

Antidegradation Policy Implementation

Internal Management Directive for NPDES Permits and Section 401 Water Quality Certifications

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Department of
Environmental
Quality

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*DEQ is a leader in restoring,
maintaining and enhancing
the quality of Oregon's air,
land and water.*



Antidegradation Policy Implementation Internal Management Directive for NPDES Permits and Section 401 Water Quality Certifications

Executive Summary

Purpose	This document provides methods and directions to be followed by the DEQ for implementing the Antidegradation Policy. Implementation of the policy provides a structured process for protecting, maintaining, and enhancing the ecological integrity of the surface waters of the State, and towards that end, defines conditions under which water quality can and cannot be degraded.
Scope	The information provided in the following document is meant to guide the Department of Environmental Quality in its internal procedures for applying existing statutes and rules related to Oregon's Antidegradation Policy. As such, the Internal Management Directive does not create rights or obligations on the part of the public or regulated entities.
Applicability	This internal management directive must be reviewed and implemented by: <ul style="list-style-type: none">• Staff issuing new or renewal NPDES permits, and• Staff issuing 401 water quality certifications.
Components of this internal management directive	This implementation internal management directive has two major chapters: <ol style="list-style-type: none">(1) <i>The Antidegradation Policy</i>, which provides background information on the Antidegradation Policy, including the definition of key terms; and(2) <i>Process for Completing an Antidegradation Review</i>, which provides more detail on how to conduct a review.
Contact for Questions	For questions about this guidance, contact Marty Fitzpatrick (503-229-5656) in the Program Policy & Project Assistance Section or the Surface Water Management Section (503-229-6962) in the Water Quality Division.

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Chapter 1: The Antidegradation Policy

Introduction

What is it? A fundamental premise of the Clean Water Act is the maintenance and restoration of the chemical, physical, and biological integrity of the Nation's waters. This concept forms the basis for what is referred to as *antidegradation*. Antidegradation policy is an integral component of our water quality standards. By definition, a water quality standard is composed of:

- 1) Designated uses of a waterbody which set the water quality goals of a waterbody (e.g. resident fish and aquatic life, water contact recreation),
- 2) Water quality criteria that define the minimum conditions necessary to achieve the designated uses, and
- 3) *Antidegradation policy* that prevents existing water quality from degrading unless specific circumstances apply.

Purpose of the policy An antidegradation policy provides a means for maintaining and protecting water quality of surface waters by requiring that all activities with the potential to affect existing water quality undergo review and comment prior to any decision to approve or deny a permit or certificate for the activity.

How does it work? The antidegradation policy complements the use of water quality criteria. While criteria provide the absolute minimum values or conditions that must be met in order to protect designated uses, the antidegradation policy offers protection to existing water quality, including instances where that water quality equals or is better than the criteria.

Antidegradation policy prohibits degradation of water quality in some circumstances and provides for exceptions to this prohibition in others; however, degradation of water quality is allowed only after a systematic decision-making process considering many factors. These factors include the classification of the waterbody, consideration of alternative treatments to the proposed activity, and comparison of economic and social benefits with environmental costs. In addition, the antidegradation policy requires the involvement of the public through direct notice and through coordination with other government agencies. In this way, decisions to maintain or to change current water quality are made only after a deliberate and inclusive process.

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Introduction, Continued

Tiers of Protection

US EPA directs States and Tribes to implement antidegradation policy at three different levels or tiers of protection:

- Tier 1 -- the basic protection afforded to all waterbodies regardless of current water quality, which is that existing uses will be maintained.
- Tier 2 -- applies protection to water quality that equals or is better than the water quality criteria.
- Tier 3 -- applies to waterbodies that constitute an outstanding national resource.

Once a waterbody or segment of a waterbody is assigned the appropriate tier of protection, the antidegradation policy specifies whether activities that degrade water quality will be prohibited or allowed.

Note: States and tribes may classify their waterbodies or segments of waterbodies into categories that differ from this tier classification as long as the degree of antidegradation protection is consistent with these tiers. For example, in Oregon, waters can be classified as Outstanding Resource Waters, High Quality Waters, or Water Quality Limited Waters. The administrative rules state that in each class of water, beneficial uses will be maintained, which is consistent with Tier 1 protection. The policies for High Quality Waters and Water Quality Limited Waters also have stipulations that are consistent with Tier 2 protection, and the policy for Outstanding Resource Waters is consistent with Tier 3 protection.

Oregon's Antidegradation Policy

Oregon's policy Oregon's antidegradation policy is found in Oregon Administrative Rule (OAR) 340-041-0026(1)(a) (see **Appendix A**). It spells out the level of protection offered to the existing water quality of a waterbody.

Oregon's strategy In Oregon, waters are classified as either Water Quality Limited, High Quality Waters, or Outstanding Resource Waters. Although there are three classes of waters, these classifications are not the same as the three tiers of protection. Outstanding Resource Waters must be High Quality Waters, and High Quality Waters cannot be Water Quality Limited Waters. This is in contrast to other States in which a waterbody can be categorized as a Water Quality Limited Water for one water quality parameter, but can simultaneously be an Outstanding Resource Water or a High Quality Water for other water quality parameters. Oregon's antidegradation policy applies to activities in all three classes of waters, but the level of protection offered differs between classes of waters.

Integration of policy into NPDES permitting An antidegradation policy provides a means for maintaining and protecting water quality of surface waters by requiring that all activities with the potential to affect existing water quality undergo review and comment prior to any decision to approve or deny the activity. For NPDES permits, this review will be conducted by the permit writer, evaluated by the designated water quality manager that approves/denies the permit application, and made available in the staff report for public comment and intergovernmental coordination.

The review portion should happen early in the application process to ensure that the environmental consequences of any activity that might affect water quality are fully assessed. This assessment should then be subjected to public comment and interagency governmental coordination (since other agencies' policies might be affected by the proposed activity). After considering the comments, the permit application may be approved or denied by the Department of Environmental Quality (DEQ) or the Environmental Quality Commission (EQC).

Definition of Key Terms

Antidegradation Review is the process by which the State determines that antidegradation requirements are satisfied for a given regulated activity that may have an effect on surface water quality.

Designated Beneficial Use means the purpose or benefit to be derived from a water body, as designated by the Oregon Water Resources Department or the Environmental Quality Commission.

High Quality Waters means those waters which meet or exceed the levels that are necessary to support the propagation of fish, shellfish, and wildlife and recreation in and on the water, and other designated beneficial uses.

Load Allocation (LA) means the portion of a receiving water's loading capacity that is attributed either to one of its existing or future non-point sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments depending on the availability of data and appropriate techniques for predicting loading. Whenever possible, natural and non-point source loads should be distinguished.

Major Sources as defined in OAR 340-045-0075(2): *Major Industries Qualifying Factors*: discharges large BOD loads; or is a large metals facility; or has significant toxic discharges; or has a treatment system which, if not operated properly, will have a significant adverse impact on the receiving stream; or any other industry which the Department determines needs special regulatory control. *Major Domestic Qualifying Factors*: serving more than 10,000 people; or serving industries which can have a significant impact on the treatment system.

Non-point Sources refers to diffuse or unconfined sources of pollution where wastes can either enter into — or be conveyed by the movement of water to — public waters.

Outstanding Resource Waters means those waters designated by the Environmental Quality Commission where existing high quality waters constitute an outstanding state or national resource based on their extraordinary water quality or ecological values, or where special water quality protection is needed to maintain critical habitat areas.

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Definition of Key Terms, Continued

Reserve Capacity means that portion of a receiving stream's loading capacity that has not been allocated to point sources or non-point sources and natural background as waste load allocations or load allocations, respectively. The reserve capacity includes that loading capacity which has been set aside for a safety margin and is otherwise unallocated.

Short-Term Disturbance means a temporary disturbance where water quality standards may be violated briefly, but not of sufficient duration to cause acute or chronic effects on beneficial uses.

Total Maximum Daily Load (TMDL) means the sum of the individual Waste Load Allocations (WLAs) for point sources and Load Allocations (LAs) for non-point sources and background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLAs plus the LAs for any non-point sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. If Best Management Practices (BMPs) or other non-point source pollution controls make more stringent load allocations practicable, then waste load allocations can be made less stringent. Thus, the TMDL process provides for non-point source control tradeoffs.

Wasteload Allocation (WLA) means the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality-based effluent limitation.

Water Quality Limited Waters refers to waterbodies in one of the following categories:

- (a) A receiving stream which does not meet instream water quality standards during the entire year or defined season even after the implementation of standard technology;
 - (b) A receiving stream which achieves and is expected to continue to achieve instream water quality standard but utilizes higher than standard technology to protect beneficial uses;
 - (c) A receiving stream for which there is insufficient information to determine if water quality standards are being met with higher than standard treatment technology or where through professional judgment the receiving stream would not be expected to meet water quality standards during the entire year or defined season without higher than standard technology.
-

Chapter 2: Process for Completing an Antidegradation Review

Overview

Introduction	The process through which the Antidegradation Policy is implemented is called the <i>Antidegradation Review</i> . The first part of the Review will be completed by the permit writer assigned to the NPDES permit application or 401 certification and signed by the permit writer and the designated water quality manager. This portion of the Review should then be included in the staff report as part of the application package, where it can be examined during the public comment and intergovernmental coordination parts of the Review.
Applicability	<p>The Antidegradation Review must be considered for every DEQ water quality action, such as issuing an NPDES permit or water quality certificate.</p> <p><i>Note:</i> Some specific situations will not require an in depth evaluation, but the antidegradation review should be documented for each case including the justification for why an in depth review is unnecessary (e.g. the proposed activity is a renewal of a permit for discharging at the same or lower loading).</p> <p>The Antidegradation Policy also applies to nonpoint source pollution; however, this document focuses on implementation of antidegradation policy with regard to point source pollution. DEQ intends to continue developing procedures for applying antidegradation policy in a nonpoint source context. In this developmental process, DEQ will work with nonpoint source Designated Management Agencies to achieve effective implementation of the antidegradation policy.</p>
Documentation of review	<p>The Antidegradation Review must be documented in the permit evaluation report (staff report) for each permit application. This includes the justification for not conducting a review or completing an in depth review. If a permit evaluation report is not developed, then written documentation to the applicant's file will suffice.</p> <p><i>Note:</i> An <i>Antidegradation Review Worksheet</i> is available to document major decisions.</p>

Stages of Review

The following briefly describes the stages of Antidegradation Review. For more detail review the relevant sections.

Stage	Description
1	The permit writer determines if the proposed activity requires an Antidegradation Review. (See p. 13.)
2	If an Antidegradation Review is required, the permit writer determines if a significant lowering of water quality is likely to occur. (See p. 15.)
3	If a lowering of water quality is likely to occur, then the permit writer determines how the classification of the waterbody receiving the discharge will further affect the review process. (See p. 18 for Outstanding Resource Waters, p. 20 for High Quality Waters, or p. 24 for Water Quality Limited Waters.)
4	After review is conducted, the permit writer along with the manager determines if they will proceed with drafting a permit.
5	The proposed permit will be put on public notice for public comment.

Flow Chart

Figure 1 presents the flow chart sequence of major questions to be answered by DEQ in conducting an Antidegradation Review. Although the permit writer prepares the answers to these questions, information can be requested from the applicant (OAR 340-045-0030(4)) or other sources to assist in this process. The first matter to be addressed is to determine which level of antidegradation protection applies. This determination will be made based on the classification of the waterbody (i.e. Outstanding Resource Waters, High Quality Waters, and Water Quality Limited Waters). Once the correct classification is determined, then a determination is made whether the proposed activity is likely to result in a lowering of water quality. Subsequently, DEQ evaluates whether authorizing the proposed activity would be consistent with the State's antidegradation requirements.

ANTIDegradation Implementation Flow Chart

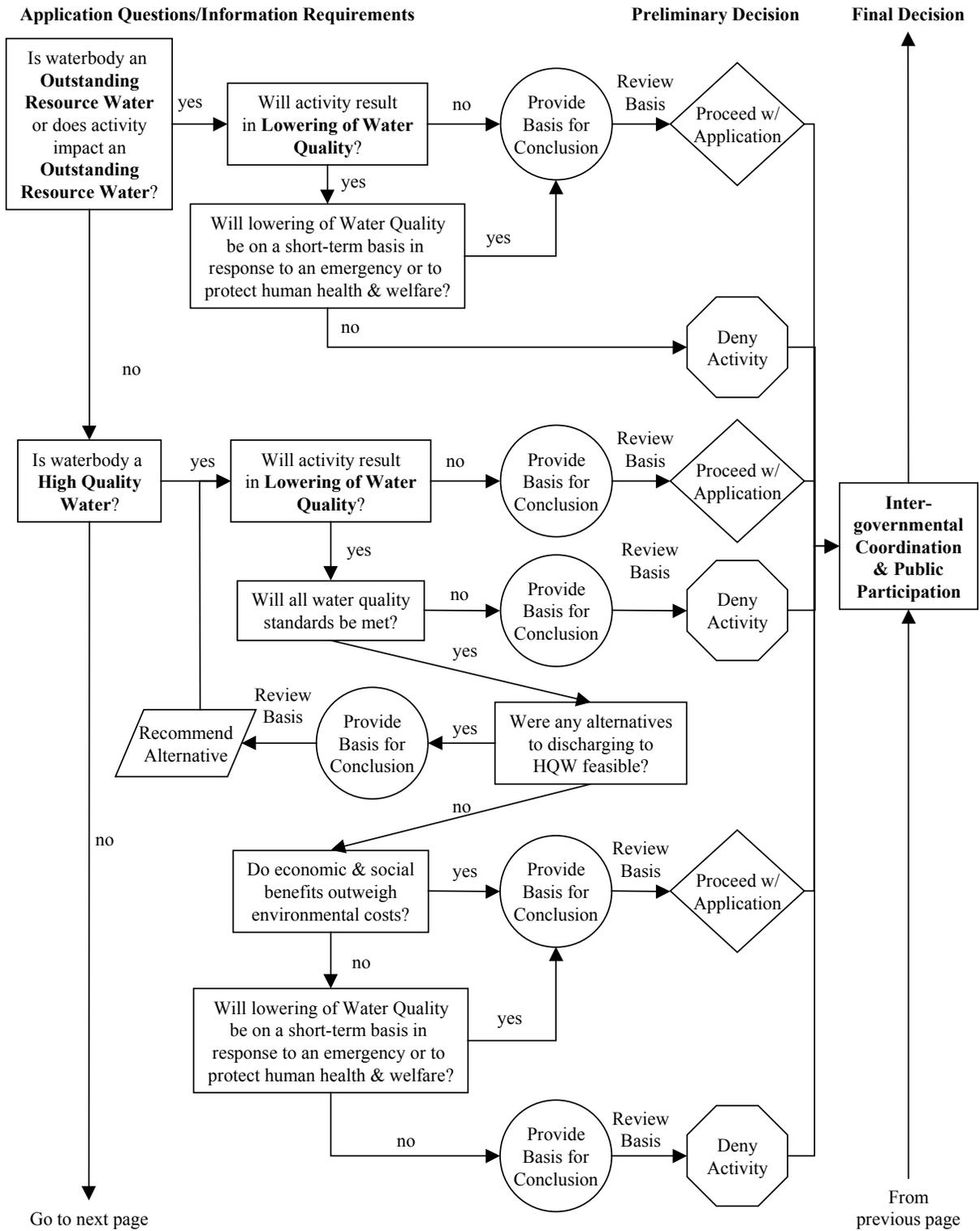


Figure 1.

