

DEPARTMENT OF ENVIRONMENTAL QUALITY
Chapter 340
Proposed Rulemaking
STATEMENT OF NEED AND FISCAL AND ECONOMIC IMPACT

Revised Water Quality Standards for Human Health Toxic Pollutants and Revised Water Quality Standards Implementation Policies
Fiscal and Economic Impacts

This form accompanies a Notice of Proposed Rulemaking

Title of Proposed Rulemaking	Revised Water Quality Standards for Human Health Toxic Pollutants and Revised Water Quality Standards Implementation Policies. Proposed changes affect Divisions 41, 42, and 45.
Statutory Authority or other Legal Authority	ORS 468B.010, ORS 468B.020, ORS 468B.035, ORS 468B.110, and ORS 468.020
Statutes Implemented	ORS 468B.048
Need for the Rule(s)	<p>DEQ's currently effective human health toxics criteria are based on a fish consumption rate that does not provide adequate protection for the amount of fish and shellfish consumed by Oregonians. On June 1, 2010, the U.S. Environmental Protection Agency (EPA) disapproved human health toxics criteria that were submitted for approval in 2004 and were based on a fish consumption rate of 17.5 grams per day (g/day). EPA disapproved the human health toxics criteria because the fish consumption rate (FCR) was not considered protective of many Oregonians. DEQ is addressing EPA's disapproval by proposing to use a higher fish consumption rate of 175 g/day to calculate more protective human health toxics criteria. If DEQ does not promulgate revised criteria, EPA must conduct rulemaking to promulgate human health toxics criteria for Oregon.</p> <p>This rulemaking also proposes new rules and revisions to existing rules for various National Pollutant Discharge Elimination System (NPDES) implementation tools developed to assist dischargers in complying with revised standards. Further, revisions to the water quality standards and Total Maximum Daily Load (TMDL) rules are proposed to make DEQ's rules consistent with state statutes affecting nonpoint sources of pollution and for DEQ to assign load allocations to significant land and air sources in TMDLs.</p>
Documents Relied Upon for Rulemaking	<p>1. <i>Cost of Compliance with Water Quality Criteria for Toxic Pollutants for Oregon Waters</i>, SAIC (June 2008)— The EPA contracted Science Applications International Corporation (SAIC) to estimate the potential incremental compliance actions and costs that may be associated with more stringent criteria based on an increased fish consumption rate. The report extrapolated compliance costs for both baseline criteria (i.e. the criteria in effect at that time: Table 20 and Table 33A) and incremental costs derived from implementation of the criteria based on various increased fish consumption rates. This report constitutes the most current and relevant source of information the department has in regards to fiscal and economic impacts. Discussions of the report's limitations are acknowledged throughout the report.</p> <p>Note that the SAIC report used the effective criteria at the time of the report to determine the base costs for compliance, which were primarily those criteria contained in Table 33A that are based upon a fish consumption rate of 17.5 g/d. Therefore, the report didn't analyze the cost of implementing and attaining the criteria based on the criteria in effect at the time of the proposed rule, which is based on a FCR of 6.5 g/d. Although the effective toxics criteria are based on 6.5 g/day given EPA's June 2010 disapproval of criteria based on 17.5 g/day, in the absence of more precise information, DEQ will use SAIC's baseline cost estimates derived from criteria</p>

	<p>based on a FCR of 17.5 g/day to estimate incremental costs of complying with the proposed criteria based on a FCR of 175 g/day.</p> <p>2. Fiscal Impact and Implementation Advisory Committee (FIIAC) Memo —The DEQ, EPA, and Confederated Tribes of the Umatilla Indian Reservation (CTUIR) convened a group of interested experts to develop feasible implementation options resulting from an increased FCR and to provide input on the impacts these options may have on a wide range of permitted dischargers, the public, and other stakeholders throughout the state. The expertise of the group ranged from backgrounds in economics, business administration, public works, public health, water quality, and engineering. The FIIAC developed a memo that provides an overview of the charge of the FIIAC, summarizes discussions around costs, benefits and implementation ideas that were considered by the group, and highlights conclusions and concerns regarding the SAIC report.</p> <p>3. <i>NPDES Implementation Issue Paper, ODEQ (December 2010)</i>—This issue paper was developed by DEQ staff to support the human health toxics criteria rulemaking. The paper is comprised of various potential NPDES implementation tools that could be used in complying with more stringent toxics criteria. Each section describes the tool and includes information such as policy evaluations, DEQ recommendations, alternatives considered, work group discussions and views, proposed rule language and a framework for implementation. (placeholder for website here)</p> <p>4. <i>Division 41 and 42 Issue Paper, ODEQ (December 2010)</i>—This issue paper was developed by DEQ staff to support the human health toxics criteria rulemaking. The paper discusses potential approaches to revise rules in the water quality standards provisions (Division 41) and the TMDL provisions (Division 42) to make our rules consistent with state statutes and clarify DEQ’s regulatory relationship with other state agencies to control nonpoint sources of pollution. The issue paper includes sections on policy evaluation, DEQ recommendations, workgroup discussions and views, and proposed rule language.</p> <p>5. <i>TMDL Development Issue Paper, ODEQ (December 2010)</i>—This issue paper was developed by DEQ to support the human health toxics criteria rulemaking. The paper discusses the strategy DEQ has developed to implement TMDLs more effectively, including the pollutant source identification at smaller geographic scales, stakeholder involvement on implementation strategies, and time lines and milestones for TMDL goals and the potential to assign load allocations to significant land and air sources in TMDLs. Includes sections on policy evaluation, DEQ recommendations, workgroup discussions and views.</p> <p>6. EPA National Recommended Water Quality Criteria Website</p> <p>7. Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health, EPA (2000). EPA 822-B-009-004.</p> <p>8. <i>Fiscal and Economic Impact Narrative, ODEQ (December 2010)</i>--This document was developed to support the Statement of Need and Fiscal and Economic form and is attached to this form.</p> <p>These documents are available on websites or by contacting Andrea Matzke, Oregon DEQ, Water Quality Division, 811 SW Sixth Ave., Portland, OR 97204-1390, (503) 229-5384 or matzke.andrea@deq.state.or.us</p>
<p>Requests for Other Options</p>	<p>Pursuant to ORS 183.335(2)(b)(G), DEQ requests public comment on whether other options should be considered for achieving the rule’s substantive goals while reducing negative economic impact of the rule on business.</p>

<p>Fiscal and Economic Impact, Statement of Cost Compliance</p>										
<p>Overview</p>	<p>The Clean Water Act (CWA) directs states to administer specific sections of the Clean Water Act (CWA). Section 303 of the Act requires that DEQ review Oregon's water quality standards regularly in order to use the latest scientific information and consider the state's current needs. Division 41 contains the rules that describe Oregon's water quality standards. Divisions 45 and 41 contain the rules that govern Oregon's development of NPDES permits and development of TMDLs, respectively, both of which contain provisions relating to how water quality standards are implemented in each of those CWA programs.</p> <p>Oregonians may be exposed to toxic pollutants through the fish we eat and the water we drink. Oregon's water quality standards contain human health criteria, which are designed to protect human health from toxic pollutants that may occur in surface waters and may accumulate in fish. A key component of the human health criteria is the fish consumption rate, which is intended to reflect how much fish people eat. This proposal revises the human health criteria for toxics based on a higher fish consumption rate of 175 g/day which is more protective of Oregonians. These criteria, if adopted by the EQC and approved by EPA, will be the most stringent human health criteria in the country. This rulemaking also proposes new rule language and revisions to existing rule language for various NPDES implementation tools to assist dischargers in complying with revised standards. In addition, this rulemaking includes revisions to make DEQ's rules consistent with state statutes affecting nonpoint sources of pollution and for DEQ to assign load allocations to significant land and air sources in TMDLs. The table below summarizes the proposed rule package.</p> <table border="1" data-bbox="394 1348 1528 1694"> <thead> <tr> <th data-bbox="394 1348 711 1381">Rulemaking Element</th> <th data-bbox="711 1348 1101 1381">Description</th> <th data-bbox="1101 1348 1528 1381">Comments</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="394 1381 1528 1423" style="text-align: center;">Proposed Rules Addressing NPDES Implementation</td> </tr> <tr> <td data-bbox="394 1423 711 1694">Intake credit</td> <td data-bbox="711 1423 1101 1694">This tool allows a source to pass through pollutants contained in their intake water to their effluent without treatment as long as the facility does not increase either the mass or concentration of the pollutant at the point of discharge.</td> <td data-bbox="1101 1423 1528 1694">DEQ expects there will be few permittees that will use this provision.</td> </tr> </tbody> </table>	Rulemaking Element	Description	Comments	Proposed Rules Addressing NPDES Implementation			Intake credit	This tool allows a source to pass through pollutants contained in their intake water to their effluent without treatment as long as the facility does not increase either the mass or concentration of the pollutant at the point of discharge.	DEQ expects there will be few permittees that will use this provision.
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<p>Background Pollutant Allowance</p>	<p>New water quality standard provisions to allow a small increase in toxic pollutant load above ambient WQ conditions from a single point source, which is small enough that it is not expected to significantly affect human health risk.</p>	<p>Underlying water quality standards remain in effect for all other CWA purposes (e.g. other permittees, 303(d) listing and TMDL development).</p>
<p>Variances with Pollutant Reduction Plans</p>	<p>A variance is a temporary exemption from meeting certain otherwise applicable water quality standards and must be justified based on one of six reasons specified in federal and state water quality standards regulations. Pollutant reduction plans are required to reduce the pollutant of concern where possible and show reasonable progress toward meeting the underlying water quality standard.</p>	<p>Substantial and widespread economic and social impact is one reason a variance may be granted. Other reasons include high, naturally occurring pollutant concentrations and human-caused conditions or sources of pollution that cannot be remedied or would cause more environmental damage to correct than leave in place. EPA must approve variances.</p> <p>Underlying water quality standards remain in effect for the water body and for all other CWA purposes (e.g. other permittees, 303(d) listing and TMDL development).</p>
<p>Proposed Rules Addressing Non-NPDES Implementation</p>		
<p>Division 41 and 42 Amendments</p>	<p>The proposed rules explain and implement ORS 527 and 568, which describe the mechanisms for forestry and agricultural nonpoint sources to meet water quality criteria. The new rules clarify how nonpoint sources must meet water quality criteria and TMDL load allocations.</p> <p>Although DEQ has authority to do so already, its ability to identify significant air and land sources and assign load allocations is not explicit in the existing Division 42 TMDL rule. DEQ proposes to revise this rule to clarify DEQ's authority to assign individual load allocations to air and land sources in TMDLs.</p>	<p>The proposed rules clarify the roles and responsibilities of DEQ, the Departments of Forestry and Agriculture and nonpoint sources to ensure that water quality standards and load allocations for nonpoint sources are achieved.</p> <p>The current rulemaking addresses only water quality regulations, but regulations governing air quality and land quality should also be reviewed in the future to ensure there are regulatory mechanisms to implement and enforce waste load allocations for land and air sources.</p>
<p>The general public, small and large businesses, communities, and public agencies could be impacted by the proposed criteria changes either directly and indirectly. The establishment of criteria, by themselves, has no direct impact or effect. Rather, how the department applies those criteria will affect Oregonians. Specifically, the department may impose additional monitoring and treatment requirements in wastewater discharge permits and to certifications for</p>		

sediment removal and fill activities and hydroelectric operations to comply with the revised criteria. The new and revised criteria may result in more waters being listed as having impaired water quality, which in turn will trigger the requirement to develop additional TMDLs with specified waste load allocations for the pollutants of concern. In addition, the revised criteria may result in the need for altered management practices to control discharges from nonpoint sources, including those subject to Total Maximum Daily Loads (TMDLs) established for water quality limited waterbodies.

The fiscal and economic impact analysis is based on a comparison of impacts between the effective human health toxics criteria, which are based on a FCR of 6.5 g/day, to the proposed toxics criteria, which are based on a FCR of 175 g/d. Therefore, the costs of complying with the existing toxics criteria will not be analyzed for this fiscal review. However, DEQ recognizes that not all CWA programs that are impacted by toxics criteria have been fully implemented at the baseline level.

It is difficult to make a direct comparison between the effective criteria and the proposed criteria and determine what the subsequent associated fiscal and economic impacts will be. Part of the complication arises from the 2004 rulemaking which segregated criteria into two groups (one group being effective for permitting purposes in advance of EPA's action and one group *not* effective until EPA action). The result of the 2004 rulemaking was that dischargers were required to implement the more stringent human health criteria based on 17.5 g/day, while other CWA programs continued to implement criteria based on 6.5 g/day (e.g. section 401 certifications). EPA did not take action on DEQ's 2004 toxics criteria until June 1, 2010, when it disapproved the majority of human health criteria based on EPA's conclusion that the fish consumption rate used in 2004 was not protective enough. Among the criteria disapproved were criteria for approximately 44 toxic pollutants that DEQ added as part of the 2004 rulemaking. In addition, many of these new criteria values DEQ adopted in 2004 were the result of criteria changing from totals of that chemical to individual species of that chemical group (e.g. PAHs, endosulfan, dichlorobenzenes). While the majority of the revised criteria were disapproved, EPA approved the withdrawal of criteria values for eight toxic pollutants based on previous EPA recommendations. In addition, EPA took no action in 2010 on some criteria withdrawn in 2004 and consequently, values for those criteria remain. However, these pollutants no longer have EPA criteria, therefore, DEQ proposes to withdraw these criteria as part of this rulemaking. In addition, DEQ is not proposing to revise eight criteria values that do not rely on a fish consumption rate. Instead, the criteria are derived from drinking water maximum contaminant levels (MCLs). The table below depicts a general comparison of current versus proposed criteria. Please refer to Table 1 in Appendix B of the fiscal narrative attachment for a comparison of the current criteria versus the proposed criteria.

Which Pollutants Have More Stringent Criteria? Proposed vs. Current	*Number
Proposed	48
Current	4
Same	10
Mix**	6

TOTAL **68**

* Analysis only includes criteria that have both current and proposed criteria and does not include criteria that were either withdrawn or added

** For example, a “water + org” proposed criterion for a chemical becomes less stringent, but then a new “org only” criterion was proposed.

Approximately 48% of the proposed human health criteria have Quantitation Limits (QLs) (i.e. levels that represent the lowest level at which a pollutant is detectable and quantifiable, using currently accepted analytical methodologies) that are higher than the criterion. For that reason, there may be pollutants in Oregon’s water bodies or in wastewater effluent that cannot be measured given limitations in analytical methods. For permitting purposes, the QL becomes the compliance point for dischargers in these circumstances. Consequently, if the criterion for a particular pollutant becomes more stringent, but the QL remains higher than the criterion, there would be no effective change in the point of compliance until and unless analytical methods improve. Historically, the pace of change in laboratory methods has not been rapid. However, when methods do improve, there will likely be additional toxics impairment listings for water bodies and more stringent water quality based effluent limits (WQBELs) for permit holders.

Identifying Pollutants Most Likely to Present Challenges for Sources

The SAIC Report

The SAIC Report identified three pollutants where additional controls may be needed to achieve compliance with lower criteria: (1) arsenic; (2) Bis(2-ethylhexyl)phthalate; and (3) mercury. As part of the 2004 rule revision, Oregon withdrew its national CWA § 304(a) human health criterion for total mercury and replaced these criteria with a new fish tissue-based “organism only” human health criterion for methylmercury. DEQ does not currently have a criterion for methylmercury because EPA disapproved the criterion on June 1, 2010 based on a fish consumption rate that was not considered protective of human health. DEQ is proposing a replacement fish-tissue based methylmercury criterion based on 175 g/day as part of this toxics rulemaking. The SAIC Report assumed that DEQ would use EPA’s default values to convert the methylmercury fish tissue criterion into a total mercury water column criterion. However, until data on methylmercury

are collected and analyzed in Oregon water bodies, it is unclear what the state of compliance will be and how relevant the results are from the SAIC Report.

DEQ proposed a revised criterion for arsenic, along with revised criteria for iron and manganese in a separate rulemaking and will not be a part of this rulemaking package. Revised criteria for iron and manganese were adopted by the EQC on December 9, 2010. A revised criterion for arsenic is anticipated to be adopted in April 2011. Because DEQ is proposing a higher criterion for arsenic than what was reflected in the SAIC report, some of the compliance issues associated with arsenic may be minimized. The economic and fiscal impact of revising criteria for iron, manganese, and arsenic will be analyzed separately and will not be addressed here.

Among the 20 facilities evaluated, SAIC found that 3 facilities could have compliance issues with Bis(2-ethylhexyl)phthalate under a fish consumption rate of 175 g/day. It is unknown to what extent additional facilities may face compliance issues. The current QL for Bis(2-ethylhexyl)phthalate is now higher than the proposed criteria (previously, the criterion was greater than the QL), therefore the QL will become the effective compliance point.

Listings for Pollutants and Pollutants Identified as “Potential Concern”

Water column sampling, as well as fish tissue sampling and sediment analysis have indicated the presence of toxics in Oregon's waterbodies. Overall, the 2004/2006 Integrated Report contains a total of 249 water body segments listed for a toxic pollutant criterion.

- 27 of those (11%) are listed for mercury. (These listings are based on fish consumption advisories, which are not affected by water quality standards.)
- 107 of those (43%) are listed for arsenic, iron or manganese, and are being analyzed for compliance issues in separate rulemakings.
- Other most commonly listed pollutants are beryllium, dieldrin, DDT, PCBs, chlorpyrifos, and copper.

Appendix C of the fiscal narrative contains a complete list of waterbodies that are contained in Oregon's 303(d) list for exceeding criteria for certain toxic pollutants. Appendix C also includes a table depicting pollutants of potential concern.

DEQ is targeting adoption of human health criteria based on a FCR of 175 g/day by the EQC in June 2011. Consequently, the proposed criteria will not be adopted and approved by EPA in time to be evaluated as part of the 2010 Integrated Report. DEQ will incorporate the revised human health toxics criteria into the Integrated Report as soon as feasible. Depending upon the timing of EPA approval, DEQ may be able to incorporate the revised criteria into the Integrated

Report as soon as the 2012 Integrated Report. Depending on monitoring results and the ability to quantify low concentrations of toxic pollutants, there may be additional listings for toxics in the 2012 Integrated Report or reports thereafter. For some toxic pollutants, DEQ anticipates removing waterbodies in future 303(d) lists based on: (1) criteria that were recently approved by EPA in June 2010 that DEQ withdrew as water quality standards (i.e. beryllium, cadmium, chromium III and VI, lead, mercury, silver, and trichloroethane 1,1,1,) and (2) criteria changes to arsenic, iron, and manganese as proposed in separate rulemakings. It is difficult for DEQ to predict which other toxics could pose potential compliance issues in the future, given the generally small amount of ambient and effluent monitoring data that is available.

