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MEMORANDUM CWS File #07-300

To: Ms. Tammie Petrone, CWCB

cc: Kathy Peterson, Chris Smith, Left Hand Water District

From: Val Flory

Date: 4-18-08

Subject: 95% Progress Report for Left Hand Water District Water Conservation Plan

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Clear Water Solutions (CWS) has completed the final draft of the Left Hand Water District (LHWD) Water Conservation Plan in accordance with the Guidance Document produced by the Colorado Water Conservation Board (CWCB). The Guidance Document outlines nine steps in the water conservation planning process. To date, CWS and the District have completed the nine steps per the scope of work and the District is currently reviewing the Draft Plan. The Draft Plan will be sent to the Board members for review and discussed at the May LHWD Board Meeting. The public-review process will begin a few days after the meeting.

Four customer categories were identified as high water use areas and were targeted for water conservation. The categories are Residential, Commercial, Master Meter Communities and Landscape. Unaccounted-for Losses was an additional category that was identified for potential water savings. Goals for each of these categories were established through the planning process with LHWD's staff. These water-savings goals for the ten-year planning period are shown in Table 1 along with the current and projected water use.

Table 1 – Water Conservation Goals

Water Use Categories:	2007 Water Use (AF)	Average of Projected Annual Water Use (2008 to 2017) (AF)	Reduction Goals for Planning Horizon (%)	(AF)
Residential	3,051	5,182	10%	518
Commercial	503	874	5%	44
Landscape	99	118	10%	12
Master Meter Communities	208	220	5%	11
Unaccounted-for Losses Including Recycling WTP Backwash: (reduction is loss at 6.5% minus loss at 5% plus 5% of ave. production for backwash recycling)	283	440	1.5%	221
Total Demand Reduction:				806
Total Water Production:	4,352	6,762		
Total Percent Reduction:				12%

A universal list of conservation measures and programs that are required by the State and/or appropriate for the District was compiled to meet these goals. The list was then screened using the following criteria:

1. System limitations
2. Staff and Board approval
3. Financial implications
4. Public acceptance

The purpose of this initial screening process was to help CWS and LHWD eliminate measures that don't make sense to implement at this time and to create a manageable list of measures to evaluate further. Both supply-side and demand-side measures and programs were screened. The measures and programs were grouped into four major categories: Utility Maintenance, Regulatory Controls, Educational Programs, and Rebates and Incentives. The groupings helped to define the nature of each measure/program and determine which District staff will be responsible for implementation.

A final list of 22 measures and programs were selected for further evaluation and seven measures rejected. There were eight existing measures that will remain the same and therefore were not evaluated further. Table 2 shows the Universal List of Conservation Measures and Programs. The Existing and Further Evaluation columns indicate the decision that was made regarding the specific measure and/or program. The Comment column indicates the reasoning for accepting or rejecting the specific measure and/or program. Existing measures and programs are highlighted in green.