ANTIDEGRADATION IMPLEMENTATION FLOW CHART

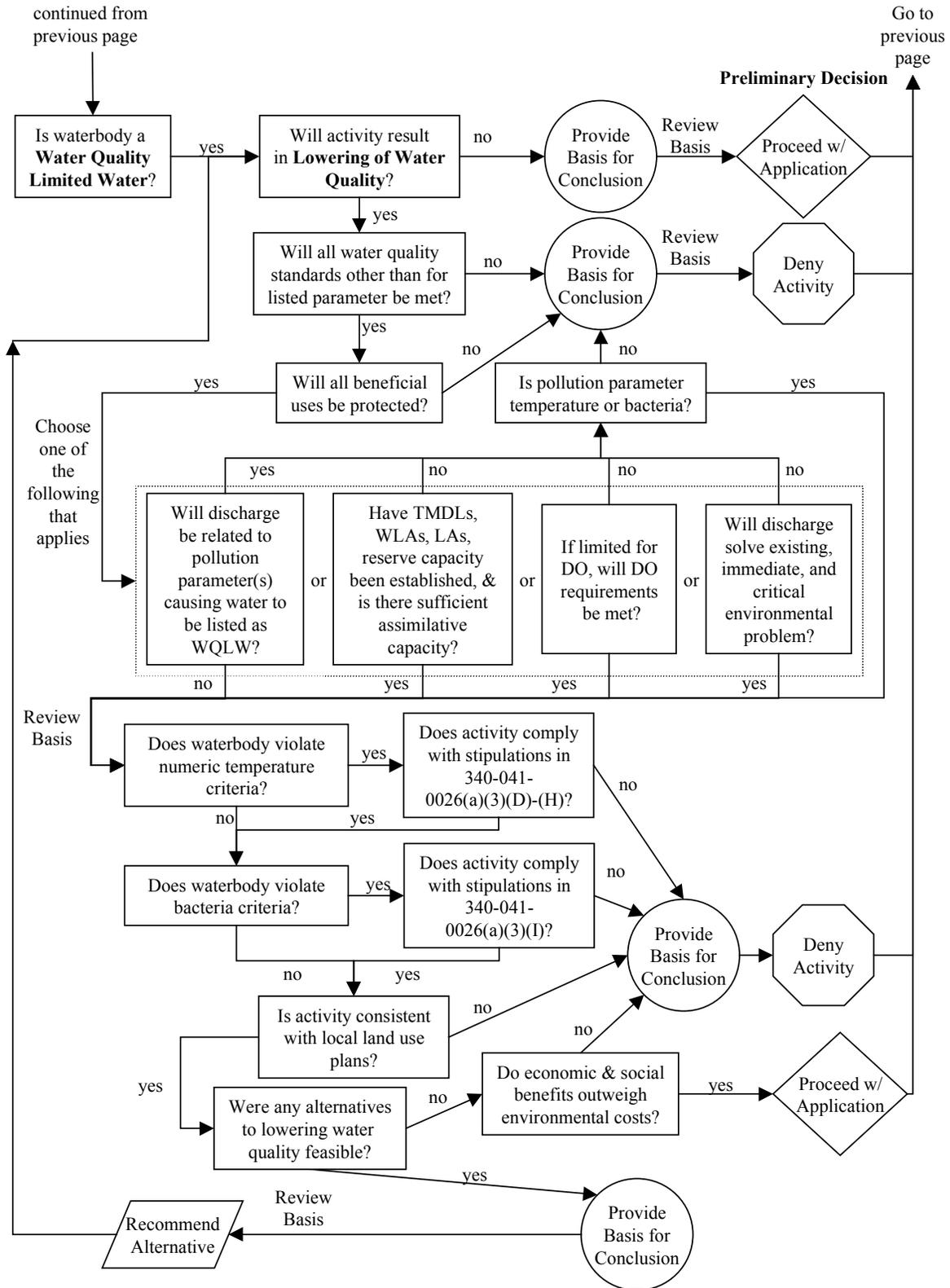


Figure 1 (continued).

Review Sheet

DEQ will document the major conclusions of the Antidegradation Review in an **Antidegradation Review Worksheet (Appendix B)** and make a preliminary recommendation to proceed with the application or deny the proposed activity. This preliminary recommendation will occur at the conclusion of the Applicant Review process. The recommendation is designated ‘preliminary’ because it can be reversed on consideration of the intergovernmental coordination and public comment steps that are the next phase of the process.

**Public Review
& Inter-
governmental
Coordination**

Public participation and intergovernmental coordination will occur if the applicant review process yields a recommendation to approve the proposed activity. DEQ will then consider the various agencies’ comments and public comments in reaching a final decision or recommendation to the Environmental Quality Commission regarding whether to authorize the proposed activity pursuant to the State’s antidegradation requirements. *If the applicant review process results in a denial of the permit, then the applicant has the right to appeal the decision to the Environmental Quality Commission (EQC).* In this situation, the antidegradation review should be made available to the EQC. If the appeal is successful and the EQC directs DEQ to proceed with a permit, then the antidegradation review will be included in the staff report and made available for public comment and intergovernmental coordination during the usual period for comment on the application.

Determining if an In-Depth Antidegradation Review is Necessary

Activities subject to review

Any activity that proposes to discharge a new or increased load (beyond that presently allowed in an existing permit) or any other activity that will lower water quality is subject to an in depth antidegradation review. The specifics of the review will depend on the waterbody segment that would be affected, the level of antidegradation protection applicable to that waterbody segment, and the extent to which existing water quality would be degraded. Antidegradation reviews for general permits will occur at the time that DEQ renews the permit—not at the time the permit is assigned to an applicant.

Note: the EPA rules [40 CFR 130.2] define a “load” as the quantity of matter [either mass or concentration times volume] or thermal energy introduced into a waterbody).

401 Water Quality certifications

Conduct a full review. New certifications that will not result in lower water quality do not require a complete review, but the permit record must fully document that no lowering of water quality is expected to occur for any water quality parameter.

New NPDES permits

Conduct a full review. The antidegradation review worksheet for new permits or water quality certifications that will not lower water quality will consist of documentation that no lowering of water quality is expected to occur.

Renewal NPDES permits

A permit renewal that will result in discharge of a new or increased load (beyond that presently allowed in the existing permit) or that will lower water quality is subject to an antidegradation review. Permit renewals with the same or lower discharge load as the previous permit are not considered to lower water quality from existing water quality and therefore, the antidegradation review worksheet will consist of substantiation that there will be no lowering of water quality.

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Determining if an In-Depth Antidegradation Review is Necessary, Continued

Historic Discharges

An historic discharge that DEQ was aware of and decided not to regulate in the past, and is now coming under permit regulation for the first time should be considered a permit renewal at the same or lower discharge load if the load is expected to be the same as or less than the historic discharge load.

An historic discharge that is expected to have a load greater than the historic discharge load should be treated as a new or increased discharge, thereby requiring an in depth antidegradation review.

Calculation of whether the proposed discharge is less than, equal to, or more than the historic discharge may be made based on historic monitoring data for the pollutant parameter in question (if available) or on modeling based on estimated pollutant loads during the existing permit period.

Illegal Discharges

Illegal discharges should not be considered historic discharges, and require an in-depth antidegradation review if the discharge is coming under permit regulation.

Is an Activity Likely to Lower Water Quality?

Concept If the proposed activity would likely result in any measurable change in water quality away from conditions unimpacted by anthropogenic sources (outside the mixing zone, if existing), then the proposed activity will be considered to likely result in a lowering of water quality.

Approach In evaluating if an activity is likely to cause water quality to be lowered, DEQ should exercise best professional judgment in focusing on those pollutants that are in the pollution stream. A “measurable change” in water quality can be assessed by calculation of mass load or by modeling. Furthermore, a “measurable change” has been defined in the administrative rules for some pollutant parameters (see below), but not for others. For these other parameters, determining whether a measurable change will occur must be made based on case-specific information.

Measurable Change A “measurable change” will be based either on criteria specified in Oregon Administrative Rules (*see below for dissolved oxygen and temperature*) or on best professional judgment (*any of the following can be used in deciding the likelihood that an activity will result in a measurable change in water quality away from conditions unimpacted by anthropogenic sources*): a) percentage change in ambient conditions at appropriate critical periods; b) the difference between current ambient conditions and the conditions that would result if the proposed activity were allowed; c) percentage change in loadings; d) percent reduction in assimilative capacity; e) nature, persistence, and potential effects of the pollutant parameter; f) potential for cumulative effects; g) predicted impacts on aquatic biota; and h) degree of confidence in any modeling techniques used.

The precise nature of conditions unimpacted by anthropogenic sources need not be known; rather, these conditions can be estimated by examining upstream conditions unaffected by similar sources of pollution or by comparing conditions in similar waterbodies that are unaffected by similar sources of pollution.

Note: The purpose of knowing the conditions unimpacted by anthropogenic sources in a general way is to aid professional judgment in deciding whether the direction of change in water quality will likely be toward or away from conditions unimpacted by anthropogenic sources. Therefore, an appropriate comparison for this purpose should be used. Only a change away from conditions unimpacted by anthropogenic sources should be considered a lowering of water quality.

Detailed knowledge of the existing levels of water quality parameters, while preferable, is not necessary for DEQ to require the antidegradation review. A reviewer from DEQ may conclude that if a pollutant is in the pollutant stream, then the discharger/applicant/source has the burden of proof to show that there is no consequent lowering of water quality. If a discharger/applicant/source claims that the activity will not result in a lowering of water quality, then DEQ can require the source to submit data in support of this claim. These data should be collected by DEQ-approved methods in order to show that no statistically significant ($p < 0.05$) change will result in water quality due to the proposed activity.

Dissolved oxygen

Based on OAR 340-041-0026(3)(a)(C)(iii), an activity that results in more than 0.10 mg/L decrease in dissolved oxygen (at the edge of the mixing zone, if existing) will constitute a lowering of water quality. This limit comes from the rule definition for “no measurable reduction” of dissolved oxygen in Water Quality Limited Waters. For consistency, this limit will be applicable to all classes of surface waters.

Temperature

Based on OAR 340-041-0026(3)(a)(F)(ii), an activity that results in more than 0.25°F change in temperature (at the edge of the mixing zone, if existing) will constitute a lowering of water quality. This limit comes from the rule restriction for Water Quality Limited Waters. For consistency, this limit will be applicable to activities in all classes of waters.

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Is an Activity Likely to Lower Water Quality?, Continued

**Example of
Non-Significant
Impact**

Two examples illustrate the types of activities that can be declared to not result in a lowering of water quality. First, facilities renewing permits which are proposing effluent concentrations and volumes at the same level as or lower than those in the previous permit will be considered to not cause a lowering of water quality. Second, general permits issued for cleanup activities (discharge of remediated groundwater) which have very efficient technology resulting in no measurable discharge of pollutants will be considered to not cause a lowering of water quality.

**Example of
Significant
Impact**

Facilities renewing permits which are proposing an effluent loading increase, or any change in discharge location or treatment process are subject to an antidegradation review. For example, operators of a wastewater treatment plant propose to expand a facility to provide for capacity to meet organic and hydraulic loads, to eliminate discharges of chlorine, and to comply with ammonia limits. However, the upgrades will result in an increase in Biochemical Oxygen Demand (BOD) discharged. Because this is a new or increased discharge, the application for the proposed action must undergo an antidegradation review.

Directions for Outstanding Resource Waters (ORWs)

Qualification Criteria The antidegradation policy affords Outstanding Resource Waters the highest level of protection. By definition at 340-041-0006(42), Outstanding Resource Waters must be High Quality Waters, i.e. a waterbody must meet all water quality criteria. OAR 340-041-0026(1)(a)(D) further clarifies the definition of ORW to mean that the waterbody must also constitute an outstanding state or national resource based on its extraordinary water quality, ecological values, or requirement for special water quality protection in order to maintain critical habitat areas. The Environmental Quality Commission designates a waterbody as an Outstanding Resource Water after a process of nomination, review, and public comment.

No Lowering of Water Quality in ORW The rules (OAR 340-041-0026(1)(a)(D)) specify that existing water quality and water quality values will be maintained and protected in ORW. This rule is interpreted to prohibit new or expanded sources from discharging directly to an ORW or upstream of an ORW if it results in a change in water quality within the ORW.

Exceptions Exceptions to this prohibition can be made by the EQC in response to emergencies or to protect human health and welfare if the effect on water quality is temporary. Activities that lower water quality for one month or less will generally be considered to have temporary effects.

Decisions on whether individual proposed activities qualify for exceptions may be based on: a) the length of time during which water quality will be lowered (e.g. no more than one month); b) the percentage change in ambient conditions (e.g. no more than 5%); c) the water quality parameters affected (e.g. magnitude of impact on the most sensitive beneficial uses); d) the likelihood that long-term water quality benefits will accrue to the waterbody (e.g. an increase in sediments or turbidity resulting from removal of a culvert to allow for fish passage); e) the degree to which achieving applicable water quality standards during the proposed activity may be at risk; and f) the potential for any residual long-term influences on existing uses.

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Directions for Outstanding Resource Waters (ORWs), Continued

If the activity will likely result in a long-term or permanent decrease in water quality, then the activity is prohibited. In the instance of an discharge upstream of the ORW, such a source would be prohibited from having an impact on water quality in the ORW. Effects on water quality in the ORW due to upstream sources will be judged using such factors as a) predicted percentage change in ambient conditions during critical periods; b) comparisons of predicted new or expanded loading with existing loading; c) percentage change in assimilative capacity; d) characteristics of the pollutant parameter (e.g. persistence, toxicity, potential impacts); e) potential for cumulative effects; and f) the degree of confidence in modeling, if utilized. These determinations will be made on a case-by-case basis.

Directions for High Quality Waters (HQWs)

Qualification Criteria Based on the rules OAR 340-041-0006(41) and 340-041-0026(1)(a)(A)(iii), High Quality Waters are those which have water quality that meets or is better than all water quality standards. A High Quality Water is one that is not a Water Quality Limited Water. This interpretation is in contrast to some other States in which the waterbody is classified on a water quality parameter-by-parameter basis (thus, in these States, a waterbody can be simultaneously Water Quality Limited for one parameter but High Quality for other parameters). Therefore, in Oregon, waterbodies must have water quality that meets or is better than all water quality criteria in order to be classified as High Quality Waters (HQW).

Overview of Regulations in HQW In HQW, a lowering of water quality is prohibited unless EQC (for major sources) or DEQ (for minor sources) decides that all of the following apply:

- All water quality standards will be met and beneficial uses protected; **and**
- No other reasonable alternative exists; **and**
- The lowering of water quality is necessary for social and economic benefits that outweigh the environmental costs.

Note: see OAR 340-041-0026(1)(a)(A).

No violation of any water quality standards The discharger/applicant/source must provide assurance that the lowering of water quality will not result in a violation of any water quality standards in the HQW. The definition of a water quality standard includes water quality criteria (numeric and narrative) and beneficial uses. Existing uses must also be protected. If insufficient information is available, then DEQ should request the applicant to submit more specific information.

Best available treatment A discharger/applicant/source is expected to employ the best available technology economically achievable in limiting their effluent discharge.