Likely Industrial Sectors Discharging Pollutants

Of the 19 facilities covered by major industrial NPDES permits, approximately nine are pulp and paper industries. Of the remaining 10 facilities, there are several smelting or refining industries, electronics and chemical manufacturing, and food processors. In a summary review of these 19 permits, DEQ has established effluent limits for several toxics, as well as additional monitoring requirements for selected toxics. The table below contains a summary of current toxics effluent limits and requirements for monitoring for a selection of major industrials. Based on a review of available information, DEQ has not established toxic pollutant effluent limits in food processing permits.

Category	Toxic Effluent Limits	Additional Toxics Monitoring
Pulp & Paper Industry	-arsenic (total), adsorbable organic halides (AOX), 2,3,7,8-TCDD, lead, and zinc	-Whole Effluent Toxicity, metals (including total arsenic), inorganic arsenic, cyanide, total phenols, volatile compounds, acidextractable compounds, and pesticides - Priority Pollutant Scan - metals, cyanide, and total phenols -Priority Pollutant Scan - organic toxic pollutants
Primary Smelting and/or Refining	-benzo (a) pyrene, antimony, nickel, aluminum, free cyanide	PCBs
Electronics	-total chromium, total toxics organics (sum of the concentrations for approximately 30 toxic organic compounds)	

Applicability and Potential Effect of Rulemaking Associated with NPDES Permits and §401 Water Quality Certifications

Generally, the proposed human health criteria for toxics are applicable to all individual and general permits. The degree to which these permits are in fact affected by the new and revised criteria will be determined by an analysis of ambient and effluent data. Analysis of monitoring data may indicate the need for WQBELs. Dischargers with WQBELs for toxic pollutants could have varying costs, ranging from minimal staff time involvement (e.g. employing intake credits) to installing various capital improvement measures to meet WQBELs.

Adoption and approval of new criteria will not affect NPDES permits until permits are renewed. DEQ will not modify existing permits in effect to incorporate the new criteria at the time of EPA approval if that approval occurs during their permit cycle. At the time of permit renewal, DEQ will evaluate whether new WQBELs need to be developed to meet revised water quality criteria.

The SAIC report indicated that some dischargers will have issues associated with complying with the existing criteria. The table below represents potential annual compliance costs extrapolated from a sample representing both major municipals and industrials, and indicates that the greatest proportional cost would be attributed to complying with the baseline standard (i.e. 17.5 g/day), rather than the incremental costs associated with a higher fish consumption rate. The highlighted cost range below indicates the incremental costs of complying with a FCR of 175 g/day, not taking into account inflow and infiltration (I&I) of arsenic, which is not relevant for this analysis since arsenic is not being addressed by this proposed rulemaking. For more detailed information on this table, including estimated costs for individual facilities in the sample selection, please see Appendix F in the SAIC Report.

Exhibit ES-1. Summary of Potential Annual Compliance Costs (millions of \$2007)

Scenario	Total		Incremental ¹	
	With I&I Costs ²	No I&I Costs	With I&I Costs ²	No I&I Costs
Baseline	\$3.62 - \$29.7	\$3.62 - \$3.92	NA	NA
63.2 gpd	\$3.69 - \$29.8	\$3.69 - \$4.04	\$0.075 - \$0.13	\$0.075 - \$0.13
113 gpd	\$3.96 - \$30.1	\$3.96 - \$4.31	\$0.35 - \$0.40	\$0.35 - \$0.40
175 gpd	\$3.96 - \$31.0	\$3.96 - \$4.36	\$0.35 - \$1.32	\$0.35 - \$0.45
389 gpd	\$4.46 - \$31.6	\$4.46 - \$4.86	\$0.85 - \$1.82	\$0.85 - \$0.95
620 gpd	\$4.46 - \$31.6	\$4.46 - \$4.86	\$0.85 - \$1.82	\$0.85 - \$0.95

NA = Not applicable

1. Represents the difference between total annual cost and baseline costs (i.e., incremental costs above and beyond those needed for compliance with baseline criteria).
2. High estimate includes cost of I&I to reduce arsenic in municipal sewer systems.

Although there are estimates available for annual compliance costs from the SAIC Report, specific costs for any one facility will vary on a case-by-case basis and will depend on variables such as pollutants present, availability of treatment technologies able to treat to specified levels, and compliance options available to facilities (e.g. intake credits vs. end of pipe treatment technologies vs. variances).

Applicability and Potential Effect of Rulemaking Associated with Stormwater Permits

DEQ issues three different types of stormwater permits: individual Municipal Separate Storm Sewer System (MS4) permits, construction stormwater permits, and industrial stormwater permits. Because stormwater discharges are intermittent, DEQ does not apply the human health criteria (which are generally based on a 70 year exposure) to permits for these discharges and instead, uses the aquatic life criteria as the basis for stormwater permit requirements. This approach is consistent with EPA's approach for stormwater permits. However, in the industrial stormwater permit currently under development (expected to be issued in August 2011), it is likely that sources who discharge to waterbodies that are listed as impaired for any criteria will have to monitor for these pollutants. Therefore, there could be sampling and analysis costs to industrial stormwater permit holders once the permit is finalized and additional impaired waters have been identified based on the revised human health criteria. As a result, there will likely be additional costs to these dischargers who exceed these criteria and are required to develop BMPs to reduce the pollutant of concern. The table below describes the number of facilities with industrial stormwater permits.

Industrial Stormwater Permit	Description	No. of Facilities*
1200-COLS	Facilities located in the Columbia Slough watershed	138
1200-Z	All other industrial facilities in the state	770
Total		908

* As of September 2010

Applicability and Potential Effect of Rulemaking Associated With General Permits for Activities Other than Stormwater

The 1500A permit for petroleum hydrocarbon cleanup from groundwater or surface water is currently the only general permit with requirements for human health criteria. When this permit is renewed, these criteria will need to be addressed. Twenty facilities are registered to the permit. There is an effluent limit for BETX, which is quantified based on an EPA approved test method to determine the total amount for benzene, ethylbenzene, toluene and xylene. The current permit establishes a 10:1 dilution. With a dilution of 10 and a revised criterion of 0.44 ug/L for benzene, the effluent limit at the end of pipe for benzene would be 4.4 ug/L. These effluent limits are met at the end of pipe by treating contaminated water with air stripping and/or activated carbon adsorption. It is not known whether technology can consistently meet a lower

effluent limit. This work would be completed as part of the general permit renewal.

Applicability and Potential Effect of Rulemaking Associated With 401 Certifications

The majority of activities for which DEQ issues Clean Water Act section 401 certifications would not be impacted by the proposed changes to the water quality criteria since the parameters of interest are typically conventional pollutants (e.g., dissolved oxygen, turbidity, temperature, etc.). However, there may be an impact to applicants (e.g. U.S. Corps of Engineers, Port of Portland) who propose sediment removal and fill projects, since some toxic pollutants that may be contained in the sediments can be released into waterbodies through movement of soil. Additional testing of the sediment may be required to assure that projects do not exceed water quality criteria for toxics and, if needed, mitigation measures may be required to reduce the impact of project.

Monitoring Costs

Generally, the costs of monitoring for dischargers could increase. If there is reasonable potential for a discharge to cause or contribute to an exceedance of applicable water quality criteria, more discharge monitoring may be needed which would increase analytical costs. Additionally, there could be a slight increase in the number of monitoring sites and/or frequency of sampling due to the implementation tools(e.g. to sufficiently characterize ambient conditions for variances, or monitoring data needed to meet a background allowance provision). Other potential analytical costs related to new QLs, analyzing individual species of pollutants, and costs for methyl mercury analysis are discussed under Fiscal and Economic Impacts to DEQ (See section III). Analytical costs described there would also be similar to costs incurred by dischargers.

With more stringent toxics criteria, there will likely be additional waterbodies listed as impaired for toxic pollutants and an increase in the subsequent number of TMDLs developed to meet toxics load allocations. Designated Management Agencies that may be identified as part of the TMDL include Oregon Department of Agriculture (ODA), Oregon Department of Forestry (ODF), Bureau of Land Management (BLM), U.S. Forest Service (USFS), municipalities, and irrigation districts and they may need additional resources in order to conduct additional monitoring for TMDL implementation tracking and BMP effectiveness monitoring. These monitoring costs may not be realized until sometime after the approval of the next Integrated Report, which would reflect any new listings based on the proposed toxics criteria.

Effect of Using Different Implementation Tools

Some situations may occur where limits or requirements based on the proposed criteria cannot

be met. Contamination of a facility's intake water by background pollutants (or in the case of municipal wastewater treatment facilities, some contaminants may be present in the drinking water) may result in high wastewater effluent concentrations that can't be feasibly treated or result in undesirable environmental tradeoffs to achieve. These pollutants may occur naturally or result from a variety of human activities. Intake credits, background pollutant allowances, and variances are implementation tools that can be used to address background contaminants and would potentially offset some of the impact of the revised criteria.

Some of the potential costs incurred by sources may be as the result of installing additional treatment technologies to reduce toxic pollutants in wastewater effluents. Some of these technologies are proven and are commonly used. Other technologies may be able to remove toxics to lower levels, but are not yet proven for wide-scale use, are not capable of treating down to the necessary levels, or present other limitations such as hazardous byproducts or prohibitive cost, thereby limiting the feasibility of their use for certain dischargers. For more information on specific treatment technologies, including advantages, disadvantages, and some limited costs, please refer to Appendix C in the SAIC Report.

Because there may not be feasible treatment technologies to remove low concentrations of toxic pollutants or other concerns regarding residual management from certain treatment technologies, some dischargers may pursue other implementation tools to comply with requirements based on the revised criteria. Some of the following tools are new (or revised), while other tools already exist in DEQ regulations. Generally, these tools provide a means to comply with and ensure progress toward meeting water quality standards and implementing regulations while ensuring protection of human health and the environment. Where meeting requirements to meet the revised criteria are infeasible, use of one of the approaches described below in appropriate circumstances can provide a lower cost means to comply with water quality standards than costs associated with removal technologies.

- o **Variations with pollution reduction plan**

DEQ is proposing to revise its current water quality standards regulation to include variances with a pollution reduction plan as an implementation pathway. Variances provide a mechanism for achieving water quality improvements when underlying water quality standards cannot be met in the short term. This provision would be allowed under limited circumstances. Variances are applicable to all types of pollutants and NPDES point sources, although DEQ anticipates that variances for toxic pollutants will be the majority of variance requests and approvals.

If a discharger is unable to comply with a water quality criterion because, for example, there are no feasible or affordable treatment technologies available, variances could be

pursued as a lower cost alternative, while complying with permit requirements and making water quality improvements. Despite lower anticipated net costs, there would still be incremental costs associated with variance requests and approvals for dischargers using this implementation tool. Potential costs include costs to sources to prepare and support an application (e.g. collecting water quality data, conducting an economic analysis, literature review for feasible pollutant removal technologies, etc); developing a pollution reduction plan, including potential strategies and implementing actions contained in the plan.

Impacts associated with this rulemaking focus on the incremental costs of complying with a fish consumption rate of 175 g/day, as opposed to costs associated with the current or baseline criteria. The SAIC Report estimates that one-time expenditures associated with variance applications could range from \$1.43 M to \$7.05 M (total statewide) with a FCR based on 17.5 g/day; incremental variance-related expenditures could range from \$0.59 million to \$2.68 million (total statewide) under revised criteria (highlighted in table below). The table below further shows a breakdown of costs between major municipal and industrial facilities. The average one-time cost per major municipality ranges from \$8,000 to \$44,000 under revised criteria, while the average one-time cost per major industrial ranges from \$9,000 to \$25,000. Costs for arsenic variances are included in these estimates and could not be apportioned out. However, proposed rulemaking to revise criteria for arsenic (i.e. become less stringent based on natural background concentrations) may reduce the need for facilities to use variances as a tool to comply with arsenic. Therefore, the variance cost estimates could be lower than what is reflected in this table.

**Exhibit F-9. Potential Baseline and Incremental Statewide One-Time Variance Costs
 (millions of 2007\$)**

Category	Sample			Statewide	Extrapolated One-Time Cost
	Total One-Time Cost	Number of Facilities	Average Cost per Facility	Number of Facilities ¹	
Baseline Criteria					
Certainty Sample ²	\$0.14 - \$1.20	5	NA	5	\$0.14 - \$1.20
Major Municipals	\$0.21 - \$0.90	9	\$0.023 - \$0.10	45	\$1.05 - \$4.50
Major Industrials	\$0.035 - \$0.20	4	\$0.009 - \$0.050	27	\$0.24 - \$1.35
Total	\$0.39 - \$2.30	18	NA	77	\$1.43 - \$7.05
Revised Criteria (Incremental)³					
Certainty Sample ²	\$0	5	NA	5	\$0
Major Municipals	\$0.070 - \$0.40	9	\$0.008 - \$0.044	45	\$0.35 - \$2.0
Major Industrials	\$0.035 - \$0.10	4	\$0.009 - \$0.025	27	\$0.24 - \$0.68
Total	\$0.11 - \$0.50	18	NA	77	\$0.59 - \$2.68

NA = not applicable

1. Random sample results extrapolated to total number in category less number in certainty sample.
2. Large flow municipals (one of which is dominated by industrial flow) plus one minor industrial.
3. Represents the annual costs of compliance above and beyond those needed for compliance with baseline criteria.

DEQ anticipates that first-time variance costs would be greater than subsequent requests to renew variances. Discharger costs associated with a renewal of a variance could be less, as most of the information required for a request would be an update of existing information gathered from the initial request. Each renewal request would need to be approved by both DEQ and EPA.

- **Intake credits**

Intake credits will be implemented at the time DEQ's permit writer is determining whether a particular facility has the reasonable potential to cause or contribute to an exceedance of the water quality criteria. Where the conditions meet the requirements in the regulation, the permit writer would conclude that the facility does not need a water quality based requirement in their limit for that pollutant or that the limit is based upon the concentration in the intake water. Without this provision the facility could have incurred the associated costs with meeting effluent limits or other requirements. As a result, where this implementation tool could be employed, the facility would avoid significant costs that would otherwise be incurred. DEQ expects that minimal input (in the form of additional monitoring data, etc.) would be needed from dischargers to facilitate the use of this tool. Given the limitations of this tool (i.e. facilities that have discharge pollutants originating from their intake water and a requirement that the mass and concentration of discharge cannot exceed that of intake water), DEQ estimates that few dischargers will be able to employ intake credits based on pollutants already present in their intake water.

- **Background pollutant allowance**

The background pollutant allowance allows a discharger to discharge effluent that is up to 3% higher than the background pollutant concentration of a water body that approaches or exceeds an applicable human health criterion (mass cannot be increased). The availability of this tool would very likely offset costs that would be incurred by dischargers if they were required to install expensive treatment technologies to reduce pollutant.

DEQ anticipates that some dischargers may need to adjust treatment processes to keep the mass of pollutant at or below upstream mass. Costs for this adjustment would vary

depending on the process needed. Dischargers may also need to adjust treatment processes to keep pollutant concentration to no greater than 3% of upstream concentration.

Based upon a review of current industrial permits, DEQ estimates that 32 minor and four major facilities have the potential to be impacted by background pollutants if present at high levels upstream of their facilities. These facilities typically employ significant quantities of surface water in their processes that result in evaporative loss and an increase in pollutant concentration.

BENEFITS

DEQ did not have the financial resources to conduct a quantitative analysis of the direct and indirect potential benefits associated with an increased fish consumption rate, however, the FIIAC committee members along with representatives from the Oregon Environmental Council and CTUIR agreed that while economic benefits can be difficult to analyze, it is important to describe potential benefits, at the very least, in a qualitative manner. A key outcome of revised water quality standards based on a higher fish consumption rate would not only benefit consumers of fish, but also achieve more stringent water quality criteria by reducing toxic contamination in waterways. The level of benefits achieved will depend on the degree to which pollution reduction is accomplished. Table 2 and the following table below is an excerpt from the FIIAC memo and describe benefits associated with this rulemaking.

Table 2: Potential Benefits of Raising the Fish Consumption Rate and Meeting the Standards

<i>Benefit</i>	<i>Examples</i>
Human Health	-safe drinking water; -avoided costs from environmentally attributable diseases; -reduced risk for those who do eat fish; -recreational – reduced risk from water contact
Environmental	-water reuse opportunities from cleaner effluent; -business—cleaner intake water for downstream industries; -ecosystem health; - tourism; -amenity/aesthetic/property values; -avoided costs to industries and utilities; -fewer contaminants; -fishing – tribal, commercial, recreational and subsistence; -improve other species in the food chain: birds, etc.; -higher quality water supply
Cultural	-enable religious/ceremonial activities; -children; -healthy fish – icon of the Northwest

-local, and sustainable food options

Potential Benefits of Specific Implementation Strategies

Strategy	Potential Benefit
Toxic Reductions	-Reduced human health impacts; -innovative possibilities used to reach more efficient systems when not fearful of litigation stemming from strict liability regulatory framework; -costs of litigation reduced; -reduced O&M; -reduced hazardous waste removal costs;
Stormwater Control	-Co-benefits for toxics reductions and control of other important stressors that affect fish health such as sedimentation and warm water temperatures
Infiltration and Inflow (I&I)*	-Reduce quantity of water and toxics entering plant, reducing operating costs

(* It should be noted that ACWA agencies are already engaged in I&I programs and do not agree that an incremental increase in I&I will result in toxics reduction and question the efficacy of additional increases in I&I rehab work since 100% I&I removal is currently not possible.)

Impacts on the General Public

As a result of this rulemaking there will be direct and indirect costs to the general public. DEQ does not have enough information to determine how significant these will be; however, the description in this section qualitatively describes the types of impacts that could be experienced by the general public. The SAIC Report estimated that proposing a fish consumption rate of 175 g/day could result in annual facility costs of \$0.35 to \$0.45 million (see Exhibit ES-1 on page 9). Some of these costs could be passed on to the general public.

