EPA Comments, 8/11/12

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# Idaho Antidegradation Implementation Procedure

**Idaho**
**Department of Environmental Quality**
**Surface Water Section**
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**Public Comment Draft**

This document provides guidance for conducting reviews of permits or licenses to determine compliance with the antidegradation provisions in Idaho's Water Quality Standards (WQS). Antidegradation reviews will be governed by existing requirements of the Clean Water Act (CWA), Environmental Protection Agency (EPA) implementing regulations, and the WQS. This document does not substitute for those provisions, regulations or rules. The recommendations in this guidance are not binding; Idaho Department of Environmental Quality (DEQ) may consider other approaches consistent with the CWA, EPA regulations and the WQS. Decisions regarding compliance with the antidegradation provisions in the WQS will be made on a case-by-case basis, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the particular situation. DEQ may vary from the recommended approach outlined in this document based upon site specific information and comments provided by the public and the permit or license applicant. DEQ may change this guidance in the future.

## Executive Summary

### *What is Antidegradation?*

Antidegradation is a policy and set of procedures aimed at maintaining the existing quality of our waters. Maintaining water quality that is better than the minimums set by water quality criteria is a primary objective of the Clean Water Act and is considered one of the three key elements of water quality standards: beneficial uses, water quality criteria, and antidegradation. This objective is achieved by reviewing permits and licenses to discharge ~~pollutants~~ for their effect on water quality. If the water receiving the discharge is of high quality, significant degradation in water quality is evaluated closely to determine if it can be minimized or avoided. If significant degradation cannot be avoided, then the activity is evaluated to determine if it is necessary and important to the social or economic health of the affected public.

**Comment [BB1]:** The exectutive summary is heavily focused on "discharge of pollutants" rather than the broader focus on all discharges requiring federal permits and licenses/state 401 cert.

Suggested some edits to reduce that focus.

### *Why This Guidance?*

Federal rules on antidegradation date back to 1983 and Idaho has had a policy in its water quality standards (WQS) that mimics the federal requirements nearly as long. Idaho however lacked an identified set of procedures on how it would implement its antidegradation policy and actual implementation was not evident. This became the subject of a legal complaint against the Environmental Protection Agency (EPA), in its oversight of Idaho's WQS, and led to Idaho adopting new rules to describe its methods of antidegradation implementation, finalized in spring of 2011. This guidance document elaborates on the requirements of these new rules, describing in greater detail than is possible in rule how antidegradation is to be implemented in Idaho.

**Comment [BB2]:** Word omission?

### *Three Tiers of Protection*

Antidegradation views water bodies as being given one of the three levels of protection. Each level, or Tier, has its own requirements for protecting the water quality that exists. These three tiers are as follows:

- Tier 1 – is the lowest level of protection and requires that water quality be maintained such the existing and designated uses of the water are supported. This is the minimum for any water body and generally means assuring that all applicable water quality criteria are met. Water bodies with this protection may already be of lower quality.

- Tier 2 – is the middle level of protection. Protection consists of making sure degradation is "necessary to accommodate important economic or social development."

Degradation is not forbidden, but it is scrutinized. Because, water quality of water bodies given Tier 2 protection is better than the minimum set by criteria and may be so by a wide margin, they are also known as high quality waters.

 Tier 3 – is the highest level of protection, reserved for waters of outstanding character. No degradation of water quality may be permitted in these waters.

Antidegradation is more about levels of protection than it is about levels of quality. In fact, for Tier 3 it could be said antidegradation is all about protection as the outstanding character may have little to do with actual quality of the water in the traditional sense of pollutant concentrations.

Most of the interest in antidegradation is on Tier 2. This is where antidegradation can work to maintain high quality water and is also where dischargers will have to potentially go through extra effort to reduce or justify their proposed degradation of water quality.

## *Key Points of Idaho's Antidegradation Program*

Federal rules for antidegradation set some minimum program requirements. Idaho's rules adhere closely to the federal minimum requirements but the federal rules are not detailed and thus have allowed states a fair degree of flexibility in how they implement their program. Key points of Idaho's rules and program in regard to this flexibility are as follows.

**What Types of Activities are Subject to Review?**

Under the CWA only discharges to waters of the US are regulated and it is only these discharges that are subject to antidegradation review in Idaho. By Idaho rule antidegradation review is triggered by an application for an EPA NPDES discharge permit (CWA §402), Army Core of Engineers dredge and fill permit (CWA §404), or Federal Energy Regulatory Commission licenses. What these activities have in common, in addition to their potential to degrade water quality, is that they all need certification (CWA §401) by Idaho DEQ that they comply with Idaho WQS before they may proceed. This certification provides the opportunity for antidegradation review.

Discharges not needing a permit or license, such as from non-point source activities, are not directly subject to antidegradation review. Idaho rule also exempts restoration activities designed to improve water quality from antidegradation review.

**How is it Determined What Tier of Protection Applies?**

Under Idaho rule the level of protection is determined on a water body by water body basis, using the most recent federally approved Integrated Report which summarizes Idaho's assessment of water quality. The Integrated Report identifies water bodies that do not support beneficial uses or meet all water quality criteria, also known as impaired water bodies. Because the water quality criteria for aquatic life and recreational uses are

distinct and different, water body tiering is split by these broad use categories. Thus a water body can be Tier 1 for recreation and Tier 2 for aquatic life, or vice versa.

**Non-degrading, Degrading and Insignificantly Degrading**

An early step in the review is an evaluation of the change in water quality proposed. Not all of the activities subject to review will be found to cause degradation of water quality.

In evaluating proposed changes in discharge that may cause degradation of water quality it is the change in what a permit or license allows to be discharged that is reviewed. If a permit or license holds the line on allowed discharge and the activity does not otherwise change in character, it will most likely be non-degrading.

Under Idaho rule our concern for degradation is forward looking. That is, we look at what may be permitted for the future, not that which has already been permitted to occur in the past. In general an activity must be new or there must be an increase its discharge of pollutants from an existing activity, through greater volume or concentration of pollutants, to degrade water quality.

For discharge to waters receiving Tier 2 protection a degrading activity that would cause not more than a cumulative 10% loss of assimilative capacity from July 1, 2001 will be considered to cause insignificant degradation of water quality. An insignificant loss of water quality is permitted without checking on other source controls or needing social or economic justification.

Although protection is afforded on a water body basis, evaluation of degradation is by pollutant for those pollutants of concern in a discharge.

**Analyzing Significant Degradation of High Quality Water**

Although only a small number of activities reviewed may lead to significant degradation of high quality water this is where the implementation effort will be the greatest and the effect of antidegradation policy in slowing degradation of water quality can really make a difference.

One of the conditions for allowing significant degradation of high quality water is that other source controls be achieved for both point and non-point sources. When evaluating proposals to significantly degrade high quality waters DEQ will look at whether non-point sources in the watershed will be controlled through cost-effective and reasonable best management practices. Thus non-point sources not subject to antidegradation review may impede the ability of activities subject to review to get approval to degrade water quality.

The other major condition that must be met in order to approve significant degradation of high quality water is that it be shown to be "necessary to accommodate important economic or social development." This has been broken down into two parts. First assessing the necessity of degradation by finding ways to reduce or eliminate increases in

discharge of pollutants or lessen their impact on water quality. Secondly, demonstrating there is a social or economic justification (SEJ) for degradation that cannot be reasonably avoided.

A new or proposed increase in discharge ~~of pollutants~~ could be rejected either because the degradation of water quality it would cause~~it~~ is unnecessary or because the project ~~it~~ is not justified. If reasonable ways to reduce degradation can be found then the analysis will come down to showing there is a social or economic reason to accept the degradation that is proposed.

### *Review Process*

Antidegradation review in Idaho is integrated in the state's 401 certification process. Reviews will be done by DEQ staff when certifying permit/license applications and supporting documents. DEQ will determine if Tier 2 protection applies according to the rules, determine the degree of water quality degradation that will occur, and if that degradation is significant.

When significant degradation of a Tier 2 (high quality) water body is proposed, DEQ will work with the applicant to evaluate alternatives to reduce degradation and determine if degradation that cannot be reasonably avoided is socially or economically justified. DEQ will write up its determination in an antidegradation review document which will be attached to DEQ's 401 certification.

Public review is an important part of this process, particularly if degradation is to be allowed in a Tier 2 water body, and so the antidegradation review will be open to public comment as part of DEQ's 401certification.

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## Glossary

In this glossary, terms are not defined so much as explained. Each term is explained the way it is used in this guidance and the way it should be understood for purposes of antidegradation analysis. Several of the terms do also have specific definitions in statute or the rules and where that is the case, those definitions are provided here as well.

**Adverse:** A change in water quality to conditions that are worse for support of a beneficial use; e.g. an increase in temperature is adverse to aquatic life, as is a decrease in dissolved oxygen.

**Administrative Record:** Documents and information that support an administrative action identified or created before the action is taken.

**Affordable:** Pollution-control alternatives being within the financial means of most dischargers or activities of the same industrial classification (e.g. SIC code), or size for a POTW (major or minor). If a wastewater treatment alternative is not affordable it is not a reasonable alternative for purposes of Tier 2 antidegradation analysis.

**Comment [BB3]:** This definition of "affordable" seems to be very much in the context of effluent guidelines development for the technology requirements of the CWA, that are applicable to all discharges within a certain category, and therefore should be revised for applicability to antidegradation and water quality-based permitting.

The definition might be useful towards establishing the minimum water quality based effluent requirements that a given discharger might reasonably be expected to afford, but it should not be used to determine the limits of affordability in the water quality-based context. In the water quality permitting context, affordability is discharger specific.

Later in the guidance, IDEQ recognizes relative cost effectiveness of treatment alternatives and environmental costs and benefits across media as acceptable factors to consider in determining appropriate pollution control alternatives for Tier 2. Thus in defining affordable in terms of what the discharger in question can afford, IDEQ would not be requiring discharges to always implement the most affordable alternative.

**Alternatives Analysis (AA):** An evaluation of reasonable alternatives for regulated activities or discharges that might degrade water quality, including less-degrading alternatives, non-degrading alternatives, and no-discharge alternatives. Examples of such alternatives include treatment process changes, relocated discharge facilities, land application, reuse, and subsurface discharges.

**Ambient:** The prevailing water quality conditions in a water body; as opposed to effluent quality.

**Antidegradation:** A regulatory policy and implementation procedure to protect existing and designated uses of surface waters and to specify how DEQ will determine whether and to what extent, existing surface water quality may be degraded.

**Applicant:** As used in this document applicant means an applicant for a permit or license subject to certification under section 401 of the Clean Water Act.

**Assessment Unit (AU):** The geographic unit for reporting water quality in Idaho's Integrated Report. AUs are a subdivision of water body identification units (WBIDs) based on stream size that contain an area of water more likely to be of similar quality than the larger WBID they are a part of.

**Assimilative Capacity:** Assimilative capacity is the ability of a water body to handle added pollutants without causing a failure to support a beneficial use. It is the amount (load) of a pollutant that can be added to a specific water body under critical conditions without causing concentration to exceed water quality criteria associated with a beneficial use. It is calculated as the difference between the criterion level and the ambient level of a pollutant.

**Beneficial Uses:** All existing and designated uses on or in surface waters of the state. This term is often shortened to just use(s). This term is defined in rule (IDAPA 58.01.02) as:

Any of the various uses which may be made of the water of Idaho, including, but not limited to, domestic water supplies, industrial water supplies, agricultural water

supplies, navigation, recreation in and on the water, wildlife habitat, and aesthetics. The beneficial use is dependent upon actual use, the ability of the water to support a non-existing use either now or in the future, and its likelihood of being used in a given manner. The use of water for the purpose of wastewater dilution or as a receiving water for a waste treatment facility effluent is not a beneficial use.

**Cost-effectiveness:** The cost per unit mass of pollutant removal achieved in wastewater treatment, e.g. dollars per pound; a greater cost per pound means lower cost-effectiveness. In comparing alternative treatment methods, if there is a large jump in cost per unit mass for a relatively small gain in pollutant removal it may be said that the alternative offering greater pollutant removal but at significantly ~~lower~~ higher cost-effectiveness is not reasonable. Differences of less than 10% in cost per unit mass of pollutant removed may be considered to be the same.

**Comment [BB4]:** Something seems inconsistent here. Is the edit consistent with the intended meaning?

**Degradation or lower water quality:** A change in pollutant concentration due to a discharge that is adverse to a designated or existing beneficial use. This term is defined in statute (IC 39-3602(6)) as:

For purposes of antidegradation review, a change in a pollutant that is adverse to designated or existing uses, as calculated for a new point source, and based upon monitoring or calculated information for an existing point source increasing its discharge. Such degradation shall be calculated or measured after appropriate mixing of the discharge and receiving water body.

**Designated Use:** A beneficial use assigned to a specific water body unit as tabulated in the Water Quality Standards – (IDAPA 58.0102.110-160), as well as the beneficial uses that apply to all waters of the state per IDAPA 58.0102.100. This term is defined in rule (IDAPA 58.01.02) as:

Those beneficial uses assigned to identified waters in Idaho Department of Environmental Quality Rules, IDAPA 58.01.02, "Water Quality Standards and Wastewater Treatment Requirements," Sections 110 through 160, whether or not the uses are being attained.

**Discharge:** This term is defined in rule (IDAPA 58.01.02) as:

When used without qualification, any spilling, leaking, emitting, escaping, leaching, or disposing of a pollutant into the waters of the state. For purposes of antidegradation review, means "discharge" as used in Section 401 of the Clean Water Act.

**Existing Use:** Beneficial uses actually attained in or on a surface water body on or after November 28, 1975, whether or not the uses are designated in the water quality standards. This term is defined in rule (IDAPA 58.01.02) as:

Those beneficial uses actually attained in waters on or after November 28, 1975, whether or not they are designated for those waters in Idaho Department of Environmental Quality Rules, IDAPA 58.01.02, "Water Quality Standards".

**Existing Water Quality**: A measurement or estimate of surface water quality for pollutants under currently permitted pollutants loads at a specific time and in a specific location and time period.

**High Water Quality:** Refers to concentrations of parameters that are better than water quality criteria.
**High Quality Water:** Refers to overall quality of a water body unconstrained by water quality of individual parameters. For example: ORWs can be recognized for their high ecological value.
**Integrated Report (IR):** A report on the status of use support and compliance with water quality standards for state surface waters. The IR meets the regulatory reporting requirements of both Clean Water Act sections 305(b) and 303(d). This term is defined in statute (IC 39-3602(15)) as:
"Integrated report" means the consolidated listing and reporting of the state's water quality status pursuant to the federal clean water act.
**Jurisdictional Waters:** Waters of the United States to which the Clean Water Act applies. This is a subset of the waters of the state of Idaho.
**Justification of Social or Economic Importance (SEJ):** An evaluation of whether the project causing degradation provides social or economic benefits important to the community in the area in which it occurs.
**Less-Degrading Alternative:** A reasonable alternative to a proposed activity or discharge that would result in less degradation to water quality than the minimum level of pollution control.
**Listed:** A water body identified in the Integrated Report in Category 5 for failure to meet one or more water quality criteria or for not fully supporting a use, e.g. bioassessment may directly determine aquatic life use is not fully supported.
**Necessary:** No reasonable alternative(s) exists to prevent or minimize degradation.
**Non-Degrading Alternative:** A reasonable alternative to a proposed or existing discharge that would not result in degradation of existing water quality.
**Notice of Intent (NOI):** A form or application that applicants must submit to EPA when seeking coverage under a general permit.
**Outstanding Resource Water (ORW):** A surface water body that the Idaho legislature has designated as an outstanding national or state resource water in the water quality standards. An ORW receives Tier 3 antidegradation protection. This term is defined in rule (IDAPA 58.01.02) as:
A high quality water, such as water of national and state parks and wildlife refuges and water of exceptional recreational or ecological significance, which has been designated by the legislature and subsequently listed in this chapter. ORW constitutes an outstanding national or state resource that requires protection from point and nonpoint source activities that may lower water quality.
**Parameter:** A characteristic of water quality relevant to a beneficial use. Parameters may be a pollutant or something affected by pollutants, e.g. dissolved oxygen is a parameter often adversely affected by discharge of oxygen demanding organic waste (pollutant), but also indirectly by nutrient enrichment (pollutant).

**Presumed Use Protection:** Protection of water quality of undesignated water bodies based on the presumption they can support cold water aquatic life and primary or secondary contact recreation.
**Reasonable:** Identified based on case-specific information. Generally speaking, non-degrading or less-degrading pollution-control alternatives shall be considered reasonable where the costs of such alternatives are affordable.

**Regulated Activity:** A regulated activity is an activity or discharge that requires a permit or license and is subject to CWA § 401 certification, e.g. CWA § 402 (NPDES permits), CWA § 404 (dredge and fill permits), or a FERC license.
**Short-term or Temporary Activity:** An activity which is as short as possible but lasts for no more than one (1) year, is limited in scope, and is expected to have only minimal impact on water quality. This term is defined in rule (IDAPA 58.01.02) as:
An activity which is as short as possible but lasts for no more than one (1) year, is limited in scope and is expected to have only minimal impact on water quality as determined by the Director. Short-term or temporary activities include, but are not limited to, those activities described in Subsection 080.02.

**Technologically feasible:** Capable of accomplishment as may be evidenced by prior success under similar circumstances, e.g., industry standards are in place for a facility, or treatment technologies exist at similar facilities.

**Tier 1 Protection:** Policies and procedures that require a review to prevent degradation which would result in a beneficial use not being fully supported or violation of water quality criteria. Tier 1 protection applies to all surface waters regardless of existing water quality as the minimum protection level.
**Tier 2 Protection:** Policies and procedures that require an analysis of reasonable alternatives and social or economic considerations to justify significant degradation or a determination the degradation is insignificant. Tier 2 protection level applies to all surface waters where existing water quality is sufficient to classify them as high quality on a water body-by-water body basis.
**Tier 3 Protection:** Policies and procedures that prohibit any degradation in waters designated in the water quality standards as an ORW. A new or expanded source of pollutants may be allowed if it is offset so as to avoid degradation.
**Water Body:** A generic term for a stream, river, lake, reservoir or other type of water, or a portion thereof, usually identified by name and/or boundaries.
**Water Body Unit and WBID:** The geographic unit used in Idaho's water quality standards for identifying and designating beneficial uses. A water body unit includes all the named and unnamed tributaries within a drainage and is considered a single unit unless designated otherwise. All water body units are assigned a unique identification number (WBID) in the rules. This term is defined in rule (IDAPA 58.01.02) as:
Includes all named and unnamed tributaries within a drainage and is considered a single unit unless designated otherwise.

**Water Quality Criteria:** Elements of water quality standards that are expressed as pollutant concentrations or narrative statements representing the level of chemical, physical or biological water quality that supports a beneficial use. Numeric criteria are use-specific, applying only to particular beneficial uses. Narrative criteria are general, applying to any and all uses applicable to a water body.

## Acronyms and Abbreviations

Any abbreviations included in a definition are also defined at the appropriate point in this list.

- 303(d) section of CWA requiring reporting of waters that need TMDLs
- 305(b) section of CWA requiring reporting on status of WQ for all waters
- 401 section of CWA requiring certification that WQS will be met
- AA alternatives analysis
- ACOE Army Corps of Engineers
- AU assessment unit
- BMP best management practice
- BURP Beneficial Use Reconnaissance Program
- CFR Code of Federal Regulations
- CWA Clean Water Act
- DEQ Idaho Department of Environmental Quality
- EPA Environmental Protection Agency
- FERC Federal Energy Regulatory Commission
- GP general NPDES permit
- HUC hydrologic unit code
- IDAPA Idaho Administrative Code
- IC Idaho Code
- IR Integrated §303(d)/§305(b) Report
- MGD million gallons per day
- NPDES National Pollutant Discharge Elimination System
- ORW Outstanding Resource Water
- POTW publicly owned treatment works
- RDI river diatom index
- RFI river fish index
- RMI river macroinvertebrate index
- RPI river physicochemical index
- RPA reasonable potential analysis

- RPTE reasonable potential to exceed [water quality criteria]
- 7Q10 7-day, 10-year minimum statistical flow value
- SEJ social or economic justification
- SFI stream fish index
- SHI stream habitat index
- SMI stream macroinvertebrate index
- SPI stream periphyton index
- TBEL technology-based effluent limitation
- 30Q5 30-day, 5-year minimum statistical flow value
- TMDL total maximum daily load
- TSD EPA's Technical Support Document for Toxics Control (see references)
- USGS United States Geological Survey
- WBAG II Idaho's Water Body Assessment Guidance, second edition
- WBID water body identification [number]
- WLA waste load allocation
- WQ water quality
- WQBEL water quality-based effluent limitation
- WQS Idaho water quality standards

# 1 Purpose and Overview

The purpose of these procedures is to provide guidance to persons implementing Idaho's policy to protect surface water quality from degradation.

Federal antidegradation policy is found at Title 40 Code of Federal Regulations (CFR) § 131.12. The State of Idaho is required by 40 CFR §131.12(a) to develop and adopt a statewide antidegradation policy and to identify procedures for implementing that policy.

## *1.1 Applicable Laws and Regulations*

Requirements for the protection and management of surface water quality are established in Idaho Code Title 39 Chapter 36. Section 3603 of this code establishes Idaho's antidegradation policy. Sections 3617 – 3620 establish procedures for designating and restricting nonpoint source activities on outstanding resource waters (ORWs).

The Board of Environmental Quality, with the assistance of the Department of Environmental Quality (DEQ) and approval of the Idaho Legislature, promulgates administrative rules on water quality. Idaho's Water Quality Standards (WQS) are specified in Idaho Administrative Code (IDAPA) Chapter 58.01.02 – Water Quality Standards.

The statutory policy on antidegradation is echoed in rule at section 051 of the WQS and consists of three tiers of antidegradation protection, as required by federal rule. Section 052 of the WQS addresses implementation of the policy. Implementation steps are depicted in the flowchart in Appendix A, and include:

- identifying the antidegradation protection levels (i.e., the "tiers") that apply to a surface water body;
- determining whether a new, or change in an existing, activity or discharge will result in water quality degradation;
- assuring existing uses of the water body are maintained and protected in all cases;
- reviewing and approving less-degrading or non-degrading alternatives for high quality waters;
- assessing the importance of social or economic development to justify significant degradation of high quality waters;
- coordinating with other government agencies; and
- engaging the public in the process

**Regulatory Context**[MAN1][DE2]

Antidegradation is one of three required regulatory elements of WQS. The other two elements are assignment of beneficial uses and adoption of water quality criteria (narrative and numeric). All three elements must be administered as a whole to effectively protect water quality and the uses dependent on that quality. Designated uses and water quality criteria applicable for each of the uses are found in Idaho's WQS.

Section 100 of the WQS describes designated uses and the use categories that may be applied in Idaho. Section 101 describes waters for which uses specified in section 100 have not been designated (undesignated surface waters as defined in section 101.01). Undesignated waters are presumed to support cold water aquatic life and primary or secondary contact recreation and therefore, DEQ applies the cold water aquatic life and contact recreation criteria when protecting and managing these waters.

For waters where uses have been designated, the specific use designations are identified in the WQS sections 110 – 160 by subbasin (USGS 4th Field hydrologic units, represented by hydrologic unit codes [HUCs]) and water body units (represented by water body identification numbers [WBIDs]). About 70% of Idaho's water bodies do not have specific use designations as of 2010 and are thus protected through the application of section 101.

Uses may exist in a water body even if they have not been designated in the WQS (sections 110-160) and are not presumed by default (section 101). Salmonid spawning, a recognized use in section 100, is a prime example. Many waters in Idaho support salmonid spawning yet have not been so designated. Such existing uses must be protected even though not designated. Designated uses normally reflect existing uses of a water body at the time of designation but may also reflect a desired or potential use not yet attained.

Water quality criteria specific to Idaho's beneficial use designations (i.e., numeric criteria) are contained in sections 210 and 250 – 253 of the WQS. All waters of the state are subject to general criteria contained in section 200 (i.e., narrative criteria), regardless of use.

Beneficial uses may vary within a water body; that is, they may change with location, water body size, or type. Most waters have more than one designated beneficial use or existing use. Where multiple uses exist or have been designated for a water body, the ~~use with the~~ most stringent water quality requirements associated with the various uses must be met.~~maintained and protected~~.

**Comment [BB5]:** I understand the intent of this sentence as it was written, but the wording was awkward. Though the use with the most stringent criterion dives the regulatory requirements, all the uses must be met (not just the use with the most stringent requirements).

All jurisdictional waters of the state are protected under at least one of three tiers of the antidegradation rule. Subsection 1.2 of this document describes these tiers. Subsection 1.3 of this document explains jurisdictional waters and the activities and discharges antidegradation applies to.

## *1.2 Tiers of Protection from Degradation*

The federal rule and Idaho's statutory policy set up three levels or tiers of antidegradation protection.

**Tier 1 (Maintenance of Existing Uses)**

Tier 1 protection requires that the level of water quality necessary to protect existing uses be maintained and that the water quality criteria be met. This is the minimum level of protection. Tier 1 protection applies to all surface waters, regardless of the existing water quality or designated use(s). A review is conducted to prevent authorizing an activity or discharge that would cause or contribute to a beneficial use not being fully supported or violation of water quality criteria.

**Tier 2 (High Quality Waters)**

Tier 2 protection is applied only to the subset of surface waters that are of high quality as determined on a water body-by-water body basis. For these high quality waters, Tier 2 provides an added layer of protection in addition to the Tier 1 minimum protection. This is an intermediate level of protection.

