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

		ANNUAL OR		2014				2015						2016				2017	7			20	18	
	Drainat	BIENNIAL	Jan'14	Apr'1	4 Jul'14	4 Oct'14	1 Jar	n'15 Apr'1	15 Jul'15 Oct'15			Jan'16	Apr'1	6 Jul'1	I6 Oct	'16 Jar	n'17 Ap	or'17 、	Jul'17 (Dct'17	Jan'18	Apr'18	Jul'18	Oct'18
1		0031					+				П				ПТ							++		
1 1	Data Acquisition and Database / DMI Administration and Management	\$60,000																						
	Develop and implement protocol for data undates and database administration	\$16,000																				++-		
	Maintain database DMI's	\$10,000																						
	Compile and review (QA/QC) data provided by collecting agencies: update hydrologic database	\$12,000																					ŦŦ	HH
4	Update hydrologic database records	\$16,000																					++	+++1
ł	Obtain updated deep aquifer head data from MODFLOW	\$6,000																	nu			++		++++
1.2	Rules Update and Development	\$26,000																						
	Modify rule policy language based on new information	\$6.000																						
	Edit rules to allow for new proposed actions to be modeled	\$10,000																						
:	Edit rules to utilize new RiverWare capabilities	\$10,000			uuun						, UUUUU	mmu		min			10000				uuuuu		annin	000688
1.3	Daily Accounting Model runs, meetings and reports	\$70.000																				╧╧╧╧┥		
	Complete daily accounting model runs	\$50,000	ninnin				njinin									ասփոխ	umm	minin	, , , , , , ,	,	nnnnn	minin	mmm	000088
:	Conduct meetings and prepare account status reports	\$20,000	nindina				ահուտ								min	ասփոխ		minin	, 	,	nnnnn	minini	mmm	
1.4	Annual Operating Plans	\$48,000																				┿┾┙		
	Obtain details about expected operations and import initial conditions	\$14,000					ш				1	lu				1011				iji				
2	Obtain NRCS forecasts, enter values and produce forecasted flows	\$8,000	ш				10					0 U				1	1				1111			
:	Complete simulations	\$26,000	111					(III)				0	I I				ψı –				101	+++		
1.5	Maintain Model Documentation and User Manuals	\$63,000																				┿┿┙		
	Maintain operation rules document	\$9,000	uuuuu	uhuh	ununun		njinin			unun	ψ.ψ.ι				minin	ասփոտ	umm	min		in in in in	nnnnn	munu	minin	
2	Maintain initialization rules document	\$9,000	ninnin	uun			njun			mm	iu iu iu i					ասփոտ	umm	min		inin)	nnnnn	mun	mmm	
:	Maintain user manual	\$9,000			ududud		uuu	.,		0.000	ψψu	mm		minim		uuuu	u)uuu	щифи		hunu	uuuuu	ann an		
4	Maintain physical model document	\$9,000	ninnin	uun			njun			mm	iu iu iu i					ասփոտ	umm	min		inin)	nnnnn	mmm	mmm	
ŧ	Maintain accounting model and reports	\$9,000	nnnnn	uuni			njinin	www.	in û n	unun	фифи				minin	ասփոտ	uuuu	min	un nun	i n i n in	nunnu	nunur	mmm	
6	Maintain URGWOM website	\$9,000			ududud		uuu	.,		0.000	ψψu	mm		minim		uuuu	u)uuu	щифи		, in the second s	uuuuu	ann an		000688
1	Prepare publications and attend conferences	\$9,000		uuni		minin	njudu		in û n	unun	in in in i				mun	ասփոտ	unnn	minin	unnnn	in in in in	nnnnn	munu	mmm	AIIIIIESE
1.6	RiverWare Software Development and Administration	\$125,000																				┿┿┙	_	
	Software development for new needs for URGWOM	\$60,000		uuni		minin	njudu		in û n	unun	in in in i				mun	ասփոտ	unnn	minin	unnnn	in in in in	nnnnn	munu	mmm	ATTALESE
2	Develop stakeholder usability features for all RiverWare capabilities	\$25,000			unn	mmm			mm		ффи													
:	Software enhancements for improved performance	\$20,000	nnnnn	uhuh		munu	nhudu		u û u	ununu	ψιψι			mun	mmn	ասփոտ	uuuu	minin	un nun	i i i i i i i	nnnnn	munu	unnu	
4	Support for RiverWare administration	\$20,000	nnnnn	uhuh		munu	nhudu		u û u	ununu	ψιψι			mun	mmn	ասփոտ	uuuu	minin	un nun	i i i i i i i	nnnnn	munu	unnu	
1.7	Independent Technical Review (ITR)	\$24,000							+														_	
