Santa Clara River Temperature Studies
Stakeholder Advisory Committee #3 – July 21, 2026
Meeting Notes

Meeting goals

- Review results from the Santa Clara River temperature study and provide an opportunity for stakeholder questions and feedback.
- Discuss implications of technical study findings for habitat conditions and future management decisions.
- Explore potential actions and management approaches to improve habitat quality in the Santa Clara River.
- Gather stakeholder input on habitat improvement opportunities and future directions for the project.

Participants

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Overview

This meeting reviewed the Santa Clara River Temperature Study to assess how water reclamation plant discharges potentially influence river temperatures, aquatic habitat conditions, and regulatory temperature objectives. Participants examined findings from temperature monitoring, biological assessments, and temperature modeling to better understand thermal conditions in the river and the implications for sensitive aquatic species. The discussion also evaluated the

effectiveness and feasibility of potential management approaches, including nature-based measures and mechanical cooling alternatives. The meeting concluded with a review of key findings, ongoing regulatory discussions, and opportunities for future habitat improvement efforts.

Key updates

- **Study Objectives and Context**: Eric and Liz reviewed the study's purpose, focusing on whether water reclamation plant discharges affect warm freshwater habitat and the unarmored three-spined stickleback. They explained that the evaluation was driven by permit limits of 80°F and a maximum 5°F change from natural conditions, with stakeholder feedback sought on study findings and future management actions.
- **Temperature Source Analysis**: Liz reported that influent and effluent temperatures closely track ambient air temperatures, with treatment processes typically adding only about 0.5–2°F. Monitoring identified substantial seasonal and daily temperature fluctuations throughout the river system, with river temperatures naturally varying far more than five degrees over a day in many locations. Data also showed that temperatures upstream of discharge locations can exceed 80 degrees during warmer periods. The outcome was a finding that seasonal air temperature is the primary driver of wastewater temperatures, and both influent and effluent can exceed 80°F during warmer months.
- **River Monitoring Results**: Andy presented continuous monitoring data from approximately 25 locations, including a core network spanning a 10-mile river reach. Monitoring showed strong seasonal and daily temperature fluctuations, natural daily swings of up to 20°F, frequent exceedance of the 5°F differential threshold, and temperatures above 80°F under summer conditions in both upstream and downstream locations.
- **Biological Tolerance Studies**: Ramona summarized laboratory studies using a surrogate stickleback species. Results showed adults tolerated higher temperatures than juveniles, embryos successfully hatched at tested temperatures up to 77°F, and fish survival improved under cycling temperatures with nighttime cooling. The team also conducted benthic invertebrate and algal surveys and detected no substantial differences upstream versus downstream of discharge locations.
- **Temperature Modeling Scenarios**: Andy explained modeling of existing conditions, 50% and 100% effluent reductions, and a scenario capping effluent at 80°F. The analysis found that river temperatures could still exceed 80°F even with full effluent removal or cooling interventions, indicating that ambient conditions and solar loading remain significant drivers and that compliance could not be consistently achieved through modeled discharge-management scenarios alone.
- **Shade and Nature-Based Cooling Evaluation**: Andy and Eric reviewed modeling of canopy shading and a broader expert-panel assessment of nature-based cooling concepts. Nature-based concepts are not anticipated to be able to achieve temperature targets and have logistical challenges, (e.g., space limitations). Although full shading could theoretically reduce temperatures by a couple degrees in some reaches, participants

concluded that the river's highly dynamic morphology and recurring channel changes limit the long-term practicality and effectiveness of such approaches.

- **Mechanical Cooling Assessment**: Liz presented preliminary evaluations of chillers and cooling towers. Chillers were estimated to require roughly $200 million in capital cost, about $3 million annually in operations and maintenance, a 65% increase in plant energy use, and 8–9 million pounds of CO_2 emissions per year. Cooling towers could not reliably meet temperature objectives, especially the delta 5. The outcome was recognition that mechanical compliance options are costly, energy intensive, and provide only localized benefits.
- **Stakeholder Discussion on Species and Seasonal Management**: Tevin, Ramona, Liz, and Katie discussed breeding temperatures, juvenile survival, and the role of nighttime cooling for stickleback populations. Stakeholder discussion focused on fish reproductive habitat, temperature thresholds during breeding periods, implications of natural temperature variability, adaptive or seasonal management approaches, invasive species concerns, recycled water constraints, and potential future habitat enhancement opportunities. Participants agreed that observed field conditions and continuous monitoring data indicate greater thermal complexity than static thresholds suggest, and further consideration of seasonal management approaches remains part of ongoing discussions.
- **Overall Findings and Next Steps**: Liz summarized that biological indicators showed no measurable upstream/downstream differences, natural river temperatures often exceed 80°F and fluctuate far more than 5°F, and neither nature-based nor mechanical controls consistently achieve temperature objectives. The project team will continue responding to Technical Advisory Committee comments, engage with regulators regarding study implications, and explore broader habitat improvements such as invasive species management, vegetation management, and potential flow-regime adjustments.