

Attachment C

Model Assumptions

General Model Assumptions

1. Generally, the saturation levels for the soft boundaries have been set at 75%.
2. Generally, the infiltration/seepage losses in the canals have been set at 15%.
3. Facet Data was used for Nevada County only. Facet Growth projections are not available for Placer County.
4. Nevada County "HI" Facet Growth Projection used for portions of the NID System w/in Nevada County.

Deer Creek System Assumptions

Snow Mountain System:

1. To account for increased sales demand of 25 M.I. (waiting list) assume a growth rate of 9.70% during the time period 2002-2007 to achieve the forecasted increase in flow delivery (0.75 cfs increase) to the end of the Cement Hill Canal.
2. The SMWTP went "off-line" in 2002. The result is a decrease in demand on the SM Canal. Future demand is expected to "fill-in", or replace, the past demand of the SNWTP.
3. Maximum saturation levels are assumed to be approximately 80% for the Snow Mountain Sub-System.
4. Use 25% exfiltration/seepage loss on Red Hill and Buffington Canals due to area-specific soil type (mostly D.G.)

DS System:

1. Model uses a conveyance loss of 74% to drive duty for the DS to 3.0 acre-feet/acre. Recommend NID evaluate this situation further to investigate possible explanations: 1) excessive amount of water entering old mine shafts, 2) excessive amount of seepage loss, or 3) inaccurate gage readings, especially those of the ramp weir DC 146 "DS at Town Talk".
2. Use 1992-2002 Trendline based on NID sales to City of Nevada City WTP to find 3.93% "Combined" Annual Growth ('92 to '02) (This growth rate has been applied to future WTP demands.) Source: Year-Round Analysis Deer Creek System Calculations
3. Use 11.5 cfs as an approximate value for natural inflows into Deer Creek, return water from Deer Creek system, and GVWWTP effluent (~ 7-8 cfs). Natural inflows

and return water (~ 11.5 cfs) not expected to significantly grow and are assumed to remain constant.

Newtown System:

1. Lake Wildwood WTP (including New Town) demand flows (through 2027) per NID T.P. projections.

Lower Grass Valley System:

1. Use 1992-2002 Trendline based on NID sales to City of Grass Valley WTP (DC 147) to find 3.1 % "Combined" Annual Growth ('92 to '02) (This growth rate has been applied to future WTP demands.) Source: Year-Round Analysis Deer Creek System Calculations

Tunnel and China Union System:

1. It is assumed the Squirrel Creek Duty is a combined average b/w the Tunnel Ext. and Rex 1 Duties
2. To account for increased sales demand of 5.5 cfs assume a growth rate of 28.20% during the time period 2002-2007 to achieve the forecasted increase in flow delivery to Melody Oaks Mutual by 2005 via China Union Canal.
3. Smartville WTP is predicted to have negligible growth. WTP demand to remain constant at 0.1 cfs.
4. Estimated amount of water naturally returning to both Squirrel and Clear Creeks is estimated to be approximately 6.5 cfs. Recommend evaluating this estimate for return water in the future as operations may change the amount of water returning to Squirrel and Clear Creeks.

Tarr and B System:

1. To account for increased sales demand of 2.0 cfs assume a growth rate of 6.3% during the time period 2002-2007 to achieve the forecasted increase in flow (2 cfs) in the B Canal
2. To account for increased sales demand of 2.0 cfs assume a growth rate of 10.7% during the time period 2002-2007 to achieve the forecasted increase in flow in the Clear Creek Canal

3. To account for increased sales demand of 2.5 cfs assume a growth rate of 19.5% during the time period 2002-2007 to achieve the forecasted increase in flow in the Beyers Canal
4. Wolf Canal return water into Combie System (Combie II & III) estimated to be approximately 2 cfs. The estimated amount of return water is subject to change, depending on the future operations of the Tarr/B system, and especially the operation of the Wolf Canal. Recommendation for updating this assumption as operations of the Tarr/B system and Wolf Canal change.

Bear River System Assumptions

Combie Ophir System:

1. The Orr/Coon Creek Release to Camp Far West and Gold Hill Canals is the sum of demands from Camp Far West at Head (BR 334) and Gold Hill I at Head (BR 368). Also included in the Coon Creek Release and Delivery is the addition of the return water into Coon Creek calculated to be approximately 2.4 cfs ('92-'02 Average) and the conveyance losses in the Creek, calculated to be approximately 2.9 cfs ('92-'02 Average). The Orr Creek Release numbers are subject to change, depending on future operations of the Camp Far West, Gold Hill, and Orr Creek. Recommend updating periodically as natural inflows into the creek and conveyance losses change in the future.
2. Future increases in demand/delivery to the Valley View canal and associated laterals are assumed to be delivered via Deadman's Ravine/Combie Ophir System/Combie System/Lake Combie/Bear River. Future increases in delivery to the Valley View canal via Whiskey Diggins are not expected to significantly increase and are assumed to remain constant in the future. Recommend updating model based on future/anticipated operations for the delivery of water to meet the demands of the Valley View canal d/s of Whiskey Diggins, if delivery to the Valley View via Whiskey Diggins is expected to significantly increase.
3. Historical Ophir Pipe deliveries to the Combie Ophir System are typically between 7-11 cfs. The PG&E System delivery (via Ophir Pipe) to the Combie Ophir System is not expected to significantly increase in the future. The Ophir Pipe delivery to the Combie Ophir System is subject to change, depending on future operations of the Combie Ophir System, PG&E system, and Ophir Pipe capacities. Recommend updating periodically as Ophir Pipe flows change in the future.

Valley View and Gold Hill System:

1. Future increases in demand/delivery to the Valley View canal and associated laterals are assumed to be delivered via Deadman's Ravine/Combie Ophir System/Combie System/Lake Combie/Bear River. Future increases in delivery to the Valley View canal via Whiskey Diggins are not expected to significantly increase and are assumed to remain constant in the future. Recommend updating model based on future/anticipated operations for the delivery of water to meet the demands of the Valley View canal d/s of Whiskey Diggins if delivery to the Valley View via Whiskey Diggins is expected to significantly increase.
2. Future increases in demand/delivery to the Doty North canal via the Valley View canal/reservoir are not expected to significantly increase and are assumed to remain constant in the future. Future increases in demand in the Doty North d/s of the Valley View spill (Comstock & Clark Jorstad) are assumed to be delivered via the Auburn Ravine System. Recommend updating model based on future/anticipated operations for the delivery of water to meet the demands of the the Comstock & Clark Jorstad canals if delivery via the Valley View Reservoir spill to Doty North is expected to significantly increase.

Auburn Ravine I System:

1. Natural return flows into Doty's Ravine (subsequently diverted by the Doty South canal) are not expected to significantly change over time. Historical data show return water flows between 2.5 and 3.5 cfs into Doty's Ravine. Recommend periodically updating return water flow estimates in Doty's Ravine as future operations may change over time, thus affecting return water flows. Assumption linked to Valley View/Gold Hill System.
2. Future increases in demand/delivery to the Doty North canal via the Valley View canal/reservoir are not expected to significantly increase and are assumed to remain constant in the future. Future increases in demand in the Doty North d/s of the Valley View spill (Comstock & Clark Jorstad) are assumed to be delivered via the Auburn Ravine System. Recommend updating model based on future/anticipated operations for the delivery of water to meet the demands of the the Comstock & Clark Jorstad canals if delivery via the Valley View Reservoir spill to Doty North is expected to significantly increase.

PG&E System:

1. Historical Ophir Pipe deliveries to the Combie Ophir System are typically between 7-11 cfs. The PG&E System delivery (via Ophir Pipe) to the Combie Ophir System is not expected to significantly increase in the future. The Ophir Pipe delivery to the Combie Ophir System is subject to change, depending on future operations of the Combie Ophir System, PG&E system, and Ophir Pipe capacities. Recommend updating periodically as Ophir Pipe flows change in the future.

Combie Phase 1, 2, and 3 System:

1. Historical data show Wolf Canal spills into the Combie System to be approximately 2 cfs. Future increases in delivery to the Combie Phase III canal via the Tarr/B System (Wolf Canal spill) are not expected to significantly increase and are assumed to remain constant in the future. Future increases in demand by the Combie Phase III (d/s of the Wolf spill) are assumed to be delivered via the Combie System/Lake Combie/Bear River. Recommend updating model based on future/anticipated delivery of water to meet the demands of the the lower Combie System if delivery via the Tarr/B System (Wolf Canal Spill to Combie Phase III) is expected to significantly increase.
2. To account for increased sales demand of 3+ cfs for the Table Meadows Mutual Water Company, assume a growth rate of 13.75% during the time period 2002-2007 in the Magnolia III & Extension Soft Service Boundary.

Camp Far West System:

1. Blackford Ranch Mutual Water Company demand anticipated to gradually increase up to an additional 2 cfs by 2017.
2. Assumption: This model assumes all sales are with NID District Boundaries. Out-of-District sales via the Camp Far West (ie. Tribal sales/Thunder Valley) are not accounted for in this model.
3. Assumption: Existing demand for an additional 1.5-2.0 cfs in sales on the Wiswell Gladding Canal. Assume a 2.0 cfs increase in flow by 2007 in the Wiswell Gladding Soft Service Boundary.