
8 Recommendations

This chapter presents the short-term (2005 – 2012) implementation plan, and budget for the HB1437 water conservation program plus a summary of the recommended actions for the implementation of the HB1437 water program.

8.1 Overview

The recommended short-term HB1437 water program includes the following components:

- Conservation charge: 25% (from 2005 to 2012)
- Conservation Strategy – combination of precision leveling and in-division controls
- Conserved Water Production – 3,500 af/yr
- Water Demand Period – 2005 – 2012 (plus field maintenance in 2014 – 2016)
- Groundwater – 600 af/yr (maximum) from an existing well in Lakeside Division
- Funding:
 - precision leveling: EQIP - 50% / Ag Fund – 30% / Farmer - 20%
 - in-division controls: Ag Fund – 100%

Program implementation will require efforts in four general areas:

- Policy/Program Development
- Technical Studies
- Construction
- Measurement and Reporting (M&R).

A discussion of these areas and a proposed budget to fund these efforts follows.

8.2 Implementation Schedule

The implementation schedule for the proposed short-term plan is summarized in Table 8.1. It shows Policy/Program Development and Construction occurring in the years 2005 – 2008, followed by a program review in 2009. Measurement and Reporting would occur in all years 2005 - 2016. The first round of field maintenance and re-leveling is projected to occur during the years 2014 and 2016.

Table 8.1 Summary HB1437 Short-term Implementation Schedule

ACTIVITY	Year									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014-16
1. Program Policy: EQIP / LCRA Partnership	●	●								
2. Program Policy: Extend Water Sales Contract	●	●	●							
3. Technical Studies	●	●	●							
4. Construction: On-Farm -Precision Level	●	●	●							
5. Construction : In-division - Check/SCADA			●	●						
6. Program Policy: Review Surcharge					●					
7. O&M: Field Re-leveling Maintenance										●
8. O&M: Measure and Monitoring	●	●	●	●	●	●	●	●	●	●

¹ Design in 2007 with conserved water production by 2008

8.3 Policy / Program Development

Action is necessary on the following policy items to implement the short-term proposed solution.

- *Prepare LCRA Policy Document:* The LCRA should prepare a document to reflect LCRA’s policy on the HB1437 water program. The document would address the stakeholders’ main concerns, and identify program administration and review processes.
- *Review Ag Advisory Committee Role:* The LCRA and the Agriculture Water Conservation Fund Advisory Committee should review roles and responsibilities in the implementation of the HB1437 Water Conservation Program.
- *Execute a Interlocal Agreement with Natural Resource Conservation Service (NRCS).* This agreement would formally acknowledge the LCRA’s and Ag Fund participation in the NRCS Environmental Quality Improvement Program (EQIP).
- *Develop HB1437 Water Conservation Program rules and operating procedures.* These procedures would define rules for participation, and integrate the EQIP’s verification program into HB 1437 funding process and associated budget. Develop monitoring and

reporting requirements. Program rules would also include procedures for monitoring and reporting of water conservation to assure water savings

- *Develop engineering plans and contract terms for farmer participation in project:* The LCRA should identify contract terms for farmer and division participation in the implementation of recommended water replacement strategies. Contract terms should establish farmer cooperation to assure water savings.
- *Acquire formal request of Chisholm Trail water and Liberty Hill:* The LCRA should acquire formal water transfer request from BRA for 2006 water delivery.
- *Begin discussions with BRA and other customers to assure water delivery past 2011:* The LCRA should start discussions with the Brazos River Authority and other potential water customers to assure that the water will continue to be delivered until 2011.

8.4 Technical Studies

The LCRA should complete by 2006 on-going technical studies to confirm water savings from the short-term proposed solution.

- *Complete desktop studies to establish conservation factors for on-farm conservation strategies:* The LCRA should take previous studies as a guide to estimate the conservation factors for precision land leveling.
- *Complete field studies to establish conservation factors for the in-division conservation strategies:* The LCRA should conduct field studies to assure water savings from recommended water conservation strategies.
- *Establish pumping capacity of existing wells in irrigation districts:* The LCRA should develop up to 600 a-f/yr of groundwater capacity as a contingency. The LCRA should establish the pumping capacity of its existing wells in the irrigation districts to assure availability of water as a contingency.