Direct Impacts

- o Agricultural activities are already subject to Agricultural Water Quality Management (AgWQM) Area Plans and Rules that prohibit pollution. Because these plans and rules already require and provide the mechanism for agriculture to meet the water quality standards and TMDL load allocations, DEQ has determined that this proposed rulemaking does not have direct fiscal impacts or effects on small businesses and general public. If AgWQM Area Rules need to be revised in order to comply with the proposed toxics WQS, there could be increased costs for some private landowners to comply with the rules including one-time costs for capital improvements. These changes, however, will take years to be implemented.
- o In terms of benefits, the objective of this rulemaking is to provide clean water for

	<p>consumers of fish, shellfish, and drinking water. Depending on the level of toxics reduced into Oregon's water bodies, Oregonians would have access to safer drinking water and fish for consumption. Other parallel benefits as discussed in the overview section would be seen.</p> <p>Indirect impacts:</p> <ul style="list-style-type: none"> o Indirect impacts to the general consumer may involve rate increases to water and sewer bills to offset compliance strategies, monitoring, etc. utilized by POTWs. Depending on the costs of the compliance strategies, rate adjustments would vary. o For consumers of industrial goods, various compliance strategy costs to produce goods could be passed on to consumers in the form of increased prices. In some cases, products may no longer be available depending on a facility's ability to absorb additional costs. 					
<p>Impacts to Small Business (50 or fewer employees – ORS183.310(10))</p>	<p>Generally, DEQ does not track small business status as part of its recordkeeping, so limited information was available to determine: 1) whether or not the potentially affected entity was a small business, or (2) if it was a small business, what specific impacts could be attributed to this rulemaking. An inquiry to the Oregon Employment Department indicated that providing small business status information to DEQ was considered confidential information.</p> <p>Similar to the range of costs associated with large businesses, compliance costs for small businesses will vary widely depending on the compliance strategy of the affected entity (e.g. increased treatment, optimization of treatment process, pollutant reduction strategies/best management practices, additional monitoring, implementation tools). The SAIC Report estimated that proposing a fish consumption rate of 175 g/day could result in annual facility costs of \$0.35 to \$0.45 million (see Exhibit ES-1 on page 9). Some of these costs could be passed on to small businesses.</p>					
<p>Cost of Compliance on Small Business (50 or fewer employees – ORS183.310(10))</p>	<p>a) Estimated number of small businesses subject to the proposed rule</p>	<p><i>Small Business Impacts to Industrial Dischargers</i></p> <p>Limited DEQ research suggests that none of the 19 major industrials are small businesses (i.e. 50 or fewer employees). DEQ is unaware of how many of the 130 minor industrial permit holders are small businesses, since DEQ does not track this type of information.</p> <table border="1" data-bbox="753 1881 1151 1921"> <thead> <tr> <th style="background-color: #cccccc;">Facility Type</th> <th style="background-color: #cccccc;">No.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Facility Type	No.		
Facility Type	No.					

Major Industrial	19
Minor Industrial	130
Total	149

Small Business Impacts to Entities Covered Under Industrial Stormwater Permits

It is unknown how many of the 908 facilities holding industrial stormwater permits are small businesses. DEQ does not track this kind of information.

Small Business Impacts to Entities Covered Under General Permits

There are various categories of general permits (totaling approximately 1828 permits statewide) that are regulated by DEQ. The 1500A permit for petroleum hydrocarbon cleanup from groundwater or surface water is currently the only general permit with requirements for human health criteria. When this permit is renewed, these criteria will need to be addressed. It is unknown how many of the 20 facilities holding 1500A permits are small businesses. DEQ does not track this kind of information.

Small Business Impacts to Indirect Dischargers

DEQ surveyed the five largest pretreatment programs and determined that out of a total number of 285 significant industrial users, approximately 130 users were small businesses. DEQ does not have any data that would lead to any conclusions about how many of these businesses would likely be impacted by the proposed revised criteria.

Small Business Impacts to Farms and Ranches

According to the Oregon Farm Bureau, 97% of Oregon farms and ranches fall under the category of small businesses based on the definition of small businesses being 50 or fewer employees.

Agricultural activities are already subject to Agricultural Water Quality Management (AgWQM) Area Plans and Rules that prohibit pollution. Because these plans and rules already require

and provide the mechanism for agriculture to meet the water quality standards and TMDL load allocations, DEQ has determined that this proposed rulemaking does not have direct fiscal impacts or effects on small businesses and general public. However, if additional practices must be developed or requirements otherwise increase or are better defined, there may be increased costs of production or land management to farmers and landowners on rural lands who operate as small businesses.

Small Business Impacts to Forestry

Forest activities are subject to Forest Practices Act and rules in order to meet water quality standards and TMDL load allocations. Because of the requirements that are currently in place, DEQ has determined that this proposed rulemaking does not have direct fiscal impacts or effects on small businesses and general public. If FPA Rules need to be revised in order to comply with the proposed changes to the toxics water quality standards, and if those changes result in restrictions to timber harvest or other forest management activities that reduce growth and yield, there could be, in some cases, increased costs for private landowners to comply with the rules. The outcomes of these rule changes are difficult to predict and also will take years to be implemented.

Oregon Small Woodlands Association (OSWA)

According to information provided by OSWA, there are over 100,000 small businesses that own forest land in Oregon. Approximately 70,000 families own 10 to 5,000 acres and these ownerships are organized in various small business structures. In addition, there are 70,000 more families that own between two to ten acres of forestlands and some of these fall under the small business category.

Non-Permitted Urban Sources

For non-MS4 communities and facilities without NPDES requirements, TMDLs are the main driver for developing water quality management plans. Since TMDLs already require local governments and counties as designated management agencies to develop and implement TMDL implementation plans, the

		<p>agency does not expect significant fiscal or economic impacts for urban sources as a result of this rulemaking process.</p> <p>If new ordinances and codes are required in order to meet TMDL load allocations that are based on the proposed revised toxics water quality standards, there could be an indirect fiscal impact to all small businesses that are within the boundary of the TMDLs.</p>
	<p>b) Types of businesses and industries with small businesses subject to the proposed rule</p>	<p>The types of businesses/industries holding wastewater permits include, but are not limited to: food processors, smelting/refining operations, timber processing, wood products manufacturing, pulp and paper, retail operations, seafood processors, seasonal fresh pack operations, and petroleum hydrocarbon clean-up operations.</p> <p>Other types of businesses that could be subject to this rulemaking include nurseries, dairy and beef producers, fruit growers, and other food producers, industrial, and small forest land owners.</p> <p>Although the businesses above are subject to the proposed rule, they will not necessarily be impacted by the rule.</p>
	<p>c) Projected reporting, recordkeeping and other administrative activities required by small businesses for compliance with the proposed rule, including costs of professional services</p>	<p>For facilities that are small businesses that discharge directly to a water body, facility staff time and contractor fees would be incurred where it was determined that the rules required additional action or compliance strategies by the business. Impacts could be seen in association with reporting, and various recordkeeping requirements associated with compliance strategies, such as a variance request or using a background pollutant allowance.</p> <p>For small businesses that discharge to a POTW with a pretreatment program, there would likely be increased indirect costs associated with recordkeeping and other administrative activities to evaluate pollutant reduction options to meet pretreatment requirements where those requirements are imposed by POTWs.</p>

	<p>d) The equipment, supplies, labor, and increased administration required by small businesses for compliance with the proposed rule</p>	<p>For facilities that are small businesses that discharge the pollutants addressed by this proposed rulemaking directly to a water body, costs associated with treatment or treatment optimization to comply with new criteria could be substantial, depending on the treatment technology used and wastes generated.</p> <p>For small businesses that discharge to a POTW with a pretreatment program, there would likely be increased costs associated with any treatment technology/optimization required to reduce the pollutant of concern to within POTW acceptable limits for indirect discharge. In some cases, small businesses which are indirect dischargers to a POTW may need to treat wastes onsite if they are unable to meet sufficient effluent limits established by a POTW.</p>								
	<p>e) A description of the manner in which DEQ involved small businesses in the development of this rulemaking</p>	<p>The Rulemaking Work Groups have several members representing small business interests: 1) Associated Oregon Industries (AOI), 2) Oregon Small Woodlands Association, 3) Oregon Forests Industry Council, and 4) Oregon Farm Bureau. The AOI member also participated as a member of the FIIAC committee. DEQ discussed the fiscal impact form and solicited input from these members during two work group meetings in August and October 2010. This input was incorporated into DEQ's analysis.</p>								
<p>Impacts on Large Business (all businesses that are not "small businesses" under ORS183.310(10))</p>	<p>Industrial Permits</p> <p>Industrial permits have a complex process to determine monitoring requirements based on the industrial category and the potential for toxicity in the receiving waterbody. The monitoring requirements at a specific facility are determined based upon factors such as industrial category, pre-existing permit status, hazardous material present, new source performance standards or permit writer discretion. The discharger may also be required to conduct additional monitoring that is tied to the pollutants identified in a pretreatment program, 303(d) listed waters or ambient waters.</p> <p>Of the 19 facilities covered by major industrial NPDES permits, approximately nine are pulp and</p>	<table border="1"> <thead> <tr> <th>Facility Type</th> <th>No.</th> </tr> </thead> <tbody> <tr> <td>Major Industrial</td> <td>19</td> </tr> <tr> <td>Minor Industrial</td> <td>130</td> </tr> <tr> <td>Total</td> <td>149</td> </tr> </tbody> </table>	Facility Type	No.	Major Industrial	19	Minor Industrial	130	Total	149
Facility Type	No.									
Major Industrial	19									
Minor Industrial	130									
Total	149									

	<p>paper industries. Of the remaining 10 facilities, there are several smelting or refining industries, electronics and chemical manufacturing, and food processors. A limited review of these 19 major industrials indicated that all 19 facilities are large businesses.</p> <p>Potential costs will vary depending on what pollutants are discharged by the facility, as well as the compliance strategy a facility follows. For example, installation of new treatment technologies could be costly, while other compliance strategies, such as using intake credits would be relatively inexpensive. It is unknown how many facilities would have a need for and be eligible to use the relatively inexpensive compliance strategies. As a result, conclusions about whether or not an industrial facility will likely be impacted by more stringent water quality standards are a site-specific analysis, and broad conclusions are difficult to reach.</p>								
<p>Impacts on Local Government</p>	<p>Domestic Permits/Publicly Owned Treatment Works (POTWs)</p> <p>The proposed toxics rulemaking would directly impact all major domestic facilities (i.e. POTWs) that monitor for toxics. Generally, minor domestic sources (average dry weather design flow of less than one million gallons per day (MGD)) have much reduced monitoring and permitting requirements than major domestic sources. The permit writer must conduct a Reasonable Potential Analysis (RPA) for toxic pollutants for major domestic sources (i.e. average dry weather design flow of at least 1 MGD). For minor sources, a permit writer may conduct a RPA for all 303(d) listed toxic pollutants if there is a potential of water quality degradation due to non-typical factors such as significant industrial discharges.</p> <table border="1" data-bbox="1130 779 1528 947"> <thead> <tr> <th>Facility Type</th> <th>No.</th> </tr> </thead> <tbody> <tr> <td>Major Domestic</td> <td>49</td> </tr> <tr> <td>Minor Domestic</td> <td>154</td> </tr> <tr> <td>Total</td> <td>203</td> </tr> </tbody> </table> <p>However, both major and minor sources could be impacted if a Total Maximum Daily Load establishes a waste load allocation for their discharge. For example, if during the development of a TMDL the minor is identified as a source of the toxic pollutant, it could be given a waste load allocation. Alternatively, if a minor source is not identified during the TMDL process, but later becomes known as a source of a toxic pollutant, it may be able to access reserve capacity in the TMDL, if available and accessible to that source. Sometimes dischargers may be allocated their unquantifiable 'current loading' if they are not considered a significant source.</p> <p>Consequently, majors will generally be more impacted by revisions to the human health toxics criteria than minors. Minors may be impacted as well in situations where discharges are to impaired waters where waste load allocations have been established. A range of costs are possible depending on the compliance tools available for each individual circumstance. Variances may be available to POTWs that cannot meet effluent limits for toxics criteria. Cost estimates for variances can be found in the Overview section.</p>	Facility Type	No.	Major Domestic	49	Minor Domestic	154	Total	203
Facility Type	No.								
Major Domestic	49								
Minor Domestic	154								
Total	203								

	<p>Potential Indirect Effects Associated with Municipalities</p> <p>Pretreatment</p> <p>Some businesses do not directly discharge to a water body but rather discharge to a municipal collection system under a municipality's pretreatment program. These businesses may be subject to additional requirements from the municipality. Currently, 23 POTWs have pretreatment programs that place requirements upon businesses discharging to their collection systems. All 23 POTWs have set local limits for metals with only one pretreatment POTW having additional limits for: pentachlorophenol, chlorobenzene, chloroform, trichloroethylene, acrylonitrile, 1,2-dichloroethane, 2,4-dinitrotoluene, nitrobenzene, and chlordane.</p> <p>It is possible that POTWs unable to meet effluent limits contained in the NPDES permit may explore pretreatment requirements for indirect dischargers with known pollutants of concern. However, it is unknown whether POTWs in addition to the 23 with existing pretreatment programs will develop their own pretreatment programs or set local limits for additional toxic pollutants based on more stringent criteria. It is also unknown what the associated costs could be for the indirect discharger with pretreatment requirements. For example, a POTW may not be able to accommodate business or industrial waste streams given new effluent limits for toxic pollutants. Consequently, some businesses and industries may need to disconnect from the sewer system and manage their wastewater on site. The types of businesses that would likely be most affected by local limits imposed by the municipality would be high tech producers, platers, dental offices, and photo processors (ACWA Memo, March 4, 2008).</p> <p><i>Other Local Government</i></p> <p>For non-MS4 communities and facilities without NPDES requirements, TMDLs are the main driver for developing water quality management plans. Since TMDLs already require local governments and counties as designated management agencies to develop and implement TMDL implementation plans, the agency does not expect the fiscal or economic impacts to be significant for urban sources as a result of this rulemaking process.</p>
<p>Impacts on State Agencies other than DEQ</p>	<p>For activities related to NPDES implementation, DEQ does not anticipate fiscal or economic impacts to other state agencies with this rulemaking. DEQ is the primary state agency responsible for implementing and enforcing the NPDES program. However, there may be impacts to other state agencies (e.g. ODA and ODF) depending on various circumstances. For example, DEQ anticipates additional 303(d) listings for toxics may result depending on monitoring results. To address impairments, TMDLs will be developed and implementation plans designed to reduce loadings from these sources. ODA and ODF are the Designated Management Agencies responsible for implementing and reducing loads from agricultural and</p>

forestry sources, so therefore could expend FTE and resources to address load reductions. Information below is from ODA and ODF staff.

From Oregon Department of Agriculture:
 Existing Agricultural Water Quality Management Area Plans and Rules are expected to be adequate to achieve TMDL load allocations and meet water quality standards on agricultural lands. The plans rely on both voluntary and regulatory approaches to implement management measures that prevent pollution by controlling upland erosion and sediment transport, restoring and maintaining riparian vegetation, appropriately utilizing nutrients, and addressing other agricultural activities as needed to protect surface and ground waters. The plans rely on, and the rules are generally limited to, available and technically feasible conservation practices. The costs of these practices were considered in adopting current area plans and rules.

Oregon Department of Forestry
 Forest activities are subject to Forest Practices Act and rules to meet the water quality standards and TMDL load allocations. Because these rules already require and provide the mechanism for forestry to meet the water quality standards and TMDL load allocations, the Department of Forestry does not expect significant fiscal or economic impacts on forest lands.

Impacts on DEQ

The following table summarizes potential fiscal and economic impacts to DEQ programs, staff, and resources. DEQ does not anticipate funding additional staff positions in response to this rulemaking. Consequently, staff time spent on implementing more stringent human health toxics criteria may impact other priorities of the department. DEQ may also receive additional requests to conduct Use Attainability Analyses or develop site specific criteria as a way of addressing compliance issues identified in conjunction with implementing the more stringent toxics criteria, if appropriate. These rules do not generate revenue for DEQ. To estimate dollar amounts below, DEQ assumed a staff Natural Resource Specialist 4 position, Step 7, at \$63/hr.

	DEQ Regional Staff	Headquarters/Lab/Administrative Staff
	Permitting	
Monitoring	- Estimate 4 – 16 additional hrs per permit (\$252 - \$1008) needed for staff to determine monitoring requirements for permits subject to this rulemaking. For this rulemaking, average review per permit could slightly increase depending on individual circumstances and compliance tools used.	-Staff and lab time needed for periodic revisions of quantitation limits (QLs) -Generally, costs increase when criteria for toxic pollutants change from totals of a chemical family to individual chemical species. Costs also generally increase to achieve lower QLs. -The criteria for total mercury will be replaced by a tissue based methyl mercury criteria. Generally, cost for methyl mercury analysis is 2-3 times higher than for total mercury. -Some of the monitoring and analysis costs have already been absorbed given DEQ's investment in toxics monitoring for SB737, the Pesticide Stewardship Program and the toxics monitoring

			program.
WQBELs and/or other WQ Limits	<p>-Regional staff will need to do more WQBEL assessments if RPA indicates that more dischargers will have reasonable potential. Estimate an additional 8 hrs/parameter/permit (\$504) to establish QBELs where they are identified as needed.</p> <p>-Intake Credits: The RPA IMD would include calculations for intake credits and wouldn't require additional staff time.</p>	<p>-Periodic revisions of RPA IMD may be required to account for intake credits</p> <p>-Increased data input into the Discharge Monitoring System (DMS) which stores information on permit features, schedules, permit limits, required monitoring and discharge monitoring report data for individually permitted facilities.</p> <p>-Because stormwater discharges are intermittent, DEQ does not apply the human health criteria (which are generally based on a 70 year exposure) to permits for these discharges. Therefore, there will not be any anticipated fiscal impact to DEQ related to stormwater permits. However, the industrial stormwater permit is currently being revised. In the current proposal, it is likely that sources which discharge to waterbodies that are listed as impaired for the human health criteria will have to monitor for these pollutants and develop BMPs if criteria are exceeded. In these cases, DEQ staff will need to oversee and review monitoring and associated BMPs as needed.</p> <p>- The only general permit with toxics that would require additional work to modify based on revised human health criteria is the 1500A. The 1500A permit covers petroleum hydrocarbon cleanup from groundwater or surface water. DEQ will need to incorporate the new permit limits as part of the general permit renewal.</p>	
Background Pollutant Allowance	<p>-More staff time needed to review applicability of a background allowance request. DEQ estimates an additional 60 hrs./permit (\$3780) where this tool is used. However, time spent in this analysis could be less than developing other "site specific solutions" if this provision was not available.</p>	<p>-HQ collaboration may be needed in the short term to provide regional consistency in evaluating background pollutant allowances.</p> <p>-Staff time needed for periodic revisions of IMD.</p> <p>-Do not anticipate greater regional or HQ FTE, so less technical assistance may be available for other issues/projects,</p>	
Variances	<p>- Regional permit writers will be interfacing with discharger to evaluate data and information needed for variance request and to incorporate permit conditions based on the variance request. In some cases, significant staff time could be spent gathering this information, possibly conducting literature reviews for treatment technology removal capabilities, and/or reviewing fiscal and economic data from discharger. Variances also require a yearly review of the pollutant reduction plan to be conducted by DEQ staff. DEQ estimates approximately 160 hrs./variance request (\$10,080).</p> <p>-Time spent in this analysis could be less than developing other "site specific solutions" if this provision was not available.</p>	<p>- Since DEQ has yet to receive a variance request, the department is unable to specify costs based on past experience, therefore costs and/or resources described here are estimates.</p> <p>-DEQ anticipates that HQ WQS staff will review variance requests submitted by the permittee and permit writer.</p> <p>- Estimate 0.75 FTE (Standards 0.56 FTE and Permitting 0.19 FTE) to review variance requests and pollutant reduction plans, and coordinate DEQ/EQC/EPA approval.</p> <p>-SAIC extrapolated the potential number of variance applications for the sample facilities and found that DEQ would need to review approximately 40 requests under the baseline criteria (FCR of 17.5 g/day) and an additional 16 under the revised criteria. Assuming a cost of \$3,900 per review, baseline costs could be approximately \$159,000 with incremental costs of approximately \$65,000 under the revised criteria.</p> <p>-DEQ anticipates ongoing costs to review variances depending on the ability of dischargers to meet effluent limits.</p> <p>-Most likely, staff time in reviewing variances could decrease as the process becomes more efficient. In addition, variance renewals should be less</p>	