Table 2 – Universal List of Conservation Measures and Programs

	Conservation Measure or Program	Existing	Further Evaluation	Comment
Supply side measures & programs	**Utility Maintenance Programs**			
	Leak detection & repair program	yes	yes	Target to reduce system loss from 6.5% to 5%.
	Meter testing and replacement program	yes		continue as is
	Recycling WTP filter backwash	yes		continue as is
	Water reuse system	no	no	This will be looked at again for the next water conservation plan update.
	Installing meters in the distribution system to pinpoint leak areas	no	yes	
	Sub-meter mobile home parks	no	yes	We could add this as a policy for new parks only.
	Leak detection for Master Meter Communities	no	yes	This could be combined with a mobile home parks leak detection program.
	Leak detection in mobile home parks	no	yes	Staff is checking current losses on the park that is already sub-metered.
Demand side measures & programs	**Regulatory Controls**			
	Inclining Block Rate water rate structure	yes		continue as is
	25% of lot irrigation restriction in Boulder County	yes		continue as is
	Drought Contingency Plan	yes		continue as is
	Landscape & irrigation system standards for new development	no	yes	These 3 are set up and authorized under the various entities within the District. The District will commit to working with other agencies on water conservation standards and ordinances.
	Restrictive covenants ordinance	no	yes	
	Soil amendment ordinance for new Residential and Commercial landscapes	no	yes	
	Removal of phreatophytes e.g. cottonwoods	no	no	Not acceptable to the public
	Requiring wind and/or rain sensors for commercial and open space irrigation	no	yes	
	Irrigation system audit & improvements for irrigation taps	no	yes	
	Educational Programs			
	Public education - newsletter, bill stuffers, website	yes	yes	The plan is to dedicate a section of the website for water conservation education - including promoting the turf demo at Northern Water.
	Children's water festival	yes	yes	This will be advertised on the website.
	Xeriscape gardening classes	yes		continue as is
	Xeriscape garden demonstration	yes		continue as is
	Billing system that encourages water savings	yes		continue as is
	Post commercial BMPs on website or as bill stuffers	no	yes	This can be posted on new website.
	Send ET irrigation scheduling in water bill	no	yes	This can be calculated based on historic ET averages.
	Designated water conservation officer	no	no	not enough staff
	School education program	no	yes	This will include training current staff and looking at support opportunities from CWCB and Northern Water.
	Rebates and Incentives			
	Sprinkler system audit kit and instructions	no	no	Part of residential audit kit.
	Residential audit kit	no	yes	This could be made available online and will include indoor and outdoor uses.
	Rebate programs for toilets, clothes washers, dishwashers, faucets and showerheads	no	yes	Evaluate separately to see savings for each.
	Xeriscape incentive for all categories	no	yes	As part of rebate program.
	Commercial & Industrial water audits	no	yes	
	Promote Hospitality BMPs	no	no	This will be part of the commercial water audit program.
	Wind and/or rain sensor rebates for residential	no	yes	Consider offering in rebate program for existing residences and/or as a regulatory requirement for developers of new construction.
	Rebates for ET (SMART) sprinkler system controllers	no	yes	
	Distribute pre-rinse spray heads to restaurants & institutions	no	no	Not enough restaurants and institutions to produce enough water savings to be feasible.
	Irrigation system rebate for residential and commercial	no	no	Not enough information at this time to determine success and cost.
	Commercial toilet rebates	no	yes	

A unit cost of dollars per 1,000 gallons saved was determined for each of the measures/programs that were selected. The measures and/or programs were ranked according to the resulting unit costs. A second screening was then conducted using the following criteria:

- Staff availability
- Amount of water savings
- Expected participation and interest
- Cost of implementation
- Overall rank in cost-benefit analysis

Table 3 shows the measures included in the final selection and arranged by goal or customer category to evaluate the expected water savings, costs and resulting goals.

