Appendix D

Upper Guadalupe River Reach 12

Clean Water Act

Section 404(b)(1) Analysis

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SUPPLEMENTAL DETERMINATION OF THE EFFECTS OF DISPOSAL OF FILL MATERIAL ON WATERS OF THE U.S. UNDER SECTION 404(b)(1) OF THE CLEAN WATER ACT

Reach 12 of the Upper Guadalupe River Flood Risk Management Project

May 9, 2014

1.0 INTRODUCTION

This determination under Section 404(b)(1) of the Clean Water Act (CWA) supplements and amends, for Reach 12 only:

- The 1999 Section 404(b)(1) determination (1999 Determination) in the 1999 Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Upper Guadalupe River Flood Control Project
- The 2005 Section 404(b)(1) determination (2005 Determination) in the 2005 Upper Guadalupe River Flood Risk Management Project Final Environmental Assessment

Material presented in these previous determinations is incorporated by reference and will not be repeated here. Please refer to Chapter 2 of the 2014 Environmental Assessment for Reach 12 for a more detailed description of the proposed action evaluated in this analysis. The basic and overall project purpose under the CWA has not changed since the 1999 and 2004 Determinations were prepared.

The low-flow channel of the Guadalupe River within the impact area of the proposed action qualifies as "Other Waters of the United States." under Section 404(b)(1) of the CWA . Between the low-flow banks of the river and "ordinary high water" as defined by the CWA, all lands qualify as jurisdictional wetlands under the CWA, with the minor exceptions of extremely limited areas of hardscape and gravel road. It should be noted that the emergent aquatic wetlands discussed in the environmental assessment for the proposed action constitute only an extremely small fraction (under 1 percent) of the jurisdictional wetlands within the boundary of the proposed action.

Construction of this project is regulated by San Francisco Regional Water Quality Control Board (RWQCB) Order R2-2003-0115 (Order), which provided water quality certification under the CWA.

2.0 FACTUAL DETERMINATIONS

2.1 Physical Substrate Determinations

The Guadalupe River is severely sediment-starved due to upstream sediment sinks and reductions in coarse sediment inputs. This has resulted in loss of most of the coarse streambed sediment (sand, gravel, and cobbles) which is essential to the geomorphic and ecological health of the river. As a consequence, deep pools have been scoured into clay in many locations along the river. This has resulted in a serious imbalance in the ratio of pools to riffles and runs in many locations along the river.

It has also resulted in substrate conditions that are generally poor for benthic invertebrates and food web support.

The existing generally trapezoidal channel in Reach 12 was excavated and reconfigured in the 1970s as part of a local flood-control effort, subsequent to several decades of gravel mining in much of the area. The channel has largely retained its shape since then, albeit with some minor and localized erosion and deposition.

The most important change in this channel since its reconfiguration has been the development of a scoured and simplified low-flow channel dominated by pools in the upper half of the reach. This has occurred due to the river banks being stabilized by riparian vegetation while the pools were scoured deeper due to the river being deficient in coarse sediment. The resulting pools have little coarse sediment and are poor habitat for salmonids and most benthic organisms found in streams.

These pools are better habitat for introduced fish species such as largemouth bass and carp than for native salmonids such as the federally listed steelhead trout. In addition, the introduced fish species which are favored by these pools prey on young salmonids on their way downstream, causing additional harm to these salmonids.

The proposed action would fill portions of these scoured pools with a mixture of gravel and cobble selected to provide an optimum coarse sediment gradation. This would raise the bottom of the river bed in these locations and place some portions above the low-flow elevation of the river. Over time, some of this gravel and cobble would wash downstream during high flow events, increasing instream gravel and cobble supply in downstream areas. The result of these changes would be more-natural geomorphic and aquatic habitat conditions within the reach, and to a lesser degree downstream.

The proposed action would introduce minor changes in the topography of the remainder of the channel due to excavation of several benches and laying back of several banks. These excavations would slightly increase Other Waters of the U.S. and Section 404 wetlands. Two new access ramps would cause minimal fill to wetlands. The net effect would be increases in wetlands of 0.526 acres and of other waters of the U.S. of 0.028 acres. These gains would fully mitigate the very minor impacts from construction of ramps. Table 1 shows temporary and long-term impacts on Section 404 wetlands and Other Waters of the U.S. from the proposed action.

