DRAFT
Use Attainability Analysis Guidance for Washington State

DRAFT – Version 1.2, July 2005

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Refer to Publication Number 03-03-???

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Preface

This guidance document was developed to assist persons or organizations interested in pursuing use attainability analyses (UAAs) in the state of Washington. The document does not constitute an agency rule or policy, and its use is not required for development of a UAA. However, the document does represent Ecology's current interpretation of how the federal and state regulations and laws guide UAA development and use. As such, Ecology expects this document to be a valuable resource for anyone wishing to pursue a UAA and to maximize the effectiveness of their efforts and their chance of success. UAAs can range from simple to complex, and Ecology has striven to include information in this document that allows for development of UAA plans that can be tailored to fit each individual water body, regardless of the level of complexity of the situation.

Few UAAs have been successfully completed and used in agency rulemaking in the Pacific Northwest. We expect that interested parties, both governmental and nongovernmental, will learn a great deal about how the UAA process works – what works successfully and what does not – as we work through the first few UAAs done in Washington. Because of this expectation, we anticipate starting a process to review and revise the guidance as early as two years after the publication date of this document.

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Glossary

Attainable use: The use that can be attained in a waterbody. In this document the attainable use is determined by examining the 6 conditions defining unattainability in 40CFR131.10(g).

Compliance Schedules for Dams: Ten-year plans for dam owners who are currently violating water quality standards to develop a process and schedule for implementing all reasonable and feasible structural and operational changes they can to meet water quality standards. After this time, other water quality standards tools such as use attainability analyses, variances, and site-specific criteria become available. See WAC 173-201A-510

Designated Uses: Those uses specified in the Water Quality Standards (Chapter 173-201A WAC) for each water body or segment, regardless of whether or not the uses are currently attained. See WAC 173-201A-020.

Existing Uses: Those uses actually attained in the waterbody on or after November 28, 1975, whether or not they are included in the water quality standards. Water body surveys, historic records, and to a limited extent, anecdotal accounts should be relied on to determine existing uses. Introduced species that are not native to Washington, and put-and-take fisheries comprised of non-self-replicating introduced native species, do not need to receive full support as an existing use. See WAC 173-201A-020.

Feasible: Guidance on a final working definition of this term is not available at this time. Ecology and the USEPA are working to develop a working definition of feasible that will fulfill the 40CFR131(10)(g)(4) condition for hydrologic modifications (UAA approach) and the WAC 173-201A-510 compliance schedule for dams.

Highest attainable use: Used synonymously with the term "attainable use." One of the most recent uses of this term is from the *Vision for the Water Quality Standards Program*, which was drafted by an ad hoc state/EPA work group formed at the State/EPA Workshop on Water Quality Standards in Warrenton, VA in April 2004, and finalized in August and September. This vision document represents a common understanding to guide future standards program activities at the national, regional, and state level. The specific language containing the term is: *"Each water body in the United States will have a clear, appropriately comprehensive suite of standards that defines its highest attainable uses and the water quality required to support the uses…"*

Highest Attainable Uses for Dams: The most sensitive (requiring the most stringent water quality conditions) existing or designated uses that can be feasibly achieved (Determined procedurally through WAC 173-201A-510 and 40 CFR 131.10).

Narrative Criteria: Are non-numeric water quality criteria that establish qualitative performance goals to protect beneficial uses from detrimental conditions (e.g., meet requirements of use, no toxic effects, no offensive odors, no blockage of migration, etc.).

Natural Conditions: Means surface water quality that was present before human-caused pollution. See WAC 173-201A-020.

Numeric Standards: Numeric water quality criteria assigned to protect designated uses in the water quality standards (Chapter 173-201A WAC) from the detrimental effects of specific water quality constituents.

Site-Specific Criterion: Criterion based on science-based study designs to show that species at a site are more (or less) tolerant of a pollutant than are the species used in the national or state studies that formed the basis for the state criteria. Site specific criteria must be formally adopted into the water quality standards and approved by the USEPA under the federal Clean Water Act. See WAC 173-201A-430.

Total Maximum Daily Load: A written quantitative assessment of water quality problems and contributing pollutant sources.

Use Attainability Analyses (UAA): Structured scientific assessments of the factors affecting the attainment of the waterbody's designated uses which may include physical, chemical, biologic, and economic factors. A UAA can be used to remove a designated use from the water quality standards (Chapter 173-201A WAC) that is neither existing nor attainable. See WAC 173-201A-440.

Use Subcategories: (1) In general, a subcategory is a more refined definition of an otherwise broad use type. For example, "warm water aquatic life" would be a subcategory of a broader "aquatic life" use category. The state of Washington has already established subcategories for the aquatic life and recreation use types. Where appropriate, however, further refinement of these subcategories is possible. (2) In some cases Ecology might develop a generalized subcategory use that is not more refined, but instead describes a characteristic use that does not fit specifically within the current designated use descriptions. This type of subcategory use would likely be a generalized category applicable to more than one waterbody.

Variance: A temporary waiver from meeting water quality standards that must be re-evaluated periodically in order to be renewed. Variances are applicable to dischargers based on a discharger-specific evaluation, or to a waterbody based on a water body-specific evaluation.

Water body: In this guidance water body refers to the area of water being evaluated by a UAA. The size of the water body will vary based on the specific focus of the UAA and the characteristics of the waterbody.

Water body-specific criterion: A parameter-specific numeric criterion that is based on supporting the best attainable aquatic life use in a specific water body. This criterion would be fully protective of the attainable use, and in general would be the same as the highest attainable water quality for the waterbody. The criterion is developed as part of the attainability analysis within a UAA.

Acronyms

UAA	Use Attainability Analysis
WQS	Water quality standards
EPA	United States Environmental Protection Agency
TMDL	Total maximum daily load
DO	Dissolved oxygen

Federal Regulations on Use Attainability Analysis: 40CFR131.10(g)

(g)States may remove a designated use which is *not* an existing use, as defined in § 131.3, or establish sub-categories of a use if the state can demonstrate that attaining the designated use is not feasible because:

(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or

(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or

(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(5) Physical conditions related to the natural features of the water body, such as lack of a proper substrate, cover, flow; depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(6) Controls more stringent than those required by sections 301 (b) and 306 of the Act would result in substantial and widespread economic and social impact...

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Part 1. How to use this Document

This document provides guidance to persons or groups interested in evaluating the uses of water bodies that are to be protected under Washington's surface water quality standards regulation. An evaluation of uses is termed a "Use Attainability Analysis" (UAA). A UAA is a structured scientific assessment of the factors affecting the attainment of uses designated for protection in the water quality standards. It may include an assessment of physical, chemical, biologic, and economic factors as described in the federal regulations at 40 CFR 131 10(g).

This guidance document is intended to be used:

1. As a step-by-step guide to the process of conducting a UAA.
2. As a source of general information about UAAs, including when and where it might be useful to invest resources in conducting a UAA, and when and where a UAA would be unlikely to result in regulatory action that would change a designated use.
3. As a very basic introduction to the economic assessment portion of the UAA. In some cases an economic assessment will not be needed to support rulemaking, but this determination should be made on a case-by-case basis.
4. As a project planning checklist for specific types of information that should be considered when a UAA is in the design phases. Each study area will need a study tailored to area-specific concerns, and this document provides a checklist of the types of data, discussion of indicators, and discussion of data sources and data quality goals that should be considered by anyone designing a UAA**.**
5. As an aid to regulatory and resource agencies when reviewing final UAA studies.

All of the data types discussed in this document may not be necessary for a specific water-body, but considering the checklist and other indicator information during planning will ensure that the study focuses on data that are relevant and necessary for the evaluation, and that important types of information are not overlooked. **Following the steps in Part 2, particularly steps that include conferring with the public, agencies, and tribes, will result in a list of data needs that is tailored to the specific waterbody you are addressing**

Not every data type or source that might need evaluation is necessarily contained in this guidance document. **Ecology strongly recommends that any person or group interested in conducting a UAA discuss the proposed study with Ecology and EPA prior to development of the study design**.

Part 2. The UAA Process

The following steps should be taken by any applicant conducting a UAA. Following these steps will (1) help the applicant determine whether a UAA is appropriate for a specific water body and (2) assist in the development of a UAA that contains relevant information that can be clearly evaluated by Ecology, EPA, and other interested parties, and that contains the types and quality of information necessary to support an Ecology rule making and Clean Water Act approval. The

steps are intended to be followed sequentially. This process is designed to avoid wasting time and resources by establishing a predictable series of decision points and planning steps.

