Appendix E CalSim-II Model Results

The CalSim-II results for the June 26, 2008 version, Studies (3a, 6.0, 7.0, 7.1 and 8.0 [defined in Chapter 9: Modeling and Assumptions]) are included as an electronic appendix. The compressed file (Filename: OCAP_CALSIMOutput_062608.zip) contains the following files and information:

1. CVP and SWP system operations information.
   a) **OCAP_2008_Deliveries.xls**
      i) CVP North of Delta (NOD) agriculture (AG)
      ii) CVP NOD Municipal and Industrial (MI)
      iii) CVP NOD Settlement Contractors
      iv) CVP NOD Refuge
      v) CVP NOD Total
      vi) CVP SOD AG
      vii) CVP SOD MI
      viii) CVP SOD Exchange Contractors
      ix) CVP SOD Refuge
      x) CVP SOD Total
      xi) SWP Table A
      xii) SWP Article 56
      xiii) SWP Article 21
      xiv) SWP Anticipated Carryover in San Luis Reserovir
      xv) SWP Table A plus Article 56
      xvi) SWP Table A plus Article 56 and Article 21

   b) **OCAP_2008_DeltaFlowsRegs.xls**
      i) SWP Banks pumping
      ii) CVP Banks pumping
      iii) CVP Jones pumping
      iv) Total Banks pumping
      v) Cross Valley Pumping
      vi) Flow at Freeport
      vii) Flow at Rio Vista
      viii) Excess Delta Outflow
      ix) Required Delta Outflow
      x) X2 position
      xi) Yolo Bypass
      xii) Mokelumne River
      xiii) San Joaquin River plus Calaveras River flow
      xiv) Modeled Required Delta Outflow
      xv) Georgiana Slough
      xvi) Delta Cross Channel
      xvii) Below Delta Cross Channel
      xviii) North Bay Aqueduct

xix)   Contra Costa Water District
xx)   Total Outflow
xxi)   Old and Middle River Flow
xxii)   Qwest
xxiii) Total Delta Inflow
xxiv)   Total Delta Export

c) **OCAP_2008_DeltaFlowsRegs_percent.xls**
i)   Percent flow at Georgiana Slough
ii)   Percent flow at Delta Cross Channel
iii)   Percent flow below Delta Cross Channel
iv)   EI Ratio
v)   Total annual Jones and Banks pumping

d) **OCAP_2008_Storage.xls**
i)   Trinity
ii)   Whiskeytown
iii)   Shasta
iv)   Folsom
v)   Trinity-Shasta-Folsom
vi)   New Melones
vii)   CVP San Luis
viii)   SWP San Luis
ix)   EWA San Luis
x)   Total San Luis

e) **OCAP_2008_UpstreamFlows.xls**
i)   Trinity Release
ii)   Clear Creek Tunnel
iii)   Clear Creek Release
iv)   Keswick Release
v)   Nimbus Release
vi)   Keswick-Nimbus Release
vii)   Mouth of the American River
viii)   Sacramento River below Red Bluff Diversion Dam
ix)   Sacramento River at Wilkin's Slough
x)   Sacramento River at Freeport
xi)   Goodwin Release
xii)   Stanislaus River mouth
xiii)   San Joaquin River flow without Stanislaus River
xiv)   Flow at Vernalis
xv)   Yolo Bypass
xvi)   Mokelumne River
xvii)   Spring Creek Tunnel

   f) **B2 Accounting Existing60_2008.xls**

   g) **B2 Accounting Existing70_2008.xls**

   h) **B2 Accounting Existing71_2008.xls**

   i) **B2 Accounting Future80_2008.xls**

   j) **EWA_OCAP_2008.xls**

   k) **SummaryTables.xls**

   l) **Transfers_OCAPStudy6.xls**

   m) **Transfers_OCAPStudy7.xls**

   n) **Transfers_OCAPStudy71.xls**

   o) **Transfers_OCAPStudy8.xls**

A similar set of CalSim-II results are also provided in a compressed file for Study 6.1 (Filename: OCAP_CALSIMOutput_Study61_081908.zip).

Examples of CalSim-II model results are shown in Figure 1 and Figure 2.

