

## **Appendix I.3: Hydromodification Management Exemptions**

## INTRODUCTION

The purpose of this appendix is to identify areas within the South Orange County (San Juan Hydrologic Unit) Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Exempt areas are defined as areas that drain directly or via a continuously exempt flow path (i.e., not susceptible to hydromodification impacts or of negligible risk to hydromodification impacts) to a water storage reservoir, lake, enclosed embayment, or the Pacific Ocean. Per Provision E.3.c.(2)(d) of Permit Order R9-2015-0001:

*Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:*

- (i) *Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;*
- (ii) *Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or*
- (iii) *An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).*

The South Orange County Copermittees are using their discretion to allow for the exemptions described above. The following sections provide justification for the exempt receiving waters within South Orange County. These receiving water exemptions are based on: (1) a detailed review of the exempt channels listed in Table 3-1 of the South Orange County Hydromodification Management Plan (HMP) (County of Orange, 2015); (2) confirmation of the exempt reservoirs listed in Table 3-2 of the HMP; and (3) a detailed review of the exempt large river reaches listed in Table 3-3 of the HMP, which are consistent with Provision E.3.c.(2)(d)(i) and (ii) and Provision E.3.c.(2)(e) of the permit.

### **Exempt Channels**

Major storm drains, concrete lined conveyance channels, and engineered channels considered exempt were listed in Table 3-1 of the HMP. A subsequent detailed review of Table 3-1 has been conducted as part of the Watershed Management Area Analysis (WMAA) to define the material lining each channel based on: available storm drain GIS layers; aerial imagery review, using Google Earth; street level imagery review, using Google Maps Street View; and a field assessment of specific reaches of interest to fill data gaps. The result of this effort is a detailed channel bed and bank material map for

each channel listed in HMP Table 3-1. A vicinity map of these channels is provided in Figure 1, which also includes the appropriate modifications to HMP Table 3-1. Maps of each individual channel are provided in Figures 2 to 12.

Based on the review, six of the twelve channels in HMP Table 3-1 are fully hardened and the other six have segments of erodible earthen bed or bank material. These include: Laguna Canyon Channel, Aliso Creek Channel, San Juan Creek Channel, North Creek, Segunda Deshecha Canada Channel, and Trafalgar Storm Drain.

San Juan Creek Channel, between Paseo Michelle and the Pacific Ocean, is included as a large river exemption in HMP Table 3-3. Thus, this channel has been deleted from the list of exempt channels since the large river exemption includes the reach downstream of Paseo Michelle.

Aliso Creek Channel, between Pacific Coast Highway (PCH) and the Pacific Ocean, is a sand bedded channel with riprap banks. While this channel is susceptible to erosion, it is considered exempt because coastal sediment processes (i.e., beach sand erosion and deposition) dominate the dynamic bed morphology over fluvial processes. The coastal influence is demonstrated on Figure 15 in a series of historical aerial images captured between 1994 and 2016. The coastal events effectively “reset” the bed form and occur much more frequently than fluvial events. The morphology of Aliso Creek is much less dynamic upstream of PCH, where fluvial processes have greater influence, than it is downstream of PCH. Another line of evidence for the influence of dynamic coastal processes is that the bed of the exempt reach was lined with riprap as of 2014, but has subsequently been buried by deposited beach sand.

The remaining four identified channels with segments of earthen channel (Laguna Canyon Channel, North Creek, Segunda Deshecha Canada Channel, and Trafalgar Storm Drain) have the potential to be susceptible to channel erosion due earthen banks and beds,, however, their tributary watersheds are fully built out or are very close to that level, as shown in Table 1, thus reducing the potential for excess erosion beyond baseline conditions. Each of these channels shows signs of past instability<sup>1</sup>, to varying degrees. However, field observations indicate that each channel has reached a state of quasi-equilibrium. Per the Southern California Channel Evolution Model (CEM) (SCCWRP, 2013), Type I and Type V channels on the top and bottom rows of Figure 17 are considered to be in dynamic equilibrium. The CEM conditions observed in the field is summarized in Table 2. Considering the lack of additional development at buildout conditions and the relative stability of the current channels, these receiving waters have