An additional 0.225 acres of Section 404 wetlands and 0.433 acres of Other Waters of the U.S. would be temporarily disturbed due to placement of log and root wad structures on the river banks and floodplain to enhance terrestrial and aquatic habitats. Disturbed areas on the banks would be hydroseeded and replanted with riparian trees and shrubs, and their wetland functions would be improved as a result of the proposed action.

Approximately 0.811 acres of other waters of the U.S. and 0.001 acres of wetlands, consisting of areas within the low-flow channel, would be partially filled with a mix of gravel and cobble for the purposes of

enhancing aquatic habitat and improving geomorphic conditions and functions. It is expected that the coarse sediment added to the river will be washed downstream in the long term, affecting additional acreage of Other Waters of the U.S. This would occur primarily in high-flow events large enough to mobilize gravel and cobble. Replacement gravel may be placed in the river in the future to compensate for these losses. All affected acreage would remain as Other Waters of the U.S.

Placing coarse sediment into the river under the proposed action, and subsequent displacement of some of this fill downstream, would improve habitat conditions for benthic organisms and provide better support for the aquatic food web. Native salmonids would benefit directly from more favorable habitat conditions including reduced predation on their young. There would be no net loss to Other Waters of the U.S., although some locations would be raised above the summer low-flow water surface during the initial placement of sediment. Overall, this action would help to restore relatively more natural aquatic conditions in the reach.

To minimize impacts on substrate conditions, coarse sediment would be placed in natural configurations typical for streams of this size, which would minimize post-placement readjustment of the stream profile except under low-frequency events that tend to readily mobilize this size range of sediment.

Type of Activity[1]	**Impacts to Section 404(b)(1) Wetlands (acres)**		**Impacts to Other Waters of the U.S. (acres)**	
	Temporary Disturbance[2]	Long-Term Net Gain[3]	Temporary Disturbance[2]	Long-Term Net Gain[3]
Jurisdictional area affected by bench excavation	0.034	0.555	0.000	0.028
Access ramps	0.008	-0.029	0.002	0.028
Gravel/cobble placement	0.001	0.000	0.811	0.000
Wood and rock instream structures	0.225	0.000	0.433	0.000
Total	**0.268**	**0.526**	**1.246**	**0.028**

[1]Areas of overlap between gravel/cobble placement and wood structures are listed under gravel. All such areas are Other Waters of the U.S.
[2]Temporary impacts would occur during construction activities and would generally be gone within a few months to a year. In limited cases (some bench excavation) trees would be removed and full recovery would take longer. Temporary impacts are mutually exclusive with permanent impacts in this table. When wood structures would be placed in gravel areas, temporary impact overlaps accrue to gravel placement.
[3]Long-term impacts are expected to last for the 50-year life of the project or longer.

Table 1. Impacts to Wetlands and Other Waters of the U.S. from the Proposed Action

2.2 Water Circulation, Fluctuation, and Salinity Determinations

Water circulation would be affected primarily by placement of gravel-cobble fill in pools and construction of wood and boulder structures in the river channel and on the banks, which would affect flows at all times. Floodplain benches would affect flows greater than approximately a two-year event. These changes in water movements would restore more natural aquatic conditions in the reach.

Gravel fill would improve the riffle-pool ratio which would benefit native aquatic organisms. Water is expected to move through the gravel-cobble fill to varying extents (depending on localized conditions) which would benefit benthic organisms in the interstices of the fill. Gravel-cobble fill may reduce the surface area of water during low-flow conditions.

Installation of wood and boulder structures on the river banks and in the channel would affect water movement down the river, increasing turbulence locally and providing velocity refugia for fish and other aquatic organisms.

New and lowered floodplain benches would increase the floodplain area during relatively frequent floods in the range above the bankfull flow. This would provide additional channel width and decreased velocities during these events. These would benefit channel stability, reduce erosion, and benefit aquatic organisms. These benches would also provide improved opportunity for additional riparian forest plantings closer to the water table where they will grow faster and better.

Berms at the top of the banks would limit the areal extent of flows in approximately the 0.04% to 0.01% (25-year to 100-year) range, and only to the extent that these flows would not overtop the existing berms from river stations 987+00 to 1002+00 and enter the percolation ponds. The percolation ponds are hydrologically separated from the river in terms of surface flows, and are not capable of providing typical floodplain functions for the Guadalupe River other than groundwater recharge. Reducing the risk of flood flows entering the ponds would maintain their ability to recharge groundwater, by minimizing the risk of fine sediment and flood pollutants entering the ponds during floods. Access ramp construction and repair would have insignificant effects due to the minimal number and size of these features.