As you read the information that accompanies each step you will find some repetition, however, each step is intended to reinforce and provide more information than the prior step. Thus, information supporting step 1 is more basic than information supporting subsequent steps.

Each step contains a reference and/or link to information that explains how to follow that particular step.

Steps in a UAA:

1. Read Part 3 of this publication (*Part 3. Is a UAA right for your waterbody? Basic Information to read before going any further*), linkLLL. This section contains basic information for applicants that will help them determine whether a UAA is appropriate for their site and situation. If you think a UAA might be appropriate for your waterbody, go to Step 2.
2. Read Part 4 of this publication (*Part 4. General Information about UAAs*) linkLLL. This section contains more in-depth information on UAAs, including guidance on the types of information that will be needed by Ecology and the USEPA in order to evaluate a use change as well as to support an Ecology rulemaking and EPA CWA review. This section discusses many of the policy and technical issues that can come up in a UAA. If you think a UAA is appropriate for your waterbody, go to Step 3.
3. Contact Ecology to discuss the UAA approach as it applies to your specific waterbody. (link LLL to appropriate Ecology contacts) If you plan to pursue a UAA proceed to Step 4.
4. Examine the six factors contained in the Federal Register that can be used to downgrade a designated use (See *Part 4. General Information about UAAs*, Link LLL). Work with Ecology and EPA to develop the approach the UAA will take. This also includes developing a list of information that the applicant will need to supply to Ecology and EPA in order to support the UAA review and potential rule-making. Develop a public involvement program to inform and involve the local public, interest groups, agencies, and interested tribes. The applicant and Ecology should consult Parts 5 (*Economic Analysis for UAAs*, Link LLL) and 6 (*Use-specific guidance for UAAs, Link LLL*) of this publication. Proceed to Step 5.
5. Develop a QAPP (see *Part 6. Use-specific guidance for UAAs,* Link LLL*)* and discuss it with Ecology. Continue to involve all interested parties in the development of the UAA plan. Ecology will let the applicant know if the QAPP appears likely to fulfill its information needs. Proceed to Step 6.
6. Perform necessary studies to complete the UAA. (See *Parts 5* (*Economic Analysis for UAAs*, Link LLL) and *6* (*Use-specific guidance for UAAs,* Link LLL)) Continue public involvement and review of recommendations with interested parties. Talk over your recommendation with Ecology and EPA. Proceed to Step 7.
7. Assemble and submit the UAA (see *Part 7 , Submittal of the UAA to Ecology*, Link LLL)
8. Ecology reviews UAA (see *Part 8, Ecology Review and Actions,* Link LLL). In this step Ecology determines whether the UAA supports a rule change, what type of rule change is

appropriate, and the work load associated with a rule revision. Ecology will proceed with the formal rule-making process (Link LLL: APA, Rule-making process, WQP schedule for revising uses (separate from triennial review)) if the proposal would .

Part 3. Is a UAA right for your waterbody? Basic Information to read before going any further.

There are a number of approaches an entity can take to comply with water quality standards. These approaches are in general based on (1) improved treatment and disposal options and (2) modifications of the water quality standards. The options available in the second approach are summarized in the Ecology publication **Tools Document, Link LLL**. The Tools Document should be reviewed before proceeding with plans for a UAA. The three specific tools that address modification of the water quality standards are use attainability analyses, variances, and site specific criteria. These tools are summarized below.

Tools that can lead to a modification of the water quality standards:

UAAs, site specific criteria, and variances are all separate processes for revising or granting compliance waivers to state water quality standards. While they can all be applied independently to a waterbody, they each have separate purposes and requirements.

Use Attainability Analyses	Variances	Site Specific Criteria
Are used to: **1. <u>Remove designated uses</u> that don't exist and that are formally determined to be unattainable** **2. <u>Revise designated uses</u> into more accurate use-subcategories.**	Are used to: **1. <u>Grant a temporary waiver</u> from needing to meet specific water quality criteria.** The same factors used to determine if a use can be removed under a UAA can be used to grant a variance.	Are used to: **1. <u>Revise the criteria for a pollutant</u>.** A site specific criteria must demonstrate that the local biota are less sensitive to a pollutant then the biota used to establish the national or state criteria.
Federal regulations establish six conditions for removing or revising designated uses. Changes in designated uses must be adopted into state water quality standards. Once adopted they remain in effect indefinitely.	Federal guidance demands that variances be adopted into the state water quality standards regulation. Compliance levels must be determined individually for each source of pollution. Variances must be re-evaluated every five years.	Federal guidance details three methods for developing site specific criteria. Site specific criteria must be adopted into state water quality standards. Once adopted they remain in effect indefinitely.

This guidance document (*Use Attainability Guidance for Washington State*) specifically addresses Use Attainability Analysis, one of the tools that can be used to modify the water quality standards. UAAs are generally undertaken in areas where the designated uses for the waterbody are suspected to be inaccurate. Designated uses are the uses specifically written out (designated) for protection in the water quality standards (**Link to WQS to see the uses and their locations**).

A UAA is necessary if the proposal is to downgrade a designated use or to develop a seasonal or subcategory of a designated use. In water bodies throughout the state designated uses might or might not be fully supported:

- If the designated use currently exists and water quality criteria to protect that use are being met (i.e., the use is being fully supported), then that use may not be downgraded.
- If the designated use appears to be present (e.g., salmon use the area for spawning but the water quality criteria that protect that use are not attainable) then the use is not considered to be fully supported. In this case it is possible to establish a new subcategory in the WQS that reflects this use.

- If the designated use only occurs seasonally because of natural factors, then a seasonal use specific to this situation can be established in the WQS. Note that when a use is modified to only apply in a certain season (e.g., a seasonal recreational use is developed), then another use must still be present to protect uses in the "off season". The *designated* aquatic life uses and criteria in the water quality standards were designed to provide a healthy thermal environment that protects entire aquatic life communities on a *year-round basis* and so cannot be applied seasonally. Thus, in the case of aquatic life, *new* seasonal uses (*not* the designated uses defined in the standards) could be developed, and they would need to be accompanied by new criteria to protect those uses.

In all cases existing uses must be maintained and protected. Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in water quality standards (40CFR131.3(e)).

The focus of a UAA is dual:

- **To use the methods available in 40 CFR131(1)(g) (Link LLL) to determine whether a specific designated use is being met and if not, why not. This focus includes an assessment of the existing uses of the waterbody.** Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in water quality standards. Existing uses cannot be removed, even with a UAA.
- **To use the relevant factors from 40CFR131(1)(g) to determine the attainable uses.** The attainable level of water quality and uses is determined by taking into account the capability of the natural system as well as the technical and economic limitations of human sources throughout the basin that affect the site. (See *Part 5* (*Economic Analysis for UAAs*, Link LLL).

In some cases the information in a UAA might result in changes that are unexpected. For instance:

- The UAA process might reveal data indicating that more sensitive uses than were expected are present, thus more protective criteria might be warranted.
- A use change for a waterbody might not be merited, but a short-term variance (Link LLL to Tools document) for a particular discharger might be appropriate.

Upgrading uses: In order to upgrade a use, credible information showing the existence or attainability of the use is required. This demonstration is likely to be an easier task than a demonstration that a use is not existing or attainable because the steps in the process can be far fewer. For instance, in a water body designated secondary recreation a series of photos demonstrating swimming, or other water contact activities associated with high levels of exposure by ingestion, occurring at a recent time, could be enough information to support a designation of primary contact recreation. When evaluating information such as photos Ecology will work with the public to determine whether the use is a characteristic use of the area, and whether other issues, such as dangerous conditions (e.g., as encountered in irrigation supply canals) would make an upgrade inappropriate (in the case of recreation, an upgrade where dangerous conditions exist could be interpreted as encouraging recreational use in dangerous

areas). In order to down grade a water body from primary to secondary recreation, information showing that the use is not existing (not attained since November 28, 1975) or attainable must be developed. This process could be fairly simple or complex, but in most cases will be a larger task than the upgrade example discussed above.

UAAs are guided by federal regulations, and recommendations for use changes resulting from information in a UAA must be adopted into the water quality standards and be approved by EPA as meeting the federal Clean Water Act and the Endangered Species Act prior to any action on the recommendation. This means that **the applicant should work with the approval agencies and affected tribes to determine the up-front data needs for the UAA**. UAAs can be costly, and moving forward with a UAA that does not adequately address the federal requirements and state needs for rule-making can result in large costs and little or no benefit to the applicant.