	Compile documents and data to be reviewed, send out for review, and set date for meeting	\$9,000							011	mm														
2	Convene ITR meeting, as necessary	\$9,000								unn	011									in 🗌				
:	Review/respond to comments, revise model and documentation as necessary	\$6,000									0000									in n n n	1			
1.8	Update Survey of Vegetated Areas	\$260,000							+													┿┿┛		++++
	Acquire biennial color infrared aerial photography for Rio Chama and Middle Rio Grande basins during July – August time frame	\$150,000																1111	••••	\square				
2	Collect field data on crop types during the aerial photo, density is to be determined depending on the required accuracy	\$50,000																- III	huhuhu					
:	Image processing: radiometric correction, geo-reference, identify area of interest and mosaic images	\$10,000																	000					
4	Use remote sensing analysis to do supervised classification of the aerial photos	\$40,000										1111								Innu	m			
ŧ	Develop a data report for acreages, vegetation type and density	\$10,000) mm									(mun [

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		ANNUAL OR		2014				2015	5				2016				2017				20	18		
	Project	BIENNIAL COST Jan'1	Jan'14	Apr'14	Jul'14	Oct'14	1 Jar	'15 Apr	'15 、	Jul'15 C	Oct'15	Jan'16	Apr'1	6 Jul'1	6 Oct'1	6 Jan'i	17 Apr	΄17 Jι	ul'17 Or	ct'17 J	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							1		11	1 1		1 1 1	1 1 1	111					t t t t			
2	Adapt monthly model as necessary to maintain consistency with daily time-step URGWOM models	\$30.000					njinin	, , , , , , , ,	nnan	mana								, in the second se	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		11111		minin	
3	Maintain the URGSiM model and interface for public download and use	\$30,000			unnu								,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		щийий			annn	adada)	annin	annn			000088
4	Maintain URGSiM documentation / user manual	\$10,000	անուն	unnin	nonin		njinin	, , , , ,										mun	,	шини	annn		minin	
-	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	uhuhuhu		սփոփո		njinin	, , , , , ,	ш															
2	Identify needs for method improvement based on data updates	\$30,000			unnu	dadada		da da da da	uut															
3	Implement changes to model methods	\$30,000					huin	nunun	uuuu	munu												+++		
4	Update model calibration	\$50,000								munn	u u u u	unnn												
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					huin	nunun	uuuu	munu			(III)		minin							+++		
2	Apply historic monsoon runoff data and NRCS forecasts in 1-year daily timestep forecast model	\$60,000										unnn						anna	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	mun				
3	Apply URGWOM for daily time step two-year forecast model	\$75,000														mm		annn	adadad	annin	annn	annan	annin	000688
4	Apply URGWOM water model for one-year time horizon with ESP traces	\$60,000																anna	innini	munur	aaaaa	mun	minin	annese
ŧ	Build new RiverWare model at hourly time step, two-day time horizon	\$150,000																		- ur	annn	minini	minin	
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							11	hunu			, in the second s	щ										
2.3	Develop Watershed HEC-HMS Model	\$280,000		•														┿┿┿	┿┿┿	_	┿┿┿	┿┿┙	_	┝┿┿┿┥╵
1	Develop data interface between URGWOM and NWS forecast model.	\$40,000			nonin		njun	onnnin	uuuu	mm	u uju u													
2	Compile data, built, test and calibrate watershed model	\$200,000					Inn	dun un un	uuu		, hin hin h		, in the second s		uuuu									
3	Maintain Model	\$40,000							11	munn	unin 1		(IIIIII)		minnin	uuuuu		annan		munur	unnn	mun	munur	
2.4	Model of Rio Grande headwater areas in Colorado	\$130,000		•																				
1	Compile hydrologic data and add headwater reservoirs to model	\$20,000			nonin	munu	njudu	nunn	uut															