Tier 2 protects high quality waters from degradation by requiring an analysis of the necessity of significant degradation and social or economic importance of the activity before it is allowed. Under Tier 2 protection, insignificant degradation will be allowed without analysis. Significant degradation may occur only after an acceptable analysis of reasonable alternatives for avoiding or minimizing pollution of the water and an acceptable justification of the social or economic importance of the action causing the degradation. Procedures for determining whether degradation is insignificant and, if significant whether it is justified and may proceed are presented in section 5 of this document.

**Tier 3 (Outstanding Resource Waters)**

Tier 3 protection prohibits degradation. This protection applies only to waters of the highest quality or with other outstanding resource values that the legislature has designated by law as worthy of such protection. These waters are termed outstanding resource waters (ORWs). An activity or discharge that will not cause degradation may be allowed as described in Section 5 of this guidance. Temporary and limited degradation of waters receiving Tier 3 protection may be allowed by DEQ on a case-by-case basis as explained in Section 3.4 of this document. This is the highest level of protection.

**No List of Tier 1 and Tier 2 Waters**

There is no need to create a list of waters in the state that are given only Tier 1 protection (Tier 1 waters), as this protection applies to all water bodies. Nor does DEQ intend to create and maintain a complete list of waters that are given Tier 2 protection in addition

to Tier 1 protection (Tier 2 waters). A list of all Tier 2 waters in Idaho would be dynamic and could not be complete unless all waters in the state are regularly monitored and assessed. DEQ has, in Appendix D, prepared a list identifying the tier of protection for waters in Idaho currently receiving NPDES-permitted discharges.

Tier 3 ORWs must be designated by the legislature. As of 2011, no ORWs have been designated.

Since it is already clear which waters get Tier 1 and Tier 3 protection, section 2 of this guidance describes how it will be determined whether a water body warrants Tier 2 antidegradation protection. This is based on Idaho's Integrated Report (IR) and its supporting data. Classification as a Tier 2 water reflects overall water body quality based on information used in compiling the IR. Since the IR is dynamic, this water body-by-water body classification will be dynamic. Therefore, it is DEQ's intent to determine whether Tier 2 protection is needed at the time an activity or discharge that might degrade water quality is proposed.

### *1.3 Waters and Activities to Which Antidegradation Applies*

Idaho's antidegradation policy applies to all activities that may result in a discharge subject to certification under section 401 of the Clean Water Act (CWA). Such activities include all those that require a permit pursuant to CWA §402 (National Pollutant Discharge Elimination System [NPDES] discharge permits), CWA §404 (dredge and fill permits), or Federal Energy Regulatory Commission (FERC) licenses.

Jurisdictional waters are an unidentified subset of the waters of the state. The EPA and the U.S. Army Corps of Engineers (ACOE) have developed guidance (ACOE and EPA, joint memorandum, December 2, 2008) on making CWA jurisdiction determinations in accordance with the Supreme Court's decision in RAPANOS v. United States (547 U.S. 715,2006). The ACOE and/or EPA are responsible for making jurisdictional determinations.

**Restoration Projects**

Water quality restoration projects are those whose primary purpose is to return a water body to something closer to its natural or original condition. It is not necessary that a restoration project get all the way to the goal of natural or get there immediately. Restoration projects are a step in that direction and designed to improve water quality; if they do not, they are unlikely to qualify as restoration projects.

Even so, it is recognized that some projects whose goal is to improve water quality in the long run may still result in short-term worsening of water quality. For example, forest road obliteration projects or culvert replacements may cause a short-term pulse in sediment. This is expected and acceptable so long as reasonable measures (BMPs) are taken to minimize short-term worsening of water quality. Such measures are to ~~should~~ be

incorporated into the design of restoration projects in accordance with section 58.01.02.052.02 and be a consideration in the decision whether to approve a proposed project.

Comment [BB6]: Insert

**Emergency Actions**

The rules regarding antidegradation do not speak to emergency actions. Most emergency activities do not require a permit or license that would trigger antidegradation review. Nor will there be time in most true emergencies for DEQ to consider antidegradation. DEQ will handle emergency actions on a case-by-case basis using its discretion to apply antidegradation provisions in a manner that is appropriate to the circumstances.

**Temporary Degradation and Short Term Activities**

As a general principle, DEQ believes degradation of water quality should be viewed in terms of permanent or long-term adverse changes. Therefore, short-term and temporary reductions in water quality, if reasonable measures are taken to minimize them, may be considered in the context of restoration projects and emergency actions subject to CWA permitting. This does not mean DEQ should overlook a collection of small short-term activities that in aggregate have a longer and more or less continuous impact.

Short term activities are addressed by Idaho's WQS at IDAPA 58.01.02.080.02 – Short Term Activity Exemption. This provision allows DEQ to exempt a discharge from the requirement to comply with the WQS, including from the WQS antidegradation requirements, for activities that are deemed essential to the protection or promotion of the public interest and that cause no permanent or long-term injury to beneficial uses.

# 2 Determining Where Tier 2 Protection Applies

Tier 1 antidegradation protection applies to all jurisdictional waters and Tier 3 waters are designated by statute; therefore, the only open question is which water bodies warrant Tier 2 protection. This section of the document describes the procedure for determining whether or not Tier 2 protection applies for a particular water body.

By statute, Idaho has established a water body-by-water body approach for identifying waters that will receive Tier 2 antidegradation protection. This approach uses Idaho's Integrated Report (IR) of water quality status and its supporting data. The IR and its supporting data are dynamic; therefore, each determination will be made as applications for new or reissued permits or licenses come before DEQ.

Determination of whether Tier 2 antidegradation classification applies for a certain water body is based on:

- the water body's category of use support according to the most recent federally approved Integrated Report (IR);
- the beneficial uses of the receiving water body, and;
- whether data indicate that the water body as a whole is of high quality.

Section 2.1 provides a brief overview of the Integrated Report. Section 2.2 describes how DEQ will determine whether or not Tier 2 protection is appropriate.

## *2.1 The Integrated Report and Use-support Status Categories*

Every two years, DEQ is required by the federal CWA to conduct a comprehensive analysis of Idaho's water bodies to determine whether they meet state WQS and support beneficial uses or if additional pollution controls are needed. This analysis is summarized in an "Integrated Water Quality Monitoring and Assessment Report"[1] (IR; DEQ 2008), which is submitted to EPA for approval. The report serves as a guide for developing and implementing water quality improvement plans (e.g. total maximum daily loads, or TMDLs) to protect water quality and achieve federal and state water quality standards. An IR must be approved by the EPA before it can be used by a state to guide its management decisions.

[1] As this guidance is being developed, the 2010 Integrated Report is being considered for final approval and may be the controlling report by the time this guidance is finalized.

Category 5 of the Integrated Report is equivalent to the former 303(d) list of impaired waters. This list identifies waters that do not meet all water quality standards, meaning if they fail to meet at least one criterion or measure of their quality, i.e. a parameter, they are impaired. The list identifies the water body and the cause(s) for listing. Causes are usually parameters for which the water body fails to meet a criterion but may also be failure of the biological community to achieve benchmark scores for biological indices

(see WBAG II, Grafe and others 2002). A TMDL must be developed for the certain parameters for which a water body is listed, unless other measures are put in place to provide the water quality improvement needed (such as category 4b).

The Integrated Report compiles available environmental data and information from all components of DEQ's surface water quality program, as well as from other agencies, organizations, companies and individuals. This data and information gives water quality managers an indication of the relative quality of Idaho's water bodies and is used to set priorities and allocate resources accordingly. All of the state's waters are classified into at least one of five different use-support categories, which correspond to the five sections of the report. The five categories are described in the following paragraphs and summarized in Table 1.

**Category 1: Waters supporting all uses**

Idaho lacks methods to assess attainment of all uses (e.g., wildlife habitat and aesthetic uses). Because they lack regulated pollutant sources, waters that lie completely within wilderness or roadless areas are assumed to support all their uses and meet all water quality standards. Only waters that lie completely within wilderness or roadless areas appear in category 1.

**Category 2: Waters supporting all uses that have been assessed**

Category 2 waters fully support all the beneficial uses that have been assessed, but may have other uses that we have no method to assess (e.g., wildlife and aesthetics), or that are unassessed due to lack of data (e.g. recreation or domestic water supply). As of 2011 this is the case for the majority of waters, and so, based on monitoring results, DEQ cannot say based on direct assessment that all uses are supported and thus the water belongs in category 1. So when the data in hand shows no impairment but there is not adequate data to assess all uses, DEQ conservatively places the water in category 2.

**Category 3: Insufficient data to make an assessment**

Category 3 consists of waters for which DEQ has insufficient data to make an assessment of whether or not any uses are fully supported and water quality standards are met. DEQ's experience has been that for aquatic life and recreational uses the majority of un-assessed waters are, once sufficient data are obtained, found to be high quality[2]. This makes sense considering that insufficient data often reflects remoteness and lack of pollutant sources as well as difficulty in sampling.

[2] In the course of negotiated rulemaking in 2010, DEQ examined the change in status of 167 assessment units that were not assessed in the 2002 IR, but then were assessed for the 2008 IR when new data was available. Of the 167 2002 AUs in category 3, 92 or 55% were determined to belong in Tier 2 based on their 2008 assessments. Of the remaining 75 AUs, 58 failed to meet at least one water quality criterion but because they lacked biological data, were not classified for antidegradation.

**Category 4: Waters not meeting one or more uses but not needing a TMDL**
Category 4 waters fail to meet at least one of the applicable water quality standards and thus do not fully support at least one applicable beneficial use. These are also known as 'impaired waters'. However, waters in Category 4 do not require a TMDL be developed to correct the impairment because: 1) a TMDL has already been developed and approved; 2) they are expected to meet water quality standards due to pollution control measures other than a TMDL; or 3) impairment is due to pollution such as flow alteration or habitat alteration but not pollutant loading and thus the impairment is not amenable to a TMDL to reduce pollutant loads.

**Comment [BB7]:** Here and at "4c" in Table 2. I am still confused about recreation uses and 4c. Couldn't a water in 4c which is Tier 1 for an aquatic life uses still be Tier 2 for a recreation use ?

**Category 5: Waters not meeting one or more uses and needing a TMDL**
Like waters in category 4, category 5 waters fail to meet at least one of the applicable water quality standards and thus do not fully support at least one applicable beneficial use. These are also known as 'impaired waters'. They do not, however, fit one of the three reasons for not needing a TMDL that would put them in category 4. Category 5 of the Integrated Report is equivalent to 303(d) lists that were prepared in the past and can also be described as a TMDL "to do" list.

**Table 1. Integrated Report Categories**

[1] The term "waters" means assessment units (AUs); subdivisions of water body units represented with WBIDs in the Idaho WQS.
[2] This presumption is based on these waters being located entirely within wilderness/roadless areas.
[3] Category 5 is equivalent to the 303(d) list of impaired waters; a TMDL "to do" list.
[4] While assessment is done by use, an AU is listed as impaired for a specific cause or pollutant. If just one water quality criterion is not met or any one use is not fully supported, the AU is listed in category 5 unless the cause is flow or habitat alteration and then it is listed in
4c.

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full |

When a TMDL is completed, the AU is listed in category 4a for the pollutant for which the TMDL was done. Because listing and TMDL development is by pollutant, a given AU can appear in both categories 5 (for one or more causes) and 4 (for different causes).

All of the State's waters are broken into assessment units (as described in the following section). An individual assessment unit may be classified in more than one of the above categories. This is because the Integrated Report lists waters by cause. For example, if a water body is listed due to temperature and flow alteration, it may be listed in Category 5 for temperature and in Category 4c for flow because flow is not a pollutant.

**Water Body Units and Assessment Units**

Water body units are the geographic basis for identifying waters of Idaho and designating beneficial uses in the WQS. These units and their identification numbers (WBIDs) are based on 1:100K hydrography and break the state of Idaho up into unique non-overlapping drainage areas.

In headwaters areas, WBIDs correspond to true watersheds; that is, all surface water in a unit flows to a single point where it exits the unit. In Figure **1**, this situation is exemplified by the stream labeled 003 (shown in red in the inset). Because water body units are non-overlapping by design, any unit downstream from a headwater unit has both an entry and an exit point and is not a true watershed. This situation would correspond to the heavy green, purple, and blue lines in the inset of Figure **1**. These non-headwater water body units may consist of a large mainstem segment and a collection of many smaller tributaries. The small tributaries likely provide only a fraction of the flow in the mainstem. Thus water quality and uses within a WBID can be quite varied.

This potential variation in water quality and uses within a WBID becomes problematic when evaluating the effect that a discharge or activity might have on water quality. It is also problematic to the assessment of use support, and even in designation of uses. The further removed from the headwaters a water body unit is, the more probable it is that the mainstem flow of water in and out of the unit is unlike that of the tributaries within the unit (e.g., WBID 001 in Figure **1**). DEQ addressed this problem for assessment purposes by using stream order (a measure of the number of tributaries upstream and thus size of a stream) to break water body units into smaller subunits for assessment; called assessment units. Small tributaries to larger streams, which can be very different in character but occur in the same water body unit, are therefore split off into separate assessment units. This allows DEQ to do a better job of refining its assessment of water quality and support of uses.

WBID 001 in Figure **1** has two very different assessment units, the 001_07 assessment unit (which is a portion of the 7th-order main stem represented by the heavy blue line) and the 001_02 assessment unit (represented by the collection of light blue lines indicating 1st- and 2nd-order tributaries to the main stem). Both assessment units are part of the 001 WBID and therefore have the same designated beneficial uses, but are assessed using different methodologies and data since it is unlikely that 1st- and 2nd-order tributaries would have the same characteristics as the 7th order Main Salmon River. The same can be seen with the tributaries to WBID 002 (green lines) and WBID 029 (purple).

**Figure 1. Map detailing WBIDs for HUC 17060203 Middle Salmon-Panther Subbasin. Inset shows how the individual waters are associated with a WBID number. WBIDs are color-coded to show the different stream segments that are part of that WBID. The size of the line corresponds to the stream order (thinner lines equate to 1st and 2nd order streams and thicker lines equate to larger order streams).**

While assessment units (AUs) are better than whole water body units (WBIDs), they still are not perfect since many separate 1st- and 2nd-order tributaries, draining different areas, are still lumped together into one AU. Although these small tributaries are in the same water body unit and are thus likely to be similar in water quality condition, they may also have different activities and discharges that differentially alter their quality. Consider again the situation represented by WBID 001 in Figure **1**, and imagine the possibility that tributaries on one side of the river drain a largely roadless area with few human impacts while tributaries on the other side have impacts from recreational use (campgrounds) and timber harvest.

DEQ could subdivide AUs further but the basic problem is that we cannot afford to measure everywhere. Instead, we must use data collected from specific sampling sites to infer water quality throughout an AU. It is always possible that there are differences in activities and discharges within an AU and thus all water within the AU may not be of the same quality as found at the sampled sites. Typically DEQ samples at the downstream most extent of a unit where it is expected water quality will be the lowest. Even in larger streams, the location of a sampling site could reflect better or poorer water quality than the bulk of the assessment unit. We will come back to this in section 2.5 Spatial Extent of Water Quality Characterization.

## *2.2 Assignment of Tier 2 Protection*

Tier 2 antidegradation classification of a water body is based on the most recent federally approved Integrated Report, its supporting data, and the beneficial uses of the receiving water body. However, to ensure that the level of protection reflects the water quality of the water that would be affected by a proposed new or increased activity or discharge, DEQ may also consider the how well the available data represents that water.

**Use of Integrated Report**

When a proposed project requires an antidegradation review, DEQ will use the most recent EPA-approved version of the Integrated Report to determine which category the water body of interest is in. If necessary, DEQ will examine the Integrated Report supporting data and more recent relevant data that may be available at the time. This evaluation is summarized in Figure 2 below and Table 2.

**Water Bodies Supporting Assessed Beneficial Uses**

All AUs considered to be fully supporting all their applicable uses (i.e., those in category 1 of the Integrated Report) will be given Tier 2 protection for all uses. All AUs found to be fully supporting their assessed applicable uses (i.e., those in category 2 of the Integrated Report) will be given Tier 2 protection for all uses.

**Water Bodies with Un-assessed Uses**

Waters in Idaho may be un-assessed due to lack of suitable data at the time assessments were performed for the latest Integrated Report. Assessment units without an assessment (i.e., those in category 3 of the Integrated Report) will be evaluated on a case-by-case basis as to whether they are high quality and need to be given Tier 2 protection. This evaluation need not occur, and generally will not occur, until DEQ receives an notification of an application [MAN3]for a new or reissued permit for a proposed new discharge or activity that could degrade water quality.

When an activity or discharge is proposed on un-assessed water, all relevant information available will be used to determine the appropriate level of antidegradation protection. This may include new information generated during the application process to specifically address the question of whether the water is of high quality. New information may come from DEQ, other agencies, organizations, companies or individuals. DEQ may ask the applicant to gather information to help with this determination.

**Water Bodies Not Fully Supporting Beneficial Uses or Not Meeting all Criteria**

DEQ assesses aquatic life and recreation uses differently because there are differences in water quality requirements in the criteria (values) as well as the pollutants (parameters) that apply to each. Although uses are assessed separately, if one use is not supported the water body is considered to not fully support applicable beneficial uses and for the purposes of the Integrated Report is placed in Category 4 or 5.

While it is required to identify a water body as not fully supporting its uses if it fails to meet even just one criterion, it is not considered to be consistent with antidegradation policy to dismiss protection of the water body from degradation that would affect another use that is fully supported. Therefore, for assessment units identified as not fully supporting at least one use the rule calls for DEQ to evaluate aquatic life and recreational uses separately to determine the appropriate level of antidegradation protection.

Because applicable uses are assessed separately and there are different data requirements for evaluating each use (e.g., bioassessment data is not used in evaluating recreation uses and *Escherichia coli* data is not used in evaluating aquatic life uses), it is possible that a water body may warrant Tier 2 protection for recreation and Tier 1 for aquatic life, or vice-versa. This mixed, by-use assignment of antidegradation tiers is intended and will be resolved during the review of a proposed activity or discharge and its expected effect on water quality and applicable uses as described in section 3. Sections 2.3 and 2.4 describe how DEQ evaluates potential degradation of aquatic life and recreation beneficial uses, respectively.

How the Integrated Report and antidegradation implementation interrelate is summarized in Table 2.

**Table 2. Translation of Integrated Report Categories to Tiers of Antidegradation Protection**

In the

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full support |
| 4c | Waters for which lack of applicable use support is caused by flow or habitat alteration which is |

Integrated Report a cause for impairment is given. Some causes are general, e.g. combined habitat/biota, and don't necessarily line up with specific water quality criteria, others are specific, e.g. copper, and are associated with particular criteria.

Waters with a use designation of NONE will be treated as impaired waters for the use with the designation of NONE.[MAN6][DE7]

**Comment [BB8]:** This needs explanation.

**Manmade Waterways**

DEQ's interpretation of the Idaho WQS is that, canals or drains not otherwise designated are not protected for CWA 101(a) uses and thus will be treated as Tier 1 waters for antidegradation purposes, unless DEQ is presented with data to the contrary. This is in keeping with IDAPA 58.01.02.101.02 Man-Made Waterways, which states manmade waters are protected for the use for which they were developed, namely irrigation water supply. DEQ does not consider natural watercourses modified after Nov. 28, 1975 to be manmade waterways.

**Comment [BB9]:** "Manmade Waterways": The addition of "unless DEQ is presented with data to the contrary," to the "policy call" that undesignated canals or drains that are navigable waters of the United States will be considered low quality Tier 1 waters for antidegradation purposes" is a step in the right direction because it opens the possibility for such waters to be afforded Tier 2 protection if they are in fact high quality. Nevertheless it remains unclear as to why, where "manmade waterways" are "Waters of the US," the decision as to whether Tier 2 is applicable in addition to Tier 1 would not be made in accordance with Idaho's methods as specified in statute and rule.

Is AU fully supporting recre

ation and aquatic life uses?
Case by Case determination for recreation and aquatic life uses
Is AU unassessed for recreation and aquatic life uses?

No
Yes

Is recreational use assessed?
Is aquatic life use assessed?
Is aquatic life use fully supported?
No, AU is listed in Category 4 or 5

Yes, AU is listed in Category 1 or 2

Case by Case determination for recreation*

Tier 2 for recreation and aquatic life uses
No

Yes

Is recreational use fully supported?

Yes
Tier 2 for recreation uses

No

Tier 1 for recreation uses

Case by Case determination for aquatic life*

No

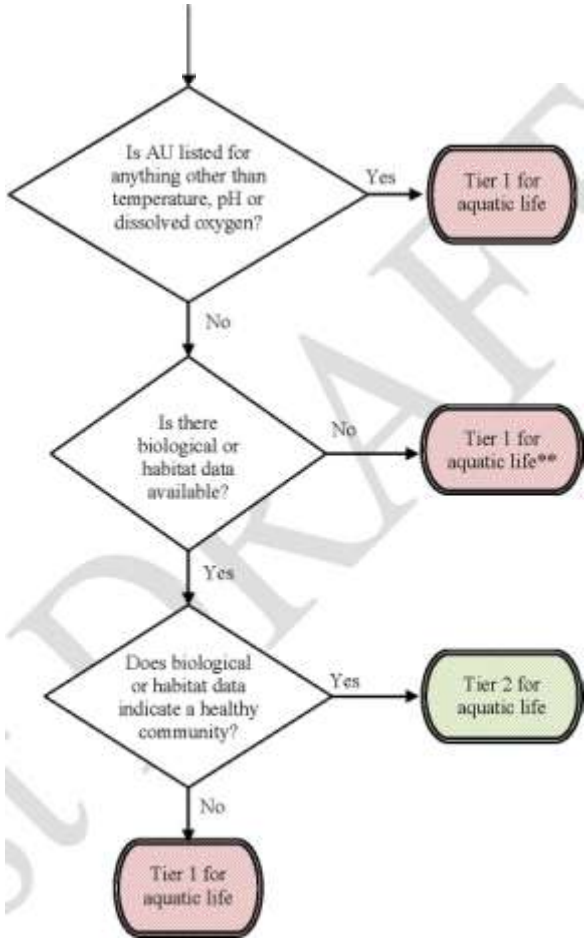
Yes

Tier 2 for aquatic life
Yes

GO TO NEXT PAGE
No

FROM PREVIOUS PAGE

Tier 1 for aquatic life**




*In this situation DEQ will make an effort to obtain data needed in order to make an informed decision on support of the use that is unassessed.
**In this situation, DEQ will make an effort to obtain biological or habitat data in order to make an informed decision on the aquatic life use support.

**Figure 2. Flow chart for determining whether Tier 1 or Tier 2 protection is warranted.**

## *2.3 Aquatic Life Beneficial Uses*

**Box 2.1 Biological Assessment**

A biological assessment is an integration of biological data that is reflective of exposure of the sampled populations to pollution over time. Thus, a biological assessment is a holistic measure of a water body's condition.

Much of the data available for biological assessment is data DEQ collects on macroinvertebrate and fish communities and on habitat quality, via its Beneficial Use Reconnaissance Program (BURP), or comparable data other entities collect. This data is reduced to various multi-metric index scores. Individual index scores are then combined for each site and, if available, scores for multiple sites may be combined to arrive at a single score for each assessment unit, as described in WBAG.

Data that is not BURP compatible may also be used in bioassessment, as described in WBAG.

An assessment unit may be identified as either supporting or not supporting its applicable aquatic life beneficial use(s) based upon one or more of the following data types:

- chemical (i.e. dissolved oxygen, pH, or other applicable pollutant concentrations),
- physical (i.e. turbidity and temperature or other applicable measures), and/or
- biological (biological assessment data [see Box 2.2.1]).

Biological data provides by far the major source of information for DEQ's assessments of aquatic life use support, although there are many instances where chemical or physical data may also be available or be the only data available. Chemical and physical data are relevant and easily compared to water quality criteria in the WQS, and they may, and often do in the case of temperature, indicate a problem when the biological data do not indicate that a problem exits.

This conflict in signals among the various data types must be resolved in some manner. For purposes of the Integrated Report, DEQ is required to implement the federal "independent applicability" policy[3], which means a water must be listed if either the biology indicates lack of use support or any one of the associated water quality criteria are not met. Independent applicability means a water body can be assessed for its support of aquatic life without biological data.

[3] While independent applicability originated with NPDES permitting, it has long been applied by EPA to reporting for CWA section 303(d) purposes.

It is somewhat counterintuitive that a single chemical or physical measure of water quality, such as a point-in-time measurement of temperature or copper concentration, can overrule a more integrative measure such as a multi-index biological assessment. However, this conservative approach is justified by EPA because chemical and physical

measures are considered leading indicators of problems that may not yet have shown up in the biology. While it may be appropriate to queue up a TMDL to address a failure to meet one criterion, this does mean there are many water bodies in Idaho that are biologically healthy and would be considered high quality by most Idahoans, yet fail to meet one or two criteria. A prime example of this is the Lochsa River in north central Idaho, a high quality stream where temperature criteria set to protect cold water aquatic life are occasionally exceeded.

In order to be similarly conservative in antidegradation and not discount the high quality of streams such as the Lochsa River, Idaho's antidegradation rule calls for basing assignment of Tier 2 protection on biological data when the listing cause is only dissolved oxygen, pH, or temperature, thus favoring biological data for these three chemical and physical measures of water quality.