Can a use be downgraded or removed just because a criterion is not being met?

No. Failure to meet a water quality criterion that is established to protect a use is not sufficient evidence that a use is not attainable.

Are UAAs used only to lower protection under the water quality standards?

No. A UAA must include sufficient information to answer the question of whether any existing or attainable uses occur at the site that are not being protected by the designated uses. In addition, the information in the UAA should be complete enough to allow a determination of the related attainable uses in the waterbody. For instance, an economic analysis might show that a specific designated use **cannot** be attained, but it should also be detailed enough to show the use that **can** be attained, even if that attainable use is better than the current conditions of the waterbody.

Can an existing use be downgraded?

No. Existing uses cannot be downgraded. Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in water quality standards. If the current use is the existing use, then that use must be maintained, and cannot be downgraded.

In some cases the existing use might not currently be present in the water body, but credible information exists that documents that the use has been attained on or after November 28, 1975. Options in this case would be to develop a UAA to change the designated use to the higher of either (1) the existing use (if the designated use is a higher use quality than the existing use) or (2) the attainable use (if a higher quality use can be attained using the criteria in 40CFR131(10)(g)).

Alternate pathways include investigating approaches such as site specific criteria and variances (see Tools document, Link LLL). Enhanced water pollution control options are included in the development of recommended attainable uses and variances.

How is the cost of additional treatment to meet water quality criteria factored into the decision to modify a use?

Federal regulations allow cost to be considered in two situations:

- Where attaining the use would cause substantial and widespread economic and social impact. If this is the case the designated use can be modified or removed so long as all existing uses are maintained.
- Specifically for hydrologic modifications, where operating the dam or restoring natural conditions is infeasible. Ecology and the USEPA are in the process of defining the term "feasible".

Do UAAs apply to waterbodies with ESA-listed species, such as some salmonid runs?

Yes, however UAAs for waterbodies used by ESA species will need an extra degree of planning and coordination with Ecology, EPA, the tribes, and the resource agencies to determine information needs. Although the WQS are not specifically designed to enforce compliance with the ESA, procedurally any change in the standards will be examined by EPA and the federal resource agencies to determine whether a formal ESA consultation is needed. Ecology recommends that an applicant interested in pursuing a UAA for one of these waterbodies should carefully consider any possible effects to ESA-listed species prior to committing resources to the project.

Part 4. General Information about UAAs

What is a UAA?

Federal regulations (40 CFR 131.10) direct states and tribes to specify attainable water uses in their water quality standards (WQS). These regulations also establish strict provisions for the removal of these uses once they have been designated by a state. The process for removing or modifying designated uses is through the application of a use attainability analysis (UAA).

The federal regulations [40 CFR 131.3(g)] describe a "Use Attainability Analysis" as being "a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors . . ." The purpose of a UAA is to ensure the attainable uses are designated for a waterbody. To help accomplish this objective the process does not allow for the removal of any existing uses or any attainable designated uses.

When is a UAA needed?

A state is required to use a UAA in two specific instances:

1. Whenever a state designates or has designated uses that do not include the uses specified in section 101(a)(2) of the Clean Water Act; or

2. When a state wishes to remove or modify a designated use that is specified in § 101(a)(2) of the Act or to adopt subcategories of uses specified in § 101(a)(2) which require less stringent criteria.

The second situation is most likely to affect parties interested in modifying a designated use in Washington state. The designated uses referred to in (2) above are found in Section 101(a)(2) of the federal Clean Water Act. This section establishes what is often referred to as the fishable/swimmable goals:

> "it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved . . ."

What are the components that make up a UAA?

In the preamble to the water quality standards regulations in the Federal Register [48 FR 51401] a UAA is defined as containing a water body survey and assessment, a wasteload allocation, and economic analysis, if appropriate.

1. A water body survey and assessment examines the physical, chemical, and biological characteristics of the water body to identify and define the existing and attainable uses of the water body. This would include examining historic records that illuminate how the waterbody has physically changed over time, historic water quality data, and historic surveys on uses (such as fish distributions or recreational use).

2. A wasteload allocation uses mathematical models and relationships to predict the amount of reduction in pollutant loading necessary to achieve protection for the designated use(s). This general method of analysis can also be used to define the natural potential water quality, because such modeling can be used to remove human sources of pollutants and physical changes to the stream system.

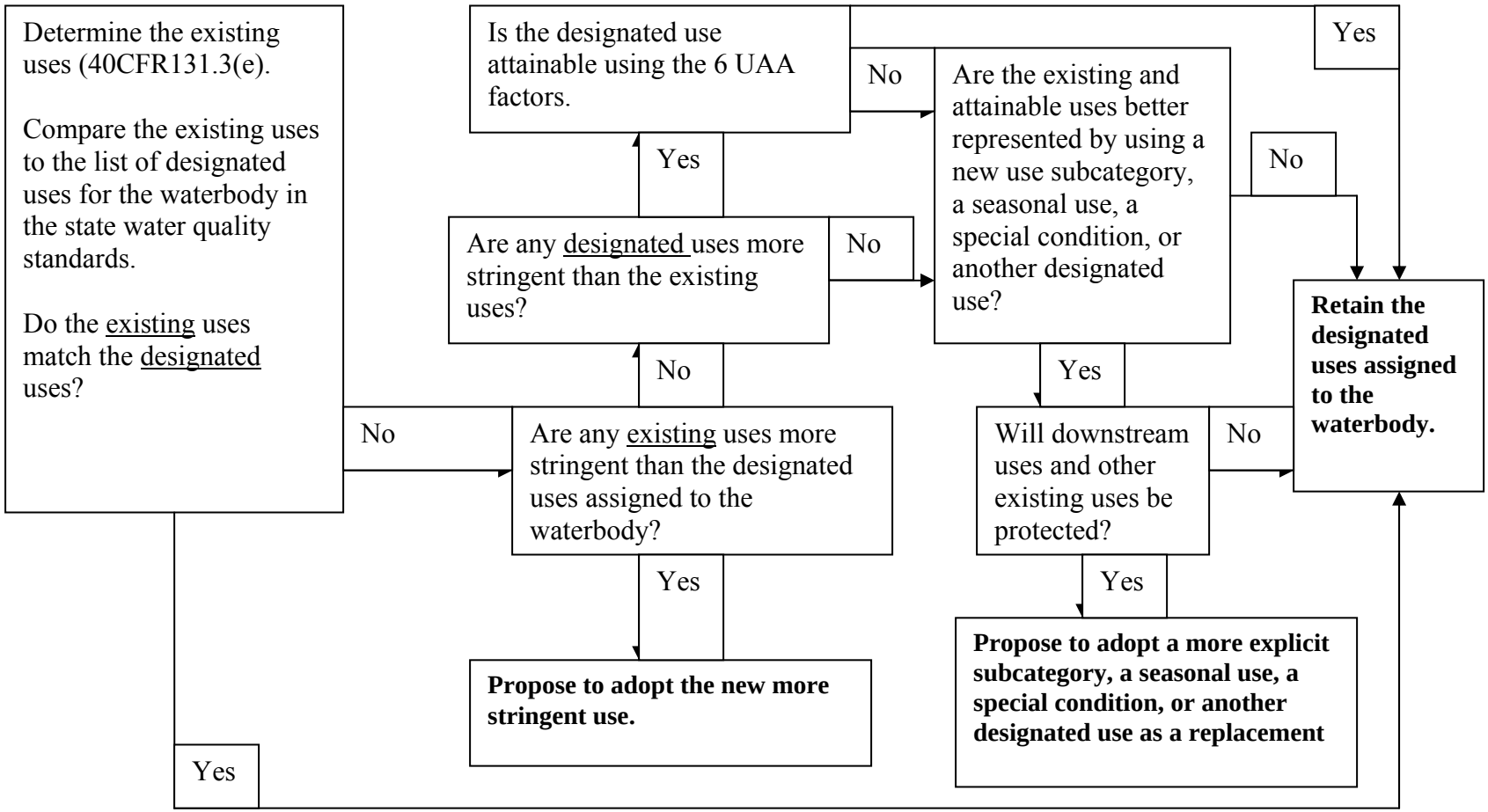
3. The economic analysis is appropriate in determining whether the more stringent requirements associated with protecting a designated use that is not an existing use would cause substantial and widespread economic and social impacts.