2	Configure model for AOP runs	\$20,000					11111	dun un	инин	01000	0000													
3	Test model setup and calibrate	\$50,000											uuuu			ш								
4	Link model to middle valley URGWOM	\$40,000												шин				ann						
2.5	Water quality simulation	\$105,000									-													
1	Test transfer of water and salinity between groundwater objects	\$50,000	ununu	unnu	unnin	unnin 1	nhudu	nun nu	uщ															
2	Test conceptual framework of modeling water quality in groundwater objects	\$40,000			unnin	unnin 1	nhudu	nun nu	uщ															
3	Compile data and test, Bernardo to San Acacia reach	\$15,000					hun	nun nu	unun	nnnnn	un,													
2.6	Monthly Timestep RiverWare Model Development	\$200,000		•	+													++++	┍┯┯┿	: TT				
1	Identify needs for new or revised accounting methods and user methods	\$60,000					uluuu																	
2	Develop tools for aggregating data and create database	\$40,000									huuu		(IIIIIII		mm									
3	Set up DMIs and ruleset	\$80,000													minin	uuuuu				ШT				
4	Prepare documentation and users manual	\$20,000														mm	un nu	պոփոր	anin mu					

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		ANNUAL OR 2014					2015							20	16			2017						:	2018				
	Project	BIENNIAL COST	Jan'14	4 Ap	or'14 J	ul'14	Oct'14	1 Jar	n'15 /	Apr'15	Jul	15 C	Oct'15	Jan'1	6 A	pr'16	Jul'16	Oct'	16 J	lan'17	Apr'1	7 Jul'	17 C	Oct'17	Jan'18	Apr'1	8 Jul'	18 C	Oct'18
2.7	Lower Rio Grande Model Enhancements (Elephant Butte Dam to Ft. Quitman, TX).	\$145,000																				•						T	
	Continue with physical model development and rules representation	\$25,000		mm		00000		mm	mun	un nu																			
:	Enhance hydrologic links with Mexico side of border	\$50,000						hin	mun	un nu	unm	unn	u nin	uuuu															
;	Continue model calibration	\$30,000									uuu		μιψn	шш	mm	шш													
	Develop links between the lower Rio Grande model and URGWOM	\$40,000																uuuu	mhn	unun i	uhuh								
	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																								+++			
	Develop monthly model rules that are consistent with daily model ruleset	\$40,000			mun	00000		nhini	mum	n n n n	0.00	unn	u nju		щин			uuuu	mhn	unun i	uhuh	uunn	Militaria			anna	unun	umu	a teses
:	Complete model runs for climate change scenarios	\$25,000	իսիսի	циф	uludu	huhu	nψιψι	uluu	циф	uuu	μuhi	u u lu u	μιψn	huud	mþin	шш	unin	цифи	ш										
;	Test model rules by comparison between monthly model results and revised URGWOM daily model, as needed	\$40,000						hui	11											unu -									
3.2	Middle Rio Grande Endangered Species Act Collaborative Program	\$100,000																	1										
	Alternative operations formulation and consultation with Collaborative Program	\$20,000	h nh nh	mm	mun	uuu		որու	mun	u u u	hum	(III)II	μιψι																
:	Identify and incorporate required modifications to model for simulation of proposed alternatives	\$20,000			- (m	huhu	nψιψι	uluu	циф	uuu	μuhi	u u lu u	ψιψn																
;	Simulation of proposed alternatives	\$50,000						hui	mun	n n n	u u u u	(III)II	μu)u		щи														
	Final Report and consultation with Collaborative Program	\$10,000)								11111	unn	u nju		щин			uuuu											
3.3	Climate change impact studies	\$270,000	+++					-								_							┿			++++		+++-	
	Apply monthly timestep Powersim model for climate change analysis	\$120,000				00000		nhini	mun	n n n	u u u u	unn	μu)u		щи		unun	uuuu	mhn	unun i	uhuh	uun	Militaria		unun	anna.	anna	umu	aiese:
:	Configure URGWOM for climate change studies and complete model	\$150,000	huhuh	mm	mun	hunu	mm	որու	mm	uhu u	huin	du u u	μıψι	(mun	muu		uninn	uhuhu	indu	hun	uhuh	uunu	huhu	un n	unun	anna 1	unun	dunuu	ane≋e
	FIVE-YEAR TOTAL URGWOM PLANNING SUPPORT =	\$475,000																											