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Mr. Thomas Lippe, Attorney at Law  
Lippe, Gaffney and Wagner, LLP  
329 Bryant Street, Suite 3D  
San Francisco, CA 94107

Re: Permanente Creek Flood Control Project Mitigation, Fish Passage Improvement and Possible Benefit to Steelhead Populations

Dear Mr. Lippe,

You have asked me to comment whether there is potential benefit of fish passage improvements by the Santa Clara Valley Water Agency (SCVWA) to allow the re-introduction of the anadromous life history of steelhead trout (*Oncorhynchus mykiss*) to upper Permanente Creek. My brief study of the issues has lead me to conclude that 1) there appears to be viable, perennial habitat and a remnant native steelhead population in the headwaters of Permanente Creek, 2) the upper watershed population is largely isolated because of channelization of lower Permanente Creek, which as noted by Rieman (1993) increases risk of extirpation of salmonids by a stochastic event, 3) Stevens Creek maintains a critical steelhead population (NMFS 2009) and is artificially connected to Permanente Creek through a flood relief channel, 4) Stevens Creek steelhead cannot reach headwaters above a major dam (NMFS 2009) and access to spawning and rearing habitat in upper Permanente Creek could benefit them; therefore, 5) establishing fish passage in the flood relief channel between Stevens Creek and Permanente creeks has potential benefit to fish populations in both watersheds. Review of background information suggests that there is justification for funding fish passage associated with flood control projects and that revenue is potentially available from Measure B passed in 2000. Therefore, it would seem that the California Environmental Quality Act (CEQA) would require analysis of fish passage into Permanente Creek as mitigation in the *Permanente Creek Flood Protection Project: Draft Subsequent Environmental Impact Report (SEIS)* (ICF 2012).

**Steelhead Population in Permanente Creek**

Leidy et al. (2005) substantiate that Permanente Creek had a steelhead population that persisted to at least 1950, but urban and suburban development lead to channelization of the stream and impediments to fish passage and loss of the anadromous life history pattern. The Santa Clara Valley Water Agency (SCVWA) in ICF (2012) acknowledges that there are resident rainbow trout in the headwaters of Permanente Creek and note that this isolated population may suffer from decreased genetic diversity. ICF (2012) specifically reports resident trout being present recently in Permanente Creek in the vicinity of San Antonio Park. Historic pollution from a cement plant along Permanente Creek has been abated, although stream habitat and the steelhead population were formerly impaired because of discharges (ICF 2012).

Titus et al. (2006) and Girman and Garza (2006) both conclude that steelhead trout populations that become disconnected by dams or other impediments to passage can persist as resident rainbow trout. Southern California steelhead living as resident trout are known to manifest an anadromous life history if washed from headwaters by storm events. Similarly, “trout” in upper Permanente Creek may be periodically washed out by large storm events. Stillwater (2004) states that water temperature in lower Stevens Creek is suitable for steelhead rearing, which means downstream migrants from Permanente Creek could survive there and subsequently, migrate to the ocean to feed and survive to return as spawners. Consequently, Permanente Creek fish may be contributing to Stevens Creek steelhead adult returns in some years.

### **Extinction Risk, Genetic Diversity and Steelhead in Stevens and Permanente Creeks**

The populations of Stevens Creek and Permanente Creek have become isolated, which increases their extinction risk. Rieman (1993) points out that “Factors that strongly influence risks of local and regional salmonid extinction include replication, dispersal and connection among populations representing a regional metapopulation.”

If the remnant population of steelhead that survives in the headwaters of Permanente Creek remains isolated, its genetic diversity will likely diminish and compromise the population’s ability to persist due to inbreeding depression (Gilpin and Soule 1986). Also, a large storm event could wash all steelhead living as residents out of the upper watershed or a severe drought could cause flow disruption. These are examples of stochastic events that befall small isolated populations. Historically metapopulation function would have provided colonists to replenish Permanente Creek with adult fish coming from Stevens Creek, the Guadalupe River or some other nearby stream. Today access is blocked by cement channelization of the lower stream bed.

Similarly, Stevens Creek is disconnected from its headwater spawning and rearing areas (NMFS 2009) by Stevens Creek Reservoir. Upper Permanente Creek could supply such spawning and rearing habitat, if passage were restored. Stevens Creek is significantly impacted by urban runoff and flows during storm events may be well over historic peaks and can cause major problems for steelhead adults and juveniles. Upper Permanente Creek drains from the Rancho San Antonio Open Space Preserve; therefore, winter flows may be more moderate and suitable for spawning and rearing.