All of these components are discussed in this guidance document.

Generalized flowchart of a use attainability analysis

A UAA that can be used by Ecology to support a change in the Water Quality Standards must clearly document the existing, designated, and attainable uses for a waterbody; be scientifically defensible; and be supported by a sufficient amount of data. The federal requirements of the UAA process are discussed in the Code of Federal Regulations [40 CFR 131.10(g)-(j). The generalized approach that would be used during a UAA is contained in Figure 1

Figure 1. Summary flowchart of the decisions in a use attainability analysis.



Grouping multiple waterbodys in one UAA

While generally not recommended, waterbodies having similar physical, chemical and biological characteristics may be grouped together when conducting UAAs. This allows several water bodies or stream segments to be treated as a single unit or allows establishment of representative conditions which are applicable to other similar water bodies or stream segments. While these grouping are not limited by hydrological boundaries, such as a single watershed, they must have enough common characteristics to ensure the groupings are logical and defensible. Examples of acceptable categories might include the agricultural or urban stormwater channels which share similar channel depths, flow regimes, substrate, and ecological characteristics. Taking this approach, however, creates more risks of the UAA being rejected (by the various state and federal agencies charged with resource protection) out of concerns that the grouping (1) is over-generalized and does not adequately cover the potential of individual systems to support aquatic uses, and (2) might not be protective of downstream uses in every situation. Applicants desiring to group waterbodies in a UAA are strongly recommended to discuss the approach with Ecology and EPA prior to proceeding.

Future re-evaluation of use assignments

Ecology is required to reevaluate water body use designations resulting from UAAs during each future triennial review of its WQS **if those revised uses do not meet the Section 101(a)(2) goals of the CWA** (cited above).

During the reevaluation, Ecology is to examine any new information that has become available that may indicate the § 101(a)(2) use goals are now attainable. The triennial review process does not require the collection of new data, nor does it require a new UAA be conducted. Rather, it provides an opportunity to analyze new information about the water body that might indicate that additional uses are now attainable. If any fishable/swimmable uses have become attainable, Ecology is required to upgrade the WQS to reflect these uses. This reevaluation requirement would apply if an entire use category (such as primary contact recreation) is removed completely, or even seasonally. However, it would not be necessary when a UAA establishes subcategories of aquatic life uses, or seasonal divisions of these subcategories, that represent a more detailed expression of what it means to protect those uses (e.g., separate spawning and rearing criteria that are applied on the basis of when those life-stages actually occur in a waterbody).

Question and Answers

What type of public involvement is needed to bring about a successful UAA?

The public involvement process is a cornerstone of UAA development. In order to gather local information, gauge the support of the public for conducting a UAA, and to draw in interested parties the applicant should begin planning the public involvement process early in the planning stages of the UAA. Early in the planning process applicants should contact and discuss the UAA concept with local groups who use the waterbody, environmental groups, local governments, downstream users, and state and federal agencies. Special care should be taken early in the process to contact and coordinate with any tribes who use the waterbody or downstream waters. Public involvement should continue throughout the duration in which the UAA is developed, and recommendations made in the UAA should be reviewed by all interested parties.

The public involvement process developed by the applicant will not replace Ecology's formal public rulemaking process if the UAA results in a proposed rule change. Ecology will conduct its own public involvement process, according to federal and state requirements, agency policy, and program needs.

What are designated uses?

Designated uses are those water uses (e.g., fishing, boating, aquatic life, water supply, etc.) that are designated in state WQS for protection in a water body, even if they are not existing or attainable uses (described below). Criteria for conventional and toxic pollutants and deleterious effects are established in the WQS to provide full protection for the designated uses. All designated uses must be fully protected, even if they are not existing or attainable uses, unless they are *formally* removed from the WQS through a UAA process. The federal regulations (40 CFR 131.10) prohibit states from removing designated uses that are also existing uses unless a use requiring more stringent criteria is added in its place [40 CFR 131.10(h)].

What are existing uses?

Existing uses are those uses actually attained in the water body on or after November 28th, 1975, whether or not they are included in the water quality standards. Water body surveys, historic records, and to a limited extent anecdotal accounts should be relied upon to determine the existing uses.

What are attainable and unattainable uses?

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Attainable Uses:

There are two types of attainable uses:

1. Designated uses that are attainable, and
2. Uses that are not designated but which are attainable**. In conducting a UAA it is important to examine not only the possibility that some designated uses can be removed, but also to examine the possibility that some new designated uses may need to be established**.

In designating uses EPA directed states to include any uses that, at a minimum, could be achieved by implementing the effluent requirements of Sections 301(b) and 306 of the Clean

Water Act (i.e., technology-based limits) and cost-effective and reasonable best management practices for non-point source control. If the water quality criteria for a designated use would be met based on these control technologies, the use is considered attainable, regardless of whether that use is currently attained in the water body. Once uses have been designated in state standards, however, they are to be considered attainable even if doing so requires the application of pollution controls more stringent than the minimums required in Sections 301(b) and 306 of the Clean Water Act, unless one of the six factors listed in 40CFR131.10(g) can be demonstrated (discussed below).

Unattainable Designated Uses:

The federal regulations establish six conditions for states to use to determine what designated uses are not attainable. **Only one of these conditions must be demonstrated in order to pass the test for unattainability:**

> *[40 CFR 131.10(g)] States may remove a designated use which is* ***not*** *an existing use, as defined in § 131.3, or establish sub-categories of a use if the state can demonstrate that attaining the designated use is not feasible because:*
>
> > *(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or*
> >
> > *(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or*
> >
> > *(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or*
> >
> > *(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or*
> >
> > *(5) Physical conditions related to the natural features of the water body, such as lack of a proper substrate, cover, flow; depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or*
> >
> > *(6) Controls more stringent than those required by sections 301 (b) and 306 of the Act would result in substantial and widespread economic and social impact...*

The six factors above should be examined to demonstrate both the unattainable designated uses and the attainable uses in a water body**. Where human activities (pollution, dams, mining, etc.) contribute to the limitation of what uses are attainable, economic and social factors associated with repairing the stream must be examined to demonstrate what is attainable.** If remediable physical barriers (i.e., a culvert) are the cause of the criteria or use not being attained in the water body, the use should generally be considered attainable.

What are subcategories of uses?

The federal water quality standards regulations [40 CFR 131.10(c)] authorize states to use the UAA process to adopt subcategories of a use and set appropriate criteria to reflect the needs of the adopted subcategories. For example, state standards may designate the subcategory use of fish migration for a waterbody where that represents the highest attainable use. The Washington WQS for aquatic life protection are already set-up into subcategories of uses that each describes assemblages of co-existing aquatic life uses. (WQS Link LLL to designated uses). Because of this current structure, there is little room for further refinements of the designated aquatic life uses established in the standards. However, if a use type can be identified that does not fall into one of the categories of designated uses, then it would be possible to add it within the water quality standards as a new subcategory or as a subcategory only for the specific water body. In addition to the situation above, in situations where uses are present but criteria levels are not attainable (full protection is not met or attainable) for all parameters, development of a generalized subcategory such as "cold water aquatic life habitat" could be applied along with a water body-specific criterion (for the parameter that does not meet criterion levels) for the designated use (see "Is use support defined by a comparison with water quality criteria?" below). This waterbody-specific criterion would provide full protection for the attainable use, and in general would be based on the highest attainable water quality for the parameter.

Development of a generalized subcategory, as mentioned above, is not an approach that has been used previously in the Washington water quality standards. Such a generalized subcategory would have a generalized description in the rule language, but criteria for that subcategory would be unique for different waterbodies, and the criteria would also be contained in rule language.

The specification of subcategories may result in making the criteria either more or less stringent depending upon the relative use-support requirements of the categories. Subcategories must also be set in a manner that will not endanger support of more sensitive downstream water uses or any more sensitive uses that occur at different seasons within the water body. While the U.S. Environmental Protection Agency (USEPA) does not require UAAs for states to assign more stringent subcategories of uses, it may be while conducting a UAA that it becomes apparent that more stringent subcategories of uses need to be protected in a water body.

What are seasonal uses?

