

# 11. Milestones and Measures of Success

## Milestones

Milestones are check points in the plan to ensure that the plan is on schedule. This element identifies measureable milestones that show whether management measures are being implemented by a particular set date. Measureable milestones can be documented through load reductions (i.e. 5% reduction of in TSS) or area of coverage (i.e. 5,000 feet of permeable sidewalk constructed). If the milestones are not achieved, the appropriate adaptive management will be initiated, tested and adjusted as needed.

Continued monitoring for water quality, precipitation, groundwater, biology and flows are necessary for the Stakeholder Committee to know if the plan is successful at maintaining or improving water quality in Cypress Creek. The data collected for characterization of the watershed was analyzed to identify pollutants, possible sources and to enhance the SWAT model's (CC-DSS) effectiveness at simulating current and future conditions in the watershed. The Stakeholder Committee determined that coordinating monitoring efforts under the WPP and monitoring done by project partners is essential to the plan's success. The strategy developed by the committee involves compiling existing data and newly collected data into one dataset that can be analyzed to better identify water quality trends and threats. The monitoring data will also be used to enhance the outputs of the CC-DSS. The stakeholders wish to use the CC-DSS to aid decision makers as they plan the future urbanization in the watershed.

Milestones and other management measures scheduled for implementation in the first ten years are presented below in Table 26. The potential pollution prevention quantity is provided as a percentage per BMP or unit because the pollution loadings in the future are only estimated and are only as accurate as the current level of available data allows. Once accepted, this WPP will be updated annually with modeling outputs that show more current land use and land cover activities in the basin. These instream loadings and subwatershed contributions will be estimated and the management measures listed below will be implemented as necessary to mitigate increases in pollution. Minimum numbers of management measures or BMPs needed to maintain water quality (and quantity) in the creek has been identified by the stakeholders.

Routine monitoring will be required to determine if implemented BMPs are reducing pollutants. The results of monitoring activities will be compared with the water quality targets below. Although 2012 baseline data (from the Clean Rivers Program) is provided as background information, desired water quality conditions were determined by the stakeholders and are shown in Tables 28-30.



Table 26. Measureable Milestones for Implementation Phase – Surface Water Protection Strategy

Management Measure	Minimum # Needed Throughout 10 Year Period	Applicable Area/Sub Watershed	Measured Milestones	Year of Implementation			Potential Pollutant Prevention per Unit Implemented £
				1-3	4-6	7-10	
Comprehensive Stormwater Assessment	1 Assessment	12, 14, 15, 39, 40, 41, 44	Completion of assessment of potential WQ Ordinance enhancements (1 PTE), selection of BMPs and locations for implementation based on findings	1			<i>E. coli</i> – 30%
Riparian Buffers	3 Managed Buffer Areas	12, 14, 15, 39, 40, 41, 44	Identify and prioritize locations for implementation, commitments for buffer management	1	1	1	N – 50% TSS – 74% <i>E. coli</i> – 30%
Xeriscaping/ Nativescaping	2 Areas	Basinwide	Establishment of at least 2 demonstration areas throughout the basin and adoption of HOA rules allowing xeri- and nativescaping		1	1	N – 75%
Engineered Swales	2 Locations	12, 14, 15, 39, 40, 41, 44	Establishment of at least 2 demonstration areas throughout the basin and use in all new development		1	1	TSS – 99%
Karst Feature Protection Measures	5 Locations	Basinwide	At least 5 properties identified as beneficial to protecting water quality with measures implemented; adoption of protection measures in city and county codes		2	3	<i>E. coli</i> – 34%

Management Measure	Minimum # Needed Throughout 10 Year Period	Applicable Area/Sub Watershed	Measured Milestones	Year of Implementation			Potential Pollutant Prevention per Unit Implemented £
				1-3	4-6	7-10	
Rainwater Harvesting Strategies	5 Areas	Basinwide	Establishment of at least 5 demonstration areas throughout the basin and use in all new development	1	2	2	Water quantity variable depending on precipitation
Rock Berms/Gabions	5 Berms	12, 14, 15, 39, 40, 41, 44	Establishment of at least 1 demonstration areas throughout the basin and use in all new development in urban public spaces; added to existing codes where appropriate	1	4		TSS – 55%
Biofiltration/Rain Garden	4 Areas	12, 14, 15, 39, 40, 41, 44	Establishment of at least 4 demonstration areas throughout the basin and use in all new development in public spaces; added to existing codes as water quality protection measure	1	1	2	N – 56% TSS – 93% <i>E. coli</i> – 75%
Pervious Sidewalks	10 Areas	12, 14, 15, 39, 40, 41, 44	Establishment of at least 10 demonstration areas throughout the basin and use in all appropriate new development in public spaces;		5	5	N – 80% TSS – 90%

