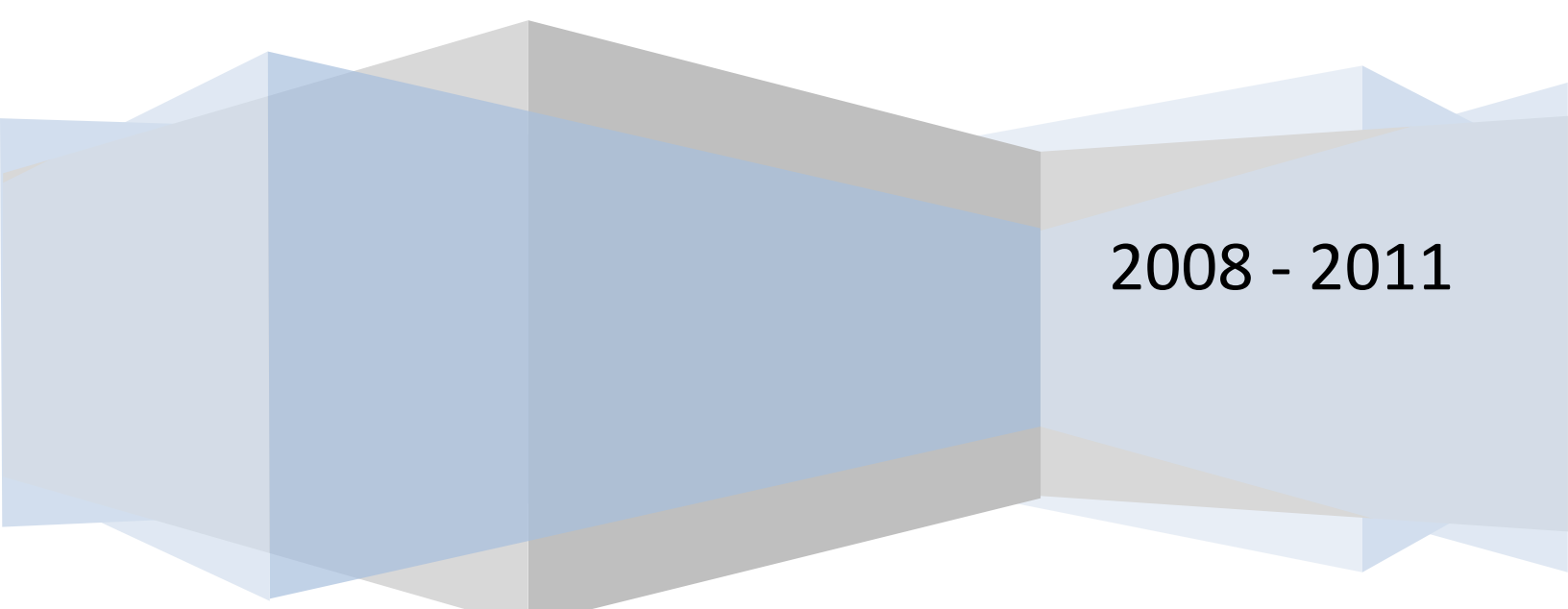


State of Oregon Department of Environmental Quality

Issue Paper: Sediment Policy Revisions to Reduce Nonpoint Sources of Toxic Pollutants to Oregon Waters

Human Health Toxics Rulemaking

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I. Introduction

As part of the review of Oregon's human health toxic pollutant criteria, stakeholders have asked DEQ to consider revising or adding to sediment standards in order to reduce the loading of toxic pollutants from nonpoint sources to waters of the state. DEQ has agreed to consider whether sediment standards revisions or additions would provide appropriate and effective means to accomplish this goal.

II. Background

Standards (Division 41)

Oregon's standards for suspended and bedded sediment consist primarily of a narrative standard for bedded sediment and the turbidity standard:

340-041-0007(12): The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.

340-041-0036: Turbidity (Nephelometric Turbidity Units, NTU): No more than a ten percent cumulative increase in natural stream turbidities may be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and one of the following has been granted:

(1) Emergency activities: Approval coordinated by the Department with the Oregon Department of Fish and Wildlife under conditions they may prescribe to accommodate response to emergencies or to protect public health and welfare;

(2) Dredging, Construction or other Legitimate Activities: Permit or certification authorized under terms of section 401 or 404 (Permits and Licenses, Federal Water Pollution Control Act) or OAR 141-085-0100 et seq. (Removal and Fill Permits, Division of State Lands), with limitations and conditions governing the activity set forth in the permit or certificate.