According to the federal regulations [40 CFR 131.10(f)], states may adopt seasonal uses as an alternative to reclassifying a water body to uses requiring less stringent criteria. In this context, a seasonal use could be for an entire category of a use, such as when swimming is not designated for protection during the winter. The federal regulations [40 CFR 131.10(f)], however, establish that water quality criteria adopted to reflect seasonal uses should clearly not preclude the attainment and maintenance of a more protective use that is existing or attainable in another season. Further, any seasonal criteria established must be adjusted so as not to interfere with the attainment and maintenance of the water quality standards of downstream waters [40 CFR 131.10(b)]. When a use is modified to apply only in a certain season the UAA must also identify the use that can be attained in the "off" season

In Washington the designated uses for aquatic life for both fresh and marine waters cannot be applied on a seasonal basis. These designated uses represent aquatic biota present in a water body throughout the year, and were not developed to apply to specific seasonal life-stages. The numeric criteria that accompany the designated use categories are also set to maintain the year-round conditions in a stream at a level that will fully protect the key species and use-types, as well as the overall aquatic community. For example, the designated use category that is abbreviated as "salmon and trout spawning, noncore rearing, and migration" is defined in the standards (**Link to WAC 173-201A-200(1)**) as "for the protection of spawning, core rearing, and migration of salmon and trout, and other associated aquatic life". The accompanying temperature criterion (**Link to WAC 173-201A-200(1)(c)**) for this designated use category is an annual maximum seven-day-average-daily-maximum value of 16°C. An annual maximum value was chosen as the simplest method for defining a water quality condition that will fully protect all the life stages of salmon and trout that occur over the course of a year as well as protecting the myriad of other aquatic life and their unique reproduction and growth periods. The focus of all the designated aquatic life categories is on the overall quality of the thermal habitat, and the purpose is to fully protect all of the fish and non-fish communities and their various life-stages that occur in that type of water body in the spring, summer, winter, and fall. It is not appropriate to try and break these ecologically-based designated uses and their associated criteria into seasons.

New seasonal aquatic life uses must be different from the designated uses described in the water quality standards. It is still possible to set seasonally based aquatic life uses, but those *new* uses would not be the designated uses described in the standards. New attainable uses would need to be developed, followed by site specific criteria development for the new seasonal uses.

The above situation does not exist with recreational uses where the use-types (i.e. primary and secondary contact) can be separated by seasons so long as it can be demonstrated that both uses would be fully protected during their respective seasons (as well as protecting other uses such as shellfish harvesting in downstream waters).

Is use support defined by a comparison with water quality criteria?

In general, uses are assumed to be met if criteria are being met. However, this assumption is not always appropriate. For instance, in some cases criteria are met but non-water quality related factors preclude the use. As an example, water quality criteria designed to protect salmonid spawning might be met in a river but the river may have a naturally fine sediment substrate that precludes its use for spawning. In this case the UAA regulations allow the use to be modified as long as all existing and attainable uses are protected. In some cases a designated use appears to be present but criteria are not met. In this case the use is not being fully attained because the criteria that define the level of use (in Washington criteria represent conditions that should support a very healthy designated use) are not being met.

What is "full support" of an aquatic life use?

Each numeric water quality criterion is developed to "fully support" the designated aquatic uses it addresses, however, it is inappropriate to assume that if a waterbody is not capable of meeting all of the numeric criteria established for protecting a specific designated use then the use-*type* is not present, or not relatively healthy. For instance, a waterbody might have excellent physical

habitat characteristics for spawning and rearing, and meet the numeric criteria for temperature, turbidity, and pH, but fail to meet the dissolved oxygen criteria. In this case a use very similar to the designated spawning and rearing use might be present and appear healthy, but the "fully protective" level of use support that was established as the target in the water quality standards would technically not be met because a single criterion is not being met. This hypothetical situation is one that we expect to be encountered in some of our waters.

So, in the situation described above, how do we determine whether the designated aquatic life use is attained (fully supported)?

- If the numeric criterion is not attained because of natural conditions, then under the Washington water quality standards the natural condition becomes the criterion, and thus the use is considered attained and the designated use is not changed.
- If the numeric criterion is attainable then the regulatory strategy for the water body will require that the criterion be met in a reasonable timeframe, and the designated use will technically be attained.
- If the criterion is not attainable (and the fully supported use is not an existing use), then the attainable level of the parameter in question (for example temperature) will be determined by Ecology and used during rule-making as the basis for a water body-specific criterion, and the designated use will be modified to reflect the healthy use that is present in the water body (e.g., a subcategory such as "limited cold water aquatic life habitat"). This waterbody-specific criterion would provide full protection for the attainable use, and in general would be based on the highest attainable water quality for the parameter.

Note that in the scenario above the water body-specific criterion is *not* what we would term a site-specific criterion. A site- specific criterion is based on a toxicological assessment of the species in the water body, and the water body-specific criterion is based on the highest attainable water quality for the parameter and on providing full support for the attainable use.

How are the attainable aquatic life uses chosen?

(This discussion focuses on attainable uses, not on existing uses. As discussed previously, all existing uses must be fully protected.)

When determining attainable uses the key issue is how to decide when to choose either (1) a designated use category that is already in the water quality standards, or (2) a new use that is **not** a use category designated in the standards. Determining the attainable use can be complex, and the discussion below addresses some of the complexities, as well as providing some examples of how attainable uses would be chosen in different situations. Freshwater aquatic life uses in the 2003 revisions to the state water quality standards are used in the discussion and examples given below.

Background information:

The designated use categories for freshwater aquatic life are *abbreviated* as:

- Char
- Salmon and trout spawning, core rearing, and migration.
- Salmon and trout spawning, noncore rearing, and migration.
- Salmon and trout rearing and migration only.
- Non-anadromous interior redband trout.
- Indigenous warm water species.

These abbreviated descriptions are more fully described within the water quality standards. One example of a full use description taken from the 2003 water quality standards is the following:

- ***Salmon and trout spawning, core rearing, and migration***. *For the protection of spawning, core rearing, and migration of salmon and trout, and other associated aquatic life.*

This description includes not just the "key species" and "key life-stages" used to identify systems where the use should be applied, but also recognizes the intent and obligation to protect associated indigenous fish and non-fish aquatic species. Even though the abbreviations of "spawning, rearing-types, and migration" are used as a short-hand way to describe the designated uses, the **uses as defined in the standards (see above) are stream-uses, not fish-species uses and not specific fish-life-stage uses**. This point is emphasized here because use of the abbreviations frequently causes the emphasis of the standards to be focused on fish, when the use descriptions are actually inclusive of all aquatic life. All of the freshwater aquatic life use categories are fully described in *Part 6, Use Specific Guidance for UAAs* Link LLL and WAC 173-201A-200(1)(a) Link LLL.

In some cases criteria and use descriptions provide protection for uses that are not specified in the use description itself. An example of this is headwater streams. A specific use called "headwater streams" is not included in the water quality standards, but in this case the use of salmon and trout core rearing, as well as the associated description of "other associated aquatic life", and the accompanying criteria, provide protection for the sensitive macroinvertebrates that inhabit headwater streams. These sensitive non-fish species are often equally or more sensitive to water quality degradation than salmon and trout. Thus, in a UAA evaluation of a headwater stream that finds sensitive macroinvertebrates forming part of the biota, the designated use of salmon and trout core rearing would likely not be removed (even if the stream does not have fish because *the core rearing criterion provides the level of protection most closely linked to these sensitive macroinvertebrate assemblages*.. This does not preclude the applicant or Ecology from developing a **new** use category that more accurately describes the use, with accompanying **new criteria** for that new use. However, because of the sensitivity of headwater macroinvertebrate assemblages, development of a new use category might not result in a less stringent criterion value.

The discrete categories of designated uses in the water quality standards will be used as the basis for establishing an attainable use **where there is a reasonable fit and where "full protection" can be attained (see question above "What is full support?")**. Where replacing one designated use category with another designated use category would not provide full protection, however, the state will establish (1) a new water body-specific use or subcategory and (2) a

water body-specific criterion that is based on the *attainable water quality condition for the parameter being examined (e.g., DO or temperature) and full protection for the attainable use.*

Regulatory approach:

Ecology will base the decision to add a new use or subcategory based on:

- How well the existing and attainable uses match one of the designated use categories in the state standards, and
- The need to provide full protection for designated uses or new uses.

The following examples illustrate this approach:

Examples:

1. If spawning is an existing use, the level of rearing use since 1975 is unknown, and the attainable water quality condition is between the core and non-core spawning and rearing criteria levels, then the question would typically be whether there is other information to suggest that the waterbody is core for rearing.