Table 3 – Combined Water Savings of Selected Conservation Measures and Programs

Conservation Measures and Programs	Estimated Annual Water Savings after full Implementation (gallons)	Estimated Total Water Savings over Planning Period (gallons) (gallons)	Annual Revenue Loss Related to Water Savings ($3.00 to $3.80/1,000 gallons2)	Estimated Annual Cost	Estimated Total Cost over Planning Period including Set-up	Cost per 1000 Gallons Saved	Assumptions and Calculations
Unaccounted for Losses							
Recycle backwash at WTP	39,262,462	392,624,616	$0	$5,000	$50,000	$0.13	Recycling WTP backwash will continue to save 5% of water produced. Savings shown are those over savings in 2007.
Improved Leak Detection & Repair Program	23,134,642	231,346,419	$0	$15,000	$150,000	$0.65	Estimate savings of 0.3% of annual production until full implementation for a 1.5% total reduction in unaccounted-for losses (6.5% to 5%) within 5 years. Savings are split 70% for leak detection and 30% for meters, but will be combined as one program. Use average projected production for planning period (2008-2017).
Installing meters in the distribution system to pinpoint leak areas	9,914,847	99,148,465	$0	$15,000	$50,000	$0.50	
Subtotal - Gallons	72,311,950	723,119,500		$35,000	$250,000		
Acre-Feet	222	2,219					
Residential							
Inclining Block Rate water rate structure	11,178,700	111,787,000	$54,000	$54,000	$540,000	$4.83	New Surcharge in rate structure for water use over allotment. Estimate 30% reduction of total water use 56 water users in high water use area.
Existing Xeriscape Program	498,897	4,988,969	$1,896	$2,896	$28,958	$5.80	Assume 10% participation of new residences and 15% savings on outdoor use in planning period.
Landscape & Irrigation system standards for new development	4,257,819	42,578,193	$16,180	$16,680	$166,797	$3.92	Assume a 5% savings of ave. planning pd. new outdoor use (ave. outdoor use from 2002-2007 is 52% of total use) will be split between these 3 measures. Cost is for staff time to review policies.
Soil amendment ordinance for new landscapes	4,257,819	42,578,193	$16,180	$16,680	$166,797	$3.92	
Restrictive covenants ordinance	4,257,819	42,578,193	$16,180	$16,680	$166,797	$3.92	
Public education - improvement to website in addition to existing bill stuffers and annual newsletter	33,766,556	197,332,197	$128,313	$129,713	$1,298,379	$6.58	Assume 2% reduction of average residential use.
Children's water festivals	16,883,278	197,332,197	$64,156	$64,156	$642,190	$3.25	Assume 1% reduction of average residential use.
Send ET irrigation scheduling in water bill, website and spring newsletter	30,783,823	307,838,228	$116,979	$117,379	$1,173,785	$3.81	ET scheduling is sent in May water bill. Assume 3% savings of ave. projected outdoor water use (52%) of residential and commercial accounts.
Residential audit	14,543,750	80,236,750	$55,266	$55,755	$558,353	$6.96	Online instruction can be set up in website update. Estimate that by 2017, 20% of residential accounts will have participated (1,625). Assume annual participation of 163 and 5% savings of ave. household use (179,000 gal).
Rebate for low-flow toilets	4,735,656	26,046,108	$17,995	$19,995	$200,055	$7.68	Estimate 40 participants per year up to 400 of pre-1994 homes. (See Table 8.1 for savings assumptions)
Rebate for high efficiency clothes washers	1,145,224	6,298,732	$4,352	$6,352	$63,619	$10.10	Estimate 20 participants per year up to 200. (See Table 8.1 for savings assumptions)
Rebate for low-flow faucet	1,950,000	10,725,000	$7,410	$7,710	$77,200	$7.20	Average water savings of 6,500 gal. per household per year for 1.5 gpm faucets[1] (1.5gpm vs. 2.75gpm). Estimate 30 participants per year up to 300 of pre-1997 homes (4,900) and 2 faucets per home.
Rebate for wind and rain sensors for residential	2,559,700	14,078,350	$9,727	$11,102	$111,119	$7.89	Estimate appr. 1% of existing 2007 taps participation per year up to 550 homes. Assume 5% savings of outdoor use (52% of 179,000 gal/tap).
Rebate for ET (SMART) sprinkler system controllers	5,119,400	28,156,700	$19,454	$22,204	$222,137	$7.89	Estimate appr. 1% of existing 2007 taps participation per year up to 550 homes. Assume 10% savings of outdoor use (52% of ave 179,000 gal/tap).
Subtotal - Gallons	135,938,441	1,112,554,811	$528,087	$541,301	$5,416,185		
Acre-Feet	417	3,414					