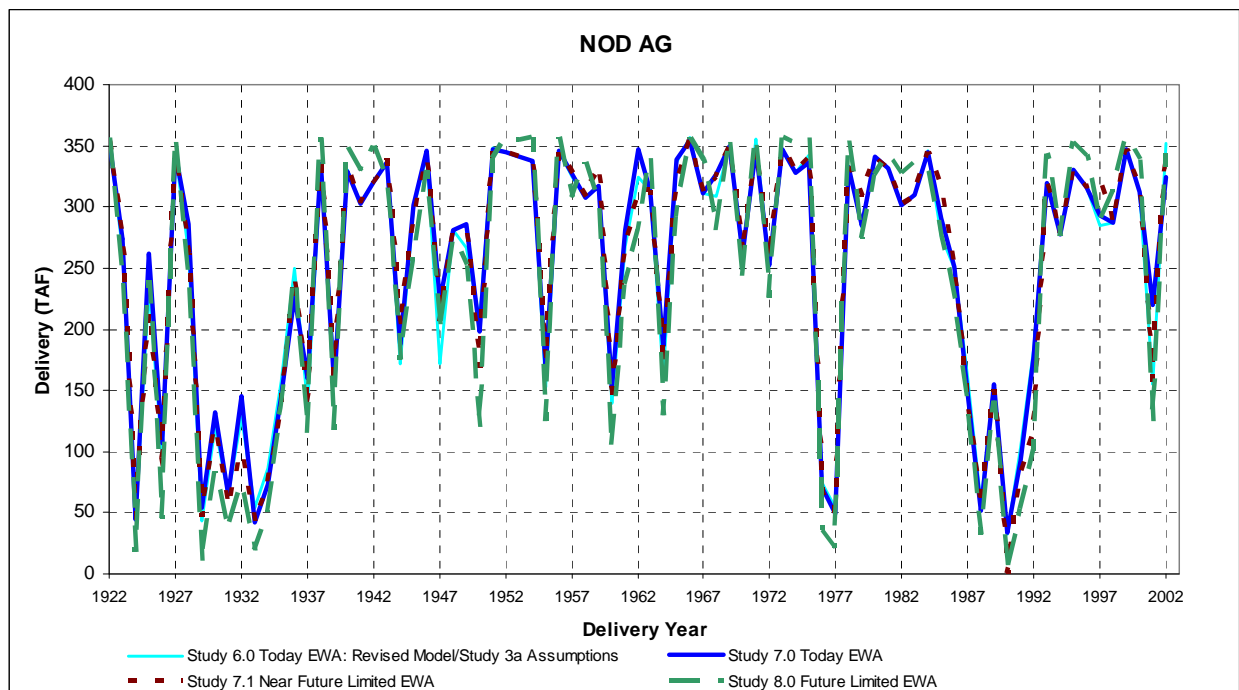**Figure 1. Example of CVP North of Delta Agriculture Delivery time-series plot**
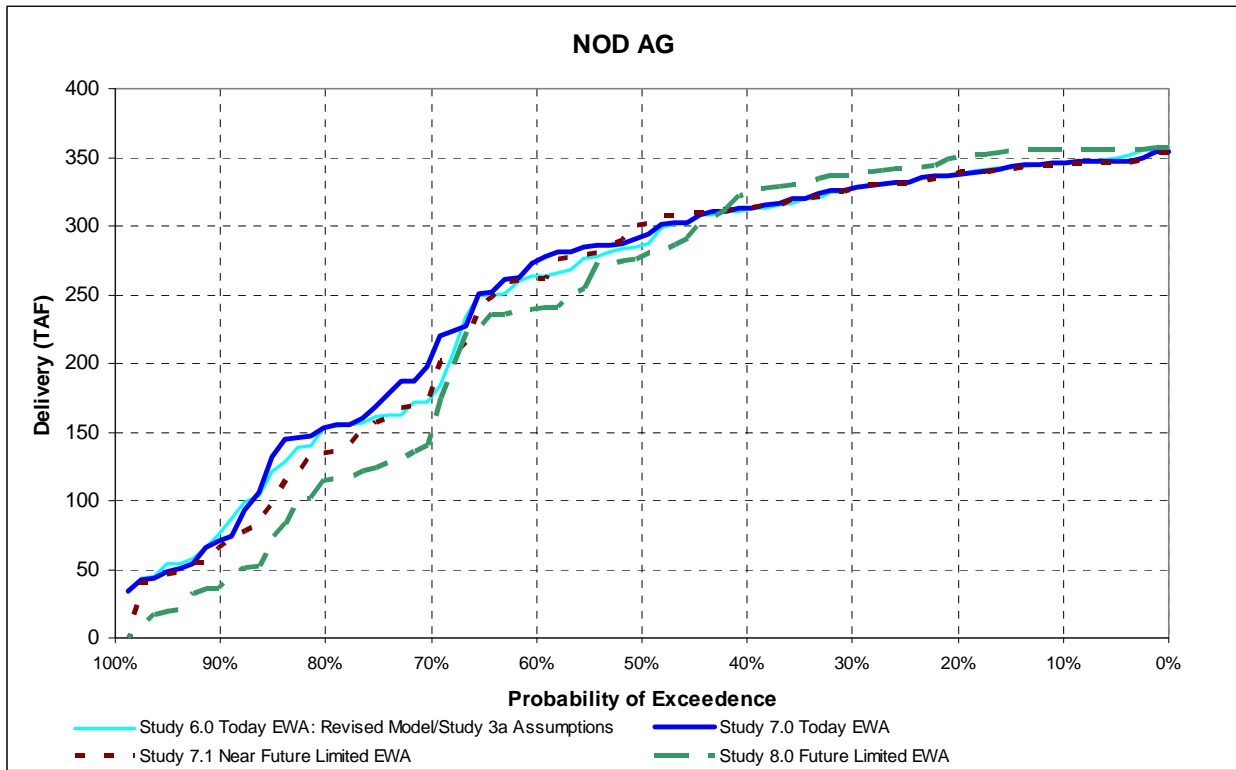
Figure 2 Example of CVP North of Delta Agriculture Delivery probability exceedence plot.