The Integrated Report and its supporting data will be the primary determinant of whether or not a segment of water is high quality. Valid data collected by a third party will also be used. For applicable aquatic life uses, if a water body is listed for one or more of the causes outlined in the rule, but the bioassessment data indicates a healthy and balanced biological community the water body will receive Tier 2 protection. If biological data is lacking or insufficient, other relevant data will be considered to make an antidegradation tier assignment for each case that arises from a proposal for an activity or discharge with degradation potential.

**Use of Biological Data**

When a water body is not fully supporting its applicable aquatic life uses due to dissolved oxygen, pH and/or temperature, DEQ will examine the underlying bioassessment data. In short, if the biological and aquatic habitat data indicate a healthy aquatic community, then the water body will be provided Tier 2 antidegradation protection. In this evaluation, DEQ needs to consider the representativeness of the data for the area that would be affected by a proposed discharge or activity (see section 2.5 for further discussion). Table 3 lists the biological assessment data that DEQ may have available.

**Table 3. Multi-metric indices currently used by DEQ in assessing aquatic life use support in streams and rivers**

In order to use these multi-metric indices for determining whether Tier 2 antidegradation protection is appropriate, scores for at least two indices must be available. DEQ will follow the protocols outlined in Idaho's Water Body Assessment Guidance – Second

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |

Edition (WBAG II) (Grafe and others 2002), or subsequent updates, for evaluating the indices. If the average of the indices is greater than or equal to 2, then DEQ will consider the water body to be of high quality and will apply the Tier 2 level of protection. If the average of the indices is less than 2, then the water body will not be considered high quality, and Tier 1 protection will apply. DEQ will incorporate biological monitoring data for the specific location of an activity or discharge that may become available during the permitting process.

There may be instances where biological data is available but is not compatible with DEQ's biological assessment protocols (not BURP-compatible). This is particularly the case for large rivers and reservoirs. In these instances, biological data collected by sources outside of DEQ (such as the USGS or Idaho Power, to name a few) is available, but the data may not have been collected in a manner that allows it to be reduced to the multi-metric indices used by DEQ. This data can still be informative; however, it will have to be evaluated on a case-by-case basis.

On the other hand, there may be instances for which there is no biological data available. In this case DEQ will try to obtain new information relevant to determining the appropriate level of protection from degradation to be applied. New information may come from DEQ, other agencies, organizations, companies or individuals. DEQ may ask the applicant to gather information to aid with this determination.

## *2.4 Recreation Beneficial Uses*

**Box 2.2 Recreational Toxics Criteria**

Toxics criteria applicable to protection of recreational use are typically concentrations in water. They are derived from the toxin's tendency to bioaccumulate in fish tissue and then be consumed by people. An exception is mercury, whose criterion is a concentration in fish flesh. This provides a more direct measure of human exposure, and bypasses the consideration of bioaccumulation from water in limiting the risk to health.

The assessment of recreational use support is typically based on traditional measures of water quality which can be compared to numeric criteria such as bacteria criteria and toxics criteria. The most common measure of water quality used to assess support of contact recreation uses is the amount of bacteria present. Measured bacteria such as *Escherichia coli* (*E. coli*) indicate the likely presence of pathogens that could affect the health of swimmers and others who may ingest the water while recreating on or in it.

Data on concentrations of toxic pollutants is also used to gauge support of recreational uses such as fishing. While catching of fish is supported by a healthy reproducing population of fish and their food organisms, supporting consumption of those fish requires they have levels of contaminants that make them safe to eat.[4] Because fish that

4 The criteria assure acceptable risk at specific levels of consumption used to calculate the criteria.

are caught may be eaten, toxics criteria (see Box 2.2.2) for protection of human health apply to waters protected for recreational use. Recreational toxics criteria are different from those for the protection of aquatic life. The relevant pollutants are different and the criteria values for the same pollutant can differ greatly.

If a water body is listed as not fully supporting its applicable primary or secondary contract recreation beneficial uses, there should be accompanying water quality data indicating an exceedance of the water quality criteria (most notably *E. coli* concentrations may be elevated). Unlike aquatic life uses, DEQ does not have an assessment methodology independent from criteria for evaluating the support of recreational beneficial uses. There is no mechanism with recreation uses to override minor exceedances of criteria and independently determine the use is fully supported. Therefore, if a water body is listed as impaired for recreation, Tier 1 antidegradation for recreation will always apply.

## *2.5 Spatial Extent of Water Quality Characterization*

Because water quality within a water body unit or even an assessment unit can vary considerably, DEQ will evaluate and assign the appropriate level of antidegradation protection to the smallest subdivision of a water body unit that makes sense in terms of representativeness of data, but at least as small as an assessment unit (AU).

**Box 2.3 Examples of Water Body Classification for Antidegradation Protection**

This example will focus on several assessment units. AU 17060303CL001_05 is the Lochsa River from Deadman Creek to the mouth. This water body is in category 5 of the Integrated Report since it is not fully supporting its aquatic life beneficial use. However, the only identified cause for listing is temperature and there is no biological data available. This water body would be assigned an antidegradation Tier of protection based on a case specific evaluation. Although this water body may be listed for temperature, local knowledge suggests that this river is considered one of the best trout fisheries in the state.

While DEQ does its best to avoid sampling sites that are not representative of an AU, occasionally an AU may have a site or sites that are not representative of the unit as a whole due to either the sheer number of smaller waters lumped in the AU, access constraints, or monitoring strategies based on probability design for a statewide assessment.

For many AUs, it is also possible that there are multiple sampling sites to represent a single unit. In such cases, the sampling results are unlikely to be exactly the same among sites, possibly due to sampling in different years. In some cases multiple results may even be in conflict with regard to determination of support status.

In situations where there are multiple sampling sites per AU, DEQ will evaluate whether these sites are representative of the water that will be affected by a proposed discharge or

activity. If all the data are determined to be representative, then DEQ will follow the procedures established in WBAG II for evaluating the information. WBAG II directs the assessor to use the lowest multi-index score when there are only two sampling sites. See Appendix B for examples of this.[DE8] If data from more than two sampling sites are available, then the assessor is directed to average the multi-index scores into one score for the AU.

If some or all of the sampling sites are not representative of the water that would be affected by the discharge or activity, then DEQ may opt to use none of the data or only use data from those sampling sites that do represent the water affected. This means that, for antidegradation purposes, DEQ may further divide an AU where that makes sense.

This may especially be the case where an AU consists of a collection of 1st- and 2nd-order tributaries and where the activities and thus quality of water differ among the streams collected in the AU. If this is the case, DEQ will use only the data from the stream that would be affected by an increased discharge or activity, or in the case of a new discharge or activity, only sampled streams within the AU with comparable influences on water quality. Another example would be a larger (higher order) stream with sampling sites both upstream and downstream of an activity or discharge. In this case it makes sense to use only the nearest downstream sampling site. This is particularly wise if doing so avoids confounding effects that intervening tributaries may have on water quality.

The guiding principle is to look at and evaluate the tier of protection appropriate for the water that could or would be affected by a proposed activity or discharge. If this is only a portion of the AU, then it is sensible to use only the data that is relevant to the affected water's condition.

# 3 Evaluating Potential to Degrade

This portion of the document outlines the procedure for evaluating an activity or discharge to determine whether it will degrade or lower water quality, that is, change the concentration of a pollutant closer to a criterion. Only an activity or discharge that might cause degradation is subject to a Tier 2 antidegradation evaluation. This evaluation is performed parameter by parameter for parameters associated with the activity or discharge. If water quality is degraded by any one parameter, that will mean the activity as a whole degrades the water.

A proposed activity can result in existing receiving water quality being degraded, improved, or unchanged. To evaluate which of these will occur, expected water quality for two different effluent scenarios must be determined and then compared with each other. These two scenarios are:

1. without the increased activity or discharge, i.e. existing or currently permitted, and
2. with the new or increased activity or discharge, i.e. proposed or future.

Existing water quality is that which is permitted to occur, before any changes in the permitted activity or discharge. Existing water quality will likely need to be estimated rather than measured, due to variations in discharge and receiving stream conditions. Proposed water quality is that which may be allowed to occur in the future after changes in an activity or discharge are licensed or permitted. Proposed water quality can not be measured and must be estimated.

Potential existing water quality is estimated by calculating the mixing of the maximum permitted discharge with the receiving water under critical conditions. Performing this calculation again with the proposed discharge gives the potential future water quality. To perform these calculations we need to know five things:

1. the upstream water quality,
2. the effluent quality that is currently allowed (zeros if the proposal is for a new discharge),
3. the effluent quality that would be allowed under the proposal,
4. the activity's design or maximum production-based flow, and
5. the appropriate critical flow of the receiving water, or multiple flows for a 'flow-tiered' permit situation.

All new regulated activities or discharges may degrade water quality as they present new pollutant loads added to the receiving water body. Similarly, an expansion or increase of an existing discharge may also cause degradation of water quality. However, degradation may be avoided if, for example, the quality of the new discharge is as good as or better

than receiving water body quality, or if the increased loads are offset by companion load reducing activities.

Existing activities that propose no expansion or existing discharges that propose no change in their discharge upon renewal of their permit or license will not cause degradation of water quality[5]. Non-degrading activities and discharges are not subject to Tier 2 antidegradation review. Thus, once it is determined that an activity would not expand or a discharge would not increase, the only antidegradation question is whether Tier 1 requirements are met.

[5] It is possible that water quality could decline even if an activity or discharge does not increase, such as due to a decrease in flow and thus assimilative capacity of the receiving water body. If this change in flow is not due to the activity or discharge under review then that activity or discharge will be not be held responsible with regard to antidegradation requirements. In such a situation compliance with water quality-based effluent limits may require a reduction in activity or discharge independent of antidegradation requirements.

### *3.1 Receiving Water Quality*

It is the change in receiving water quality caused by an activity or discharge that is the concern of antidegradation policy. In flowing waters our focus is on downstream water quality that results from mixing of discharge with the receiving stream. However, in order to calculate resulting water quality for a new activity or discharge or for an increase in an existing discharge, we need to know the quality of the receiving water body unaffected by the increased or new activity or discharge in question, before mixing or upstream in flowing waters. Thus, receiving water quality at two locations is of interest:

1. Before / upstream. A location where the water body is not influenced by the source under consideration. This is either immediately upstream (in a river or stream) or outside the influence of the plume (for lakes or reservoirs) for existing sources; or water quality at the place of discharge before new discharge begins.

2. After / downstream. The location where water quality will reflect the addition of pollutants from the proposed activity or discharge.

**Upstream vs. Downstream**

It may be tempting to view degradation of water quality simply as the change in quality from upstream to downstream. While this comparison works for a new activity or discharge – because it amounts to the same thing as the before/after change in downstream water quality – it does not work for an existing discharge. For existing discharges there may be a change in water quality from upstream to downstream, but this difference may not indicate worsening conditions due to a change in discharge. Antidegradation review is forward looking and so to fairly judge both new and existing discharges we look at the ~~change in~~ downstream water quality before and after a change in permitted operation.

**Characterizing Upstream Water Quality**

Knowing upstream water quality is essential to calculating potential degradation of new and increased sources, and remaining assimilative capacity. While it is important to adequately characterize upstream water quality, how much data this takes will depend on water quality variability and how much uncertainty can be tolerated in the analysis. Depending upon the quantity of available background data, DEQ will generally use a conservative estimate of pollutant concentrations when calculating degradation.

EPA Region 10 typically uses the 95th percentile (i.e., the value that is expected to be exceeded 5% of the time) of measurements as a conservative characterization of ambient concentrations when evaluating permit limits[6]. In particular, EPA uses this value for evaluating limits based on receiving water criteria applicable to relativity short-term effects (e.g., acute and chronic aquatic life criteria). However, getting a reliable estimate of the 95th percentile requires sufficient data. Generally, 30 measurements across the full range of variation are recommended although as few as 12 (monthly samples for a year) will be acceptable. If fewer than 12 measurements are available, DEQ will use the maximum observed during critical conditions, rather than an estimated 95th percentile. If no data are available, DEQ may request that the applicant obtain such data.

[6] Idaho has proposed methods for calculating WQBELs, including how to define ambient concentrations, in both a WQBELs guidance document and a Board of Environmental Quality rule-making (both developed in 2002). EPA has not adopted DEQ's guidance or rule for permitting purposes, and thus DEQ's antidegradation calculation procedures will need to be consistent with EPA's permitting calculations for as long as EPA retains NPDES primacy.

[7] For example, DEQ's guidance for implementing its criteria for mercury recommends use of the mean value for water column or fish tissue concentration as related to the human health criterion, and recommends the geometric mean for potential future aquatic life criteria (DEQ, 2005). Another example is the Idaho Falls NPDES permit in which EPA evaluated phosphorus limits using a median value for the upstream concentration.

For other types of receiving water criteria (e.g., criteria based on longer form effects such as those applicable to human health or nutrients), a more appropriate assumption for upstream water quality would be a representation of the "central tendency" (such as a mean, geometric mean, or median)[7]. In addition, DEQ recognizes that differing time periods will apply to derivation of central tendency values for different types of designated uses and associated criteria. For example, annual averaging would be appropriate for mercury, annual or seasonal for nutrients, and during summer critical periods for pollutants such as dissolved oxygen and temperature. Such temporal considerations apply not only to upstream concentrations, but to other elements of limits calculations (sections 3.2 and 3.3).

**Comment [BB10]:** Clarification needed. Longer "form" effects?

DEQ expects sufficient data to usually be available in the permit or license application and discharge monitoring reports for existing NPDES-permitted discharges. For the latter, DEQ also expects to rely heavily on EPA's calculation of upstream water quality prepared in their drafting of effluent limitations for the permit. Depending on the permitting situations these calculations may need to address seasonal water flows and a flow-tiered discharge framework

Measurements of upstream water quality are important but may not be sufficient. This is because measurement of upstream quality may not reflect potential upstream quality, that is, the quality that would occur with other sources upstream discharging at their permitted limits. Potential upstream quality must be estimated so that we know the remaining unallocated assimilative capacity and ensure that we do not over-allocate it. This also affects the determination of whether an increase in discharge is significant or not (see section 5.1). Therefore, some situations may require the calculation or modeling of upstream water quality.

The question of how far upstream to look for other sources effecting water quality at a point downstream is not easy to answer. As everything flows downstream it is clearly desirable to consider the entire upstream watershed, but as a practical matter a more limited geographic scope is needed. Also if there are large increases in flow, or upstream sources are relatively small, or they are already discharging at their permitted maximum, their effect on future change in water quality will be small. It is suggested that when estimating the potential water quality immediately upstream of a new or increased discharge that the upstream limit for taking into account other permitted sources that may be affecting that water quality be the upstream boundary of the 4th-field HUC, i.e. subbasin, or one subbasin above if the source under evaluation is closer to the upstream rather than downstream extent of the subbasin in which it is located.

Most pollutants are not strictly conservative, meaning that they do not just accumulate or steadily increase downstream; instead they are physically, chemically, or biologically active and they experience transformation or fractionation with time and travel. They may adsorb to sediments, combine with other constituents and precipitate, be converted into a gaseous form and lost to the atmosphere, be taken up by living organisms, or otherwise lost from the water column. Thus assimilative capacity is more than mere dilution.

Although the possibilities are nearly endless, there are a few parameters and pollutants for which relatively common and dominant transformations are known well enough to be modeled. Dissolved oxygen, nutrients, and temperatures are examples of very non-conservative parameters. Any estimate of their concentration that is not representative of a physical point near the source of load increases will likely be more accurate if modeled to account for known transformations.

Upstream water quality may be affected by distant sources, some of which may not currently be discharging at their allowed limits. This is a situation in which modeling can be quite useful and perhaps necessary. Ultimately, the decision whether to estimate water quality with modeling or with simpler mixing calculations is up to the person analyzing effects on water quality. This decision to model should be driven by the pollutant, acceptable error in the estimates, and whether time and data are available to conduct modeling. Even though monitoring data may not reflect potential upstream water quality it is valuable in calibrating model predictions.

Simple mixing estimates that ignore pollutant fate and transport are always a starting point and may be sufficient in many instances. There is no point in conducting modeling that will not improve upon simpler estimates.

Recommendations for modeling:
- Always model dissolved oxygen and temperature.
- Seriously consider modeling forms of phosphorus and nitrogen, as suggested by tolerance of uncertainty.
- Only model other pollutants if needed to reduce bias in conservative mixing estimates.

Recommended references on water quality modeling are the text by Steve Chapra (Chapra 1997) and the Council for Regulatory Environmental Modeling 2009 Guidance (CREM 2009).

To summarize, upstream water quality can be determined by a number of methods. The method(s) used will depend on the site-specific situation, such as the extent of monitoring data available, existing upstream point source discharges, and the specific characteristics of the pollutant(s) of interest. For certain situations, the use of monitoring data, especially where there are extensive data (for example 30 or more measurements to calculate a 95th percentile concentration) may be sufficient. For other situations, calculations or modeling using the appropriate model for the parameter(s) of interest may be needed.

### *3.2 Effluent Characteristics*

Much of the needed information on effluent quality and quantity will be found in the current and/or proposed permit or license. Additional information may be found in the permit application and, for an existing discharge, in discharge monitoring reports.

For pollutants with quantitative limitations in a permit or license, those limits will be used in calculation of the discharge's effect on water quality. However, there are two common situations in which data in the permit alone will be inadequate to assess the effect of a new or an increased existing discharge on water quality:

- **No permit limits:** In either a new or an increased existing discharge, a pollutant may be known to be present for which there are no effluent limitations (no technology-based effluent limitation requirements) and for which it has been determined there will be no reasonable potential to exceed (RPTE) criteria. In this case, there will be no permit limits in either the new or reissued permit from which to calculate degradation.

- **First time permit limits:** In the renewal of an existing permit, a pollutant may be added for the first time, either because of new regulation or due to an increase in discharge leading to RPTE. In this situation, there will be a limit in the reissued permit but not a limit in the old permit.

Even for pollutants without permit limits there can be degradation of water quality. Thus it will be necessary to determine both the current and proposed quality of the effluent for pollutants of concern regardless of whether they rise to the level of needing permit limits. For NPDES discharges this is typically limited to information on characteristics of the discharge as described in the permit application.

A first time permit limit suggests there will be degradation of water quality but this is not necessarily the case. A new limit could be due solely to a change in regulation, e.g., a new or more stringent criterion or a new effluent limitation guideline, and therefore not result in worsening of water quality. In these situations it will be necessary to determine the quality of the effluent prior to the limit, and compare it to the quality with the proposed new limit. Current effluent quality for a pollutant without a prior limitation must be based on discharge monitoring data or, lacking monitoring data, estimated based on other similar discharges.

Where new limits are a result of reasonable potential analysis in absence of any actual increased discharge of pollutants, it is essential to apply the same statistical procedures to characterize the quality of the effluent prior to a new limitation as are used in developing the new limit, e.g., procedures in EPA's Technical Support Document for Water-Quality Based Toxics Controls (TSD) (EPA, 1991)[8]. If the same statistical procedures are not used water quality could appear to change when in fact it is unchanged. Information on proposed effluent quality with regard to a limited pollutant may be found in the permit application or, lacking such information in the permit application, may be estimated based on other similar discharges.

8 Citation of the TSD here is used as an example of the statistical procedures that are often used in deriving NPDES permit limits. This is not to say the TSD is appropriate for all pollutants or discharge situations, or that other statistical procedures may not be used. The point is that the same statistical procedures should be applied to both the current and future discharge scenarios when judging if discharge has increased.

9 An adverse change in water quality is one which moves the concentration of a pollutant closer to the most limiting applicable criterion, thus reducing assimilative capacity.

### *3.3 Calculating the Effect of an Activity or Discharge – Will Degradation Result?*

Antidegradation is concerned with adverse change[9] in water quality that may occur due to a new or changed activity or discharge. Therefore, for rivers and streams, our focus is at a point downstream of the activity or discharge and on a comparison between potential existing water quality (under the current permit or license or lack thereof), and potential water quality in the future (under the proposed permit or license). For lakes and reservoirs, modified methods of calculating the effect are in the section on Modification for Lakes and Reservoirs, page 30.

As a practical matter we focus on the change in water quality near the source and after appropriate mixing in determining if the change is adverse and significant and make two simplifying assumptions:

**Box 3.1 Conservative versus non-conservative pollutant behavior**

If a pollutant is conservative, then conservation of mass implies that average cross-section pollutant concentrations where mixing is incomplete will be the same as ultimate fully-mixed conditions. If mass is lost, i.e. a non-conservative pollutant, calculations based on dilution alone will overestimate fully mixed concentrations.

While near and far are not precise terms they are useful when estimating the effect of a discharge on water quality. Near the point of discharge the time elapsed is generally too short for any significant transformations of pollutants to have occurred. Thus average cross-section pollutant concentrations may be reasonably calculated considering dilution only, even for non-conservative pollutants such as dissolved oxygen, ammonia, and temperature.

Farther away from the point of discharge fate and transport for non-conservative pollutants becomes increasingly important. At some distance (time of travel) from the point of discharge, accurate estimates of non-conservative pollutant concentrations requires accounting for their transformations during transport in addition to mixing.

When examining the effect of a discharge we can consider effects near the point of discharge or those far beyond the point of discharge. Near-field effects are those that generally occur up to the edge of any authorized mixing zone. The times involved are generally too short for significant transformations of pollutants to occur and therefore pollutant concentrations in the near-field may be reasonably calculated considering dilution only, even for non-conservative pollutants.

Farther away from the point of discharge fate and transport for non-conservative pollutants becomes increasingly important. In the far-field, distant from the point of discharge, accurate estimates of pollutant concentrations require accounting for fate and transport.

1) Near a source all pollutants can be treated as conservative (see Box 3.1);

2) While mixing may be incomplete near a source fully mixed concentrations provide a fixed reference on which to gauge change in water quality.

For conservative pollutants this near-field analysis will not necessarily assure water quality criteria are not exceeded further downstream, and conversely may overestimate exceedance for non-conservative pollutants. For accurate assessment of distant effects a far-field analysis taking into account fate and transport and additional loading that may be occurring downstream is needed. This is generally the province of a TMDL and not permitting.

For all activities or discharges we calculate their effect on downstream water quality as:

$C_p - C_c = C_{diff}$ or $\Delta C$ *Equation 1. Effect on downstream water quality*[10]

10 Please note that the equations presented are general, i.e. without units of measure. In use, consistent measurements units must be used and/or appropriate conversion factors. For example to get pollutant load expressed in lbs/day from equation 3 with a flow measured in millions of gallons/day and a pollutant concentration measured in mg/l the result must be multiplied by a unit conversion factor of 8.34.

Where:

$C_p$ = proposed downstream water quality, after mixing

$C_c$ = current downstream water quality, after mixing

$\Delta C$ = change in downstream water quality, after mixing

DEQ will evaluate the effect on water quality for each pollutant of interest. If ΔC is in an adverse direction, i.e., it moves pollutant concentration closer to a criterion for a particular use, there is degradation of water quality.

Now let us turn our attention to calculating current and proposed water quality for use in *Equation 1*. For this, we will consider two situations: first, a completely new activity or discharge—more simply a *new discharge;* second, an expansion or increase in an existing activity or discharge—more simply an *increased discharge*.

For both new and increased discharges, the following simple mixing equation can be used:

C = *Equation 2. Mixing equation for effect of discharges* disupdisupQQLRLR
Where:
C = fully mixed concentration in the receiving water body resulting from discharge, generally downstream
= receiving water body pollutant loading rate, upstream of the discharge upLR
= discharge pollutant loading rate disLR
= receiving water body flow, upstream of the discharge upQ
= discharge flow disQ
Loading rates are calculated as product of flow and concentration, such that:
= x $C_{up}$, and *Equation 3. Loading rates* upLR
= x $C_{dis}$ disLR

Where:
$C_{up}$ = pollutant concentration in receiving water body, upstream of the discharge
$C_{dis}$ = pollutant concentration in the discharge

*Equation 2* is generic and dynamic. It has infinite solutions but we are interested in a particular pair of solutions for each pollutant of interest. These two solutions are 1) for the current receiving water concentration ($C_c$), and 2) for the receiving water concentration that would result from the proposed permit limits ($C_p$)[11]. If seasonality or 'flow-tiered' permit limits are involved there will be multiple such pairs. These concentrations are determined using low-flow conditions in the receiving water body and permit conditions associated with the instream low-flow condition. These flow conditions are termed critical conditions and are described in greater detail in the following section.

11 Note that *Equation 2* works as well if $Q_{dis}$ were zero and the discharge load a direct input. Upstream load on the other hand is always calculated from *Equation 3,* because receiving stream flow must be known as well as concentration.

**Critical Conditions**

Critical conditions are typically a combination of the maximum permitted effluent flow, maximum projected effluent concentrations or maximum allowable effluent limitations, critical conditions (e.g., "critical flows") of the receiving stream, and upstream receiving water quality concentrations (as determined by monitoring, calculation or modeling). If there is consideration of seasonality or 'flow-tiered' effluent limits there will be multiple sets of these critical conditions.