8.5 Construction and Conserved Water Production

8.5.1 Construction

A construction and conserved water production schedule for the short-term plan is presented in Table 8.2 below. It shows the following:

- Precision leveling of 6,000 acres (2,000 acres/yr) over the period 2005 – 2007
- Design and construction of the in-division control system and check structures in 2007/2008. Note: In division construction would only proceed if water delivery is assured past 2011 and there are adequate Ag-Funds to support construction. Current projections show adequate funds will be available to implement the proposed plan.

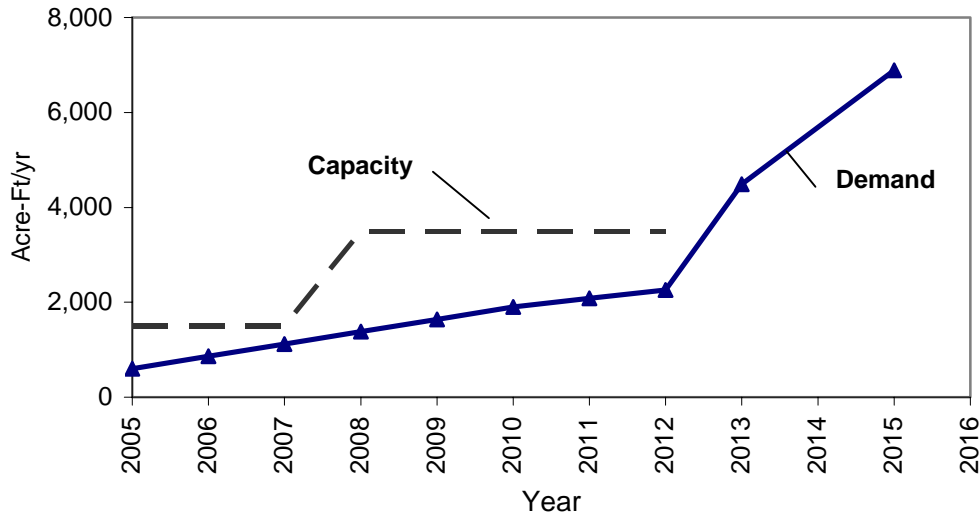
Table 8.2 Construction Schedule

Year	Projected Water Transfers (af/yr)	On Farm: Precision Leveling		In Division: Check Structures and Control System		Total Conserved Water Produced ⁴ (af/yr)
		Area Leveled, (acres)	Conserved Water produced (af/yr)	Number of Check Structures	Conserved Water produced (af/yr)	
2005	600	2000	1500	-	0	1500
2006	860	2000	1500	-	0	1500
2007	1120	2000	1500	-	0	1500
2008	1380	-	1500	8	2000	3500
2009	1640	-	1500	8	2000	3500
2010	1900	-	1500	8	2000	3500

8.5.2 Conserved Water Production

Figure 8.1 presents the demand versus system capacity projections for the short-term plan. During the initial period 2005 – 2007, where only precision leveling is used, system capacity is 2,000 af/yr and increases to 3,500 af/yr when the in-division improvements are brought on line in 2008.

Figure 8.1 Short-Term System Capacity vs. Demand Projections



8.6 Budget

The primary focus of this study has been on the Ag Fund requirements, however, because it is one of three funding sources, it is important to look at the project from a total cost, or program perspective.

8.6.1 Program Costs

The proposed program costs and income for the short-term recommendations are summarized below:

- Period: 2005 – 2016 (includes field re-level in years 2014 – 2016)
- Conservation Charge: 25 percent
- Total Program Cost: \$5,176,000
- Total Ag Fund Costs: \$3,891,000

Program costs fall into 3 categories: construction, operations, and field maintenance. A breakdown of these total program costs is presented in Table 8.3.

Table 8.3 Breakdown of Total Program Costs

Category	Costs
Construction	\$3,585,000
Operations ¹	\$991,000
Field Maint	\$600,000
Total	\$5,176,000

¹ Includes Management and Reporting, equipment maintenance and power costs

Funding of these program costs will come from three sources: precision leveling costs will come from: EQIP (50 percent), the Ag-Fund (30 percent), and farmers (20 percent). EQIP and farmer funds are for construction only. The Ag-Fund expenditures will fund all of the SCADA and check structure option including construction, operation and maintenance.

8.6.2 Ag Fund Costs

Table 8.4 presents a summary of the income and expenditures for the Ag-Fund component of the program. It shows total fund income over the period 2005 – 2016 to exceed \$3.9 million based upon the projected water sales for the period 2005 to 2012. Ag Fund expenditures during the period 2005 - 2016 are expected to exceed \$3.8 million or approximately 87 percent of total program costs.