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Directions for High Quality Waters (HQWs), Continued

Reasonable alternatives must be considered

In evaluating the alternatives, the discharger/applicant/source must consider all known, available, and reasonable methods of prevention, control, and treatment to prevent the lowering of water quality. At a minimum, the following alternatives must be considered:

- Improved operation and maintenance of existing treatment system
- Recycling or reuse with no discharge
- Discharge to on-site system
- Seasonal or controlled discharges to avoid critical water quality periods
- Discharge to sanitary sewer
- Land application

Resources for Identifying Alternatives

In the case of individual NPDES permits, the applicant proposing an activity that will likely result in a lowering of water quality must prepare an evaluation of alternatives. One source of information on alternatives is EPA, which publishes effluent guidelines for wastewater treatment discharges and publicly owned treatment plants that provide information on best available technology (<http://www.epa.gov/ostwater/guide/>) for a variety of activities as well as other guidance (e.g. <http://www.epa.gov/owm/muni.htm>) that identifies alternatives for some aquatic discharges. Other sources of information on alternatives may also be used provided that they are credible.

Evaluation of Alternatives

The evaluation of alternatives should provide substantive information pertaining to the effectiveness, costs, and environmental impacts of the alternatives. DEQ will evaluate any analysis of alternatives submitted by the applicant. Analysis of alternatives should include discussions of their technical feasibility and economic feasibility for the particular situation. If at least one of the alternatives to lowering water quality is technically and economically feasible, then the source should pursue that alternative rather than the activity that results in a lowering of water quality. If an alternative will still result in a lowering of water quality, then that alternative is subject to analysis of socioeconomic benefits and environmental costs. If an acceptable analysis was submitted to DEQ as part of an initial project proposal or best management practice, then no further evaluation of alternatives is required of the applicant. If an acceptable analysis has not been submitted, then DEQ will work with the applicant to develop an acceptable analysis of alternatives.

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Directions for High Quality Waters (HQWs), Continued

Technical and Economic Analyses

The technical and economic analyses of alternatives feed into the overall comparison of social and economic benefits with environmental costs (discussed below). Obviously, if an alternative is not technically feasible, then an economic feasibility analysis of the alternative is not required. Furthermore, the lack of a technically feasible alternative obviates the need to show that the lowering of water quality is “necessary” but does not relieve the need to show that the lowering of water quality is “important” (see discussion below). If a technically feasible alternative does exist, then the economic analysis will help to determine whether lowering of water quality is justified. However, regardless of whether alternatives are technically or economically feasible, the lowering of water quality still must be shown to provide widespread socioeconomic benefits.

Socioeconomic Benefits vs. Environmental Costs

The antidegradation review next turns to the analysis of social and economic benefits versus the environmental costs. The two key elements that must be addressed are: 1) is the lowering of water quality “necessary” (i.e. no alternatives feasible) and 2) is the lowering of water quality “important” (i.e. will it result in widespread benefits)?

Is Lowering Water Quality “Necessary”?

In such an analysis, the applicant must demonstrate that the proposed activity is necessary, i.e. the same social and economic benefits cannot be achieved with some other approach. This assumes that an alternative approach is technically feasible.

Note: This concept is discussed more fully in the section on Analysis of Socioeconomic Benefits and Environmental Costs.

Is Lowering Water Quality “Important”?

It must also be demonstrated that the value of the social and economic benefits due to lowering water quality is greater than the environmental costs of lowering water quality.

Note: This concept is discussed more fully in the section on Analysis of Socioeconomic Benefits and Environmental Costs.

Continued on next page

Directions for High Quality Waters (HQWs), Continued

Resources for Socioeconomic Analyses and Environmental Costs

The EPA's Office of Science and Technology provides some help in conducting these analyses in the "Economic Guidance for Water Quality Standards Workbook" (<http://www.epa.gov/ost/econ/>). In some instances of particularly difficult analyses, site-specific assistance from EPA should be requested.

Note: Explanation of the process for analyzing socioeconomic benefits and environmental costs is given below in the section on [Analysis of Socioeconomic Benefits and Environmental Costs](#).

Unusual Circumstances

For unusual circumstances, the Director or designee may grant exceptions for short-term lowering of water quality during emergencies or to protect human health and welfare. Activities that lower water quality for one month or less will generally be considered to have temporary effects. The context for evaluating whether the exception may be granted is similar to that for Outstanding Resource Waters: a) the length of time during which water quality will be lowered; b) the percentage change in ambient conditions; c) the water quality parameters affected; d) the likelihood that long-term water quality benefits will accrue to the water body (e.g. an increase in sediments or turbidity resulting from removal of a culvert to allow for fish passage); e) the degree to which achieving applicable water quality standards during the proposed activity may be at risk; and f) the potential for any residual long-term influences on existing uses. The criteria for granting this exception are evaluated on a case-by-case basis.

Directions for Water Quality Limited Waters (WQLWs)

Qualification Criteria	As defined in OAR 340-041-0006(30), Water Quality Limited Waters (WQLW) are those which a) do not meet the water quality standards during the entire year or defined season even after implementation of standard technology, b) only meet water quality standards through the use of higher than standard technology, or c) insufficient information exists to determine if water quality standards are being met.
Overview of Regulation in WQLW	In WQLW, a lowering of Water Quality by new or increased discharges is prohibited unless EQC (major sources) or DEQ (minor sources) decides the provisions of OAR 340-041-0026(3) apply. OAR 340-041-0026(3) (Appendix A) details the circumstances and conditions under which the antidegradation policy is applied to WQLW. In the case of major sources, DEQ will prepare the information for presentation to the EQC; therefore, regardless of whether it is a major or minor source, DEQ staff will conduct the antidegradation review.
No violation of standards	The rule language indicates that all water quality standards must be met. For a WQLW, this refers to all water quality criteria other than that for which the waterbody is listed as water quality limited (or to the situation where “higher than standard” or advanced treatment technology must be used to protect beneficial uses).
All beneficial uses protected	All beneficial uses except for those for which the standards are in violation must also be protected. In practice, a reviewer generally may conclude that beneficial uses are protected if all narrative and numeric water quality requirements are being met. Existing uses must also be protected.
Best available treatment	A discharger/applicant/source is expected to employ the best available technology economically achievable in limiting their effluent discharge.

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Directions for Water Quality Limited Waters (WQLWs),

Continued

Compliance with one of the following

If the activity will result in a lowering of water quality, then the discharger/applicant/source must comply with one of the following four provisions: 1) the activity can only discharge pollution parameters unrelated either directly or indirectly to the parameter for which the waterbody is already listed; or 2) there must be a Total Maximum Daily Load (TMDL) plan in place that demonstrates sufficient reserve capacity to assimilate the parameter that the activity will change; or 3) in waterbodies that are water quality limited for dissolved oxygen (DO), the activity must result in a reduction in DO of no more than 0.10 mg/l for a single source and no more than 0.20 mg/L for all anthropogenic activities that influence the waterbody; or 4) under extraordinary circumstances to solve a critical environmental problem, a waste load increase may be allowed if TMDLs, WLAs, LAs have been set, a compliance plan has been established and implemented, the increased load will not result in adverse effects on beneficial uses, and the increased load is temporary.

WQLW for temperature

For WQLWs that are limited for temperature, a surface water temperature management plan must be developed and implemented if the proposed discharge will increase temperature by 0.25°F or more. New or increased discharge loads may be allowed to increase ambient water temperature (measured at the edge of the mixing zone, if existing) by less than or equal to 0.25°F in WQLW limited for temperature if such a plan is in place. However, this increase must not have a measurable impact on beneficial uses (see OAR 340-041-0026(3)(a)(D)-(H)). A discharger/applicant/source may petition DEQ for an exception of the above stipulations, if it 1) demonstrates that the discharge will result in less than 1.0°F increase at the edge of the mixing zone; 2) provides the necessary scientific information describing how no designated beneficial uses will be adversely impacted; and 3) demonstrates that it is implementing all reasonable management practices, its activity will not affect beneficial uses, and the environmental cost of treating the parameter to the level necessary to assure full protection would outweigh the risk to the resource. A discharger/applicant/source may petition the EQC for an exception to the previously mentioned stipulations if 2 and 3 apply.

WQLW for bacteria

If the discharger/applicant/source intends to contribute to the bacteria contamination problem in a WQLW that is limited for bacteria, then the source must develop and implement a bacteria management plan. These management plans must describe the technologies, best management practices (BMPs), and measures or approaches that will be implemented by the source to limit bacterial contamination (see OAR 340-041-0026(3)(a)(I)).

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Directions for Water Quality Limited Waters (WQLWs),

Continued

Consistency with Local Land Use Plans

A lowering of water quality by the discharger/applicant/source must be consistent with local land use plans by providing a statement to that effect from the appropriate local land use agency (see OAR 340-041-0026(3)(a)(J)). An example of consistency would be showing that local zoning allows for the presence of the activity.

Evaluation of Environmental and Economic Effects Criteria

OAR 340-041-0026(3)(b) acknowledges the value of unused assimilative capacity in Oregon's waterbodies and indicates that, in allowing a source to use any of that unused assimilative capacity, DEQ or the EQC should consider environmental and economic effects that the activity might cause. Under environmental and economic effects criteria, the discharger/applicant/source must demonstrate that there are no alternatives to lowering water quality in the WQLW, and that economic benefits of lowering water quality are greater than other uses of the assimilative capacity. Antidegradation policy prohibits discharge of pollution parameters related either directly or indirectly to the parameter causing the waterbody to be listed (except in the specialized circumstances specified for temperature or dissolved oxygen); therefore, the water quality parameters considered under this section are those that are equal to or better than the water quality criteria. Implementation of this part of the antidegradation policy in WQLW will be essentially the same as that for HQW.

Reasonable alternatives must be considered

In evaluating the alternatives, the discharger/applicant/source must consider all known, available, and reasonable methods of prevention, control, and treatment to prevent the lowering of water quality. At a minimum, the following alternatives must be considered:

- Improved operation and maintenance of existing treatment system
 - Recycling or reuse with no discharge
 - Discharge to on-site system
 - Seasonal or controlled discharges to avoid critical water quality periods
 - Discharge to sanitary sewer
 - Land application
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Directions for Water Quality Limited Waters (WQLWs),

Continued

Resources for Identifying Alternatives

For individual NPDES permits, the discharger/applicant/source must prepare an evaluation of alternatives to lowering of water quality. As stated above, EPA publishes information on alternative treatment technologies (e.g. <http://www.epa.gov/ostwater/guide/>; <http://www.epa.gov/owm/muni.htm>) for a variety of activities. Other credible sources may also be consulted.

Evaluation of Alternatives

Information on the effectiveness, costs, and environmental impacts of the alternatives should be included so that DEQ can complete this evaluation. Analysis of alternatives should include discussion of their technical feasibility and economic feasibility for the particular circumstances. Technical and economic feasibility of at least one alternative is sufficient for DEQ to deny the application to lower water quality and to recommend that the alternative be used. Therefore, it is important that enough information is submitted to evaluate the alternatives. If an alternative will still result in a lowering of water quality, then that alternative is subject to analysis of socioeconomic benefits and environmental costs. If an acceptable analysis is submitted to DEQ as part of an initial project proposal or best management practice, then no further information on alternatives will be required of the applicant. If an acceptable analysis is not submitted, then DEQ will work with the applicant to develop an acceptable analysis of alternatives.

Technical and Economic Analyses

The comparison of social and economic benefits with environmental costs requires the technical and economic analyses of alternatives. If alternatives are not technically feasible, then no analysis of economic feasibility of alternatives is necessary; however, lowering of water quality must still be shown to provide widespread socioeconomic benefits (see below). The lack of a technically feasible alternative should be interpreted to mean that the requirement of showing that ‘a lowering of water quality is necessary’ has been satisfied. However, if a technically feasible alternative does exist, then the economic analysis will help to determine whether lowering of water quality is justified. Regardless of whether alternatives are technically or economically feasible, the lowering of water quality still must be shown to provide widespread socioeconomic benefits. In addition, the socioeconomic benefits of lowering water quality must be demonstrated to outweigh the environmental costs.

Socioeconomic Benefits vs. Environmental Costs

The two key elements that must be addressed in the analysis of social and economic benefits versus the environmental costs are: 1) is the lowering of water quality “necessary” (i.e. no alternatives feasible) and 2) is the lowering of water quality “important” (i.e. will it result in widespread benefits)?

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Directions for Water Quality Limited Waters (WQLWs),

Continued

Is Lowering Water Quality “Necessary”?

In such an analysis, the applicant must demonstrate that the proposed activity is necessary, i.e. the same social and economic benefits cannot be achieved with some other approach. This assumes that an alternative approach is technically feasible.

Note: This concept is discussed more fully in the section on Analysis of Socioeconomic Benefits and Environmental Costs.

Is Lowering Water Quality “Important”?

The socioeconomic benefits of lowering water quality must be demonstrated to be important, i.e. they must outweigh the environmental costs.

Note: This concept is discussed more fully in the section on Analysis of Socioeconomic Benefits and Environmental Costs.

Resources for Socioeconomic Analyses and Environmental Costs

The EPA’s Office of Science and Technology provides some help in conducting these analyses in the “Economic Guidance for Water Quality Standards Workbook” (<http://www.epa.gov/ost/econ/>). In some instances of particularly difficult analyses, site-specific assistance from EPA should be requested.

Note: Explanation of the process for analyzing socioeconomic benefits and environmental costs is given below in [the section on Analysis of Socioeconomic Benefits and Environmental Costs](#).

Directions for General Permits

Considerations General permits (see **Table 1**) have effluent limits and monitoring requirements that are set at the same level within each permit issued regardless of the class of receiving water (e.g. ORW, HQW, WQLW). Since antidegradation policy focuses on protecting existing water quality, the antidegradation review proposed in the Draft Implementation Internal Management Directive does not readily fit general permits. Furthermore, the low fees charged for general permits do not allow for generation of revenues sufficient to perform the type of analysis required in an antidegradation review of an individual NPDES permit application.

Therefore, unless there are data to indicate that activities under a general permit are likely to cause a significant lowering of water quality, such activities should be considered as not likely to cause a lowering of water quality for the purposes of the antidegradation review. If DEQ staff believe that an activity proposed under a general permit will result in a lowering of water quality, then DEQ should require the source/discharger to apply for an individual NPDES permit.

Permit Renewals Renewal of general permits at the same or more stringent effluent limitations will be deemed to not cause a lowering of water quality (similar to an individual NPDES permit renewed for the same discharge load that is not considered to cause a lowering of water quality). However, if the new technology-based effluent limits are less stringent than the previous effluent limits, then water quality-based limits must be set at levels that cause no lowering of water quality in any ORW, that prohibit increased discharge of the limited water quality parameter (or parameter related to the limited parameter) in a WQLW, and that follow Best Management Practices for all waters.

New Permits New general permits should undergo an analysis of potential impact on water quality before they are issued. Modeling can be used, where appropriate, to determine the likelihood that water quality will be lowered as a result of activities under a general permit. Effluent limitations and operating conditions of the general permit should be designed to cause no lowering of water quality. This may require adherence to Best Management Practices or to progressively restrictive effluent limitations. If a lowering of water quality is likely to take place, then an analysis must be conducted to determine if the socioeconomic benefits of allowing the lowering of water quality outweigh the environmental costs.

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Directions for General Permits, Continued

Socioeconomic Benefits vs. Environmental Costs

Determination of socioeconomic benefits/environmental costs will be done in a general way since activities allowed under general permits are not necessarily limited geographically. The following list of benefits and costs may be useful in evaluating the activity, but others may be added or substituted if necessary.