When flow or volume in the receiving water body is low, addition of a pollutant will have a greater effect on its concentration than when flow or volume is high, simply because there is less water to dilute the pollutant load. Therefore, to evaluate what could be a realistic "near worst case scenario", we must consider critical conditions for dilution that could occur. The maximum discharge flow is based on the facility design capacity or production-based maximum discharge. This will be stated in the permit or license for the current discharge and in the permit application for the proposed discharge. The receiving water body critical flow is determined according to the WQS (at §210.03) for each pollutant evaluated, e.g., for chronic aquatic life criteria, this is the 7Q10 flow. For nutrients, it is recommended that the 30Q10 flow during the growing season (e.g. April-September) be used. For mercury, it is recommended that the annual average flow be used. For temperature and dissolved oxygen, the 7Q10 flow is also useful but may be calculated on a monthly basis to account for seasonality.[12]

12 Calculation of low-flows for regulated systems should only include flow data from the period of flow regulation.

13 There will be even more pairs of conditions to be evaluated if seasonality or flow-tiered effluent limits are involved, one pair of critical conditions for each season or flow-tier.

**Comment [BB11]:** Don - Going back to our email exchange of 6/8-9/11, a determination that it is not appropriate to mix the data for two flow regimes (the portion of the hydrograph affected by regulation and the portion of the hydrograph not affected by regulation), and a determination that it is appropriate to entirely disregard the data for one of the flow regimes, can be related but separate decisions. Footnote 12 states that only flow data from the period of regulation should be used. What if the "worst case" design conditions (critical conditions) occur when regulation does not occur? The language should recognize the need to decide based on the specifics of the case under consideration.

For the effluent, the critical load is the maximum permitted load stated in the permit or license or, if a load is not stated, the product of:

- the maximum discharge flow as described above, and
- the maximum permitted effluent concentration.

The receiving water body critical load is the product of the critical flow described above and the potential upstream concentration determined as described in section 3.1 Receiving Water Quality.

There will be at least two sets of critical conditions to be evaluated[13]; one for the current permit or license and a second for the proposed permit or license. These will yield $C_c$ and $C_p$ in *Equation 2*, for each pollutant evaluated, to be then used in *Equation 1*. It is possible, but unlikely, that the receiving stream critical conditions used in the analysis will also differ between now and the future. An anticipated change in upstream flow regulation or diversion would be one possible cause of a change in critical stream flow.

**Modification for Lakes and Reservoirs**

Application of criteria to lakes and reservoirs depends upon how slowly water moves through the water body, also known as the detention time. A lake or reservoir with 15-days or less detention time is treated as flowing, i.e. as a stream or river. Those with more than a 15-day detention time are treated differently and the calculations described above need to be modified. This is because if there is little flow then the concept of upstream and downstream loses meaning and there is not sufficient velocity in the receiving water to facilitate rapid mixing.

Instead of flow rate in the receiving water body we will look instead at volume available for mixing, which is limited by rule. And instead of loading rates, we look at total load added over some period of time. Similar to the situation with flowing waters, critical conditions determine the appropriate values for these input variables.

C = *Equation 4. Mixing equation for lakes and reservoirs* disdisVVLL1010

Where:

C = mixed concentration resulting from discharge

= receiving water body pollutant load in $V_{10}$ 10L

= effluent pollutant load delivered over the time it takes to exchange mixed volume of receiving water body at critical inflow disL

= receiving water body volume available for mixing 10V

= volume of effluent discharged over time it takes to exchange mixed volume of receiving water body at critical inflow disV

The limitation on mixing volume in lakes and reservoirs is based on the limitation in the Idaho WQS that the horizontal extent of a mixing zone in a lake or reservoir is not to take up more than 10% of the surface area (IDAPA 58.0102.060.01.f). In place of $Q_{up}$ we use $V_{10}$, the volume of the lake or reservoir beneath a circle centered on the point of discharge that encompasses one-tenth the minimum surface area of the water body. If the water body is stratified this volume should be limited to the layer (e.g. epilimnion or hypolimnion) to which the discharge occurs. A circle is used as a simplified depiction of the plume, which could instead be modeled or determined through a tracer study if a more accurate assessment is desired. The ambient load is a product of this volume and the ambient concentration outside the influence of the discharge plume.

Whether the water body is stratified at the time of critical low inflow will be based on when that critical flow occurs and depends on the pollutant. For example, if the pollutant is a metal that is toxic to aquatic life, then the critical low inflow would be the 7Q10 for all inflows combined. If critical inflow occurs the last week of September then that is the time when presence or absence of stratification would be judged. It would also mark the time when the volume available for mixing would be determined.

To determine the appropriate volume of discharge, and thus corresponding load to use in the calculation, we must determine the time period over which the discharge should be evaluated. This will be called the renewal time, and is described here as the time it would take critical inflow to replace the volume of water allowed for mixing. The volume of effluent discharged in this time is then mathematically mixed with the volume of water in the lake or reservoir allowed for mixing form above.

Ideally, a measurement or estimate in the area surrounding the point of discharge would be used. In absence of this, it is recommended that a suitable time be based on the volume of the mixed layer (e.g., epilimnion) for the entire water body divided by the critical inflow for the entire water body; let us call this the residence time. For example, if the volume of the entire epilimnion of a lake or reservoir is 1,000 acre-feet and the 7Q10 for all inflow is 25 cubic feet per second (cfs), then the residence time would be about 20 days (1,000 acre-ft / (25 cfs * 1.984 ac-ft/day/cfs) = ~20). So in the absence of more specific information about renewal time in the actual area allowed for mixing, we expect the volume allowed for mixing to exchange at the same rate as for the entire water body[14]. Thus, in this example, the volume and load of effluent used in *Equation 4* would be that which is discharged in 20 days.

14 This is a crude approximation that is unlikely to hold true in portions of lakes and reservoirs that have irregular shorelines and deep bays. In such areas, the exchange rate could be considerably slower than for the water body as a whole and the residence time much longer. This simplifying assumption should be used with caution. Where the simplifying assumption is not appropriate, area specific exchange rates will be evaluated and used.

15 Although very unusual, it is possible that where effluent discharge dominates water quality the receiving water quality becomes worse even though discharge load decreases, e.g. a decrease in discharge volume coupled with an increase in effluent pollutant concentration.

As with streams and rivers, *Equation 4* would be calculated for two conditions – existing and proposed. Those paired results would be used in *Equation 1* to quantify the proposed change in water quality.

Alternatively, a three-dimensional hydro-dynamic model could be used to identify the worst case water quality conditions at the edge of any authorized mixing zone, with the mixing zone not to exceed 10% of the lake or reservoir's surface area.

**Change in water quality requires change in discharge**

It should be obvious that there has to be a change in an existing discharge in order for that discharge to cause a change in water quality that may be subject to regulation. Therefore, for purposes of antidegradation review, we can conclude an existing discharge is non-degrading if there are no changes in the discharge. Appendix C contains various examples of new or increased discharges and how they would be addressed.

Normally, an existing discharge must increase its pollutant loading in order to degrade the receiving water body's quality[15]. An increase in load may occur through either an increase in concentration at static discharge volume or an increase in the discharge

volume with no change in, or possibly even a decrease in concentration. Concentration changes may be pollutant specific, while changes in discharge volume affect the loads of all pollutants.

While increased loads typically result in worse water quality, it is possible for an increased discharge load to decrease concentrations of a pollutant in the receiving water body. This oddity occurs when effluent quality is better than receiving water quality. It may also occur when flow tiers in a flow-tiered permit are adjusted with no increase is discharged load.

**Mixing**

Below the point where an activity or discharge adds pollutant load to the receiving water body, downstream water quality is in transition, changing more or less rapidly. Eventually, after full mixing, downstream receiving water quality will reach a steady state. Mixing zone characteristics, particularly location and diffuser design, are important to minimize the physical size of this transition zone and possible adverse effects, and these characteristics often limit the volume that may be used to dilute a discharge.

Irrespective of how quickly mixing occurs or the size of a regulatory mixing zone, we can calculate downstream water quality that results from an activity or discharge only if we specify the volume of water it mixes with. Using that volume we can calculate the fully mixed result as a reference point for change in water quality. As a practical matter we recommend assessing changes in water quality for antidegradation purposes based on full mixing. We recommend this because regulatory mixing zones represent partial mixing, may change in size with time, such as due to a change in diffuser design, and are always sized so that criteria are met at the edge of the zone. [16]

16 Pollutant concentrations resulting from discharge will always be less at full mix than partial mix, so too the magnitude of change in those concentrations due to an increase in load. A partial mix point could be used for assessing change, but the dilution ratio would need to be the same for existing and future conditions.

## *3.4 Other Considerations*

In evaluating changes in water quality, there are several other things to consider. These include whether upstream pollution reductions will offset downstream increases, whether adverse changes are temporary, and whether more information is needed to draw conclusions.

**Use of offsets**

The Idaho antidegradation rule allows for the use of offsets to proposed increases in pollutant load to Tier 2 and 3 waters (Tier 1 waters are already covered by pollutant trading). The rule requires that the offsets occur before an activity or discharge commences and be upstream of any potential degradation. The diagram in Figure 3 shows

degradation resulting from a discharge with no offset. The diagram in Figure 4 shows no degradation resulting because water quality upstream is improved before the discharge is added—the upstream improvement of water quality offsets the downstream lowering of water quality resulting from the discharge.

For some pollutants, e.g. nutrients, there may be a lag in their effect on water quality. This would appear as a gap between the point of discharge and the water quality degradation shown in Figure 3. In this case the location of an offset could be below the point of discharge yet upstream of degradation.

**Figure 3. Diagram of discharge without offset.**

**Figure 4. Diagram of discharge with offset.**

The idea is that through properly conducted offsets there will be no net degradation (i.e. lowering) of water quality, not even in a portion of the receiving water, relative to current conditions. There would be, as the diagrams show, upstream to downstream
changes in water quality. However, due to placement of the offsets, water quality at all points in the stream would still be better after than before the discharge plus its associated offsets. Degradation is avoided and this avoids the need for antidegradation analysis in Tier 2 waters and makes it possible to allow new or increased discharge in Tier 3 waters.

Because of placement considerations and lack of flow, the use of offsets in lakes and reservoirs to assure no degradation is problematic but may be considered by DEQ.

**Temporary Activities**

For temporary activities, DEQ may conclude that because of the limited duration and scope of their effect no significant degradation of water quality will occur. When evaluating such projects, DEQ may consider the following:

- duration and extent of water quality impact
- likelihood for long term water quality benefits to the water body; and
- potential for delayed, cumulative or long-term effects on existing beneficial uses

DEQ may conclude that no significant, permanent degradation will occur if all appropriate and reasonable BMPs related to erosion and sediment control, project

stabilization, and prevention of both short and long-term water quality degradation will be applied and maintained (e.g., preserving vegetation, stream bank stability, and basic drainage).

Examples of projects that may result in only temporary water quality impacts include culvert replacements, bridge installations, and streambank restoration. Such projects may cause a temporary increase in sediment. As an example, culvert replacements which are done in accordance with the Idaho Forest Practices Act (FPA) may be deemed to comply with Idaho's antidegradation implementation rule.

**Request for additional information**

In evaluating proposed changes to water quality, DEQ may find it necessary to request from the applicant additional information on the proposed activity or discharge. Such information may include details about the proposed project's location or operation, outfall design, effluent characteristics, or monitoring data for the receiving water body. This is particularly likely if modeling is involved in estimating upstream water quality or plume configuration.

# 4 Tier 1 Review – Protecting Existing Uses

This section of the document describes the review that is performed to assure existing uses are protected.

Existing uses and the water quality necessary to protect those uses must be maintained. In addition, all activities or discharges must not cause or contribute to a violation of water quality criteria. For National Pollutant Discharge Elimination System (NPDES) permitting, ensuring the water quality necessary to protect existing uses will generally be assured through evaluating reasonable potential to exceed (RPTE) water quality criteria. This evaluation is based on the lowest applicable criterion and must protect the most sensitive use, whether or not existing uses are designated. The key in this process is to determine what the existing uses are and whether they are more sensitive than the water body's designated uses or undesignated presumed use protections.

## *4.1 What is an Existing Use?*

The regulatory definition of an existing use is:

Those beneficial uses actually attained in waters on or after November 28, 1975, whether or not they are designated for those waters in Idaho Department of Environmental Quality Rules, IDAPA 58.01.02, "Water Quality Standards."

Thus if historical data indicates a use has once occurred (between now and November 28, 1975), it would be an existing use.

Two questions that regularly come up when discussing existing uses are:

- What does it mean for a use to be actually attained?
- Is the suite of possible use choices limited to those described in the Idaho WQS?

It is not the purpose of this guidance to fully explore these questions, so as a practical matter the following answers are provided for purposes of antidegradation:

- A use may be determined as existing as described in Chapter 3 of Idaho's WBAG II (Grafe and others 2002). DEQ will use all available information to make this determination including information in any completed Subbasin Assessment (SBA).
- Existing uses will generally fall within the beneficial use choices defined in the Idaho WQS. These uses will be protected and maintained by applying the numeric and narrative criteria in the Idaho WQS.

Once the applicable uses are determined—for most water bodies, there are several uses—a Tier 1 review is generally a matter of assuring that an activity or discharge will not cause or contribute to a failure to meet applicable criteria for the most sensitive use in the receiving water, which may mean at the edge of any authorized mixing zone.

**Comment [BB12]:** On October 1, 2010 EPA commented on IDEQ's proposed antidegradation implementation rule. EPA identified specific areas of concern where EPA approval would be unlikely if those concerns were not addressed. Existing use protection was one of those areas.

EPA expressed concern that the proposed rule was based on a premise that the criteria in Idaho's water quality standards will ensure protection of all existing uses in all cases, and that Idaho's list of potential designated uses at IDAPA 58.0102.100 covers all potential existing uses. EPA commented that it was important that the antidegradation provisions provide for protection of existing uses that are not designated in Idaho's water quality standards, and provide for the possibility that the criteria in Idaho's standards may not always ensure the water quality necessary to protect all existing uses.

IDEQ made suggested revisions to the proposed rule to address EPA concerns. However, those concerns are raised again in the draft guidance. On 3/9/11 EPA provided suggested edits to the guidance to address EPA's concerns. While for the most part those suggestions are included here, a key point of EPA's comments and suggested edits is still not reflected. Please note that we have inserted "generally" at several points in the Tier 1 review discussion.

While it may be that in most cases, or potentially all cases, the criteria in Idaho's water quality standards will ensure protection of all existing uses, and that the list of potential designated uses at IDAPA 58.0102.100 covers all potential existing uses, foreclosing the ability to address exceptions is a concern. EPA has suggested edits intended to reflect IDEQ's expectation, without foreclosing the ability to address, consistent with 40 CFR 131.12(a)(1), other situations that may arise.

**Comment [BB13]:** Insert

**Comment [BB14]:** Insert

**Comment [BB15]:** Insert

**Beneficial Uses**
The Idaho WQS describe the beneficial uses that may be assigned to water bodies at IDAPA 58.0102.100, Surface Water Use Designations. Specifically, these are by category (aquatic life, recreation, or water supply) and subcategory (for example, *cold water* aquatic life or *primary contact* recreation):
**Aquatic Life**
Salmonid spawning, Cold water, Seasonal cold water, or Warm water
**Recreation**
Primary contact or Secondary contact
**Water Supply**
Domestic, Agricultural, or Industrial

In addition wildlife habitat and aesthetic uses are recognized for all surface waters of Idaho [see IDAPA 58.0101.100.04 & .05].

Multiple use categories may apply to a given water body, and in fact all waters are required by the CWA to support both an aquatic life use and a recreation use. For aquatic life and recreation the subcategories are for the most part mutually exclusive; e.g. a water body is designated for either primary or secondary contact recreation and for either warm water or cold water aquatic life. An exception within the aquatic life category is that a water body may be designated as protected for both salmonid spawning and cold water aquatic life. Within the water supply category, however, the uses are not mutually exclusive. Agricultural and industrial water supply uses apply to all waters of the state [see IDAPA 58.0101.100.04 & .05]; and domestic water supply is designated on a case-by-case basis. So a water body might have all three water supply uses designated.

**Comment [BB16]:** Designation of secondary contact recreation would be exclusive of primary contact recreation. However, does not ID's designation of primary contact recreation carry with it a goal of providing for secondary contact recreation as well? That is, if primary is designated, secondary is too?

The subcategories, as listed above, are in somewhat hierarchical order, e.g., domestic water supply generally requires better quality than agricultural water supply, but this is not strictly so. The most sensitive use is discussed in more detail below.

## *4.2 Determining Applicable Criteria*

Uses are protected by criteria, which are specifications of:
 For some pollutants—a numeric limit on quality (numeric criteria), or

 For other pollutants—general narrative statements that prohibit harmful quantities of a particular pollutant (e.g., sediment narrative) or class of pollutants (e.g., nutrient and toxics narratives).

Narrative criteria play an important role in protecting uses from harm due to pollutants for which there is limited knowledge of adverse effects or difficulty in specifying broadly applicable numeric criteria. In determining use support status these criteria are often evaluated by looking at ecological, biological or other physical factors for a water

segment. However, a narrative criterion requires water body-specific interpretation; just as in a TMDL or water quality based effluent limits, to arrive at a numeric value useful in antidegradation. Together, numeric and narrative criteria cover all possible pollutants that may harm uses.

Ensuring the water quality necessary to protect existing uses in a Tier 1 review will generally come down to assuring that the applicable criteria for the most sensitive existing use, designated or not, will not be exceeded by the proposed activity or discharge.

**Comment [BB17]:** Insert

**Most Sensitive Use**

The use that is more sensitive depends on the pollutant – for example, humans are more sensitive to arsenic while fish and many other aquatic organisms are more sensitive to zinc. Since the CWA requires all waters of the U.S. to support some form of both recreation and aquatic life uses (unless it is shown such uses are unattainable), and many water bodies have other designated uses as well, multiple criteria apply. The result of these multiple uses and overlapping criteria is that the use of a water body with the most restrictive criteria determines the required water quality.

There will always be multiple uses existing or designated for a water body, resulting in two kinds or levels of multiple criteria. First, each use has its own set of relevant parameters, e.g. dissolved oxygen, temperature, arsenic, etc. for aquatic life and bacteria and arsenic and other bioaccumulative toxins for recreation. Second, where parameters are the same, the criterion set for each use may be different, e.g. the level of arsenic that will support aquatic life differs from that necessary to support fish consumption (recreational use). Thus, for each pollutant we are evaluating, we must determine whether there are multiple criteria values for that pollutant that differ by use. If different criterion values are applicable for a given pollutant, the focus in the Tier 1 review will be on the criterion for the use that requires better water quality. The use requiring better water quality is referred to as the most sensitive use[17]. This will vary from pollutant to pollutant. Some examples will clarify this.

[17] When we say most sensitive it is in the context of what we know now. There may be a more sensitive use that we are not aware of when we make this determination.

Let us consider a water body that has cold water aquatic life and primary contact recreation as existing or designated uses.

**Case 1 – Criterion for one use category but not the other.**

If bacteria are the pollutant, then a criterion exists for the recreation use but not for aquatic life, so recreation use is the most sensitive use for bacteria. For temperature and dissolved oxygen, criteria exist for aquatic life but not recreational use, and so aquatic life is the most sensitive use for temperature and dissolved oxygen.

**Case 2 – Criterion for both use categories.**
If arsenic is the pollutant, then there are different criteria values to protect aquatic life uses and recreational uses. For arsenic, the criterion for recreation[18], set to protect human health, is at lower levels than the arsenic criteria for aquatic life; thus, recreation is the most sensitive use. If selenium, zinc, or cyanide is the pollutant under evaluation, then the most sensitive use is aquatic life.

[18] Human health criteria for toxins such as arsenic applicable to water protected for recreation are based on exposure due to consumption of fish.

The example described above involves numeric criteria. Narrative criteria are fundamentally no different and can create either of the situations exemplified in the two cases above. A common example is sediment, for which aquatic life is generally the most sensitive use.

# 5 Tier 2 Analysis – Is Degradation Necessary and Important?

This section of the document describes the analysis necessary to determine whether significant degradation of high quality (Tier 2) water is justified. It also describes how DEQ will determine if degradation is significant or not, and how DEQ will be assured that controls on other sources of pollution to a high quality water body are being implemented before allowing justifiable degradation. Examples of Tier 2 antidegradation reviews are provided in Appendix E.

For waters that are determined to be of high quality (see Tier 2 determination in section 2.2 Assignment of Tier 2 Protection), the rules at IDAPA 58.0102.051.02 require that before DEQ allows degradation that is significant it must be shown to be:

"…. necessary to accommodate important economic or social development in the area in which the waters are located."

This requirement can be broken down into two components: 1) necessity of the degradation in water quality; and 2) importance of social or economic development associated with an activity or discharge. Hereafter we refer to this simply as necessary and important. For the latter, the geographic scope—the area in which the waters are located—is a necessary consideration that must be defined during the analysis. Assuring that degradation of high quality waters is necessary and important has been part of federal regulation since 1983 and DEQ policy as set in rule since 1993.

While necessity and importance are the core of Tier 2 analysis, federal regulations (40 CFR 131.12(a)(2)) and Idaho policy in rule (IDAPA 58.0102.051.02) also require:

"In allowing such degradation or lower water quality, the Department shall assure water quality adequate to protect existing uses fully. Further, the Department shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and cost-effective and reasonable best management practices for nonpoint source control."

In 2011, Idaho codified in rule antidegradation implementation procedures that address the above longstanding policy requirements and provide details on the determination of necessary and important degradation. The new rules also provide for allowing insignificant discharges to Tier 2 waters without analysis of necessity and importance.

When allowing degradation in a Tier 2 water, it is still necessary to assure water quality will adequately protect existing uses. That is the purpose of Tier 1 protection, which is provided to all waters and is addressed in section 4 Tier 1 Review – Protecting Existing Uses. Tier 2 protection is, in effect, an extra level of protection that goes above and beyond Tier 1 protection for high quality waters.

The remainder of this section goes into detail on four questions that come up only in Tier 2 antidegradation analysis:

1. Is the discharge insignificant?

2. Are other required controls in place and operating?

3. Is the degradation necessary?

4. Does the activity bring important social or economic development to the affected community?

It should be remembered that these questions apply only to:

- activities or discharges that will cause degradation, of
- high quality water where Tier 2 protection is assigned, when
- an applicant applies for a new or renewed permit or license

### *5.1 Insignificant Degradation*

Although the federal regulations make no mention of insignificant degradation, court cases have allowed for activities or discharges that are "de minimis," that is, too trivial to warrant governmental regulatory concern[19]. The purpose of determining whether some degradation is insignificant is to ensure that limited state resources are focused where they can provide the most good. A determination of insignificance simply means that Idaho is willing to overlook degradation that has little effect in order to focus on discharges or activities that create a larger amount of degradation. Determining that a discharge or activity is significant does not mean that the activity or discharge cannot take place, only that the discharge or activity will need to be justified as necessary and important before it can be permitted. Offsets may be used to prevent what would otherwise be significant degradation (see section 3.4 Use of offsets)

[19] In the specific case of antidegradation, the courts have accepted a loss of up to 10% of a water body's assimilative capacity as de minimis, as long as there is a cumulative cap on excused degradation (Kentucky Waterways Alliance v. EPA, 540 F.3d 466 (6th Circuit) Decided Sept. 3, 2008). A 10% threshold for significance is also stated in a August 10, 2005 EPA memo regarding "Tier 2 Antidegradation Reviews and Significance Thresholds" signed by Office of Science and Technology Director Ephraim King.

Idaho's antidegradation rule provides for determining a discharge is insignificant. Specifically, Idaho's rule at IDAPA 58.01.02.052.08.a provides:[dae9]

**a.** Insignificant Activity or Discharge. The Department shall consider the size and character of an activity or discharge or the magnitude of its effect on the receiving stream and shall determine whether it is insignificant. If an activity or discharge is determined to be insignificant, then no further Tier II analysis, as set forth in Subsections 052.08.b., 052.08.c., and 052.08.d., shall be required.

i. The Department shall determine insignificance when the proposed change in an activity or discharge, from conditions as of July 1, 2011 will not cumulatively decrease assimilative capacity by more than ten percent (10%).

ii. The Department reserves the right to request additional information from the applicant in making a determination a proposed change in discharge is insignificant.

Assimilative capacity is the difference between ambient concentration and concentration allowed by the controlling criterion. Allowing multiple insignificant regulated sources to collectively use all the assimilative capacity without going through a Tier 2 review is prevented by having a cap on cumulative degradation in water quality that is considered insignificant. Idaho bases its cap on assimilative capacity.

Idaho set a cumulative cap at 10% of assimilative capacity and establishes water quality conditions as of July 1, 2011 as the baseline. Without a cumulative cap, a series of insignificant discharges over time could cumulatively consume a significant share, or all, of the assimilative capacity and ultimately degrade water quality down to the level of the criterion without necessity and importance ever being questioned. A cumulative cap merely prevents the lack of analysis that could occur through a series of incremental steps, none of which are significant in themselves.

This works as depicted in Figure 5, so that the greatest amount of change in a pollutant concentration that can be dismissed as insignificant would occur when the ambient concentration of that pollutant as of July 1, 2011, is lowest.

0204060801000204060801 00Receiving Water Concentrations (ug/L)Criterion Concentrations (ug/L)No Tier 2 AnalysisCriterionProjected Water QualityBaseline Water Quality

**Figure 5. Insignificant Discharge This graph illustrates what would be considered "insignificant" when examining a single new/increased discharge in a high quality water without consideration of a cumulative cap. First, you determine the applicable baseline water quality. Then you compare that to the criterion to determine the remaining assimilative capacity. Ten percent of the remaining assimilative capacity is the basis for**

**an insignificance determination. The blue shaded area is the change in water quality considered insignificant in this example.**

Applying this for parameter concentrations regulated by narrative criteria, such as sediment and nutrients, will require determining a numeric value applicable to the receiving water body in question.