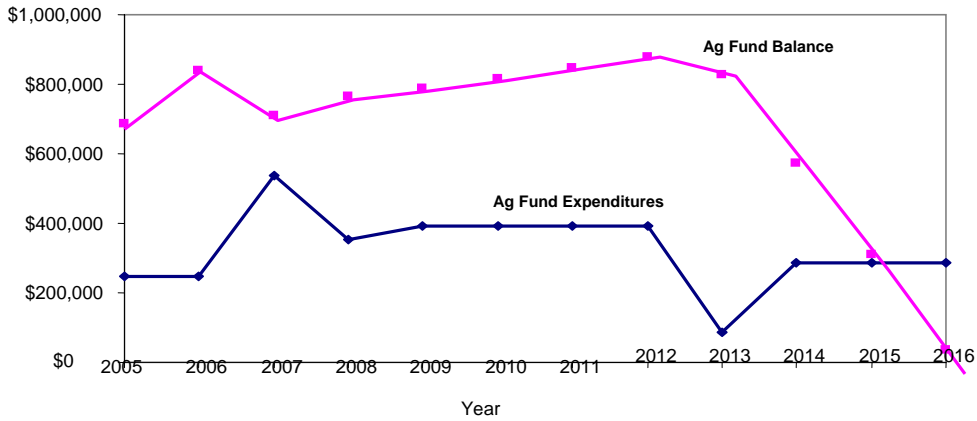
Table 8.4 Breakdown of Ag Fund Income and Expenditures

Ag Fund Balance	Income	Expenditures
Ag Fund Income:	\$3,927,000	-
Operations	-	\$991,000
Field Maint.	-	\$600,000
Construction	-	\$2,300,000
Total	\$3,927,000	\$3,891,000
Balance	\$36,000	

8.6.2.1 Cash Flow

A projected cash flow for the short-term plan is presented in Table 8.5. Projections show a remaining fund balance of approximately \$36,000 in 2016 assuming contract termination in 2012 and no additional income to the AG-Fund past the year 2012.

Ag Fund Cash Flow



8.6.3 Construction Costs

Construction costs for the short-term plan are estimated at \$3.58 million as shown in Table 8.6. The Ag Conservation Fund will fund approximately \$2.3 million or approximately 64% of total construction costs.

Table 8.6 Estimated Short-term Construction Costs

Strategy	Total	Funding Source		
		EQIP	Ag Fund	Farmer
Precision Level ¹	\$1,836,000	\$918,000	\$551,000	\$367,000
Check/SCADA	\$1,749,000	\$0	\$1,748,000	\$0
Total Construction	\$3,585,000	\$918,000	\$2,299,000	\$367,000

¹Total of 6000 acres.

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Table 8.5 Cash Flow Projections for Short-term Alternative

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Level Costs		\$183,600	\$183,600	\$183,600	\$0	\$0	\$0	\$0	\$0	\$0			
O&M Cost (10 Year)		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$200,000	\$200,000	\$200,000
Well Cost		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0				
GW Mitigation		\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000	\$11,000				
Well O&M		\$2,090	\$2,090	\$2,090	\$2,090	\$2,090	\$2,090	\$2,090	\$2,090				
Check Capital				\$291,429	\$291,429	\$291,429	\$291,429	\$291,429	\$291,429				
Check O&M						\$35,826	\$35,826	\$35,826	\$35,826	\$35,826	\$35,826	\$35,826	\$35,826
M&R Costs		\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Total Costs		\$246,690	\$246,690	\$538,119	\$354,519	\$390,346	\$390,346	\$390,346	\$390,346	\$85,826	\$285,826	\$285,826	\$285,826
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Beginning Balance	\$ 544,125	\$544,125	\$687,200	\$839,736	\$710,681	\$763,801	\$786,958	\$814,778	\$846,299	\$876,521	\$825,756	\$572,960	\$310,052
Deposited to Ag Fund		\$368,000	\$371,738	\$375,475	\$379,213	\$382,950	\$386,688	\$389,275	\$386,716	\$0	\$0	\$0	\$0
Used to Implement Strategy		\$246,690	\$246,690	\$538,119	\$354,519	\$390,346	\$390,346	\$390,346	\$390,346	\$85,826	\$285,826	\$285,826	\$285,826
Interest Accrued on Balance		\$21,765	\$27,488	\$33,589	\$28,427	\$30,552	\$31,478	\$32,591	\$33,852	\$35,061	\$33,030	\$22,918	\$12,402
Balance	\$544,125	\$687,200	\$839,736	\$710,681	\$763,801	\$786,958	\$814,778	\$846,299	\$876,521	\$825,756	\$572,960	\$310,052	\$36,628

8.7 Recommendations

The LBJ School recommends that the LCRA reassess the performance and cost comparisons of the short-term strategies near the end of the currently proposed short-term implementation period as well as the results of the field studies currently underway for the LCRA-SAW Water Project. This reassessment will allow for verification of conservation savings, improve the reliability of demand projections, and revise cost comparisons among options.