Impacts during construction in the river's low-flow channel would be minimized by dewatering work areas prior to placement of fill, subject to potential areas of localized seepage from substrate. If seepage from the substrate affects dewatering of the channel, measures required by the RWQCB would be used to ensure that water quality standards are met at all times during construction.

2.3 Suspended Particulates/Turbidity Determinations

Proposed construction activities, effects, and mitigation measures *outside* of the low-flow river channel would not differ in kind from those described in the 1999 and 2004 Determinations, but these activities

would be much smaller in magnitude than those addressed in previous analyses. No off-stream ponds or associated mitigation areas would be constructed. Construction impacts are expected to be much smaller than those described in the previous analyses. However, impacts to riparian forest including invasive non-native trees and shrubs would be greater than in the EIS due to the large amount of riparian forest that has developed in the reach along with numerous individual invasive trees and shrubs. Some of the riparian forest is located in areas that would be graded for the channel modifications described in the environmental assessment.

Proposed activities *within* the low-flow river channel would not substantially differ in kind from the proposed activities described in the 1999 and 2004 Determinations, in that temporary cofferdams, temporary dewatering, and earthwork would occur. However, the spatial arrangement of these activities would be modified and their extent greatly reduced. Gravel-cobble fill, and wood and boulder structures, would replace discrete rock grade control structures. Work would be done in a dewatered river bed to avoid direct creation of turbidity with the possible exception of minor areas as discussed below. No sediment would be added to the river bed during construction other than gravel and cobble. Additional specific mitigation measures and best management practices to minimize turbidity effects and meet water quality standards will be selected for the proposed work in coordination with the RWQCB and the National Marine Fisheries Service (NMFS) to ensure that all regulatory requirements are met.

If groundwater conditions make complete dewatering infeasible in locations adjacent to the percolation ponds, these locations would be completely isolated from the river flow prior to work being conducted in the wet, if this is authorized by the RWQCB and the NMFS. In addition, best management practices such as holding basins and/or silt bags would be used upon approval of the regulatory agencies to ensure that there are no unacceptable impacts to water quality downstream due to water returned to the river from dewatering operations. River flow would not be returned to these locations until water quality tested daily meets standards and treatments specified by the RWQCB and the NMFS.

Impacts on biota from effects on turbidity are expected to be insignificant due to impact-avoidance measures required under RWQCB regulations and the Order.

2.4 Contaminant Determinations

The only contaminant of concern that could be affected by the proposed action is mercury, present in site soils due to historic mining upstream. Due to over 100 years of transport of sediment with elevated levels of mercury from upstream sources, the entire reach contains sediment in excess of RWQCB standards for wetland fill. Furthermore, sediment with elevated mercury levels continues to enter the site every year via the river, so any effort to permanently lower mercury levels in areas subject to Section 404(b)(1) jurisdiction would be futile over time due to the accumulation of new sediment and its infiltration into fill on the site.

The Upper Guadalupe River Flood Risk Management Project was not authorized as an environmental cleanup project. Modification of the project to meet the RWQCB mercury standard would not be practicable due to the need to import all fill from off-site locations. Therefore, coordination with the RWQCB resulted in development of a practicable plan for sediment reuse that would leave the site with equal or lower levels of mercury than it has at present.

As described in the environmental assessment, reuse of material from the site would be limited as follows:

- In areas within 20 feet of the low flow channel, sediment with concentrations of mercury ranging from 2.3–5.0 parts per million (ppm) would be reused only if it is buried under 2 feet of clean material.
- Sediment with mercury concentrations ranging from 5.0–20.0 ppm would be used anywhere within the project area beyond 20 feet from the low flow channel.

These restrictions would avoid any increase in mercury loading to the Guadalupe River.

2.5 Aquatic Ecosystems and Organism Determinations

Modifications to the low-flow channel of the river would consist of two types: log, rootwad, and boulder structures in the channel and on the banks and coarse sediment fill in some of the river's pools. Both of these modifications are intended to and expected to benefit the aquatic ecosystem of the river and its constituent native organisms.

Log, rootwad, and boulder structures would provide aquatic habitat complexity, hiding places for fish, and locations where fish can loaf and seek shelter from currents to conserve energy. Placement of these structures would restore some of the lost habitat values caused by past modifications to the river.