Modifications to the CalSim-II model from the April 10, 2008 version to the August 16, 2008 version include changes to Study 7.0, Study 7.1 and Study 8.0 in Table 1. Modifications to the CalSim-II Study 6.0 are listed in Table 2.

Table 1 CalSim-II Modification Log to Studies 7.0, 7.1, and 8.0 from April 10, 2008 to August 16, 2008

Update	Directory	Files	Type	7.0	7.1 FRWP-EBMUD Transfer	8.0	Comment
American River Demands							
2005	common/dss	2005A01ASV	DSS	X	X	████	
2025	""	2020D09ESV	DSS	████	████	X	
	all dirs/run/lookup	American_PRJ_WR	table	X	X	X	Made tables consistent with input sheets
B2 Updates							
main files	B2/Run	all mains	wresl	████	████	████	Change B2actions from common to B2 directory
	CONV/Run	all mains	wresl	████	████	████	Take out reference to B2ReserveCap.wresl not necessary in post B2 steps
	TXFR/Run	all mains	wresl	████	████	████	""
	EWA/Run	all mains	wresl	████	████	████	""
	B2/Run/B2Actions	B2Action1	wresl	X	X	X	
	""	B2ReserveCap	wresl	X	X	X	
	""	B2ActionsUpstream	wresl	X	X	X	
	""	B2ActionsDelta	wresl	X	X	X	
	""	B2Action3	wresl	X	X	X	
	""	B2Action4	wresl	X	X	X	
	""	B2Action7	wresl	X	X	X	
	""	B2Action2	wresl	X	X	X	
	""	B2ActionConditions	wresl	X	X	X	
	""	MaxActionCap	wresl	X	X	X	
	""	B2AcctConditionCheck	wresl	X	X	X	
	""	WqcpCost	wresl	X	X	X	
	""	UpdateB2Accnt	wresl	X	X	X	
	B2/Run/Lookup	B2ActionRes	table	X	X	X	
	""	AFRP_SAC	table	X	X	X	