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<sup>1</sup> Instability occurs when the controls on channel form are perturbed to a point that the fluvial system must adjust to a new equilibrium channel form.

negligible likelihood of in-stream hydromodification impacts caused by future urban development and warrant an exemption. Attachment 1 of this Appendix provides the basis for designating negligible hydromodification impact based on cumulative future buildout. The levels of additional buildout development, summarized in Table 1, are below the threshold for impact, even if the additional development footprint were 100 percent impervious. Figure 16 shows the watersheds tributary to each earthen channel segment of interest in relation to existing urban areas and future buildout development.

**Table 1. Tributary Land Use Conditions for Existing and Buildout Conditions in Earthen Channels of Interest**

Earthen Channel of Interest	Tributary Area (sq mi)	Existing Tributary Impervious Cover (%)	Existing Tributary Urban Development (%)	Future Build out Tributary Urban Development (%)	% Increase in Tributary Development (Buildout - Existing)
Laguna Canyon	6.24	16.9	22.0	22.0	0.0
North Creek	0.15	45.5	56.7	56.7	0.0
Segunda Deshecha	6.86	27.7	45.7	46.3	0.6
Trafalgar	0.51	55.8	72.2	72.2	0.0

**Table 2. Southern California CEM Condition Observed for Earthen Channels of Interest**

Earthen Channel of Interest	Southern California CEM Condition
Laguna Canyon	CEM Type V - Quasi-equilibrium
North Creek	CEM Type V - Quasi-equilibrium & Phase 1Veg - Vegetated
Segunda Deshecha	CEM Type V - Quasi-equilibrium & Phase 5C - Constructed
Trafalgar	CEM Type V - Quasi-equilibrium & Phase B5 - Braided quasi-equilibrium

Based on the detailed review performed, Table 3 below provides a summary for the justification of each channel exemption. Field photographs are provided in Attachment 2 for the five exempt channels which have earthen segments.

**Table 3. Summary for the Justification of Channel Exemptions**

Channel	Downstream Limit	Upstream Limit	Justification for Channel Exemption		
			Fully Hardened	Dominant Coastal Processes	Negligible Future Development in Watershed / Quasi-equilibrium
Laguna Canyon Channel	Pacific Ocean	Philips Street			X
Sleepy Hollow Storm Drain	Pacific Ocean	Park Avenue	X		
Bluebird Storm Drain	Pacific Ocean	Glennestre Street	X		
Aliso Creek Channel	Pacific Ocean	Pacific Coast Highway		X	
Salt Creek Channel	Pacific Ocean	300 ft north of Pacific Coast Highway	X		
San Juan Creek Channel	Pacific Ocean	Paseo Michelle			
Prima Deshecha Canada Channel	Pacific Ocean	Avenida Vaquero	X		
North Creek	Pacific Ocean	Dana Harbor Drive*			X
Cascadita Canyon Storm Channel	Prima Deshecha Canada Channel	Via Cascadita	X		
Segunda Deshecha Canada Channel	Pacific Ocean	Calle Frontera			X
Marquita Storm Channel	Pacific Ocean	Encino Lane	X		
Trafalgar Storm Drain	Pacific Ocean	South Ola Vista			X

\*HMP Table 3-1 incorrectly indicated Doheny Park Road as the upstream limit of North Creek's channel exemption. The correct upstream limit is Dana Harbor Drive.

### **Exempt Reservoirs**

HMP Table 3-2 included a summary of exempt water storage reservoirs and lakes in South Orange County. These water bodies include Sulphur Creek Reservoir, El Toro Reservoir, Rancho Santa Margarita Lake, and Dove Canyon Lake, as shown in Figure 1. No revisions are necessary to HMP Table 3-2.

