11	19	--	--	--	--	30
<i>Air Vac Valves</i>							
2019 Proposed	16	82	--	--	--	--	98
2019 Actual (est.)	14	80	--	--	--	--	94
2020 Proposed	14	80	--	--	--	--	94

EXHIBIT C -- PROJECTED 2020 MAINTENANCE

		Platte Canyon		Southwest Metro.		Bow Mar		Columbine		Lochmoor		Valley		Hours
		Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	
January -	21 days -	1,072 Manhours												
Hyd. Cleaning		3,631	15	28,007	119	0	0	0	0	0	0	0	0	135
Root Cutting		10,018	71	0	0	0	0	0	0	0	0	0	0	71
Root Treatment		251	2	0	0	0	0	0	0	0	0	0	0	2
T.V. Inspections		12,018	55	23,908	109	0	0	0	0	0	0	0	0	164
Grease Traps		35	18	103	52	0	0	3	2	0	0	0	0	71
Gen. Sched. Mntc			40		60		0		10		0		0	110
Gen. Unsched. Mntc.			131		196		15		5		0		10	357
Gen. Mntc. Admin.			65		85		4		4		0		4	162
			397		622		19		21		0		14	1,072 100.00%
February -	19 days -	960 Manhours												
Hyd. Cleaning		1,868	8	12,675	54	0	0	91	0	0	0	1,881	8	70
Root Cutting		10,246	73	0	0	0	0	0	0	0	0	0	0	73
Root Treatment		2,028	13	0	0	0	0	0	0	0	0	0	0	13
T.V. Inspections		10,782	49	8,750	40	0	0	0	0	0	0	15,941	73	162
Gen. Sched. Mntc			40		60		0		10		0		0	110
Gen. Unsched. Mntc.			136		204		15		5		0		10	370
Gen. Mntc. Admin.			65		85		4		4		0		4	162
			384		443		19		19		0		95	960 100.00%
March -	22 days -	1,128 Manhours												
Hyd. Cleaning		2,136	9	31,637	135	0	0	1,179	5	0	0	0	0	149
Root Cutting		4,260	30	0	0	0	0	2,276	16	0	0	0	0	46
Root Treatment		1,789	11	0	0	0	0	0	0	0	0	0	0	11
T.V. Inspections		9,951	45	18,135	83	0	0	8,086	37	0	0	0	0	165
Air Vac's		7	11	40	64	0	0	0	0	0	0	0	0	75
Dist. System Flushing		17	5	74	20	0	0	0	0	0	0	0	0	24
Valves		131	30	419	96	0	0	0	0	0	0	0	0	126
Gen. Sched. Mntc			40		60		0		10		0		0	110
Gen. Unsched. Mntc.			91		137		15		5		0		10	258
Gen. Mntc. Admin.			65		85		4		4		0		4	162
			338		679		19		77		0		14	1,128 100.00%

EXHIBIT C -- PROJECTED 2020 MAINTENANCE

		Platte Canyon		Southwest Metro.		Bow Mar		Columbine		Lochmoor		Valley		Hours
		Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	
April -	22 days -	1,128	Manhours											
Hyd. Cleaning		3,813	16	8,257	35	0	0	91	0	0	0	0	0	52
Root Cutting		0	0	0	0	0	0	0	0	0	0	0	0	0
Root Treatment		2,460	16	100	1	0	0	0	0	0	0	1,720	11	27
T.V. Inspections		10,941	50	15,519	71	0	0	0	0	0	0	0	0	121
Grease Traps		35	18	103	52	0	0	3	2	0	0	0	0	71
Dist. System Flushing		35	9	35	9	0	0	0	0	0	0	0	0	19
Valves		196	45	421	96	0	0	0	0	0	0	0	0	141
Hydrants		52	15	249	74	0	0	0	0	0	0	0	0	89
Hyd. Painting		24	8	97	31	0	0	0	0	0	0	0	0	39
Gen. Sched. Mntc			40		60		0		10		0		0	110
Gen. Unsched. Mntc.			107		161		15		5		0		10	298
Gen. Mntc. Admin.			65		85		4		4		0		4	162
		389		674		19		21		0		25		1,128 100.00%
May -	20 days -	1,016	Manhours											
Hyd. Cleaning		5,586	24	10,659	45	0	0	0	0	0	0	0	0	69
Root Cutting		0	0	0	0	0	0	0	0	0	0	0	0	0
Root Treatment		1,700	11	0	0	0	0	0	0	0	0	0	0	11
T.V. Inspections		10,613	49	17,217	79	0	0	0	0	0	0	0	0	127
Dist. System Flushing		13	3	45	12	3	1	0	0	0	0	0	0	16
Valves		161	37	403	92	0	0	0	0	0	0	0	0	129
Hydrants		106	31	165	49	59	17	0	0	0	0	0	0	98
Hyd. Painting		35	11	88	28	59	19	0	0	0	0	0	0	58
Gen. Sched. Mntc			40		60		0		10		0		0	110
Gen. Unsched. Mntc.			82		123		15		5		0		10	235
Gen. Mntc. Admin.			65		85		4		4		0		4	162
		353		574		56		19		0		14		1,016 100.00%
June -	22 days -	1,128	Manhours											
Hyd. Cleaning		3,373	14	3,600	15	0	0	91	0	0	0	2,380	10	40
Root Cutting		0	0	0	0	0	0	0	0	0	0	0	0	0
Root Treatment		897	6	245	2	0	0	0	0	0	0	0	0	7
T.V. Inspections		15,260	70	5,160	24	0	0	0	0	0	0	0	0	93
Dist. System Flushing		11	3	61	16	0	0	0	0	0	0	0	0	19
Valves		128	29	406	93	0	0	0	0	0	0	0	0	122
Hydrants		111	33	262	78	0	0	0	0	0	0	0	0	111
Hyd. Painting		64	20	122	39	0	0	0	0	0	0	0	0	60
Gen. Sched. Mntc			40		60		0		10		0		0	110
Gen. Unsched. Mntc.			150		224		15		5		0		10	404
Gen. Mntc. Admin.			65		85		4		4		0		4	162
		430		636		19		19		0		24		1,128 100.00%

