

2009 Working Se TMDL Documents

Monitoring Plan



Regional Water Quality Control Board – Santa Ana Region

Workshop 2
January 30, 2014

Purpose

- To discuss the monitoring approach, objectives and minimum requirements proposed in the 2009 draft TMDL implementation plan

TMDL Monitoring Plan

- A regional, integrated monitoring and reporting approach offers the most effective and efficient method to assess TMDL attainment and provide data for future refinement of the Se TMDLs
 - ❖ Most cost-effective approach



TMDL Monitoring Plan

Expectation that RMP would be integrated with other TMDL tasks:

- ~~Compliance~~ Assessment monitoring program
- BMP effectiveness monitoring
- Selenium management programs (e.g., Big Canyon, IRWD/UCI wetlands)
- Special studies



Compliance vs. Assessment

- Compliance
 - Permitting options/issues
- Assessment
 - TMDL attainment



Regional Monitoring Plan

Goals identified:

- 1) Assess progress towards achieving the selenium TMDLs, including WLAs/LAs and numeric targets/SSOs
- 2) Provide data for the evaluation and future refinement of the Se TMDLs/SSOs
- 3) Integrate TMDL monitoring with other ongoing or proposed monitoring in response to permits or other requirements/projects

❖ Data collected from the Monitoring Program should help to identify priority areas in the watershed for BMP implementation and areas needing additional study or more focused monitoring



Assessment Monitoring

Minimum expectations of approvable ~~compliance~~ assessment monitoring program identified:

- Suggested routine monitoring parameters
- Fish/bird egg collection recommendations
- Suggested monitoring locations
- Numbers of samples and reporting frequency



Assessment Monitoring

Monitoring locations should be selected based on:

- Concentrations of selenium present
- Sensitivity of the habitat
- Type of hydrologic unit (e.g., lentic, lotic, wetlands) and hydrologic connections
- A reasonable assurance that the targeted samples will be present in sufficient numbers for the necessary analyses



Assessment Monitoring

8 representative locations suggested for assessment monitoring:

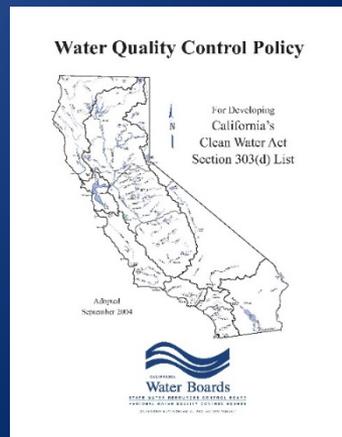
- Peters Canyon Wash up/s of San Diego Creek (PCW)
- Lower San Diego Creek (R1) up/stream of UNB (SDC)
- IRWD wetlands and Carlson Marsh (IRWD)
- UCI San Joaquin Marsh Reserve (UCI)
- Big Canyon Wash Nature Park wetlands (BCW)
- Santa Ana Delhi Channel (SADC)
- Upper and Lower Newport Bay (UNB, LNB)*

* No finding of impairment due to Se in the Bay, so will not be included in assessment monitoring. Periodic monitoring of Se in the Bay should be conducted whether as part of a Regional Monitoring Program for Se or as part of other required monitoring

Assessment Monitoring

Describes methods for assessing compliance with achievement of the tissue targets and recommended response actions:

- Special consideration because of difficulty in tissue sample collection
- Reliance on State 303(d) Listing Policy
- Recommendation for tiered assessment and triggers for additional actions



Assessing Attainment of the Se TMDLs Numeric Tissue Targets

Assessing attainment of both the proposed fish and bird egg tissue targets at all targeted locations in the watershed may be difficult.

- Not all locations provide sufficient habitat for fish and/or bird reproduction
- Habitat, accessibility, foraging opportunities, and nesting sites, among other factors, can vary significantly from year to year

Assessment Areas

Staff recommended grouping of sites where birds and fish are most likely to be found into assessment areas:

- Swamp of the Frogs Drainage area: PCW, SDC, and SADC sites
- Off-channel wetlands: UCI and IRWD/Carlson marsh wetlands
- Big Canyon Wash
- Upper and Lower Newport Bay*

* The Bay will no longer need to be included in the Assessment Monitoring as is not impaired for Se

Special Studies

- Several special studies suggested as part of the monitoring plan
- Many of these are no longer applicable or have been partially or fully completed in the last 5 years
 - Water balance for Swamp of the Frogs completed
 - Water balance for Big Canyon Wash nearing completion
- ❖ Will discuss this in more detail when potential modifications to the TMDL are presented

Monitoring – Additional Details



TMDL Monitoring Plan

Tissue and water column monitoring will be integral to the selenium TMDLs monitoring effort

- Water column monitoring will provide:
 - A direct mechanism for measuring progress towards achieving the TMDL allocations (both WCG-based and CTR-based)
 - An indirect means, via the translated WCGs, of measuring progress toward reaching the tissue targets and tissue-based SSOs



