



Stantec

**South Fork Stanislaus River
Water Supply Reliability Project
Technical Memorandum #2**



ADMINISTRATIVE DRAFT



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Executive Summary

Tuolumne Utilities District (District) is completing the South Fork Stanislaus River Water Supply Reliability Project (Project) to develop a better understanding of the reliability of the District's water supply. The purpose of Technical Memorandum #2 is to develop and analyze alternatives to address/mitigate the risks identified in Technical Memorandum #1. The Project is intended to be implemented in four phases, with progression to subsequent phases dependent upon the findings of the prior phase. Each phase is to be summarized in a Technical Memorandum:

- Technical Memorandum #1: Risk Assessment of PG&E Main Canal (Completed 10/2009)
- Technical Memorandum #2: Develop and Analyze Alternatives
- Technical Memorandum #3: Further Develop, Evaluate, and Select Task 2 Alternatives
- Technical Memorandum #4: Environmental Information Document for Preferred Alternative

SUMMARY OF TECHNICAL MEMORANDUM #1

The portion of the Main Canal included in this project is a series of flumes and ditches that transports water from Lyons Reservoir to the Section 4 Ditch. The research conducted as part of Technical Memo #1 lead us to believe that the District is at significant risk for losing a safe and reliable water supply. The findings are summarized below.

Fire Risk

There is a high risk of fire in a location of the watershed that could easily result in the loss of Flume A (the one mile flume at the top of the Main Canal system) or Flume B. Fire behavior in this area of the Sierra Nevada is extreme due to very high fuel loading, steep slopes, and erratic winds that are common in this narrow canyon. Fires spread at very high rates along the ground, run through the tree tops, and embers can be spread long distances by the winds.

Water Supply Assessment

The Water Supply Assessment shows that in the event of the loss of Flume A or Flume B, ALL District customers above Phoenix Lake would be out of water within a month. It would take significantly longer than one month to repair either Flume A or Flume B. Six of the 11 flume sections would take approximately one month or longer to reconstruct.

Financial Impact

The potential financial impact to the community would be devastating to several sectors of the economy, including recreation and tourism, agriculture, and retail sales. The fiscal impact has been estimated to be \$50 to \$100 million.

System Ownership

The Main Canal is owned and operated by PG&E; the District has no control over the operations, maintenance, or repair of the Main Canal system. Should there be a widespread outage, the District has no control over a temporary bypass, including what flow is supplied.

TECHNICAL MEMORANDUM #2

Technical Memo #2 was completed in two steps with the first step identifying feasible alternatives and the second step completing a screening of the feasible alternatives.

Identification of Feasible Alternatives

An initial list of 26 alternatives was developed for discussion with key stakeholders at a March 24, 2010 meeting. The stakeholder group made a recommendation that each of the alternatives either be further considered individually or in combination with other alternatives or discontinued from further consideration.

Screening of Alternatives

Based on the outcome of the stakeholder meeting, the alternatives included for initial screening are:

- Fuels Management Plan
- Renegotiating contract with PG&E
- Emergency Response Plan for the Main Canal
- Provide new raw water storage capacity
- Replace flume with permanent pipe system

Each of the five alternatives was evaluated with respect to the following screening criteria:

- Water Supply Reliability Benefit
- Social and Environmental Issues
- Federal Energy Regulatory Commission (FERC) Compliance and Interaction
- Cost

The following table summarizes the potential impacts of each of the alternatives on the screening criteria in a high, medium, low manner. A green box indicates a positive impact, yellow is moderate impact, and red is a negative impact. Green, Yellow, Red impacts for each of the screening criteria are defined below.

Water Supply Reliability Benefit

Green. The alternative would dramatically improve water supply reliability.

Yellow. The alternative provides a minimal change from the status quo, but provides additional operational direction for responding to an emergency situation.

Red. The alternative provides a minimal change from the status quo.

Social and Environmental Issues

Green. The project would result in minimal potential impacts and would require an Initial Study/Mitigated Negative Declaration or Environmental Assessment level environmental document. Permitting could be complete at a general permit/nationwide permit level.

Yellow. The potential impacts of the project would require an Environmental Impact Report or Environmental Impact Study, but not impact special status species or cultural/paleontological resources.

Red. The alternative would result in potential impact to special status species and/or cultural/paleontological resources.

Federal Energy Regulatory Commission

Green. The alternative does not fall under FERC jurisdiction.

Yellow. FERC compliance could be achieved through a non-capacity increasing license amendment with minor revisions to Exhibit E, Environmental Analysis, anticipated.

