Appendix H
Marina Park Project Grunion Monitoring Plan

ANCHOR QEA

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MEMORANDUM

To:	Iris Lee, City of Newport Beach	**Date:**	June 13, 2014
From:	Adam Gale, Anchor QEA,LLC	**Project:**	130243-02.01
Cc:	Steve Cappellino, Anchor QEA,LLC		
Re:	Grunion Monitoring Plan for the Marina Park Project		

BACKGROUND

A new bayfront public park and marina is being developed in the Marina Park area of Balboa Peninsula in Newport Bay, California. In-water activities for the Marina Park Project include demolishing an existing groin wall, dredging approximately 53,000 cubic yards of sediment, and constructing new perimeter bulkhead walls, groin, and a marina. The new marina will be composed of concrete floating docks for 23 slips, gangways, and a dinghy storage area. In addition, dredged material will be used for beach nourishment at approved locations in Newport Harbor and on coastal beaches south of Newport Pier. On-shore construction started in early 2014; dredging is scheduled for mid- to late June 2014.

Prior to initiating sediment placement on beaches in Newport Beach, potential impacts to California grunion (*Leuresthes tenuis*) spawning activity must be evaluated in accordance with Special Condition 5C of the Coastal Development Permit (CDP; No. 5-10-229). Specifically, the receiving beach must be surveyed to determine whether California grunion are present and spawning during predicted run and egg incubation periods identified by the California Department of Fish and Wildlife (CDFW 2014). If grunion are present at a receiving beach, placement activities that would affect grunion spawning must cease until the next predicted run period in which no grunion are observed at the receiving beach.

This memorandum provides additional detail about receiving beaches, and areas within those beaches, that require grunion monitoring in accordance with the CDP. Information is also provided on when and how the California grunion surveys will be conducted, based on the predicted spawning and egg incubation periods identified by CDFW.

CALIFORNIA GRUNION MONITORING

Construction of the marina will require dredging using an excavator and bottom-dump barge. Dredged material will be placed at receiving sites by bottom-dump barge (nearshore disposal) or truck (dry sand beach placement). Material placed directly on the beach will be spread by a small bulldozer or front-end loader. Receiving sites are shown in Figure 1 and include:

- Beach adjacent to Marina Park project site (within Newport Harbor)
- China Cove (southeast portion of Newport Harbor)
- Marine Center (south side of Newport Pier, ocean beach)
- Nearshore Marine Environment (south side of Newport Pier)

Grunion spawning is not expected at all receiving sites, as described below.

Monitoring Locations

Grunion spawning events occur on sandy beaches along the Pacific Coast from Southern California to Northern Baja California (CDFW 2013). Limited wave action within the harbor does not facilitate beach access for grunion spawning or returning to the water after hatching. Thus, California grunion spawning is not known to occur on beaches with very little wave influence, such as China Cove or the beach adjacent to the Marina Park project site.

Sediment placed within the nearshore marine environment will be placed at a safe distance from the shoreline and with sufficient depth for a tugboat and bottom-dump scow to operate. In discussion with the U.S. Army Corps of Engineers, grunion spawning activities are not monitored during its nearshore disposal operations as the material replenishes the beaches through the natural seasonal movement of sand on to the beach through wave action and does not affect grunion spawning (Smith 2014).

Based on guidance provided from the City of Newport Beach (City) resulting from City staff experience with grunion runs in the area, and consistent with other projects of similar magnitude and geography, it is our opinion that the Marine Center placement location is the

only receiving site that requires grunion monitoring prior to placement activities (CDFW 2014; Love 2011; USACE 2012; CCC 2011).

Basis for Monitoring Timing

The timing and frequency of recommended monitoring is based on the predicted spawning and egg incubation periods of California grunion, which are in turn related to the lunar cycle and tides. Specifically, grunion beach themselves and spawn only during the 4 nights after the highest tide associated with each full or new moon. The fertilized eggs are later agitated by ocean waves prompting the eggs to hatch as they are swept to the ocean during the next high tide, approximately 10 days later (David 1939; Moffatt and Thomson 1978; Darken et al. 1998; Griem and Martin 2000). Due to the unique nature of these events, large disturbance of the beach as a result of sediment placement has the potential to greatly reduce grunion egg survival if eggs are present on the beach. The predictable spawning and hatching of the grunion are the basis for the required grunion survey described in the CDP.

Monitoring Methods

Grunion monitoring will occur at the receiving site during the applicable predicted grunion run time periods listed by CDFW for 2014, if sediment placement is planned for the receiving site. Predicted grunion runs occur from June through the end of August (Table 1). Monitoring will be initiated at the receiving site 30 minutes prior to each expected grunion period that could be affected by sediment placement. Qualified scientists will monitor the receiving site for the presence of grunion and grunion spawning behavior. The spawning behavior will serve as an indication of grunion eggs on the receiving beach over the next 10 days, because sampling the sediment to determine the presence of grunion eggs is difficult due to their extremely small size (diameter 1.5 to 1.6 millimeters) (David 1939). Monitoring will occur during the entire time period predicted by CDFW as the expected grunion run time.