### **Historic and Current Hydrology of Stevens and Permanente Creeks**

The SCVWD is considering Permanente Creek to be separate from Stevens Creek, but they are currently artificially connected. Permanente Creek historically ran roughly parallel to Stevens Creek east to San Francisco Bay. These streams were likely connected in lowland areas near the bay during high flow events. Coho salmon were likely historically present in both streams and their juveniles and those of steelhead would likely travel from one stream to the other to opportunistically feed. Variable imprinting would also then lead to an interchange in adults. Today Permanente Creek has a flood overflow channel not far below the headwater section in Rancho San Antonio Open Space Preserve that connects it to Stevens Creek. Although building fish passage in the flood control channel does not mimic past hydrologic conditions, it would help re-establish connection of the steelhead populations that historically occurred.

## **Potential for and Benefit of Reconnection of Permanente Creek**

Becker et al. (2007) made the following statement with regard to Permanente Creek:

“In the lower watershed area, the historical Stevens/Permanente creeks confluence has been re-aligned to flow through the Permanente Creek by-pass channel. A potential modification to this channel may allow fish passage to good habitat in upstream portions of Permanente Creek and the possible re-establishment of the anadromous life history form of the existing *O. mykiss* population.”

The Santa Clara Basin Watershed Management Initiative (SCBWMI, 2003) stated that:

“Watersheds with extensive, relatively undisturbed headwaters provide summertime stream flows and the best habitats for native fish. These species may rebound rapidly if in-stream habitat is partially restored and barriers are removed.”

Permanente Creek was so named by the Spanish colonists because of its perennial flow. Past damage by a cement plant has been remediated and pollution abated and fish habitat above the urban area is recovering. The upper most headwaters of Permanente Creek are in a park and; therefore, serve as a cold water refugia. Therefore, the creek meets the SCBWMI (2003) description above and re-establishing connectivity might restore anadromy.

### **Justification for Establishing Fish Passage**

In reviewing documents for this project, it became apparent that there is certainly justification for consideration of improvement of fish passage in locations such as the flood overflow channel between Permanente Creek and Stevens Creek, as recommended by Becker et al. (2007). For example, Senate Bill 449 passed and signed into law by Governor Davis in 2001 expanded the mission of the SCVWA to emphasize conservation (SCBWMI 2003):

“Among other changes, the amendment allows SCVWD to use its powers to ‘enhance, protect, and restore streams, riparian corridors, and natural resources...’. SCVWD’s water supply and flood-control operations and facilities comprise the most significant influence on stream habitats. Amendment of SCVWD’s purposes creates unprecedented new opportunities to integrate stream and riparian restoration into SCVWD’s capital construction projects and its maintenance operations.”

The Santa Clara Basin Watershed Management Initiative (SCBWMI, 2003) has many lofty objectives, but they are selectively applied to Stevens Creek, but not its tributary Permanente Creek.

“The 30-year program includes habitat restoration, capital projects and other improvements along Stevens Creek, the Guadalupe River and Coyote Creek for both steelhead trout and fall-run Chinook salmon. The program includes removal of barriers to fish passage.”

“In the WMI’s vision, the Basin’s streams flow freely through continuous riparian corridors. Seasonal high flows support migration of salmon and steelhead to and from

their spawning redds. In the winter, floods sometimes overtop stream banks, but they spill across protected floodplains and cause little property damage.”

The Permanente Creek flood control project (ICF 2012) should have resolved some of the fish passage barriers as part of mitigation to come into conformance with this vision and restored connectivity to the Stevens Creek population. Furthermore, the Independent Oversight Report for Fiscal Year 2010-2011 (SCVWA 2012)(at p. 62) states that there are \$5.6 million in reserve from tax revenues that could be used for Outcome 3.2 of the Clean Safe Creeks and Natural Flood Protection Plan that includes establishing fish passage.

## **Conclusion**

There is a clear logical case for consideration of re-establishing fish passage between Stevens Creek and Permanente Creek by retrofitting the flood relief channel that connects them, as recommended by Becker et al. (2007). It would seem that this alternative needs consideration and full analysis under CEQA as part of mitigation for impacts of flood control improvements. This is especially true given the Clean Safe Creeks and Natural Flood Protection Plan objectives that specify improvement of fish population reconnection and the associated revenues available for that purpose.

Sincerely,

A handwritten signature in black ink, appearing to read 'Patrick Higgins', with a stylized flourish at the end.

Patrick Higgins

## References

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