Update	Directory	Files	Type	7.0	7.1 FRWP-EBMUD Transfer	8.0	Comment
	B2/Run/BaseStudyRestults	BaseStudyResults	wresl	X	X	X	
	.\common\Delta\Ann	ExportEstimate1_B2	wresl	X	X	X	
Rock Slough							
	common\Delta\Ann	RockSlough_constrain	wresl	X	X	X	Check to see if D1485 is different
	all lookups	salinity_std_rsl	table	X	X	X	Check to see if D1485 is different
Rule Curve							
	.\common\Rulecurve	cvpdeliv_rulecv	wresl	X	X	X	
	.\common\Rulecurve	cvprule	wresl	X	X	X	
	.\B2\Run\DeliveryLogic	delcar_cvp_s	wresl	X	X	X	
	.\B2\Run\DeliveryLogic	delcar_swp	wresl	X	X	X	
	.\common\swp_dellogic\WSI_DI	delcar_swp	wresl	X	X	X	
	.\CONV\Run\DeliveryLogic	delcar_swp	wresl	X	X	X	
	.\D1485\Run\DeliveryLogic	delcar_swp	wresl	X	X	X	
	.\common\swp_dellogic\WSI_DI	di_swp	wresl	X	X	X	
	.\common\cvp_dellogic\cvp_dellogic_s\exp_based	exp_based_del_cvp_s	wresl	X	X	X	
	.\common\swp_dellogic\WSI_DI	exp_based_del_swp_s	wresl	X	X	X	
	.\common\NorthOfDelta\Feather	OroRuleCurv	wresl	X	X	X	
	.\common\NorthOfDelta\Feather	OroRuleCurvEWA	wresl	X	X	X	
	.\EWA\Run\RuleCurve	RuleCurve	wresl	X	X	X	
	.\TXFR\Run\RuleCurve	RuleCurve	wresl	X	X	X	
	.\common\Rulecurve	swpdeliv_rulecv	wresl	X	X	X	
	.\common\Rulecurve	swprule	wresl	X	X	X	
	.\common\NorthOfDelta\Feather	feather_special	wresl	X	X	X	
	.\common\NorthOfDelta\Sacramento	ncp_relax	wresl	X	X	X	
	.\common\NorthOfDelta\American	HSt_base	wresl	X	X	X	

Update	Directory	Files	Type	7.0	7.1 FRWP-EBMUD Transfer	8.0	Comment
EWA							
	EWA\Run\EwaActions\Purchase	Annual_Purchases	wresl	X	■	■	
	EWA\Run\EwaActions\Purchase	EWA_PumpAndDO	wresl	X	■	■	
	EWA\Run\EwaActions\Purchase	EWA_PumpAndDOlim	wresl	■	X	X	
	EWA\Run\EwaActions	EwaActions345lim	wresl	■	X	X	
	EWA\Run\System\SystemTables_ALL	Weight-table	wresl	■	X	X	
Red Bluff Diversion Dam							
	common\NorthOfDelta\Sacramento	RedBluffOps	wresl	X	X	■X	
Calaveras Demands							
	common\SanJoaquin\Various\definitions	SJR_DeliverySplits	wresl	X	X	■	Zero D510
X2 Ann							DWR developed new code to consider X2 partial month antecedent conditions
	common\Delta	DeltaExtFuncs_6inpANN	wresl	X	X	X	
	common\Delta\mrdo\X2	X2req_ANN	wresl	X	X	X	
	All Studies..\Run\External	Ann6inp_CA_widerDICU	dll	X	X	X	
Yuba River							
	EWA\Run\EwaActions\Purchase	Annual_Purchases	wresl	X	■	■	
	common\dss	all SV files	dss	X	X	X	Update Yuba inflows is all SV files from the Yuba Input for All Runs xls file
CVP Delivery							
	D1485\Run\Lookup	dltidx_expidx_cvp_s	table	X	■	X	