Table 1
CDFW Expected Grunion Runs

Month	Date	Expected Run Times
June	13	10:00 p.m. - midnight
	14	10:40 p.m. - 12:40 a.m.
	15	11:30 p.m. - 1:30 a.m.
	16	12:25 a.m. - 2:25 a.m.*
	27	9:50 p.m. - 11:50 p.m.
	28	10:20 p.m. - 12:20 a.m.
	29	10:55 p.m. - 12:55 a.m.
	30	11:30 p.m. - 1:30 a.m.
July	12	9:45 p.m. - 11:45 p.m.
	13	10:35 p.m. - 12:35 a.m.
	14	11:25 p.m. - 1:25 a.m.
	15	12:15 a.m. - 2:15 a.m.
	26	9:35 p.m. - 11:35 p.m.
	27	10:05 p.m. - 12:05 a.m.
	28	10:40 p.m. - 12:40 a.m.
	29	11:10 p.m. - 1:10 a.m.
August	10	9:35 p.m. - 11:35 p.m.
	11	10:25 p.m. - 12:25 a.m.
	12	11:15 p.m. - 1:15 a.m.
	13	12:05 a.m. - 2:05 a.m.
	25	9:50 p.m. - 11:50 p.m.
	26	10:20 p.m. - 12:20 a.m.
	27	10:55 p.m. - 12:55 a.m.

Note:
Times listed are in reference to grunion runs on Cabrillo Beach near Los Angeles Harbor. Grunion run time vary along the coast and may be 5 minutes earlier in San Diego and 25 minutes earlier in Santa Barbara.

If grunion are observed, photographs will be taken for documentation and GPS coordinates will be logged to delineate the area in which grunion eggs are likely to be present as a result of the spawning activity. Photographs will also be taken to document the absence of grunion on the beach during the required monitoring time period. If grunion are present and spawning during the monitoring period, the City will be notified that dredged material cannot be placed within 150 feet of the high water line within the receiving site, which is the area in which grunion eggs are predicted to be developing until the next highest tide (approximately 10 days later), at which time the eggs will have presumably hatched. During the 10 day egg incubation period following observed grunion spawning, the contractor may continue to place dredged material in the portion of the receiving site that is at least 150 feet above the high water line.

All field activities will be recorded on field forms logged by qualified scientists. These forms will provide a description of the monitoring time period and activities, GPS coordinates of the area monitored and location of observed grunion (if applicable), monitoring personnel, weather conditions, and a record of any communication with the City.

Reporting

Inspection reports will be prepared following each California grunion monitoring event. The report will include a cover letter summarizing field monitoring efforts, any grunion spawning observed, and recommendations for dredged material placement changes if appropriate. Following the City's review, inspection reports will be submitted to the California Coastal Commission Executive Director and to the CDFW.

REFERENCES

CCC (California Coastal Commission), 2011. Staff Report: Regular Calendar. Coastal Development Permit No. 5-11-006-[OC Parks]. Exhibit 6: Grunion Protection Plan for Necessary Maintenance During the Grunion Spawning Season of March through September. Document dated September 7, 2006.

CDFW (California Department of Fish and Wildlife), 2014. California Grunion Facts and Runs. Accessed on: June 3, 2014. Available online from: https://www.dfg.ca.gov/marine/grunionschedule.asp.

Smith, L., 2014. Personal communication between Larry Smith, U.S. Army Corps of Engineers Los Angeles District and Steve Cappellino, Anchor QEA. May 23, 2014.

Darken, R.S., K.L. Martin, and M.C. Fisher, 1998. Metabolism during delayed hatching in terrestrial eggs of a marine fish, the grunion *Leuresthes tenuis*. *Physiological and Biochemical Zoology*, 71: 400-406.

David, L.R., 1939. Embryonic and early larval stages of the grunion, *Leuresthes tenuis*, and of the sculpin, *Scorpaena guttata*. *Copeia*, *1939*: 75-81.

Griem, J.N. and K.L.M. Martin, 2000. Wave action: the environmental trigger for hatching in the California grunion *Leuresthes tenuis* (*Teleostei: Atherinopsidae*). *Marine Biology*, *137*: 177-181.

Love, M.S., 2011. *Certainly More Than You Want To Know About the Fishes of the Pacific Coast*. Santa Barbara: Really Big Press.

Moffatt, N.M. and D.A. Thomson, 1978. Tidal influence on the evolution of egg size in the grunions (*Leuresthes*, *Atherinidae*). *Environmental Biology of Fishes*, 3: 267-273.

USACE (U.S. Army Corps of Engineers Los Angeles District), 2012. Public Notice. Application for Regional General Permit (RGP). Public Notice/Application No. SPL-2010-00868-SME. Orange County Public Works Ocean Outlet Maintenance Program.

MARINA PARK SAND DISPOSAL LOCATIONS

PROJECT SITE, 17TH TO 18TH STREETS

1. 16TH TO 19TH STREETS (1,500 CY)
2. CHINA COVE (5,000 CY)
3. MARINE CENTER TO 19TH STREET, ABOVE HIGH TIDE LINE (+7' MLLW) (10,000 CY)
4. NEAR SHORE DISPOSAL, 6TH TO 16TH STREETS (ALTERNATE UPON APPROVAL BY CITY)
5. NEAR SHORE DISPOSAL, 40TH TO 52ND STREETS (REMAINING QUANTITY)
6. DISPOSAL AT LA-3 (ALTERNATE UPON APPROVAL BY CITY)

NOTE: ANY DREDGE DEPOSIT / BEACH NOURISHMENT ACTIVITY MUST AVOID SENSITIVE AQUATIC OR TERRESTRIAL HABITAT PER THE PROJECT PERMIT SPECIAL CONDITIONS.

1/8 0' 1/8 1/4
SCALE: 1"=1/8 MILE

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Marina Park
City of Newport Beach

REVISIONS | DATE

PACKAGE 2 - BASIN

JOB NO.:	2005.14
DRAWN BY:	CF / TM / RS / SS
DATE:	1/18/13
CITY PROJECT NO.	C-3857

TITLE: DREDGED SAND RECEIVING SITES

SHEET: DR1.03

XREF:
FILE PATH: P:\7173 Marina Park\10 CAD_7173000R1.03.dwg; Jan 29, 2013 - 12:37pm;