Management Measure	Minimum # Needed Throughout 10 Year Period	Applicable Area/Sub Watershed	Measured Milestones	Year of Implementation			Potential Pollutant Prevention per Unit Implemented £
				1-3	4-6	7-10	
Pet Waste Ordinance & Stations	3 Locations	12, 14, 15, 39, 40, 41, 44	Establishment of at least 3 pet waste stations in urban subwatersheds; added to existing codes as water quality protection measure		1	2	<i>E. coli</i> – 510 billion cfu/day
Vegetative Filter Strips	1 location	12, 14, 15, 39, 40, 41, 44	Establishment of at least 1 demonstration area throughout the basin and use in all new development in public spaces; added to existing codes as water quality protection measure		1		N – 56% TSS – 93% <i>E. coli</i> – 75%
Low Impact Development	2 location	12, 14, 15, 39, 40, 41, 44	Establishment of at least 1 demonstration area throughout the basin to show Net Energy Zero Lodging and a green roof		1	1	Water quantity variable depending on precipitation
Existing BMP maintenance	20 inspections and maintenance when needed	12, 14, 15, 39, 40, 41, 44	Establishment of program to maintain existing BMPs for proper function	6	6	8	N – 50% TSS – 74% <i>E. coli</i> – 30%
Ordinance enforcements, enhancements and Master Plan development	3 ordinances/plans	12, 14, 15, 39, 40, 41, 44	Redevelopment and implementation of at least 3 key water quality ordinances or plans at the local government level		1	2	N – 50% TSS – 74% <i>E. coli</i> – 30%



Management Measure	Minimum # Needed Throughout 10 Year Period	Applicable Area/Sub Watershed	Measured Milestones	Year of Implementation			Potential Pollutant Prevention per Unit Implemented £
				1-3	4-6	7-10	
Small Scale Waste Water Treatment	1 location	12, 14, 15, 39, 40, 41, 44	Establishment of at least 1 demonstration area throughout the basin to show small scale wastewater treatment		1		N – 50% E. coli – 30%
Nature Trail Signs	3 signs	12, 14, 15, 39, 40, 41, 44	Erection of at least 3 signs for education		1	2	% prevention unknown
“Entering Watershed” Signs on Roadway	6 signs	Basinwide	Installation of 6 “Entering Watershed” Signs on Roadway to increase community awareness	3	3		% prevention unknown
Watershed Coordinator	10 years	Basinwide	1 employee to implement BMPs for water quality reduction and community awareness	3	3	4	% prevention unknown
Enhanced Water Quality and Groundwater Modeling (CC-DSS)	3 sessions	Basinwide	At least 3 sessions in enhanced Water Quality and Groundwater Modeling (CC-DSS) to improve water quality decision making as the scenario changes	1	1	1	% prevention unknown

*This table satisfies Element I.*

*£ - Potential preventions as compared to no action taken in the face of projected development.*

In the interim the Stakeholder Committee will begin work to compile historical data and data collected by project partners since characterization as well as implement components of the ground/source water protection strategy (Table 27).

**Table 27. Potential Ground/source water Protection Strategy Benchmarks**

Management Measure	Applicable Area	Benchmarks	Responsible Party/ Partners	Year of Implementation			
				1-2	3-4	5-6	7-8
<b>Highest Prioritization</b>							
Water Conservation Pricing Strategies	Basin-wide	Identification of successful pricing strategies	Stakeholder Committee	X			
	Basin-wide	Finalize pricing schedules and adoption by water providers	Stakeholder Committee	X			
	Basin-wide	Implementation of new pricing and monitoring of water use changes.	Stakeholder Committee	X	X	X	X
Water Conservation Program for Water Providers or Municipalities	Basin-wide	Identification of successful program components.	Stakeholder Committee	X			
		Development of program, schedule and adoption by water providers	Stakeholder Committee	X			
		Implementation of program and individual measures. Monitoring of water use changes.	Stakeholder Committee		X	X	X
<b>Source Water Protection Strategy</b>							
GW (Flowing) committee meets to ensure GW strategy implementation	Basin-wide	Meet quarterly	Stakeholder Committee	X	X	X	X
Begin meeting with responsible parties to determine what actions are possible	Basin-wide	As needed	Stakeholder Committee	X		X	
Identify what GMA9 process standards are used so CCP can effectively participate in the GMA process	Basin-wide	Identify protocols and report to Stakeholder Committee to determine next steps.	Stakeholder Committee	X			
Apply for funding and technical assistance – including JW USGS gage	Basin-wide	Begin applying for funds/assistance to implement Source Water Protection Strategy using accepted CC-WPP as justification.	Stakeholder Committee	X	X	X	X
<b>Preliminary BMPs for Source Water Protection</b>							

