Meeting Notes
Potter Valley Project Modeling Subgroup
June 28, 2018

Location: Sonoma County Water Agency, 404 Aviation Blvd, Santa Rosa
Madrone Conference Room

Participants: Craig Addley, Chris Delaney, Jared Emery, Michelle Lent, Scott McBain, John Mendoza, Don Seymour, Andres Tidavilca

1. Modeling Approach
    a. Delegation of roles of modeling analysis
        i. Subgroup will develop model scenarios to propose to the Ad Hoc group.
        ii. Water Agency will set up and simulate scenarios with Potter Valley Project ResSim model.
        iii. ResSim will be shared with members of the subgroup for review, as well as other interested Water Supply WG members.
            1. Cardno will set up SharePoint folder for model collaboration.
    b. Potter Valley Project ResSim model.
        i. Gate closures:
            1. After 2016 PG&E developed and implemented a new process for commencing gate closure.
            2. John Mendoza has developed empirical model to simulate beginning and end of gate closure.
                a. Spreadsheet has been shared with group.
                b. Andres suggests looking at a non-linear regression to improve fit of empirical variables.
                c. This model performs better than assuming a static date to begin gate closure as assumed by the FORTRAN model.
                d. Sensitivity analysis should be completed by varying beginning of closure date to better understand model sensitivity to this parameter.
        ii. Drought variance rules:
            1. Group collectively agreed that it is better to not simulate drought variances in the model.
                a. Actual terms of variance may vary year to year, which makes it difficult to simulate with one rule.
                b. Approval of the variances by FERC is not guaranteed.
                c. By not simulating the variances, it highlights the potential need to modify existing operational requirements to better account for current water availability (e.g., it illustrates when the system doesn't meet current storage and/or water delivery obligations).

        d. If Lake Pillsbury's active storage is exhausted, then only natural flows are release downstream and diverted through the tunnel.
            i. Not meeting RPA flow requirements should fail the Eel River and tunnel release requirements equally.
    iii. Discretionary Water:
        1. Under current operations, discretionary diversions are typically made if there is enough storage (or there is forecasted to be enough) in the reservoir to sustain 3 or more days of tunnel diversions.
            a. Model rules should be developed that simulate latency in commencing discretionary diversions that are consistent with current operations.
            b. There should also likely be a minimum discretionary diversion threshold.
                i. This value may be informed by operators or derived through sensitivity analysis.

    iv. Model boundary conditions:
        1. Boundary conditions, such as hydrologic states, that are a function of non-managed parameters, such as inflow into Lake Pillsbury, are currently pre-processed then specified in the model.
            a. Increases speed of model simulation.
            b. These pre-processed boundary conditions should be well documented for transparency.
2. Modeling Results Performance Metrics
    a. Primary locations of interest:
        i. Lake Pillsbury storage and release
        ii. Flows downstream of Scott Dam
        iii. Flows downstream of Cape Horn Dam
        iv. Tunnel diversions
        v. PVID delivery amounts and deficits from specified demand defined in boundary conditions
    b. Water Agency will prepare simple template reports to display simulation results.
        i. Subgroup will provide feedback to refine content included in template reports.
3. Define baseline scenarios
    a. Historical hydrology to be provided by Cardno
        i. Simulate entire historical record 1910-2016, unless model run-time requires reducing time frame to shorter, more recent record (1976-2017)
        ii. Should be completed in coming weeks, and should not hold up our modeling effort.
    b. Climate Change hydrology
        i. Start with 2 scenarios (low and high) to provide bookends of potential impacts, and if needed, other scenarios could be run later
            1. Hot – Dry future
            2. Cooler – Wet future

c. Systems demands and losses
    i. Existing Conditions: For Russian River, use consumptive water demands used in the Lake Mendocino Reliability Study. For Eel River, assume no consumptive water demands
    ii. Future Conditions: Demands currently under development for the Water Agency climate adaptation study.
d. Eel River operations baseline:
    i. Consistent with RPA requirements and current operational practices.
    ii. Currently being refined with the PVP ResSim model.
e. Russian River operations baseline:
    i. Minimum Instream Flows: Temporary flows required under the Biological Opinion (TUC)
    ii. Hydrologic Index: Current index of Decision 1610 based on cumulative inflows into Lake Pillsbury.

4. Possible model alternatives to be proposed to Ad Hoc group:
    a. PVP Alternatives:
        i. Current operations (Baseline)
        ii. PVP Decommission – no Scott Dam and no tunnel diversions
        iii. PVP RPA Modification
            1. Modify the E5 condition to allow diversions in the spring when Pillsbury is spilling and reduce minimum release requirements to the EBRR in the summer to improve storage in Pillsbury for the fall migration (i.e., trade summer water for spring water).
        iv. Partial removal of Scott Dam - Provide enough storage for PVID needs
        v. Run of the River (seasonal diversions)
            1. Existing tunnel diversion capacity
            2. Increased tunnel diversion capacity
    b. Lake Mendocino Alternatives:
        i. Current Operations (Baseline)
        ii. Lake Mendocino Forecast Informed Reservoir Operations (FIRO)
            1. Full Ensemble Forecast Operations Alternative
            2. Hybrid Alternative
        iii. Fish Flow EIR Operations – proposed project of the Fish Flow EIR
        iv. Raise Coyote Valley Dam
    c. High priority combination scenarios (beyond baseline scenarios):
        i. PVP Decommission + FIRO
    d. Upcoming model simulation scenarios would be developed from different combinations of PVP and Lake Mendocino alternatives. [See matrix]

Each model alternatives can potentially be run under three scenarios:

- Current: Historic hydrology + current water supply demands
- Future A: Hot, dry climate hydrology + future water supply demands
- Future B: Less hot, wet climate hydrology + future water supply demands

Potential alternatives combinations – current 30 (x 3 = 90), will need to choose a subset…

		Russian River / Lake Mendocino Alternatives				
		Baseline / Current ops	Lake Mendocino FIRO (Full)	Lake Mendocino FIRO (Hybrid)	Fish Flow EIR Ops	Raise Coyote Valley Dam
PVP Alternatives	Baseline / Current Ops	X				
	PVP Decommission					
	PVP Revised Ops (TBD)					
	Lowered Scott Dam					
	Run-of-River diversions (existing cap.)					
	Run-of-River diversions (Increased cap.)					