	Project	ANNUAL OR BIENNIAL COST
1.	URGWOM REGULAR ACTIVITIES	
1.1	Data Acquisition and Database / DMI Administration and Management	$60,000
1	Develop and implement protocol for data updates and database administration	$16,000
2	Maintain database DMI's	$10,000
3	Compile and review (QA/QC) data provided by collecting agencies; update hydrologic database	$12,000
4	Update hydrologic database records	$16,000
5	Obtain updated deep aquifer head data from MODFLOW	$6,000
1.2	Rules Update and Development	$26,000
1	Modify rule policy language based on new information	$6,000
2	Edit rules to allow for new proposed actions to be modeled	$10,000
3	Edit rules to utilize new RiverWare capabilities	$10,000
1.3	Daily Accounting Model runs, meetings and reports	$70,000
1	Complete daily accounting model runs	$50,000
2	Conduct meetings and prepare account status reports	$20,000
1.4	Annual Operating Plans	$48,000
1	Obtain details about expected operations and import initial conditions	$14,000
2	Obtain NRCS forecasts, enter values and produce forecasted flows	$8,000
3	Complete simulations	$26,000
1.5	Maintain Model Documentation and User Manuals	$63,000
1	Maintain operation rules document	$9,000
2	Maintain initialization rules document	$9,000
3	Maintain user manual	$9,000
4	Maintain physical model document	$9,000
5	Maintain accounting model and reports	$9,000
6	Maintain URGWOM website	$9,000
7	Prepare publications and attend conferences	$9,000
1.6	RiverWare Software Development and Administration	$125,000
1	Software development for new needs for URGWOM	$60,000
2	Develop stakeholder usability features for all RiverWare capabilities	$25,000
3	Software enhancements for improved performance	$20,000
4	Support for RiverWare administration	$20,000
1.7	Independent Technical Review (ITR)	$24,000
1	Compile documents and data to be reviewed, send out for review, and set date for meeting	$9,000
2	Convene ITR meeting, as necessary	$9,000
3	Review/respond to comments, revise model and documentation as necessary	$6,000
1.8	Update Survey of Vegetated Areas	$260,000
1	Acquire biennial color infrared aerial photography for Rio Chama and Middle Rio Grande basins during July – August time frame	$150,000
2	Collect field data on crop types during the aerial photo, density is to be determined depending on the required accuracy	$50,000
3	Image processing: radiometric correction, geo-reference, identify area of interest and mosaic images	$10,000
4	Use remote sensing analysis to do supervised classification of the aerial photos	$40,000
5	Develop a data report for acreages, vegetation type and density	$10,000

The schedule timeline spans 2014–2018 with quarterly columns (Jan, Apr, Jul, Oct) for each year.