- If information suggests the waterbody does not (and can not) provide for core rearing, then re-designating it as the spawning and non-core rearing use would be appropriate, and allowing degradation to the spawning and non-core rearing criteria (i.e., 8.0 mg/l dissolved oxygen) would be acceptable. This approach uses a designated use category that fits the attainable use and provides for full protection of the new designated use.

- If information suggests the waterbody provides (or can provide) for some level of core rearing then it should be redesignated to a general use category such as "limited cold water aquatic life habitat" and a waterbody-specific criterion for dissolved oxygen should be established in the state standards that preserves the attainable water quality condition (e.g., 8.75 mg/l dissolved oxygen). This waterbody-specific criterion would provide full protection for the attainable use, and in general would be based on the highest attainable water quality for the parameter. Criteria values for other parameters would remain unchanged. This approach creates a subcategory that fits the attainable condition, and sets criteria levels that provide full protection for the new subcategory of use.

- If spawning is not an existing use (only rearing and migration are the existing uses) and spawning is not identified as an attainable use, then the water could be reclassified to the rearing and migration only use and water quality could be allowed to degrade to the 6.5 mg/l dissolved oxygen criteria. This approach uses a designated use category that fits the attainable use and provides for full protection of the new designated use.

2. A waterbody has the designated use of salmon and trout spawning and core rearing, but its headwaters include non fish-bearing streams. Can the designated use be removed from the headwaters? If so, then what would be the basis for the revised designated use?

In this situation, aquatic insects and amphibians may be the aquatic life types that have a natural ability to colonize and thrive in these non-fishbearing waters. In fact, the absence of fish may be

one of the key factors to their use. Since some of these species are as sensitive, or more sensitive, to water quality pollution than most salmon and trout species, replacing the designated use with a *less stringent* designated use would not meet the requirement to protect these unique aquatic communities. Also, the need to set uses and criteria at a site such that downstream uses and criteria will not be put in jeopardy, makes downgrading uses in non-fish bearing headwaters generally inappropriate. However, non-fish bearing headwater streams may be suitable for the development of new subcategories of uses and criteria, since the use categories in the water quality standards were not specifically developed for these types of waters.

3. A waterbody has the designated use of salmon and trout spawning and **core** rearing (the specific existing use is unknown), but it does not meet the criteria established to protect this use. Can the designated use be changed to spawning and **non-core** rearing even if the waterbody can support a use that is better than the spawning and non-core use?

This question asks whether it would always be necessary to establish the highest water quality chemistry goal for a waterbody when doing a UAA for aquatic life uses. The answer should be based on meeting the directive to protect the highest attainable uses. If the waterbody has an attainable healthy use-type similar to spawning and core rearing(and no other unique uses that would better define this aquatic community can be defensibly identified), and a criterion for spawning and core rearing is not attainable (full protection for the designated use cannot be attained), then the waterbody should be redesignated to a general use category such as "limited cold water aquatic life habitat", and an accompanying criterion based on the attainable condition (waterbody-specific criterion) adopted. This waterbody-specific criterion would provide full protection for the attainable use. If the attainable level of the parameter of interest is found to be the natural condition in the waterbody, then a criterion and use change would not be necessary. To avoid confusion in future interpretation of the standards for that particular waterbody, the decision to adopt a specific criterion based on the natural conditions could be made.

4. A waterbody has the designated use of salmon and trout rearing and migration-only, but the waterbody is instead a healthy warm water fishery. Salmonids are sometimes observed in the waterbody, but their use of the waterbody is thought to be very infrequent. This observed situation also matches the available information on the existing use of the waterbody. Can a UAA be used to remove the salmon and trout rearing and migration-only use even though trout are sometimes found in the waterbody?

This describes a situation where a very low level of a specific use is present but that use does not appear to be characteristic of the aquatic community of the site. *Great care must be exercised in trying to demonstrate the attainable uses in this type of situation*:

> If the attainable condition clearly fits the description of the warm water habitat use-type established in the water quality standards (and the level of rearing use by cold water species appears to be just "incidental wandering into a waterbody"), then replacement of the salmon and trout rearing-only use may occur. In this case the approach of using the best aquatic life community that characterizes the attainable uses at the site is followed.

If the level of rearing use by cold water species appears to be more than just "incidental wandering into a waterbody" then the case for changing the designated use to the warmwater

fishery use (as defined in the standards) is not appropriate because the characteristic use of the waterbody is in fact a "warm water fishery with an infrequent but characteristic use of salmonid rearing". In this situation a general use category such as "moderate temperature aquatic life habitat", and a waterbody specific criterion based on the highest attainable condition could be adopted for the waterbody. This waterbody-specific criterion would provide full protection for the attainable use. This approach describes and addresses the attainable and existing level of use of the site by different species, and ensures that the infrequent use of the waterbody for trout rearing would continue to be supported at attainable levels.

What needs to be shown to demonstrate protection of down-gradient waters?

40CFR131.10(b) says:

> *"In designating uses of a water body and the appropriate criteria for those uses, the state shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters."*

This statement uses the general term "water quality standards", which includes both uses and criteria. Thus, when evaluating the effects of an upstream use or criterion change on downstream waters the effects to both uses and criteria should be evaluated to ensure that all standards downstream are met.

There are three main steps to this analysis:

(1) identify the water quality parameters that will be effected by changing the use designation in the upper watershed,
(2) examine the extent to which down-gradient uses may be put at risk or criteria exceeded by any changes in criteria assignment in the upstream area, and
(3) examine through dilution studies, thermodynamic modeling, or other procedures where any more uses would need to be designated (by description in the WQS) to ensure that, by the time the water reaches the point where more sensitive downstream uses exist or are attainable, those more sensitive uses will be protected and criteria will be met.

The intent is to determine (1) the criteria that will be altered by changing a designated use and (2) whether or not that change will hinder the maintenance of other attainable uses and their criteria down-gradient of the site. <u>Regardless of whether a use actually exists or is attainable at any given location, the criteria assigned to that location must fully protect all existing and attainable uses down-gradient of that point.</u> Where downgradient criteria can continue to be met even if the up-gradient use is changed, then uses will generally be considered fully protected.

How do you determine if undesignated uses are protected?

The basic intent of this analysis is to ensure that the criteria established to protect the designated uses at a site will also protect other undesignated uses at that site. A simple comparison between the uses at a site and the categories of designated uses established in the water quality standards is

typically all that is required for this analysis. If a waterbody has been designated the salmon and trout rearing–only use, but salmon or trout spawning occurs at the site or physical conditions of flow, temperature, substrate, and gradient demonstrate it is an attainable use, then the use would need to be upgraded to reflect this attainable use.

The categories of aquatic life uses designated in the standards were developed to fully support the most sensitive uses that would occur in the waterbody where that category of use applies. Thus assigning the most sensitive use category – such as salmon and trout spawning and core rearing – should fully support all life stages of salmon and trout species plus the various life stages of the associated non-fish species indigenous to that type of waterbody. For this reason, where the most sensitive use occurring at a site matches a use-category that has been established in state standards, Ecology will generally assume that all other uses within that category are also protected.

How do you determine if water quality criteria that apply to seasonal uses would allow uses in other seasons to be harmed?

There are two steps to this analysis: 1) determine whether less stringent water quality criteria applied during an "off" season will in any way cause non-compliance with more stringent criteria applied during the "on "season, and 2) determine whether the beginning or ending of an "off" season for a particular downgraded use needs to be adjusted to account for pollutants or water quality effects that persist in a waterbody.

For example, if a UAA recommends that water contact recreation should be supported only seasonally, then the analysis must demonstrate that the concentrations of bacteria that would be allowed during the "off season" would not persist into the "on season" due to build-up in the sediment followed by resuspension into the water column from swimmer or wave action. This analysis would also need to demonstrate that criteria authorized for seasonal uses upstream would support uses that occur seasonally or year-round in down-gradient areas (see discussion above on protecting down-gradient uses).

What size water body can be addressed in a UAA?

This question tries to address the geographic extent of use changes. For instance, a UAA might contain information that indicates that spawning occurs at several locations along a 30 mile stream. In this case, should a spawning use be applied only in those isolated areas where spawning is observed, or along the entire 30 mile stream? When evaluating this situation Ecology will consider the following types of information:

- Does spawning typically only occur in the areas it is observed in, or is it likely to occur in other areas of the river? For instance, could flow events cause modifications of the substrate to such an extent that the location of appropriate spawning areas could change over time? Or do the observed species change spawning sites from year to year? If this is the case then the entire stream should typically have a spawning use applied to it.
- Would establishing the spawning use intermittently along the stream allow for conditions in any of the non-spawning reaches to cause non-support of spawning when the water reaches the next spawning reach? In setting criteria and uses, the state water quality

standards must ensure that all downstream and existing uses will be protected and criteria met.

