



## **Merkel & Associates, Inc.**

5434 Ruffin Road, San Diego, CA 92123

Tel: 858/560-5465 • Fax: 858/560-7779

e-mail: associates@merkelinc.com

May 4, 2009  
M&A #07-046-03

Eileen Maher  
San Diego Unified Port District  
P.O. Box 120488  
San Diego, CA 92112



### **Re: Fish Enhancement Structures, Chula Vista Tidelands Park Borrow Pit, San Diego Bay, California 1<sup>st</sup> Quarterly Report**

Dear Eileen:

This letter reports the biological observations made at the south bay artificial reef sites. The reef structures were installed by Merkel & Associates, Inc. (M&A) on December 11, 2008 (M&A 2008a). These observations constitute the first quarterly biological monitoring of the artificial reef site. Additionally, the reef installation positions for this project and a previously installed set of reef structures were used to generate a new bathymetric surface for the site.

#### **Biological Survey**

The biological survey in south bay was performed on March 3 by M&A biologist, Heather Krish. Due to extreme turbidity in the water, the visibility was not suitable to make observations of vertebrates that may have been present. Suspended sediment plumes, presumably from fleeing bass or flatfish, were observed; however, no fish could be positively identified. There were signs of burrowing invertebrates in the surrounding mud bottom similar to the surrounding bay bottom. There were no signs of colonizing motile invertebrates (e.g. shed carapaces or body parts). The A-jacks were covered in a light sediment load and were bare of any algal growth. There was no algal growth on the surrounding mud bottom.

#### **Bathymetry Survey**

Data derived from a 2008 Merkel & Associates, Inc. San Diego bay wide bathymetry surface was used as a base map for development of the reef bathymetry surface (M&A 2008b). Coordinates for each reef placement structure and the reef heights, measured from sea floor to pinnacle by a diver, were used to create a reef height surface. The addition of the bathymetry surface and the reef height surface resulted in a new bathymetry surface containing the reef heights (Figure 1). Table 1 lists the central position (UTM WGS 1984 Zone 11) of each reef structure and the corresponding depth in feet (MLLW).

It has been a pleasure working on this project with the Port of San Diego. We look forward to the next monitoring event in June 2009. If you have any questions regarding this letter or the included materials, please contact me at (858) 560-5465.