There are other statewide narrative criteria that relate to sediment as well:

340-041-0007

(5) Logging and forest management activities must be conducted in accordance with the Oregon Forest Practices Act to minimize adverse effects on water quality.

(6) Log handling in public waters must conform to current Commission policies and guidelines.

(8) Road building and maintenance activities must be conducted in a manner so as to keep waste materials out of public waters and minimize erosion of cut banks, fills, and road surfaces.

(9) In order to improve controls over nonpoint sources of pollution, federal, State, and local resource management agencies will be encouraged and assisted to coordinate planning and implementation of programs to regulate or control runoff, erosion, turbidity, stream temperature, stream flow, and the withdrawal and use of irrigation water on a basin-wide approach so as to protect the quality and beneficial uses of water and related resources. Such programs may include, but not be limited to, the following:

(a) Development of projects for storage and release of suitable quality waters to augment low stream flow;

(b) Urban runoff control to reduce erosion;

(c) Possible modification of irrigation practices to reduce or minimize adverse impacts from irrigation return flows;

(d) Stream bank erosion reduction projects; and

(e) Federal water quality restoration plans.

(10) The development of fungi or other growths having a deleterious effect on stream bottoms, fish or other aquatic life, or that are injurious to health, recreation, or industry may not be allowed.

(11) The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.

Listing Criteria

Sediments in water bodies can be divided into two broad states: suspended sediments and bedded sediments. Suspended sediments are carried within the water column and are regulated by the turbidity standard. Bedded sediments are deposited on the bottom of the water body and are regulated by the narrative standards above, particularly 340-041-0007(12).

The narrative standards give DEQ authority to regulate bedded sediment, but lack specificity and are difficult to implement without extensive background work to define deleterious effects. Placement of water bodies on the 303(d) list has frequently relied on the best professional judgment of experts. A sediment benchmark workgroup at DEQ created a draft list of numeric benchmarks to improve implementation of the narrative sediment standard, 340-041-0007(12) for use in the assessment methodology for the 2008/2010 Integrated Report. These benchmarks are only draft and were reviewed by the Independent Multi-Disciplinary Science Team (IMST). Although there were no "fatal flaws" in the approach, additional work is needed before its use as an assessment methodology for the

Integrated Report. Numeric benchmarks or other refinements to bedded sediment rules would improve assessment and listing, assist the development of TMDLs or Category 4b plans, and speed the improvement of water quality and aquatic ecosystems affected by sediment or sedimentation.

In addition, the bedded sediment narrative standard does not address the effects of too little sediment (armoring) in streams. A stream system lacking in large woody debris and coarse sediment (gravel, cobbles, and boulders) will have limited hyporheic exchange, have less habitat for aquatic invertebrates, fish, and amphibians, and have a reduced capacity to moderate high flows. The current narrative sediment standard does not address the conditions of limited LWD and coarse sediment deficiency in many Oregon streams. While the biocriteria narrative (340-041-0011) could theoretically address this issue, it also lacks specificity and does not address negative effects on drinking water, recreation, and industry that may result from armoring and hydrologic regime alterations.

The turbidity standard limits activities to a 10 percent increase relative to an upstream control point. Oregon's turbidity standard was first adopted in 1977. The turbidity standard is loosely based on EPA's 1976 criteria for Solids (Suspended, Settleable) and Turbidity developed to protect freshwater fish and other aquatic life (USEPA 1976). The only substantive change to Oregon's water quality standard for turbidity in 1990 was a shift from measurement using Jackson Turbidity Units (JTUs), which are only measureable at turbidity levels of 25 units and greater, to Nephelometric Turbidity Units (NTUs), which can be measured at turbidity levels of less than 1 and higher.

While a 10 percent increase is easily measured in a water body with a baseline turbidity of 50 NTU, the standard is not measureable or biologically meaningful in low turbidity systems (e.g. baseline turbidity of 2 NTU). The standard is fairly easy to apply to point sources, but difficult to apply to nonpoint sources, like forestry and agriculture, that must be evaluated programmatically rather than individually. During the 1990 change to using NTU for turbidity, public comments noted that naturally occurring fluctuations for turbidity in many streams would violate the proposed standard and requested consideration of an approach that considers these natural fluctuations. At that time, DEQ adopted the change in units and recommended that a scientific panel be established for review of literature on effects of turbidity, suspended and settleable solids, and accumulated fines and make recommendations on appropriate standards and criteria. Under the clear water background conditions (<5 NTU) that are prevalent in Oregon much of the year, meeting the current standard has been achieved by implementing the narrative limited duration exceedance allowance, which lacks specificity regarding what duration and/or frequency of exceedances would constitute an exceedance of the standard (e.g., instantaneous, daily average, monthly average, etc.). As a result, DEQ has identified the need to review the standard to address this issue, as well as to address the public's request to make recommendations on the turbidity standard based on science.