A summary of the short-term and long-term recommendations are presented in Table 8.5.

Table 7.6 Recommendations

Topic	Recommendation
"No Net Loss" Definition	Any water transferred from the Lower Colorado River Basin to Williamson County should be balanced by water imported or treated effluent returned to the watershed, water conserved in the irrigation districts, or groundwater developed in the irrigation districts.
"No Net Loss" Implementation	Water delivered in a year should be balanced by: water saved in the previous year, water returned in that year, plus any groundwater needed to balance transfers in the next year.
Recommended Replacement Strategies	Automated check structures and control systems, precision land leveling, balancing reservoir(s) in irrigation districts, groundwater development in irrigation districts, reduced irrigation for second crop, and/or other voluntary conservation.
Actions for 2005-11	<p>Precision land level 2000 acres each year for three rotating years to conserve 1500 acre feet of water per year.</p> <p>Automate 8 automated check structures in Garwood to provide 2000 acre-feet of conservation water savings every year from 2007 to 2011.</p> <p>Utilize one or more of the existing wells in irrigation districts to replace water transferred to Williamson County in 2005. Limit groundwater usage to 600 acre-ft per year</p>
Water Replacement (2011 –)	<p>Implement on-farm and in-division water conservation options, depending upon cost and performance outcomes of experiments during 2005-11.</p> <p>All other factors being equal, the LCRA Board should consider implementing one of the following strategies: precision land leveling, automated check structures and control systems, balancing reservoirs, groundwater development, reduced irrigation for second crop or other voluntary conservation.</p>
Contingency Water	<p>Groundwater utilization should be in "very limited quantities under special situations."⁵</p> <p>The LBJ School defines "very limited quantities under special situations" to permit groundwater withdrawal of up to 600 acre-feet per year to assure no net loss to the Lower Colorado River watershed. Groundwater utilization should be contingent upon its availability in accordance with the rules promulgated by local groundwater conservation districts (GCD).</p>

⁵ Unpublished letter from Haskell L. Simon to Robert W. Lambert, Chairman, LCRA Board of Directors, November 11, 2003, Austin, TX, p. 3.

Topic	Recommendation
	The LBJ School recommends that the LCRA should have in place a contingency source of developed water up to 20 percent of Williamson County's water demand after 2011.
Surcharge Rate	Maintain the LCRA's current surcharge rate: 25 percent. Adjust the surcharge rate prior to 2011 to pay for the long-term solution, based on costs.
Water Balance Goal	Assure that water conservation savings each year balance water transfers to Williamson County within the period of January through December.
Water Balance Calculation	The LCRA should document a balance of "water out" and "water in" each year, based on an average over a three year moving average, subject to correction in the event that the water conserved is less than the water exported.
Advisory Committee	Maintain the HB 1437-Designated Agricultural Water Conservation Fund Committee intact. Establish a committee of interested parties to discuss implementation of the HB 1437 process.
Measurement	Use complementary historical studies, cross-sectional, time-series, and experimental analyses to assure transparency, validity, and reliability of water savings.
Mitigation	If groundwater withdrawals as a contingent source affect adjacent landowners, the LCRA should consider mitigating any adverse impacts.
Reporting	Design a website to report progress on implementation and annual water savings.
Tests to Resolve Uncertainties	Four tests during 2005-11: Evaluate cost and operating water conservation performance of automated check structures and control systems in Garwood; Assess cost and water conservation performance of precision leveling on an operating farm; Appraise the cost and water conservation performance of a gravel pit in Garwood, as a potential balancing reservoir; Test a well as a contingent water source.
Water Contract	The LCRA should negotiate with the Brazos River Authority to obtain a commitment from the Brazos River Authority to forgo cancellation of the contract to at least 2012, thereby allowing the surcharge to remain at 25 percent.