EXHIBIT C -- PROJECTED 2020 MAINTENANCE

		Platte Canyon		Southwest Metro.		Bow Mar		Columbine		Lochmoor		Valley		Hours	
		Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours		
July -	22 days -	1,128	Manhours												
Hyd. Cleaning		1,327	6	17,384	74	6,697	29	0	0	0	0	0	0	108	
Root Cutting		0	0	0	0	0	0	0	0	0	0	0	0	0	
Root Treatment		1,748	11	538	3	0	0	0	0	0	0	0	0	15	
T.V. Inspections		0	0	20,448	93	8,901	41	0	0	0	0	0	0	134	
Grease Traps		35	18	103	52	0	0	3	2	0	0	0	0	71	
Dist. System Flushing		17	5	71	19	0	0	0	0	0	0	0	0	23	
Valves		154	35	406	93	0	0	0	0	0	0	0	0	128	
Hydrants		110	33	307	91	0	0	0	0	0	0	0	0	124	
Hyd. Painting		47	15	140	45	0	0	0	0	0	0	0	0	60	
Gen. Sched. Mntc			40		60		0		10		0		0	110	
Gen. Unsched. Mntc.			65		98		15		5		0		10	193	
Gen. Mntc. Admin.			65		85		4		4		0		4	162	
			292		713				21		0		14	1,128	100.00%
August -	21 days -	1,072	Manhours												
Hyd. Cleaning		110	0	19,070	81	3,154	13	91	0	0	0	0	0	96	
Root Cutting		0	0	0	0	0	0	0	0	0	0	0	0	0	
Root Treatment		1,325	8	0	0	0	0	0	0	0	0	0	0	8	
T.V. Inspections		10,275	47	18,249	83	4,058	19	0	0	0	0	0	0	149	
Dist. System Flushing		25	7	103	27	0	0	0	0	0	0	0	0	34	
Valves		164	37	432	99	0	0	0	0	0	0	0	0	136	
Hydrants		51	15	356	105	0	0	0	0	0	0	0	0	121	
Hyd. Painting		27	9	275	88	0	0	0	0	0	0	0	0	97	
Gen. Sched. Mntc			40		60		0		10		0		0	110	
Gen. Unsched. Mntc.			52		78		15		5		0		10	159	
Gen. Mntc. Admin.			65		85		4		4		0		4	162	
			281		707		51		19		0		14	1,072	100.00%
September -	21 days -	1,072	Manhours												
Hyd. Cleaning		1,342	6	17,510	75	0	0	8,133	35	0	0	0	0	115	
Root Cutting		0	0	0	0	0	0	0	0	0	0	0	0	0	
Root Treatment		0	0	0	0	760	5	0	0	0	0	2,707	17	22	
T.V. Inspections		11,772	54	11,099	51	0	0	8,042	37	0	0	0	0	141	
Dist. System Flushing		16	4	52	14	0	0	0	0	0	0	0	0	18	
Valves		158	36	384	88	134	31	0	0	0	0	0	0	155	
Hydrants		61	18	218	65	0	0	0	0	0	0	0	0	83	
Hyd. Painting		28	9	156	50	0	0	0	0	0	0	0	0	59	
Gen. Sched. Mntc			40		60		0		10		0		0	110	
Gen. Unsched. Mntc.			71		106		15		5		0		10	207	
Gen. Mntc. Admin.			65		85		4		4		0		4	162	
			303		593		54		90		0		31	1,072	100.00%