This can also be tabulated as shown in Table 4.

As an example, consider pollutant "Y" with a criterion of 100 ug/L and an ambient concentration of 20 ug/L as of July 1, 2011. The assimilative capacity for Y in the water is 80 ug/L and the threshold based on assimilative capacity would be 8.0 ug/L with a cumulative cap of 28.0 ug/L (10% of 80 ug/L = 8 ug/L added to the ambient concentration of 20 ug/L = 28 ug/L).

**Table 4. Example of Assimilative Capacity, and Associated Significance Thresholds (all values in ug/L)**

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presun be fully supported. Presumption based of pollution sources[2] |
| 2 | Waters for which all applicable uses tha been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable us to lack of data |
| 4a | Waters that have an EPA approved TM |
| 4b | Waters with controls other than a TMDI |

Now consider a series of discharges, or increases in a single discharge, over time to the same water body. Example 1 (

Table 5) illustrates how this would work for a series of four proposed changes in discharge for a pollutant with an ambient concentration of 20 ug/L as of July 1, 2011 and a criterion of 100 ug/L. Initially - that is as of July 1, 2011 - the remaining assimilative capacity is 80 µg/L, of which 10% or 8 µg/L, can be lost before the change in water quality becomes significant.

Only the final increase on Jan. 1, 2023 would be considered a significant change in water quality, because the cumulative change would exceed the allowable 10% loss in assimilative capacity. The first three cases of increased discharge are all insignificant because the cumulative loss of assimilative capacity does not exceed 10% (8µg/L) of the initial value (80 µg/L) on July 1, 2011.

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full support |
| 4c | Waters for which lack of applicable use support |

**Table 5. Example 1 of Significance Determinations for a Series of Changes in Discharge**

Now consider a second example for the same pollutant (criterion of 100 ug/L) in another water body where the initial ambient concentration is 80 ug/L as of July 1, 2011. The assimilative capacity for the pollutant in the water would be 20 ug/L and thus the threshold for cumulative loss based on this initial assimilative capacity would be 2.0 ug/L (10% of 20 ug/L = 2 ug/L).
Example 2 in Table 6 illustrates how this would work for the same series of proposed changes in discharge as in Example 1. Only the first discharge could claim insignificance. All subsequent discharges are over the cumulative cap and are thus significant, even though the incremental change for the third and fourth discharges is less than 2.0 µg/L.

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full |

**Table 6. Example 2 of Significance Determinations for a Series of Changes in Discharge**

Analysis of insignificance is necessarily done by pollutant. Thus, it is possible that some proposed changes in pollutant discharge will be found insignificant while others are significant for the same

discharge. When this is the case, even one pollutant causing significant change in water quality will trigger the need to take Tier 2 analysis further for that pollutant. If the proposed change in all pollutants evaluated is insignificant, then the discharge as a whole is insignificant and further Tier 2 analysis is not needed.

If a proposed activity or discharge is determined significant, it only means further Tier 2 analysis is required, it does not automatically mean the discharge is not allowed or must be modified. It is possible that no changes in the discharge as proposed are needed before allowing the discharge but that is the subject of alternatives analysis.

**Baseline Water Quality as of July 1, 2011**

Baseline water quality as of July 1, 2011 does not mean the conditions exactly on that date and that date alone, but rather the water quality under critical conditions that would exist given authorized discharges and non-point source activities as of that date. Furthermore, it is the quality that would be present if other sources of pollutants that affect water quality for the parameter under question were to be discharging at their full permitted load. This is the baseline water quality for judging loss of assimilative capacity and whether new or increased activity or discharge after July 1, 2011 will be causing significant degradation of water quality.

Where ambient monitoring data is available, such as from discharge monitoring reports (DMRs), DEQ recommends that the 95th percentile from at least a year of monthly data be used to characterize baseline water quality (See also section 3.1 for alternative statistical approaches characterizing water quality) . If there are upstream sources that contribute to baseline water quality, then their potential contribution to baseline quality, i.e. full permitted loads if that is not what they were discharging at as of July 1, 2011, will need to be added in. In situations where new or increased upstream sources have contributed to degradation of water quality since July 1, 2011, their contribution will need to be subtracted out.

For many water bodies, it is likely there will be insufficient monitoring data to document the baseline water quality as of July 1, 2011. This is especially true for new sources or a new process or new pollutant of interest. In these situations DEQ will do its best to anticipate the need for data and work with dischargers to acquire the data needed. This will be new data so it will be necessary for DEQ to do its best to estimate water quality under critical conditions by starting with measurements of present water quality, then "backing out" increases in pollutant loads authorized since July 1, 2011, to determine baseline water quality. A decision tree for various scenarios in determining baseline water quality as of July 1, 2011 is provided in Appendix F.

See section 3.1 Receiving Water Quality for more on determining baseline water quality.

## *5.2 Assurance Other Controls Are Achieved*

Federal regulations (40 CFR 131.12(a)(2)) and Idaho's policy in rule (IDAPA 58.0102.051.02) require that degradation of high quality water cannot be allowed unless measures to control other sources of water quality degradation in the watershed will be achieved. This analysis is specific to the pollutants/parameters that are determined to be

significant in the proposed or increased activity or discharge. In the Idaho policy, this is stated as:

In allowing any degradation of high water quality, the Department must assure that there shall be achieved in the watershed the highest statutory and regulatory requirements for all new and existing point sources and cost-effective and reasonable best management practices for nonpoint source controls. In providing such assurance, the Department may enter together into an agreement with other State of Idaho or federal agencies in accordance with Sections 67-2326 through 67-2333, Idaho Code.

The WQS define "cost-effective and reasonable best management practices (BMPs) for nonpoint source" as approved BMPs specified in the Idaho WQS and "highest statutory and regulatory requirements for point sources" as:

"All applicable effluent limits required by the Clean Water Act and other permit conditions. It also includes any compliance schedules or consent orders requiring measures to achieve applicable effluent limits and other permit conditions required by the Clean Water Act. " IDAPA 58.0102.010.45[dae10]

DEQ will generally review point source and nonpoint source controls on a WBID unit basis (including those areas upstream and downstream of the discharge) unless it is determined that a larger spatial extent is necessary for a particular pollutant. While no more is required of other sources than already is required before a new activity or discharge is proposed, this rule language does require DEQ to check up on other sources, in the context of proposed degradation of water quality, and verify they are meeting their respective control requirements or have an enforceable mechanism in place to achieve those requirements.

For other point sources that have NPDES permits, this verification means looking at permit compliance reports and identifying any matters of non-compliance that indicate that the pollutant(s) or parameter(s) of significance are being discharged at a level greater than permitted. If information is lacking, such as in any failure to monitor effluent as required, DEQ will not be able to determine compliance.

For nonpoint sources with approved BMPs, e.g., rules pertaining to the Idaho Forest Practices Act; Stream Channel Alteration Rules and Rules Governing Exploration and Surface Mining, and the Idaho Agricultural Pollution Abatement Plan, identify cost-effective and reasonable BMPs.

DEQ will make efforts to contact, work with, and generally rely on other agencies to verify all required pollution controls for point sources and cost-effective and reasonable BMPs for nonpoint sources are in fact in place and operating.

If noncompliance with required pollutant discharge controls or BMPs is identified for the pollutant(s) or parameter(s) of significance, then DEQ will determine if there is an enforceable agreement in place with the appropriate regulatory authority to achieve compliance. For situations where noncompliance is occurring and no enforceable agreement is in place, DEQ will notify the applicant that the requirements for potentially

allowing degradation are not met. DEQ may provide options to the applicant to consider on how to resolve such a situation, including contacting Designated Management Agencies.

### *5.3 Assuring Necessity through Analysis of Alternatives to Degradation*

As stated at the outset of this chapter, federal and state regulations require that in order for DEQ to allow degradation of high quality water it must be *necessary and important*. This section describes the process of determining whether it is necessary, and the process of determining importance is described in the next section.

Determining whether the proposed pollution is necessary requires an analysis of the various alternatives that are available to the discharger to identify the least degrading alternative that is reasonable to reduce or eliminate the pollutant(s) or parameter(s) of significance associated with the discharge. This analysis of alternatives identifies feasible alternatives, evaluates the reasonableness of implementing them, considers costs, and selects one that contributes the least amount of significant pollutant(s) possible under reasonable circumstances.

The Idaho antidegradation implementation rule (IDAPA 58.0102.052.08) establishes principles to be followed in identifying alternatives and selecting the least degrading alternative that is reasonable.

**c. Alternatives Analysis.** Degradation will be deemed necessary only if there are no reasonable alternatives to discharging at the levels proposed. The applicant seeking authorization to degrade high water quality must provide an analysis of alternatives aimed at selecting the best combination of site, structural, managerial and treatment approaches that can be reasonably implemented to avoid or minimize the degradation of water quality. To identify the least degrading alternative that is reasonable, the following principles shall be followed:

i. Controls to avoid or minimize degradation should be considered at the earliest possible stage of project design.

ii. Alternatives that must be evaluated, as appropriate, are:

(1) Relocation or configuration of outfall or diffuser;
(2) Process changes/improved efficiency that reduces pollutant discharge;
(3) Seasonal discharge to avoid critical time periods for water quality;
(4) Non-discharge alternatives such as land application; and
(5) Offsets to the activity or discharge's effect on water quality.

iii. The Department retains the discretion to require the applicant to examine specific alternatives or provide additional information to conduct the analysis.

iv. In selecting the preferred alternative the applicant shall:

(1) Evaluate economic impacts (total cost effectiveness, incremental cost effectiveness) of all technologically feasible alternatives;

(2) Rank all technologically feasible treatment alternatives by their cost effectiveness at pollutant reduction;
(3) Consider the environmental costs and benefits across media and between pollutants; and
(4) Select the least degrading option or show that a more degrading alternative is justified based on Subsections 052.08.c.iv.(1), 052.08.c.iv.(2), or 052.08.c.iv.(3) above.

Thus, consideration of alternatives that would still allow the desired development with less or no pollution is a required part of the Tier 2 demonstration of necessity.20

20 See EPA Advance Notice of Proposed Rulemaking (ANPRM) 63 Federal Register 36742, 36784 (1998).

**Evaluating Alternatives and Making a Choice**

While only technologically feasible alternatives should be considered, they will likely vary in their level of pollutant loading and may not all be reasonable. They may vary widely and non-linearly in cost-effectiveness of pollution reduction and involve competing environmental costs and benefits. Discharge alternatives will also rank in cost to the discharger and at some point will not be reasonable to implement. Choosing the preferred alternative becomes a matter of balancing cost of pollution reduction versus overall environmental gain, while remaining affordable. The type of pollution controls that are reasonable to implement will be pollutant and process specific.

In some cases, treatment costs can be and are passed on to the consumer, e.g. ratepayers in the case of a publicly-owned sewage treatment plant. Who will ultimately bear the cost is important in fairly assessing whether an alternative can be reasonably implemented.

To make the selection process more systematic a four step winnowing of alternatives is recommended, in which the following are determined:

1. amount of degradation caused,
2. cost-effectiveness of pollutant removal,
3. environmental cost-benefit tradeoffs, and
4. affordability of alternatives.

Because there are steps described in both the analysis of alternatives and the analysis of social and economic importance, the alternative analysis steps are labeled AA (the socioeconomic importance steps, in the next section, are labeled SEI).

**Timing and Integration of Alternatives Analysis**

DEQ believes earliest possible consideration of alternatives that will reduce or eliminate pollutant discharge is of paramount importance to minimizing project delay or redesign during water quality permitting and ultimately meeting the intent of antidegradation to maintain high water quality.

It is not DEQ's intent to create a whole separate analysis of alternatives in project design. Rather, to the extent there is a proposed discharge of pollutants that could degrade water quality, DEQ believes it is prudent to consider the implication of water quality degradation and the Idaho antidegradation requirements at the outset and integrate them into project design. To this end, DEQ encourages early communication between project designers, EPA or ACOE permit writers, other federal agencies involved in complying with the National Environmental Policy Act (NEPA) and DEQ staff that will be responsible for review of an application for permit or license.

**Identifying Non-Degrading and Less-Degrading Pollution Control Measures**

Minimizing degradation is a process to evaluate waste generation as well as treatment, and manner of waste disposal. This can involve changes in location or timing of discharge to surface water, as well as alternatives to the direct discharge to surface waters, such as land application, groundwater injection, or reuse. Finally an entity considering new or increased discharge of pollutants could work with other dischargers upstream in the same watershed to reduce pollutant loads upstream of the degradation and thereby offset their own proposed adverse effect on water quality.

For facilities that have an outfall, relocation or reconfiguration of an outfall or diffuser must be considered where appropriate. While this action alone will not reduce pollutant loads, it can be effective in reducing receiving water concentrations and thus the effect on high water quality. This is particularly true where a larger stream offering greater assimilative capacity is nearby and will be most useful as a consideration in location of a new facility, but for existing discharges it could be beneficial to extend pipe to a larger stream. Diffusers, which do not alter fully mixed concentrations, are effective in altering the extent and distribution of elevated pollutant concentrations and thus minimizing degradation of high quality water.

Generation of waste that needs to be treated and discharged might be reduced through changes in industrial process or greater efficiency in raw material utilization. The latter will save material cost as well as reduce waste. Sometimes a substitution in materials is found to be worthwhile if more costly raw materials create even greater savings in waste treatment costs. For a municipality, waste reduction could include such things as hazardous waste education and collection to reduce loads at the source. Other examples might be recovery of heat from an effluent, water conservation, or reuse.

Usually there is a critical or limiting time for waste discharge, typically during seasonal low flows when assimilative capacity of flowing waters is at a minimum. If wastewater can be stored seasonally or alternatively discharged seasonally, e.g. through land application or irrigation use during the summer, the critical time for aquatic life and recreation use may be avoided and thus reduce overall degradation of water quality and need for load reduction.

Ways to avoid discharge to surface water are to land apply it, inject it into ground water or use a closed loop reuse system. These all have their limitations, e.g. potential impacts

to groundwater and indirectly to surface water, and their own permitting requirements. But for some processes in some settings, such non-discharge alternatives can be viable. With the increasing shortage of water in many areas and overall increase in the value of water as a resource, some form of reuse, even if not in the original process, will likely become more attractive and commonplace with time and therefore could become more cost effective to implement.

Often there are multiple sources of pollution, especially for any sizeable receiving water body. Some sources may have been operating for a long time and although they are discharging legally, redesigning their facilities or processes may provide for greater pollution reduction than better design of a new source would. This creates an opportunity for the operator of a proposed new or increased discharge to join forces with other dischargers and forge a binding agreement that would reduce their combined pollutant loads and improve water quality of the water body as a whole compared to what may otherwise be the case.

With advances in application of pollution control technology there are examples in which what was once unreasonable or not even considered becomes possible, then reasonable, and eventually the norm. This is the likely progression for water use and treatment. New efficiencies and treatment technologies are almost certain to arise, driven in part by society's values and also made affordable by society's relative values. But these things cannot be predicted beyond general terms. To account for such changes, DEQ has reserved the right to require an applicant to examine specific alternatives such as reducing waste generation.

The overall goal of alternative analysis is to find ways to minimize or eliminate the detrimental effect on water quality by whatever means can be reasonably implemented for the pollutant(s) or parameter(s) of significance. This analysis may result in the identification of multiple reasonable alternatives. While some cost savings may ensue from some of the alternatives, for the most part steps to discharge less pollution are going to cost more and therefore raise the question whether it is reasonable to implement more costly pollution control alternatives.

**AA Step 1 – Ranking alternatives from least to most degrading**

First, all feasible alternatives should be ranked from least to most degrading of water quality. The applicant may bypass further analysis of alternatives (steps 2-4) by selecting the least degrading alternative feasible for the pollutant(s) or parameter(s) of significance.

If the applicant opts for the least degrading alternative at this point, the test of degradation necessity is met and analysis to determine social and economic importance should be conducted. If the least degrading feasible option is not preferred, then the next least-degrading alternative may be justified as reasonable on the basis of cost-effectiveness of improved pollutant reduction, environmental trade-offs, or affordability. Steps 2-4 are optional, needed only if the applicant wishes to justify that an alternative other than the least degrading feasible alternative is reasonable.

**AA Step 2 – Ranking alternatives by the cost-effectiveness of their pollutant reduction**

If proceeding, step 2 is to rank alternatives by their pollutant-reduction cost-effectiveness. Cost-effectiveness looks at the cost per unit mass of pollutant removed, e.g., dollars per pound ($/lb). Most processes generate an effluent stream or volume per day, therefore cost-effectiveness becomes unitized as $/lb/million gallons per day [MGD], or other comparable units.

Greater pollution reduction will typically cost more, but economies of scale and alternate technologies can result in different per-unit costs.[21] It is not within the scope of this guidance to go into detail on treatment costing and the amortization of initial capital costs versus ongoing operation and maintenance costs. Suffice it to say that if alternatives are ranked by their per-unit pollutant reduction costs, the marginal cost of improved pollutant reduction can be simply compared. Doing so may allow the justification of a more-degrading alternative if the incremental cost of improved treatment far outweighs the incremental gain in pollutant reduction.

[21] Some costs of treatment will be scalable. For example, power costs and cost of reagents such as alum go up in proportion to the volume treated. However, differing treatment alternatives have differing costs that aren't always proportional to volume. Instead, a doubling of pollutant reduction may cost more or less than twice as much. Therefore, options are best compared on a per unit basis, taking into account all various costs and their timing.

For example, if the least-degrading alternative removes 100 lbs of a pollutant for $10,000 per MGD, the unit cost is $100/lb/MGD. If the second-least-degrading alternative removes 90 lbs of the pollutant for only $900 per MGD, its unit cost is only $10/lb/MGD. The latter is much more cost-effective as there is a sharp jump in per- pound cost for removing the additional 10 lbs/MGD, a marginal cost of $910/lb/MGD ( ($10,000 - $900) / 10 lbs). In this case, it would be easy for the discharger to argue that the marginal cost of removing 10 more lbs of pollutant was unreasonable and thus the next best alternative should be accepted as the preferred alternative. In this way, alternatives that impose a cost that is disproportionate to the possible environmental gain may be eliminated from further consideration.

Consider the previous example further. If the third-least-degrading alternative could achieve pollutant reduction of 50 lbs at a cost of $450 per MGD, the cost per lb of treatment would be only slightly better at $9/lb/MGD and the marginal cost of nearly doubling pollutant removal compared to using the second-least-degrading alternative would be $11.25/lb/MGD ($900 - $450 / 40 lbs).

**AA Step 3 – Considering environmental trade-offs**

The example above, comparing alternatives' cost-effectiveness, looks at only one pollutant in isolation. There are almost always multiple pollutants in a discharge and what may be the best alternative for one may not be the best for another. This is a situation in which a lot of judgment is involved[m11].

As a hypothetical example, a discharge may involve adding heat as well as phosphorus to a receiving water. Some of the treatment processes and alternatives may be quite different, e.g., chilling for temperature and ultra-filtration for phosphorus; maximizing one will do nothing for the other and treatment costs will be additive. Finding the optimum environmental solution in this situation may involve some intermediate level of treatment of both phosphorus and temperature. A compromise in treatment may also be warranted if it is found that one of the pollutants is more limiting to support of beneficial uses.[dae12] In the latter case, it would make more environmental sense to favor the treatment of the limiting pollutant; in this example, favoring temperature reduction over phosphorus reduction. This could be further complicated if costs of treating temperature are substantially greater than the cost of treating phosphorus. In that case phosphorus treatment may offer more environmental benefit per unit cost of pollutant reduction, even though temperature overall is judged the more limiting pollutant. Another alternative for treating both may avoid such trade-off, e.g. land application could deal with both temperature and phosphorus at once, without additive costs for each pollutant, but a trade-off may occur in that there would be less water in the receiving water body.

Another form of environmental trade-off is between media—that is, reducing discharge to water may create more air pollution or solid waste to be disposed of. In addition to the direct effects of increased pollutant loads to other media, either of the latter may eventually affect water quality as well. For example, we may question the virtue of using electricity to run chillers to cool effluent temperatures (to keep our streams cooler) when we have every reason to believe the release of carbon dioxide from thermo-electric power generation contributes to global warming and thus to warming stream temperatures.

The choices may be difficult to delineate and hard to illuminate. It may be difficult to quantify such trade-offs in a common currency such as $/lb/MGD but efforts to do so will be useful and will help reduce the amount of judgment that will otherwise be required. No easy answers can be given, but nonetheless DEQ believes that thinking about and considering such trade-offs is important if not necessary. The applicant is encouraged to raise issues of environmental trade-offs, and may, but is not required, to quantify them.

The only thing we know for sure is that the less pollution discharged to the environment the better environmental quality will be. Finding the best place or medium in which to discharge them, and determining what is the most economically efficient way to treat and handle waste considering both public and environmental health versus public or private economic health is an ongoing challenge.

**AA Step 4 – Judging affordability**

Following an analysis of pollutant-reduction cost-effectiveness and environmental trade-offs, the affordability of the best remaining alternatives will be assessed by the applicant. [dae13]This assessment may be used to determine if an alternative is too expensive to reasonably implement. This approach might result in the selection of the next-least-degrading alternative, while maintaining affordability to the public or private entity.

Alternatives identified as technologically feasible are considered affordable if the applicant does not supply an affordability analysis.

Cost-effectiveness alone should not rule; it should be tempered by consideration of affordability and standard practice in the industry. In this example, the second-best alternative is only slightly less cost effective than the third-best ($11.25/lb/MGD vs. $10/lb/MGD) but offers a large improvement in pollutant load reduction. While overall treatment costs double they may still be quite reasonable—both affordable and worthwhile give their cost-effectiveness. Furthermore, if the $900 per MGD second-best alternative is commonly implemented by similar facilities, then the argument for the cheaper option is less compelling.

**Comment [BB18]:** Please see earlier comment on the definition of "affordable."

If the applicant determines that the least-degrading remaining alternative is affordable, then it is the preferred alternative. If it is not affordable, then the affordability of the next alternative should be evaluated until an alternative is chosen that is practicable, economically efficient, and overall reasonable.

A demonstration that an alternative is not affordable should be clearly documented and should show that it would have a substantial adverse economic impact that would preclude its use for the activity/discharge under review.

If, after appropriate discussions with the discharger, DEQ determines that the necessity of the preferred alternative has not been demonstrated, DEQ shall either request more information or deny certification of the activity as proposed.

### *5.4 Justification of Social or Economic Importance*

If the preferred alternative will result in degradation to the receiving waters, then the applicant must demonstrate that this activity or discharge will result in important economic or social development in the area in which the waters are located. A justification of social or economic importance (SEJ) entails showing that the social or economic benefits occurring from an activity are important to the affected community. An activity needs to be either socially or economically important, not both. However, depending on the nature of the project, it may be prudent to focus on one or the other.

The Idaho antidegradation implementation rule (IDAPA 58.0102.052.08) establishes principles to be followed in showing socio-economic justification of an activity that will cause significant degradation:

**d**. **Socioeconomic Justification.** Degradation of water quality deemed necessary must also be determined by the Department to accommodate important economic or social development. Therefore, the applicant seeking authorization to degrade water quality must at a minimum identify the important economic or social development for which lowering water quality is necessary and should use the following steps to demonstrate this:

i. Identify the affected community;

ii. Describe the important social or economic development associated with the activity, which can include cleanup/restoration of a closed facility;

iii. Identify the relevant social, economic and environmental health benefits and costs associated with the proposed degradation in water quality for the preferred alternative. Benefits and costs that must be analyzed include, but are not limited to:

(1) Economic benefits to the community such as changes in employment, household incomes and tax base;
(2) Provision of necessary services to the community;
(3) Potential health impacts related to the proposed activity;
(4) Impacts to direct and indirect uses associated with high quality water, e.g., fishing, recreation, and tourism; and
(5) Retention of assimilative capacity for future activities or discharges.

iv. Factors identified in the socioeconomic justification should be quantified whenever possible but for those factors that cannot be quantified, a qualitative description of the impacts may be accepted; and

v. If the Department determines that more information is required, then the Department may require the applicant to provide further information or seek additional sources of information.

A project that is socially justified is one that is important to the social development of the local community in at least one aspect, e.g., population growth or job growth or help meet important community service needs, e.g. sewage treatment or transportation infrastructure. Socially justified projects may include publicly-owned treatment works that provide additional capacity for wastewater treatment, reclamation of mine sites and cleanup of historical sites as such projects provide added environmental benefits. Socially justified projects would need to demonstrate that there is some local need for the project, i.e., identify the social conditions and relate how the project would fulfill those needs.

A project that is economically justified is a project that is important to the economic development of the local community. Economic development projects would include those that increase the economic base of the local community. An analysis of the economic importance of a project would likely require more in-depth analysis covering how the costs of the proposed degradation (including downstream effects) are equaled or exceeded by benefits to the community. This would be a simplified cost-benefit analysis.

The applicant should use the following three steps to show the SEJ:
1. Identify the affected community.
2. Describe the important social or economic development associated with the activity.
3. Identify the relevant factors that characterize the environmental and social or economic conditions of the affected community.

**SEJ Step 1 – Identify the affected community**

The affected community is the community in the geographical area in which the waters are located. This area should be large enough to include both the people living near the site of the proposed activity and those in the community who are expected to directly or indirectly benefit from the activity.