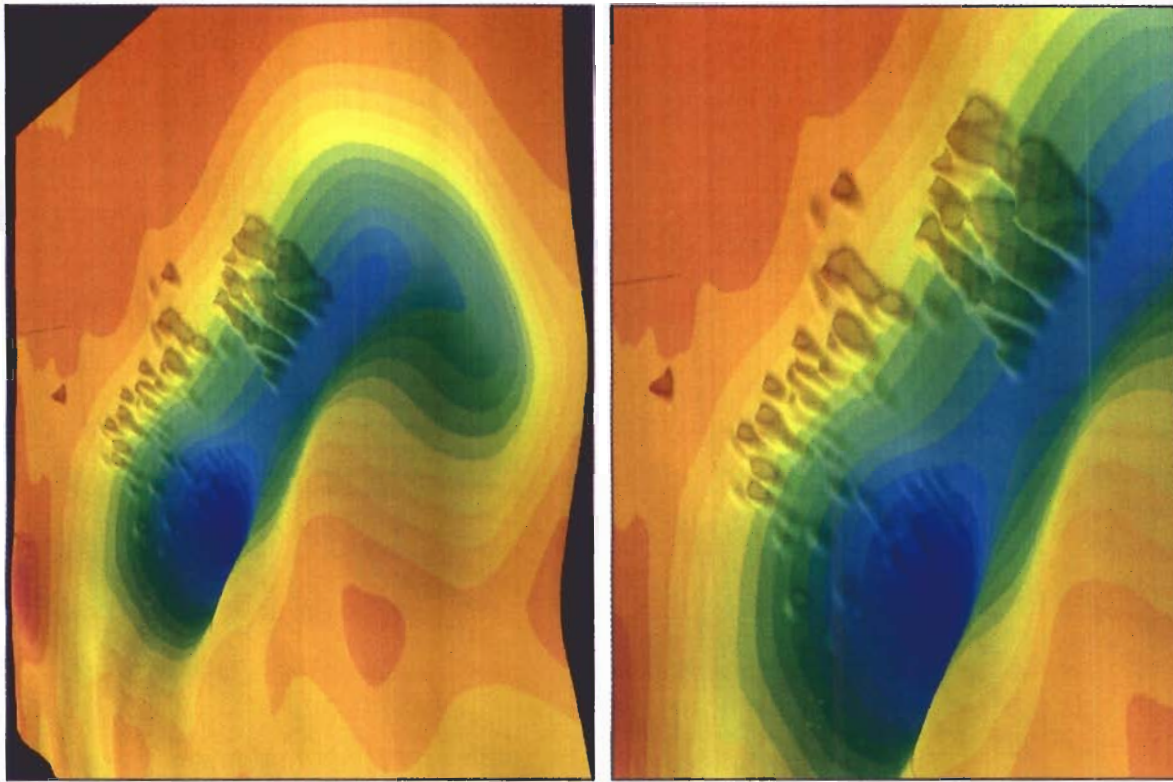
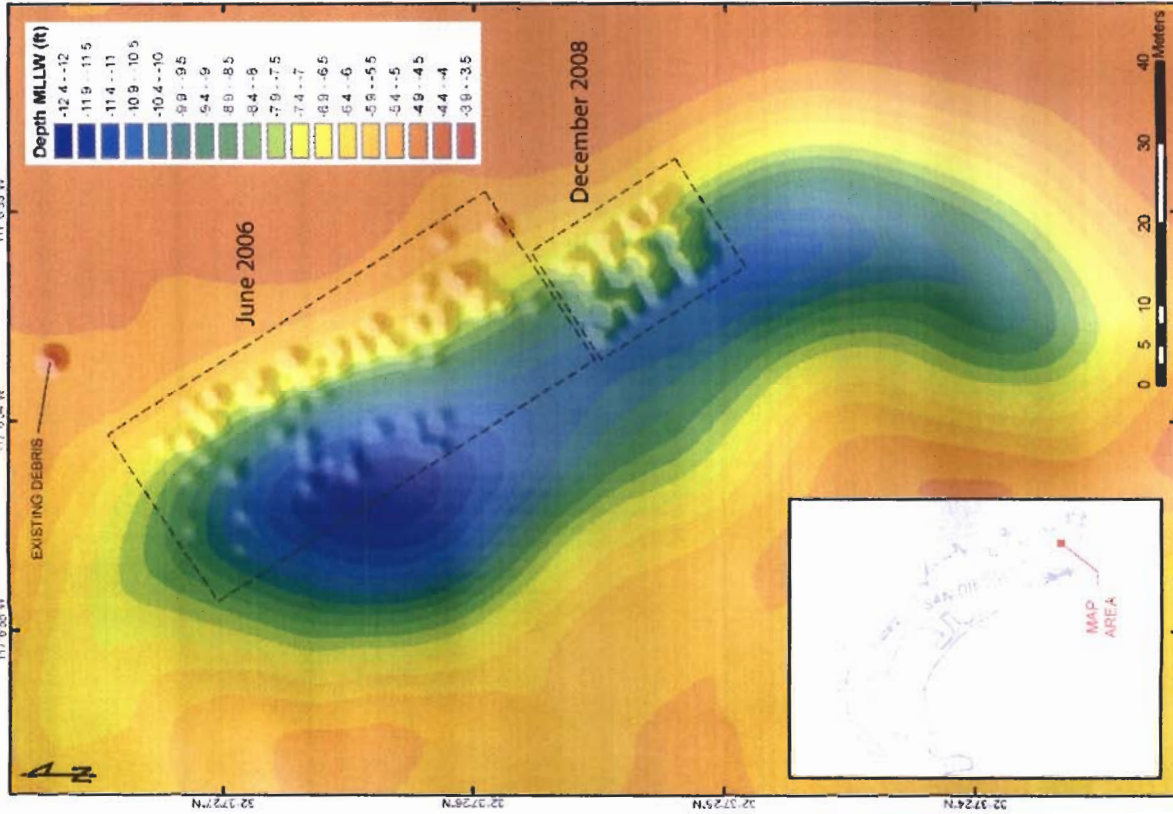
Sincerely,

A handwritten signature in black ink, appearing to read "Robert Mooney". The signature is fluid and cursive, with a horizontal line underneath the name.

Robert Mooney, Ph.D.  
Senior Biologist

**References:**

- [M&A] Merkel & Associates, Inc. 2008a. Embarcadero Fishing Pier and Le Meridien Fish Enhancement Structures. Letter report regarding installation process. Prepared for the San Diego Unified Port District. May 15, 2008.
- [M&A] Merkel & Associates, Inc. 2008b. Composite Bathymetric Map for San Diego Bay. Prepared for the San Diego Unified Port District and US Navy Southwest.



