SAN DIEGO UNIFIED PORT DISTRICT

MEMORANDUM

Date: October 11, 2021

To: Board of Port Commissioners

Via: Jason H. Giffen
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From: Karen Holman
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Subject: Agenda Related Materials- Additional Shelter Island Yacht Basin Water Quality Information

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The purpose of this memo is to provide agenda related material for Agenda Item 2021-0345 that includes additional water quality information for Shelter Island Yacht Basin (SIYB). This information became available after the completion of the agenda sheet for Agenda Item 2021-0345.

Investigative Order No. R9-2011-0036 (Investigative Order) issued by the San Diego Regional Water Quality Control Board (Regional Board) to the District requires that the District provide technical reports on the progress of implementation of the SIYB Dissolved Copper Total Maximum Daily Load (TMDL). The District conducts the Investigative Order's required annual water quality monitoring for dissolved copper every summer.

The most recent annual monitoring was conducted on August 24, 2021 and preliminary, draft water quality data recently became available. This data is still in draft form and has yet to undergo the full quality assurance/quality control (QA/QC) process. However, it is important to share the preliminary draft data in this memo as it has relevance to Board Agenda Item 2021-0345 and the recommended temporary pause of in-water hull cleaning for boats with copper-based antifouling paints in the SIYB (Hull Cleaning Pause). A summary of the 2021 draft data and a description of the remaining QA/QC process were provided to the District in a Technical Memo from Wood Environment & Infrastructure Solutions (Wood) the District's environmental consultant. The information is included as Attachment A.

Subject: Agenda Related Materials- Additional Shelter Island Yacht Basin Water Quality Information

For 2021, the SIYB dissolved copper water quality average, as well as individual monitoring station concentrations, exhibited an overall decrease in dissolved copper concentrations when compared to recent past monitoring events. The 2021 basin average was 4.9 µg/L.

While the driving factor behind the most recent improvement in water quality cannot be determined from draft data alone, areas for consideration as potential explanations for the recent improvement in water quality concentrations may be related to on-going paint transitions, cooler water temperatures in 2021, and/or recent hull cleaning engagement efforts.

The 2021 draft water quality data for SIYB is encouraging, however it should be cautioned that one data point does not equate to a trend of water quality improvement. Similar improvements in water quality also were observed in 2013. However, water quality in subsequent years did not continue to improve and instead returned to averages consistent with baseline measurements. And although the 2021 draft water quality data is promising, the basin average, as well as individual stations, remain above the 3.1 µg/L state standards, reaffirming the point that additional efforts are needed to further improve water quality.

The data was shared with the Regional Board. Both District and Regional Board staffs agreed that, in light of this new information, it is important to conduct the Hull Cleaning Pause because it will be valuable to couple this information with the findings from the water quality data collected during the hull cleaning pause. Furthermore, if the improvement continues into future monitoring years, the information gleaned from the Hull Cleaning Pause will help the regulatory agencies and the District determine what measures are needed to improve water quality and achieve TMDL compliance.

If you have any questions, please contact Karen Holman at (619) 725-6073 or via email at kholman@portofsandiego.org or Kelly Tait at (619) 348-1690 or via email at ktait@portofsandiego.org.

Attachments:

Attachment A: October 4, 2021 Wood PLC Technical Memorandum: Draft 2021 SIYB Annual Monitoring Data

Attachment A

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October 5, 2021

Ms. Karen Holman
Port of San Diego
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Subject: Draft Preliminary Results for 2021 Annual Summer Compliance Monitoring for the SIYB Dissolved Copper TMDL

Sampling and Analysis

The 2021 annual summer compliance monitoring for the Shelter Island Yacht Basin (SIYB) Dissolved Copper Total Maximum Daily Load (TMDL) was conducted on August 24, 2021. Surface water samples (1-meter below the surface) were collected from six stations within SIYB (SIYB-1 at the head of the basin through SIYB-6 at the mouth of the basin) and two reference stations in the main channel of San Diego Bay (SIYB-REF-1 and SIYB-REF-2). In addition, quality control (QC) samples were collected, which included an independent replicate sample at Station SIYB-1 (SIYB-1 [Rep]), a field blank, and an equipment rinsate blank. Sampling procedures were conducted in accordance with procedures described in the SIYB TMDL Monitoring Plan and Quality Assurance Project Plan (QAPP).

