

Memorandum

To: The Water Supply Advisory Committee

From: Robert Raucher and Colleen Donovan, Stratus Consulting Inc.; and Bill Faisst, Brown and Caldwell

Date: 2/6/2015

Subject: Consolidating the Alternatives

Goal and Purpose of Consolidation

The goal of consolidating the more than 70 water convention alternatives (WCAs)¹ is twofold: to capture the range of high-level ideas that people from the community suggested for the water convention; and to balance the need to have a manageable number of consolidated alternatives (CAs) – in terms of time, clarity, and resources – which the technical team will carry forward in more-detailed analysis. The technical team is working and coordinating with the subcommittee to define the appropriate set of CAs to present at the March Water Supply Advisory Committee (WSAC) meeting. We imagine this process will be iterative and involve dialogue among the technical team, City staff, the planning subcommittee, and other WSAC members.

Our approach to consolidation is outlined below. There will be an opportunity at the February meeting to discuss both the purpose of CAs and the approach outlined in this memorandum.

Process and State of the Work

We have begun the process of consolidating the WCAs so that the WSAC has a set of approximately 20 manageable and representative CAs to carry through Phase 2 and eventually to use in building portfolios for the scenario-analysis process. Eventually, the Confluence® model will test the CAs to determine how well they address water shortfalls as part of scenario planning.

We have compiled the full list of WCAs in a spreadsheet, along with the indicator variables below. The purpose of this compilation exercise is threefold:

- ▶ First, we want to group similar alternatives to reduce redundancy. For example, several people submitted similar ideas about water reuse for irrigation, and we can group these into one CA.

1. Sixty-seven alternatives came from submissions to the Alts Fair, one was submitted after the Alts Convention (Tanaka), and five were recently added (Program C from the Conservation Master Plan; home water recycling; peak season reductions – 10%, 25%, and 50%; Hanson quarry; and deep water desalination).

- ▶ Second, we want to ensure that the WSAC captures the full breadth of project types in the final list of CAs so that each major type of alternative is reflected.
- ▶ Third, we want to clearly demonstrate that at a high level we have not discarded, omitted, or lost any alternatives from consideration during the consolidation process.

As shown in the accompanying spreadsheet, we took care not to lose any alternatives during the consolidation process and we have carefully documented what has happened to each alternative.

- ▶ **Column A – WCA #:** we assigned a unique number to each WCA (WCA1 through WCA72)
- ▶ **Column B – WCA name**
- ▶ **Column C – Description:** a brief overview of the alternative
- ▶ **Column D – Focus area:** an indicator of whether a particular alternative falls under demand, supply, storage, institutional/administration, or strategy
- ▶ **Column E – Water source(s):** an indicator of where water comes; for example, whether it comes from winter flows, reclaimed water, saltwater, conservation (e.g., mandatory or voluntary), decentralized (grey water and rainwater), groundwater, some combination of sources, or some other source
- ▶ **Column F – Where to store the water:** an indicator to identify proposed storage options for a given alternative, for example, Loch Lomond, new surface reservoirs, groundwater, or other options
- ▶ **Column G – Intended use(s):** an indicator for how an alternative proposes to use water, for example, potable, non-potable, or both; groundwater recharge, stream augmentation, or some other use
- ▶ **Column H – Additional treatment required:** a yes/no indicator for whether a particular alternative requires additional treatment
- ▶ **Column I – Additional infrastructure:** a yes/no indicator for whether a particular project requires additional infrastructure
- ▶ **Column J – Outstanding issues:** for alternatives that the technical team has already examined, we provide a preliminary list of outstanding issues.

Figure 1 provides an illustration of our process during consolidation and how WSAC can use the consolidated groupings in the portfolio development work as part of scenario planning.

