Adopted Basin Plan Amendment

The following text will appear as shown when the Basin Plan is updated. We will include language at the end of the second paragraph of 3.3.21 in Chapter 3 of the Basin Plan.

Site-specific objectives have been adopted for copper in segments of San Francisco Bay shown (see Figure 7.1), for nickel, in South San Francisco Bay, (Table 3-3A) and for cyanide in all San Francisco Bay segments (Table 3-3C)

Table 3-3A will now read as follows.

Table 3-3A: Water Quality Objectives for Copper and Nickel in San Francisco Bay

Compound	4-day Average (CCC)[1]	1-hr Average (CMC)[2]	Extent of Applicability
Copper	6.9	10.8	The portion of Lower San Francisco Bay south of the line representing the Hayward Shoals shown on Figure 7.1, and South San Francisco Bay.
Copper	6.0	9.4	The portion of the delta located in the San Francisco Bay Region, Suisun Bay, Carquinez Strait, San Pablo Bay, Central San Francisco Bay, and the portion of Lower San Francisco Bay north of the line representing the Hayward Shoals on Figure 7.1.
Nickel	11.9	62.4*	South San Francisco Bay

*Handbook of Water Quality Standards, 2nd ed. 1994 in Section 3.7.6 states that the CMC = Final AcuteValue/2; 62.4 is the Final Acute Value (resident species database)/2; so the site-specific CMC is lower than the California Toxics Rule value because we are using the resident species database instead of the National Species Database.

[1]Criteria Continuous Concentration

[2]Criteria Maximum Concentration

Amend the following language in Chapter 4 of the Basin Plan as follows:

SITE-SPECIFIC OBJECTIVES

Site-specific objectives have been adopted by the Water Board for copper in San Francisco Bay and for nickel in South San Francisco Bay, (Table 3-3A) and for cyanide in San Francisco Bay (Table 3-3C).

7.2. A WATER QUALITY ATTAINMENT STRATEGY TO SUPPORT COPPER SITE-SPECIFIC OBJECTIVES FOR SAN FRANCISCO BAY AND NICKEL SITE-SPECIFIC OBJECTIVES FOR SOUTH SAN FRANCISCO BAY

The Water Quality Attainment Strategy (WQAS) for copper in all San Francisco Bay segments (see Figure 7.1) and nickel in South San Francisco Bay is designed to prevent water quality degradation and ensure attainment of the copper and nickel site-specific objectives (SSOs). This section describes the details of the WQAS and how the Water Board will use its regulatory authority to implement this strategy.

The four elements of the WQAS are:

- Control measures/actions to minimize the discharge of copper-from wastewater treatment plants, urban runoff, anti-fouling boat paints, and lagoons to ensure that significant copper sources are properly managed;
- Statistically-based water quality "triggers" and a receiving water monitoring program that would initiate additional control measures/actions if the "triggers" are exceeded;

- Metal translators that will be used to compute copper and nickel effluent limits for the municipal wastewater treatment plants discharging to South San Francisco Bay.
- Metal translators that will be used to compute copper effluent limits for municipal and industrial wastewater treatment plants that discharge to deep water (see Section 4.5.2.2 for definition) north of the Dumbarton Bridge.

7.2.1 BACKGROUND

All San Francisco Bay segments (see Figure 7.1) meet water quality objectives for copper and nickel. Since the mid-1980s, because of effective treatment and successful pollution prevention and source control efforts, substantial reductions in metal loading to San Francisco Bay segments have been achieved. Other sources that are difficult to manage such as urban runoff (which includes copper from automobile brake pads), historical deposits of copper in the Bay sediments and natural sources of copper are among the dominant contributions to current ambient water concentrations. SSOs (see Chapter 3) for dissolved copper in all Bay segments (and nickel in South San Francisco Bay) have been derived using toxicity data representing site-specific conditions in all San Francisco Bay segments, and these SSOs fully protect San Francisco Bay beneficial uses.

7.2.2 IMPLEMENTATION PLAN AND MONITORING PROGRAM

This section discusses the actions and ambient monitoring program needed to ensure continued attainment of the copper site-specific objectives throughout San Francisco Bay and ensure that copper sources are properly managed so ambient copper levels do not increase due to potential increases in loading of copper to San Francisco Bay. The implementation plan also calls for requirements in NPDES permits to support investigations to resolve three key areas of remaining technical uncertainty regarding copper: urban tributary loads and trends; toxicity to benthic organisms; and possible effects on the olfactory system of salmonids.