After collection, each water sample was sent to the analytical chemistry laboratory to be analyzed for dissolved and total copper and zinc, dissolved organic carbon (DOC), total organic carbon (TOC), and total suspended solids (TSS). A subset of samples (SIYB-1 through SIYB-6 and SIYB-REF-1) were also sent to the toxicology laboratory for toxicity testing. Toxicity testing consisted of (1) a 48-hour chronic bioassay test using mussel larvae (*Mytilus galloprovincialis*) and (2) a 96-hour acute bioassay test using Pacific topsmelt (*Atherinops affinis*).

Draft Preliminary Results

Draft preliminary results for the 2021 summer monitoring event are presented in Table 1. This table includes all data received from the chemistry laboratory, as well as preliminary data received from the toxicology laboratory. Note that the initial quality assurance (QA) review has been performed on the chemistry data; final QA review of the chemistry data will be completed and summarized upon receipt of the complete QA/QC results for the TOC analyses (matrix spike and matrix spike duplicate results), which are currently incomplete. No QA review has been performed on the draft preliminary toxicity data. In addition, the bivalve larvae test results are still being analyzed at the time of this memo; only draft preliminary results for Station SIYB-1 are included.

Chemistry

During the 2021 summer monitoring event, dissolved copper concentrations in SIYB ranged from 1.3 micrograms per liter (µg/L) at the mouth of the basin (SIYB-6) to 6.7 µg/L at the head of the basin (SIYB-1; dissolved copper concentration for the SIYB-1 replicate sample was 7.8 µg/L). The

2021 summer basin-wide average dissolved copper concentration (including Stations SIYB-1 through SIYB-6) was 4.9 µg/L. For comparison, dissolved copper concentrations over time (2011–2021) are presented in Table 2.

Toxicity

Draft preliminary results from the chronic bivalve larvae test indicate that there was no statistically significant effect to bivalve larvae at Station SIYB-1 (Table 1). Bivalve larvae test results from the remaining stations are pending for the summer 2021 monitoring event. For comparison, bivalve larvae test results over time (2012–2021) are presented in Table 3.

As in previous years, no acute toxic response was observed in larval topsmelt in the summer of 2021 (Table 1).

Attachment A

Table 1. DRAFT Water Quality and Toxicity Results Summary
2021 SIYB Dissolved Copper TMDL Summer Monitoring
Sample Collection Date: 08/24/2021

Station ID	Dissolved Copper (µg/L)	Total Copper (µg/L)	Dissolved Zinc (µg/L)	Total Zinc (µg/L)	DOC (mg/L)	TOC (mg/L)	TSS (mg/L)	Bivalve Larvae Development (% Normal/Alive in Undiluted Test Water)		Fish Survival (% Alive in Undiluted Test Water)
								Unfiltered	Filtered	Unfiltered
SIYB-REF-2	1.4	2.0	4.1	5.0	1.3	1.4	11	NT[a]	NT[a]	NT[a]
SIYB-REF-1	0.98	1.4	2.6	3.4	1.2	1.4	7	TBD	TBD	90.0
SIYB-6	1.3	2.3	3.8	5.6	1.4	1.3	8	TBD	TBD	96.7
SIYB-5	2.9	3.8	7.8	8.9	1.4	1.3	5	TBD	TBD	90.0
SIYB-4	**6.5**	9.4	15	17	1.3	1.3	7	TBD	TBD	90.0
SIYB-3	**6.2**	8.9	16	20	2.5	1.3	4 J	TBD	TBD	93.3
SIYB-2	**5.5**	7.9	16	18	2.4	1.4	10	TBD	TBD	96.7
SIYB-1	**6.7**	12	19	22	1.5	1.4	6	88.6	83.9	90.0
SIYB-1 (Rep)	**7.8**	9.9	20	21	1.6	1.3	6	NA	NA	NA
Equip. Rinse	0.038	0.048	0.41	1.0	0.50	0.35	0.2 J	NA	NA	NA
Field Blank	ND	0.024	ND	0.045 J	0.33	0.34	0.9 J	NA	NA	NA

