

Presentation to Modeling & Forecasting Working Group – The Confluence® Model
 Gary Fiske, January 21, 2015

Summary of Santa Cruz Confluence Assumption Changes over Time							
			IWP	IWP Update	HCP Pre-2013	Desal EIR	HCP Current
Demand							
	Service Area Annual Demand (BG)		4.6-5.3	3.5-4.5	3.5-4.0	3.5-4.0	3.5
	North Coast Annual Demand (MG)		31	81	=====>		40
	Fraction in Peak-Season		64%	=====>			59%
Hydrology							
	Hydrologic Record		59 years	73 years	=====>		
	Available Flows		Linsley-Kraeger	Balance	Multiple Scenarios	Tier 3/2; Tier 3	City Proposal (T3/2); DFG-5
Diversions							
	Turbidity Constraints		25 ntu	Updated 25 ntu	Updated 25 ntu; 200 ntu	Updated 25 ntu	Updated 25 ntu
	Tait Street Buffer (cfs)		0	=====>			0.5
	North Coast Transmission losses		15%=>1%	8%=>3%	=====		
Beltz Groundwater Availability (mgd)			1.0-2.0	3 scenarios 0.3-1.0 in PS months	0.8 all years + 0.3 dry years in PS months	2 scenarios: (1) 0.8 all years + 0.3 dry years in PS months (2) 0.3 dry years in PS months	0.8 all years + 0.3 dry years in PS months
Tait Street Well Capacity (cfs)			1.78	=====>			1.29 off-pk 0.78 peak
Loch Lomond							
	Rule curves		Optimize to end of 1977	Optimize to end of 1977	Optimize to end of 1990	Optimize to end of 1977	Optimize to end of 1990
	Max/usable capacity (mg)		2810/1710	2810/1740	=====>		
	Water rights						
		3200 AF annual withdrawal limit	Total Newell & Felton	=====>			Newell only
		Allowable diversion months	Oct-May	Nov-May			Sept-Jun
GHWTP summer/winter capacity (mgd)			20/20	20/20	16.5/16.5	16.5/16.5	16.5/10
Desalination				Sharing w/ SqCWD	Sharing w/ SqCWD	Sharing w/ SqCWD & 2 operating modes	N/A

The left-hand column of the table shows the key modeling assumptions that have changed over time with a brief discussion below.

Demand. In recent years, Santa Cruz customers have been significantly reducing their outdoor demand, thereby flattening the annual demand shape, i.e. less of the assumed 3500 mg annual demand is in the peak season. About 175 mg of demand, on average, is shifted from the peak to the off-peak season.

North Coast Agricultural Use. Based on recent trends in usage by north coast agricultural customers, the estimated annual demand of those customers was reduced by more than half, making more North Coast water available to serve municipal demands.

Tait Street Buffer. Each day, system operators release slightly more than is required at Tait Street to ensure that actual daily releases do not go below requirements. To reflect this in the model, we have subtracted 0.5 cfs from the available daily flows.

Tait Street Well Capacity. A review of actual production records and operational constraints concluded that the assumed 800 gpm (1.78 cfs) well capacity overstated actual production potential. It was determined that a more accurate depiction of reality was 580 gpm (1.29 cfs) May-November and 350 gpm (0.78 cfs) December-April. Model assumptions have been changed accordingly. (Note that this reduces peak-season supply by about 60 mg.)

Annual Loch Lomond Withdrawal Limit. The water right only applies to water from Newell Creek. Withdrawal of stored water that has been pumped from Felton is not limited. Confluence is not able to directly model such a selective limit. However, when the model is run with no withdrawal limit at all, we discover that in all of the 15 hydrologic years in which the lake withdrawals exceed the 3200 AF limit, the excess never exceeds the volume diverted from Felton. Thus, the 3200 AFY withdrawal limit of Newell water does not constrain lake operation and no model changes were made.