EXHIBIT C -- PROJECTED 2020 MAINTENANCE

		Platte Canyon		Southwest Metro.		Bow Mar		Columbine		Lochmoor		Valley		Hours
		Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	
October -	22 days -	1,128 Manhours												
Hyd. Cleaning		1,355	6	21,832	93	0	0	91	0	0	0	4,687	20	119
Root Cutting		0	0	2,832	20	0	0	0	0	0	0	6,350	45	65
Root Treatment		1,022	7	0	0	0	0	0	0	0	0	0	0	7
T.V. Inspections		5,844	27	27,574	126	0	0	0	0	0	0	0	0	153
Grease Traps		35	18	103	52	0	0	3	2	0	0	0	0	71
Air Vac's		7	11	40	64	0	0	0	0	0	0	0	0	75
Dist. System Flushing		14	4	53	14	0	0	0	0	0	0	0	0	18
Valves		68	16	300	69	0	0	0	0	0	0	0	0	84
Gen. Sched. Mntc			40		60		0		10		0		0	110
Gen. Unsched. Mntc.			94		141		15		5		0		10	264
Gen. Mntc. Admin.			65		85		4		4		0		4	162
			286		723		19		21		0		79	1,128 100.00%
November -	18 days -	904 Manhours												
Hyd. Cleaning		10,027	43	12,989	55	206	1	0	0	0	0	4,536	19	118
Root Cutting		0	0	0	0	9,161	65	0	0	0	0	0	0	65
Root Treatment		2,346	15	0	0	0	0	339	2	0	0	0	0	17
T.V. Inspections		11,513	53	12,989	59	0	0	0	0	0	0	8,135	37	149
P.R.V.'s		11	35	19	61	0	0	0	0	0	0	0	0	96
Gen. Sched. Mntc			40		60		0		10		0		0	110
Gen. Unsched. Mntc.			62		94		15		5		0		10	186
Gen. Mntc. Admin.			65		85		4		4		0		4	162
			313		414		85		21		0		71	904 100.00%
December -	21 days -	1,072 Manhours												
Hyd. Cleaning		3,977	17	12,506	53	0	0	91	0	0	0	17,836	76	147
Root Cutting		8,366	59	532	4	0	0	0	0	0	0	140	1	64
Root Treatment		1,176	8	0	0	0	0	0	0	0	0	0	0	8
T.V. Inspections		11,336	52	7,096	32	0	0	2,189	10	0	0	16,779	77	171
Gen. Sched. Mntc			40		60		0		10		0		0	110
Gen. Unsched. Mntc.			152		228		15		5		0		10	410
Gen. Mntc. Admin.			65		85		4		4		0		4	162
			393		463		19		29		0		168	1,072 100.00%

EXHIBIT C -- PROJECTED 2020 MAINTENANCE

	Platte Canyon		Southwest Metro.		Bow Mar		Columbine		Lochmoor		Valley		Hours	
	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours	Quantity	Hours		
Total Hyd. Cleaning	38,545		196,126		10,057		9,858		0		31,320			
Total Root Cutting	32,890		3,364		9,161		2,276		0		6,490			
Total Root Treatment	16,742		883		760		339		0		4,427		2	
Total T.V. Inspects.	120,305		186,144		12,959		18,317		0		40,855			
Total Grease Traps	140		412		0		12		0		0			
Total Dist. Flushing Mntc	148		494		3		0		0		0			
Total Valve Mntc	1,160		3,171		134		0		0		0			
Total Hydrant Mntc	491		1,557		59		0		0		0			
Total Hyd. Painting	225		878		59									
Total Air Vac's	14		80		0		0		0		0			
Total PRV's	11		19		0		0		0		0			
													12,808	
Total Hours		4,158		7,241		468		378		0		563	12,808	100.00%

(Hourly Labor Distribution Table)
Leave Time for Projected Maintenance Report for 2020

1. There are **11 Holidays** each calendar year. Each employee has **88** hours, per year, for Holiday Leave Time.
2. Each employee has 2 days **Personal Time** or **16 hours** per year.
3. Each employee has up to 2 **Safety Days** or **16 hours** per year.
4. There are **2,008 total work hours available from each employee;** (251 days x 8 hrs.)
5. Vacation Leave Time is as follows:

4 weeks (20 days) = (160 hours)

3 weeks (15 days) = (120 hours)

2 weeks (10 days) = (80 hours)