### **Exempt Large Rivers**

HMP Table 3-3 provided a summary of large river exemptions in South Orange County based on interim criteria. A subsequent detailed review of HMP Table 3-3 has been conducted as part of the Watershed Management Area Analysis (WMAA) to justify or appropriately modify the large river exemptions. A vicinity map of the two interim large river exemptions evaluated is provided in Figure 1, which also includes the appropriate modifications to HMP Table 3-3. Maps of each large river evaluated for exemption, San Mateo Creek and San Juan Creek, are provided in Figures 13 and 14.

The large river exemption for San Mateo Creek is being eliminated from HMP Table 3-3 because no South Orange County development is anticipated to discharge directly to this river, which is situated entirely outside the WMA, in San Diego County. Thus, a San Mateo Creek exemption is considered unnecessary and no justification is provided.

Justification for San Juan Creek's large river exemption is provided in the Rancho Mission Viejo (RMV) Runoff Management Plan (ROMP) (PACE et al, 2013). This reference is directly applicable given that the majority remaining urban development planned in the San Juan Creek watershed is associated with the RMV project. Chapter 15 of the ROMP states the following:

*The Conceptual WQMP [Water Quality Management Plan] (Geosyntec, 2004) established that, although the tributaries to San Juan Creek are susceptible to hydromodification impacts, the mainstem of San Juan Creek is not susceptible to hydromodification impacts from direct discharges from the planned Ranch Plan development. As stated in the Conceptual WQMP, San Juan Creek, given its watershed and channel characteristics, is considered to be able to accept additional flows without causing erosion. This conclusion was based on the watershed/sub-watershed-based hydrologic and fluvial geomorphologic studies and planning principles used to develop the Ranch Plan (Geosyntec, 2012). The resiliency of San Juan Creek is described by Balance Hydrologics (2005) as follows:*

*"The intrinsic resilience of these larger channels [San Juan Creek and lower Gabino channels] – which have a very similar channel form as that reflected in 1938 aerial photographs or 1947 topographic maps (PCR [et al], 2002) – is coupled with the proportionately smaller project-related discharges to minimize hungry-water effects on these two channels. In addition, these larger watersheds are inherently more dynamic systems than the side canyons, and better able to modulate the effects of any slight downstream erosion that may occur."*

## **Conclusion**

In conclusion, while the justifications for receiving water exemptions presented in this WMAA differs slightly from that provided in the South Orange County HMP, the extent of the exempt receiving waters is consistent with those used to create the HMP Exemption Maps (Figure 3-2 and Appendix F of the HMP). Thus these exemption maps are consistent with the E.3.c.(2)(d) exemption criteria and can continue to be used as a basis for evaluating whether hydromodification management requirements apply to areas in South Orange County. These Exemption Maps should be considered a living document to be updated by the Copermittees if more accurate information on drainage infrastructure and subcatchment delineation is obtained in the future.

## **REFERENCES**

- Balance Hydrologics, Inc. 2005. Geomorphologic Factors Affecting Sediment Generation and Transport Under Pre- and Post-Urbanization conditions at Rancho Mission Viejo and in the San Juan and San Mateo Watersheds, Orange County, California. June 2005.
- County of Orange. 2015. South Orange County Hydromodification Management Plan (HMP). OC Watersheds. April 1.
- County of Orange. 2016. Zoning Map. Planning Division.
- Geosyntec Consultants. 2004. Rancho Mission Viejo Conceptual Water Quality Management Plan. Prepared for Rancho Mission Viejo by Geosyntec Consultants, June 2004.
- Geosyntec Consultants. 2012. RMV ROMP Water Quality and Hydromodification Analysis, Memorandum. February 21, 2012.
- PACE, Geosyntec Consultants, and Huitt-Zollars. Rancho Mission Viejo Runoff Management Plan. 2013. Chapter 15: Rancho Mission Viejo Hydromodification Management Plan.
- PCR Services Corporation, Philip Williams and Associates, and Balance Hydrologics, Inc. 2002. Baseline Geomorphic and Hydrologic Conditions Report, Ranch Mission Viejo: Portions of the San Juan and Western San Mateo Watersheds, prepared for Rancho Mission Viejo.
- Southern California Association of Governments (SCAG). 2005. Land Use Map.