Conservation Measures and Programs	Estimated Annual Water Savings after full Implementation (gallons)	Estimated Total Water Savings over Planning Period (gallons) (gallons)	Annual Revenue Loss Related to Water Savings ($3.00 to $3.80/1,000 gallons2)	Estimated Annual Cost	Estimated Total Cost over Planning Period including Set-up	Cost per 1000 Gallons Saved	Assumptions and Calculations
Unaccounted for Losses							
Commercial							
Commercial and Industrial water audits	3,642,883	33,690,767	$12,750	$15,250	$152,601	$4.53	Target 5 companies per year starting with highest users up to 20 companies. Top 13 companies ave. annual use from 2005 to 2007 is 66,418,333. Average use per comm. tap from 2002 to 2007 is 743,000. Assume 5% savings of annual use for top 13 taps and 7 taps at ave use. Audit will be performed by third party contractor.
Post commercial BMPs on website or as bill stuffers	8,549,826	85,498,255	$29,924	$51,724	$517,869	$6.06	Assume 3% reduction in average commercial use.
Requiring wind and rain sensors for commercial and open space irrigation	2,674,800	14,711,400	$9,362	$12,039	$120,465	$6.37	Assume 5% water savings on all irrigation tap use and 45% (outdoor) of commercial tap use[1]. Assume participation is 54% of the projected commercial taps per year (ave. of 29) and all of the projected irrigation taps (ave. of 6) over the planning pd. Cost is for sensor and staff time to set up program (split with res. program).
Subtotal - Gallons	14,867,509	133,900,422	$52,036	$79,013	$790,935		
Acre-Feet	46	411					
Landscape							
Requiring wind and rain sensors for commercial and open space irrigation	1,644,000	9,042,000	$5,754	$4,013	$40,155	$6.37	Assume 5% water savings on all irrigation tap use and 45% (outdoor) of commercial tap use[1]. Assume participation is 54% of the projected commercial taps per year (ave. of 29) and all of the projected irrigation taps (ave. of 6) over the planning pd. Cost is for sensor and staff time to set up program (split with res. program).
Irrigation system audit & improvements for existing irrigation taps	4,712,800	39,236,800	$16,495	$17,245	$172,648	$1.49	Assume 10 of 43 existing irrigation taps are targeted per year for a 20% savings[1] of 548,000 gal per tap. Studies show water savings of 20-50%. Set up cost is split between Irrigation and commercial audit programs. Audits performed by 3rd party.
Subtotal - Gallons	6,356,800	48,278,800	$22,249	$21,258	$212,803		
Acre-Feet	20	148					
Master Meter Communities							
Leak detection program in mobile home parks	1,002,243	10,022,430	$3,007	$3,007	$34,067	$3.40	Assume annual 5% savings of Mobile Home Park use after implementation.
Leak detection for master meter communities	2,242,830	22,428,302	$6,728	$6,728	$75,285	$3.36	Assume annual 5% savings of Master Meter Community use after implementation.
Subtotal - Gallons	3,245,073	32,450,733	$9,735	$9,735	$109,352		
Acre-Feet	10	100					
Grand Total - (Gallons)	232,719,773	2,050,304,265	$612,107	$686,307	$6,779,275	$3.31	
Acre-Feet	714	6,292					

The cumulative water savings in each category from Table 3 were compared to the original goals shown in Table 1 and found to fall short. Because setting and reaching goals in water conservation planning is an iterative process, the assumptions and goals were re-evaluated. The assumptions used to calculate the water savings were on the conservative end of the expected range of water savings. These assumptions were adjusted appropriately while making sure to avoid double counting savings from different measures. Also, one measure (rebate for faucets) that had originally been screened out was added to help meet the goal for the Residential category.

Residential customers were originally targeted for higher savings because the Residential category is the largest customer category for the District. However, since the District has had on-going conservation practices and education in place for a significant amount of time, we believe there will not be as much savings potential as originally thought. Therefore, the target goal for this category was lowered. On the other hand, the Landscape category showed even more water savings potential than originally expected and the goal for this category was increased.

Table 4 shows the resulting goals next to the original goals and the amount of water that will be saved on an annual basis after full implementation of the Plan.