Red. FERC compliance could be achieved through a non-capacity increasing license amendment with significant revisions to Exhibit E, Environmental Analysis, anticipated.

Cost

Green. The initial costs of the project are estimated to be less than \$1 million with minimal ongoing operational costs.

Yellow. The initial costs of the project are estimated to range from \$1 to 5 million plus ongoing operational costs.

Red. The initial costs of the project are estimated to be more than \$5 million plus ongoing operational costs.

Alternative	Evaluation Criteria			
	Water Supply Reliability Benefit	Social/ Environmental Issues	FERC Compliance and Interaction	Cost
Fuels Management Plan	N	N	M	M
Renegotiate PG&E Agreement	N	N	P	P
Emergency Response Plan for the Main Canal	M	P	P	M
Provide Additional Raw Water Storage				
New Raw Water Reservoir near Sierra Pines	P	N	P	M
New Raw Water Reservoir along Soulsbyville	P	N	P	M
Replace Flume with Permanent Pipe				
Install Pipe to Replace Flume	P	N	N	N
Install Pipe as Redundant Conveyance	P	N	M	N
Install Pipe for Use in an Emergency	P	N	M	N

RECOMMENDATION

The purpose of this phase of the project (Task 2: Develop and Analyze Alternatives) is to identify feasible alternatives for the District to consider for improving their water supply reliability. Alternatives that are recommended as a result of Task 2 will be further evaluated in Task 3 such that the District can select a preferred alternative. In order to determine which alternatives to continue to evaluate, we note that the District’s mission is:

To responsibly manage District resources in order to provide our community with reliable, high quality water, wastewater and other utility services.

Based on the screening of the five alternatives discussed in Section 3, there are two approaches for selecting projects for further consideration. The alternatives selected depend upon the District's approach to risk management.

If the District wants to *minimize* the possibility of a catastrophic outage or to improve operational efficiency for responding to a widespread outage, the following alternatives should be considered:

- Fuels Management Plan. Although from the modeling perspective a Fuels Management Plan could theoretically reduce the flame length, fire intensity, and rate of spread, it would only function to decrease the likelihood of a fire destroying the flume system. Although there are additional actions that could be taken to reduce the probability of a fire destroying the flume, the potential of a catastrophic fire remains. It is important to note that even with the Fuels Management Plan, if a fire were to start in the South Fork Stanislaus Canyon area, CalFire has indicated that they would not deploy firefighters due to the extreme terrain that exists in this area.
- Renegotiate contract with PG&E. Similar to the Fuels Management Plan, renegotiating the Agreement with PG&E could result in specific activities (e.g., maintenance) that could decrease of the likelihood of a fire destroying the flume, but the potential of a catastrophic fire destroying the flume remains.
- Prepare an Emergency Response Plan for the Main Canal. Although the Emergency Response Plan would not directly increase the District's water supply reliability, it would improve the District's operational efficiency in responding to a catastrophic failure. It is recommended that the District pursue development of an Emergency Response Plan for the Main Canal regardless of the other alternatives that are considered. A benefit of the Emergency Response Plan is developing the contacts and relationships that will be built with other concerned agencies. The Emergency Response Plan for the Main Canal should be rehearsed and practiced on a regular basis and should be a routine budgeted activity

Based on the evaluation criteria identified in this report, none of these three alternatives dramatically improve the District's water supply reliability.

If the District decides that it is most important to their customers to optimize water supply reliability, the following two alternatives should be continued:

- Additional raw water storage alternatives. The addition of 350 acre-feet of storage near Sierra Pines could provide over 3 months of supply to Big Hill, Cedar Ridge, Crystal Falls, Ponderosa Hills, Tuolumne City, Scenic Heights, Curtis Creek Ranch, and Upper Basin. The addition of 150 acre-feet of storage along Soulsbyville Ditch is also possible, but the storage would be readily available only to Monte Vista and Curtis Creek Ranch where it could supply the demand for over 16 months. Because of the more widespread benefit of the Sierra Pines

widespread benefit of the Sierra Pines reservoir location, it is not necessary to pursue both the Sierra Pines and Soulsbyville Ditch locations.

- Permanent pipeline alternatives. Replacing the flume with a permanent pipe system essentially removes the potential for a catastrophic failure due to a wildfire. It also provides a secondary benefit by providing the best water quality to a location at the juncture of the Main Canal and the Section 4 Ditch. If the District builds a treatment plant at this general location, the improved water quality could become even more valuable.

Providing additional raw water storage and the permanent pipeline alternatives are the only alternatives that substantially improve the District's water supply reliability.