Do all sources (including structures) that contribute to impairment of a water body need to be addressed in a UAA?

Yes, all sources of impairment to a waterbody must be addressed in the UAA. However, the emphasis on each source of impairment might differ, depending on the amount of impairment contributed by each source. If a single cause of impairment completely overshadows the effects of smaller sources, and modeling indicates that cleaning up the smaller sources of impairment would not result in a measurable increase in water quality, then for purposes of the economic analysis it might be reasonable to only consider the large source.

How are site-specific criteria and UAAs related?

Site-specific criteria development and UAAs are two separate processes. A UAA is a review of the uses in a waterbody (as generally described in this guidance document) while a site-specific criterion is a modification of a numeric or narrative criterion that takes into account the specific biological and/or chemical composition at a site. EPA has published guidance for developing site-specific criteria. For aquatic life-based criteria, the process to develop site-specific criteria is generally expensive (may be in the hundreds of thousands of dollars) and time-consuming. The process is rigorous, involving assessment of the physical and chemical characteristics of the site as well as the resident biota. Literature reviews and (frequently) generation of new aquatic bioassay information is required. Study plans for site-specific criteria have in the past been set-up with the assistance of regional, headquarters, and laboratory staff from EPA. It frequently takes a minimum of 2 years to develop the proposed criteria (this does not include Ecology rule-making to incorporate the criteria into the WQS). Development of a site-specific criterion does not include a change in the intended level of protection for aquatic life – uses must be fully protected. Anyone interested in pursuing development of site-specific criteria is urged to speak with water quality standards staff at Ecology prior to investing resources in the project.

A second type of criterion modification can occur for aquatic life uses, as a result of a UAA, that sounds similar to "site-specific criterion" development, but should not be confused with the process described above. In this second case the attainable water quality condition may be adopted as a "water body-specific criterion." This waterbody-specific criterion would provide full protection for the attainable aquatic life use, and would be based on the highest attainable water quality for the parameter. In this document this criterion type is always termed a "water body-specific criterion" to differentiate it from the site-specific criterion process described above. Specific circumstances leading to the adoption of a water body-specific criterion are discussed above under "What is full support? "

More information on development of site-specific criteria can be found in the EPA's 1994 *Water Quality Standards Handbook: Second Edition (EPA 823-8-94-005a)* **LINK LLL**.

How are water quality criteria based on natural conditions and UAAs related?

Natural Conditions: When a waterbody does not meet the assigned criteria due to natural climatic or landscape attributes, the natural conditions constitute the water quality criteria (WAC 173-201A-260(1)(a) Link LLL). The data generated for a UAA might be used to help justify use of the "natural conditions clause" in the WQS (1) in lieu of a use modification, or (2) after a use modification has occurred. Criteria based on natural conditions are usually proposed for sites where the current water quality exceeds statewide water quality criteria but is perceived to be "natural. For example, these situations could exist in areas where naturally high mineral concentrations in the underlying geology raise the concentrations of minerals in the water column to levels that exceed criteria (e.g., copper or zinc).

As with any criterion adjustment, criteria based on natural conditions must be scientifically defensible. The key pieces of information that will generally be used to identify natural conditions include:

- Current water quality
- The contribution of natural sources of pollution and natural physical conditions, and
- The contribution of human-induced conditions.

The contribution from human sources must be distinguished in order to accurately determine the natural condition. In some cases a determination of "natural condition" could be developed using data from reference sites.

UAAs, natural conditions, and use changes: 40CFR131.10(g)(1) allows a designated use to be modified if "naturally occurring pollutant concentrations prevent the attainment of the use". In general this can be addressed by the same information used to make a natural conditions determination, but an analysis of uses is required in addition to water quality information

How are variances and use changes related?

Variances are a temporary waiver from needing to meet specific water quality criteria. The same factors used to determine if a use can be removed under a UAA can be used to grant a variance. Federal guidance demands that variances be adopted into the state water quality standards regulation, and compliance levels must be determined individually for each source of pollution. Variances must be re-evaluated every five years.

In many cases a designated but unattained use need not be removed. Instead, individual dischargers may be granted variances from the water quality standards for a limited time with the expectation that they will be able to comply with water quality standards by the time their variance expires. Dischargers who are capable of meeting the standards would still be required to comply with the standards through their permits. In cases where a discharger can meet water quality based permit limits for some parameters, a variance would not be granted for those parameters. The variance procedure was designed by the USEPA to encourage compliance with the Clean Water Act within a reasonable timeframe.

Variances are most often based on an analysis of "substantial and widespread economic and social impact", developed using the economic analysis guidance discussed below. One of the unresolved issues surrounding use changes and variances has to do with the time frame used to evaluate whether funds or technologies will be available in the future to meet water quality standards:

- If a short time frame is used in the evaluation of technology and economics, short-lived local downturns in an economy might create the appearance that the UAA proponent would have little or no chance of meeting water quality standards within the short time evaluated, and thus a use change would be appropriate.
- If a longer time frame is used in the analysis it becomes easier to argue for (and more difficult to argue against) technological advances and/or increasing growth or economy in the local area making compliance with water quality standards attainable in the future.

How this issue is addressed is not resolved at this time, and the approach will likely be somewhat different for different waterbodies and different regulatory situations. Ecology expects that this issue will be of great interest to many members of the public, both proponents and opponents of UAAs.

How are economics taken into account in UAAs?

Economic considerations are taken into account in the federal rule provisions [40 CFR 131.10(g)(6)] which reads:

- Controls more stringent than those required by § 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

Where human activities (pollution, dams, mining, etc.) contribute to the limitation of what uses are attainable, economic and social factors associated with repairing the stream must be examined in determining what is attainable**.**

Guidance on economic analysis is provided in ***Part 5*** of this document (**LINK LLL**.)

How are flows evaluated in UAAs?

Flows exert a great effect on the water quality of many waters in Washington. Low flows contribute to increases in temperature and decreases in dissolved oxygen, thus negatively impacting uses and contributing to exceedances of criteria. High flows can also be detrimental to water quality by creating conditions conducive to scouring and wash-out of aquatic habitat. When a UAA is conducted the applicant should evaluate the effect of flows on the system and determine the natural flows and conditions for the areas, as well as human-caused changes in flows, their causes, and their effects.

Not all UAA waterbodies will be impacted by flow modifications. In some cases, however, uses that are not currently present in the waterbody could be attained by modification of flow regimes.

For instance, dams conducting a UAA under 40CFR131.10(g)(4) are required to evaluate whether the waterbody can be restored or whether the dam could be operated differently to improve use attainment:

> *40CFR131.10(g)(4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to the original condition or to operate such modification in a way that would result in the attainment of the use;"*

For waterbodies that are downstream or upstream of dams or other hydrologic modifications that impact flows and could impact uses, applicants must address whether changing flows could improve water quality and attainable uses in the waterbody. Ecology strongly recommends that applicants discuss this issue with owners of the modification and try to coordinate the UAA project with the owners.

Because a UAA is for a waterbody, and not an individual discharger, all sources of impairment to the waterbody must be considered when determining attainability. In many cases the changes in flow regulation will not be under the control of the applicant, or might be at what is considered to be a great distance (such as a physical hydrologic modification upstream of the waterbody being examined). If the owner of the modification is unwilling to fully participate in the UAA, and modifications in flow could help attain the use, then a use change cannot be done, and the individual applicant might be able to pursue a variance to the specific standard based on economic impacts.

If water quality standards violations are occurring in the waterbody then the waterbody will eventually be added to the 303(d) list, followed by a TMDL. The TMDL, as explained below, will look at all sources of degradation to water quality in the waterbody, and at that time contributors of impairment to the waterbody will be brought into efforts to improve water quality. Dams specifically are required under the 2003 Water Quality Standards revisions to attain compliance within a 10-year period **(LINK LLL to WQS)** In this case final action might include conducting a UAA, developing site specific criteria, or being granted a variance while improvements are made to the system.

What are the relationships between UAAs, TMDLs, and 303(d) reports

Use Attainability Analyses (UAAs) are a part of the Water Quality Standards (WQS) development process. UAAs assure that the attainable use is designated in the WQS for a particular waterbody. Waterbodies failing to meet the WQS (these are called water quality limited segments), when identified are generally prioritized in a Clean Water Act § 303(d) list (Link LLL to web site with current list) for the completion of Total Maximum Daily Load clean up plan.