Social and Economic Benefits (examples)

- Creation or expansion of employment
- Increase of median family income
- Increase of community tax base
- Providing necessary social services
- Enhancing environmental attributes
- Providing an innovative pollution control and management approach that would result in significant improvement in current practices
- Prevention of a substantial environmental or public health threat

Costs associated with Lowering Water Quality (examples)

- Losing assimilative capacity otherwise used for other industries/development
- Impacting fishing, recreation, and tourism industries negatively
- Impacting health protection negatively
- Impacting societal value for environmental quality negatively
- Impacting other Federal, State, or Local environmental goals

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Directions for General Permits, Continued

Table 1.	
NPDES General Permits	
100	Cooling water/heat pumps
200	Filter backwash
300	Fish hatcheries
400	Log ponds
500	Boiler blowdown
700	Suction dredges
900	Seafood processing
1200A	Stormwater permit for gravel mining
1200C	Construction that disturbs five or more acres
1200CA	Construction that disturbs five or more acres - Government agencies
1200CM	Construction activities, 1200-C permit administered by DEQ agents
1200COL	Industrial stormwater discharging to Columbia Slough
1200Z	Industrial stormwater
1300	Oily stormwater runoff, oil/water separators
1500A	Tanks cleanup and treatment of groundwater
1700A	Washwater
1900	Non contact geothermal
WPCF General Permits	
600	Offstream placer mining
1000	Gravel mining
1400A	Wineries, fresh pack food processors
1400B	Canneries, food/animal processing, extracts
1500B	Tanks cleanup and treatment of groundwater
1700B	Washwater
1800	Dog kennels

General WPCF Permits General WPCF Permits (see **Table 1**) do not allow discharge to surface waters; therefore, activities under such permits are considered to not lower water quality. Thus, the antidegradation review need only note that the previous sentence is true.

Analysis of Socioeconomic Benefits and Environmental Costs

Overview To demonstrate the necessity and importance of the proposed activity in either a HQW or WQLW, the discharger/applicant/source must provide DEQ with enough information to allow for a financial impact analysis that assesses whether allowing an activity that lowers water quality has socioeconomic benefits that outweigh the environmental costs. Information on the economic analysis of alternatives to lowering water quality comes into play here. The process of evaluation differs between public and private sector developments; however, each process applies equally to activities in HQW and WQLW.

Effluent Trading Effluent trading may be proposed as a means to offset the expected lowering of water quality due to the proposed activity. In this instance, the effluent trading should be conducted within the same waterbody segment or in such a way that improvements in water quality will accrue to the waterbody segment in which the proposed activity will take place (e.g. upstream of the proposed activity such that improvements of water quality will occur at the location of the proposed activity). If such trading is proposed, then the discharger/applicant/source should still be subjected to an antidegradation review; the trade can be used to show how environmental costs will be lowered as a result of allowing the lowering of water quality due to the proposed activity.

Public Sector Developments EPA’s “Economic Guidance for Water Quality Standards Workbook” provides worksheets that can be used as a step-by-step guide for making these calculations. For public sector developments such as Publicly Owned Treatment Works (POTWs), primary and secondary tests are applied to determine if the community can afford alternatives to lowering water quality (e.g. additional treatment). The information necessary to run these tests can be requested from the applicant (although some of the information is readily available from public sources). The results of these tests can then be used to justify the decision to either allow or deny application to lower water quality.

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Analysis of Socioeconomic Benefits and Environmental Costs, Continued

Municipal Preliminary Screener

For the first test, information on the median household income and the cost of treatment required to maintain current water quality is useful in generating the Municipal Preliminary Screener (MPS). The MPS is a ratio of the total annual cost of pollution control (expressed on a per household basis) to the median household income, which serves as an initial screening tool to see if the treatment cost of maintaining current water quality conditions is too much of a burden to the community.

$$\text{MunicipalPreliminaryScreener} = \frac{\text{TotalAnnualPollutionControlCostperHousehold}}{\text{MedianHouseholdIncome}} * 100$$

Secondary Tests

The secondary tests involve further estimates of the economic impact of the alternative on the community using indicators of debt, socioeconomic health, and financial management within the impacted community. As specified in the EPA guidance, information on **bond rating** (indicates credit worthiness of the community), **overall net debt per capita** (indicates debt burden on residents within the community), **unemployment rate** (indicates general economic health of the community), **median household income** (indicates wealth of the community), and **property tax collection rate** (indicates how well local government is administered) is necessary to make the secondary test and therefore, the DEQ reviewer will not be able to make a favorable determination or recommendation unless the applicant supplies sufficient information. The EPA guidance also calls for information on **property tax revenue as a percent of full market value of taxable property**. However, since Oregon currently places limits on property tax collections and/or rates, this information is not appropriate for estimating impacts. Worksheets for generating values and for calculating the results of these secondary tests are provided in **Appendix C**. An example of socioeconomic analysis of a POTW is presented in **Appendix D**.

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Analysis of Socioeconomic Benefits and Environmental Costs, Continued

Private Sector Developments EPA’s “Economic Guidance for Water Quality Standards Workbook” provides worksheets that can be used as a step-by-step guide for making these calculations. For private sector developments, primary and secondary tests are applied to determine if the company can afford alternatives to lowering water quality (e.g. additional treatment). The information necessary to run these tests can be requested from the company (although some of the information is readily available from public sources). The results of these tests can then be used to justify the decision to either allow or deny application to lower water quality.

Profit Test For private sector developments, the initial focus is on how maintaining existing water quality will affect profits of the facility in question. In attempting to justify that a lowering of water quality is warranted, the private sector entity must provide sufficient information on its economic health and the economic consequences of adopting alternative treatment(s) that would maintain existing water quality. The information required to make this evaluation includes the cost of the alternative treatment (alternative costs) and the earnings/revenue information of the private sector entity’s facility in question (both with and without the additional cost associated with the alternative to lowering water quality).

$$\text{ProfitRateWithoutAlternativeCosts} = \frac{\text{EarningsBeforeTaxes}}{\text{Revenues}}$$

$$\text{ProfitRateWithAlternativeCost} = \frac{\text{EarningsBeforeTaxesWithAlternativeCosts}}{\text{Revenues}}$$

Interpreting the results of the Profit Test These ratios can be used to assess whether the discharger/applicant/source is already in financial risk (either not profitable or profits far below industry norms) even before pollution control investments are estimated. If the facility of the discharger/applicant/source is already not profitable, it may not claim that substantial impacts would occur due to maintaining existing water quality.

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Analysis of Socioeconomic Benefits and Environmental Costs, Continued

Information Resources	The information on Earnings Before Taxes can be obtained from the private entity's annual income statement. Earnings Before Taxes consists of the Revenues (or net sales) minus the Cost of Goods Sold (or cost of sales) minus the Portion of Corporate Overhead Assigned to the Discharger (or selling, general and administrative costs). It is useful to have access to the Earnings Before Taxes for the previous three years in order to identify trends or atypical years. The private entity's design engineers should be able to provide an accurate estimate of alternative costs.
EPA contacts	In addition, EPA can be consulted for estimates as well. Such information can be obtained from a) EPA Region 10 (http://www.epa.gov/region10 ; 206-553-1448) or EPA Headquarters staff (http://www.epa.gov/ost/ ; George Denning 202-260-7374), who at the request of DEQ could review the project and develop estimates of alternative costs (provided resources are available); and b) the effluent guidelines program which collects national costs and prepares national engineering models to support each Federal effluent guideline rulemaking action (see http://www.epa.gov/ost/guide).
Minimal Effect on Profits	DEQ should require that the alternative approach be followed if maintaining current water quality is shown to minimally affect profits. Obviously, determining whether the cut in profits due to adoption of the alternative is excessive becomes a subjective judgment. However, the discharger/applicant/source can be asked to provide some comparisons of expenditures on other infrastructure made by the discharger/applicant/source or others in the same business sector, which might be useful in determining the tolerance for profit reduction and the likelihood that competitor's facilities face similar project costs. In addition, information can be obtained that indicates the willingness of consumers to pay more for the product.

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Analysis of Socioeconomic Benefits and Environmental Costs, Continued

Secondary Measures

If maintaining water quality is expected to unduly lower profits at the facility, then secondary measures of the **financial liquidity** (indicates the ease with which the discharger/applicant/source can pay its short-term bills), **solvency** (indicates the ease with which the discharger/applicant/source can pay its fixed and long-term bills), and **leverage** (indicates the ease with which the discharger/applicant/source can borrow money) of the private sector entity should be calculated and compared to that of industry standards in order to determine if maintaining water quality would cause interference with development.

Information Resources

Information on industry standards for these comparisons is available in “Annual Statement Studies” (Risk Management Association), “Moody’s Industrial Manual,” “Dun’s Industry Norms” (Dun and Bradstreet), and “Industry Surveys (Standard & Poor), which are available at many public and university libraries. Again, the “Economic Guidance for Water Quality Standards Workbook” provides step-by-step instructions for making these calculations. Worksheets for generating values and for calculating the results of these secondary tests are provided in **Appendix E** (Calculation of Current Ratio, Beaver’s Ratio, and Debt to Equity Ratio). The objective of these tests is to determine if the discharger/applicant/source can readily obtain financing for pollution control to maintain existing water quality.

Determining the Importance of Lowering Water Quality

In contrast to the financial calculations that can be used to assess the necessity of lowering water quality, determining the importance of lowering water quality with regard to economic and social development of the community is not as easily reduced to economic ratios. Instead, a number of indicators must be considered, all of which would be projected to occur if a lowering of water quality was not allowed. These include indicators such as increases in unemployment, losses to the local economy, changes in household income, decreases in tax revenues, indirect effects on other businesses, and increases in sewer fees. The “Economic Guidance for Water Quality Standards” from EPA provides worksheets to aid in the analysis of socioeconomic importance and these are reproduced in **Appendix F** (Widespread Social and Economic Impact Factors).

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Analysis of Socioeconomic Benefits and Environmental Costs, Continued

Environmental Costs: Intrinsic & Human Use Values

In examining the environmental costs of lowering water quality, a distinction is made between the intrinsic value of the water and the value that derives from use by the human population. Intrinsic value is the sum of the existence value and the option value. The existence value is the willingness of an individual or society to pay to maintain water quality for its own sake regardless of any perceived future use; the option value is the willingness of an individual or society to pay to maintain water quality as an opportunity for future use.

Estimating Intrinsic Value

The intrinsic value can be difficult to estimate, but it still should be considered when examining environmental cost. If an estimate cannot be made at the time of the initial review of the proposed activity, then the potential existence of this intrinsic value should be noted in the antidegradation review for possible comment during public notice and intergovernmental coordination. For example, if the proposed activity might have an impact on a rare species of no known economic value, then an estimate of the willingness of society to pay for maintaining the existence of this species would be one intrinsic value. If the species is or was to become listed as threatened or endangered, then the associated costs of protection and restoration should be considered.

Note: This is not an exhaustive list of examples.

Human Use Value

The value derived from human use includes direct uses that may be consumptive (e.g. water supplies for agriculture, industry, and municipalities) or non-consumptive (e.g. fishing, swimming, boating, human health) and indirect uses (e.g. property values, fishing equipment manufacturer).

Estimating Human Use Value

Although more data sources exist on the value that derives from human use, estimates can be difficult to make because of their widespread and diffuse nature. Nevertheless, these values should be taken into account when weighing the environmental cost. Again, if estimates prove too difficult to make during the initial review, then the potential value for human use should be noted in the antidegradation review for possible comment during public notice and intergovernmental coordination. For example, if the proposed activity will likely have an impact on local sport fishing but the precise value of that fishery is unknown, then the antidegradation review should note this potential impact and whatever metrics are available (e.g. number of angler hours in impacted stream).

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Analysis of Socioeconomic Benefits and Environmental Costs, Continued

Information Requirements

If DEQ does not have sufficient information to make a preliminary recommendation regarding the socioeconomic benefits and environmental costs, then DEQ may require that the applicant submit more specific information. The type of information required of the applicant will vary from case to case, but might include:

- a) information pertaining to current aquatic life, recreational, or other waterbody uses;
- b) information necessary to determine the environmental impacts that may result from the proposed activity;
- c) facts pertaining to the current state of economic development in the area (e.g. population, area employment, area income, major employers, types of businesses);
- d) government fiscal base; and
- e) land use in the areas surrounding the proposed activity.

A list of categories for listing information on environmental costs is presented below. This information will be made available during the public review and intergovernmental coordination phase of the antidegradation review.

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Analysis of Socioeconomic Benefits and Environmental Costs, Continued

Categories of Benefits for Assessing Environmental Costs

Use Benefits

Direct

Consumptive: *Market Benefits*

Industrial Water Supply

Agricultural Water Supply

Municipal Water Supply

Commercial Fishing

Consumptive: *Non-Market Benefits*

Recreational Fishing

Hunting

Industrial Water Supply

Agricultural Water Supply

Municipal Water Supply

Non-Consumptive:

Swimming

Boating

Human Health

Indirect

Fishing Equipment Manufacturer

Property Values

Aesthetics (scenic views, water enhanced recreation)

Intrinsic Benefits

Option Value (access to resource in future)

Existence Value (knowledge that services

Preliminary Decision/Recommendation on Approval/Denial by DEQ

Preliminary Decision Issued

After considering which level of protection applies to the waterbody (based on the waterbody's classification), whether the activity will likely cause a lowering of water quality, and whether the discharger/applicant/source has demonstrated the necessary justification (e.g. consideration of alternatives, socioeconomic benefits compared to environmental costs), the Department will issue a preliminary decision/recommendation on whether to allow or deny the proposed permit or certificate. This decision/recommendation will be noted prior to the intergovernmental coordination and public notice phases of the antidegradation review. This decision/recommendation is preliminary and can be reversed once intergovernmental coordination and public comments are considered.

Intergovernmental and Public Review of Preliminary Decision

Intergovernmental Coordination

The Department will provide intergovernmental coordination of all preliminarily approved antidegradation reviews in compliance with OAR 340-018-0010. In addition to the general public notice requirements specified below, the Department will make a reasonable attempt to identify state and local governments, federal agencies, and Native American tribes that would likely be affected or interested in the waterbody or action under review. The preliminary antidegradation decision/recommendation should be made available to these governmental entities, which will be given a reasonable opportunity to provide comments to DEQ.

General Public Notice

The public must also have an opportunity to comment on the proposed activity and the preliminary decision/recommendation by the Department. Existing public involvement processes (e.g. those for issuing waste water discharge permits) may be used to provide this opportunity. The antidegradation review findings will be subjected to public review (the logical timing for this would be during public comment on the permit itself, thus the antidegradation review sheet should be included in the staff report for the permit). The content of the public notice will be as specified in OAR 340-011-0007 for activities that require a permit and as a general notice for all other activities. The public notice will contain at a minimum: 1) a substantive outline of the antidegradation review including the preliminary decision/recommendation; 2) a request for public input on particular aspects of the antidegradation review that might be improved based on public input; 3) notice that the antidegradation review sheet is available for review; 4) notice of any introductory public information available on Oregon's antidegradation policy; and 5) the formal reference to Oregon's antidegradation policy. The public will be provided a reasonable opportunity for written and/or oral comment.

Final Decision to Allow/Deny Activity

**EQC/DEQ
Final Decision**

Once the intergovernmental and public comment have been considered, DEQ or the EQC will issue a final decision on whether to allow or deny the proposed activity.