		<p>resource intensive.</p> <ul style="list-style-type: none"> -Staff time needed for periodic revisions of variance IMD and associated staff training. -Do not anticipate availability of additional FTE, so less HQ technical assistance available for other issues/projects.
Compliance Schedules	<ul style="list-style-type: none"> -Regional permit writers may need to develop additional compliance schedules for permittees given more stringent toxics criteria. -Use of compliance schedules would depend on if the discharger could ultimately meet discharge limits within a specified amount of time. - DEQ estimates approximately 40 hrs./compliance schedule development (\$2520). -Generally, more complex permits (e.g. those including compliance schedules) require additional oversight and communication with permittees. 	<ul style="list-style-type: none"> -HQ permitting staff may assist regional permit writers in developing compliance schedules depending on backlog and permitting priorities.
Non-Permitting		
<p>More Stringent Criteria <i>TMDL monitoring</i></p>	<ul style="list-style-type: none"> -Regional staff may be involved in both developing a sampling and analysis plan and collection of samples needed for development of TMDLs to address waterbodies listed for toxics. 	<ul style="list-style-type: none"> -Lab FTE to develop sampling and analysis plans, collect and analyze data, and develop reports. Will depend on the quality and quantity of data needed for the TMDL and availability of existing data from other sources (e.g. USGS, FWS, BLM, USFS, etc.). -DEQ does not anticipate additional FTE, therefore, costs may be similar to that incurred under the current toxics criteria. However, there may be a backlog of TMDL development due to lack of DEQ monitoring resources.
<p><i>TMDL Development</i></p>	<ul style="list-style-type: none"> -Regional staff members lead TMDL development by coordinating with HQ and Lab staff and working with local advisory group. - There may also be an additional backlog of TMDL development if there are additional 303(d) listings as anticipated. - Since DEQ will not seek additional FTE for the TMDL program, DEQ expects to issue TMDLs at a slower rate. 	<ul style="list-style-type: none"> -HQ supports TMDL development by providing modeling and programmatic support. - Since DEQ will not seek additional FTE for the TMDL program, DEQ expect to issue TMDLs at a slower rate. -Additional resources maybe needed for Lab in order to support the development of monitoring strategies for Implementation-Ready TMDLs. - There may also be an additional backlog of TMDL development if there are additional 303(d) listings as anticipated.
<p>TMDL Development</p> <p>1. TMDLs: Clarifying EQC and DEQ's authorities in Divisions 41 and 42</p>	<ul style="list-style-type: none"> - The resource needs are expected to double for TMDLs compared to current subbasin level TMDLs. -TMDL development phase, additional resources should not be required for implementation. (It should be noted that there currently is a shortage of staff resources to support implementation of TMDLs that are in place. The need for additional resources to implement TMDLs already exists.) 	<ul style="list-style-type: none"> - The resource needs are expected to double for TMDLs compared to current subbasin level TMDLs. - Toxics TMDLs have roughly cost between 50,000 to 1,000,000 to develop depending on the extent of listings within a basin. -According to the SAIC Report, additional technical assistance may be needed in order for the dischargers to meet TMDL waste load allocations. Requests for pursuing variances by facilities may increase, for example.
<p>2. Addressing air sources in TMDLs: Clarifying EQC and DEQ's</p>	<ul style="list-style-type: none"> -No significant increase in resource needs for the regional staff members 	<ul style="list-style-type: none"> -No significant increase in resource needs for the HQ and Lab staff members are expected.

<p>authorities to regulate air sources to meet TMDL goals in Division 42</p>	<p>are expected. -If air depositional load is determined to be significant through TMDL source analysis, resource needs for Air Quality Division may increase to work with facilities and coordinate with Water Quality Division.</p>	<p>-If air depositional load is determined to be significant through TMDL source analysis, resource needs for Air Quality Division may increase for rulemaking and coordination with Water Quality Division.</p>
<p>TMDL Implementation</p>	<p>-Regional staff members are central to coordinate implementation efforts and monitoring efforts in their region. Since more work will be done during TMDL development phase, additional resources should not be required for implementation. (It should be noted that there currently is a shortage of staff resources to support implementation of TMDLs that are in place. The need for additional resources to implement TMDLs already exists.)</p>	<p>-HQ and Lab provide technical and programmatic support to the region for TMDL implementation. -Additional resources maybe needed for HQ to provide modeling and analyses associated with TMDLs. (It should be noted that there currently is a shortage of staff resources to support implementation of TMDLs that are in place. The need for additional resources to implement TMDLs already exists.)</p>
<p>401 Certifications</p>		<p>- Section 401 of the federal Clean Water Act requires that any federal license or permit to conduct an activity that may result in a discharge to waters of the United States must first receive a water quality certification from the state in which the activity will occur. These discharges must meet any new water quality toxics criteria for human health. -DEQ does not anticipate additional FTE or resources needed as part of this rulemaking since new processes or approaches are not anticipated being needed and toxic pollutants are not routinely significant pollutants of concern for these activities.</p>
<p>Integrated Report</p>		<p>-Potential of additional toxics listings - Data evaluation tools and database systems used to prepare the Integrated Report will need to be revised. -For the 2010 Integrated Report, it required 2 FTE (1 programmer and 1 standards specialist) for 6 months (approximately \$40,000) to evaluate toxics data in LASAR using Table 20 criteria. A similar level of effort is likely needed to revise the data systems to incorporate new criteria. Additional effort will be needed to revise and update the assessment of water bodies done prior to date of EPA approval of new toxic substance criteria. -Water body analytical data in DEQ's LASAR data system may need to be synchronized/correlated to include metadata needed to apply new criteria (e.g. CAS numbers, total forms vs. individual species forms). This analysis is needed to correlate data collected in LASAR to Integrated Report analysis and listing status of that pollutant.</p>
<p>Land Quality</p>		<p>DEQ's cost to implement the new human health criteria into clean-up standards would be minimal. Work involves substituting lower risk numbers at sites where surface-water discharge is the pathway of concern.</p>

<p>Assumptions</p>	<p>DEQ assumes that the best available information which DEQ has relied on to make these proposed rule revisions, is reasonably true and accurate.</p> <p>DEQ assumes that is it in the interest of the public to expend public and private resources on actions that will result in measurable environmental benefits.</p>																										
<p>Housing Costs</p>	<p>DEQ has determined that this proposed rulemaking will have no effect on the cost of development of a 6,000 square foot parcel and the construction of a 1,200 square foot detached single family dwelling on that parcel.</p>																										
<p>Administrative Rule Advisory Committee</p>	<p>DEQ assembled a Toxics Water Quality Standards Rulemaking Workgroup to assist the department in developing and evaluating the proposed rule. There were two workgroups which focused on specific rulemaking items. The Rulemaking Work Group (RWG) focused on NPDES implementation tools to comply with revised toxics criteria, while the Non-NPDES Work Group, focused on rulemaking items associated with nonpoint sources of pollution contributing to toxics pollution, and pretreatment options for indirect dischargers to POTWs. These groups met on a monthly basis from January 2009 until September of 2010. Materials developed for these work group meetings can be found here.</p> <p>The process to develop and recommend a fish consumption rate occurred earlier from 2006 – 2008. In August and September 2010, DEQ discussed this fiscal analysis with the workgroup and solicited input. DEQ received information from ODA, ODF, Oregon Small Woodlots Association, the Oregon Farm Bureau and the Oregon Association of Clean Water Agencies. The work group consists of the following members:</p> <p>Rulemaking Work Group Members</p> <table border="1" data-bbox="391 1377 1511 1719"> <thead> <tr> <th>Organization</th> <th>Representative</th> </tr> </thead> <tbody> <tr> <td>CTUIR</td> <td>Ryan Sudbury/Rick George</td> </tr> <tr> <td>EPA</td> <td>Jannine Jennings</td> </tr> <tr> <td>ACWA</td> <td>Dave Kliewer</td> </tr> <tr> <td>League of Oregon Cities</td> <td>Peter Ruffier</td> </tr> <tr> <td>Northwest Pulp and Paper</td> <td>Kathryn Van Natta</td> </tr> <tr> <td>Industrial Dischargers</td> <td>Michael Campbell</td> </tr> <tr> <td>Associated Oregon Industries</td> <td>Rich Garber or alternate Myron Burr</td> </tr> <tr> <td>Northwest Environmental Advocates</td> <td>Nina Bell</td> </tr> <tr> <td>Oregon Environmental Council</td> <td>Andrew Hawley*</td> </tr> <tr> <td>Columbia Riverkeeper</td> <td>Lauren Goldberg</td> </tr> </tbody> </table> <p>*Andrew did not participate after the first several meetings</p> <p>Non-NPDES Work Group Members</p> <table border="1" data-bbox="391 1843 1511 1904"> <thead> <tr> <th>Organization</th> <th>Representative</th> </tr> </thead> <tbody> <tr> <td>CTUIR</td> <td>Ryan Sudbury/Rick George</td> </tr> </tbody> </table>	Organization	Representative	CTUIR	Ryan Sudbury/Rick George	EPA	Jannine Jennings	ACWA	Dave Kliewer	League of Oregon Cities	Peter Ruffier	Northwest Pulp and Paper	Kathryn Van Natta	Industrial Dischargers	Michael Campbell	Associated Oregon Industries	Rich Garber or alternate Myron Burr	Northwest Environmental Advocates	Nina Bell	Oregon Environmental Council	Andrew Hawley*	Columbia Riverkeeper	Lauren Goldberg	Organization	Representative	CTUIR	Ryan Sudbury/Rick George
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EPA	Jannine Jennings/Mary Lou Soscia
Department of Forestry	Peter Daugherty
Department of Agriculture	Dave Wilkinson/Ellen Hammond
ACWA	Dave Kliever
League of Oregon Cities	Peter Ruffier
Northwest Pulp and Paper	Kathryn Van Natta
Industrial Dischargers	Michael Campbell
Associated Oregon Industries	Rich Garber or alternate Myron Burr
Northwest Environmental Advocates	Nina Bell
Oregon Environmental Council	Andrew Hawley*
Columbia Riverkeeper	Lauren Goldberg
Oregonians for Food and Shelter	Terry Witt
Oregon Farm Bureau	Jennifer Shmikler
Oregon Forest Industries Council	Chris Jarmer
Association of Oregon Counties	Emily Ackland
Oregon Small Woodlands Association	David Ford

*Andrew did not participate after the first several meetings

The FIIAC met six times from January to June in 2008. Its membership consisted of the following members:

Fiscal Impacts and Implementation Advisory Committee

Organization	Representative
OR Dept. of Human Services	Deanna Conners
CTUIR	Kathleen Feehan
Associated Oregon Industries	Rich Garber
Ecotrust	Sarah Kruse
ECONorthwest	Kristin Lee
Confederated Tribes of the Grand Ronde	Eric Scott*
Association of Clean Water Agencies	Susie Smith
League of Oregon Cities	Willie Tiffany

*Eric participated in the first four FIIAC meetings and was not able to remain on the committee through the completion of the process. Therefore he did not provide input to the FIIAC memo.

Prepared by _____

Printed name _____

Date _____

Approved by DEQ Budget Office _____

Printed name _____

Date _____

**ATTACHMENT
FISCAL AND ECONOMIC NARRATIVE**

Fiscal and Economic Impact Narrative

Objective: The objective of this narrative is to support the Statement of Need and Fiscal and Economic template that is required for rulemaking.

Overall:

- The fiscal and economic impact analysis characterizes potential costs that may result from the proposed toxics criteria based on a fish consumption rate (FCR) of 175 grams per day (g/d) compared to the existing human health toxics criteria . The costs of complying with the existing toxics criteria will not be analyzed for this fiscal review.
- There are two main elements contained in this fiscal analysis: (1) Direct and Indirect impacts attributable to the criteria revisions, and (2) Impact of using different implementation tools

I. Direct and Indirect Impacts Attributable to the Criteria Revisions

The general public, small and large businesses, communities, and public agencies will likely be impacted by the proposed criteria changes either directly and indirectly. The establishment of criteria, by themselves, has no direct impact or effect. Rather, how the Department applies those criteria will affect Oregonians. Specifically, the Department may require modifications to wastewater discharge permits and the use of various implementation tools, and to certifications for sediment removal and fill activities and hydroelectric operations to comply with the revised criteria. The new criteria might result in more waters being listed as having impaired water quality. In addition, the revised criteria may alter the management practices required to control discharges from nonpoint sources, including those subject to Total Maximum Daily Loads (TMDLs) established for water quality limited waterbodies.

It is difficult to make a direct comparison between the effective criteria and the proposed criteria and determine what the subsequent associated fiscal and economic impacts will be. Part of the complication arises from the 2004 rulemaking which segregated criteria into two groups (one group being effective for permitting purposes in advance of EPA's action and one group *not* effective until EPA action). The result of the 2004 rulemaking was that dischargers were required to implement the more stringent human health criteria based on 17.5 g/day, while other CWA programs continued to implement criteria based on 6.5 g/day (e.g. section 401 certifications). EPA did not take action on

DEQ's 2004 toxics criteria until June 1, 2010, when it disapproved the majority of human health criteria based on EPA's conclusion that the fish consumption rate used in 2004 was not protective enough. Among the criteria disapproved were criteria for approximately 44 toxic pollutants that DEQ added as part of the 2004 rulemaking. In addition, many of these new criteria values DEQ adopted in 2004 were the result of criteria changing from totals of that chemical to individual species of that chemical group (e.g. PAHs, endosulfan, dichlorobenzenes). While the majority of the revised criteria were disapproved, EPA approved the withdrawal of criteria values for eight toxic pollutants based on previous EPA recommendations. In addition, EPA took no action in 2010 on some criteria withdrawn in 2004 and consequently, values for those criteria remain. However, these pollutants no longer have EPA criteria, therefore, DEQ proposes to withdraw these criteria as part of this rulemaking. In addition, DEQ is not proposing to revise eight criteria values that do not rely on a fish consumption rate. Instead, the criteria are derived from drinking water maximum contaminant levels (MCLs). The table below depicts a general comparison of current versus proposed criteria. Please refer to Table 1 in Appendix B for a comparison of the current criteria versus the proposed criteria.

Which Criteria are More Stringent? Proposed vs. Current	*Number
Proposed	48
Current	4
Same	10
Mix**	6

TOTAL **68**

* Analysis only includes criteria that have both current and proposed criteria and does not include criteria that were either withdrawn or added
 ** For example, a "water + org" proposed criterion for a chemical becomes less stringent, but then a new "org only" criterion was proposed.

Approximately 48% of the proposed human health pollutants have Quantification Limits (QLs) which are higher than the actual criterion. For that reason, there may be small quantities of pollutants in Oregon's waterbodies or in wastewater effluent that cannot be measured given limitations in analytical methodologies. For permitting purposes, the QL becomes the compliance point for dischargers in these circumstances. Consequently, if the criterion for any particular pollutant becomes more stringent, but the QL remains higher than the criterion, there would be no effective change in the point of compliance. As laboratory methodologies improve, it is likely that QLs will begin to shift lower towards (or be lower than) the water quality criterion of these pollutants. While historically, the pace of change

in laboratory methodologies has not been rapid, when methodologies improve, additional toxics listings and WQBELs established for dischargers may result.

a. Identifying pollutants most likely to present challenges for sources

i. The SAIC Report

The SAIC Report identified three pollutants where additional controls may be needed to achieve compliance with lower criteria: (1) arsenic; (2) Bis(2-ethylhexyl)phthalate; and (3) mercury. As part of the 2004 rule revision, Oregon withdrew its national CWA § 304(a) human health criterion for total mercury and replaced these criteria with a new fish tissue-based “organism only” human health criterion for methylmercury. DEQ does not currently have a criterion for methylmercury because EPA disapproved the criterion on June 1, 2010 based on a fish consumption rate that was not considered protective of human health. DEQ is proposing a replacement fish-tissue based methylmercury criterion based on 175 g/day as part of this toxics rulemaking. The SAIC Report assumed that DEQ would use EPA’s default values to convert the methylmercury fish tissue criterion into a total mercury water column criterion. However, until data on methylmercury are collected and analyzed in Oregon water bodies, it is unclear what the state of compliance will be and how relevant the results are from the SAIC Report.

DEQ proposed a revised criterion for arsenic, along with revised criteria for iron and manganese in a separate rulemaking and will not be a part of this rulemaking package. Revised criteria for iron and manganese were adopted by the EQC on December 9, 2010. A revised criterion for arsenic is anticipated to be adopted in April 2011. Because DEQ is proposing a higher criterion for arsenic than what was reflected in the SAIC report, some of the compliance issues associated with arsenic may be minimized. The economic and fiscal impact of revising criteria for iron, manganese, and arsenic will be analyzed separately and will not be addressed here.

Among the 20 facilities evaluated, SAIC found 3 facilities that could have compliance issues with Bis(2-ethylhexyl)phthalate. It is unknown to what extent additional facilities may face compliance issues will be. The current QL for Bis(2-ethylhexyl)phthalate is now higher than the proposed criteria (previously, the criterion was greater than the QL), therefore the QL will become the effective compliance point.

ii. Listings for pollutants and pollutants identified as “potential concern”

Water column sampling, as well as fish tissue sampling and sediment analysis have indicated the presence of toxics in Oregon's waterbodies. Overall, the 2004/2006 Integrated Report contains a total of 249 water body segments listed for a toxic pollutant criterion.

- 27 of those (11%) are listed for mercury. (These listings are based on fish consumption advisories, which are not affected by water quality standards.)
- 107 of those (43%) are listed for arsenic, iron or manganese, and are being analyzed for compliance issues in separate rulemakings.
- Other most commonly listed pollutants are beryllium, dieldrin, DDT, PCBs, chlorpyrifos, and copper.

Appendix C contains a complete list of waterbodies that are contained in Oregon's 303(d) list for exceeding criteria for certain toxic pollutants. Appendix C also includes a table depicting pollutants of potential concern.