Update	Directory	Files	Type	7.0	7.1 FRWP-EBMUD Transfer	8.0	Comment
	common\cvp_dellogic\cvp_dellogic_sys\deliveries_sys	cvp_bound_del_sys	wresl	X	X	X	
SWP Delivery Logic							
	CONV\Run\Lookup	TableA	table	X			Corrected
FRWP							
	common/dss	2005A01ASV	DSS		X		Includes Future Mokulmne Inflows to Delta and EBMUD demands at FRWP. SCWA demands were left at 15 TAF
CCWD							
	.\common\Los_Vaqueros	LVE_resolve	wresl		X		Deleted
	.\common\Los_Vaqueros	LVE_WQatDiversion	wresl		X		Deleted
	.\common\Los_Vaqueros	LVE_DeltaSurplus_WHEELJPOD	wresl		X		New
	.\common\Los_Vaqueros	LVE_DeltaSurplus_LVE_ADJUST	wresl		X		New
	.\common\Los_Vaqueros	LVE_DeltaSurplus_PREMONWGHTED	wresl		X		New
	.\common\Los_Vaqueros	LVE_EwaDemand	wresl		X		New
	.\common\Los_Vaqueros	LVE_Switches_Existing	wresl		X		New
	.\common\Los_Vaqueros	LVE_Switches_WPC	wresl		X		New
	.\common\Los_Vaqueros	LVE_Switches_FNA	wresl		X		New
	.\common\Los_Vaqueros	LVE_SBA_DEM	wresl		X		New
	.\EWA\Run	mainEWA1 and m ainEWA2	wresl		X		Modified
	.\TXFR\Run	mainTXFRF	wresl		X		Modified
	.\EWA\Run\EwaActions\Purchase	LVE_Exchange	wresl		X		Modified
	.\EWA\Run\EwaActions	EwaRelsConstrain1	wresl		X		Modified
	.\EWA\Run\EwaActions\Purchase	Annual_Purchases	wresl		X		Modified
	.\D1485\Run\COA	coa	wresl		X		Modified
	.\B2\Run\COA	coa	wresl		X		Modified
	.\D1641\Run\COA	coa	wresl		X		Modified

Update	Directory	Files	Type	7.0	7.1 FRWP-EBMUD Transfer	8.0	Comment
	.\CONV\Run\COA	coa	wresl		X		Modified
	.\EWA\Run\COA	coa	wresl		X		Modified
	.\TXFR\Run\COA	coa	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_Switches	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_Parameters	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_Demands	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_OpsMaxDiversion	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_OpsFixEWA	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_DeltaSurplus	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_WQ	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_BlendReservoirWQ	wresl		X		Modified
	.\common\System\SystemTables_LVR	Weight-table	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_EWAOutput	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_DelivBlend_CycleOut	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_BlendDelivWQ	wresl		X		Modified
	.\common\System\SystemTables_LVR	Connectivity-table	wresl		X		Modified
	.\common\System\SystemTables_LVR	Channel-table	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_OpsFixEWApreLVAdj	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_OpsFixPreJPOD	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_OpsFixStep4	wresl		X		Modified
	.\common\System\SystemTables_LVR	Delivery-table	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_SBA_REL	wresl		X		Modified
	.\common\Los_Vaqueros	LVE	wresl		X		Modified
	.\common\System\SystemTables_LVR	Reservoir-table	wresl		X		Modified
	.\common\Los_Vaqueros	LVE_MaxDivert_CycleOut	wresl		X		Modified
	.\TXFR\Run\Lookup	LVE_demand_pattern	table		X		Modified
	.\EWA\Run\Lookup	LVE_demand_pattern	table		X		Modified
	.\TXFR\Run\Lookup	LVE_WQ_target	table		X		Modified
	.\EWA\Run\Lookup	LVE_WQ_target	table		X		Modified

Update	Directory	Files	Type	7.0	7.1 FRWP-EBMUD Transfer	8.0	Comment
	.\EWA\Run\Lookup	LVE_Estorage	table	■	X	■	Modified
	.\TXFR\Run\Lookup	LVE_Estorage	table	■	X	■	Modified
	.\TXFR\Run\Lookup	LVE_ann_demand	table	■	X	■	Modified
	.\EWA\Run\Lookup	LVE_ann_demand	table	■	X	■	Modified
Feather River Hydrology							
	.\common\dss	SV file	dss	X	X	X	Smoothed the Dec-Jan Acc-Dep to cut out huge depletions in Dec and Jan
Oroville Release Operations	Transfers_Capacity_Limits	.\common\ReOperations\Transfers	wresl	X	X	X	Modified
Old and Middle River flow calculation	\common\Delta	OMR_flow	wresl	X	X	X	Corrected logic error