Scott Hand:	Vacation	(20 days)	(160 hours)	
	Pers. Time	(2 days)	(16 hours)	
	Safety Days	(2 days)	(16 hours)	
Total Leave Time		(24 days)	(192 hours)	
Total Work Hours	(251 days x 8 hrs. = 2,008 – 192 hrs. =)			(1,816 hours)

Armando Quintana:	Vacation	(20 days)	(160 hours)	
	Pers. Time	(2 days)	(16 hours)	
	Safety Days	(2 days)	(16 hours)	
Total Leave Time		(24 days)	(192 hours)	
Total Work Hours	(251 days x 8 hrs. = 2,008 – 192 hrs. =)			(1,816 hours)

Bruce Yarish:	Vacation	(20 days)	(160 hours)	
	Pers. Time	(2 days)	(16 hours)	
	Safety Days	(2 days)	(16 hours)	
Total Leave Time		(24 days)	(192 hours)	
Total Work Hours	(251 days x 8 hrs. = 2,008 – 192 hrs. =)			(1,816 hours)

John Mathias:	Vacation	(20 days)	(160 hours)	
	Pers. Time	(2 days)	(16 hours)	
	Safety Days	(2 days)	(16 hours)	
Total Leave Time		(24 days)	(192 hours)	
Total Work Hours	(251 days x 8 hrs. = 2,008 – 192 hrs. =)			(1,816 hours)

Justin Roquemore:	Vacation	(20 days)	(160 hours)	
	Pers. Time	(2 days)	(16 hours)	
	Safety Days	(2 days)	(16 hours)	
Total Leave Time		(24 days)	(192 hours)	
Total Work Hours	(251 days x 8 hrs. = 2,008 – 192 hrs. =)			(1,816 hours)

Cory Taylor:	Vacation	(15 days)	(120 hours)	
	Pers. Time	(2 days)	(16 hours)	
	Safety Days	(2 days)	(16 hours)	
Total Leave Time		(14 days)	(152 hours)	
Total Work Hours	(251 days x 8 hrs. = 2,008 – 152 hrs. =)			(1,856 hours)

Mike Chavez:	Vacation	(15 days)	(120 hours)	
	Pers. Time	(2 days)	(16 hours)	
	Safety Days	(2 days)	(16 hours)	
Total Leave Time		(14 days)	(152 hours)	
Total Work Hours	(251 days x 8 hrs. = 2,008 – 152 hrs. =)			(1,856 hours)

*** Total 1,264 hours, Leave Time for 2020.**

6. The **Estimated** hourly number is generated by the Crystal Report, named **“Laborhours.table.rpt”**. Actual hourly number is divided by eight, that number is multiplied by twelve.

7. The **Projected** hourly number is figured as:

2,008 hrs. (Total hrs. available per employee)	(251 days x 8 hrs)	
x <u>7</u>	(Total number of employees)	
14,056	(Total man-hours combined)	
- <u>1,264</u>	(Combined leave -Vacation-Personal-Sick-Safety)	
12,792	(Total man-hours available - 2020)	

8. Add total hours projected for each District from projected maintenance spreadsheet (Exhibit C) for regular full time hours.

9. Subtract regular full time hours from actual hours needed to get seasonal hours required. Divide regular full time hours to get percentage for seasonal hours needed.

10. Overtime hours are average hours from previous years.

11. Sick time is an average of 12 hours per month.

Projected Maintenance Worksheet with 7 Employees

1. To calculate total man-hours, multiply the actual number of working days by the actual hours worked (8) and then by the number of maintenance employees. Subtract **105 hours** allowed for Vacation, Personal Time, Sick Leave, and Safety Leave - **per month**.
2. Crystal Reports generate tasks to be completed.
3. General scheduled maintenance hours are pre-determined hours calculated from actual hours used to complete these tasks. These hours are not adjustable.
4. General unscheduled maintenance hours are hours which are calculated from past history. These hours are adjustable.
5. All man hours for tasks are calculated by dividing the number of tasks by a predetermined number for each task and then multiplying it by the number of hours it takes to complete this task. (See table below)

Sewer

Hydraulic Cleaning/Root Cut - Divide **3,250' per day** x 16 hrs. (2 men)

TV Inspections - Divide **3,500' per day** x 16 hrs. (2 men)

Root Treatment - Divide **2250' per day** x 16 hours (2 men)

Water

Valves - Divide **35 Valves per day** x 8 hrs. (1 man)

Hydrants - Divide **27 Hydrants per day** x 8 hrs. (1 man)

Hydrant Painting - Divide **50 Hydrants per day** x 16 hrs. (2 men)

Blow-offs - Divide **30 Blow-Offs per day** x 8 hrs. (1 man) - Water Quality Flushing of dead-end mains.