**Artificial Reef Placement Structures  
South San Diego Bay, San Diego, California  
June 2006 & December 2008**

**Figure 1**

**Table 1. Reef structure positions and top of reef structure elevations for structures placed in June 2006 and December 2008 at the former Chula Vista borrow pit in south San Diego Bay. Position data are in UTM (zone 11), meters, NAD 83. Elevations are in feet MLLW.**

<b>Easting</b>	<b>Northing</b>	<b>Elevation</b>	<b>Easting</b>	<b>Northing</b>	<b>Elevation</b>
489,230.74	3,609,586.35	-7.4	489,218.94	3,609,615.08	-6.7
489,233.63	3,609,572.09	-8.4	489,221.04	3,609,614.56	-6.1
489,233.32	3,609,581.85	-6.8	489,222.09	3,609,612.08	-5.9
489,233.10	3,609,584.98	-7.0	489,223.96	3,609,610.14	-5.6
489,237.66	3,609,582.04	-6.6	489,221.71	3,609,608.19	-6.5
489,235.10	3,609,573.93	-7.8	489,223.96	3,609,604.59	-6.2
489,238.34	3,609,574.58	-6.8	489,224.04	3,609,601.97	-6.5
489,228.41	3,609,582.47	-8.5	489,225.68	3,609,601.89	-6.0
489,236.72	3,609,574.11	-7.4	489,230.03	3,609,600.32	-5.2
489,233.53	3,609,588.04	-7.0	489,230.40	3,609,598.52	-5.5
489,238.22	3,609,578.50	-6.5	489,226.96	3,609,595.00	-7.0
489,234.86	3,609,582.87	-6.7	489,226.51	3,609,597.25	-6.6
489,229.86	3,609,584.33	-7.4	489,228.53	3,609,597.25	-6.1
489,233.05	3,609,579.46	-7.4	489,228.61	3,609,599.42	-5.7
489,239.40	3,609,573.38	-7.4	489,236.02	3,609,595.00	-4.8
489,234.89	3,609,577.07	-7.8	489,205.38	3,609,632.91	-8.4
489,238.25	3,609,576.90	-6.5	489,207.55	3,609,630.89	-8.3
489,242.33	3,609,575.07	-6.4	489,205.90	3,609,627.82	-9.4
489,239.79	3,609,576.44	-6.5	489,210.70	3,609,621.75	-9.5
489,236.23	3,609,582.79	-6.8	489,215.50	3,609,616.95	-8.4
489,233.34	3,609,576.04	-8.3	489,219.77	3,609,603.32	-8.3
489,234.81	3,609,581.26	-6.6	489,221.79	3,609,603.24	-7.6
489,234.64	3,609,584.50	-7.2	489,220.29	3,609,606.16	-7.7
489,228.80	3,609,579.28	-8.6	489,208.83	3,609,602.57	-11.4
489,233.39	3,609,577.66	-7.4	489,209.50	3,609,604.82	-11.4
489,233.57	3,609,574.41	-8.8	489,206.13	3,609,612.83	-11.8
489,234.57	3,609,586.83	-6.8	489,208.00	3,609,613.51	-11.4
489,229.95	3,609,582.01	-8.5	489,207.33	3,609,615.46	-11.4
489,235.15	3,609,579.45	-7.5	489,204.26	3,609,618.38	-11.4
489,228.87	3,609,585.77	-8.1	489,198.56	3,609,624.60	-10.5
489,226.87	3,609,582.56	-8.4	489,200.89	3,609,626.17	-10.3
489,239.40	3,609,579.63	-6.4	489,209.88	3,609,618.75	-10.2
489,234.68	3,609,570.88	-9.0	489,207.55	3,609,618.30	-11.0
489,231.49	3,609,584.80	-7.0	489,212.35	3,609,602.27	-10.7
489,229.98	3,609,580.41	-8.5	489,211.82	3,609,605.49	-10.8
489,237.47	3,609,572.56	-7.8	489,211.15	3,609,609.91	-10.8
489,230.55	3,609,576.87	-7.9	489,196.91	3,609,626.39	-10.0
489,231.98	3,609,576.12	-7.8	489,199.09	3,609,632.76	-9.0
489,241.33	3,609,576.35	-6.4	489,214.37	3,609,632.99	-6.1
489,236.70	3,609,579.31	-6.5	489,209.58	3,609,636.28	-6.7
489,231.50	3,609,579.60	-8.0	489,213.17	3,609,631.49	-6.6
489,225.87	3,609,583.84	-9.1	489,214.15	3,609,624.60	-7.5
489,209.65	3,609,633.06	-6.8	489,216.47	3,609,620.92	-7.5
489,211.90	3,609,630.14	-6.7	489,214.15	3,609,619.88	-8.5
489,215.35	3,609,629.84	-5.9	489,220.44	3,609,611.33	-7.1
489,215.87	3,609,625.34	-6.3	489,222.54	3,609,606.24	-6.9
489,214.97	3,609,622.95	-7.1	489,227.18	3,609,604.22	-6.0
489,217.29	3,609,624.15	-6.0	489,229.13	3,609,604.22	-5.6
489,217.52	3,609,618.68	-6.7	489,227.63	3,609,601.37	-6.2
489,218.64	3,609,617.25	-6.6	489,234.83	3,609,601.82	-5.1
489,219.99	3,609,620.33	-5.8	489,226.66	3,609,590.66	-8.2