DEQ is targeting adoption of human health criteria based on a FCR of 175 g/day by the EQC in June 2011. Consequently, the proposed criteria will not be adopted and approved by EPA in time to be evaluated as part of the 2010 Integrated Report. DEQ will incorporate the revised human health toxics criteria into the Integrated Report as soon as feasible. Depending upon the timing of EPA approval, DEQ may be able to incorporate the revised criteria into the Integrated Report as soon as the 2012 Integrated Report. Depending on monitoring results and the ability to quantify low concentrations of toxic pollutants, there may be additional listings for toxics in the 2012 Integrated Report or reports thereafter. For some toxic pollutants, DEQ anticipates removing waterbodies in future 303(d) lists based on: (1) criteria that were recently approved by EPA in June 2010 that DEQ withdrew as water quality standards (i.e. beryllium, cadmium, chromium III and VI, lead, mercury, silver, and trichloroethane 1,1,1,) and (2) criteria changes to arsenic, iron, and manganese as proposed in separate rulemakings. It is difficult for DEQ to predict which other toxics could pose potential compliance issues in the future, given the generally small amount of ambient and effluent monitoring data that is available.

iii. Likely industrial sectors discharging pollutants

Of the 19 facilities covered by major industrial NPDES permits, approximately nine are pulp and paper industries. Of the remaining 10 facilities, there are several smelting or refining industries, electronics and chemical manufacturing, and food processors. In a summary review of these 19 permits, DEQ has established effluent limits for several toxics, as well as additional monitoring

requirements for selected toxics. The table below contains a summary of current toxics effluent limits and requirements for monitoring for a selection of major industrials. Based on a review of available information, DEQ has not established toxic pollutant effluent limits in food processing permits.

Category	Toxic Effluent Limits	Additional Toxics Monitoring
Pulp & Paper Industry	-arsenic (total), adsorbable organic halides (AOX), 2,3,7,8-TCDD, lead, and zinc	-Whole Effluent Toxicity, metals (including total arsenic), inorganic arsenic, cyanide, total phenols, volatile compounds, acidextractable compounds, and pesticides - Priority Pollutant Scan - metals, cyanide, and total phenols -Priority Pollutant Scan - organic toxic pollutants
Primary Smelting and/or Refining	-benzo (a) pyrene, antimony, nickel, aluminum, free cyanide	PCBs
Electronics	-total chromium, total toxics organics (sum of the concentrations for approximately 30 toxic organic compounds)	

a. Applicability and Potential Effect of Rulemaking Associated with NPDES Permits and §401 Water Quality Certifications

Generally, the proposed human health criteria for toxics are applicable to all individual and general permits. The degree to which these permits are in fact affected by the new and revised criteria will be determined by an analysis of ambient and effluent data. Analysis of monitoring data may indicate the need for WQBELs. Dischargers with WQBELs for toxic pollutants could have varying costs, ranging from minimal staff time involvement (e.g. employing intake credits) to installing various capital improvement measures to meet WQBELs.

Adoption and approval of new criteria will not affect NPDES permits until permits are renewed. DEQ will not modify existing permits in effect to incorporate the new criteria at the time of EPA approval if

that approval occurs during their permit cycle. At the time of permit renewal, DEQ will evaluate whether new WQBELs need to be developed to meet revised water quality criteria.

The SAIC report indicated that some dischargers will have issues associated with complying with the existing criteria. The table below represents potential annual compliance costs extrapolated from a sample representing both major municipals and industrials, and indicates that the greatest proportional cost would be attributed to complying with the baseline standard (i.e. 17.5 g/day), rather than the incremental costs associated with a higher fish consumption rate. The highlighted cost range below indicates the incremental costs of complying with a FCR of 175 g/day, not taking into account inflow and infiltration (I&I) of arsenic, which is not relevant for this analysis since arsenic is not being addressed by this proposed rulemaking. For more detailed information on this table, please see Appendix F in the SAIC Report.

Exhibit ES-1. Summary of Potential Annual Compliance Costs (millions of \$2007)

Scenario	Total		Incremental ¹	
	With I&I Costs ²	No I&I Costs	With I&I Costs ²	No I&I Costs
Baseline	\$3.62 - \$29.7	\$3.62 - \$3.92	NA	NA
63.2 gpd	\$3.69 - \$29.8	\$3.69 - \$4.04	\$0.075 - \$0.13	\$0.075 - \$0.13
113 gpd	\$3.96 - \$30.1	\$3.96 - \$4.31	\$0.35 - \$0.40	\$0.35 - \$0.40
175 gpd	\$3.96 - \$31.0	\$3.96 - \$4.36	\$0.35 - \$1.32	\$0.35 - \$0.45
389 gpd	\$4.46 - \$31.6	\$4.46 - \$4.86	\$0.85 - \$1.82	\$0.85 - \$0.95
620 gpd	\$4.46 - \$31.6	\$4.46 - \$4.86	\$0.85 - \$1.82	\$0.85 - \$0.95

NA = Not applicable

1. Represents the difference between total annual cost and baseline costs (i.e., incremental costs above and beyond those needed for compliance with baseline criteria).
2. High estimate includes cost of I&I to reduce arsenic in municipal sewer systems.

Although there are estimates available for annual compliance costs from the SAIC Report, specific costs for any one facility will vary on a case-by-case basis and will depend on variables such as pollutants present, availability of treatment technologies able to treat to specified levels, and compliance options available to facilities (e.g. intake credits vs. end of pipe treatment technologies vs. variances).

i. Industrial Permits

Industrial permits have a complex process to determine monitoring requirements based on the industrial category and the potential for toxicity in the receiving waterbody. The monitoring requirements at a specific facility are determined based upon factors such as industrial category, pre-existing permit status, hazardous material present, new source

Facility Type	No.
Major Industrial	19
Minor Industrial	130
Total	149

performance standards or permit writer discretion. The discharger may also be required to conduct additional monitoring that is tied to the pollutants identified in a pretreatment program, 303(d) listed waters or ambient waters.

Of the 19 facilities covered by major industrial NPDES permits, approximately nine are pulp and paper industries. Of the remaining 10 facilities, there are several smelting or refining industries, electronics and chemical manufacturing, and food processors. A limited review of these 19 major industrials indicated that all 19 facilities are large businesses. DEQ is unaware of how many of the 130 minor industrial permit holders are small businesses, since DEQ does not track this type of information.

Potential costs will vary depending on what pollutants are discharged by the facility, as well as the compliance strategy a facility follows. For example, installation of new treatment technologies could be costly, while other compliance strategies, such as using intake credits would be relatively inexpensive. It is unknown how many facilities would have a need for and be eligible to use the relatively inexpensive compliance strategies. As a result, conclusions about whether or not an industrial facility will likely be impacted by more stringent water quality standards are a site-specific analysis, and broad conclusions are difficult to reach.

ii. Stormwater Permits

DEQ issues three different types of stormwater permits: individual Municipal Separate Storm Sewer System (MS4) permits, construction stormwater permits, and industrial stormwater permits. Because stormwater discharges are intermittent, DEQ does not apply the human health criteria (which are generally based on a 70 year exposure) to permits for these discharges and instead, uses the aquatic life criteria as the basis for stormwater permit requirements. This approach is consistent with EPA's approach for stormwater permits. However, in the industrial stormwater permit currently under development (expected to be issued in August 2011), it is likely that sources who discharge to waterbodies that are listed as impaired for any criteria will have to monitor for these pollutants. Therefore, there could be sampling and analysis costs to industrial stormwater permit holders once the permit is finalized and additional impaired waters have been identified based on the revised human health criteria. As a result, there will likely be additional costs to these dischargers who exceed these criteria and are required to develop BMPs to reduce the pollutant of concern. The table below describes the number of facilities with industrial stormwater permits.

Industrial Stormwater Permit	Description	No. of Facilities*
1200-COLS	Facilities located in the Columbia Slough watershed	138
1200-Z	All other industrial facilities in the state	770
Total		908

* As of September 2010

Small Business Impacts to Entities Covered Under Industrial Stormwater Permits

It is unknown how many of the 908 facilities holding industrial stormwater permits are small businesses (50 or less employees). DEQ does not track this kind of information.

iii. General Permits for Activities Other than Stormwater

The 1500A is the only general permit with requirements for toxic pollutants that have human health criteria that would require additional work to modify based on the revised human health criteria. The 1500A permit covers petroleum hydrocarbon cleanup from groundwater or surface water. It expired on June 30, 2005. Twenty facilities are registered to the permit. There is an effluent limit for BETX, which is quantified based on an EPA approved test method to determine the total amount for benzene, ethylbenzene, toluene and xylene. There is an effluent limit of 0.025 mg/L (25 ug/L) for benzene. A 10:1 dilution is required for the mixing zone in the current permit. These effluent limits are met at the end of pipe by treating contaminated water with air stripping and/or activated carbon adsorption or equivalent in order to meet the permit limits. With a dilution of 10 and a revised criterion of 0.44 ug/L for benzene, the effluent limit at the end of pipe for benzene would have to meet 4.4 ug/L. Effluent limits would then need to be lowered. It is not known whether technology can consistently meet a lower effluent limit. This work would be completed as part of the general permit renewal.

Small Business Impacts to Entities Covered Under General Permits

It is unknown how many of the 20 facilities holding 1500A permits are small businesses (50 or less employees). DEQ does not track this kind of information.

iv. Local Government

Domestic Permits/Publicly Owned Treatment Works (POTWs)

The proposed toxics rulemaking would directly impact all major domestic facilities (i.e. POTWs) that monitor for toxics.

Generally, minor domestic sources (average dry weather design flow of less than one million gallons per day (MGD)) have much reduced monitoring, and, subsequently, permitting requirements

than major domestic sources. The permit writer must conduct a Reasonable Potential Analysis (RPA) for toxic pollutants for major domestic sources (i.e. average dry weather design flow of at least 1 MGD). For minor sources, a permit writer may conduct a RPA for all listed toxic pollutants if there is a potential of water quality degradation due to non-typical factors such as significant industrial discharges.

Facility Type	No.
Major Domestic	49
Minor Domestic	154
Total	203

However, both major and minor sources could be impacted if a Total Maximum Daily Load establishes a waste load allocation for their discharge. For example, if during the development of a TMDL the minor is identified as a source of the toxic pollutant, it could be given a waste load allocation. Alternatively, if a minor source is not identified during the TMDL process, but later becomes known as a source of a toxic pollutant, it may be able to access reserve capacity in the TMDL, if available and accessible to that source. Sometimes dischargers may be allocated their unquantifiable 'current loading' if they are not considered a significant source.

Consequently, although majors will generally be more impacted by revisions to the human health toxics criteria than minors, minors may be impacted as well in situations where discharges are to impaired waters where waste load allocations have been established. A range of costs are possible depending on the compliance tools available for each individual circumstance. One possible implementation tool a POTW could use if it cannot meet effluent limits for toxics criteria would be variances. General costs associated with variances are found under section II.

Other Local Government

For non-MS4 communities and facilities without NPDES requirements, TMDLs are the main driver for developing water quality management plans. Since TMDLs already require local governments and counties as designated management agencies to develop and implement TMDL implementation plans, the agency does not expect the fiscal or economic impacts to be significant for urban sources as a result of this rulemaking process.

v. 401 Certifications

The majority of activities for which DEQ issues Clean Water Act section 401 certifications would not be impacted by the proposed changes to the water quality criteria since the parameters of interest are typically conventional pollutants (e.g., dissolved oxygen, turbidity, temperature, etc.). However, there may be an impact to applicants (e.g. U.S. Corps of Engineers, Port of Portland) who propose sediment removal and fill projects, since some toxic pollutants that may be contained in the sediments can be released into waterbodies through movement of soil. Additional testing of the sediment may be required to assure that projects do not exceed water quality criteria for toxics and, if needed, mitigation measures may be required to reduce the impact of project.

b. Monitoring costs based on priority pollutant scans and other required monitoring

Generally, the costs of monitoring for dischargers could increase. If there is reasonable potential for a discharge to cause or contribute to an exceedance of applicable water quality standards, more discharge monitoring may be needed which would increase analytical costs. Additionally, there could be a slight increase in the number of monitoring sites and/or frequency of sampling due to implementation tools used to stay in compliance (e.g. to sufficiently characterize ambient conditions for variances, or monitoring data needed to meet a background allowance provision). Other potential analytical costs related to new QLs, analyzing individual species of pollutants, and costs for methyl mercury analysis are discussed under Fiscal and Economic Impacts to DEQ (See section III). Analytical costs described there would also be similar to costs possibly incurred by dischargers.

With more stringent toxics criteria, there could be additional waterbody listings for toxic pollutants and an increase in the subsequent number of TMDLs developed to meet toxics load allocations. Designated Management Agencies that may be identified as part of the TMDL include ODA, ODF, BLM, USFS, municipalities, and irrigation districts and they may need additional resources in order to conduct additional monitoring for toxics listings as well as for TMDL implementation tracking and BMP effectiveness monitoring. These monitoring costs may not be realized until sometime after the approval of the next Integrated Report, which would reflect any new listings based on the proposed toxics criteria.

c. Indirect Effects

1. **Potential Indirect Effects Associated with Municipalities**

1. Pretreatment

Some businesses do not directly discharge to a waterbody but rather, discharge to a municipal collection system under a municipality's pretreatment program. These businesses may be subject to additional requirements from the municipality. Currently, 23 POTWs have pretreatment programs that place requirements upon businesses discharging to their collection systems. All 23 POTWs have set local limits for metals with only one pretreatment POTW having additional limits for: pentachlorophenol, chlorobenzene, chloroform, trichloroethylene, acrylonitrile, 1,2-dichloroethane, 2,4-dinitrotoluene, nitrobenzene, and chlordane.

It is possible that POTWs unable to meet effluent limits contained in the NPDES permit may explore pretreatment requirements for indirect dischargers with known pollutants of concern. However, it is unknown at this time whether POTWs in addition to the 23 with existing pretreatment programs will develop their own pretreatment programs or set local limits for additional toxic pollutants based on more stringent criteria. It is also unknown what the associated costs could be for the indirect discharger with pretreatment requirements. For example, a POTW may not be able to accommodate business or industrial waste streams given new effluent limits for toxic pollutants. Consequently, some businesses and industries would need to disconnect from the sewer system and manage their wastewater on site. The types of businesses that would likely be most affected by local limits imposed by the municipality would be high tech producers, platers, dental offices, and photo processors¹.

Small Business Impacts to Indirect Dischargers

DEQ surveyed the five largest pretreatment programs and determined that out of total number of 285 significant industrial users, approximately 130 users² were small businesses. DEQ does not have any data that would lead to any conclusions about how many of these businesses would likely be impacted by the proposed revised criteria.

¹ ACWA Memo. March 4, 2008.

² Estimate given through DEQ pretreatment coordinator communications with the five largest pretreatment programs

2. Costs passed on to municipal ratepayers

Indirect impacts to the general consumer may involve rate increases to water and sewer bills to offset compliance strategies, monitoring, etc. utilized by POTWs. Depending on the costs of the compliance strategies, rate adjustments would vary.

2. **Potential Indirect Effects Associated with Industrial Sources**

For consumers of industrial goods, various compliance strategy costs to produce goods could be passed on to consumers in the form of increased prices. Higher costs for goods and services could drive consumers to other lower-cost competitor products which are not affected by more stringent water quality compliance responsibilities.

d. Implications for other sources (direct and indirect implementation)

SAIC report states that existing regulatory programs are currently not fully implemented for nonpoint sources. For example, there has not been a formal review of the sufficiency of nonpoint source control programs for meeting water quality standards for toxic pollutants. As a result, it is not possible to determine the additional controls that are required to be in compliance above what would be required if the current regulations are fully implemented. Precise fiscal and economic impact from the rulemaking therefore cannot be determined. If sufficiency reviews of nonpoint source programs are conducted, it is possible that additional controls are needed to meet the water quality standards for toxic pollutants. If that is the case, there could be significant fiscal and economic impacts on nonpoint source control programs such as the AgWQM Program, FPA rules, and non-MS4 urban stormwater control programs. DEQ's determination that this proposed rulemaking will not have a significant fiscal and economic effect on the following sectors of nonpoint sources of pollution is based on the assumption that current nonpoint source programs are generally sufficient to meet the current water quality standards for toxics.

1. Agriculture

1. Relevant pollutants

The List of relevant Pollutants for nonpoint sources (Appendix A) shows pollutants on Table 40 that are applicable to agriculture. The relevant pollutants to agriculture include a couple of current use pesticides, but most of them are legacy pollutants.

2. Changes in agricultural activities and conservation practices

In Oregon, agricultural activities are subject to AgWQMA rules that prohibit pollution. AgWQMA Plans and Rules are the mechanisms used for agriculture to meet water quality standards and where applicable, TMDL load allocations. There is a possibility that AgWQM Area plans and rules will need to be revised in order to meet the proposed amendment to the toxics water quality standards in some areas.

3. Types and Numbers of small business

According to Oregon Farm Bureau, 97% of Oregon farms and ranches fall under the category of small businesses based on the definition of small businesses being 50 or less FTEs.

Impacts on small businesses and general public

Agricultural activities are already subject to AgWQM Area Plans and Rules that prohibit pollution. Because these plans and rules already require and provide the mechanism for agriculture to meet the water quality standards and TMDL load allocations, DEQ has determined that this proposed rulemaking does not have direct fiscal impacts or effects on small businesses and general public. If AgWQM Area Rules need to be revised in order to comply with the proposed toxics WQS, there could be increased costs for some private landowners to comply with the rules including one-time costs for capital improvements. These changes, however, will take years to be implemented.

Impacts on State Agencies

Oregon Department of Agriculture³

Existing Agricultural Water Quality Management Area Plans and Rules are expected to be adequate to achieve TMDL load allocations and meet water quality standards on agricultural lands. The plans rely on both voluntary and regulatory approaches to implement management measures that prevent pollution by controlling upland erosion and sediment transport, restoring and maintaining riparian vegetation, appropriately utilizing nutrients, and addressing other agricultural activities as needed to protect surface and ground waters. The plans rely on, and the rules are generally limited to, available and technically

³ Dave Wilkinson, OR Department of Agriculture, e-mail September 24, 2010

feasible conservation practices. The cost of these practices were considered in adopting current area plans and rules.

Impacts on Small Business

If additional practices must be developed or requirements otherwise increase or are better defined, there may be increased costs of production or land management to farmers and landowners on rural lands who operate as small businesses.

OAR 340-041-0061(12)

The proposed rule describes how DEQ would communicate with ODA if DEQ believed that an area plan was not adequate to achieve a water quality standard. Currently, all waters of the state on agricultural lands are addressed with one of 39 area plans and area rules to implement them. The area plans are designed to achieve water quality standards and meet TMDL load allocations. Because ORS 568.930 currently provides for the EQC to petition ODA for changes to the area plans, no additional cost from this proposed rule is anticipated. If DEQ determines any of the area plans are inadequate, in some aspect, there could be additional cost to ODA, and possibly to landowners, if the area plans must be modified.