**SEJ Step 2 – Describe the important social or economic development associated with the activity**

The applicant must describe the benefits of the activity on the economic or social development of the affected community. This description should describe why the activity resulting in degradation of high quality waters in the affected community is important to the overall social or economic health of the community. The applicant should first describe the existing condition of the affected community. Once the current condition of the affected community is established estimates of changes in the community based on the effects of the proposed activity can be made. The applicant should make every effort to quantify these changes but it is recognized that not all social indicators can be easily quantified and a qualitative assessment of changes to these indicators is acceptable.

Some benefits that may accrue from proposed activities include job growth, ability to serve larger area or greater population, increases to property values or increases to the tax base in the affected community, a decrease in household expenses for services and retention of assimilative capacity for future growth.

**SEJ Step 3 – Identify the factors that characterize the environmental and social or economic conditions of the affected community**

In order to describe the economic or social development associated with the proposed project, the applicant will first need to determine the social and economic factors that best characterize the affected community. These social and economic factors include:

- Employment rate
- Personal or household income
- Property values / community tax base
- Provision of necessary public services (e.g., fire department, school, infrastructure)
- Current or potential public health or safety problems (e.g., levels of lead in people's blood)
- Impacts to uses based on water quality (e.g. fishing, recreation, tourism)
- Retaining assimilative capacity for future industry and development
- Environmental benefits associated with reclamation and other restored property

The social and economic measures identified above do not constitute a comprehensive list. Nor will all be relevant to all activities or discharges. Each situation and community is different and will require an analysis of unique social and economic factors. The applicant is encouraged to consider analyzing additional factors that characterize the specific community under consideration.

**Public versus private entities**

Public sector developments encompass publicly owned treatment works, public utilities and other entities that are owned and/or operated by a governmental (local, state or federal) agency or an entity that is controlled by the government. Public sector entities typically do not operate on a for-profit basis and generally gain most of their capital for expenses from user fees and obligation or revenue bonds. Evaluating impacts to public entities may include looking at financial impacts to the public entity and socioeconomic conditions of the surrounding community. Since governments typically have the authority to increase fees and distribute pollution control costs among households and businesses[MAN14][DE15]. However, the impact of those pollution control costs often may affect a wider community and the general financial and economic health of the community will determine if the impacts are important.

Private developments typically are owned and operated on a for-profit basis. These private entities use profits or investments from shareholders to raise the capital needed for pollution control costs and may pass along those costs to the end user in the form of higher prices for the goods or services they provide. For these private entities, measuring substantial impacts may require estimating the financial impacts on their balance sheet as well as analyzing the overall impact on the surrounding community (e.g., the impact of lost employment on the community, or the increased cost of goods or services).

The line between public and private entities may be blurred when the public entity provides a service to significant numbers of private entities, e.g., a wastewater treatment plant that services a mainly industrial area, or a private, for-profit hospital that provides a substantial benefit to the public. In this case the methods that evaluate public entities and those that evaluate private entities may both need to be employed to determine an overall economic impact.

Upon the consideration of all relevant factors, the project will be considered to provide important social or economic development if the applicant demonstrates that the project will lead to overall beneficial changes in the factors presented (i.e., increased jobs, employment, housing, or other appropriate factors balanced against the benefits associated with maintaining a higher level of water quality). This determination will be made on a case-by-case basis using information provided with the application and obtained during public comment. Activities which provide necessary public service such as a wastewater treatment plant, hospital, or school, or their expansion, may be determined *a priori* to be socially important.

When information available to DEQ is not sufficient to make a determination regarding the social or economic benefits or environmental impacts associated with the proposed activity, DEQ may request that the applicant submit additional information.

If, after appropriate discussions with the discharger, DEQ determines that the SEJ of the proposed activity has not been demonstrated, DEQ shall deny certification of the proposed activity. If DEQ makes such a determination, DEQ will provide a written explanation to the applicant of the deficiencies in this analysis.

### *5.5 Summary of the Justification for Degrading Water Quality*

The preceding discussion describes the approach that shall be followed by the applicant for determining whether less- or non-degrading alternatives to the proposed activity will be required to prevent degradation of Idaho surface waters. The following steps summarize the alternatives analysis process and other relevant actions conducted during Tier 2 antidegradation reviews:

• If it is determined that significant degradation would likely occur due to the proposed activity, an analysis of less-degrading and non-degrading alternatives to the proposed activity will be required for the pollutant(s) or parameter(s) that are significant.

• The applicant will be required to identify feasible pollution control alternatives including those that would result in no degradation, and other less-degrading alternatives as appropriate, in addition to the minimum level of pollution control required.

• If the applicant prefers the least degrading feasible alternative, the alternatives analysis is complete.

• To justify a more-degrading alternative as reasonable the applicant must evaluate the pollutant reduction cost-efficiency, environmental trade-offs, or affordability associated with each alternative or mix of alternatives.

• The applicant will identify the least degrading alternative – or mix of alternatives – that is reasonable based on the above evaluation. This will be the preferred alternative.

**Comment [BB19]:** Subject to IDEQ's oversight,, correct? While this section is simply meant to be a summary of steps, maybe it could be modified so that it does not imply that the applicant's word is final. Maybe include the steps where IDEQ reviews and determines if all appropriate alternatives have been considered, etc.

• If the preferred alternative (i.e., pollution control alternative or mix of alternatives) will not result in significant degradation of the receiving water segment, DEQ will certify the activity without any further SEJ.

• If the preferred alternative (i.e., pollution control alternative or mix of alternatives) will result in significant degradation of the receiving water, the applicant will be required to conduct an analysis of economic or social benefit.

• If the activity is deemed to be socially or economically important, DEQ will provide certification.

# 6 Tier 3 Protection of Outstanding Resource Waters

High quality water bodies considered to be of exceptional recreational or ecological significance (e.g., waters in national or state parks, wild and scenic rivers, or wildlife refuges) may be nominated for designation as outstanding resource waters (ORWs). Water bodies designated by the state legislature as ORWs are then given the Tier 3 level of protection and are protected from the impacts of point and nonpoint source activities.

## *6.1 Point Source Activities*

Tier 3 protections applying to ORWs require that the water quality be maintained and protected from impacts of both point and nonpoint source activities. This typically means point source discharges to the ORW will not be allowed to expand nor will new point sources be allowed to discharge into the ORW.

However, point source discharges that may cause degradation to an ORW may be allowed if the proposed degradation is offset by reductions from other sources that are tied to the proposed point source activity as described in IDAPA 58.0102.052.04.c. These offsets must occur prior to the beginning of the activity and upstream of the degradation that the discharge may cause. Offsets that are allowed are described in greater detail in Section 3.4.

To show that the degradation caused by a point source discharge to an ORW is being offset by reductions from other sources, the point source discharger may submit documentation on both the proposed degradation due to the discharge and the reductions proposed to offset this reduction. Calculations showing the change in ambient water quality downstream of the offsets and also downstream of the proposed discharge would demonstrate the overall net impact of the offsets and the proposed discharge to the ORW. A net improvement in water quality is the most desirable outcome of these proposed offsets to the discharge, especially in a water body considered to be of exceptional significance. However, if the calculations demonstrate that the degradation of the ORW is not fully and completely offset by reductions upstream of the degradation the point source discharge may not be allowed.

**Comment [BB20]:** Presumably the edits we discussed at the 8/5/11 meeting will be included in the version that goes to public notice. If there are questions about this, please contact me and the suggestions will be made again.

The point source discharger may also want to submit documentation of scheduled timelines for the proposed reductions as well as for the proposed activity to demonstrate that the offsets are occurring prior to the proposed degradation. It is recommended that this documentation also show how the discharger is capable of assuring that the reductions proposed to offset the degradation will be accomplished.

Point source activities that discharge to tributaries of ORWs are not subject to the same controls as those that discharge directly to ORWs. These activities are subject to the antidegradation protections for the water body they discharge to.

**Comment [BB21]:** Presumably the edits we discussed at the 8/5/11 meeting will be included in the version that goes to public notice. If there are questions about this, please contact me and the suggestions will be made again.

### *6.2 Nonpoint Source Activities*

Water quality in ORWs is granted the highest level of protection, Tier 3. This means that water quality in these waters will be maintained and no person shall conduct a new or substantially modify an existing activity if that activity is expected to lower or degrade water quality. The only allowed exception is for those activities that are short term or temporary and which do not alter the essential character or special uses of a segment, allocation of water rights or the operation of water diversions or impoundments.

Tributaries to ORWs are not subject to restrictions of nonpoint source activities in the same manner as ORWs are. A person or organization may conduct a new or substantially modify an existing nonpoint source activity that may lower or degrade water quality in the tributary to an ORW provided that water quality of the ORW (below the appropriate or designated mixing zone) is not lowered and that antidegradation requirements for the tributary (i.e., Tier 1 or 2) are addressed.

For nonpoint source activities that took place prior to the designation of the water as an ORW, these activities may continue and shall be conducted in a manner that protects and maintains the current water quality of the ORW. However these existing nonpoint source activities may not be substantially modified in a way that may be reasonably expected to lower or degrade the quality of water once the water has been designated as an ORW.

# 7 General Permits, Dredge and Fill Permits, and FERC Licenses

A number of relatively similar discharges to surface waters may be authorized under a single general NPDES permit issued by Region 10 EPA. Such discharges include aquaculture facilities and storm water runoff from industrial facilities, mining and processing facilities, confined animal feeding operations, and construction sites that are one acre or larger. These NPDES permits are currently issued by EPA and thus subject to §401 certification by the State of Idaho. Section 401 certification is also required for individual and general §404 dredge and fill permits and FERC operation licenses. These permits and licenses must meet antidegradation requirements.

Except as described below, regulated activities authorized by existing general permits (that are currently in effect, not expired) are not required to undergo a Tier 2 antidegradation review as part of the Notice of Intent process. New and reissued general permits after July 1, 2011, must be evaluated to consider the potential for degradation as a result of new or expanded permitted discharges they cover.

## *7.1 Antidegradation Review of General Permits*

All NPDES general permits require that permit conditions be met, including the general requirement that permitted discharges must ensure that water quality standards are not violated and best management practices contained in the permit are implemented. Compliance with the terms of the general permits issued by EPA and certified by DEQ is required to maintain authorization to discharge under the general permit. Discharges that might be covered by a general permit but cannot comply with general permit conditions or antidegradation requirements will be required to seek coverage under an individual permit.

**Existing General Permits**

For regulated activities currently authorized by general permits issued prior to July 1, 2011, such activities are not required to undergo a Tier 2 antidegradation review as part of the Notice of Intent (NOI) process. However, such a discharge would need to comply with the existing general permit conditions and any associated antidegradation requirements that were put in place when the general permit was issued. This includes new or expanded activities or discharges regulated by existing general permits. For example, an NOI being submitted for a new discharge covered by the existing construction stormwater general permit would not undergo a Tier 2 antidegradation review. Where DEQ has denied water quality certification (e.g., some of the nationwide 404 permits), a Tier 2 antidegradation review may be necessary to obtain individual certification. As of January 11, 2011, there are eleven general permits that are currently effective in Idaho and two general permits that are in draft form. Table 1 summarizes whether a Tier 2 antidegradation review could be required for new or increased discharges or activities seeking coverage under the existing general permits.

**Table 7. Summary of whether new or increased discharges are required to undergo a Tier 2 antidegradation review when seeking coverage under existing EPA and ACOE general permits in Idaho**

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full support |
| 4c | Waters for which lack of applicable use support is caused by flow or habitat alteration which is not a pollutant |
| 5[3] | Waters for which one or more applicable uses are not fully supported, due to a pollutant[4] |

| Integrated Report Category | Antidegradation Protection Tier |
|---|---|
| 1 | Tier 2 for all applicable uses |
| 2 | Tier 2 for all applicable uses |
| 3 | Tier 1 or 2, as data shows at time of antidegradation review |
| 4a | Tier I for the use that is impaired; except |

## New or Reissued General Permits

For general permits issued or reissued after July 1, 2011, antidegradation reviews will be conducted for the entire class of general permittees at the time DEQ reviews the permit to decide whether or not to certify that the general permit complies with state water quality standards. Antidegradation reviews will focus on pollutants that may contribute to water quality degradation, and will examine whether water quality criteria are met, whether degradation is likely to occur, and whether the permit conditions and permit record satisfies the requirements of the Tier 2 analysis. This review will also include whether or not the potential activity or discharge will have an insignificant effect on water quality and as such be an insignificant activity or discharge. If DEQ finds that the general permit adequately addresses antidegradation at the time the permit is issued, then DEQ will not need to include conditions specific to antidegradation in its §401 certification of the permit.

**Comment [BB22]:** Insert

However, if DEQ cannot determine that the general permit adequately addresses antidegradation at the time the permit is issued, DEQ must include conditions in the §401 certification that provide reasonable assurance activities covered under the general permit will comply with the antidegradation policy.

Depending on the type of activities covered

under the general permit and the conditions and requirements of the general permit, conditions that DEQ may incorporate into the §401 certification include:

- Requiring additional or more stringent effluent limitations and any other limitations and monitoring requirements necessary to ensure compliance with the antidegradation provisions.
- Retaining DEQ's authority to, after reviewing submitted NOIs, require all or a subset of new or expanding discharges to undergo a Tier 2 analysis if it is determined that degradation may occur as a result of cumulative impacts from multiple discharges to a water body, or as of result of impacts from a single discharger over time, or as a result of other individual circumstances.

Existing activities or discharges currently covered under an effective general permit will be deemed to comply with Tier 2 of the antidegradation policy when seeking coverage under a reissued general permit as long as the activity or discharge is not expanding. Such activities or discharges will not be required to undergo a Tier 2 antidegradation review as part of the NOI process. However, if the activity or discharge is expanding, it must comply with any new antidegradation requirements of the reissued general permit.

Existing activities or discharges that are required to be permitted for the first time under a new general permit and that are not proposing to expand will be deemed to not cause degradation. This is because the mere fact of becoming regulated will limit their discharge for the first time and will be a step toward reducing their degradation of water quality.

New or increased activities or discharges seeking coverage under a new or reissued general permit for the first time will be required to comply with the antidegradation requirements of that general permit and associated §401 certification.

### *7.2 §404 Dredge and Fill Permits*

Section 404 of the Clean Water Act regulates the placement of dredged or fill material into "waters of the United States." The U.S. Army Corps of Engineers (ACOE or the Corps) administers the §404 permit program dealing with these activities (e.g., wetland fills, in-stream sand/gravel work, etc.) in cooperation with the EPA and in consultation with other public agencies.

To ensure that antidegradation and other water quality protection requirements are considered, reviewed, and met in a comprehensive and efficient manner, these requirements will be addressed and implemented through DEQ's §401 water quality certification processes. Under this approach, applicants who fulfill the terms and conditions of applicable §404 permits and the terms and conditions of the corresponding §401 water quality certification will have fulfilled the antidegradation requirements. Additional antidegradation considerations may be incorporated into §404 permits and the corresponding §401 certifications at the time of permit issuance.

For activities covered under §404 general permits (e.g., "nationwide" or "regional" permits), the antidegradation review will be conducted at the time DEQ is reviewing the general permit for §401 certification. Similar to the process for general NPDES permits, the antidegradation review will focus on pollutants that may contribute to water quality degradation and will examine whether water quality criteria are met, whether degradation is likely to occur, and whether the permit conditions or the permit administrative record satisfies the requirements of any required Tier 2 analysis.

**Comment [BB23]:** Insert

For discharges of dredged or fill material covered under an individual §404 permit, the ACOE must ensure that the §404(b)(1) guidelines have been met (40 CFR Part 230). These guidelines require that all appropriate alternatives to avoid and minimize degradation be evaluated. DEQ will coordinate with the Corps and the applicant to ensure that the analysis conducted to fulfill the 404(b)(1) guidelines will also fulfill the antidegradation review requirements.

### *7.3 Federal Energy Regulatory Commission Licenses*

The Federal Energy Regulatory Commission (FERC) licenses the operation of dams that generate hydroelectric power. Applicants for these licenses are required to obtain §401 water quality certification. DEQ's certification will look at conditions that are necessary to comply with Idaho water quality standards, including antidegradation provisions.

Although dams merely impound water rather than adding anything to it, they may affect water quality in the impoundment and downstream. Water quality certification and antidegradation review thus are focused not on the effect of a traditional discharge but on the changes in water quality that may result from the dam and its impoundment and how operations may alter that quality.

DEQ may place conditions on operations or require other actions to ensure compliance with the antidegradation provisions. Applicants who fulfill the terms and conditions of an applicable FERC license and the terms and conditions of the corresponding §401 water quality certification will have fulfilled antidegradation requirements. Where there will be significant degradation, DEQ will evaluate whether the project is necessary to accommodate important social or economic development.

Antidegradation is concerned with any adverse change in water quality that may occur due to an activity or discharge. When a project undergoes relicensing with FERC, the relicensing certification process will compare the calculated water quality now under the current FERC license with calculated water quality in the future under the proposed FERC license. If this comparison shows there will be no degradation in water quality, then no Tier 2 antidegradation analysis is necessary.

# 8 Public and Intergovernmental Participation in Antidegradation Review

Intergovernmental coordination and public review assures that a full range of alternatives is considered. Public review is essential to a legitimate determination of social and economic importance.

## *8.1 Intergovernmental Coordination*

Intergovernmental coordination is required of DEQ prior to approving a regulated activity that would degrade Tier 2 surface water. This requirement seeks to ensure that all relevant public entities at the local, state, and federal levels are aware of any proposal to degrade high water quality and are provided with an opportunity to review, seek additional information, and comment on the proposal. In addition, intergovernmental coordination is needed to collect information regarding whether other source controls shall be achieved. An applicant may contact other government agencies to solicit their input, but if they do not DEQ will.

Agencies to be consulted as appropriate include:

- EPA Region 10
- U.S. Forest Service, Bureau of Land Management, Idaho Department of Lands, and other land management agencies in the affected watershed
- Idaho Department of Fish and Game, U.S. Fish and Wildlife Service, and National Marine Fisheries Service
- the district health department serving the county where the facility or activity discharges
- municipal governments of communities affected by the discharge
- the environmental agencies of other states whose waters may be affected by the issuance of the permit
- any other interested governmental organization, upon request

The intergovernmental coordination and review process is probably best if it occurs before the alternatives analysis and social and economic importance review are finalized but it may occur later, in tandem with the public notice procedures outlined in the next section.

## *8.2 Public Notification and Review*

DEQ must provide public notice and opportunity for public comment on the alternatives analysis and the social and economic importance review. DEQ intends to provide public review of all antidegradation reviews in conjunction with public review of DEQ's draft §401 water quality certification. This typically will occur at the same time as public

review of a NPDES or 404permit, which provides a comment period lasting at least 30 days. If DEQ does not provide a draft water quality certification at the time of permit review, a draft certification will be made available for review on DEQ's Web site and the public will be given 30-days to submit comments. Because FERC does not provide notice to the public, DEQ will issue its own public notice regarding certification decisions.

Notices will be posted on the Department's Web site at:

http://www.deq.idaho.gov/Applications/NewsApp/comment.cfm?CFID=169508&CFTOKEN=75960440

A copy of the public notice shall also be sent to the relevant government agencies listed in Section 8.1 Intergovernmental Coordination.

The notice will identify the action being considered, list all beneficial uses identified for the surface water, and call for comments from the public regarding the proposed activity. It shall clearly state the time frame for submitting comments, the methods by which comments may be submitted, and to whom comments must be directed.

An applicant may also engage the public before the alternatives analysis and SEJ review is finalized. This is recommended as it may lead to fewer questions later during formal public comment, but it is not required. If choosing to engage the public of its own accord, the applicant should provide DEQ with a summary of public comments received and the applicant's responses.

# 9 Antidegradation Review Decisions

Once the intergovernmental coordination and public notice requirements outlined above are satisfied, DEQ will review the applicant's alternatives analysis, the social and economic importance review, and the results of public comment.

Regulated activities that may result in degradation of Tier 2 waters can only be approved after DEQ makes all of the following findings:

- The level of water quality necessary to protect applicable beneficial uses is fully maintained. Water quality shall not be degraded to a level that does not comply with the applicable water quality standards (WQS).
- The highest statutory and regulatory requirements for new and existing point sources are achieved.
- All cost-effective and reasonable BMPs for nonpoint source pollution control are implemented.
- Allowing degradation of water quality is necessary and accommodates important social or economic development in the area where the surface water is located.

DEQ will then make a final determination concerning the proposed activity. If the decision is that degradation is justified then implementation of the preferred alternative will become a condition of the §401 certification to be incorporated in the permit or license. When information submitted to DEQ is not sufficient to justify the proposed degradation, DEQ may request additional information.

All antidegradation review decisions, including determinations to deny certification shall be documented by DEQ and made part of the permit or license issuer's Administrative Record of Decision. Review documents, including existing water quality assessments, determination of degradation, analysis of public comments, alternatives analyses, demonstration of social and economic importance and any other decisions or findings are public records.

To the extent allowed under Idaho Code sections 9-340D (1) and 9-342A, any information submitted pursuant to the rules of the Board of Environmental Quality that contains trade secrets shall be kept confidential by DEQ if notice of the existence of a trade secret appears on the information and DEQ determines the information constitutes a trade secret pursuant to the process provided in Idaho Code section 9-342A and the Rules Governing the Protection and Disclosure of Public Records, IDAPA 16.01.21.

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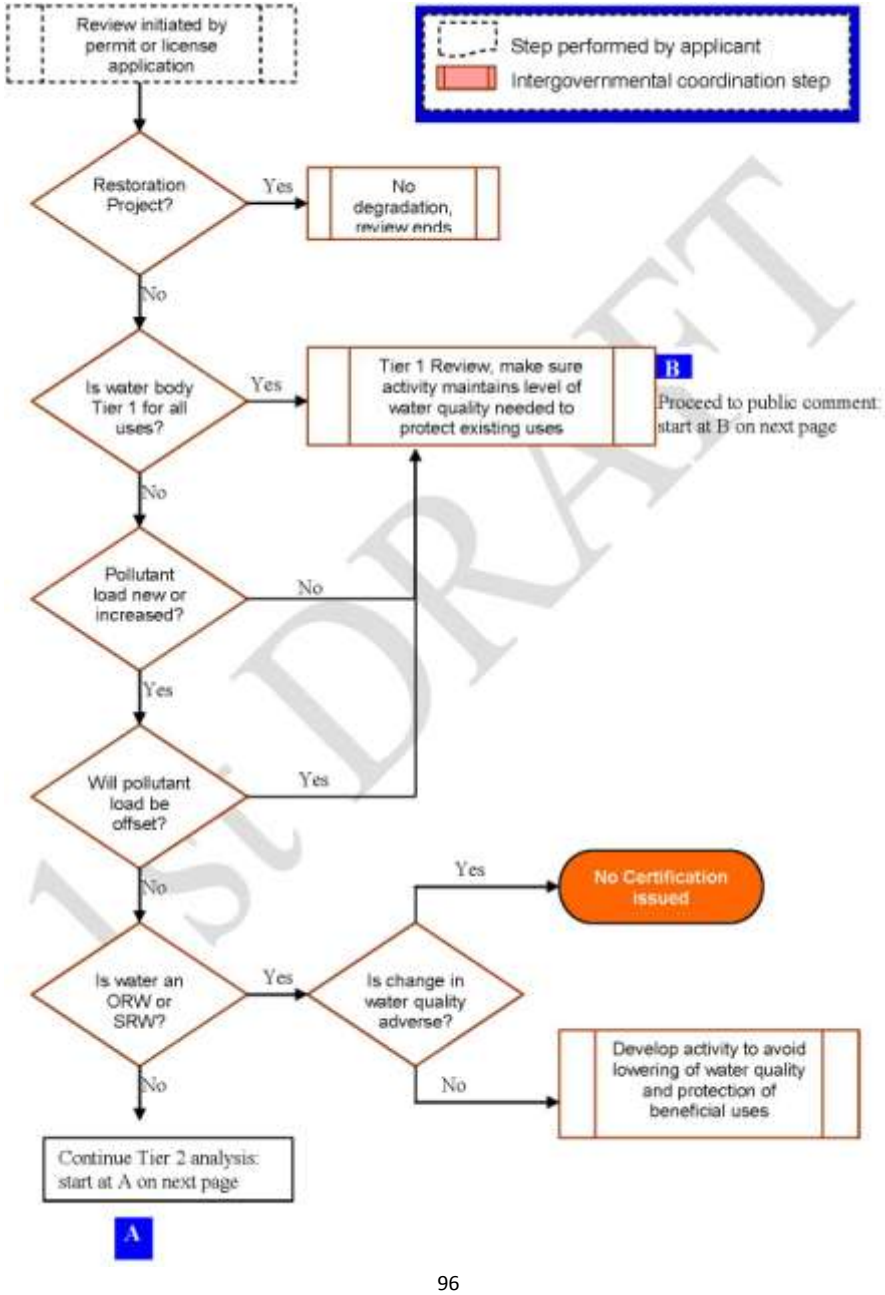
Water Quality Standards. Title 58, Chapter 01.02, *Idaho Administrative Code (IDAPA)*, 2011 ed. Antidegradation addressed in sections 051 and 052.