Appendix A: OAR 340-041-0026

Policies and Guidelines Generally Applicable to All Basins

(1) In order to maintain the quality of waters in the State of Oregon, the following is the general policy of the EQC:

(a) Antidegradation Policy for Surface Waters. The purpose of the Antidegradation Policy is to guide decisions that affect water quality such that unnecessary degradation from point and non-point sources of pollution is prevented, and to protect, maintain, and enhance existing surface water quality to protect all existing beneficial uses. The standards and policies set forth in OAR 340-041-0120 through 340-041-0962 are intended to implement the Antidegradation Policy;

(A) High Quality Waters Policy: Where existing water quality meets or exceeds those levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, and other designated beneficial uses, that level of water quality shall be maintained and protected. The Environmental Quality Commission, after full satisfaction of the intergovernmental coordination and public participation provisions of the continuing planning process, and with full consideration of sections (2), (3) and (5) of this rule, however, may allow a lowering of water quality in these high quality waters if they find:

- (i) No other reasonable *alternatives* exist except to lower water quality; and
- (ii) The action is necessary and justifiable for *economic or social development* benefits and outweighs the environmental costs of lowered water quality; and
- (iii) All *water quality standards* will be met and *beneficial uses* protected.

(B) The Director or a designee may allow lower water quality on a *short term basis* in order to respond to *emergencies* or to otherwise protect public health and welfare;

(C) Water Quality Limited Waters Policy: For water quality limited waterbodies, the water quality shall be managed as described in section (3) of this rule;

(D) Outstanding Resource Waters Policy: Where existing high quality waters constitute an outstanding state or national resource such as those waters designated as extraordinary resource waters, or as critical habitat areas, the existing water quality and water quality values shall be maintained and protected, and classified as “Outstanding Resource Waters of Oregon”. The Commission may specially designate high quality waterbodies to be classified as Outstanding Resource Waters in order to protect the water quality parameters that affect ecological integrity of critical habitat or special water quality values that are vital to the unique character of those waterbodies. The Department will develop a screening process and establish a list of nominated waterbodies for Outstanding Resource Waters designation in the Biennial Water Quality Status Assessment Report (305(b) Report). The priority waterbodies for nomination include:

- (i) National Parks;
- (ii) National Wild and Scenic Rivers;
- (iii) National Wildlife Refuges;
- (iv) State Parks; and
- (v) State Scenic Waterways.

- (E) The Department will bring to the Commission a *list of waterbodies* which are proposed for designation as Outstanding Resource Waters at the time of each Triennial Water Quality Standards Review;
 - (F) In designating Outstanding Resource Waters, the Commission shall establish the *water quality values to be protected* and provide a process for determining what activities are allowed that would not affect the outstanding resource values. After the designation, the Commission shall not allow activities that may lower water quality below the level established except on a short term basis to respond to emergencies or to otherwise protect human health and welfare.
- (b) Point source discharges shall follow policies and guidelines in sections (2), (5) and (6) of this rule, and non-point source activities shall follow guidelines in sections (7), (8), (9), (10), and (11) of this rule.
- (2) In order to maintain the quality of waters in the State of Oregon, it is the general policy of the EQC to require that *growth and development* be accommodated by *increased efficiency and effectiveness of waste treatment* and control such that measurable future discharged waste loads from existing sources do not exceed presently allowed discharged loads except as provided in section (3) of this rule.
- (3) The Commission or Department may grant exceptions to sections (2) and (6) of this rule and approvals to section (5) of this rule for major dischargers and other dischargers, respectively. Major dischargers include those industrial and domestic sources that are classified as major sources for permit fee purposes in OAR 340-045-0075(2).
- (a) In allowing new or increased discharged loads, the Commission or Department shall make the following findings:
- (A) The new or increased discharged load would not cause *water quality standards* to be violated;
 - (B) The new or increased discharged load would not unacceptably threaten or impair any *recognized beneficial uses*. In making this determination, the Commission or Department may rely upon the presumption that if the numeric criteria established to protect specific uses are met the beneficial uses they were designed to protect are protected. In making this determination the Commission or Department may also evaluate other state and federal agency data that would provide information on potential impacts to beneficial uses for which the numeric criteria have not been set;
 - (C) The new or increased discharged load shall not be granted if the receiving stream is classified as being *water quality limited* under OAR 340-041-0006(30)(a), unless:
 - (i) The pollutant parameters associated with the proposed discharge are unrelated either directly or indirectly to the parameter(s) causing the receiving stream to violate water quality standards and being designated water quality limited; or
 - (ii) Total maximum daily loads (TMDLs), waste load allocations (WLAs) load allocations (LAs), and the reserve capacity have been established for the water quality limited receiving stream; and compliance plans under which enforcement action can be taken have been established; and there will be sufficient reserve capacity to assimilate the increased load under the established TMDL at the time of discharge; or
 - (iii) Effective July 1, 1996, in waterbodies designated water-quality limited for dissolved oxygen, when establishing WLAs under a TMDL for waterbodies meeting the conditions defined in this rule, the Department may at its discretion

provide an allowance for WLAs calculated to result in no measurable reduction of dissolved oxygen. For this purpose, “no measurable reduction” is defined as no more than 0.10 mg/L for a single source and no more than 0.20 mg/L for all anthropogenic activities that influence the water quality limited segment. The allowance applies for surface water DO criteria and for Intergravel DO if a determination is made that the conditions are natural. The allowance for WLAs would apply only to surface water 30-day and seven-day means, and the IGDO action level; or

- (iv) Under extraordinary circumstances to solve an existing, immediate, and critical environmental problem that the Commission or Department may consider a waste load increase for an existing source on a receiving stream designated water quality limited under OAR 340-041-0006(30)(a) during the period between the establishment of TMDLs, WLAs and LAs and their achievement based on the following conditions:
 - (I) That TMDLs, WLAs and LAs have been set; and
 - (II) That a compliance plan under which enforcement actions can be taken has been established and is being implemented on schedule; and
 - (III) That an evaluation of the requested increased load shows that this increment of load will not have an unacceptable temporary or permanent adverse effect on beneficial uses; and
 - (IV) That any waste load increase granted under subparagraph (iv) of this paragraph is temporary and does not extend beyond the TMDL compliance deadline established for the waterbody. If this action will result in a permanent load increase, the action has to comply with subparagraphs (i) or (ii) of this paragraph.
- (D) Effective July 1, 1996, in any waterbody identified by the Department as exceeding the relevant numeric temperature criteria specified for each individual water quality management basin identified in OAR 340-041-0205, OAR-340-041-0245, OAR-340-041-0285, OAR-340-041-0325, OAR-340-041-0365, OAR-340-041-0445, OAR-340-041-0485, OAR-340-041-0525, OAR-340-041-0565, OAR-340-041-0605, OAR-340-041-0645, OAR-340-041-0685, OAR-340-041-0725, OAR-340-041-0765, OAR-340-041-0805, OAR-340-041-0845, OAR-340-041-0885, OAR-340-041-0925, OAR-340-041-0965, and designated as water quality limited under Section 303(d) of the Clean Water Act, the following requirements shall apply to appropriate watersheds or stream segments in accordance with priorities established by the Department. The Department may determine that a plan is not necessary for a particular stream segment or segments within a water-quality limited basin based on the contribution of the segment(s) to the temperature problem:
 - (i) Anthropogenic sources are required to develop and implement a surface water temperature management plan which describes the best management practices, measures, and/or control technologies which will be used to reverse the warming trend of the basin, watershed, or stream segment identified as water quality limited for temperature;
 - (ii) Sources shall continue to maintain and improve, if necessary, the surface water temperature management plan in order to maintain the cooling trend until the numeric criterion is achieved or until the Department, in consultation with the

- Designated Management Agencies (DMAs), has determined that all feasible steps have been taken to meet the criterion and that the designated beneficial uses are not being adversely impacted. In this latter situation, the temperature achieved after all feasible steps have been taken will be the temperature criterion for the surface waters covered by the applicable management plan. The determination that all feasible steps have been taken will be based on, but not limited to, a site-specific balance of the following criteria: protection of beneficial uses; appropriateness to local conditions; use of best treatment technologies or management practices or measures; and cost of compliance;
- (iii) Once the numeric criterion is achieved or the Department has determined that all feasible steps have been taken, sources shall continue to implement the practices or measures described in the surface water temperature management plan in order to continually achieve the temperature criterion;
 - (iv) For point sources, the surface water temperature management plan will be part of their National Pollutant Discharge Elimination System Permit (NPDES);
 - (v) For non-point sources, the surface water temperature management plan will be developed by designated management agencies (DMAs) which will identify the appropriate BMPs or measures;
 - (vi) A source (including but not limited to permitted point sources, individual landowners and land managers) in compliance with the Department or DMA (as appropriate) approved surface water temperature management plan shall not be deemed to be causing or contributing to a violation of the numeric criterion if the surface water temperature exceeds the criterion;
 - (vii) In waters the Department determines to be critical for bull trout recovery, the goal of a bull trout surface water temperature management plan is to specifically protect those habitat ranges necessary to maintain the viability of existing stocks by restoring stream and riparian conditions or allowing them to revert to conditions attaining the coolest surface water temperatures possible under natural background conditions;
- (E) Waters of the state exceeding the temperature criteria will be identified in the Clean Water Act (CWA), Section 303(d) list developed by the Department according to the schedule required by the Clean Water Act. This list will be prioritized in consultation with the DMAs to identify the order in which those waters will be addressed by the Department and the DMAs;
- (F) In basins determined by the Department to be exceeding the numeric temperature criteria, and which are required to develop surface water temperature management plans, new or increased discharge loads from point sources which require an NPDES permit under Section 402 of the Clean Water Act or hydro-power projects which require certification under Section 401 of the Clean Water Act are allowed a 1.0°F total cumulative increase in surface water temperatures as the surface water temperature management plan is being developed and implemented for the water quality limited basin if:
- (i) In the best professional judgment of the Department, the new or increased discharge load, even with the resulting 1.0°F cumulative increase, will not conflict with or impair the ability of a surface water temperature management plan to achieve the numeric temperature criteria; and

- (ii) A new or expanding source must demonstrate that it fits within the 1.0°F increase and that its activities will not result in a measurable impact on beneficial uses. This latter showing must be made by demonstrating to the Department that the temperature change due to its activities will be less than or equal to 0.25°F under a conservative approach or by demonstrating the same to the EQC with appropriate modeling.
 - (G) Any source may petition the Department for an exception to paragraph (F) of this subsection, provided:
 - (i) The discharge will result in less than 1.0°F increase at the edge of the mixing zone, and subparagraph(ii) or (iii) of this paragraph applies;
 - (ii) The source provides the necessary scientific information to describe how the designated beneficial uses would not be adversely impacted; or
 - (iii) The source demonstrates that:
 - (I) It is implementing all reasonable management practices;
 - (II) Its activity will not significantly affect the beneficial uses; and
 - (III) The environmental cost of treating the parameter to the level necessary to assure full protection would outweigh the risk to the resource.
 - (H) Any source or DMA may petition the Commission for an exception to paragraph (F) of this subsection, provided:
 - (i) The source or DMA provides the necessary scientific information to describe how the designated beneficial uses would not be adversely impacted; or
 - (ii) The source or DMA demonstrates that:
 - (I) It is implementing all reasonable management practices;
 - (II) Its activity will not significantly affect the beneficial uses; and
 - (III) The environmental cost of treating the parameter to the level necessary to assure full protection would outweigh the risk to the resource.
 - (I) In waterbodies designated by the Department as water-quality limited for bacteria, and in accordance with priorities established by the Department, development and implementation of a bacteria management plan shall be required of those sources that the Department determines to be contributing to the problem. The Department may determine that a plan is not necessary for a particular stream segment or segments within a water-quality limited basin based on the contribution of the segment(s) to the problem. The bacteria management plans will identify the technologies, BMPs and/or measures and approaches to be implemented by point and non-point sources to limit bacterial contamination. For point sources, their National Pollutant Discharge Elimination System permit is their bacteria management plan. For non-point sources, the bacteria management plan will be developed by designated management agencies (DMAs) which will identify the appropriate BMPs or measures and approaches.
 - (J) The activity, expansion, or growth necessitating a new or increased discharge load is consistent with the acknowledged local land use plans as evidenced by a statement of land use compatibility from the appropriate local planning agency.
- (b) Oregon's water quality management policies and programs recognize that Oregon's water bodies have a finite capacity to assimilate waste. Unused assimilative capacity is an exceedingly valuable resource that enhances in-stream values specifically, and environmental quality generally. Allocation of any unused assimilative capacity should be based on explicit

criteria. In addition to the conditions in subsection (a) of this section, the Commission or Department shall consider the following:

- (A) Environmental Effects Criteria:**
 - (i) Adverse Out-of-Stream Effects.** There may be instances where the non-discharge or limited discharge alternatives may cause greater adverse environmental effects than the increased discharge alternative. An example may be the potential degradation of groundwater from land application of wastes;
 - (ii) Instream Effects.** Total stream loading may be reduced through elimination or reduction of other source discharges or through a reduction in seasonal discharge. A source that replaces other sources, accepts additional waste from less efficient treatment units or systems, or reduces discharge loading during periods of low stream flow may be permitted an increased discharge load year-round or during seasons of high flow, as appropriate;
 - (iii) Beneficial Effects.** Land application, upland wetlands application, or other non-discharge alternatives for appropriately treated wastewater may replenish groundwater levels and increase streamflow and assimilative capacity during otherwise low streamflow periods.
- (B) Economic Effects Criteria.** When assimilative capacity exists in a stream, and when it is judged that increased loading will not have significantly greater adverse environmental effects than other alternatives to increased discharge, the economic effect of increased loading will be considered. Economic effects will be of two general types:
 - (i) Value of Assimilative Capacity.** The assimilative capacity of Oregon's streams are finite, but the potential uses of this capacity are virtually unlimited. Thus it is important that priority be given to those beneficial uses that promise the greatest return (beneficial use) relative to the unused assimilative capacity that might be utilized. In-stream uses that will benefit from reserve assimilative capacity, as well as potential future beneficial use, will be weighed against the economic benefit associated with increased loading;
 - (ii) Cost of Treatment Technology.** The cost of improved treatment technology, non-discharge and limited discharge alternatives shall be evaluated.
- (4) (a)** A receiving stream shall be designated as water quality limited through the biennial water quality status assessment report prepared to meet the requirements of Section 305(b) of the Water Quality Act. Appendix A of the Status Assessment report shall identify: what waterbodies are water quality limited, the time of year the water quality standards violations occur, the segment of stream or area of waterbody limited, the parameter(s) of concern, whether it is water quality limited under OAR 340-041-0006(30)(a), (b) or (c). Appendix B and C of the Status Assessment report shall identify the specific evaluation process for designating waterbodies limited;
- (b)** The WQL list contained in Appendix A of the Status Assessment report shall be placed on public notice and reviewed through the public hearing process. At the conclusion of the hearing process and the evaluation of the testimony received, Appendix A will become the official water quality limited list. The Department may add a waterbody to the water quality limited list between status assessment reports after placing that action out on public notice and conducting a public hearing;
- (c)** For interstate waterbodies, the state shall be responsible for completing the requirements of section (3) of this rule for that portion of the interstate waterbody within the boundary of the state;

- (d) For waterbodies designated WQL under OAR 340-041-0006(30)(c), the Department shall establish a priority list and schedule for future water quality monitoring activities to determine: if the waterbody should be designated WQL under OAR 340-041-0006(30)(a) or (b), if estimated TMDLs need to be prepared, and if an implementation plan needs to be developed and implemented;
 - (e) For waterbodies designated WQL under OAR 340-041-0006(30)(b), requests for load increases shall be considered following subsection (3)(b) of this rule.
 - (5) For any new waste sources, alternatives which utilize reuse or disposal with no discharge to public waters shall be given highest priority for use wherever practicable. New source discharges may be approved subject to the criteria in section (3) of this rule.
 - (6) No discharges of wastes to lakes or reservoirs shall be allowed except as provided in section (3) of this rule.
 - (7) Log handling in public waters shall conform to current EQC policies and guidelines.
 - (8) Sand and gravel removal operations shall be conducted pursuant to a permit from the Division of State Lands and separated from the active flowing stream by a watertight berm wherever physically practicable. Recirculation and reuse of process water shall be required wherever practicable. Discharges, when allowed, or seepage or leakage losses to public waters shall not cause a violation of water quality standards or adversely affect legitimate beneficial uses.
 - (9) Logging and forest management activities shall be conducted in accordance with the Oregon Forest Practices Act so as to minimize adverse effects on water quality.
 - (10) Road building and maintenance activities shall be conducted in a manner so as to keep waste materials out of public waters and minimize erosion of cut banks, fills, and road surfaces.
 - (11) In order to improve controls over nonpoint sources of pollution, federal, state, and local resource management agencies will be encouraged and assisted to coordinate planning and implementation of programs to regulate or control runoff, erosion, turbidity, stream temperature, stream flow, and the withdrawal and use of irrigation water on a basin-wide approach so as to protect the quality and beneficial uses of water and related resources. Such programs may include, but not be limited to, the following:
 - (a) Development of projects for storage and release of suitable quality waters to augment low stream flow;
 - (b) Urban runoff control to reduce erosion;
 - (c) Possible modification of irrigation practices to reduce or minimize adverse impacts from irrigation return flows;
 - (d) Stream bank erosion reduction projects.
-

Appendix B: Antidegradation Review Sheet

ANTIDEGRADATION REVIEW SHEET FOR A PROPOSED INDIVIDUAL NPDES DISCHARGE

1. What is the name of Surface Water that receives the discharge? _____

Briefly describe the proposed activity:

Is this review for a renewal OR new (circle one) permit application?
Go to Step 2.