7.2.2.1 Control Measures for Urban Runoff Management Agencies

The NPDES permits for urban runoff management agencies shall require the implementation of best management practices and copper control measures designed to prevent urban runoff discharges from causing or contributing to exceedances of copper water quality objectives. Requirements in each permit issued or reissued and applicable for the term of the permit shall be based on an updated assessment of control measures intended to reduce copper in stormwater runoff to the maximum extent practicable. Urban runoff management agencies must implement control measures targeting: vehicle brake pads, architectural copper, copper pesticides, and industrial copper use. Additionally, these permits shall contain requirements to conduct or cause to be conducted: monitoring of copper loading to the Bay at locations and frequency sufficient to track loading trends; and technical studies to investigate possible copper sediment toxicity and sublethal effects on salmonids.

If an ambient trigger concentration in any San Francisco Bay segment (see Section 7.2.2.5) is exceeded, all urban runoff management agencies discharging to that segment shall submit a report to the Water Board that describes best management practices that are currently being implemented and additional measures, with a schedule, that will be

implemented to prevent their copper discharges from causing or contributing to the exceedance.

7.2.2.2 Control Measures for Wastewater Treatment Facilities

The management measures for municipal and industrial wastewater treatment facilities will be implemented through their individual NPDES permits, which shall include the following elements:

- Water quality-based effluent limits (WQBELs) computed from the SSOs.
- Baseline Program of pollution prevention measures.
- Requirement to conduct or cause to be conducted technical studies to investigate possible copper sediment toxicity and sublethal effects on salmonids.
- Effluent Monitoring and Reporting.

The baseline pollution prevention measures for wastewater facilities include:

- Evaluate copper sources (all municipal and industrial facilities)
- Confirm industrial facility compliance with local pre-treatment copper limits (municipal facilities only)
- Control municipal water supply pipeline corrosion from commercial and residential sources (municipal facilities only)

More advanced, facility-specific pollution prevention measures shall be implemented by facilities that exceed a copper effluent limit due to increased copper influent loading compared to the previous year's performance. Additionally, if an ambient trigger concentration (see Section 7.2.2.5) is exceeded, each municipal and industrial wastewater facility discharging to that segment of the Bay shall evaluate the history of its facility's effluent copper concentrations. Those facilities with increasing copper effluent trends shall develop and implement plans to control these increasing levels.

METAL TRANSLATORS

An important regulatory element of the WQAS is the specification of metal translators. Water quality objectives for copper and nickel are expressed as dissolved metal concentrations. Effluent limits for the wastewater dischargers' treatment facilities are expressed as total metal concentrations and must be calculated according to the procedure outlined in the "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California". Therefore, for metals like copper and nickel, the calculation of an effluent limit requires the use of a ratio of total to dissolved metals called the metal translator.

South San Francisco Bay copper and nickel translators were developed using a regression relationship between the translators and total suspended solids (TSS). The translators were computed by evaluating the upper 95% confidence interval regression relationship at the median TSS value for South San Francisco Bay. For this reason, there is a single translator value for each metal (Table 7.2-1). The higher translators that result from using

the upper confidence level regression result in lower numeric effluent limits and provide an additional measure of protection of beneficial uses.

There is not a strong relationship between TSS and translators for the segments of the Bay north of the Dumbarton Bridge. There are geographic differences in computed translators between the northernmost segments and those in the southern segments the Bay. In such cases, median and 90th percentile translators can be computed from available data for use in computing average monthly and maximum daily effluent limits, respectively. The translators in Table 7.2-2 apply only to deepwater wastewater discharges to San Francisco Bay because the available translator data are not representative of shallow water discharge (defined as those wastewater discharges that have been granted an exception to the prohibition against wastewater discharges into non-tidal water, dead-end sloughs or at any point that wastewater does not receive dilution of at least 10:1) locations. Shallow water wastewater dischargers must develop translators applicable to the discharge location at the time of permit reissuance.