The proposed rule also clarifies that DEQ has the authority to require a landowner to change their activities if found to be causing or contributing to a water quality standards violation. The rule reflects current DEQ practice of first referring the landowner to ODA to resolve the issue. Because this rule clarifies existing interagency practice to address pollution from agricultural activities, no additional cost to ODA or landowners is anticipated.

OAR 340-042-0080(2)

This proposed rule explains that area plans and rules must be adequate to prevent and control water pollution from agricultural activities and soil erosion as provided by ORS 568.900 to 933 and 561.191. The rule allows the DEQ to request the EQC to petition ODA to modify an area plan if it believes the plan to be inadequate. Because the ability of the EQC to petition ODA is provided in law

and is currently available to the EQC to resolve any perceived plan deficiencies, no additional cost is anticipated by this proposed rule change.

The proposed rule also allows DEQ to assign load allocations to specific agricultural sources or sectors. As with TMDLs generally, the cost of compliance can be shifted from one type of source to another through assignment of load allocations. Any specific load allocation would be achieved through an area plan and implementation of area rules. Since plans and rules are currently designed to meet load allocations by implementing available conservation practices, any increase in specific load allocation could result in additional cost to the agricultural producers in that source or sector. Until an individual source or sector has been identified in this way, it is not possible to estimate any additional cost compared to current requirements to prevent and control pollution.

Total Maximum Daily Loads (TMDL)

- *TMDL Development*

DEQ proposes to develop TMDLs with improved spatial scale and source assessment. The potential benefit would be to better inform ODA, other agricultural agencies, and landowners more specifically where water quality problems exist and restoration projects or management changes would be most beneficial. There would likely be no direct cost savings because the amount of work to be done is large compared to the resources available. However, the investments in time and effort could, potentially yield better water quality results.

DEQ proposes to include timelines and associated milestones in TMDLs. A potential benefit of this would be to allow area plans to set clear objectives and work effectively and measurably toward the identified milestones. Costs could potentially be increased to ODA and landowners if timelines are accelerated beyond the current implementation rate. Until individual TMDL timelines and milestones are created, it is not possible to estimate potential additional costs.

- *TMDL Implementation*

DEQ proposes to further clarify TMDLs goals by working collaboratively with ODA to identify surrogates to water quality standards and evaluate measures to

effectively achieve the surrogates. A benefit could be realized by using surrogates that are easily applied by landowners and reported as progress in implementation. No additional cost is anticipated, however landowners and local agencies may be able to work more effectively toward agreed upon water quality goals.

2. Forestry

1. The List of relevant Pollutants for nonpoint sources (Appendix A) shows applicable pollutants on Table 40 for forestry. These pollutants include a couple of current use pesticides.
2. Forest activities are subject to Forest Practices Act and rules to meet the water quality standards and TMDL load allocations. Because these rules already require and provide the mechanism for forestry to meet the water quality standards and TMDL load allocations, the agency does not expect significant fiscal or economic impacts on forest lands.
3. Types and Numbers of Small Business
According to information provided by OSWA, there are over 100,000 small businesses that own forest land in Oregon. Approximately 70,000 families own 10 to 5,000 acres and these ownerships are organized in various small business structures. In addition, there are 70,000 more families that own between 2 to 10 acres of forestlands and some of these fall under the small business category.

Impacts on small businesses and general public

Forest activities are subject to Forest Practices Act and rules in order to meet water quality standards and TMDL load allocations. Because of these requirements that are currently in place, DEQ has determined that this proposed rulemaking does not have direct fiscal impacts or effects on small businesses and general public. If FPA Rules need to be revised in order to comply with the proposed changes to the toxics WQS, and if those changes result in restrictions to timber harvest or other forest management activities that reduce growth and yield, there could be, in some cases, increased costs for private landowners to comply with the rules. The outcomes of these rule changes are difficult to predict and also will take years to be implemented.

Impacts on state agencies

Where toxics TMDLs are developed due to proposed lower criteria, ODF may need additional staff resources for administrative and technical assistance.

3. Non-Permitted Urban Sources

1. Relevant pollutants

Appendix A, the List of relevant Pollutants for nonpoint sources, indicates the pollutant on Table 40 that are applicable to urban areas.

2. Changes in urban BMPs

For non-MS4 communities and facilities without NPDES requirements, TMDLs are the main driver for developing water quality management plans. Since TMDLs already require local governments and counties as designated management agencies to develop and implement TMDL implementation plans, the agency does not expect significant fiscal or economic impacts for urban sources as a result of this rulemaking process.

3. Types and Numbers of small businesses affected

If new ordinances and codes are required in order to meet TMDL load allocations that are based on the proposed revised toxics WQS, there could be an indirect fiscal impact to all small businesses that are within the boundary of the TMDLs.

Potential Impacts on small businesses and general public

Urban stormwater and other water quality parameters in urban areas are subject to TMDLs. DEQ has determined that this proposed rulemaking does not have additional fiscal impacts or effects on small businesses and general public. If new ordinances and codes are required in order to meet TMDL load allocations that are based on the proposed revised toxics WQS, there could be an indirect fiscal impact to small businesses and general public to implement additional control measures.

Impacts on other state agencies

The department does not expect other state agencies to experience significant fiscal or economic impacts.

4. Land & Air sources

1. Relevant pollutants

The List of relevant Pollutants for nonpoint sources (Appendix A) shows which pollutants are naturally occurring or could potentially be air deposited on Table 40.

2. Changes in air source control

DEQ made a policy decision to limit the scope of the toxics water quality standards rulemaking to divisions under water program. The actual regulatory mechanism for addressing TMDL allocations through other media programs still needs to be defined and described. Since DEQ has all along had the authority to assign load allocations to air sources, the current rulemaking process does not have any fiscal or economic impact.

Types and Numbers of small businesses affected

Fiscal analysis for air sources will be determined if air rules need to be revised or established in order to implement TMDL load allocations.

Impacts on small businesses and general public

Air sources are already subject to TMDLs under current rules. DEQ has determined that this proposed rulemaking does not have direct fiscal impacts or effects on small businesses and general public.

3. Impacts on state agencies

The department does not expect other state agencies to experience significant fiscal or economic impacts.

e. Benefits attributable to revision and implementation of human health criteria for toxics

DEQ did not have the financial resources to conduct a quantitative analysis of the direct and indirect potential benefits associated with an increased fish consumption rate, however, the FIIAC committee members along with representatives from the Oregon Environmental Council and CTUIR agreed that while economic benefits can be difficult to analyze, it is important to describe potential benefits, at the very least, in a qualitative manner. A key outcome of revised water quality standards based on a higher fish consumption rate would not only benefit consumers of fish, but also achieve more stringent water quality criteria by reducing toxic contamination in waterways. The level of benefits achieved will depend on the degree to which

pollution reduction is accomplished. Tables 1 and 2 below are excerpts from the FIIAC memo and describe benefits associated with this rulemaking.

Table 1: Potential Benefits of Raising the Fish Consumption Rate and Meeting the Standards

<i>Benefit</i>	<i>Examples</i>
Human Health	-safe drinking water; -avoided costs from environmentally attributable diseases; -reduced risk for those who do eat fish; -recreational – reduced risk from water contact
Environmental	-water reuse opportunities from cleaner effluent; -business—cleaner intake water for downstream industries; -ecosystem health; -tourism; -amenity/aesthetic/property values; -avoided costs to industries and utilities; -fewer contaminants; -fishing – tribal, commercial, recreational and subsistence; -improve other species in the food chain: birds, etc.; -higher quality water supply
Cultural	-enable religious/ceremonial activities; -children; -healthy fish – icon of the Northwest -local, and sustainable food options

Table 2: Potential Benefits of Specific Implementation Strategies

Strategy	Potential Benefit
Toxic Reductions	-Reduced human health impacts; -innovative possibilities used to reach more efficient systems when not fearful of litigation stemming from strict liability regulatory framework; -costs of litigation reduced; -reduced O&M; -reduced hazardous waste removal costs;
Stormwater Control	-Co-benefits for toxics reductions and control of other important stressors that affect fish health such as sedimentation and warm water temperatures
Infiltration and Inflow (I&I)	-Reduce quantity of water and toxics entering plant, reducing operating costs

(* It should be noted that ACWA agencies are already engaged in I&I programs and do not agree that an incremental increase in I&I will result in toxics reduction and question the efficacy of additional increases in I&I rehab work since 100% I&I removal is currently not possible.)

II. Effect of Utilizing Different Implementation Tools

Some situations may occur where limits or requirements based on the proposed criteria cannot be met. Contamination of a facility's intake water by background pollutants (or in the case of municipal wastewater treatment facilities, some contaminants may be present in the drinking water) may result in high wastewater effluent concentrations that can't be feasibly treated or result in undesirable environmental tradeoffs to achieve. These pollutants may occur naturally or result from a variety of

human activities. Intake credits, background pollutant allowances, and variances are implementation tools that can be used to address background contaminants and would potentially offset some of the impact of the revised criteria.

Some of the potential costs incurred by sources may be as the result of installing additional treatment technologies to reduce toxic pollutants in wastewater effluents. Some of these technologies are proven and are commonly used. Other technologies may be able to remove toxics to lower levels, but are not yet proven for wide-scale use, are not capable of treating down to the necessary levels, or present other limitations such as hazardous byproducts or prohibitive cost, thereby limiting the feasibility of their use for certain dischargers. For more information on specific treatment technologies, including advantages, disadvantages, and some limited costs, please refer to Appendix C in the SAIC Report.

Because there may not be feasible treatment technologies to remove low concentrations of toxic pollutants or other concerns regarding residual management from certain treatment technologies, some dischargers may pursue other implementation tools to comply with requirements based on the revised criteria. Some of the following tools are new (or revised), while other tools already exist in DEQ regulations. Generally, these tools provide a means to comply with and ensure progress toward meeting water quality standards and implementing regulations while ensuring protection of human health and the environment. Where meeting requirements to meet the revised criteria are infeasible, use of one of the approaches described below in appropriate circumstances can provide a lower cost means to comply with water quality standards than costs associated with removal technologies.

i. New Implementation Tools

1. Variances with pollution reduction plan

DEQ is proposing to revise its current water quality standards regulation to include variances with a pollution reduction plan as an implementation pathway. Variances provide a mechanism for achieving water quality improvements when underlying water quality standards cannot be met in the short term. This provision would be allowed under limited circumstances. Variances are applicable to all types of pollutants and facilities, although DEQ anticipates that variances for toxic pollutants will be the majority of variance requests and approvals.

If a discharger is unable to comply with a water quality standard because, for example, there are no feasible or affordable treatment technologies available, variances could be pursued as a lower cost alternative, while complying with permit requirements and

making water quality improvements. Despite lower anticipated net costs, there would still be incremental costs associated with variance requests and approvals for dischargers using this implementation tool. Potential costs include costs to sources to prepare and support an application (e.g. collecting water quality data, conducting an economic analysis, literature review for feasible pollutant removal technologies, etc); developing a pollution reduction plan, including potential strategies and implementing actions contained in the plan.

Impacts associated with this rulemaking focus on the incremental costs of complying with a fish consumption rate of 175 g/day, as opposed to costs associated with the current or baseline criteria. The SAIC Report estimates that one-time expenditures associated with variance applications could range from \$1.43 M to \$7.05 M (total statewide) with a FCR based on 17.5 g/day; incremental variance-related expenditures could range from \$0.59 million to \$2.68 million (total statewide) under revised criteria (highlighted in table below). The table below further shows a breakdown of costs between major municipal and industrial facilities. The average one-time cost per major municipality ranges from \$8,000 to \$44,000 under revised criteria, while the average one-time cost per major industrial ranges from \$9,000 to \$25,000. Costs for arsenic variances are included in these estimates and could not be apportioned out. However, proposed rulemaking to revise criteria for arsenic (i.e. become less stringent based on natural background concentrations) may reduce the need for facilities to use variances as a tool to comply with arsenic. Therefore, the variance cost estimates could be lower than what is reflected in this table.

Exhibit F-9. Potential Baseline and Incremental Statewide One-Time Variance Costs
 (millions of 2007\$)

Category	Sample			Statewide Number of Facilities ¹	Extrapolated One- Time Cost
	Total One-Time Cost	Number of Facilities	Average Cost per Facility		
Baseline Criteria					
Certainty Sample ²	\$0.14 - \$1.20	5	NA	5	\$0.14 - \$1.20
Major Municipals	\$0.21 - \$0.90	9	\$0.023 - \$0.10	45	\$1.05 - \$4.50
Major Industrials	\$0.035 - \$0.20	4	\$0.009 - \$0.050	27	\$0.24 - \$1.35
Total	\$0.39 - \$2.30	18	NA	77	\$1.43 - \$7.05
Revised Criteria (Incremental)³					
Certainty Sample ²	\$0	5	NA	5	\$0
Major Municipals	\$0.070 - \$0.40	9	\$0.008 - \$0.044	45	\$0.35 - \$2.0
Major Industrials	\$0.035 - \$0.10	4	\$0.009 - \$0.025	27	\$0.24 - \$0.68
Total	\$0.11 - \$0.50	18	NA	77	\$0.59 - \$2.68

NA = not applicable

1. Random sample results extrapolated to total number in category less number in certainty sample.
2. Large flow municipals (one of which is dominated by industrial flow) plus one minor industrial.
3. Represents the annual costs of compliance above and beyond those needed for compliance with baseline criteria.

DEQ anticipates that first-time variance costs would be greater than subsequent requests to renew variances. Discharger costs associated with a renewal of a variance are anticipated to be less, as most of the information required for a request would be an update of existing information gathered from the initial request. Each renewal request would need to be approved by both DEQ and EPA.

2. Intake credits

Intake credits will be implemented at the time DEQ's permit writer is determining whether a particular facility has the reasonable potential to cause or contribute to an exceedance of the water quality criteria. Where the conditions meet the requirements in the regulation, the permit writer would conclude that the facility does not need a water quality based requirement in their limit for that pollutant or that the limit is based upon the concentration in the intake water. Without this provision the facility could have incurred the associated costs with meeting effluent limits or other requirements. As a result, where this implementation tool could be employed, the facility would avoid significant costs that would otherwise be incurred. DEQ expects that minimal input (in the form of additional monitoring data, etc.) would be needed from dischargers to facilitate the use of this tool. Given the limitations of this tool (i.e. facilities that have discharge pollutants originating from their intake water and a requirement that the mass and concentration of discharge cannot exceed that of intake water), DEQ estimates that few dischargers will be able to employ intake credits based on pollutants already present in their intake water.

3. Background pollutant allowance

The background pollutant allowance allows a discharger to discharge effluent that is up to 3% higher than the background pollutant concentration of a water body that approaches or exceeds an applicable human health criterion (mass cannot be increased). The availability of this tool would very likely offset costs that would be incurred by dischargers if they were required to install expensive treatment technologies to reduce pollutant.

DEQ anticipates that some dischargers may need to adjust treatment processes to keep the mass of pollutant at or below upstream mass. Costs for this adjustment would vary depending on the process needed. Dischargers may also need to adjust treatment processes to keep pollutant concentration to no greater than 3% of upstream concentration.

Based upon a review of current industrial permits, DEQ estimates that 32 minor and four major facilities have the potential to be impacted by background pollutants if present at high levels upstream of their facilities. These facilities typically employ significant quantities of surface water in their processes that result in evaporative loss and an increase in pollutant concentration.

ii. Existing Tools/Mechanisms

Generally, there should be no additional costs for administering these tools, unless there is a significant increase in the use of these tools.

1. Compliance schedules

A compliance schedule can be used to implement newly applicable water quality-based effluent limits that the permittee is unable to meet upon issuance of the permit. Although the schedule must ensure that the limits are achieved as soon as possible, it allows the permittee additional time to comply with criteria. DEQ anticipates that the use of this tool will mitigate some of the costs to sources who would otherwise need to immediately comply with effluent limits upon permit renewal

2. General Permits

General permits may be used as an alternative to address background pollutants. Typically, DEQ develops an individual NPDES permit to regulate the discharge of a single effluent stream derived from multiple industrial activities. If this effluent stream from a facility was separated into individual streams, many of these individual industrial activities could qualify for a general permit. Because general permits do not have many of the pollutant monitoring and reasonable potential analysis requirements that individual permits have, it could be more cost effective for dischargers to separate processes and comply with general permit conditions, rather than conduct compliance actions to meet effluent limits resulting from a mixed waste stream.

3. Use Attainability Analysis (UAA)

Federal water quality standards regulations allow states to remove or revise a designated use which is not an existing use if the State can demonstrate that attaining the designated use is not feasible based on one of six reasons. The objective of the UAA is to replace a use with a use that is determined to be attainable. In some cases, Oregon has established designated uses for waterbodies that may not be attainable (e.g. drinking water designated use for irrigation dominated water bodies). By setting appropriate and attainable designated use goals, resources can be allocated where they are more likely to accomplish the desired environmental result. Although there are costs involved to develop a UAA, appropriate designations of water bodies may be less costly than actions needed to comply with more stringent water quality standards based on more sensitive designated uses. In cases where changes in designated uses are deemed to be appropriate, such an action could result in applicable standards that are less costly to meet.

4. Possibility of trading with upstream sources to meet WQBEL

Upstream trading allows a permittee to reduce loading from an upstream source of the same pollutant in order to create the assimilative capacity they need to meet water quality standards. This option could allow a permittee to achieve toxics reductions more cost effectively than meeting effluent WQBELs, as long as there are other sources upstream discharging the same pollutant of concern.

DEQ does not know of any precedence for toxics pollutant trading to comply with a water quality criterion in Oregon or elsewhere outside of a TMDL, given the concern of creating acute toxic environments near the vicinity of the effluent outfall. If such a situation arose, DEQ would carefully evaluate the feasibility of conducting such a trade.

III. Impact to DEQ Programs, Staff, and Resources

The following table summarizes potential fiscal and economic impacts to DEQ programs, staff, and resources. DEQ does not anticipate funding additional staff positions in response to this rulemaking. Consequently, staff time spent on implementing more stringent human health toxics criteria may impact other priorities of the department. DEQ may also receive additional requests to conduct Use Attainability Analyses or develop site specific criteria as a way of addressing compliance issues identified in conjunction with implementing the more stringent toxics criteria, if appropriate. These rules

do not generate revenue for DEQ. To estimate dollar amounts below, DEQ assumed a staff Natural Resource Specialist 4 position, Step 7, at \$63/hr.