2. Is this surface water an **Outstanding Resource Water** or **upstream** from an **Outstanding Resource Water**?

Yes. Go to Step 5.

No. Go to Step 3.

3. Is this surface water a **High Quality Water**?

Yes. Go to Step 8.

No. Go to Step 4.

4. Is this surface water a **Water Quality Limited Water**?

Yes. Go to Step 12.

No. Go to Step 2. Note: The surface water must fall into one of three (3) categories: Outstanding Resource Water (Step 2), High Quality Water (Step 3), or Water Quality Limited Water (Step 4).

5. Will the proposed activity result in a permanent new or expanded source of pollutants directly to or affecting the **Outstanding Resource Water**?

Yes. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

No. Please provide basis for conclusion. Go to Step 6.

6. Will the proposed activity result in a lowering of water quality in the **Outstanding Resource Water**?

Yes. Please provide basis for conclusion. Go to Step 7.

No. Please provide basis for conclusion. Go to Step 8.

7. If the proposed activity results in a non-permanent new or expanded source of pollutants directly to or affecting an **Outstanding Resource Water**, will the lowering of water quality in the **Outstanding Resource Water** be on a short-term basis in response to an emergency or to protect human health and welfare?
- Yes. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 24.
- No. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
-
8. Will the proposed activity result in a Lowering of Water Quality?
- Yes. Go to Step 9.
- No. Proceed with Permit Application. Applicant should provide basis for conclusion. Go to Step 24.
9. OAR 340-041-0026(1)(a)(A)(iii) of the *High Quality Waters Policy* requires that the Department evaluate the application to determine all water quality standards will be met and beneficial uses protected after allowing discharge to **High Quality Waters**. Will all water quality standards be met and beneficial uses protected?
- Yes. Please provide basis for conclusion. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 10.
- No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
10. OAR 340-041-0026(1)(a)(A)(i) of the *High Quality Waters Policy* requires that the Department evaluate the application to determine if no other reasonable alternatives exist except to discharge to **High Quality Waters**. Were any of the alternatives (at a minimum, the following list must be considered) feasible?
- Improved operation and maintenance of existing treatment system
 - Recycling or reuse with no discharge
 - Discharge to on-site system
 - Seasonal or controlled discharges to avoid critical water quality periods
 - Discharge to sanitary sewer
 - Land application
- Yes. Please provide basis for conclusion (see below for information requirements). Recommend Preliminary Decision that applicant use alternative. Go to Step 8.
- No. Please provide basis for conclusion (see below for information requirements). Go to Step 11.

In a separate statement to this application, please explain the *technical feasibility* of the alternative, explain the *economic feasibility* of the alternative, and provide an *estimated cost* of NPDES permit alternative for a five-year period from start-up.

11. OAR 340-041-0026(1)(a)(A)(ii) of the *High Quality Waters Policy* requires that the Department evaluate the application to determine if there are social and economic benefits that outweigh the environmental costs of allowing discharge to High Quality Waters. Do the social and economic benefits outweigh the environmental costs of lowering the water quality?
- Yes. Please provide basis for conclusion (see below for information requirements).
Go to Step 24.
- No. Please provide basis for conclusion (see below for information requirements).
Go to Step 12.

The basis for conclusion should include a discussion of whether the lowering of water quality is necessary and important. “Necessary” means that the same social and economic benefits cannot be achieved with some other approach. “Important” means that the value of the social and economic benefits due to lowering water quality is greater than the environmental costs of lowering water quality. Benefits can be created from measures such as:

- Creating or expanding employment (provide current/expected number of employees, type & relative amount of each type)
- Increasing median family income
- Increasing community tax base (provide current/expected annual sales, tax info)
- Providing necessary social services
- Enhancing environmental attributes

and Environmental Costs can include:

- Losing assimilative capacity otherwise used for other industries/development
- Impacting fishing, recreation, and tourism industries negatively
- Impacting health protection negatively
- Impacting societal value for environmental quality negatively

12. Will the lowering of water quality in the **High Quality Water** be on a short-term basis in response to an emergency or to protect human health and welfare?
- Yes. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 24.
- No. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

-
13. Will the proposed activity result in a Lowering of Water Quality in the **Water Quality Limited Water**?
- Yes. Go to Step 14.
- No. Proceed with Permit Application. Applicant should provide basis for conclusion. Go to Step 24.

14. OAR 340-041-0026(3)(a)(A) of the *Water Quality Limited Waters Policy* requires that the Department evaluate the application to determine that all water quality standards will be met. Will all water quality standards be met?

- Yes. Please provide basis for conclusion. Go to Step 15.
- No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
15. OAR 340-041-0026(3)(a)(B) of the *Water Quality Limited Waters Policy* requires that the Department evaluate the application to determine that all beneficial uses will be met. Will all beneficial uses be met?
- Yes. Please provide basis for conclusion. Go to Step 16.
- No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
16. OAR 340-041-0026(3)(a)(C)(i-iv) of the *Water Quality Limited Waters Policy* requires that the Department evaluate the application for one of the following: Will the discharge be associated (directly or indirectly) with the pollution parameter(s) causing the waterbody to be designated a Water Quality Limited Water?
- Yes. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
- No. Please provide basis for conclusion. Go to Step 17.
- Have TMDLs, WLAs, LAs, and reserve capacity been established, compliance plans been established, and is there sufficient reserve capacity to assimilate the increased load under the established TMDL?
- Yes. Please provide basis for conclusion. Go to Step 17.
- No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
- Will the proposed activity meet the requirements, as specified under OAR 340-041-0026(1)(C)(3)(a)(C)(iii) of the *Water Quality Limited Waters Policy*, for dissolved oxygen?
- Yes. Please provide basis for conclusion. Go to Step 17.
- No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
- Will the activity solve an existing, immediate, and critical environmental problem?
- Yes. Please provide basis for conclusion. Go to Step 17.
- No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
17. Is the water body water quality limited for temperature?
- Yes. Go to Step 18.
- No. Go to Step 19.

18. Will the proposed activity meet the requirements for waterbodies water-quality limited for temperature as specified under OAR 340-041-0026(3)(a)(D-H) of the *Water Quality Limited Waters Policy*?
- Yes. Please provide basis for conclusion. Go to Step 19.
- No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
19. Is the water body water quality limited for bacteria?
- Yes. Go to Step 20.
- No. Go to Step 21.
20. Will the proposed activity meet the requirements for waterbodies designated water-quality limited for bacteria as specified under OAR 340-041-0026(3)(a)(I) of the *Water Quality Limited Waters Policy*?
- Yes. Please provide basis for conclusion. Go to Step 21.
- No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
21. Is the proposed activity consistent with local land use plans?
- Yes. Go to Step 22.
- No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
22. OAR 340-041-0026(3)(b)(A) of the *Water Quality Limited Waters Policy* requires the Department to consider alternatives to lowering water quality. Were any of the alternatives (at a minimum, the following list must be considered) feasible?
- Improved operation and maintenance of existing treatment system
 - Recycling or reuse with no discharge
 - Discharge to on-site system
 - Seasonal or controlled discharges to avoid critical water quality periods
 - Discharge to sanitary sewer
 - Land application
- Yes. Please provide basis for conclusion (see below for information requirements). Recommend Preliminary Decision that applicant use alternative. Go to Step 13.
- No. Please provide basis for conclusion (see below for information requirements). Go to Step 23.

In a separate statement to this application, please explain the *technical feasibility* of the alternative, explain the *economic feasibility* of the alternative, and provide an *estimated cost* of NPDES permit alternative for a five-year period from start-up.

23. OAR 340-041-0026(3)(b)(B) of the *Water Quality Limited Waters Policy* requires the Department to consider the economic effects of the proposed activity, which in this context consists of determining if the social and economic benefits of the activity outweigh the environmental costs of allowing a lowering of water quality. Do the social and economic benefits outweigh the environmental costs of lowering the water quality?

Yes. Please provide basis for conclusion. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 24.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

The basis for conclusion should include a discussion of whether the lowering of water quality is necessary and important. “Necessary” means that the same social and economic benefits cannot be achieved with some other approach. “Important” means that the value of the social and economic benefits due to lowering water quality is greater than the environmental costs of lowering water quality. Benefits can be created from measures such as:

- Creating or expanding employment (provide current/expected number of employees, type & relative amount of each type)
- Increasing median family income
- Increasing community tax base (provide current/expected annual sales, tax info)
- Providing necessary social services
- Enhancing environmental attributes

and Environmental Costs can include:

- Losing assimilative capacity otherwise used for other industries/development
 - Impacting fishing, recreation, and tourism industries negatively
 - Impacting health protection negatively
 - Impacting societal value for environmental quality negatively
-

24. On the basis of the Antidegradation Review, the following is recommended:
_____ Proceed with Application to Interagency Coordination and Public Comment Phase.
_____ Deny Application; return to applicant and provide public notice.

Action Approved

Section: _____

Review Prepared By: _____

Phone: _____

Date Prepared: _____

Please provide the following information and submit with the completed application form to:
Department of Environmental Quality
Water Quality Division—Surface Water Management
811 SW Sixth Avenue
Portland, Oregon 97204-1390

Name: _____

Name of Company: _____

Address: _____

Phone: _____

Fax: _____

Appendix C: Socioeconomic Benefits Worksheets for Public Sector Developments

Instructions: Fill in the blanks with the appropriate information. For these calculations, the term “Proposed Project” refers to the discharger/applicant/source’s proposed activity that will affect water quality; the term “Alternative Project” refers to one or more technically feasible alternative(s) to the Proposed Project in which either there will be no degradation of water quality or less degradation than the Proposed Project.

The following worksheets are provided:

- C.1. Public Sector Pollution Control Calculation of Total Annualized Project Costs
- C.2. Calculation of Total Annual Pollution Control Costs Per Household
- C.3. Municipal Preliminary Screener
- C.4. Data Used in Secondary Test for Public Sector Project
- C.5. Calculating The Secondary Score

C.1 Public Sector Pollution Control Calculation of Total Annualized Project Costs

A. Capital Costs of Proposed Project

Capital Cost of Project	\$		
Other One-Time Costs of Project (Please List, if any):			
Total Capital Costs (Sum column)	\$		(1)
Portion of Capital Costs to be Paid for with Grant Monies	\$		(2)
Capital Costs to be Financed [Calculate: (1) - (2)]	\$		(3)
Type of financing (e.g., G.O. bond, revenue bond, bank loan)			
Interest Rate for Financing (expressed as decimal)			(i)
Time Period of Financing (in years)			(n)
Annualization Factor = (or see Interest Rate spreadsheet)			(4)
		$\frac{(i)}{(1 + i)^n - 1}$	
Annualized Capital Cost of Proposed Project [Calculate: (3) x (4)]			(5)

B. Operating and Maintenance Costs of Proposed Project

Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below)			
Total Annual O & M Costs (Sum column)	\$		(6)

C.1 Public Sector Pollution Control Calculation of Total Annualized Project Costs (con't)

C. Total Annual Cost of Proposed Pollution Control Project

Total Annual Cost of Pollution Control Project [(5) + (6)] \$ (7)

D. Capital Costs of Alternative Project

Capital Cost of Project \$ _____
 Other One-Time Costs of Project (Please List, if any):

 \$ _____

 \$ _____

Total Capital Costs (Sum column) \$ _____ (8)

Portion of Capital Costs to be Paid for with Grant Monies \$ _____ (9)

Capital Costs to be Financed [Calculate: (8) - (9)] \$ _____ (10)

Type of financing (e.g., G.O. bond, revenue bond, bank loan) _____

Interest Rate for Financing (expressed as decimal) _____ (i)

Time Period of Financing (in years) _____ (n)

Annualization Factor = $\frac{i}{(1 + i)^n - 1}$ _____ (11)
 (or see Interest Rate spreadsheet)

Annualized Capital Cost of Alternative Project (12)
[Calculate: (10) x (11)]

E. Operating and Maintenance Costs of Alternative Project

Annual Costs of Operation and Maintenance (including but not limited to: monitoring, inspection, permitting fees, waste disposal charges, repair, administration and replacement.) (Please list below)

 \$ _____

 \$ _____

 \$ _____

Total Annual O & M Costs (Sum column) \$ _____ (13)

F. Total Annual Cost of Alternative Pollution Control Project

Total Annual Cost of Pollution Control Project [(12) + (13)] \$ (14)

(based on Worksheet P from EPA's "Economic Guidance for Water Quality Standards Workbook"; <http://www.epa.gov/ost/econ/>)

C.2. Calculation of Total Annual Pollution Control Costs Per Household

A. Current Pollution Control Costs (for renewals):

Total Annual Cost of Existing Pollution Control	\$ _____	(1)
Amount of Existing Costs Paid By Households	\$ _____	(2)
Percent of Existing Costs Paid By Households [Calculate: ((2)/(1))x100]	% _____	(3)
Number of Households*	_____	(4)
Annual Cost Per Household [Calculate: (2)/(4)]	\$ _____	(5)

* Do not use number of hook-ups.