Notes:

The initial quality assurance (QA) review has been performed on the chemistry data; final QA review of the chemistry data will be completed and summarized upon receipt of the complete QA/QC results for the TOC analyses (matrix spike and matrix spike duplicate results), which are currently incomplete. No QA review has been performed on the draft preliminary toxicity data. In addition, the bivalve larvae test results are still being analyzed at the time of this memo; only draft preliminary results for Station SIYB-1 are included.

Values in **bold** are above the EPA National Recommended Water Quality Criteria Continuous Concentration (CCC) for dissolved copper of 3.1 µg/L in marine waters.

µg/L – microgram(s) per liter; % - percent; DOC – dissolved organic carbon; ID – identifier; mg/L – milligram(s) per liter; NA – not applicable; NT – not tested; REF – reference; (Rep) – replicate; SIYB – Shelter Island Yacht Basin; TMDL – Total Maximum Daily Load; TOC – total organic carbon; TSS – total suspended solids

J – estimated concentration detected between the reporting limit and the method detection limit

ND – non-detect

a. A second reference site (SIYB-REF-2) was added in 2020. No toxicity testing is performed at this site.

TBD – to be determined. Bivalve larvae test results are still being analyzed and undergoing QA review.

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Attachment A

Table 2. DRAFT Dissolved Copper Levels Measured During SIYB TMDL Monitoring Events (2011–2021)

Station ID	Dissolved Copper (µg/L)											
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2021
	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Winter	Summer
SIYB-REF-2	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	1.0	1.8	1.4
SIYB-REF-1	2.1	0.8	0.37	0.62	0.67	1.5	0.95	0.65	1.9	0.29	1.1	0.98
SIYB-6	**7.5**	2.9	2.0	1.8	1.7	1.7	1.8	1.9	**4.1**	0.77	1.8	1.3
SIYB-5	**8.7**	**3.3**	**4.1**	**6.0**	**3.4**	**3.3**	**3.4**	**6.2**	**4.9**	**5.4**	**6.3**	2.9
SIYB-4	**7.8**	**5.6**	**5.3**	**7.2**	**7.4**	**8.5**	**7.9**	**7.4**	**8.1**	**9.0**	**8.2** [b]	**6.5**
SIYB-3	**7.6**	**7.7**	**4.4**	**7.7**	**6.8**	**9.2**	**9.1**	**7.4**	**11**	**9.9**	**7.5** [c]	**6.2**
SIYB-2	**7.2**	**7.8**	**5.0**	**7.3**	**11**	**8.9**	**13**	**7.0**	**8.1**	**10**	**8.3**	**5.5**
SIYB-1	**11.5**	**9.6**	**8.6**	**12**	**11**	**11**	**12**	**10**	**15**	**15**	**10**	**6.7**
SIYB Basin-Wide Average*	**8.4**	**6.2**	**4.9**	**7.0**	**6.9**	**7.1**	**7.9**	**6.7**	**8.5**	**8.3**	**7.0**	**4.9**

Notes:

The initial quality assurance (QA) review has been performed on the chemistry data; final QA review of the chemistry data will be completed and summarized upon receipt of the complete QA/QC results for the TOC analyses (matrix spike and matrix spike duplicate results), which are currently incomplete.