Table of Potential Impacts to DEQ

	DEQ Regional Staff	Headquarters/Lab/Administrative Staff
	Permitting	
Monitoring	<p>- Estimate 4 – 16 additional hrs per permit (\$252 - \$1008) needed for staff to determine monitoring requirements for permits subject to this rulemaking. For this rulemaking, average review per permit could slightly increase depending on individual circumstances and compliance tools used.</p>	<p>-Staff and lab time needed for periodic revisions of quantitation limits (QLs) -Generally, costs increase when criteria for toxic pollutants change from totals of a chemical family to individual chemical species. Costs also generally increase to achieve lower QLs. -The criteria for total mercury will be replaced by a tissue based methyl mercury criteria. Generally, cost for methyl mercury analysis is 2-3 times higher than for total mercury. -Some of the monitoring and analysis costs have already been absorbed given DEQ's investment in toxics monitoring for SB737, the Pesticide Stewardship Program and the toxics monitoring program.</p>
WQBELs and/or other WQ Limits	<p>-Regional staff will need to do more WQBEL assessments if RPA indicates that more dischargers will have reasonable potential. Estimate an additional 8 hrs/parameter/permit (\$504) to establish QBELs where they are identified as needed. -Intake Credits: The RPA IMD would include calculations for intake credits and wouldn't require additional staff time.</p>	<p>-Periodic revisions of RPA IMD may be required to account for intake credits -Increased data input into the Discharge Monitoring System (DMS) which stores information on permit features, schedules, permit limits, required monitoring and discharge monitoring report data for individually permitted facilities. -Because stormwater discharges are intermittent, DEQ does not apply the human health criteria (which are generally based on a 70 year exposure) to permits for these discharges. Therefore, there will not be any anticipated fiscal impact to DEQ related to stormwater permits. However, the industrial stormwater permit is currently being revised. In the current proposal, it is likely that sources which discharge to waterbodies that are listed as impaired for the human health criteria will have to monitor for these pollutants and develop BMPs if criteria are exceeded. In these cases, DEQ staff will need to oversee and review monitoring and associated BMPs as needed. - The only general permit with toxics that would require additional work to modify based on revised human health criteria is the 1500A. The 1500A permit covers petroleum hydrocarbon cleanup from groundwater or surface water. DEQ will need to incorporate the new permit limits as part of the general permit renewal.</p>
Background Pollutant Allowance	-More staff time needed to review	-HQ collaboration may be needed in the short term to

	<p>applicability of a background allowance request. DEQ estimates an additional 60 hrs./permit (\$3780) where this tool is used. However, time spent in this analysis could be less than developing other “site specific solutions” if this provision was not available.</p>	<p>provide regional consistency in evaluating background pollutant allowances. -Staff time needed for periodic revisions of IMD. -Do not anticipate greater regional or HQ FTE, so less technical assistance may be available for other issues/projects,</p>
<p>Variances</p>	<p>- Regional permit writers will be interfacing with discharger to evaluate data and information needed for variance request and to incorporate permit conditions based on the variance request. In some cases, significant staff time could be spent gathering this information, possibly conducting literature reviews for treatment technology removal capabilities, and/or reviewing fiscal and economic data from discharger. Variances also require a yearly review of the pollutant reduction plan to be conducted by DEQ staff. DEQ estimates approximately 160 hrs./variance request (\$10,080). -Time spent in this analysis could be less than developing other “site specific solutions” if this provision was not available.</p>	<p>- Since DEQ has yet to receive a variance request, the department is unable to specify costs based on past experience, therefore costs and/or resources described here are estimates. -DEQ anticipates that HQ WQS staff will review variance requests submitted by the permittee and permit writer. - Estimate 0.75 FTE (Standards 0.56 FTE and Permitting 0.19 FTE) to review variance requests and pollutant reduction plans, and coordinate DEQ/EQC/EPA approval. -SAIC extrapolated the potential number of variance applications for the sample facilities and found that DEQ would need to review approximately 40 requests under the baseline criteria (FCR of 17.5 g/day) and an additional 16 under the revised criteria. Assuming a cost of \$3,900 per review, baseline costs could be approximately \$159,000 with incremental costs of approximately \$65,000 under the revised criteria. -DEQ anticipates ongoing costs to review variances depending on the ability of dischargers to meet effluent limits. -Most likely, staff time in reviewing variances could decrease as the process becomes more efficient. In addition, variance renewals should be less resource intensive. -Staff time needed for periodic revisions of variance IMD and associated staff training. -Do not anticipate availability of additional FTE, so less HQ technical assistance available for other issues/projects.</p>
<p>Compliance Schedules</p>	<p>-Regional permit writers may need to develop additional compliance schedules for permittees given more stringent toxics criteria. -Use of compliance schedules would depend on if the discharger could ultimately meet discharge limits within a specified amount of time. - DEQ estimates approximately 40 hrs./compliance schedule development (\$2520). -Generally, more complex permits (e.g. those including compliance</p>	<p>-HQ permitting staff may assist regional permit writers in developing compliance schedules depending on backlog and permitting priorities.</p>

	schedules) require additional oversight and communication with permittees.	
Non-Permitting		
More Stringent Criteria <i>TMDL monitoring</i>	-Regional staff may be involved in both developing a sampling and analysis plan and collection of samples needed for development of TMDLs to address waterbodies listed for toxics.	-Lab FTE to develop sampling and analysis plans, collect and analyze data, and develop reports. Will depend on the quality and quantity of data needed for the TMDL and availability of existing data from other sources (e.g. USGS, FWS, BLM, USFS, etc.). -DEQ does not anticipate additional FTE, therefore, costs may be similar to that incurred under the current toxics criteria. However, there may be a backlog of TMDL development due to lack of DEQ monitoring resources.
<i>TMDL Development</i>	-Regional staff members lead TMDL development by coordinating with HQ and Lab staff and working with local advisory group. - There may also be an additional backlog of TMDL development if there are additional 303(d) listings as anticipated. - Since DEQ will not seek additional FTE for the TMDL program, DEQ expects to issue TMDLs at a slower rate.	-HQ supports TMDL development by providing modeling and programmatic support. - Since DEQ will not seek additional FTE for the TMDL program, DEQ expect to issue TMDLs at a slower rate. -Additional resources maybe needed for Lab in order to support the development of monitoring strategies for Implementation-Ready TMDLs. - There may also be an additional backlog of TMDL development if there are additional 303(d) listings as anticipated.
TMDL Development 1. TMDLs: Clarifying EQC and DEQ's authorities in Divisions 41 and 42	- The resource needs are expected to double for TMDLs compared to current subbasin level TMDLs. -TMDL development phase, additional resources should not be required for implementation. (It should be noted that there currently is a shortage of staff resources to support implementation of TMDLs that are in place. The need for additional resources to implement TMDLs already exists.)	- The resource needs are expected to double for TMDLs compared to current subbasin level TMDLs. - Toxics TMDLS have roughly cost between 50,000 to 1,000,000 to develop depending on the extent of listings within a basin. -According to the SAIC Report, additional technical assistance may be needed in order for the dischargers to meet TMDL waste load allocations. Requests for pursuing variances by facilities may increase, for example.
2. Addressing air sources in TMDLs: Clarifying EQC and DEQ's authorities to regulate air sources to meet TMDL goals in Division 42	-No significant increase in resource needs for the regional staff members are expected. -If air depositional load is determined to be significant through TMDL source analysis, resource needs for Air Quality Division may increase to work with facilities and coordinate with Water Quality Division.	-No significant increase in resource needs for the HQ and Lab staff members are expected. -If air depositional load is determined to be significant through TMDL source analysis, resource needs for Air Quality Division may increase for rulemaking and coordination with Water Quality Division.
TMDL Implementation	-Regional staff members are central to coordinate implementation efforts and monitoring efforts in their region. Since more work will be done during TMDL	-HQ and Lab provide technical and programmatic support to the region for TMDL implementation. -Additional resources maybe needed for HQ to

	<p>development phase, additional resources should not be required for implementation. (It should be noted that there currently is a shortage of staff resources to support implementation of TMDLs that are in place. The need for additional resources to implement TMDLs already exists.)</p>	<p>provide modeling and analyses associated with TMDLs. (It should be noted that there currently is a shortage of staff resources to support implementation of TMDLs that are in place. The need for additional resources to implement TMDLs already exists.)</p>
<p>401 Certifications</p>		<p>- Section 401 of the federal Clean Water Act requires that any federal license or permit to conduct an activity that may result in a discharge to waters of the United States must first receive a water quality certification from the state in which the activity will occur. These discharges must meet any new water quality toxics criteria for human health. -DEQ does not anticipate additional FTE or resources needed as part of this rulemaking since new processes or approaches are not anticipated being needed and toxic pollutants are not routinely significant pollutants of concern for these activities.</p>
<p>Integrated Report</p>		<p>-Potential of additional toxics listings - Data evaluation tools and database systems used to prepare the Integrated Report will need to be revised. -For the 2010 Integrated Report, it required 2 FTE (1 programmer and 1 standards specialist) for 6 months (approximately \$40,000) to evaluate toxics data in LASAR using Table 20 criteria. A similar level of effort is likely needed to revise the data systems to incorporate new criteria. Additional effort will be needed to revise and update the assessment of water bodies done prior to date of EPA approval of new toxic substance criteria. -Water body analytical data in DEQ's LASAR data system may need to be synchronized/correlated to include metadata needed to apply new criteria (e.g. CAS numbers, total forms vs. individual species forms). This analysis is needed to correlate data collected in LASAR to Integrated Report analysis and listing status of that pollutant.</p>
<p>Land Quality</p>		<p>DEQ's cost to implement the new human health criteria into clean-up standards would be minimal. Work involves substituting lower risk numbers at sites where surface-water discharge is the pathway of concern.</p>

Appendix A: List of Relevant Pollutants for Nonpoint Sources

	Pollutant	CAS number	Agriculture (Legacy)	Agriculture (Current Use)	Forestry (Historic or current)	Urban Stormwater	Air Deposition (widespread)	Naturally Occurring
1	Acenaphthene	83329				y		
2	Acrolein	107028				y	y	
3	Acrylonitrile	107131				y		
4	Aldrin	309002	y					
5	Anthracene	120127				y	y	
6	Antimony	7440360				y	y	y
7	Arsenic	7440382	y				y	y
8	Asbestos	1332214				y		
9	Benzene [represents range]	71432				y		
10	Benzene	71432				y		
11	Benzidine	92875				y		
12	Benzo(a)anthracene	56553				y	y	
13	Benzo(a)pyrene	50328				y	y	
14	Benzo(b)fluoranthene 3,4	205992				y	y	
15	Benzo(k)fluoranthene	207089				y	y	
16	BHC Alpha	319846	y					
17	BHC Beta	319857	y					
18	BHC Gamma (Lindane)	58899	y					
19	Bromoform	75252						
20	Butylbenzyl Phthalate	85687				y	y	
21	Carbon Tetrachloride	56235						
22	Chlordane	57749	y			y		

23	Chlorinated benzenes							
	Pollutant	CAS number	Agriculture (Legacy)	Agriculture (Current Use)	Forestry (Historic or current)	Urban Stormwater	Air Deposition (widespread)	Naturally Occurring
24	Chlorobenzene	108907						
25	Chlorodibromomethane	124481						
26	Chloroethyl Ether bis 2	111444						
27	Chloroform	67663						
28	Chloroisopropyl Ether bis 2	108601						
29	Chloromethyl ether, bis	542881						
30	Chloroethyl Ether bis 2	91587						
31	Chlorophenol 2	95578	y					
32	Chlorophenoxy Herbicide (2,4,5,-TP)	93721	y		y	y		
33	Chlorophenoxy Herbicide (2,4-D)	94757		y	y	y		
34	Chrysene	218019				y	y	
35	Copper	7440508		y		y	y	y
36	Cyanide	57125						
37	DDD 4,4'	72548	y					
38	DDE 4,4'	72559	y					
39	DDT 4,4'	50293	y					
40	Di-2-ethylhexyl Phthalate					y	y	
41	Dibenzo(a,h)anthracene	53703				y	y	
42	Dibutylphthalate	84742				y	y	
43	Dichlorobenzene(m) 1,3	541731						
44	Dichlorobenzene(o) 1,2	95501						
45	Dichlorobenzene(p) 1,4	106467						
46	Dichlorobenzenes							
47	Dichlorobenzidine 3,3'	91941						
48	Dichlorobromomethane	124481						

49	Dichloroethane 1,2	107062						
50	Dichloroethylene 1,1	75354						
	Pollutant	CAS number	Agriculture (Legacy)	Agriculture (Current Use)	Forestry (Historic or current)	Urban Stormwater	Air Deposition (widespread)	Naturally Occurring
51	Dichloroethylene trans 1,2	156605						
52	Dichloroethylenes							
53	Dichlorophenol 2,4	120832						
54	Dichloropropane 1,2	78875						
55	Dichloropropene 1,3	542756						
56	Dieldrin	60571	y					
57	Diethyl Phthalate	84662						
58	Dimethyl Phthalate	131113						
59	Dimethylphenol 2,4	105679						
60	Di-n-butyl Phthalate	84742						
61	Dinitrophenol 2,4	51285						
62	Dinitrophenols	25550587						
63	Dinitrotoluene 2,4	121142						
64	Dioxin (2,3,7,8-TCDD)	1746016				y	y	
65	Diphenylhydrazine							
66	Diphenylhydrazine 1,2	122667						
67	Endosulfan			y				
68	Endosulfan Alpha	959988		y				
69	Endosulfan Beta	33213659		y				
70	Endosulfan Sulfate	1031078		y				
71	Endrin	72208	y					
72	Endrin Aldehyde	7421934	y					
73	Ethylbenzene	100414				y		
74	Ethylhexyl Phthalate bis 2	117817				y	y	

75	Fluoranthene	206440				y	y	
76	Fluorene	86737				y	y	
77	Heptachlor	76448	y					
	Pollutant	CAS number	Agriculture (Legacy)	Agriculture (Current Use)	Forestry (Historic or current)	Urban Stormwater	Air Deposition (widespread)	Naturally Occurring
78	Heptachlor Epoxide	1024573	y					
79	Hexachlorobenzene	118741	y					
80	Hexachlorobutadiene	87683						
81	Hexachlorocyclopentadiene	77474						
82	Hexachloroethane	67721	y					
83	Indeno(1,2,3-cd)pyrene	193395				y	y	
84	Isophorone	78591						
85	Manganese	7439965				y	y	y
86	Methoxychlor	72435	y					
87	Methyl Bromide	74839	y					
88	Methyl-4,6-dinitrophenol 2	534521						
89	Methylene Chloride	75092						
90	Methylmercury (mg/kg)	22967926				y	y	y
91	Nickel	7440020				y	y	y
92	Nitrates	14797558		y				
93	Nitrobenzene	98953						
94	Nitrosodibutylamine, N	924163						
95	Nitrosodimethylamine, N	62759						
96	Nitrosodi-n-propylamine, N	621647						
97	Nitrosodiphenylamine, N	86306						
98	Nitrosopyrrolidine, N	930552						
99	Pentachlorobenzene	608935						
100	Pentachlorophenol	87865				y		

101	Phenol*	108952						
102	Polychlorinated Biphenyls (PCBs)					y	y	
103	Pyrene	129000				y	y	
104	Selenium	7782492				y	y	y
	Pollutant	CAS number	Agriculture (Legacy)	Agriculture (Current Use)	Forestry (Historic or current)	Urban Stormwater	Air Deposition (widespread)	Naturally Occurring
105	Tetrachlorobenzene, 1,2,4,5-	95943						
106	Tetrachloroethane 1,1,2,2	79345						
107	Tetrachloroethylene	127184						
108	Thallium	7440280					y	
109	Toluene	108883						
110	Toxaphene	8001352	y					
111	Trichlorobenzene 1,2,4	120821						
112	Trichloroethane 1,1,2	79005						
113	Trichloroethylene	79016						
114	Trichlorophenol 2,4,6	88062						
115	Trichlorophenol, 2, 4, 5-	95954	y					
116	Vinyl Chloride	75014						
117	Zinc	7440666				y	y	y

Appendix B

TABLE 1: Comparison of Current and Proposed Human Health Toxics Criteria and Quantitation Limits

Compound Name or Class [Table 40 Name, if different] <small>*Criteria denoted in red indicate proposed additions to the human health criteria*</small>	Priority Pollutant	Carcinogen	Quantitation Limit (µg/L)	Concentration in Units Per Liter for Protection of Human Health CURRENT		Concentration in Units Per Liter for Protection of Human Health PROPOSED TABLE 40	
				Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)	Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)
ACENAPTHENE	Y	N	1*	--	--	95	99
ACROLEIN	Y	N	5	320	780	0.88	0.93
ACRYLONITRILE	Y	Y	5	0.058	0.65	0.018	0.025
ALDRIN	Y	Y	0.01	0.000074	0.000079	0.0000050	0.0000050
ANTHRACENE	N	N	1*	--	--	2900	4000
ANTIMONY	Y	N	0.1	146	45,000	5.1	64
ARSENIC	Y	Y	0.5	2.1	2.1 (freshwater) 1.0 (saltwater)	2.1	2.1 (freshwater) 1.0 (saltwater)
ASBESTOS	Y	Y		7,000,000 fibers/L	--	7,000,000 fibers/L	--
BARIUM	N	N	0.1	1000	--	1000	--
BENZENE	N	Y	0.5	0.66	40	0.44	1.4
BENZIDINE	N	Y	10	0.00012	0.00053	0.000018	0.000020
BENZ(A) ANTHRACENE	N	Y	1*	--	--	0.0013	0.0018
BENZO(A)PYRENE	N	Y	1*	--	--	0.0013	0.0018
BENZO(B)FLUORANTHENE 3,4	N	Y	1*	--	--	0.0013	0.0018
BENZO(K)FLUORANTHENE	N	Y	1*	--	--	0.0013	0.0018
BROMOFORM	N	Y	0.5	--	--	3.3	14
BUTYLBENZYL PHTHALATE	N	N	1	--	--	190	190
CARBON TETRACHLORIDE	Y	Y	0.5	0.4	6.94	0.10	0.16
CHLORDANE	Y	Y	0.1	0.00046	0.00048	0.000081	0.000081
CHLORINATED BENZENES [CHLOROBENZENE]	Y	N	0.5	488	--	74	160
CHLORODIBROMOMETHANE	N	Y	0.5	--	--	0.31	1.3
CHLOROETHYL ETHER (BIS-2)	Y	Y	2	0.03	1.36	0.020	0.05
CHLOROFORM	Y	N	0.5	0.19	15.7	260	1100