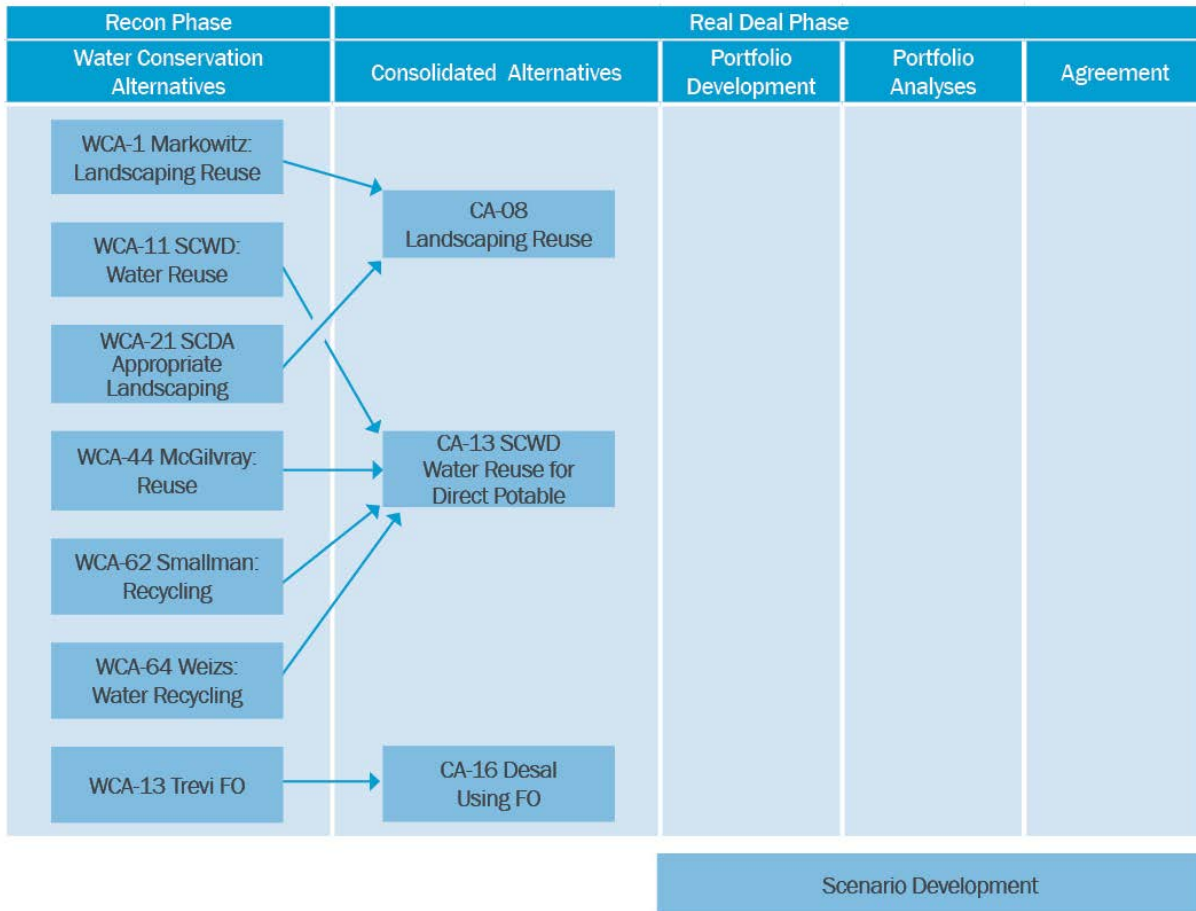


Figure 1. Flow schematic for portfolio development.

Figure 2 presents three simplified schematics that show the typical components required for functional CAs that are not based on water efficiency/water conservation. Water efficiency/water conservation would occur in parallel with alternatives that create supply from new sources (e.g., recycled water, water from new groundwater sources, captured stormwater, or additional diverted surface water).