Table 7.2-1 Translators Applicable to South San Francisco Bay Municipal Wastewater Discharges for Copper and Nickel

Bay Segments	Copper Translator For Effluent Limit Calculation	Nickel Translator For Effluent Limit Calculation
South San Francisco Bay	0.53	0.44

Table 7.2-2 Translators Applicable to Other San Francisco Bay Municipal and Industrial Wastewater Deep Water Discharges for Copper

Bay Segments	Copper Translator For Average Monthly Effluent Limit Calculation	Copper Translator For Maximum Daily Effluent Limit Calculation
Suisun Bay San Pablo Bay	0.38	0.66
Central San Francisco Bay Lower San Francisco Bay	0.73	0.87

7.2.2.3 Copper From Anti-Fouling Boat Paint

Paints applied to boats and ships to control unwanted "fouling" growth on their hulls often contain copper-based biocides. In San Francisco Bay, there are major ports, industrial piers, and dozens of marinas. Boats and ships coated with copper-containing biocides may release copper directly into the Bay during storage, operation, and in-water maintenance.

The Water Board is relying on the authority of the California Department of Pesticide Regulation (DPR) to regulate the pesticidal use of copper in antifouling paints such that water quality objectives will be attained. The Water Board will work with DPR as it executes its regulatory strategy for biocides in marine antifouling coatings, which includes monitoring to evaluate water quality impacts and review of registration status.

7.2.2.4 Control Measures for Lagoons

There are many managed lagoons that are hydraulically connected to the Bay. Because of nutrient loading and stagnant conditions, excessive growth of aquatic plants and algae can cause nuisance conditions. In addition to mechanical harvesting, copper-based algaecides are used to control nuisance plant and algae growth. The application of these algaecides is permitted under the State Water Board's Statewide General NPDES Permit (Order No. 2004-0009-DWQ) for discharges of aquatic pesticides to surface waters. The Water Board recognizes coverage under the general permit as being sufficient to ensure that application of copper pesticides to lagoons shall not cause or contribute to violations of the water quality objectives.

7.2.2.5 Ambient Monitoring Program

The implementation plan establishes copper control measures in order to prevent increases in ambient dissolved copper concentrations. Ambient concentrations of copper in the Bay have remained essentially unchanged from 1993 through 2006 and are not expected to increase in the future. In order to determine systematically if ambient concentrations have increased, specific copper concentration triggers are compared to data collected through the Regional Monitoring Program for Trace Substances (RMP). This is accomplished by calculating every year the three-year rolling mean of RMP copper concentrations in segments of the Bay. These rolling mean concentrations will be

compared to trigger concentration values for each segment. The trigger concentrations (shown in Table 7.3) were calculated in order to detect a change (from 2003 concentrations) in dissolved copper concentration of about 1 µg/L with a statistical power of 99%. If the trigger concentration is exceeded in any Bay segment, the Water Board will investigate causes of the exceedance and potential control options and require wastewater and urban runoff dischargers to that segment to investigate whether they have caused or contributed to the exceedance and, if so, to identify and submit a plan and schedule to implement controls to resolve their contribution to the exceedance.

The Water Board will assess the continued appropriateness of the SSOs for San Francisco Bay should conditions change in Bay water quality. Dissolved organic carbon (DOC) will be used as a surrogate measure of the protective effect of Bay water against copper water column toxicity. An analysis and evaluation of trends in DOC data collected through the RMP will determine whether or not additional water column toxicity tests are needed to confirm that the SSOs are protective. In addition, the Water Board will evaluate sediment copper concentration and sediment toxicity data collected through the RMP to assess possible effects related to copper accumulation in Bay sediments. The need for a reevaluation of the SSOs or other regulatory actions will be established through the triennial review of the Basin Plan.

Table 7.3 Dissolved Copper (µg/L) Trigger Concentrations at 99% Statistical Power.

Bay Segment (or portion thereof)	Trigger Level (µg/L)
Suisun Bay	2.8
San Pablo Bay	3.0
Central San Francisco Bay Lower San Francisco Bay (north Hayward Shoals)	2.2
Lower San Francisco Bay (south of Hayward Shoals)	3.6
South San Francisco Bay	4.2

Figure 7.1 Segments of San Francisco Bay showing location of Hayward Shoals as a line connecting Little Coyote Point and the Oakland Airport.