Compound Name or Class [Table 40 Name, if different] *Criteria denoted in red indicate proposed additions to the human health criteria*	Priority Pollutant	Carcinogen	Quantitation Limit (µg/L)	Concentration in Units Per Liter for Protection of Human Health CURRENT		Concentration in Units Per Liter for Protection of Human Health PROPOSED TABLE 40	
				Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)	Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)
CHLOROISOPROPYL ETHER (BIS-2)	Y	N	2	34.7	4360	1200	6500
CHLOROMETHYL ETHER (BIS)	N	Y	Contact DEQ Lab	0.00000376	0.00184	0.000024	0.000029
CHLORONAPHTHALENE 2	N	N	1	--	--	150	160
CHLOROPHENOL 2	Y	N	1	--	--	14	15
CHLOROPHENOXY HERBICIDES (2,4,5,-TP)	N	N	1	10	--	10	--
CHLOROPHENOXY HERBICIDES (2,4-D)	N	N	1	100	--	100	--
CHRYSENE	N	Y	1*	--	--	0.0013	0.0018
COPPER	Y	N	10	1300	--	1300	--
CYANIDE	Y	N	5	200	--	130	130
DDT [DDT 4,4']	Y	Y	0.01	0.000024	0.000024	0.000022	0.000022
DDD 4, 4'	Y	Y	0.01	--	--	0.000031	0.000031
DDE 4, 4'	Y	Y	0.01	--	--	0.000022	0.000022
DIBENZO(A,H)ANTHRACENE	N	Y	1*	--	--	0.0013	0.0018
DIBUTYLPHTHALATE [DI-N-BUTYL PHTHALATE]	Y	N	1	35,000	154,000	400	450
DICHLOROBENZENES [DICHLOROBENZENE(O)1,2]	Y	N	0.5	400	2,600	110	130
DICHLOROBENZENE(P) 1,4	N	N	0.5	--	--	16	19
DICHLOROBENZIDINE [DICHLOROBENZIDINE 3,3']	Y	Y	1	0.01	0.020	0.0027	0.0028
DICHLOROBROMOMETHANE	N	Y	0.5	--	--	0.42	1.7
DICHLOROETHANE 1,2	Y	Y	0.5	0.94	243	0.35	3.7
DICHLOROETHYLENES [DICHLOROETHYLENE 1,1]	Y	N	0.5	0.033	1.85	230	710
DICHLOROETHYLENE TRANS 1,2	N	N	0.5	--	--	120	1000
DICHLOROPHENOL 2,4	N	N	1	3,090	--	23	29
DICHLOROPROPANE [DICHLOROPROPANE 1,2]	Y	Y	0.5	--	--	0.38	1.5

Compound Name or Class [Table 40 Name, if different] *Criteria denoted in red indicate proposed additions to the human health criteria*	Priority Pollutant	Carcinogen	Quantitation Limit (µg/L)	Concentration in Units Per Liter for Protection of Human Health CURRENT		Concentration in Units Per Liter for Protection of Human Health PROPOSED TABLE 40	
				Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)	Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)
DICHLOROPROPENE [DICHLOROPROPENE 1,3]	Y	Y	0.5	87	14,100	0.30	2.1
DIELDRIN	Y	Y	0.01	0.000071	0.000076	0.0000053	0.0000054
DIETHYLPTHALATE	Y	N	1	350,000	1,800,000	3800	4400
DIMETHYL PHENOL 2,4	Y	N	2	--	--	76	85
DIMETHYL PHTHALATE	Y	N	1	313,000	2,900,000	84,000	110,000
DINITROPHENOL 2,4	Y	N	5	--	--	62	530
DINITROPHENOLS	Y	N	Contact DEQ Lab	--	--	62	530
DINITROTOLUENE 2,4	N	Y	1	0.11	9.1	0.084	0.34
DINITROTOLUENE	Y	N		70	14,300	No criteria	No criteria
DINITRO-O-CRESOL 2,4	Y	N		13.4	765	No criteria	No criteria
DIOXIN (2,3,7,8-TCDD)	Y	Y	0.000005	0.000000013	0.000000014	0.00000000051	0.00000000051
DIPHENYLHYDRAZINE	Y	N		0.042	0.56	No criteria	No criteria
DIPHENYLHYDRAZINE 1,2	Y	Y	5	--	--	0.014	0.02
DI-2-ETHYLHEXYL PHTHALATE [BIS-2-ETHYLHEXYL PHTHALATE]	Y	Y	1	15,000	50,000	0.20	0.22
ENDOSULFAN	Y	N		74	159	No criteria	No criteria
ENDOSULFAN ALPHA	Y	N	0.01	--	--	8.5	8.9
ENDOSULFAN BETA	Y	N	0.01	--	--	8.5	8.9
ENDOSULFAN SULFATE	Y	N	0.01	--	--	8.5	8.9
ENDRIN	Y	N	0.01	1	--	0.024	0.024
ENDRIN ALDEHYDE	Y	N	0.01	--	--	0.03	0.03
ETHYLBENZENE	Y	N	0.5	1,400	3,280	160	210
FLUORANTHENE	Y	N	2*	42	54	14	14
FLUORENE	Y	N	1*	--	--	390	530
HALOMETHANES	Y	Y		0.19	15.7	No criteria	No criteria
HEPTACHLOR	Y	Y	0.01	0.00028	0.00029	0.0000079	0.0000079
HEPTACHLOR EPOXIDE	Y	Y	0.01	--	--	0.0000039	0.0000039
HEXACHLOROETHANE	N	Y	2	1.9	8.74	0.29	0.33
HEXACHLOROBENZENE	Y	Y	1	0.00072	0.00074	0.000029	0.000029
HEXACHLOROBUTADIENE	Y	Y	2	0.45	50	0.36	1.8

Compound Name or Class [Table 40 Name, if different] *Criteria denoted in red indicate proposed additions to the human health criteria*	Priority Pollutant	Carcinogen	Quantitation Limit (µg/L)	Concentration in Units Per Liter for Protection of Human Health CURRENT		Concentration in Units Per Liter for Protection of Human Health PROPOSED TABLE 40	
				Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)	Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)
HEXACHLOROCYCLOHEXAN E-ALPHA [BHC ALPHA]	Y	Y	0.01	0.0092	0.031	0.00045	0.00049
HEXACHLOROCYCLOHEXAN E-BETA [BHC BETA]	Y	Y	0.01	0.0163	0.0547	0.0016	0.0017
HEXACHLOROCYCLOHEXAN E-GAMA [BHC GAMMA (LINDANE)]	Y	N	0.01	0.0186	0.0625	0.17	0.18
HEXACHLOROCYCLOHEXAN E-TECHNICAL	Y	Y		0.0123	0.0414	0.0014	0.0015
HEXACHLOROCYCLOPENTA DIENE	Y	N	2	206	--	30	110
INDENO(1,2,3-CD)PYRENE	Y	Y	1*	--	--	0.0013	0.0018
ISOPHORONE	Y	Y	10	5,200	520,000	27	96
MANGANESE	N	N	2	--	100	--	100
METHOXYCHLOR	N	N	0.01	100	--	100	--
METHYL BROMIDE	Y	N	0.5	--	--	37	150
METHYL-4,6-DINITROPHENOL 2	Y	N	2	--	--	9.2	28
METHYLENE CHLORIDE	Y	Y	0.5	--	--	4.3	59
METHYLMERCURY (MG/KG)	Y	N	0.00005	--	--	--	0.040
MONOCHLOROBENZENE	Y	N		488	--	No criteria	No criteria
NICKEL	Y	N	10	13.4	100	140	170
NITRATES	N	N	100	10,000	--	10,000	--
NITROBENZENE	Y	N	1	19,800	--	14	69
NITROSAMINES	Y	Y		0.0008	1.24	0.00079	0.046
NITROSODIBUTYLAMINE N	Y	Y	10	0.0064	0.587	0.0050	0.02
NITROSODIETHYLAMINE N	Y	Y		0.0008	1.24	0.00079	0.046
NITROSODIMETHYLAMINE N	Y	Y	1	0.0014	16	0.00068	0.30
NITROSODI-N-PROPYLAMINE, N	Y	Y	2	--	--	0.0046	0.051
NITROSODIPHENYLAMINE N	Y	Y	1	4.9	16.1	0.55	0.60
NITROSOPYRROLIDINE N	Y	Y	10	0.016	91.9	0.016	3.4
PCBS	Y	Y	0.5	0.000079	0.000079	0.0000064	0.0000064

Compound Name or Class [Table 40 Name, if different] *Criteria denoted in red indicate proposed additions to the human health criteria*	Priority Pollutant	Carcinogen	Quantitation Limit (µg/L)	Concentration in Units Per Liter for Protection of Human Health CURRENT		Concentration in Units Per Liter for Protection of Human Health PROPOSED TABLE 40	
				Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)	Water and Fish Ingestion (µg/L)	Fish Consumption Only (µg/L)
PENTACHLOROBENZENE	N	N	10/Contact DEQ Lab	74	85	0.15	0.15
PENTACHLOROPHENOL	Y	Y	2	1,010	--	0.15	0.30
PHENOL	Y	N	1	3,500	--	9,400	86,000
POLYNUCLEAR AROMATIC HYDROCARBONS	Y	Y		0.0028	0.0311	No criteria	No criteria
PYRENE	Y	N	1	--	--	290	400
SELENIUM	Y	N	2	10	--	120	420
TETRACHLOROBENZENE 1,2,4,5	Y	N	1	38	48	0.11	0.11
TETRACHLOROETHANE 1,1,2,2	Y	Y	0.5	0.17	10.7	0.12	0.40
TETRACHLOROETHYLENE	Y	Y	0.5	0.8	8.85	0.24	0.33
THALLIUM	Y	N	0.1	13	48	0.043	0.047
TOLUENE	Y	N	0.5	14,300	424,000	720	1500
TOXAPHENE	Y	Y	0.5	0.00071	0.00073	0.000028	0.000028
TRICHLOROBENZENE 1,2,4	Y	N	0.5	--	--	6.4	7.0
TRICHLOROETHANE 1,1,2	Y	Y	0.5	0.6	41.8	0.44	1.6
TRICHLOROETHYLENE	Y	Y	0.5	2.7	80.7	1.4	3.0
TRICHLOROPHENOL 2,4,5	N	N	2/Contact DEQ Lab	2,600	--	330	360
TRICHLOROPHENOL 2,4,6	Y	Y	1	1.2	3.6	0.23	0.24
VINYL CHLORIDE	Y	Y	0.5	2	525	0.02	0.24
ZINC	Y	N	5	--	--	2100	2600

* If lab cannot meet using full scan (625), please contact DEQ Lab

Appendix C

TABLE 1: Waterbodies* Listed for Toxics on the 2004/2006 Integrated Report⁴

Watershed (USGS 4th Field Name)	Water Body (Stream/Lake)	303(d) Toxics Listing
COAST FORK WILLAMETTE	Coast Fork Willamette River	Iron, Mercury
COAST FORK WILLAMETTE	Coast Fork Willamette River / Cottage Grove Reservoir	Mercury
COAST FORK WILLAMETTE	Dennis Creek	Mercury
COAST FORK WILLAMETTE	Row River / Dorena Lake	Mercury
COOS	Elk Creek	Iron
COOS	Isthmus Slough	Manganese
COQUILLE	Fishtrap Creek	Iron
CROSSES SUBBASINS	Columbia River	Arsenic, DDE, PCB, PAH
CROSSES SUBBASINS	Klamath River	Ammonia
CROSSES SUBBASINS	Malheur River	DDT, Dieldrin
CROSSES SUBBASINS	Owyhee River	Arsenic, DDT, Dieldrin, Mercury
CROSSES SUBBASINS	Snake River	Mercury
CROSSES SUBBASINS	Willamette River	Aldrin, Arsenic, DDT, DDE, Dieldrin, Iron, Manganese, Mercury, PCB, Pentachlorophenol, PAH,
CROSSES SUBBASINS / LOWER OWYHEE	Owyhee River / Owyhee, Lake	Mercury
DONNER UND BLITZEN	Bridge Creek	Iron, Manganese, Beryllium
DONNER UND BLITZEN	Little Blitzen River	Beryllium
GOOSE LAKE	East Branch Thomas Creek	Iron
GOOSE LAKE	Thomas Creek	Iron
JORDAN	Jack Creek / Antelope Reservoir	Mercury
JORDAN	Jordan Creek	Arsenic, Mercury
LOST	Klamath Strait	Ammonia
LOST	Lost River	Ammonia

⁴ For information on the 2004/2006 Integrated Report, please visit:
<http://www.deq.state.or.us/wq/assessment/rpt0406.htm>

Watershed (USGS 4th Field Name)	Water Body (Stream/Lake)	303(d) Toxics Listing
Lower Columbia	Unnamed Creek	Chromium (hex)
Lower Columbia	Unnamed Creek	Copper
Lower Columbia	Unnamed Creek	Iron
Lower Columbia	Unnamed Creek	Manganese
Lower Columbia	Unnamed Creek	Zinc
LOWER OWYHEE	Overstreet Drain	Copper, Iron, Lead, Manganese
LOWER WILLAMETTE	Arata Creek / Blue Lake	Ammonia, Manganese
LOWER WILLAMETTE	Columbia Slough	Iron, Manganese
LOWER WILLAMETTE	Johnson Creek	DDT, Dieldrin, PCB, PAH
LOWER WILLAMETTE	South Columbia Slough	Iron, Manganese
MCKENZIE	Blue River	Manganese
MCKENZIE	Mohawk River	Iron
MIDDLE COLUMBIA-HOOD	Dog River	Beryllium, Iron
MIDDLE COLUMBIA-HOOD	East Fork Hood River	Beryllium, Copper, Iron
MIDDLE COLUMBIA-HOOD	Evans Creek	Beryllium, Copper, Iron
MIDDLE COLUMBIA-HOOD	Hood River	Beryllium, Copper, Iron
MIDDLE COLUMBIA-HOOD	Indian Creek	Chlorpyrifos
MIDDLE COLUMBIA-HOOD	Lenz Creek	Arsenic (tri), Beryllium, Chloropyrifos, Iron, Manganese
MIDDLE COLUMBIA-HOOD	Middle Fork Hood River	Beryllium, Iron
MIDDLE COLUMBIA-HOOD	Mitchell Creek	Zinc
MIDDLE COLUMBIA-HOOD	Neal Creek	Arsenic (tri), Beryllium, Chloropyrifos, Guthion, Iron, Manganese
MIDDLE COLUMBIA-HOOD	West Fork Hood River	Beryllium
MIDDLE WILLAMETTE	Champoeg Creek	Dieldrin
MIDDLE WILLAMETTE	Pringle Creek	Copper, Dieldrin, Lead, Zinc
MIDDLE WILLAMETTE	Pringle Creek Trib	Heptachlor
MOLALLA-PUDDING	Pudding River	DDT, Iron, Manganese
MOLALLA-PUDDING	Zollner Creek	Arsenic, Chlordane, Dieldrin, Iron, Manganese, Nitrates
NECANICUM	Ecola Creek	Iron
NORTH UMPQUA	Cooper Creek / Cooper Creek Reservoir	Iron, Mercury

Watershed (USGS 4th Field Name)	Water Body (Stream/Lake)	303(d) Toxics Listing
NORTH UMPQUA	North Umpqua River	Arsenic
NORTH UMPQUA	Platt I Reservoir	Mercury
NORTH UMPQUA	Sutherlin Creek	Arsenic, Beryllium, Copper, Iron, Lead, Manganese
NORTH UMPQUA	Unnamed creek	Arsenic
NORTH UMPQUA	Unnamed creek	Iron
NORTH UMPQUA	Unnamed creek	Lead
SOUTH UMPQUA	Galesville Reservoir	Mercury
SOUTH UMPQUA	Middle Creek	Arsenic, Cadmium, Copper, Manganese, Nickel, Zinc
SOUTH UMPQUA	Olalla Creek	Iron
SOUTH UMPQUA	South Fork Middle Creek	Cadmium, Copper, Manganese, Zinc
SOUTH UMPQUA	South Umpqua River	Arsenic, Cadmium
TUALATIN	Beaverton Creek	Iron, Manganese
TUALATIN	Fanno Creek	Dieldrin
Tualatin	Koll Wetland	Chromium (hex), Copper, Lead, Silver, Zinc
TUALATIN	Tualatin River	Iron, Manganese
UMATILLA	Athena Spring	Nitrates
UMATILLA	Birch Creek	Iron
UMATILLA	Butter Creek	Iron
UMATILLA	McKay Creek	Iron
UMATILLA	Umatilla River	Iron, Manganese
UMATILLA	Wildhorse Creek	Iron, Manganese
UMPQUA	Calapooya Creek	Iron
UMPQUA	Cook Creek	Beryllium, Copper, Iron, Lead, Manganese
UPPER WILLAMETTE	A-3 Drain	Arsenic, Dichloroethylenes, Tetrachloroethylene
UPPER WILLAMETTE	Amazon Creek	Arsenic, Copper, Dichloroethylenes, Lead, tetrachloroethylene, Trichloroethylene
UPPER WILLAMETTE	Amazon Creek Diversion Channel	Arsenic (tri), Copper, Lead, Mercury
UPPER WILLAMETTE	Amazon Diversion Canal/A3 Drain	Mercury
UPPER WILLAMETTE	Calapooia River	Iron, Manganese

Watershed (USGS 4th Field Name)	Water Body (Stream/Lake)	303(d) Toxics Listing
UPPER WILLAMETTE	Long Tom River	Iron, Manganese
UPPER WILLAMETTE	Marys River	Iron, Manganese
UPPER WILLAMETTE	Willow Creek	Arsenic
WALLA WALLA	Pine Creek	Iron
WARNER LAKES	Fifteenmile Creek	Silver
WARNER LAKES	Twelvemile Creek	Arsenic (tri), Silver
WARNER LAKES	Twentymile Creek	Arsenic, Silver
WILSON-TRASK-NESTUCCA	Mill Creek	Iron
YAMHILL	Cedar Creek	Iron
YAMHILL	North Yamhill River	Iron, Manganese
YAMHILL	Salt Creek	Manganese
YAMHILL	South Yamhill River	Iron
YAMHILL	West Fork Palmer Creek	Chlorpyrifos
YAMHILL	Yamhill River	Iron, Manganese

* Toxics listings for any one waterbody may only represent a certain portion of that waterbody as being water quality limited.

TABLE 2: Pollutants of Concern from 2004/2006 Integrated Report

Pollutants of Potential Concern	
Acenaphthene	Endrin
Aldrin	Fluoranthene
Alkalinity	Guthion
Alpha-BHC	Heptachlor
Ammonia	Iron
Antimony	Isophorone
Arsenic	Lead
Arsenic (tri)	Malathion
Benzo(a)anthracene	Manganese
Benzo(A)anthracene	Mercury
Benzo(A)pyrene	Naphthalene
Benzo(g,h,i)perylene	Nickel
Beryllium	Nitrates
BHC	p,p` DDD
Cadmium	Parathion
Chlordane	PCB
Chlorophenoxy Herbicides (2,4-D)	Pentachlorophenol
Chlorpyrifos	phenanthrene
Chromium (hex)	Phenol
Chrysene	Phthalate Esters
Copper	Polynuclear Aromatic Hydrocarbons
Cyanide	pyrene
DDD	Radionuclides
DDT	Silver
DDT Metabolite (DDE)	Tetrachloroethylene
Dichloroethylenes	Thallium
Dieldrin	Toxaphene
Dioxin (2,3,7,8-TCDD)	Tributyltin
Dioxins/Furans	Trichloroethylene
	Zinc