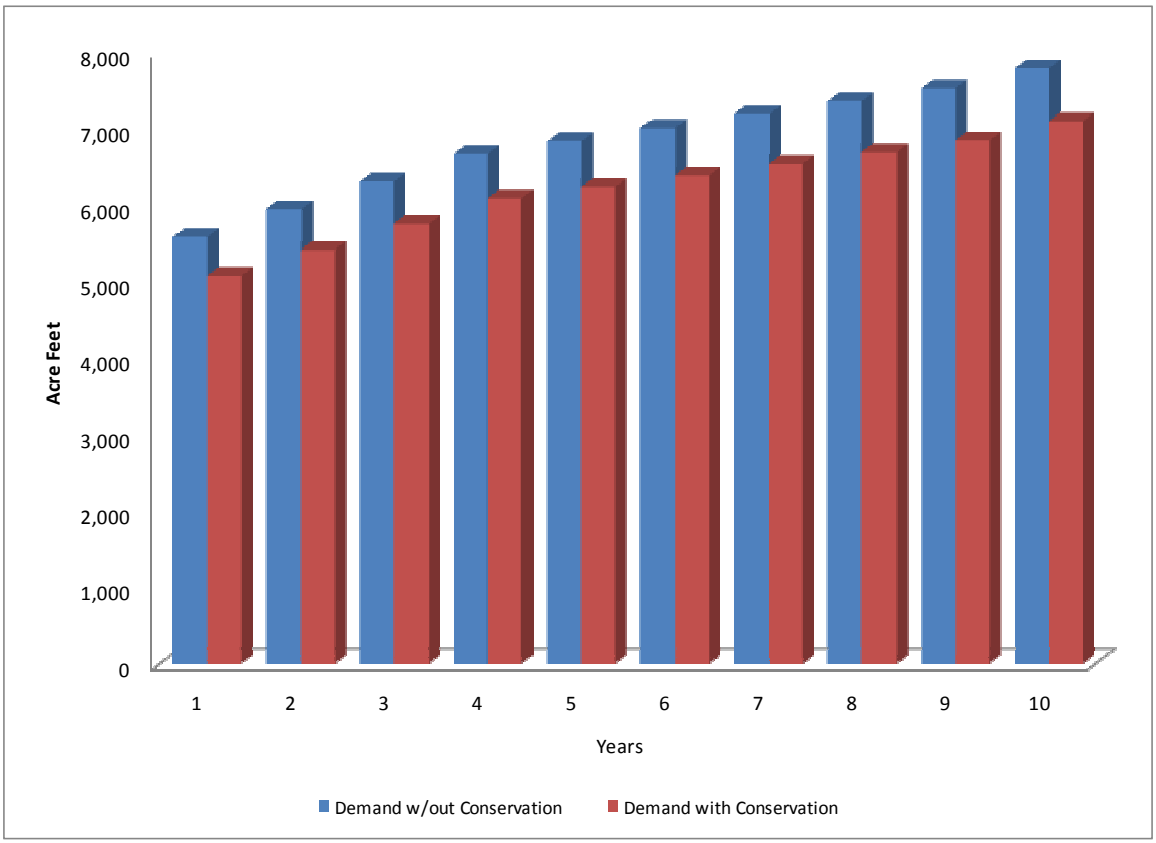
Table 4 – Water Conservation Goal Comparison

Water Use Categories:	2007 Water Use (AF)	Average of Projected Annual Water Use (2008 to 2017) (AF)	Reduction Goals for Planning Horizon (%)	Reduction Goals for Planning Horizon (AF)	Water Savings from Selected Programs (AF)	Resulting Reduction (%)
Residential	3,051	5,182	10%	518	417	8.1%
Commercial	503	874	5%	44	46	5.2%
Landscape	99	118	10%	12	20	16.5%
Master Meter Communities	208	220	5%	11	10	4.5%
Unaccounted-for Losses Including Recycling WTP Backwash: (reduction is loss at 6.5% minus loss at 5% plus 5% of ave. production for backwash recycling)	283	440	1.5%	221	221	1.5%
Total Demand Reduction:				806	714	
Total Water Production:	4,352	6,762				
Total Percent Reduction:				12%	11%	

The goals expected based on the calculated water savings are 8% for Residential, 5% for Commercial, 15% for Landscape, 5% for Master Meter Communities, and 1.5% for Unaccounted-for Losses.

The demands for these categories with and without water conservation are shown in Figure 1 for the ten-year planning horizon associated with this Water Conservation Plan. Savings associated with Unaccounted-for Losses are also considered.

Figure 1 – Comparison of Demand Forecast with and without Conservation



The total water saved will be 714 AF and will reduce the total demand by 11%.