TMDL Approaches

Total Maximum Daily Loads (TMDLs) for listed parameters are created using basin specific data. The site-specific analysis details the pollutant load each source can contribute while restoring and meeting water quality standards. Several TMDLs have load allocations for toxic pollutants (e.g. Willamette TMDL

for Mercury, Molalla-Pudding TMDL for DDT). These load allocations are administered through surrogate measures. Because the pollutants enter the waterbodies bound to fine sediment, the load allocations are given in Total Suspended Solids, which can be measured directly or through its relationship with turbidity. The use of the sediment surrogates explicitly acknowledges the link between erosion and toxic pollution while providing a mechanism to reduce loads of the toxic substance to the water body in question. Implementation-Ready TMDLs with their site-specific analyses are one mechanism for regulating toxic pollutants bound to fine sediment. Implementation-Ready TMDLs will expand on this by detailing and requiring specific implementation practices to meet the load allocations.

III. Federal Regulation

In 2003, EPA released draft guidance on “Developing Water Quality Criteria for suspended and bedded sediments (SABS); Potential Approaches.”

(<http://www.epa.gov/waterscience/criteria/sediment/pdf/sab-discussion-paper.pdf>) The draft guidance discussed the impacts of sediment runoff and potential approaches for crafting water quality criteria.

However, there are no national criteria established by EPA for suspended sediment, bedded sediment, or armoring of streams.

Other States

Washington State has aquatic life turbidity criteria for fresh and marine waters of the state. These criteria restrict the amount that turbidity can increase over the background turbidity, depending on the type of aquatic life and the background turbidity level. Washington does not have numeric or narrative criteria that prohibit detrimental sediment deposits or controllable erosion. Part of the Washington Administrative Code [173-201A-260(2)(a); “Toxic, radioactive, or deleterious material concentrations must be below those which have the potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health”] can be construed to apply to sediment deposits.

California’s water quality is managed by nine regional water quality boards. According the North Coast Regional Water Quality Control Board, many basins in California’s North Coast Region are not meeting water quality objectives (California’s equivalent to water quality standards). Turbidity increases must be less than 20% of background levels. Narrative criteria for suspended sediment, settleable material, and suspended material disallow amounts that cause a nuisance or interfere with beneficial uses. The toxic substances narrative is similar to Oregon’s. Sediment has been a major problem in this region. US EPA established sediment TMDLs for basins comprising 61% of the North Coast area. The Board has Sediment Control Workplan (04/08/2008) with regional actions that range from increased coordination with other state and federal agencies and local governments to grants to technical (scientific and GIS) work. Tasks were also crafted for individual watersheds. For example, Albion River sediment control tasks are:

- 1 Identify and work with key stakeholders.
- 2 Conduct outreach and education and work with interested stakeholders.
- 3 Fund excess sediment control projects and LWD (large woody debris) placement work.
- 4 Identify most egregious excess sediment sources.
- 5 Investigate Marsh Creek Road.

- 6 Use progressive enforcement or develop WDRs (Waste Discharge Requirements) or conditional waivers.
- 7 Develop ownership-wide WDRs for Mendocino Redwood Company.
- 8 Develop WDRs for county roads in Mendocino County.

The tasks are generally a combination of technical assistance, outreach, grants, and enforcement. As another example, the Garcia River TMDL required a 60% decrease in sediment loads. The implementation plan (Garcia River Action Plan) says: "The controllable discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, gravel mining, agricultural, grazing, or other activity of whatever nature into waters of the State within the Garcia River watershed is prohibited."