B. Pollution Control Costs of Proposed Project

Are households expected to provide revenues for the new pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

- | | | |
|---|-------|--------|
| a) Yes [fill in percent from (3)] | _____ | % (6a) |
| b) No, they are expected to pay | _____ | % (6b) |
| c) No, they are expected to pay based on flow.
(Continue on Worksheet Q, Option A) | _____ | |

Total Annual Cost of Pollution Control Project [Line (7), Worksheet P]	\$ _____	(7)
Proportion of Costs Households are Expected to Pay [6(a) or 6(b)]	_____	(8)
Amount to be Paid by Households [Calculate: (7) x (8)]	\$ _____	(9)
Annual Cost per Household [Calculate: (9)/(4)]	\$ _____	(10)

C. Total Annual Pollution Control Cost Per Household of Proposed Project

Total Annual Cost of Pollution Control per Household [Calculate: (5) + (10)]	\$ _____	(11)
--	----------	------

D. Pollution Control Costs of Alternative Project

Are households expected to provide revenues for the alternative pollution control project in the same proportion that they support existing pollution control? (Check a, b or c and continue as directed.)

- | | | |
|--|-------|---------|
| a) Yes [fill in percent from (3)] | _____ | % (12a) |
| b) No, they are expected to pay | _____ | % (12b) |
| c) No, they are expected to pay based on flow.
(Continue on Option B below) | _____ | |

C.2. Calculation of Total Annual Pollution Control Costs Per Household (con't).

Total Annual Cost of Alternative Pollution Control Project [Worksheet P, (14)]	\$ _____	(13)
Proportion of Costs Households are Expected to Pay [12(a) or 12(b)]	_____	(14)
Amount to be Paid by Households [Calculate: (13) x (14)]	\$ _____	(15)
Annual Cost per Household [Calculate: (15)/(4)]	\$ _____	(16)

E. Total Alternative Annual Pollution Control Cost Per Household

Total Annual Cost of Pollution Control per Household [Calculate: (5) + (17)]	\$ _____	(17)
--	----------	------

F. Comparison of Proposed and Alternative Pollution Control Cost Per Household

Difference between Proposed and Alternative Pollution Control Cost Per Household [Calculate: (11) - (17)]		(18)
If (18) is < 0, then Alternative is more expensive. Go to Secondary Cost Estimates		
If (18) is > 0, then Alternative is less expensive. Recommend Alternative.		

Option A

G. Calculating Proposed Project Costs Incurred by Households Based on Flow

Expected Total Usage of Project (e.g. MGD for Wastewater Treatment)		(19)
Usage due to Household Use (MGD of Household Wastewater)	\$ _____	(20)
Percent of Usage due to Household Use [Calculate ((20)/(21)) x 100]	% _____	(21)
Total Annual Cost of Proposed Pollution Control Project	\$ _____	(22)
Industrial Surcharges, if any	\$ _____	(23)
Costs to be Allocated [Calculate: (22) - (23)]	\$ _____	(24)
Amount to be Paid by Households [Calculate: (21) x (24)]	\$ _____	(25)
Annual Project Cost per Household [Calculate: (25)/(4)]	\$ _____	(26)

H. Total Annual Pollution Control Cost Per Household

Total Annual Cost of Proposed Pollution Control Per Household [Calculate: (5) + (26)]	\$ 	(27)
---	--	------

Option B

I. Calculating Alternative Project Costs Incurred by Households Based on Flow

Expected Total Usage of Project (e.g. MGD for Wastewater Treatment)	_____	(28)
---	-------	------

C.2. Calculation of Total Annual Pollution Control Costs Per Household (con't).

Usage due to Household Use (MGD of Household Wastewater)	\$	_____	(29)
Percent of Usage due to Household Use [Calculate: ((29)/(28)) x 100]	%	_____	(30)
Total Annual Cost of Alternative Pollution Control Project	\$	_____	(31)
Industrial Surcharges, if any	\$	_____	(32)
Costs to be Allocated [Calculate: (22) - (23)]	\$	_____	(33)
Amount to be Paid by Households [Calculate: (21) x (24)]	\$	_____	(34)
Annual Project Cost per Household [Calculate: (25)/(4)]	\$	_____	(35)

**J. Total Annual Pollution Control Cost
Per Household**

Total Annual Cost of Alternative Pollution Control Per Household [Calculate: (5) + (35)]	\$	<input style="width: 100px; height: 20px;" type="text"/>	(36)
---	----	--	------

(based on Worksheet Q from EPA's "Economic Guidance for Water Quality Standards Workbook";
<http://www.epa.gov/ost/econ/>)

Appendix D: Example of Applying Antidegradation Review

Example of Applying Antidegradation Review to Water Quality Limited Water.

City S notified DEQ in 1986 of deficiencies in its new wastewater facilities. City S and DEQ entered into a Stipulation and Final Order in January 1993 with a compliance schedule to address these problems, including a Facility Plan that determined that the existing wastewater treatment plant needed to be expanded and upgraded to address the problems. One of the major problems was that ammonia and chlorine levels were well above the acute toxicity criteria during low flow times. City S proposed (and DEQ accepted) a plan for a major plant upgrade that would eliminate discharges of chlorine, comply with ammonia limits, and would discharge a portion of the summer flow to a series of wetlands that had been constructed at the new Statename Garden site.

The treatment plant had discharged its effluent to S Creek, which is in the Molalla/Pudding Subbasin of the Willamette River Basin. S Creek was listed on the 1998 303(d) list as being water quality limited for temperature. It was not listed as water quality limited for dissolved oxygen. Table 1 presents a comparison between current and future discharges of the major pollutants during the summer low flow period.

TABLE 1 – SUMMER

1998 Discharges Versus Expected Discharges Over Design Life

Pollutant	Actual Discharge 1998	Average Projected Discharge in 2005	Average Projected Discharge in 2015
BOD ₅	53 #/day	48 #/day	77 #/day
TSS	43 #/day	48 #/day	77 #/day
Ammonia (see note 1)	10.7 mg/l	1.5 mg/l	1.5 mg/l
Chlorine (see note 2)	180 ppb	0 ppb	0 ppb

note 1 Without the Statename Gardens Project, the projected mass discharges of CBOD₅ and TSS to S Creek would be 69 pounds per day in 2005 and 103 pounds per day in 2015.

note 2 The acute toxicity level for chlorine is 19 ppb.

The Beneficial Uses listed for Willamette River tributaries (Table 6 at OAR 340-041-0442), which would apply to S Creek, include all uses except Commercial Navigation & Transportation.

Antidegradation Review. The following review is structured according to the proposed Antidegradation Review Sheet for NPDES permits. This proposed review consists of a series of questions that a permit writer would be required to answer based on information provided either by the applicant or by other sources.

ANTIDegradation Review Sheet

1. What is the name of Surface Water that receives the discharge?

S Creek in the Molalla/Pudding Subbasin of the Willamette River Basin

Briefly describe the proposed activity:

Sewage Treatment Plant will be upgraded to eliminate the discharge of chlorine and lower the discharge of ammonia. There will be an increase in the discharge of BOD5 and TSS.

Is this review for a renewal OR new (circle one) permit application?

Go to Step 2.

2. Is this surface water an **Outstanding Resource Water** or **upstream** from an **Outstanding Resource Water**?

Yes. Go to Step 5.

No. Go to Step 3.

3. Is this surface water a **High Quality Water**?

Yes. Go to Step 8.

No. Go to Step 4.

4. Is this surface water a **Water Quality Limited Water** (on the most current 303(d) list)?

Yes. Go to Step 12.

No. Go to Step 2. Note: The surface water must fall into one of three (3) categories: Outstanding Resource Water (Step 2), High Quality Water (Step 3), or Water Quality Limited Water (Step 4).

5. Will the proposed activity result in a permanent new or expanded source of pollutants directly to or affecting the **Outstanding Resource Water**?

Yes. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

No. Please provide basis for conclusion. Go to Step 6.

6. Will the proposed activity result in a lowering of water quality in the **Outstanding Resource Water**?

Yes. Please provide basis for conclusion. Go to Step 7.

No. Please provide basis for conclusion. Go to Step 8.

7. If the proposed activity results in a non-permanent new or expanded source of pollutants directly to or affecting an **Outstanding Resource Water**, will the lowering of water quality in the **Outstanding Resource Water** be on a short-term basis in response to an emergency or to protect human health and welfare?

Yes. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 24.

No. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

9. OAR 340-041-0026(1)(a)(A)(iii) of the *High Quality Waters Policy* requires that the Department evaluate the application to determine all water quality standards will be met and beneficial uses protected after allowing discharge to **High Quality Waters**. Will all water quality standards be met and beneficial uses protected?

Yes. Please provide basis for conclusion. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 10.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

10. OAR 340-041-0026(1)(a)(A)(i) of the *High Quality Waters Policy* requires that the Department evaluate the application to determine if no other reasonable alternatives exist except to discharge to **High Quality Waters**. Were any of the alternatives (at a minimum, the following list must be considered) feasible?

- Improved operation and maintenance of existing treatment system
- Recycling or reuse with no discharge
- Discharge to on-site system
- Seasonal or controlled discharges to avoid critical water quality periods
- Discharge to sanitary sewer
- Land application

Yes. Please provide basis for conclusion (see below for information requirements). Recommend Preliminary Decision that applicant use alternative. Go to Step 24.

No. Please provide basis for conclusion (see below for information requirements). Go to Step 11.

In a separate statement to this application, please explain the *technical feasibility* of the alternative, explain the *economic feasibility* of the alternative, and provide an *estimated cost* of NPDES permit alternative for a five-year period from start-up.

11. OAR 340-041-0026(1)(a)(A)(ii) of the *High Quality Waters Policy* requires that the Department evaluate the application to determine if there are social and economic benefits that outweigh the environmental costs of allowing discharge to High Quality Waters. Do the social and economic benefits outweigh the environmental costs of lowering the water quality?

Yes. Please provide basis for conclusion (see below for information requirements). Go to Step 24.

No. Please provide basis for conclusion (see below for information requirements). Go to Step 12.

The basis for conclusion should include a discussion of whether the lowering of water quality is necessary and important. "Necessary" means that the same social and economic benefits cannot be achieved with some other approach. "Important" means that the value of the social and economic benefits due to lowering water quality is greater than the environmental costs of lowering water quality. Benefits can be created from measures such as:

- Creating or expanding employment (provide current/expected number of employees, type & relative amount of each type)
- Increasing median family income
- Increasing community tax base (provide current/expected annual sales, tax info)
- Providing necessary social services
- Enhancing environmental attributes

and Environmental Costs can include:

- Losing assimilative capacity otherwise used for other industries/development
- Impacting fishing, recreation, and tourism industries negatively
- Impacting health protection negatively
- Impacting societal value for environmental quality negatively

12. Will the lowering of water quality in the **High Quality Water** be on a short-term basis in response to an emergency or to protect human health and welfare?
- Yes. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 24.
- No. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.
-

13. Will the proposed activity result in a Lowering of Water Quality in the **Water Quality Limited Water**?

Yes. Go to Step 14.

No. Proceed with Permit Application. Applicant should provide basis for conclusion. Go to Step 24.

14. OAR 340-041-0026(3)(a)(A) of the *Water Quality Limited Waters Policy* requires that the Department evaluate the application to determine that all water quality standards will be met. Will all water quality standards be met?

Yes. Please provide basis for conclusion. Go to Step 15.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

The proposed wasteloads have been evaluated. Dissolved oxygen is the only water quality standard of concern with the CBOD₅ and TSS wasteloads proposed. While there will be an increase in oxygen demand from the CBOD₅, the summer discharges are more than offset by the much lower ammonia discharges and the alternate discharge point at the Statename Gardens wetland. The projected summer discharges were evaluated, and will not cause water quality standard violations. For the winter discharges, the projected increases have been evaluated and will not cause water quality standard violations, due to the lower temperature and larger assimilative capacity in S Creek in the winter.

15. OAR 340-041-0026(3)(a)(B) of the *Water Quality Limited Waters Policy* requires that the Department evaluate the application to determine that all beneficial uses will be met. Will all beneficial uses be met?

Yes. Please provide basis for conclusion. Go to Step 16.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

As discussed in the rule, if a discharge meets the applicable instream water quality standards, then the Commission may consider that beneficial uses are protected. The proposed discharge will meet the dissolved oxygen instream water quality standards, and therefore will not impair any beneficial use.

16. OAR 340-041-0026(3)(a)(C)(i-iv) of the *Water Quality Limited Waters Policy* requires that the Department evaluate the application for one of the following: Will the discharge be associated (directly or indirectly) with the pollution parameter(s) causing the waterbody to be designated a Water Quality Limited Water?

Yes. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

No. Please provide basis for conclusion. Go to Step 17.

S Creek is not water quality limited for dissolved oxygen. There will be no increase in the temperature load.

Have TMDLs, WLAs, LAs, and reserve capacity been established, compliance plans been established, and is there sufficient reserve capacity to assimilate the increased load under the established TMDL?

Yes. Please provide basis for conclusion. Go to Step 17.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

Because only one of the four questions needs to be answered, this question is not addressed.

Will the proposed activity meet the requirements, as specified under OAR 340-041-0026(1)(C)(3)(a)(C)(iii) of the *Water Quality Limited Waters Policy*, for dissolved oxygen?

Yes. Please provide basis for conclusion. Go to Step 17.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

Because only one of the four questions needs to be answered, this question is not addressed.

Will the activity solve an existing, immediate, and critical environmental problem?

Yes. Please provide basis for conclusion. Go to Step 17.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

Because only one of the four questions needs to be answered, this question is not addressed.

17. Is the water body water quality limited for temperature?

Yes. Go to Step 18.

No. Go to Step 19.

18. Will the proposed activity meet the requirements for waterbodies water-quality limited for temperature as specified under OAR 340-041-0026(3)(a)(D-H) of the *Water Quality Limited Waters Policy*?

Yes. Please provide basis for conclusion. Go to Step 19.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

Because the activity will only affect dissolved oxygen, this question is not addressed.

19. Is the water body water quality limited for bacteria?

Yes. Go to Step 20.

No. Go to Step 21.

20. Will the proposed activity meet the requirements for waterbodies designated water-quality limited for bacteria as specified under OAR 340-041-0026(3)(a)(I) of the *Water Quality Limited Waters Policy*?

Yes. Please provide basis for conclusion. Go to Step 21.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

Because the activity will only affect dissolved oxygen, this question is not addressed.

21. Is the proposed activity consistent with local land use plans?

Yes. Go to Step 22.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

The activity in question is serving existing customers within the City S, and providing for additional growth in the area. The activity is consistent with the adopted and approved comprehensive plan for the City.

ANALYSIS OF ALTERNATIVES AND SOCIOECONOMIC & ENVIRONMENTAL BENEFITS/COSTS

22. OAR 340-041-0026(3)(b)(A) of the *Water Quality Limited Waters Policy* requires the Department to consider alternatives to lowering water quality. Were any of the alternatives (at a minimum, the following list must be considered) feasible?

- Improved operation and maintenance of existing treatment system
- Recycling or reuse with no discharge
- Discharge to on-site system
- Seasonal or controlled discharges to avoid critical water quality periods
- Discharge to sanitary sewer
- Land application

Yes. Please provide basis for conclusion (see below for information requirements).

Recommend Preliminary Decision that applicant use alternative. Go to Step 24.

No. Please provide basis for conclusion (see below for information requirements). Go to Step 23.

In a separate statement to this application, please explain the *technical feasibility* of the alternative, explain the *economic feasibility* of the alternative, and provide an *estimated cost* of NPDES permit alternative for a five-year period from start-up.