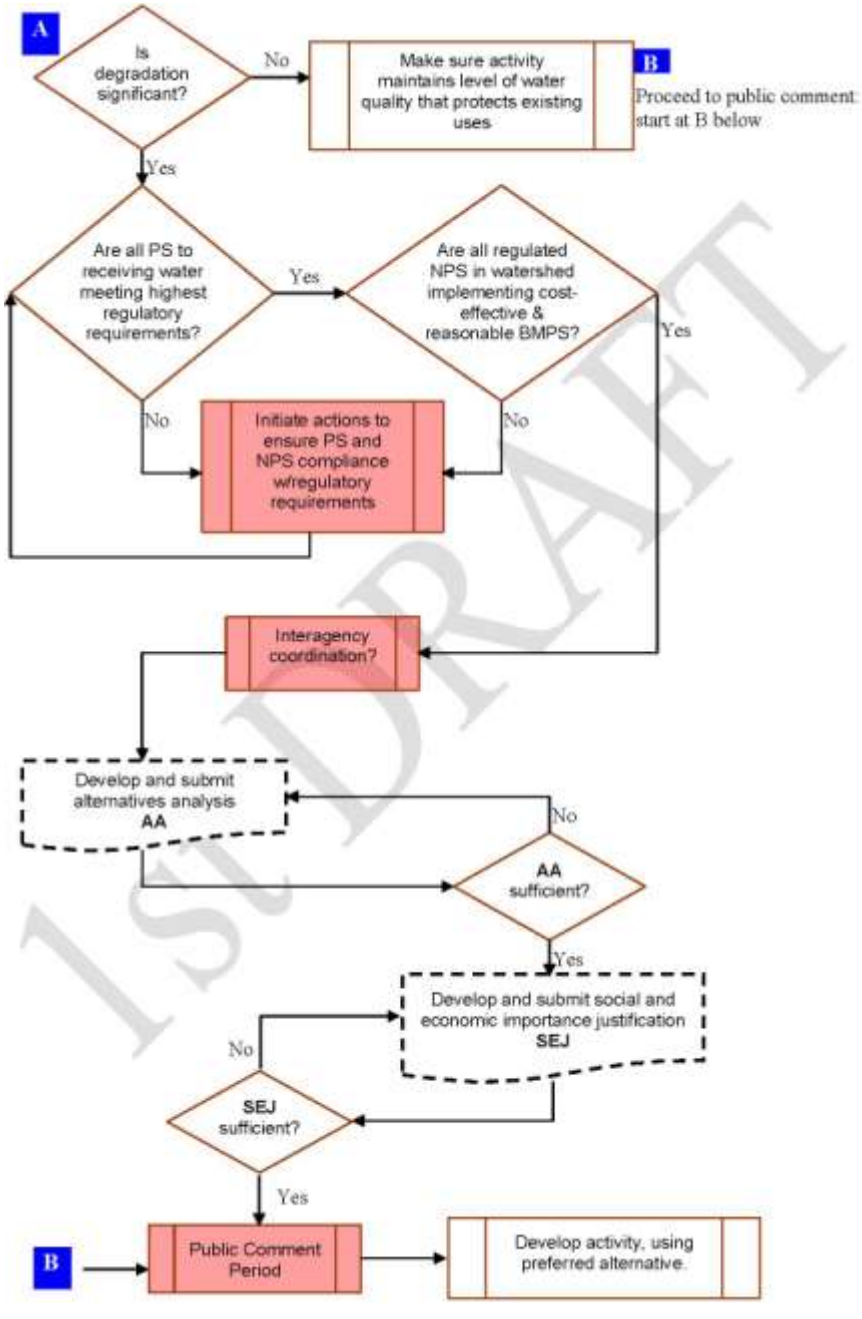
Water Quality. Title 39, Chapter 36, *Idaho Code (IC)*. 2010 ed. Antidegradation addressed in sections 39-3603, and 39-3617 to 39-3620.

Water Quality Standards Regulation, Advance Notice of Proposed Rulemaking (ANPRM). *Federal Register*, Volume 63, Number 129, Pgs 36741-36806. July 7, 1998.

# Appendix A – Antidegradation Review Flow Chart

**Comment [BB24]:** Presumably the edits we discussed for the ORW portion, at the 8/5/11 meeting , will be included in the version that goes to public notice. If there are questions about this, please contact me and the suggestions will be made again.


Review initiated by permit or license application
Step performed by applicant
Intergovernmental coordination step
Restoration Project?
Yes
No degradation, review ends
No
Is water body Tier 1 for all uses?
Yes
Tier 1 Review, make sure activity maintains level of water quality needed to protect existing uses
B
Proceed to public comment: start at B on next page
No
Pollutant load new or increased?
No
Yes
Will pollutant load be offset?
Yes
No
Yes
No Certification Issued
Is water an ORW or SRW?
Yes
Is change in water quality adverse?
No
Develop activity to avoid lowering of water quality and protection of beneficial uses
No
Continue Tier 2 analysis: start at A on next page
A
1st DRAFT


A
Is degradation significant?
No
Make sure activity maintains level of water quality that protects existing uses
B
Proceed to public comment: start at B below
Yes
Are all PS to receiving water meeting highest regulatory requirements?
Yes
Are all regulated NPS in watershed implementing cost-effective & reasonable BMPS?
Yes
No
Initiate actions to ensure PS and NPS compliance w/regulatory requirements
No
Interagency coordination?
Develop and submit alternatives analysis AA
No
AA sufficient?
Yes
Develop and submit social and economic importance justification SEJ
No
SEJ sufficient?
Yes
B
Public Comment Period
Develop activity, using preferred alternative.

1st DRAFT

## Appendix B – Examples of Water Body-by-Water Body Classification

These examples draw on information contained in Table 1 (page 8) that explains the categories of the Integrated Report, and Table 2 (page 13) that translates from Integrated Report category to tier of antidegradation protection.

**Water body classification**

1. If water is listed in Category 1 or 2 of Integrated Report, then it receives Tier 2 protection for all uses.

Examples of assessment units in this category include:
ID17060306CL008_03 Lapwai Creek, ID17050123SW016_04 North Fork Payette River, ID17060108CL016_04 Palouse River, ID17060306CL039_02 Canal Creek, ID17050122SW003_06 Payette River, ID17040204SK001_05 South Fork Teton River, ID17060201SL028_03 Thompson Creek, and ID17060201SL031_05 Salmon River

2. If water is listed in Category 3 of Integrated Report, then case-by-case evaluation is necessary.

Examples of assessment units in this category include:
ID17060306CL022_06 Clearwater River, ID17050122SW011_02 Payette River, ID17040221SK000_02 Little Wood River, ID17040221SK001_05a Little Wood River and ID17060108CL007b_02 Fourmile Creek.

3. If water is listed in Category 4 or 5 of Integrated Report

a. Then for recreation uses, are applicable criteria metAre recreational uses supported?

i. no, water is Tier 1 for recreation.

An example of this would be ID17040204SK050_02 Woods Creek – source to mouth. This AU is listed as not supporting contact recreation uses due to E. Coli violations. The aquatic life uses are un-assessed.

ii. yes, water is Tier 2 for recreation.

An example of this would be ID16010202BR005_02b Worm Creek. This AU fully supports its contact recreation use and is listed in category 4a of the Integrated Report for not supporting cold water aquatic life uses.

iii. Un-assessed, water is Tier 1 for recreation.

An example of this would be ID17010302PN001_04 South Fork Coeur d'Alene River. This AU is un-assessed for recreation and is therefore Tier 1 for recreationa case by case determination.

b. Then for aquatic life uses, is water listed for dissolved oxygen, pH, nutrients, sediment or temperatureAre aquatic life uses supported?
i. yes, water body receives Tier 2 protection for aquatic life

ii. no, Is water body is listed for anything other than temperature, pH or dissolved oxygen.
1) no water body is listed for something other than temperature, pH or dissolved oxygen, water body is Tier 1 for aquatic life.

An example of this would be ID17010302PN001_04 South Fork Coeur d'Alene River. It is in categories 4a and 5 of the Integrated Report for not supporting the cold water aquatic life beneficial use. The causes for listing include cadmium, lead, zinc and sediment. Because this AU is listed for pollutants other than the three outlined in the rule, it is provided only Tier 1 protection.
2) yes, then does biological assessment indicate a healthy and balanced community?
a. yes, Tier 2 for aquatic life

b. no, Tier 1 for aquatic life

c. if no bioassessment data available, then case-by-case evaluation.

**Comment [BB25]:** Presumably the edits we discussed at the 8/5/11 meeting will be included in the version that goes to public notice. If there are questions about this, please contact me and the suggestions will be made again.

An example of this would be ID17060201SL021_04 Squaw Creek. It is listed in category 5 as not supporting its aquatic life use due to temperature. There is no current biological data available to evaluate the health of the biological community, therefore it would be evaluated on a case by case basis when a permit for a discharge to that stream came to the agency.
no, water is Tier 1 for aquatic life
An example of this would be ID17010302PN001_04 South Fork Coeur d'Alene River. This AU is un-assessed for recreation and therefore receives Tier 1 protection for recreation uses. It is in categories 4a and 5 of the Integrated Report for not supporting the cold water aquatic life beneficial use. The causes for listing include cadmium, lead, zinc and sediment. Because this AU is listed for pollutants other than the five outlined in the rule, it is provided only Tier 1 protection.
Another example of this would be ID17040219SK007_05 Big Wood River. This AU is un-assessed for recreation therefore receives Tier 1 protection for recreation uses. It is also listed as not supporting aquatic life. The listing cause is other flow regime. This AU is in category 4c of the Integrated Report, non-support caused by a non-pollutant.
A third example of this would be ID17060306CL001_07 Clearwater River. This AU is un-assessed for recreation and therefore receives Tier 1

protection for recreation uses. This AU is listed in category 5 as not supporting its aquatic life uses due to dissolved gas saturation.
i. yes, then does biological assessment show use is supported?
1) no, water body receives Tier 1 protection for aquatic life

An example of this would be ID16010201BR023_02a Soda Creek. This AU is un-assessed for recreation and therefore receives Tier 1 protection for recreation. It is listed in category 4a as not supporting its aquatic life use due to nutrients (total phosphorus) and sediment. When evaluating the available biological data there are 2 sites located on the stream. One of those two sites scored a 0 in the overall index rating. This rating score indicates there is not a healthy balance biological community present. This AU would receive Tier 1 protection.
2) yes, water body receives Tier 2 protection for aquatic life

An example of this would be ID17010214PN053_02 Little Sand Creek. This AU fully supports contact recreation and therefore would be Tier 2 for recreation. It is listed in category 4a as not supporting its aquatic life use due to sediment. When evaluating the available biological data there is one site located on the steam. This site scored a 2 in the overall index rating. This rating score indicates a healthy balanced biological community is present. This AU would receive Tier 2 protection as well as Tier 1 protection.
3) if no bioassessment data available, then case-by-case evaluation.

An example of this would be ID17060201SL021_04 Squaw Creek. This AU is un-assessed for recreation and therefore receives Tier 1 protection for recreation uses. It is listed in category 5 as not supporting its aquatic life use due to temperature. There is no current biological data available to evaluate the health of the biological community, therefore it would be evaluated on a case by case basis when a permit for a discharge to that stream came to the agency.

ii. A few water bodies listed as not fully supporting assessed uses, therefore found in category 4 or 5 of the Integrated Report, are listed only due to a recreation criterion exceedance. In some of these water bodies the aquatic life use may be assessed and found to be fully supporting or the aquatic life use is un-assessed. However, because the AU is listed in category 4 or 5 as not supporting at least one assessed use, this water body may receive only Tier 1 protection for aquatic life. Due to the wording of the rule in 052.05.c.i that assigns Tier 1 unless the water is listed for a subset of causes, this occurs when an AU in this example fully supports its aquatic life uses but is not listed for the five causes which then allows good biological data add Tier 2 protection.

One example of this would be ID17060204SL001_06 Lemhi River. This AU is listed as not supporting recreation uses due to exceedances of the *E. coli* criteria. However, the aquatic life use was assessed and determined to be fully supporting. This AU receives only Tier 1 protection for both contact recreation and aquatic life uses.

One example of this would be ID17040204SK050_02 Woods Creek – source to mouth. This AU is listed as not supporting contact recreation uses due to *E. coli* violations. The aquatic life uses are un-assessed. This AU receives only Tier 1 protections for contact recreation and aquatic life uses.

## Appendix C – Examples of New and Increased Discharge

**Examples of new and increased discharge.**

In each of the following examples the line represents the level of discharge with time, the beginning of the line indicates commencement of the discharge.

Discharge A – Existing permitted discharge, no increase

In this situation permitted discharge does not increase with renewed permit thus there is no degradation of water quality. Discharge receives Tier 1 review only.

Discharge A2 – Existing permitted discharge, permitted discharge increases

In this situation permitted discharge increases with renewed permit thus there is degradation of water quality. IF this degradation is significant and of a Tier 2 water body, then there will be Tier 2 analysis in addition to Tier 1 review.

Discharge B – New permitted discharge

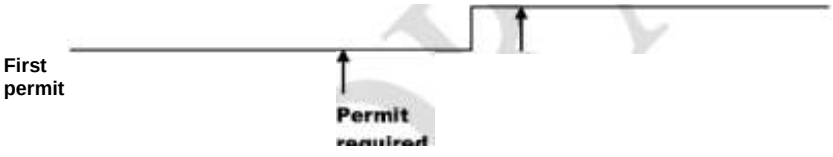
There will likely be degradation of water quality. IF this degradation is significant and of a Tier 2 water body, then there will be Tier 2 analysis in addition to Tier 1 review.

**Examples of existing discharge without a permit**

Discharge C – Change in regulation, existing discharge with no permit required when discharge commenced, no increase in discharge since permit required

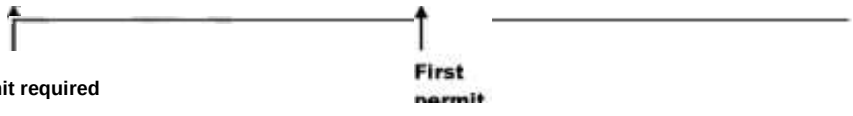
In this situation discharge does not increase with first permit thus there is no degradation of water quality. Discharge receives Tier 1 review only.

Discharge C2 – Change in regulation, existing discharge with no permit required when discharge commenced, discharges increases since permit required




In this situation discharge increases with first permit thus there is degradation of water quality. IF this degradation is significant and of a Tier 2 water body, then there will be Tier 2 analysis in addition to Tier 1 review.

Discharge D – Illegal discharge, existing discharge without required permit




In this situation a permit was required when the discharge commenced. When permitted for first time, this discharge will be treated as a new discharged (B above). Baseline will be water quality without discharge, i.e. upstream water quality. Thus there will be degradation of water quality. IF this degradation is significant and of a Tier 2 water body, then there will be Tier 2 analysis in addition to Tier 1 review.

## Appendix D – Antidegradation Tier for Waters with NPDES-Permitted Discharge

The table in this appendix is created using information from the 2008 Integrated Report, only BURP monitoring data from 2001 to 2005 (years identified as appropriate in WBAG), GIS coverages of Idaho's 305(b) streams, 1:24K NHD streams, NPDES dischargers and permit information gleaned from Region 10 EPA's website (http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/Current+ID1319#permits) and EPA's envirofacts website. The antidegradation Tier for the appropriate assessment unit was determined according to the proposed rule section 052.05.c. The biological and aquatic habitat index score is listed to provide a reference for Tier 1 vs. Tier 2 for aquatic life tiers. *The antidegradation tiers identified in this table are **preliminary only** and are subject to change as more information is identified and gathered from sources other than the BURP database used in creating this table as per WBAG assessment processes.*

All permits were screened to determine the receiving water identified in the permit. This was then checked against the shapefile provided containing locations of the various dischargers. If the GIS stream that the point fell upon or was closest to matched the receiving water in the permit, that was the assessment unit used to determine the antidegradation tier. If the GIS stream that the point was closest to did not match the receiving water on the permit, a visual inspection of the NAIP 2009 aerial photography and the USGS 1:24K quadrangle map was done to determine if the discharge was to the GIS stream identified or to the receiving water listed on the permit. If a visual inspection could not identify the discharge source a comment was logged saying that the discharge could not be verified. In these cases a more in depth evaluation of the true discharge location would be necessary before determining the antidegradation tier. For the purposes of this preliminary table only, this further evaluation was not completed due to time and resource constraints. Comments are made where appropriate to identify problems either with the shapefile or the coordinates provided on the permits.

For those AUs appearing in either category 4 or 5 of the Integrated Report, the comments field lists those pollutants for which the water body is listed. There were 120 119 discharges to Aquatic Life Tier 1 water bodies, 16 14 to Aquatic Life Tier 2 water bodies, 1 discharge to a water with aquatic life uses removed and 53 55 to waters that require more information before assigning an antidegradation Tier. There were 53 54 discharges to Contact Recreation Tier 1 water bodies, 38 37 to Contact Recreation Tier 2 water bodies and 99 98 to waters that require more information before assigning an antidegradation Tier for Contact Recreation. There are 21 water bodies where the contact recreation and aquatic life tiers are different. These are highlighted by bold face type in the table.

The table below summarizes the number of dischargers in various antidegradation tiers. The beneficial uses of aquatic life and contact recreation are summarized concurrently and in a number of cases they are the same for aquatic life and contact recreation uses (e.g., there are 44 dischargers to waters that are classified Tier 1 for both aquatic life and contact recreation).

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applical be fully supported. Pres of pollution sources[2] |
| 2 | Waters for which all app been assessed were fou supported |
| 3 | Waters with no assesse to lack of data |
| 4a | Waters that have an EP |

Permit Status and Use Tiering based on BURP data alone as of January 31, 2011

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full support |
| 4c | Waters for which lack of applicable use support is caused by flow or habitat alteration which is not a pollutant |
| 5[3] | Waters for which one or more applicable uses are not fully supported, due to a pollutant[4] |

| Integrated Report Category | Antidegradation Protection Tier |
|---|---|
| 1 | Tier 2 for all applicable uses |
| 2 | Tier 2 for all applicable uses |
| 3 | Tier 1 or 2, as data shows at time of antidegradation review |
| 4a | Tier I for the use that is impaired; except aquatic life use may be Tier 2 if cause of impairment is dissolved oxygen, pH or temperature and bioassessment shows support of aquatic life use. [m4] |

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full support |
| 4c | Waters for which lack of applicable use support is caused by flow or habitat alteration which is not a pollutant |
| 5[3] | Waters for which one or more applicable uses are not fully supported, due to a pollutant[4] |

| Integrated Report Category | Antidegradation Protection Tier |
|---|---|
| 1 | Tier 2 for all applicable uses |
| 2 | Tier 2 for all applicable uses |
| 3 | Tier 1 or 2, as data shows at time of antidegradation review |
| 4a | Tier I for the use that is impaired; except aquatic life use may be Tier 2 if cause of impairment is dissolved oxygen, pH or temperature and bioassessment shows support of aquatic life use. [m4] |
| 4b | Same as 4a above |
| 4c | Tier 1 for aquatic life uses. AUs in category 4c are listed for causes other than dissolved oxygen, pH or temperature and therefore the rule does not allow for biological data to |

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full support |
| 4c | Waters for which lack of applicable use support is caused by flow or habitat alteration which is not a pollutant |
| 5[3] | Waters for which one or more applicable uses are not fully supported, due to a pollutant[4] |

| Integrated Report Category | Antidegradation Protection Tier |
|---|---|
| 1 | Tier 2 for all applicable uses |
| 2 | Tier 2 for all applicable uses |
| 3 | Tier 1 or 2, as data shows at time of antidegradation review |
| 4a | Tier I for the use that is impaired; except aquatic life use may be Tier 2 if cause of impairment is dissolved oxygen, pH or temperature and bioassessment shows support of aquatic life use. [m4] |
| 4b | Same as 4a above |
| 4c | Tier 1 for aquatic life uses. AUs in category 4c are listed for causes other than dissolved oxygen, pH or temperature and therefore the rule does not allow for biological data to |

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full support |
| 4c | Waters for which lack of applicable use support is caused by flow or habitat alteration which is not a pollutant |
| 5[3] | Waters for which one or more applicable uses are not fully supported, due to a pollutant[4] |

| Integrated Report Category | Antidegradation Protection Tier |
|---|---|
| 1 | Tier 2 for all applicable uses |
| 2 | Tier 2 for all applicable uses |
| 3 | Tier 1 or 2, as data shows at time of antidegradation review |
| 4a | Tier I for the use that is impaired; except aquatic life use may be Tier 2 if cause of impairment is dissolved oxygen, pH or temperature and bioassessment shows support of aquatic life use. [m4] |
| 4b | Same as 4a above |
| 4c | Tier 1 for aquatic life uses. AUs in category 4c are listed for causes other than dissolved oxygen, pH or temperature and therefore the rule does not allow for biological data to |

**WWTP – Wastewater Treatment Plant**
**ADC – Administratively Continued**
**PND – Pending**

**EXP – Expired**
**EFF – Effective**

[1]This table was prepared looking only at BURP data and does not take into account all data that may be available and relevant to making a water body Tiering determination.

[2]An average index score of 2 or greater means biological and aquatic habitat data indicate a water body supports its aquatic life uses. See Water body Body Assessment Guidance, Second Edition for more information on index scores.

## Appendix E – Examples of Antidegradation Reviews

### ANTIDEGRADATION REVIEW

**NPDES Permit # [insert number]**
**[Insert name of facility/permit]**

Idaho Department of Environmental Quality
[Insert date]

*Antidegradation Overview*

In March 2011, Idaho incorporated new provisions addressing antidegradation implementation in the Idaho Code. The new antidegradation provisions are in Idaho Code § 39-3603. At the same time, Idaho adopted antidegradation implementation procedures in the Idaho Water Quality Standards ("WQS"). DEQ submitted the antidegradation implementation procedures to EPA for approval on April 15, 2011.

The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051). The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and assures that existing uses of a water body and the level of water quality necessary to protect the existing uses will be maintained and protected (Tier 1 protection) (IDAPA 58.01.02.051.01; 58.01.02.052.01). A Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.05). The second level of protection applies to those water bodies that are considered high quality and assures that no lowering of water quality will be allowed unless it is deemed necessary to accommodate important economic or social development (Tier 2 protection) (IDAPA 58.01.02.051.02; 58.01.02.052.06). The third level of protection applies to water bodies that have been designated outstanding resource waters and requires activities to not cause a lowering of water quality (Tier 3 protection) (IDAPA 58.01.02.03; 58.01.02.052.07).

DEQ is employing a water body-by-water body approach to implementing Idaho's antidegradation policy. This approach to antidegradation implementation means that any water body fully supporting its beneficial uses will be considered high quality (Idaho Code §39-3603(20(b)(i)). Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for that use, unless specific circumstances warranting Tier 2 protection are met (Idaho Code §39-3603(2)(b)(iii)). The most recent federally-approved Integrated Report and supporting data are used to determine support status and the tier of protection (Idaho Code §39-3603(2)(b)).

*Pollutants of Concern*

*This section describes the pollutants of concern and which ones have effluent limits and should be modified as appropriate for the discharger. The following example was developed for the City of Fruitland.*

The City of Fruitland Wastewater Treatment Plant (Fruitland WWTP) discharges the following pollutants of concern: biological oxygen demand (BOD), total suspended solids (TSS), *E. coli*, pH, chlorine, ammonia, mercury, and temperature. Effluent limitations have been developed for BOD, TSS, *E. coli*, pH, chlorine, and temperature. No effluent limits are proposed for**:** ammonia and mercury.

### *Receiving Water Body Level of Protection*

*This section describes the designated/presumed beneficial uses, and where appropriate, includes the statement "There are no existing beneficial uses aside from those that are already designated." It also describes how DEQ determined the appropriate level of antidegradation protection.*

The Fruitland WWTP discharges to the Snake River (assessment unit ID17050115SW001_08). This Snake River assessment unit (AU) has the following designated beneficial uses: cold water aquatic life; primary contact recreation; domestic, agricultural, and industrial water supply; wildlife habitat; and aesthetics. There is no available information indicating the presence of any existing beneficial uses aside from those that are already designated.

Idaho has established a water body-by-water body approach for identifying what level of antidegradation protection DEQ will provide when reviewing whether activities or discharges will comply with Idaho's antidegradation policy. This approach relies upon Idaho's most recent federally-approved Integrated Report (IR) of water quality status and its supporting data. The cold water aquatic life use in this Snake River AU is not fully supported due to excess sedimentation, total phosphorus, temperature and low levels of dissolved oxygen (DEQ, 2008 IR). The primary contact beneficial use is fully supported. As such, DEQ will provide Tier 1 protection only for the aquatic life use (Idaho Code §39-3603(20(b)(i)) and Tier 2 protection, in addition to Tier 1, for the recreation beneficial use (Idaho Code §39-3603(2)(b)(iii)).

### *Protection and Maintenance of Existing Uses (Tier 1 Protection)*

*This section describes how Tier 1 antidegradation protection is assured.*

As noted above, a Tier 1 review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the CWA, and requires a showing that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain designated and existing beneficial uses, a permitted discharge must comply with Idaho water quality standards (WQS), which contain narrative and numeric criteria as well as other provisions of the WQS such as Section 054 which addresses water quality limited waters. The numeric and narrative criteria in the WQS are set at levels which ensure protection of designated beneficial uses. The effluent limitations and associated requirements contained in the Fruitland WWTP permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS. Because there is no available information indicating the presence of any existing uses other than the designated uses discussed above, the permit

ensures that the level of water quality necessary to protect both designated and existing uses is maintained and protected, in compliance with IDAPA 58.01.02.051.01, IDAPA 58.01.02.052.05 and 40 CFR 131.12(a)(1).