Coarse sediment fill would serve several purposes. It would resupply coarse sediment to a river which has lost the vast majority of its coarse sediment; some of this sediment would wash downstream over time to help restore aquatic habitat conditions in downstream reaches. It would restore a more natural pool-riffle-run and coarse-sediment morphology to the river which would favor native salmonids over introduced centrarchid fish and carp. It would greatly improve substrate conditions for the benthic organisms which normally inhabit streams of this sort, thus providing substantial food web support. Finally, it would potentially provide spawning and rearing habitat for salmonids.

When the river overflows onto its floodplains, the log, rootwad, and boulder structures would provide additional habitat value by slowing flows and providing some degree of refuge for fish from fast currents. Riparian forest plantings planned for the reach would also provide this habitat value, as well as additional value to instream habitat and organisms in the form of increased organic matter input and shade, and decreased water temperatures.

The proposed action would benefit the federally listed Central California Coast Evolutionarily Significant Unit (ESU) of steelhead trout. This species would benefit from multiple improvements to its habitat that would partially restore natural conditions to this reach.

2.6 Disposal Site Determinations

All placement of material on waters of the U.S. in the reach would be for purposes of habitat restoration or maintenance of habitat areas. Fill would be placed to the maximum extent practicable in dewatered areas.

If coarse fill needs to be placed in isolated water due to excessive upwelling of groundwater, there would be no mixing zone because the fill would have no fines. In this event, existing riverbed sediment on very limited portions of the site may be temporarily mobilized in the water column within a separate pool entirely cut off from the river, but would not be allowed to mix with water contiguous to the river due to intervening dewatering, silt fences, water treatment, and/or other BMPs approved by the RWQCB and the NMFS.

It would not be possible to comply with the RWQCB mercury standard for wetland fill, because the entire reach is in violation of this standard due to pre-existing contamination from upstream sources (historic mercury mining). However, the sediment reuse plan that has been developed in coordination with the RWQCB would leave the site equal to or cleaner than it currently is.

Recreational fisheries may experience *de minimus* positive effects if Chinook salmon spawn or rear in the improved aquatic habitat that would be created by the proposed action. Chinook salmon spawning and spring rearing is not particularly likely since this species generally utilizes reaches of the river well downstream from the site of the proposed action.

Steelhead trout spawning in Reach 12 is possible based on past surveys in the upper reaches of the river, and the proposed action would encourage such spawning. Rearing in Reach 12 may occur in spring months but is less likely in summer due to unfavorable water temperatures. However, recreational and commercial fishing of wild steelhead trout is not allowed in San Francisco Bay or nearby parts of the Pacific Ocean so positive fishery effects are not expected for this species. Fishing is not allowed in the Guadalupe River.

There would be no other effects on recreational fisheries from the proposed action, and no effects on commercial fisheries.

The currently proposed action would not have any effects on the following:

- Municipal and private water supply
- Water-related recreation

- Parks, national and historic monuments, national seashores, wilderness areas, research sites, or similar preserves

2.7 Determination of Cumulative Effects on the Aquatic Ecosystem

The proposed action would have more favorable cumulative effects on the aquatic ecosystem of the Guadalupe River than the previous design for this reach. Natural conditions and processes would be fostered and supported through actions designed for this purpose.

2.8 Determination of Secondary Effects on the Aquatic Ecosystem

Secondary effects beyond those discussed in the 1999 and 2004 Determinations are not expected.

3.0 FINDINGS OFCOMPLIANCE OR NON-COMPLIANCE WITH RESTRICTIONS ON DISCHARGE

The proposed action would comply with all applicable restrictions on discharge of dredged or fill material with the exception of RWQCB standards for mercury content of wetland fill in the watershed of San Francisco Bay. This situation is discussed in Section 2.4 above.

3.1 Adaptation of the Section 404(b)(1) Guidelines to this Evaluation

No adaptations were made.

3.2 Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem

Impacts to the aquatic ecosystem from the proposed action would all be for the direct or indirect purpose of enhancing the structures, functions, and values of the aquatic ecosystem on the site of the proposed action. Other alternatives for this reach were previously considered and rejected in the 1999 and 2004 Determinations and will not be repeated here.

Additional alternative designs were considered in the recent design effort, which included increased grading of the reach to create additional floodplain benches. The five additional sites for grading would together result in a net losses of 0.331 acre of riparian forest after applying the compensation ratio to mitigation plantings. Therefore, these sites were dropped from the plan. Alternately, the No-Action Plan would avoid all impacts but would perpetuate currently degraded aquatic habitat conditions. Therefore, the proposed action was selected for implementation as the optimized balance between geomorphic improvements and habitat quantity.