Table 2 CalSim-II Modification Log to 6.0 from April 10, 2008 to August 16, 2008

Update	Directory	Files	Type	6.0	Comment
Feather River Hydrology					
	.\common\dss	SV file	dss	X	Smoothed the Dec-Jan Acc-Dep to cut out huge depletions in Dec and Jan
Rule Curve					
	.\common\Rulecurve	cvpdeliv_rulecv	wresl	X	
	.\common\Rulecurve	cvprule	wresl	X	
	.\B2\Run\DeliveryLogic	delcar_cvp_s	wresl	X	
	.\B2\Run\DeliveryLogic	delcar_swp	wresl	X	
	.\common\swp_dellogic\WSI_DI	delcar_swp	wresl	X	
	.\CONV\Run\DeliveryLogic	delcar_swp	wresl	X	
	.\D1485\Run\DeliveryLogic	delcar_swp	wresl	X	
	.\common\swp_dellogic\WSI_DI	di_swp	wresl	X	

Update	Directory	Files	Type	6.0	Comment
	.\common\cvp_dellogic\cvp_dellogic_s\exp_based	exp_based_del_cvp_s	wresl	X	
	.\common\swp_dellogic\WSI_DI	exp_based_del_swp_s	wresl	X	
	.\common\NorthOfDelta\Feather	OroRuleCurv	wresl	X	
	.\common\NorthOfDelta\Feather	OroRuleCurvEWA	wresl	X	
	.\EWA\Run\RuleCurve	RuleCurve	wresl	X	
	.\TXFR\Run\RuleCurve	RuleCurve	wresl	X	
	.\common\Rulecurve	swpdeliv_rulecv	wresl	X	
	.\common\Rulecurve	swprule	wresl	X	
	.\common\NorthOfDelta\Feather	feather_special	wresl	X	
	.\common\NorthOfDelta\Sacramento	ncp_relax	wresl	X	
	.\common\NorthOfDelta\American	HSt_base	wresl	X	
X2 Ann					DWR developed new code to consider X2 partial month antecedent conditions
	common\Delta	DeltaExtFuncs_6inpANN	wresl	X	

Update	Directory	Files	Type	6.0	Comment
	common\Delta\mrdo\X2	X2req_ANN	wresl	X	
	All Studies..\Run\External	Ann6inp_CA_widerDICU	dll	X	
CCWD					
	.\common\Los_Vaqueros	LVE_resolve	wresl	X	Deleted
	.\common\Los_Vaqueros	LVE_WQatDiversion	wresl	X	Deleted
	.\common\Los_Vaqueros	LVE_DeltaSurplus_WHEELJPOD	wresl	X	New
	.\common\Los_Vaqueros	LVE_DeltaSurplus_LVE_ADJUST	wresl	X	New
	.\common\Los_Vaqueros	LVE_DeltaSurplus_PREMONWGHTED	wresl	X	New
	.\common\Los_Vaqueros	LVE_EwaDemand	wresl	X	New
	.\common\Los_Vaqueros	LVE_Switches_Existing	wresl	X	New
	.\common\Los_Vaqueros	LVE_Switches_WPC	wresl	X	New
	.\common\Los_Vaqueros	LVE_Switches_FNA	wresl	X	New
	.\common\Los_Vaqueros	LVE_SBA_DEM	wresl	X	New

Update	Directory	Files	Type	6.0	Comment
	.\EWA\Run	mainEWA1 and m ainEWA2	wresl	X	Modified
	.\TXFR\Run	mainTXFRF	wresl	X	Modified
	.\EWA\Run\EwaActions\Purchase	LVE_Exchange	wresl	X	Modified
	.\EWA\Run\EwaActions	EwaRelsConstrain1	wresl	X	Modified
	.\EWA\Run\EwaActions\Purchase	Annual_Purchases	wresl	X	Modified
	.\D1485\Run\COA	coa	wresl	X	Modified
	.\B2\Run\COA	coa	wresl	X	Modified
	.\D1641\Run\COA	coa	wresl	X	Modified
	.\CONV\Run\COA	coa	wresl	X	Modified
	.\EWA\Run\COA	coa	wresl	X	Modified
	.\TXFR\Run\COA	coa	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_Switches	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_Parameters	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_Demands	wresl	X	Modified