Tap fees for a new service connection to the District include a PIF, water acquisition fee, meter/pit installation fee, and a line fee. This reflects infrastructure costs related to treatment and transmission as well as the current price to acquire water. A unit cost in the same form as that found for the measures and programs was determined for the tap fee and equates to $85.68 per 1,000 gallons.

For the 714 AF/yr. of projected savings at $85.68 per 1,000 gallons, the cost of the infrastructure and water acquisition for entire ten year planning horizon would be approximately $20.0 million. This can be compared to the cost of the water conservation program over the ten year planning horizon at $3.30 per 1,000 gallons for a total cost of $6.8 million, including lost revenue.

Delayed capital improvement cost savings were estimated at $3.6 million and lost revenue at $612 thousand. All of these considerations show a value to the District and its customers of implementing the selected water conservation programs.

The suggested implementation plan is shown in Table 5 and will occur over four years. The measures have been grouped into programs with one program being implemented per year. This implementation plan will aid in monitoring the separate programs for success.

Table 10.1 – Implementation Plan

Year - Program	Estimated Cost	Action Required	Possible Causes for Delay	Start Date
2008 - Leak Detection Program				
Improved Leak Detection & Repair Program	$15,000.00	Staff scheduling	Funding shortage	6/1/2008
Installing meters in the distribution system to pinpoint leak areas	$15,000.00	Staff scheduling	Funding shortage	6/1/2008
Leak detection for master meter communities	$8,000.00	Collaboration with HOA's	Staff and funding shortage	
Leak detection program in mobile home parks	$4,000.00	Collaboration with mobile home parks	Staff and funding shortage	
Annual Total	$42,000.00			
2009 - Audit Program				
Residential audit	$1,289.00	Research and set up	Staff availability	1/1/2009
Commercial and Industrial water audits	$2,600.00	Research and set up	Staff and funding shortage	1/1/2009
Irrigation system audit & improvements for existing irrigation taps	$950.00	Research and set up	Staff availability	4/1/2009
Requiring wind and rain sensors for commercial and open space irrigation	$100.00	Add to Policies	Staff availability	4/1/2009
Landscape & Irrigation system standards for new development	$500.00	Add to Policies	Staff availability	1/1/2009
Soil amendment ordinance for new landscapes	$500.00	Add to Policies	Staff availability	1/1/2009
Restrictive covenants ordinance	$500.00	Add to Policies	Staff availability	1/1/2009
Annual Total	$6,439.00			
2010 - Public Education Program				
Public education - improvement to website in addition to existing bill stuffers and annual newsletter	$2,650.00	Research and hiring web developer	Staff and funding shortage	1/1/2010
Children's water festivals	$625.00	Research	Staff availability	1/1/2010
Post commercial BMPs on website or as bill stuffers	$1,725.00	Research and obtaining material	Staff and funding shortage	1/1/2010
Send ET irrigation scheduling in water bill, website and spring newsletter	$400.00	Calculate ET	Staff availability	4/1/2010
Annual Total	$5,400.00			
2011 - Rebate Program				
Rebate for low-flow toilets	$2,100.00	Research and set up	Staff and funding shortage	1/1/2011
Rebate for high efficiency clothes washers	$2,100.00	Research and set up	Staff and funding shortage	1/1/2011
Rebate for low-flow faucet	$400.00	Research and set up	Staff and funding shortage	1/1/2011
Rebate for wind and rain sensors for residential	$1,475.00	Research and set up	Staff and funding shortage	4/1/2011
Rebate for ET (SMART) sprinkler system controllers	$2,850.00	Research and set up	Staff and funding shortage	4/1/2011
Annual Total	$8,925.00			

LHWD's staff is currently reviewing the draft plan. Their revisions will be incorporated and the Plan sent to the Board for review and to be discussed at the May Board Meeting. The District will hold its public review process from May 18, 2008 to July 18, 2008 after Board comments are incorporated. After the 60-day public process, public comments will be added to the plan, if any, and the Board will formally adopt the Water Conservation Plan. The Plan will then be submitted to CWCB for final approval.