Management Measure	Applicable Area	Benchmarks	Responsible Party/ Partners	Year of Implementation			
				1-2	3-4	5-6	7-8
Data collection (historical and current)	Basin-wide	Begin collecting monitoring data for analysis	Stakeholder Committee	X			
Data analysis	Basin-wide	Perform analysis on collected monitoring data	Stakeholder Committee	X			
Present findings to Stakeholder Committee	Basin-wide	Present results of analysis to Stakeholder Committee and determine adaptive management strategy	Stakeholder Committee		X		
Identify Data gaps for next data collection and analysis	Basin-wide	Stakeholder Committee with technical assistance from project partners will identify what is needed to better understand flows from Jacobs Well and effects on surface water quality.	Stakeholder Committee		X		
Coordinate CCP conservation efforts and determine if they can work beyond the watershed to include the Cypress Creek Jacob's Well Springshed	Basin-wide	Stakeholder Committee to begin reaching out to conservation groups in the watershed to discuss pooling efforts and resources to protect the Cypress Creek recharge zone.	Stakeholder Committee			X	
Karst Feature Protection	Basin-wide	Identify and prioritize karst features for protection in the watershed that contribute water to Jacobs Well	Stakeholder Committee		X		

## Water Quality Targets Measures of Success

The Cypress Creek WPP is a preventative plan that will first address immediate water quality threats from nitrogen while implementing the integrated ground/source water protection strategy. After the first 3 years of implementation the Stakeholder Committee will conduct an adaptive management review to see how well water quality and water quantity goals are being met (Table 28, Table 29, Table 30). Interim water quality milestones are designated in-stream concentrations between current conditions and future conditions. The Stakeholder Committee decided that between 2014 and 2050, nitrogen concentrations should remain constant, while *E. coli* levels could increase in 2020 and TSS would be reduced between 2020

and 2050. The Stakeholder Committee will also review monitoring data to determine when action is needed to mitigate parameters of concern.

### Nitrogen Targets and BMP Effectiveness

The Stakeholder Committee identified priority reaches/subwatersheds affected by nitrogen concentrations in which to implement BMPs, as well as monitoring locations. Stakeholders selected initial BMPs to prevent increases in nitrogen and other pollutants as well as to promote education about nonpoint source pollution. These subwatersheds will be targeted in the first 3 years of implementation and routine monitoring will indicate if milestones are being met and if additional BMPs will be required in the future.

Table 28. Nitrogen Concentration Targets

Year	<b>Priority Reaches for Nitrogen Concentration (mg/L)</b>	
	Priority Reaches (including reaches 2, 4, 7, 32, 35)	Monitoring locations (including Jacobs Well, Downtown and Confluence)
2014 - 2050	1.65 mg/L	1.65 mg/L

### Parameters of Concern

The Stakeholder Committee identified priority reaches/subwatersheds affected by other parameters. BMPs will be implemented during the first 3 years in these subwatersheds as well. Monitoring will be performed at Jacobs Well, in the creek downtown, and at the confluence, as well as in any priority tributaries required to complete existing data gaps.

Table 29. *E. coli* Concentration Targets

Year	<b><i>E. coli</i> Concentration (cfu/100mL)</b>	
	Priority Reaches (including reaches 2, 12, 15, 27, 36, 41, 42, 44, 45, 46)	Monitoring locations (including Jacobs Well, Downtown and Confluence)
2014-2018	126 cfu/100ml	126 cfu/100ml
2020-2050	<394 cfu/100ml	<394 cfu/100ml



Table 30. TSS Concentration Targets

Year	TSS Concentration (mg/L)	
	Priority Reaches (including reaches 2, 4, 9, 14, 27, 29, 32, 36, 41, 42, 44, 45, 46)	Monitoring locations (including Jacobs Well, Downtown and Confluence)
2014-2018	5.0 mg/L	5.0 mg/L
2020-2050	Groups A, B, C - 4.5 mg/L	Groups A, B, C - 4.5 mg/L

## 12. Technical and Financial Assistance

During the fall of 2013, the Cypress Creek Stakeholder Committee worked together with governmental and nongovernmental organizations to gain commitment for technical and financial assistance in implementing the Watershed Protection Plan. Both cities, the County and local NGOs discussed commitments for implementing WPP activities. Formal financial agreements will be finalized during the Interim period (between acceptance of the WPP and implementation):

- **Woodcreek, Wimberley, Hays County and WVWA have pledged to implement the BMPs in Table 21 with TCEQ guidance with an estimated value of \$2,832,060.**
- **Since appropriation funding cycles for local governments cannot anticipate future projects beyond the current budget cycles, the formal appropriations at the city and county-level have not yet been approved nor allocated. The city of Woodcreek, city of Wimberley, and Hays county representatives have pledged to support and present the WPP implementation needs to their respective appropriations bodies for approval and allocation.**
- **The local governments have pledged to seek proclamations adopting the WPP during the interim.**
- **The local governments have pledged to conduct an education and outreach campaign for elected officials to ensure approval, appropriation, and allocation of funds for implementation of the WPP.**

Table 21 above shows dollar amounts pledged for initial implementation of BMPs throughout the watershed. Stakeholders decided that initial implementation efforts should span a three year period, during which time additional modeling, monitoring and assessments of pollution reductions from existing and proposed ordinances will take place, in addition to the installation of demonstration and pollution reduction BMPs. Modeling, monitoring and ordinance review outcomes will likely lead to adaptive management and revisions to this plan, including strategic placement of structural BMPs in vulnerable subwatersheds, additional land