Values in **bold** are above the EPA National Recommended Water Quality Criteria Continuous Concentration (CCC) for dissolved copper of 3.1 µg/L in marine waters.

µg/L – microgram(s) per liter; ID – identifier; NA – not applicable; REF – reference; SIYB – Shelter Island Yacht Basin; TMDL – Total Maximum Daily Load

a. A second reference site (SIYB-REF-2) was added in 2020. No historical results are currently available for this site.

b. During the 2021 winter sampling event, approximately 20 vessels were moored at the La Playa Cove Anchorage, which precluded the field team from sampling at the designated sampling location at Station SIYB-4. As a result of these obstructions, it was determined in the field to move the SIYB-4 sampling location approximately 60 meters east-northeast to open water.

c. During the 2021 winter sampling event, approximately 20 vessels were moored at the La Playa Cove Anchorage, which precluded the field team from sampling at the designated sampling location at Station SIYB-3. As a result of these obstructions, it was determined in the field to move the SIYB-3 sampling location approximately 10 meters east to open water.

* SIYB Basin-Wide Average does not include SIYB-REF-1 or SIYB-REF-2.

2011 data collected by Weston Solutions, Inc.

2012-2021 data collected by Wood Environment & Infrastructure Solutions, Inc. (formerly Amec Foster Wheeler)

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Attachment A

Table 3. DRAFT Bivalve Larvae Development Measured During SIYB TMDL Monitoring Events (2012–2021)

Station ID	Bivalve Larvae Development (% Normal/Alive in Undiluted/Unfiltered Test Water)										
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2021
	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Winter	Summer
SIYB-REF-2	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NA[a]	NT[a]	NT[a]	NT[a]
SIYB-REF-1	95.5	79* [b]	92	91	92	96.7	90.4	97.0	94.0	90.1	TBD
SIYB-6	88.0	100	89	93	91	96.7	88.2	97.3	93.2	90.8	TBD
SIYB-5	94.3	97	93	94	91	97.2	86.3	97.9	82.3	89.1	TBD
SIYB-4	91.7	98	85	90	82	94.7	86.9	95.2	87.0	91.4 [c]	TBD
SIYB-3	75.5	95	89	92	79	89.1	85.6	94.6	80.1	90.9 [d]	TBD
SIYB-2	65.5*	96	86	66*	74*	71.4*	87.9	96.0	87.6	87.8	TBD
SIYB-1	25.8*	50*	41*	49*	38*	41.9*	55.2*	26.0*	49.7*	40.7*	88.6

Notes:

No QA review has been performed on the draft preliminary toxicity data for the summer 2021 monitoring event. In addition, the bivalve larvae test results are still being analyzed at the time of this memo; only draft preliminary results for Station SIYB-1 are included.

% – percent; NA – not applicable; NT – not tested; REF – reference; SIYB – Shelter Island Yacht Basin; TMDL – Total Maximum Daily Load

* Indicates a statistically significant decrease compared to control using both the traditional EPA flow-chart statistical methods and the TST analysis.

a. A second reference site (SIYB-REF-2) was added in 2020. No toxicity testing is performed at this site.

b. SIYB-REF undiluted and filtered sample did not result in a statistically significant reduction in normal bivalve larval development.

c. During the 2021 winter sampling event, approximately 20 vessels were moored at the La Playa Cove Anchorage, which precluded the field team from sampling at the designated sampling location at Station SIYB-4. As a result of these obstructions, it was determined in the field to move the SIYB-4 sampling location approximately 60 meters east-northeast to open water.

d. During the 2021 winter sampling event, approximately 20 vessels were moored at the La Playa Cove Anchorage, which precluded the field team from sampling at the designated sampling location at Station SIYB-3. As a result of these obstructions, it was determined in the field to move the SIYB-3 sampling location approximately 10 meters east to open water.

TBD – to be determined. Bivalve larvae test results are still being analyzed and undergoing QA review.

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