Update	Directory	Files	Type	6.0	Comment
	.\common\Los_Vaqueros	LVE_OpsMaxDiversion	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_OpsFixEWA	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_DeltaSurplus	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_WQ	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_BlendReservoirWQ	wresl	X	Modified
	.\common\System\SystemTables_LVR	Weight-table	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_EWAOutput	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_DelivBlend_CycleOut	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_BlendDelivWQ	wresl	X	Modified
	.\common\System\SystemTables_LVR	Connectivity-table	wresl	X	Modified
	.\common\System\SystemTables_LVR	Channel-table	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_OpsFixEWApreLVAdj	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_OpsFixPreJPOD	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_OpsFixStep4	wresl	X	Modified

Update	Directory	Files	Type	6.0	Comment
	.\common\System\SystemTables_LVR	Delivery-table	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_SBA_REL	wresl	X	Modified
	.\common\Los_Vaqueros	LVE	wresl	X	Modified
	.\common\System\SystemTables_LVR	Reservoir-table	wresl	X	Modified
	.\common\Los_Vaqueros	LVE_MaxDivert_CycleOut	wresl	X	Modified
	.\TXFR\Run\Lookup	LVE_demand_pattern	table	X	Modified
	.\EWA\Run\Lookup	LVE_demand_pattern	table	X	Modified
	.\TXFR\Run\Lookup	LVE_WQ_target	table	X	Modified
	.\EWA\Run\Lookup	LVE_WQ_target	table	X	Modified
	.\EWA\Run\Lookup	LVE_Estorage	table	X	Modified
	.\TXFR\Run\Lookup	LVE_Estorage	table	X	Modified
	.\TXFR\Run\Lookup	LVE_ann_demand	table	X	Modified
	.\EWA\Run\Lookup	LVE_ann_demand	table	X	Modified
	.\common\DSS	CCWD_CS_INIT	SV	X	Modified

Update	Directory	Files	Type	6.0	Comment
	.\common\DSS	CCWD_CVPAllocDV__Z5	SV	X	Modified
	.\common\DSS	D420__Z5	SV	X	Modified
SWP deliveries in the EWA and TXFR steps					
	.\TXFR\Run\Lookup	swp_carryover	table	X	Modified
	.\TXFR\Run\Lookup	salinity_std_rsl	table	X	Modified
	.\TXFR\Run\Lookup	salinity_std_rsl	table	X	Modified
	American_PRJ_WR	.\EWA\Run\Lookup	table	X	Modified
	American_PRJ_WR	.\TXFR\Run\Lookup	table	X	Modified
	swprule	.\B2\Run\Lookup	table	X	Modified
	swprule	.\CONV\Run\Lookup	table	X	Modified
	swprule	.\D1485\Run\Lookup	table	X	Modified
	swprule	.\D1641\Run\Lookup	table	X	Modified
	AnnualReqDel_swp	.\EWA\Run\Lookup	table	X	Modified

Update	Directory	Files	Type	6.0	Comment
	AnnualReqDel_swp	.\TXFR\Run\Lookup	table	X	Modified
	TableA	.\TXFR\Run\Lookup	table	X	Modified
	TableA	.\TXFR\Run\Lookup	table	X	Modified
	swp_3pattern_demands	.\TXFR\Run\Lookup	table	X	Modified
	swp_3pattern_demands	.\EWA\Run\Lookup	table	X	Modified
	swp_3_tablea	.\TXFR\Run\Lookup	table	X	Modified
	swp_3_tablea	.\EWA\Run\Lookup	table	X	Modified
	swp_table_a table	.\EWA\Run\Lookup	table	X	Modified
	swp_table_a table	.\TXFR\Run\Lookup	table	X	Modified
	swp_carryover	.\EWA\Run\Lookup	table	X	Modified
	swp_3pattern_SLRule	.\EWA\Run\Lookup	table	X	Modified
	swp_3pattern_SLRule	.\TXFR\Run\Lookup	table	X	Modified
	CAM_SWPDem	.\TXFR\Run\Lookup	table	X	Modified
	CAM_SWPDem	.\EWA\Run\Lookup	table	X	Modified

Update	Directory	Files	Type	6.0	Comment
Old and Middle River flow calculation	\common\Delta	OMR_flow	wresl	X	Corrected logic error