		Project	ANNUAL OR BIENNIAL COST	2014				2015				2016				2017				2018			
				Jan'14	Apr'14	Jul'14	Oct'14	Jan'15	Apr'15	Jul'15	Oct'15	Jan'16	Apr'16	Jul'16	Oct'16	Jan'17	Apr'17	Jul'17	Oct'17	Jan'18	Apr'18	Jul'18	Oct'18
1.9		Maintenance of Monthly URGSiM Model	$80,000																				
	1	Participation of monthly model team in relevant URGWOM related meetings and activities.	$10,000																				
	2	Adapt monthly model as necessary to maintain consistency with daily time-step URGWOM models	$30,000																				
	3	Maintain the URGSiM model and interface for public download and use	$30,000																				
	4	Maintain URGSiM documentation / user manual	$10,000																				
		TOTAL ANNUAL COST URGWOM REGULAR ACTIVITIES (inc. 1/2 cost of Tasks 1.7 and 1.8) =	**$614,000**																				
2		URGWOM ENHANCEMENT AND DEVELOPMENT																					
2.1		Enhancements to Middle Rio Grande configuration	$140,000																				
	1	San Marcial to Elephant Butte Dam reach analysis and method development	$30,000																				
	2	Identify needs for method improvement based on data updates	$30,000																				
	3	Implement changes to model methods	$30,000																				
	4	Update model calibration	$50,000																				
2.2		Real-Time Water Operations Model																					
2.2.1		Using Existing Model	$445,000																				
	1	Apply URGWOM to function as a 7-day forecast model	$100,000																				
	2	Apply historic monsoon runoff data and NRCS forecasts in 1-year daily timestep forecast model	$60,000																				
	3	Apply URGWOM for daily time step two-year forecast model	$75,000																				
	4	Apply URGWOM water model for one-year time horizon with ESP traces	$60,000																				
	5	Build new RiverWare model at hourly time step, two-day time horizon	$150,000																				
2.2.2		Using Watershed Model in the Real -time Water Operations Model	$80,000																				
	1	Develop DMI's to output Watershed Model results and input data to Water Operations Model	$80,000																				
2.3		Develop Watershed HEC-HMS Model	$280,000																				
	1	Develop data interface between URGWOM and NWS forecast model.	$40,000																				
	2	Compile data, built, test and calibrate watershed model	$200,000																				
	3	Maintain Model	$40,000																				
2.4		Model of Rio Grande headwater areas in Colorado	$130,000																				
	1	Compile hydrologic data and add headwater reservoirs to model	$20,000																				
	2	Configure model for AOP runs	$20,000																				
	3	Test model setup and calibrate	$50,000																				
	4	Link model to middle valley URGWOM	$40,000																				
2.5		Water quality simulation	$105,000																				
	1	Test transfer of water and salinity between groundwater objects	$50,000																				
	2	Test conceptual framework of modeling water quality in groundwater objects	$40,000																				
	3	Compile data and test, Bernardo to San Acacia reach	$15,000																				
2.6		Monthly Timestep RiverWare Model Development	$200,000																				
	1	Identify needs for new or revised accounting methods and user methods	$60,000																				
	2	Develop tools for aggregating data and create database	$40,000																				
	3	Set up DMIs and ruleset	$80,000																				
	4	Prepare documentation and users manual	$20,000																				

UPPER RIO GRANDE WATER OPERATIONS MODEL
FINAL DRAFT
Five Year Plan Schedule

	Project	ANNUAL OR BIENNIAL COST	2014	2015	2016	2017	2018
2.7	Lower Rio Grande Model Enhancements (Elephant Butte Dam to Ft. Quitman, TX).	$145,000	◆			◆	
1	Continue with physical model development and rules representation	$25,000	▮▮▮▮ (2014)				
2	Enhance hydrologic links with Mexico side of border	$50,000		▮▮▮▮ (2015)			
3	Continue model calibration	$30,000		▮▮▮ (2015)			
4	Develop links between the lower Rio Grande model and URGWOM	$40,000			▮▮▮▮ (2016–17)		
	FIVE YEAR TOTAL URGWOM ENHANCEMENT AND DEVELOPMENT=	**$1,525,000**					
3.	PLANNING SUPPORT						
3.1	Development and Use of Monthly Powersim Scoping Model	$105,000	◆				◆
1	Develop monthly model rules that are consistent with daily model ruleset	$40,000	▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮▮▮
2	Complete model runs for climate change scenarios	$25,000	▮▮▮▮	▮▮▮▮	▮▮▮▮		
3	Test model rules by comparison between monthly model results and revised URGWOM daily model, as needed	$40,000		▮ (2015)		▮ (2017)	
3.2	Middle Rio Grande Endangered Species Act Collaborative Program	$100,000	◆			◆	
1	Alternative operations formulation and consultation with Collaborative Program	$20,000	▮▮▮▮ (2014)				
2	Identify and incorporate required modifications to model for simulation of proposed alternatives	$20,000		▮▮▮▮ (2014–15)			
3	Simulation of proposed alternatives	$50,000		▮▮▮▮ (2015)			
4	Final Report and consultation with Collaborative Program	$10,000			▮▮▮▮ (2016)		
3.3	Climate change impact studies	$270,000	◆				◆
1	Apply monthly timestep Powersim model for climate change analysis	$120,000	▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮▮▮
2	Configure URGWOM for climate change studies and complete model	$150,000	▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮▮▮	▮▮▮▮
	FIVE-YEAR TOTAL URGWOM PLANNING SUPPORT =	**$475,000**					