The following alternatives were considered:

- A. Year-round discharge to Pudding River. **Rejected** because of inconsistency with philosophy of avoiding creek discharge of treated effluents, and because of uncertainty about future total mass load limitations in the Pudding River. Estimated Cost: \$10.1 million.
- B. Store treated effluent on-site during the summer and then release it to S Creek or Pudding River in the winter. **Rejected** because of economic infeasibility. Estimated Cost: \$16.7 million to \$20.7 million.
- C. Summertime effluent use for irrigation (reuse level 2 or 3), wintertime discharge to either S Creek or the Pudding River. **Rejected** because superior option was available. Estimated cost: \$13.3 million to \$14.8 million.
- D. Summertime effluent use for irrigation (reuse level 4), wintertime discharge to either S Creek or the Pudding River. **Rejected** because superior option was available. Estimated cost: \$15.0 million to \$16.1 million.
- E. Summertime effluent to treatment wetlands followed by use as source water for constructed mitigation wetlands; wintertime discharge to either S Creek or the Pudding River. **Rejected** because lower cost option with same advantages available. Estimated cost: \$12.2 million to \$13.2 million.
- F. Summertime effluent to treatment wetlands followed by reuse; wintertime discharge to either S Creek or the Pudding River. **Rejected** because type of wetlands inconsistent with City goals. Estimated cost: no costs developed.
- G. Summertime effluent used as irrigation with runoff captured and sent to mitigation wetlands; wintertime discharge to either S Creek or the Pudding River. **Rejected** because lower cost and less complex option with same advantages available. Estimated cost: \$13.6 million to \$14.1 million.
- H. Summertime effluent and some wintertime effluent used as a source for constructed mitigation wetlands; wintertime discharge to either S Creek or the Pudding River. **Proposed Choice**. Estimated cost: \$10.2 million to \$11.4 million.

23. OAR 340-041-0026(3)(b)(B) of the *Water Quality Limited Waters Policy* requires the Department to consider the economic effects of the proposed activity, which in this context consists of determining if the social and economic benefits of the activity outweigh the environmental costs of allowing a lowering of water quality. Do the social and economic benefits outweigh the environmental costs of lowering the water quality?

Yes. Please provide basis for conclusion. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 24.

No. Please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 24.

The basis for conclusion should include a discussion of whether the lowering of water quality is necessary and important. "Necessary" means that the same social and economic benefits cannot be achieved with some other approach. "Important" means that the value of the social and economic benefits due to lowering water quality is greater than the environmental costs of lowering water quality. Benefits can be created from measures such as:

- Creating or expanding employment (provide current/expected number of employees, type & relative amount of each type)
- Increasing median family income
- Increasing community tax base (provide current/expected annual sales, tax info)
- Providing necessary social services
- Enhancing environmental attributes

and Environmental Costs can include:

- Losing assimilative capacity otherwise used for other industries/development
- Impacting fishing, recreation, and tourism industries negatively
- Impacting health protection negatively
- Impacting societal value for environmental quality negatively

The socioeconomic analysis requires that the lowering of water quality is "necessary" (no alternatives feasible) and "important" (will result in widespread benefits). The City S has considered a number of alternatives and has settled on a proposal to increase the mass load for the City S Sewage Treatment Plant (including summer discharge to Statename Gardens). In conducting an socioeconomic analysis (see attached spread sheet) of this alternative, the Municipal Preliminary Screener suggested that the financial burden of this alternative would have a mid-range impact on the community which indicated that further community economic health and financial impact tests should be conducted. The following information is recommended for calculating these Secondary Test scores: Bond Rating, Overall Net Debt per capita, Unemployment Comparison, Median Household Income Comparison, Property Tax Collection Rate. A bond rating was not available for City S; however, information was available on the other categories and this led to a Secondary Test score of 1.5. Combining this score with the Municipal Preliminary Screener in the Substantial Impacts Matrix (see attached spreadsheet) led to the conclusion that the impact of the financial burden of this alternative on City S would be unclear. This did not rule out that this alternative was financially feasible. Therefore, further qualitative and quantitative analyses were conducted on the alternative and its probable environmental cost was also assessed.

The City S Sewage Treatment Plant expansion will require an increase in employment at the plant from 2.75 operators to 3.75 operators at the initiation of by September 2000 and 4.75 operators by June 2001. As far as indirect employment effects, the Statename Gardens will require a staff of 19 employees through its official opening in about June 2001 and will eventually have 30-40 employees. Establishment of the Statename Gardens as a major tourist destination will require a number of ancillary services to be developed such as restaurants, hotels/motels, and other services, which will also increase employment opportunities.

At the time of this analysis, information on the expected impact of operations of the City S Sewage Treatment Plant on median household income could not be found. The City S community had a Median Household Income of \$22,644 (\$28,758 estimated for 2000) which is 17% below the State Median Household Income based on 1990 census data. The Sewage Treatment Plant operators get paid an average of about \$32,000 for 2000; therefore, the expansion of the Sewage Treatment Plant will result in the creation of 1 to 2 better-than-median income jobs. In addition, between 1990 and 1997, the population grew by 18.5% with the city becoming a bedroom community for Salem and other larger cities and towns. The development of the Statename Gardens should increase

this growth trend; however, it is not clear what the impact will be on overall community median income.

The continued growth of City S should increase the tax base for the community. In addition, housing prices tend to be about 25% more than for the same square footage in Salem. The development of the Statename Gardens should maintain these higher-than-average property values.

The Sewage Treatment Plant will be providing the Statename Gardens will all of its irrigation water (free of charge) and the development of the Statename Gardens is expected to enhance environmental attributes of the community by providing a 200+ acre "natural" setting that will counter urban sprawl.

The environmental costs of the increased BOD₅ are expected to be negligible because of the over-compensatory decrease in ammonia. The net effect will be a lower impact of the Sewage Treatment Plant on dissolved oxygen in S Creek, which should have positive effects on local fishing, recreation, and tourism. No detrimental effect on health protection is expected.

-
24. On the basis of the Antidegradation Review, the following is recommended:
 Proceed with Application to Interagency Coordination and Public Comment Phase.
 Deny Application; return to applicant and provide public notice.

Action Approved

Section: _____

Review Prepared By: _____

Phone: _____

Date Prepared: _____

Please provide the following information and submit with the completed application form to:

Department of Environmental Quality
Water Quality Division—Surface Water Management
811 SW Sixth Avenue
Portland, Oregon 97204-1390

Name: _____

Name of Company: _____

Address: _____

Phone: _____

Fax: _____

Appendix E: Socioeconomic Benefits Worksheets for Private Entity Development

Instructions: Fill in the blanks with the appropriate information. For these calculations, the terms “Proposed Project” and “Proposed Pollution Control Project” refer to the discharger/applicant/source’s proposed activity that will affect water quality; the term “Alternative Project” and “Alternative Pollution Control Project” refer to one or more technically feasible alternative(s) to the Proposed Project in which either there will be no degradation of water quality or less degradation than the Proposed Project.

The following worksheets are provided:

- E.1. Private Sector Pollution Control Calculation of Total Annualized Project Costs
- E.2. Calculation of Earnings Before Taxes
- E.3. Calculation of Profit Rates
- E.4. Calculation of Ratios

E.1. Private Sector Pollution Control Calculation of Total Annualized Project Costs

A. Capital Costs of Proposed Project

Capital Cost of Proposed Project to be Financed	\$ _____	(1)
Interest Rate for Financing (expressed as decimal)	_____	(i)
Time Period of Financing (in years)	_____	(n)
Annualization Factor = (or see Interest Rate spreadsheet)	_____	(2)

$$\frac{(i)}{(1 + i)^{10} - 1}$$

Annualized Capital Cost of Proposed Project
[Calculate: (1) x (2)] (3)

Annual Costs of Operation and Maintenance
(including but not limited to: monitoring, inspection,
permitting fees,
waste disposal charges, repair, administration and
replacement.) \$ _____ (4)

Total Annual Cost of Proposed Pollution Control Project [(3) + (4)] \$ (5)

B. Capital Costs of Alternative Project

Capital Cost of Alternative Project to be Financed	\$ _____	(6)
Interest Rate for Financing (expressed as decimal)	_____	(i)
Time Period of Financing (in years)	_____	(n)
Annualization Factor = (or see Interest Rate spreadsheet)	_____	(7)

$$\frac{(i)}{(1 + i)^{10} - 1}$$

Annualized Capital Cost of Alternative Project
[Calculate: (1) x (2)] (8)

Annual Costs of Operation and Maintenance
(including but not limited to: monitoring, inspection,
waste disposal charges, repair, administration and
replacement.) \$ _____ (9)

permitting fees,
waste disposal charges, repair, administration and
replacement.)

**Total Annual Cost of Alternative Pollution
Control Project [(3) + (4)]**

\$ (10)

*While actual payback schedules may differ across projects and companies, assume equal annual payments over a 10-year period for consistency in comparing projects.

**Or see Interest Rate spreadsheet for calculated annualization factors

***For recurring costs that occur less frequently than once a year, pro rate the cost over the relevant number of years (e.g., for pumps replaced once every three years, include one-third of the cost in each year).

(based on Worksheet R from EPA's "Economic Guidance for Water Quality Standards Workbook"; <http://www.epa.gov/ost/econ/>)

E.2. Calculation of Earnings Before Taxes

A. Earnings Without Pollution Control Project Costs

$$EBT = R - CGS - CO$$

B. Earnings With Proposed Pollution Control Project Costs

$$EWPR = EBT - ACPR$$

C. Earnings With Alternative Pollution Control Project Costs

$$EWAR = EBT - ACAR$$

Where:

EBT = Earnings Before Taxes
R = Revenues
CGS = Cost of Goods Sold
CO = Portion of Corporate Overhead Assigned to the Discharger
(selling, general administrative, interest, R&D expenses, and depreciation on common property)
ACPR = Total Annual Costs of Proposed Pollution Control Project
(Worksheet R (5))
ACAR = Total Annual Costs of Alternative Pollution Control Project
(Worksheet R (10))

R	(or net sales)	\$ _____	(1)
CGS	(or cost of sales)	\$ _____	(2)
CO	(or selling, general and administrative expenses)	\$ _____	(3)
EBT	[Calculate: (1) - (2) - (3)]	\$ <input type="text"/>	(4)
ACPR	[Worksheet R (5)]	\$ _____	(5)
EWPR	[Calculate (4) - (5)]	\$ <input type="text"/>	(6)
ACAR	[Worksheet R (10)]	\$ _____	(7)
EWAR	[Calculate (4) - (7)]	\$ <input type="text"/>	(8)

(based on Worksheet V from EPA's "Economic Guidance for Water Quality Standards Workbook"; <http://www.epa.gov/ost/econ/>)

E.3. Calculation of Profit Rates

A. Profit Rate Without Pollution Control Project Costs

$$PRT = EBT / R$$

B. Profit Rate With Proposed Pollution Control Project Costs

$$PRPR = EWPR / R$$

C. Profit Rate With Alternative Pollution Control Project Costs

$$PRAR = EWAR / R$$

Where:

PRT = Profit Rate Before Taxes
 R = Revenues
 PRPR = Profit Rate Without Proposed Pollution Control Project Costs
 PRAR = Profit Rate Without Alternative Pollution Control Project Costs

EBT	[Worksheet V (4)]	\$ _____	(1)
R	[Worksheet V (1)]	\$ _____	(2)
PRT [Calculate: (1) / (2)]		\$ <input type="text"/>	(3)
EWPR	[Worksheet V (6)]	\$ _____	(4)
PRPR [Calculate: (4) / (2)]		\$ <input type="text"/>	(5)
EWAR	[Worksheet V (8)]	\$ _____	(6)
PR AR [Calculate (6) / (2)]		\$ <input type="text"/>	(7)

(based on Worksheet W from EPA's "Economic Guidance for Water Quality Standards Workbook"; <http://www.epa.gov/ost/econ/>)

E.4. Calculation of Ratios

A. Current Ratio

$$CR = CA / CL$$

Where: CR = Current Ratio
 CA = Current Assets (the sum of inventories, prepaid expenses, and accounts receivable)
 CL = Current Liabilities (the sum of accounts payable, accrued expenses, taxes, and the current portion of long-term debt)

CA	\$ _____	(1)
CL	\$ _____	(2)
CR [Calculate (1) / (2)]	\$ <input type="text"/>	(3)

B. Beaver's Ratio

$$BR = CF / TD$$

Where: BR = Beaver's Ratio (indicator of ability to meet fixed & long-term obligations)
 CF = Cash Flow
 TD = Total Debt

Net income after taxes	\$ _____	(4)
Depreciation	\$ _____	(5)
CF [Calculate (4) + (5)]	\$ <input type="text"/>	(6)
Current Debt	\$ _____	(7)
Long-Term Debt	\$ _____	(8)
TD [Calculate (7) + (8)]	\$ <input type="text"/>	(9)
BR [Calculate (6) / (9)]	\$ <input type="text"/>	(10)

C. Debt to Equity Ratio

$$DER = LTL / OE$$

Where: DER = Debt to Equity Ratio
 LTL = Long-Term Liabilities (long term debt such as bonds, debentures, and bank debt, and all other noncurrent liabilities such as deferred income taxes)
 OE = Owner Equity (the difference between total assets and total liabilities, including contributed or paid in capital and retained earnings)

LTL	\$ _____	(11)
OE	\$ _____	(12)
DER [Calculate (11) / (12)]	\$ <input type="text"/>	(13)

(based on Worksheets X,Y, & Z from EPA's "Economic Guidance for Water Quality Standards Workbook"; <http://www.epa.gov/ost/econ/>)

Appendix F. Widespread Social and Economic Impact Factors

Factors to consider in making a determination of widespread social and economic impact of Public or Private Sector Developments.

Instructions: Fill in the blanks with the appropriate information.

Public Sector Development

Estimated change in
Median Household
Income for Proposed
& Alternative Pollution
Control Costs

Estimated change in
the unemployment
rate for Proposed &
Alternative Pollution
Control Costs

Estimated change in
overall net debt per
capita for Proposed &
Alternative Pollution
Control Costs

Estimated change in
% of households
below the poverty line
for Proposed &
Alternative Pollution
Control Costs

Impact on commercial
development potential
for Proposed &
Alternative Pollution
Control Costs

Impact on Property
Values for Proposed &
Alternative Pollution
Control Costs

(based on Worksheet AA from EPA's "Economic Guidance for Water Quality Standards Workbook";
<http://www.epa.gov/ost/econ/>)

Private Sector Development

- Define the affected community; which areas are included? _____ (1)

- Current unemployment rate in affected community (if available) _____ (2)

- Current national unemployment rate _____ (3)

- Additional number of persons expected to collect unemployment in affected community due to compliance with water quality standards _____ (4)

- Expected unemployment rate in affected community after compliance with water quality standards [(current # of persons collecting unemployment in affected community + (4)) / (labor force in affected community)] _____ (5)
- Median household income in affected community _____ (6)
- Total number of households in affected community _____ (7)
- Percent of population below the poverty line in affected community _____ (8)
- Current expenditures on social services in affected community _____ (9)
- Expected expenditures on social services due to job losses in affected community _____ (10)
- Current total tax revenues in the affected community _____ (11)
- Tax revenues paid by the private entity to the affected community _____ (12)

(based on Worksheet AB from EPA's "Economic Guidance for Water Quality Standards Workbook"; <http://www.epa.gov/ost/econ/>)