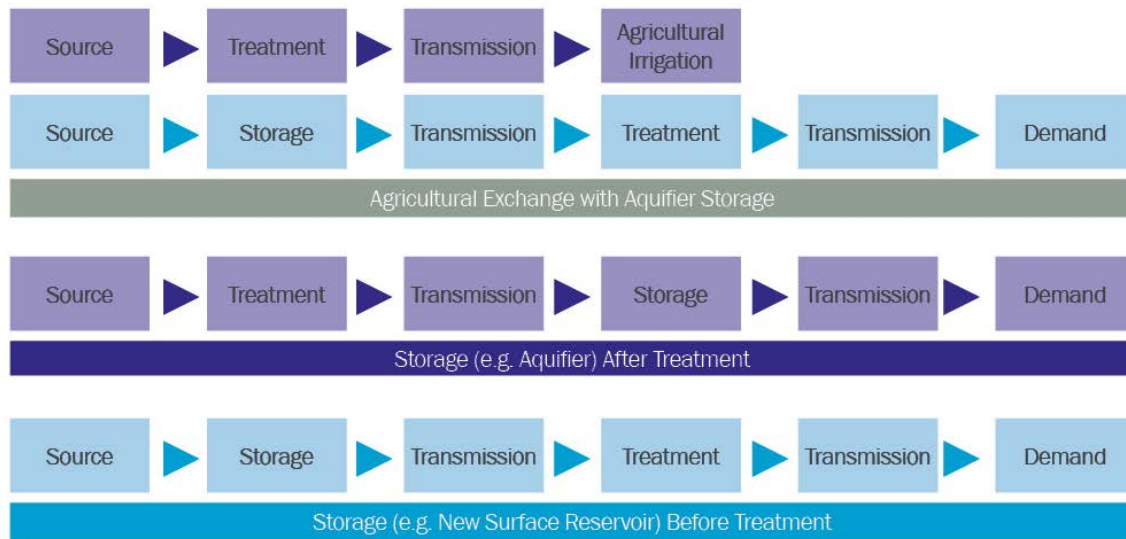


Figure 2. Schematic overview: key components (for example, non-water efficiency CAs).

Examples of CAs

Because many WCAs appear to use similar water sources, means of treatment and/or transmission, and storage – similar high-level ideas – we propose grouping similar WCAs. *One example is creating a CA about expanded treatment capacity.* Below, we include our assumptions and reasoning for this example.

Assumptions: We assumed that the City would add a new 14-million-gallons-per-day (mgd) water treatment plant (WTP) at the Tait Street Diversion and pipe treated water directly into the distribution system. The City could send water in excess of the City’s demand to the City’s Live Oaks wells, to the Soquel Creek Water District, or to the Scotts Valley Water District (or both), for aquifer storage and recovery.

Reasoning: We have assumed that this alternative captures the intent of both WCA-06 McKinney: Expanded Treatment Capacity, and WCA-27 Malone: Enhanced Storage and Recovery. Both of these alternatives propose to capture additional surface flow from the San Lorenzo River and divert such flow to storage for retrieval later by the City. This CA would have an added benefit for the City, in that a new WTP would replace the Graham Hill WTP (GHWTP) with a modern, more seismically durable facility, obviating the need to upgrade the GHWTP.

A second example is creating a CA for off-stream water storage. Below, we include our assumptions and reasoning for this example.

Assumptions: We assume that the City would convert Liddell Quarry into a surface-water reservoir to create new storage. Water diverted from the City's existing surface-water rights would fill the new reservoir during average-rainfall and wet years, likely using parts of the existing North Coast Pipeline combined with new pumping systems, a reservoir inlet/outlet pipeline, and a re-contoured and lined reservoir.

Reasoning: We have assumed that this CA captures the high-level intent of WCA-05 Bevirt: North Coast Quarries (modified to include diversion of water from City existing sources); WCA-26 Fieberling: Expand Storage (addresses off-stream storage); WCA-30 McGilvray (2): Quarries for Water Storage; WCA-32 SCWD: Zayante Dam and Reservoir; WCA-33 Smallman: Reservoirs; and WCA-34 Smallman: Storm Aquarries. All of these WCAs propose to store diverted surface water in surface-storage reservoirs. Although we are not capturing all of the specifics for each WCA included in this CA, we are incorporating this high-level idea: off-stream storage drawing water under the City's existing water rights. We selected a quarry site because such an approach would eliminate the need and associated environmental and political issues that would flow from damming an existing channel and degrading existing, likely undisturbed habitat.

Transparency

The technical team intends that the approach described here will be transparent to the WSAC members, the public at large, and, more importantly, the proposers who have offered potential solutions for the City's water challenges. The planned iterative process for creating CAs will allow ample opportunity for discussion and alternative adjustment.

Conclusion

The technical team is prepared to apply the approach described above, developing a set of CAs and explaining the rationale for each CA's essential components. We look forward to WSAC feedback and ideas on how we might polish and implement the consolidation process.