Proposed revisions applicable to Suspended and Bedded Sediment rules from Mixed Media memo (October 21, 2009) and Toxic Pollutants Reduction Options Inventory (2/4/10 draft)

- Add a narrative prohibition on controllable erosion in the WQ rules (Item 1 in Inventory)
- Remove existing shields for nonpoint sources in water quality standards (Item 2 in Inventory)
- Clarify the statutory requirement that logging practices must conform with water quality standards (Item 3 in Inventory; in rule package currently)
- Add requirement that nonpoint sources comply with load allocations (Item 4 in Inventory; addressed under Implementation-Ready TMDLs)
- Add nonpoint sources excluded from the Oregon Forest Practices Act (Item 7 in Inventory)
- Add requirements that surrogate measures be clear and easily applied statements as to how to meet load allocations (Item 8 in Inventory; addressed under Implementation-Ready TMDLs)
- Add requirement to use an enhanced Universal Soil Loss Equation (or other approach) to calculate and limit controllable erosion rates. (Item 9 in Inventory)
- Recommend/Develop rule requiring that the Commission direct the Department to develop design specifications for riparian buffer strips (Item 11 in Inventory; addressed under Implementation-Ready TMDLs)
- Add that agricultural landowners must implement specific practices to be in compliance with water quality standards (Item 12 in Inventory; addressed under Implementation-Ready TMDLs)

The Scoping Evaluation document has additional information. Item 3 is being considered as standalone item, and Items 4, 8, 11, and 12 will be addressed under Implementation-Ready TMDLs.

Options for Sediment Approaches during the Toxics Rulemaking

1. Do nothing specific to sediment. DEQ is working on sediment issues as a parallel process and as fine sediment pollution issues are addressed, the corresponding issues with sediment-bound toxic pollutants will also be addressed.
2. Request specific direction for sediment issues from EQC. With the understanding that sediment issues are related to but distinct from toxic pollutants issues, the toxics rulemaking should ask EQC to give DEQ specific direction and a timeframe to deal with sediment issues in an integrated fashion that includes sediment-bound toxicants, excessive suspended and bedded fine sediments, and armoring/deficits of large woody debris and coarse sediment.
3. Regulate sediment through the toxics rulemaking process. Some of the rule concepts suggested in the Mixed Media Subcommittee memo (Items 1-3, 7, 9 in the Inventory) are not included in

other parts of the rulemaking package. Some or all of these could be adopted as rules during the toxic pollutants rulemaking and implemented.

Addressing Sediment as a Parallel Process (Option 1)

1. Anti-degradation policy. A robust and enforceable anti-degradation policy that explicitly includes nonpoint sources will enable prevention of toxic pollutants getting into water bodies. Changes to the Anti-Degradation Internal Management Directive will enable reviews of existing and future nonpoint source Best Management Practices (BMPs), restricting or preventing increases of sediment pollution to prevent disruption of beneficial uses and keep sediment-bound toxics out of water bodies.
2. Division 41 rule changes. Clarification that agricultural and forestry BMPs must meet DEQ's water quality standards *including the anti-degradation policy* can lead to stronger BMPs if it is made clear that the burden of proof lies on proving that BMPs are sufficient.
3. Implementation-Ready TMDLs. Once toxic pollutant impairments are identified and added to the 303(d) list, Total Maximum Daily Loads (TMDLs) will be established for impaired water bodies. Implementation-Ready TMDLs will specify which required and enforceable BMPs must be implemented by landowners and Designated Management Agencies (DMAs) to reduce sediment pollution and associated toxics, rather than relying solely on plans from DMAs. Alternate BMPs can be used if DEQ determines that they will meet the load allocations. Implementation-Ready TMDLs will give DEQ the authority to ensure that sediment targets in TMDLs are being met.
4. Other sediment efforts outside of toxics rulemaking. Numeric benchmarks are being established to guide use of the narrative standard for bedded sediment. The turbidity standard is being reviewed and revised. These standards changes will simplify consistent application of criteria and will facilitate listing of sediment-impaired water bodies and the subsequent creation of TMDLs or other water quality-based management strategies. Control of sediment and prevention of erosion will keep sediment-bound mercury (deposited from the air onto the soil) and legacy pollutants (e.g. DDT) out of water bodies. Current use pesticides can be kept out of water bodies through ongoing Integrated Pest Management and Pesticide Stewardship Partnership efforts as well as erosion control.

Furthermore, if data show that the BMPs required by state agencies that regulate nonpoint sources (e.g. Oregon Department of Forestry and Oregon Department of Agriculture) are not sufficient to meet water quality standards or TMDL load allocations, then DEQ is committed to pursue changes to BMPs and regulations in order to ensure attainment of water quality standards and/or TMDL load allocations.

DEQ Recommendation

The Department recommends addressing sediment through the existing efforts. These are: development of methods for interpreting the narrative sediment standard; the use of Implementation Ready TMDLs; providing comment on Agricultural Water Quality Management Area Plans and rules during review cycles; and review of Forest Practices Act BMPs after issuance of a TMDL. Rule changes are not recommended at this time.