TMDL Monitoring Plan

Target Species for Tissue Monitoring

- Fish:

- Juvenile and adult fish in the Centrarchidae (sunfish) family (e.g., bluegill, largemouth bass) for direct comparison to the fish tissue target
- Juveniles or fingerlings of bluegill or largemouth bass, or smaller fish such as red shiners or fathead minnows for assessment of risk to fish-eating birds



TMDL Monitoring Plan

Target Species for Tissue Monitoring

- Bird Eggs:
 - Shorebirds (avocet, stilt; invertivorous birds), grebes (omnivorous or insectivorous birds), coots (omnivorous or herbivorous birds), terns or skimmers (piscivorous birds)



Monitoring Plan Considerations

- The proposed monitoring program should include a method for determining when the selenium TMDLs have been achieved
- The proposed methodology must be based on a statistically significant population of samples that accurately reflect the uncertainty associated with the analysis
- The monitoring and assessment methodology must be designed to assure the long-term protection of both the most sensitive and most exposed species of fish and birds in the watershed

Monitoring Plan Considerations

- The monitoring program must be adaptable and flexible and account for year-to-year differences in habitat, species availability and abundance, potential nesting sites, surface flows (in freshwater systems) and selenium concentrations in the watershed that are likely to occur
- The program should include a discussion of alternatives that can be used if the target species/sampling locations are not present or conditions for sample collection are not optimal
 - A decision tree should be developed to identify the triggers for the selection of the alternatives

TABLE 4.1: MAXIMUM NUMBER OF MEASURED EXCEEDANCES ALLOWED TO REMOVE A WATER SEGMENT FROM THE SECTION 303(D) LIST FOR TOXICANTS.

Null Hypothesis: Actual exceedance proportion ≥ 18 percent.

Alternate Hypothesis: Actual proportion < 3 percent of the samples

The minimum effect size is 15 percent.

Sample Size	Delist if the number of exceedances equal or is less than
28 – 36	2
37 – 47	3
48 – 59	4
60 – 71	5
72 – 82	6
83 – 94	7
95 – 106	8
107 – 117	9
118 – 129	10

For sample sizes greater than 129, the maximum number of measured exceedances allowed is established where α and $\beta \leq 0.10$ and where $|\alpha - \beta|$ is minimized.

α = Excel® Function BINOMDIST(k, n, 0.18, TRUE)

β = Excel® Function BINOMDIST(n-k-1, n, 1 - 0.03, TRUE)

where n = the number of samples,

k = maximum number of measured exceedances allowed,

0.03 = acceptable exceedance proportion, and

0.18 = unacceptable exceedance proportion.

Table 12-4. Tiered Compliance Assessment and Proposed Actions Approach; Selenium TMDLs Monitoring Program, Newport Bay Watershed. Whole-body Fish Tissue and Bird Egg Tissue considered separately for exceedance of targets for each Compliance Assessment Site/Area.

Tier	Frequency of Exceedance of Tissue Targets*	Proposed Action
1: Compliance	Less than 8%* (no egg to exceed 16 ug Se/g dw; no fish tissue composite to exceed 10 ug Se/g dw)†	Continued monitoring Continue BMP Strategic Plan
2: Non-compliance	8-18%**	All actions in Tier 1, plus: Identify sites for increased sampling Identify potential sources/causes for outlier results Reassess the Newport Bay biodynamic model parameters and results (partitioning coefficients, trophic transfer factors, water quality guidelines, etc.) Identify options for focused BMP enhancements, need for and nature of additional BMPs or other implementation actions; Implement appropriate measures in a timely manner
3: Non-compliance	Over 18%***	All actions in Tier 2, plus: Resample biota Increase sampling (include selenium speciation in water column samples) Institute special studies as needed Assess need for additional source controls Early/timely implementation of additional BMPs

* This is based on the State Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, September 2004 (State Listing Policy). The Listing Policy determination for findings of impairment is based on a binomial distribution and varies depending on the total number of samples from 6-8%. However, the number of tissue samples per year is expected to be highly variable. If the data meet the Listing Policy delisting criteria and fall into the Tier 1 category, the compliance assessment area is considered to be in compliance with the TMDLs.

† These not-to-exceed concentrations will ensure compliance with the Migratory Bird Treat Act and protection of the beneficial uses in the Newport Bay watershed.

** Tier 2 represents progress towards achieving compliance, but recognizes that additional actions are necessary to ensure that compliance is achieved by the end of the implementation period. The upper end of the frequency of exceedance range is based on the unacceptable exceedance proportion identified in Table 4.1 within the Listing Policy. The lower end of the frequency of exceedance range is just above the upper end of the allowable frequency of exceedance range.

*** Tier 3 represents an assessment area for which meeting the tissue targets requires more significant actions than Tier 2. The frequency of exceedance range is based on the unacceptable exceedance proportion identified in Table 4.1 within the Listing Policy.