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a total maximum daily load (TMDL) must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish waste load allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limitations that are consistent with WLAs in the approved TMDL. A permit with effluent limitations consistent with TMDL wasteload allocations will provide the level of water quality necessary to support existing and designated uses and therefore satisfies Tier 1 antidegradation requirements.

The EPA-approved *Snake River – Hells Canyon TMDL* (DEQ 2004) establishes waste load allocations for TSS, temperature, and total phosphorus. These waste load allocations are designed to ensure the Snake River will achieve the quality necessary to support its existing and designated aquatic life beneficial uses and comply with the applicable numeric and narrative criteria. The effluent limitations and associated requirements contained in the Fruitland WWTP permit are set at levels that comply with these WLAs.

In sum, the effluent limitations and associated requirements contained in the Fruitland WWTP permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS as well as the waste load allocations established in the *Snake River – Hells Canyon TMDL*. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Snake River.

### *High Quality Waters (Tier 2 Protection)*

*This section describes how Tier 2 antidegradation protection is assured. In the first paragraph, the pollutants relevant to the use for which the water is afforded Tier 2 protection must be listed. For example, bacteria will be relevant to recreational uses, but temperature will not. In the second paragraph, language is set out for either reissued permits or new permits. Starting with the third paragraph, the various situations that may occur are set out—not all of these may apply to the particular permit being worked on.*

*Tables comparing the current and proposed limits are included to demonstrate differences and similarities between the permits. Limits for those pollutants that are relevant to a use for which the water body is being granted Tier 2 protections should be highlighted. For the example shown here, there is a significant amount of detail comparing fecal coliform limits to E. coli limits. This is not typical of an antidegradation analysis but was done in this analysis to build a case for removal of the fecal coliform limits.*

The Snake River is considered high quality for the primary contact recreation beneficial use. As such, the water quality relevant to recreational uses of the Snake River must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

In order to determine whether degradation will occur, DEQ must evaluate the effect on water quality of the issuance of the permit for each pollutant that is relevant to recreational uses of the Snake River. (IDAPA 58.01.02.052.04). These include the following pollutants: bacteria, total phosphorus and mercury**.** Effluent limits are set in the proposed and existing permit for all these pollutants except mercury.

For a reissued permit or license, the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the current permit and the water quality that would result from the activity or discharge as proposed in the reissued permit or license. (IDAPA 58.01.02.052.04.a) OR For a new permit or license, the effect on water quality is determined by reviewing the difference between the existing receiving water quality and water quality that would result from the activity or discharge as proposed in the new permit or license. (IDAPA 58.01.02.052.04.a).

Pollutants with limits in the current and proposed permit
For pollutants that currently are limited and will have limits under the reissued permit, the current discharge quality is based on the limits in the current permit or license (IDAPA 58.01.02.052.04.a.i), and the future discharge quality is based on the proposed permit limits. (IDAPA 58.01.02.052.04ii). For the Fruitland WWTP permit this means determining the effect on water quality based upon the limits for BOD, TSS, e-coli, pH and chlorine in the current and proposed permits.

Table 1. Comparison of proposed permit limits with current permit limits for the parameters of concern.

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full support |
| 4c | Waters for which lack of applicable use support is caused by flow or habitat alteration which is not a pollutant |
| 5[3] | Waters for which one or more applicable uses are not fully supported, due to a pollutant[4] |

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have |

[1] DEQ is requesting EPA remove the fecal coliform limits. See Discussion

[2] nc = no change, I = increase, d = decrease.

The existing permit for the Fruitland WWTP contains effluent limitations for fecal coliform as well as *E. coli*. In 1986, EPA updated its criteria to protect recreational use of water recommending an *E. coli* criterion as a better indicator of bacteria levels that may cause gastro-intestinal distress in swimmers than fecal coliform. In 2000, DEQ changed its bacteria criterion from fecal coliform to *E. coli.* The *E. coli* limits were in the existing permit to reflect the bacteria criterion that DEQ adopted to protect the contact recreation beneficial use (IDAPA 58.01.02.251.01). The fecal coliform limits were in the current permit because at the time the permit was issued, IDAPA 58.01.02.420.05 established a disinfection requirement for sewage wastewater treatment plant effluent. This requirement specified fecal coliform concentrations not exceed a geometric mean of 200/100 mL fecal based on a minimum of five samples in one week. This section of Idaho WQS was revised in 2002 to reflect the change in the bacteria criterion from fecal coliform to *E. coli* in 2000. The *E. coli* limits are as or more protective of water quality than the old fecal coliform limits. The proposed final permit contains both fecal coliform and *E. coli* effluent limitations that comply with previous and current numeric criteria at the "end-of-pipe."

Because the fecal coliform criteria have been replaced with *E. coli* criteria, DEQ is requesting that EPA remove the fecal coliform effluent limitations. This is consistent with how EPA has handled other NPDES permits for WWTPs in Idaho. Furthermore, retention of the *E. coli* limits will ensure that the receiving water quality will not be degraded even when the fecal coliform limits are removed. Even with the omission of fecal coliform limitations, DEQ believes the discharge will not cause or contribute to a violation of the bacteria criteria because the permit incorporates "end-of-pipe" limitations for *E. coli*. Thus, removal of the fecal coliform limits complies with both the Tier 1 and Tier 2 components of Idaho's antidegradation policy.

The proposed permit limits for other pollutants of concern that have limits in Table 1, BOD,TSS, pH and total residual chlorine, are the same as, or more stringent than those in the current permit (nc or I in change column). Therefore, there will be no adverse change in water quality and no degradation resulting from the discharge of these pollutants.

New permit limits for pollutants currently discharged

When new limits are proposed in a reissued permit for pollutants in the existing discharge, the effect on water quality is based upon the current discharge quality and the proposed discharge quality resulting from the new limits. Current discharge quality for pollutants that are not currently limited is based upon available discharge quality data.

(IDAPA 58.01.02.052.04.a.i) Future discharge quality is based upon proposed permit limits. (IDAPA 58.01.02.052.04.a.ii).

The proposed permit for Fruitland WWTP contains new limits for temperature and total phosphorus. These limits were included in the permit in order to be consistent with the WLAs in the approved Snake River-Hells Canyon TMDL. The TP and temperature limits in the proposed permit reflect the existing level of these pollutants currently discharged. Therefore, there will be no adverse change in water quality and no degradation with respect to these pollutants.

Pollutants with no limits
There are twois one pollutants of concern relevant to Tier 2 protection of recreation, ammonia and mercury, that currently are is not limited, and for which the proposed permit also contains no limits. For thesesuch pollutants, a change in water quality is determined by reviewing whether there will likely be changes in production, treatment or operation that will increase the discharge of these pollutants. (IDAPA 58.01.02.052.04.a.ii). With respect to ammonia and mercury, there is no reason to believe that theise pollutants will be discharged in quantities greater than that which is discharged under the current permit. This conclusion is based upon the fact that there has been no change in the design flow, influent quality or treatment processes that would likely result in an increased discharge of theise pollutants. Because the proposed permit does not allow for any increased water quality impact from these pollutants, DEQ has concluded that the proposed permit should not cause a lowering of water quality for the pollutants that have no limits. As such, the proposed permit should maintain the high existing water quality in Snake River.

**River City Publicly Owned Treatment Works; Water Body Fully Supporting All Uses**

River City submitted an application for permit renewal for its publicly owned treatment works to EPA. River City is not planning to increase their design capacity or change their treatment processes or influent quality. As a result, EPA proposes a permit with the exact same effluent limitations as those currently in effect.

The receiving water body has the following designated beneficial uses: cold water aquatic life and secondary contact recreation. There are no existing uses beyond those already designated.

*Antidegradation Review*

*Level of Antidegradation Protection:* The receiving water body is fully supporting all of its beneficial uses; therefore, it is provided Tier 2 protection. Because existing uses are to be protected for all waters, the receiving water body will also receive Tier 1 protection.

*Degradation:* Because the permit is exactly the same as the previous permit, DEQ will conclude that no degradation will occur. Also, the permit limits ensure that the facility

will not violate water quality criteria (narrative or numeric), thus DEQ concludes the permit is protective of existing uses.

**Hayfield Mine; Water Body Impaired for Sediment**

The Hayfield Mine submitted an application for permit renewal to EPA. The mine is planning on expanding their facility capacity from 0.65 million gallons per day (MGD) to 1.3 MGD. The quality of their influent is expected to stay the same and they aren't expecting to change their treatment processes.

The receiving water body has the following designated beneficial uses: cold water aquatic life and primary contact recreation. There are no existing uses beyond those already designated.

*Antidegradation Review*

*Level of Antidegradation Protection:* The receiving water body is fully supporting its primary contact recreation beneficial use; however, DEQ determined that due to exceedances of the narrative criteria for sediment, the receiving water body is not fully supporting its aquatic life beneficial use.

There is BURP biological data available for the receiving water body. The BURP sampling location is 2 miles from the discharge location and is determined to be representative. The overall BURP multi-index score is 1.5; therefore, the biological data indicates the ecological integrity of the water is not high quality.

- Tier 1 and 2 protection apply for Primary Contact Recreation
- Tier 1 protection applies for Cold Water Aquatic Life

The pollutants evaluated for this facility are arsenic and nickel. Table 7 summarizes the information used in the antidegradation review as well as the results of the Tier 1 and 2 analyses.

**Table 7. Antidegradation review of the proposed permit authorizing increased discharge from the Hayfield Mine**

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due |

| Integrated Report Category | Description |
|---|---|
| 1 | Waters[1] with all applicable uses presumed to be fully supported. Presumption based on lack of pollution sources[2] |
| 2 | Waters for which all applicable uses that have been assessed were found to be fully supported |
| 3 | Waters with no assessed applicable uses due to lack of data |
| 4a | Waters that have an EPA approved TMDL |
| 4b | Waters with controls other than a TMDL expected to restore all applicable uses to full support |
| 4c | Waters for which lack of applicable use support is caused by flow or habitat alteration which is not a pollutant |
| 5[3] | Waters for which one or more applicable uses are not fully supported, due to a pollutant[4] |

*: mgd = million gallons per day; mg/L = milligrams per liter; ug/L = micrograms per liter; SEJ = socioeconomic justification; CMC = criterion maximum concentration; CCC = criterion continuous concentration; N/A = not applicable

*Determine whether the high quality water for Primary Contact Recreation is degraded.*
Although the proposed concentration-based effluent limitation for nickel is lower, the increase in effluent flow is projected to increase the receiving water concentration, from 35.6 ug/L to 38.5 ug/L. The increase of 2.9 ug/L is less than 10% of the ambient (background) quality (30 * 0.10 = 3 ug/L), so DEQ considers this degradation to be insignificant. On the other hand, the proposed increase in arsenic concentration in the receiving water is considered significant. This is because the ambient (background) concentration for arsenic is only 2 ug/L, so the 2.8 ug/L increase is more than 10% of ambient (2.8 ug/L > 0.2 ug/L). As such, the Hayfield Mine will need to conduct a Tier 2 analysis and demonstrate that discharging at the proposed effluent limitation is necessary for important social or economic development in the area.

Because the proposed effluent limitations will not result in an exceedance of receiving water concentrations outside of the authorized mixing zone, DEQ concludes that the existing and designated beneficial uses (primary contact recreation) will be protected and Tier 1 antidegradation requirements have been met.

*Evaluate whether the permit is protective of the Cold Water Aquatic Life beneficial use.*
The effluent limitations are the protective of the cold water aquatic life criteria; therefore, DEQ concludes that the existing and designated beneficial uses for aquatic life will be protected and Tier I antidegradation requirements have been met.

# ANTIDEGRADATION REVIEW

**Army Corps of Engineers Northwestern Division, Walla Walla District (NWW) Application #NWW-043200012**

**Blackfoot Bridge Phosphate Mine**

Comment [BB26]: In the instances where High quality was determined/Tier 2 review was required, it is unclear as to what degradation was allowed, or prohibited, as a result of the analysis. This should be added…was the result just meeting criteria, or will high quality water be maintained? It might also be useful to add specifics about the chosen alternative and why it was accepted and being consistent with IDEQ's rule.

Idaho Department of Environmental Quality
May 4, 2011

**Overview**

In conducting this antidegradation review, the Idaho Department of Environmental Quality (DEQ) considered information presented in various documents including but not limited to the following:

- Application for Section 404 Permit, Blackfoot Bridge Project;
- Army Corps of Engineers Public Notice (August 27, 2009);
- *Final Environmental Impact Statement, Blackfoot Bridge Mine* (BLM, March 2011);
- *Final Water Management Plan, Proposed Blackfoot Bridge Mine* (AMEC Geomatrix November 2010);
- *Final Compensatory Mitigation Plan for Waters of the U.S., Blackfoot Bridge Project* (AMEC Geomatrix, August 2010);
- *Blackfoot Bridge Mine Environmental Monitoring Plan* (P4 Production, LLC [P4], September 2010);
- *Final Adaptive Management Plan for Water Management System, Blackfoot Bridge Project* (P4, September 2010);
- *Supplemental 404(b)(1) Analysis for Least Environmental Damaging Practicable Alternatives for Wetlands and Other Waters of the U.S. Blackfoot Bridge Project* (P4, January 2010); and
- *Compliance with Idaho Antidegradation Policy* (AMEC Geomatrix, July 2010).

**Antidegradation Policy**

The Idaho Water Quality Standards (WQS) contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051). The first level of protection (Tier 1 protection) applies to all water bodies and assures that existing uses of a water body will be maintained. The second level of protection (Tier 2 protection) applies to those water bodies that are considered high quality and assures that no lowering of water quality will be allowed unless it is deemed to be necessary to accommodate important economic or social development. The third level of protection (Tier 3 protection) applies to water bodies that have been designated outstanding resource waters and requires activities to not cause a lowering of water quality.

In March 2011, Idaho incorporated additional sections addressing antidegradation implementation in the Idaho Code. At the same time, Idaho adopted antidegradation implementation procedures in its WQS. DEQ submitted the antidegradation implementation procedures to EPA for approval on April 15, 2011. DEQ is employing a

water body-by-water body approach to implementing Idaho's antidegradation policy. This approach to antidegradation implementation means that any water body fully supporting its beneficial uses will be considered high quality. Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for the impaired use, unless specific circumstances warranting Tier 2 protection are met. The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection.

**Description of the Project**

P4 is proposing to develop a new open pit phosphate mine (approximately 1469 acres) in a small tributary drainage to the Blackfoot River. The proposed project will be comprised of several open pits, external overburden piles, a haul road, an ancillary ore loading and handling area, and water management ponds and associated drainage ditches. The phosphate ore will be crushed and screened on-site; chemical processing of the ore will occur off-site at the Soda Springs elemental phosphorus plant.

This project will involve the discharge of dredge and fill material into 9.43 acres of waters of the U.S., of which 6.11 acres are wetlands and the remaining 3.32 acres are non-wetlands. In conducting its review of compliance with Idaho WQS, DEQ looked at the potential impacts of the activity as a whole on water quality in the receiving water bodies potentially affected by the project. Those water bodies include the Blackfoot River, the unnamed tributary to the Blackfoot River, State Land Creek, and Wetlands X and M (as defined in the project documentation).

**Pollutants of Concern**

Based on experiences with similar mining activities as well as information provided by P4, the primary pollutants of concern for this proposed Blackfoot Bridge Phosphate Mine are: sediment, phosphorus, pH, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, and zinc.

**Receiving Water Body Level of Protection**

According to the most recent EPA-approved Integrated Report (DEQ, 2008), the Blackfoot River is not fully supporting its cold water aquatic life beneficial use due to sedimentation, elevated concentrations of selenium and temperature, and low dissolved oxygen concentrations. The Blackfoot River has an EPA-approved sediment total maximum daily load (TMDL), which describes how the river can achieve water quality standards and fully support its beneficial uses. State Land Creek is also not fully supporting its cold water aquatic life and salmonid spawning beneficial uses due to sedimentation and elevated concentrations of selenium. There are no EPA-approved TMDLs for State Land Creek. Because these waters are not fully supporting their aquatic life beneficial uses, DEQ will provide a Tier 1 level of protection for the aquatic life beneficial uses. DEQ has not assessed the support status of recreational uses in these water bodies; therefore, DEQ must determine the appropriate level of antidegradation protection for recreation on a case-by-case basis. Because no data is currently available, the applicant has agreed to consider these water bodies high quality for recreational uses for the purposes of this antidegradation review in order to prevent further delays in the

issuance of this certification. Thus, DEQ has provided Tier 2 antidegradation protection to recreational uses in the Blackfoot River and State Land Creek. DEQ will reevaluate the level of antidegradation protection afforded to recreational uses based on available information when preparing future 401 certifications for federally-permitted activities that may affect these water bodies.

The unnamed tributary and its associated wetlands are part of assessment unit ID17040207SK010_02. This assessment unit is included in Category 2 of the EPA-approved 2008 Integrated Report (DEQ, 2008), and is fully supporting its cold water aquatic life and contact recreation beneficial uses. Therefore, the unnamed tributary and associated wetlands are considered high quality and DEQ will provide a Tier 2 level of protection.

**Protection and Maintenance of Existing Uses**

The Blackfoot River, State Land Creek, and unnamed tributary are designated (IDAPA 58.01.02.150.09) for the following beneficial uses: coldwater aquatic life, primary contact recreation, salmonid spawning, agricultural water supply, industrial water supply, domestic water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100.03.b.c, 04, and 05). There is no additional information that suggests there are existing uses other than those already designated or presumed in this reach of the Blackfoot River. The segment of the Blackfoot River adjacent to the project is also considered a Special Resource Water (SRW).

Three main types of discharges, or potential discharges to waters of the U.S. are associated with this project: discharge of dredge or fill material, discharge of stormwater, and potential discharge of seepage water. P4 is proposing to implement a water management system and associated adaptive management plan and environmental monitoring plan that will greatly reduce the potential for contaminated stormwater or seepage water from entering into waters of the U.S. Contaminated stormwater, collected seepage water, and water from the mine pit will be pumped to water management ponds where the water will evaporate over time. Water that meets water quality standards will be discharged to waters of the U.S.

Numeric and narrative criteria are set at levels designed to protect existing beneficial uses. In order to protect and maintain designated and existing beneficial uses, the activity must comply with these criteria. Implementation of the project will be done in a manner that does not violate numeric or narrative water quality criteria in waters of the state that are in or adjacent to the project area.

A TMDL for sediment was developed for the Blackfoot River by DEQ and approved by EPA in 2002. The TMDL sets a target of 80% stream bank stability to reduce sediment impacting the Blackfoot River. In addition, the 2006 Implementation Plan for the Blackfoot River Sediment TMDL provides that mining activities implement appropriate and approved BMPs to minimize erosion and sediment delivery to adjacent water bodies. An “Assessment of Potential Mitigation Sites and Preliminary Design – Blackfoot Bridge Project, Caribou County, Idaho” was prepared by AMEC Geomatrix for P4 Production,

LLC (December 2009) to identify areas and methods where wetland habitat would be restored to offset the loss of 9.43 acres associated with the proposed Blackfoot Bridge Mine. This plan proposes streambank and wetland restoration on the mainstem Blackfoot River within the Fox Hills Ranch (owned by Monsanto Corporation) in close proximity to the Blackfoot Bridge Project. Approximately 7 miles of the Blackfoot River meanders through the Fox Hills Ranch. Preliminary data would suggest that of the ~74,000 feet of streambank in this reach, ~5500 feet or roughly 7-8% are in a degraded condition and would lend themselves to restoration. Given this information and the observations of DEQ field staff it would appear that streambank conditions within the Fox Hills Ranch is likely meeting the 80% streambank target and will improve to near reference if the restoration activities proposed by P4/Monsanto are successful. Moreover, it is DEQ's opinion that BMPs identified in the DEIS and to be detailed in the Storm Water Pollution Prevention Plan, including the monitoring that will be required by the Environmental Monitoring Plan provide appropriate BMPs to minimize erosion and sediment delivery to adjacent water bodies. Therefore, the project will be consistent with the approved sediment TMDL and its implementation plan.

In sum, because the Blackfoot Bridge Project will comply with applicable narrative and numeric criteria, will be consistent with the approved sediment TMDL, the existing beneficial uses of all potentially affected waters of the U.S. will be maintained and protected.

**Protection of High Quality Waters**

As indicated previously, the unnamed tributary and adjacent wetlands are considered high quality. Blackfoot River and State Land Creek are also considered high quality waters for recreational uses. As such, according to IDAPA 58.01.02.051.02, that:

"quality shall be maintained and protected unless the Department finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the Department's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the Department shall assure water quality adequate to protect existing uses fully. Further, the Department shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and cost-effective and reasonable best management practices for nonpoint source control."

Based on the information provided by P4, DEQ concluded the project would not result in a lowering of water quality in the Blackfoot River and State Land Creek. However, because modeling data indicates that concentrations of selenium in the unnamed tributary have the potential to reach 0.8 ug/L, DEQ concluded that the project does have potential to significantly degrade water quality in the unnamed tributary and adjacent wetlands. Because of this conclusion, DEQ requested that P4 provide documentation summarizing the alternatives considered and the social or economic justification for the project. In addition, DEQ examined whether

existing point source discharges in the drainage were complying with the highest statutory and regulatory requirements and whether nonpoint sources were achieving all required cost-effective and reasonable best management practices (BMPs).

*Alternatives Analysis*
P4 examined at least eighteen different alternatives for implementing the project. These alternatives were evaluated in the Final Environmental Impact Statement (BLM, 2011) or the Supplemental Alternatives Analysis (P4, 2010). In choosing the least environmental damaging practicable alternative, P4 considered the following factors: whether the alternative was practicable (e.g. achieve the project purpose), the impacts on the aquatic ecosystem, and other environmental impacts.

P4 has selected an alternative that balances practicality and minimization of environmental impacts. P4 selected an alternative that couples placement of a geosynthetic clay laminate liner cover system over the core Meade Peak materials in the EOP and overburden in the pits with installation of a mine water management system. The water management system will encompass an overburden seepage management system, stormwater management system, and a groundwater underdrain system. DEQ considers this to be the least degrading alternative that is reasonable.

*Social or Economic Justification*
The Blackfoot Bridge Mine will allow P4 to continue operations in Caribou Country for another 17 years. As described in the *Compliance with Idaho Antidegradation Policy* (AMEX Geometrix, 2010), implementation of this project "would maintain continued mining employment opportunities in Caribou and surrounding counties, enhance community stability, and provide for continued payment of local, state, and federal taxes by the P4 and its employees." DEQ considers the Blackfoot Bridge Mine an important social or economic development for the area.

*Point and Nonpoint Source Controls*
P4 is the only known point source in the unnamed tributary drainage. P4 is currently conducting exploration activities and stormwater discharges associated with the activity are covered under the 2003 construction stormwater general permit. EPA has not conducted any compliance inspections on P4's exploration activities. Because P4 has coverage under the CGP, DEQ believes that the highest statutory and regulatory requirements are in place. Current nonpoint source activities in the watershed are primarily agricultural; however, these activities are not expected to occur in the drainage once the Project begins. The mine will be the only nonpoint source activity occurring in the drainage and will be implementing all required cost-effective and reasonable BMPs.

*Summary*
This antidegradation review summarizes DEQ's findings based upon review of the documents identified in the "Overview" section above. Based on its review of these referenced documents, DEQ has concluded that the potential degradation of water quality in the unnamed tributary and adjacent wetlands that may result from the Blackfoot Bridge

Mine operation is necessary to accommodate important social or economic development in the area. Additionally, DEQ has concluded that all cost-effective and reasonable BMPs that are required of NPS activities are being implemented. Furthermore, as long as P4 complies with the terms and conditions of the certification, federal Record of Decision, and the federal 404 permit, then the activity is expected to protect existing and designated beneficial uses in the waters of the U.S. within and adjacent to the project area.

## Appendix F – Decision Tree for Baseline Water Quality

**Baseline Water Quality as of July 1, 2011**

Decision Tree

1) There is water quality data for pollutant(s) of interest (i.e. an existing source with appropriate discharge monitoring report (DMR) data) upstream of discharge.

A. There are **no** other sources of pollutant(s) of interest upstream

I. Data are from 2011. Use ambient upstream water quality measurements to characterize baseline; use 95th percentile of at least a year of monthly data up to July 1, 2011.

II. Data are since 2011. Use ambient upstream water quality measurements as in I. above, assuming they represent baseline as of July 1, 2011 because there are no other sources of pollutant(s) of interest upstream

B. There are other sources of pollutant(s) of interest upstream

I. Data are from 2011. Use ambient upstream water quality measurements, as in 1-A-I above (i.e. 95th percentile) AND add in the increase in load due to upstream sources as if they were discharging at their permitted maximum.

II. Data are since 2011.

a. If sources upstream are unchanged since July 1, 2011, then data more recent than 2011 may still characterize baseline WQ as of July 1, 2001, by taking into account discharge potential as in 1-B-I above.

b. With new or increased sources upstream since July 1, 2011 it will be necessary to back out their contribution to load that has occurred since July 1, 2011. This should be a matter of consulting the permitting and DMR records.

2) There is **not** water quality data for pollutant(s) of interest as of July 1, 2011 (i.e. working with a new source or inadequate data from and exisiting source).

A. Ask discharge applicant to acquire a year of monthly data for pollutant(s) of interest, and then proceed as in 1-A-II or 1-B-II above.

B. Or if discharge applicant agrees, proceed as if degradation is significant

## Appendix G – Questions and Answers

[To be added after public comment.]