Total Maximum Daily Load analyses (TMDLs) are tools used for implementing state WQS (Link to TMDL website). They are a technical assessment of the amount of pollution a waterbody can receive without causing a violation of water quality standards. TMDLs provide a structured process for Ecology and the public to establish plans for bringing waterbodies into compliance with the water quality standards, but the technical process itself can also be used to determine how clean the waterbody would be without any human sources of degradation. For this reason, the

information from a completed TMDL may also be used in the Use Attainability Analysis process when trying to assess the attainable uses and natural conditions of a waterbody.

Since use designations (swimming, salmon spawning, wildlife habitat, etc.) are in themselves water quality standards established for specific waterbodies, the failure to achieve a numeric water quality criteria, even after the TMDL is developed, does not mean Ecology should or can downgrade the designated use of a waterbody. As noted previously, use attainability goes beyond a simple comparison with the ability of the waterbody to meet established water quality criteria. Instead, when faced with this situation Ecology would need to refine the assumptions and techniques used in determining the ability to meet water quality criteria or would need to recognize the natural potential of the waterbody absent human influences as being the criterion.

Coordinating TMDL studies and UAAs

Ecology thinks that most of the designated uses assigned to waters throughout the state are appropriate, however, the department also recognizes that some are likely inaccurate. Prior to initiating a TMDL, the department will make a preliminary determination on whether or not the designated uses appear inaccurate for the waterbody. Such a screening level analysis does not supercede, contradict, or replace a formal UAA. It is only a procedural step to help identify those waters where the designated uses that would drive the TMDL are almost certainly incorrect, and where a combined UAA/TMDL study might prove beneficial. In those rare cases where the uses were inaccurately assigned, the UAA component of the process might result in either: (1) delisting the water as being impaired and requiring a TMDL, or (2) identifying an alternative criteria target for the TMDL load allocations.

Screening factors to use when evaluating whether a UAA should be considered for a waterbody scheduled for a TMDL:

In considering how screening factors could be used it is important to understand that in all cases designated uses must be applied to protect:

1. **all existing uses**;
2. **all attainable uses**;
3. **all downstream/downgradient uses and criteria** (i.e., even if a use does not exist at one location, the state must establish uses or criteria and appropriate implementation at that site that will ensure that the downstream uses are also protected fully).

Ecology thinks that a UAA is truly only a viable alternative when it is clear that: 1) the use does not exist, 2) the use would not exist under natural conditions, 3) other unnamed uses do not exist that would arguably need the same or more stringent criteria, and 4) the criteria for the use would not be needed to protect uses or meet criteria in downstream waterbodies.

The following list of screening factors should be examined for any waterbody prior to initiating a TMDL:

Screening Factors – Category 1: Designated uses should be considered most likely correct, and pursuit of a UAA a poor investment of time and resources in the following situations:

1. **The use is known to historically have existed in the waterbody**. If the use existed at anytime in the past, and there is a reasonable likelihood it might still exist, it will likely be difficult to easily demonstrate the use is not attainable. An exception is where there is a clear cause for the loss of the use and that cause has created a perceived permanent condition (overwhelming social, economic, and technical limitations are present that would limit removing the impediment), such as the loss of migratory fish due to federal regional hydropower facilities. In these cases it might make sense to pursue a combined UAA/TMDL where the issue of attainability will receive formal consideration in the UAA.
2. **An aquatic life use is known to exist downstream**. Unless there are clear physical barriers to organisms moving upstream the use might exist at some level in the upstream waterbody, even if not well documented.
3. **The use is known to exist in similar types of waterbodies in the watershed**. The use of reference waters is a strong line of evidence that a use can probably be supported in a waterbody.
4. **Pollution is likely to be a significant contributing factor to the absence of the use**. If a source of human degradation is great enough to likely cause significant harm to a use, then there is a good chance the use would reoccur once that degradation is remedied.
5. **Perennial waters with available public access that would attract recreational use by either children or adults** (e.g., flows through parks or other public lands, or through residential properties). If water is inviting to the public and they have a path to access that water it will likely be used for some form of contact recreation.

Screening Factors – Category 2: The designated use should be considered potentially non-existent and suspected of being non-attainable (a UAA will be needed to validate these assumptions) in the following situations:

1. **Federal, state, or tribal biologists working in the watershed agree that the key fisheries uses are not present and are not likely attainable.** If substantial field experience exists and the biologists have been brought into an understanding of the requirements to protect existing and attainable uses, then their documentation and testimonial should be considered adequate strength to support moving towards a UAA.
2. **Naturally ephemeral or intermittent flows would make the waterbody generally not provide sufficient depths or persistence of water to invite recreational primary contact use**. There would still need to be bacterial criteria established for secondary contact of the water, but the general unavailability of water coupled with the physical limitations to exposure of mucus membranes in such waters is strong evidence that primary contact is neither existing nor attainable. However, it must be considered whether such low water depths would actually make the waterbody more attractive to children.
3. **Water is brackish and no water rights exist for domestic appropriation**. Chemical qualities that would deter use as a water supply, coupled with evidence that no one currently has a legal right to use the water for that purpose is sufficient evidence that the use might not be existing or attainable.

When should a TMDL be put on hold to conduct a UAA?

There is only one situation where a TMDL should be postponed to conduct a UAA. This occurs where **both** of the following two conditions exist:

1. Available information strongly supports the contention that the designated uses are neither existing nor attainable (lack of information on uses does not fulfill this condition); **and** ,

2. The uses that are thought to be most likely existing or attainable have numeric criteria that would be met by the existing water quality conditions thus possibly negating the need for the TMDL in the future.

Such a delay should also only be authorized/occur where a UAA plan has been developed that includes specific progress milestones to ensure that the UAA is completed in an expedient manner. Failure to meet the milestones should be considered a basis to initiate or re-initiate a TMDL.

The same technical studies that would occur with a TMDL will almost always be required as part of a UAA whenever the basis of the UAA involves human sources of water quality degradation. These TMDL components include:

- Source identification and assessment
- Modeling to estimate natural potential conditions

What is a combined UAA/TMDL study?

It is a study that combines and coordinates the elements of both a UAA and a TMDL in a fashion designed to first determine (1) the existing uses, (2) the sources of degradation to the waterbody, and (3) the attainable uses, prior to establishing waste load allocations and implementation plans.

What if the screening step demonstrates more sensitive uses are present?

It is quite possible that information will be collected in the screening step that reasonably demonstrates that the designated uses do not include some sensitive existing uses. Where available information demonstrates the waters actually support higher quality (more stringent) uses, those uses need to be protected in any TMDL and reflected at the earliest practical time in the state water quality standards. Examples include where a waterbody is listed as salmon and trout rearing-only but information shows it is also used regularly for spawning, or where a waterbody is listed for salmon and trout spawning and rearing but information demonstrates the waters are used for bull trout spawning as well.

In such situations, it would be inconsistent with state and federal laws and regulations to set the TMDL target at the lower use as that would not adhere to the requirement to fully protect all

existing uses. In these cases the TMDL should be designed to meet the criteria associated with the higher quality use, and documentation collected to support a revision to the list of designated uses assigned to that waterbody under the state surface water quality standards regulation.

Toxic Clean-up sites and UAAs

Toxic clean-up sites are found in waterbodies throughout Washington. In general, toxic clean-up sites are accounted for as sources to the waterbody during the TMDL process. In some cases the presence of extremely high levels of long-lived toxics could be a reason to modify a use, but in general the expectation that over time sites will return to less toxic levels is a preferred approach for Ecology. In areas where toxics are impacting the uses of fish or invertebrate consumption Ecology will look at variances as a reasonable approach to address waterbody clean-ups.

What is the Relationship between Threatened and Endangered Species and UAAs?

Threatened or endangered aquatic species might inhabit or use waters where a UAA is being considered. For many waterbodies a final Recovery Plan developed under the ESA may be in place. Although the WQS are not specifically designed to enforce compliance with the ESA, procedurally any change in the standards will be examined by EPA and the federal resource agencies to determine whether a formal ESA consultation is needed. Ecology strongly urges any party wishing to modify uses in a waterbody that is either used by ESA-listed species, necessary to an ESA-listed species' recovery, or upstream from either of the two preceding situations to confer with both Ecology and EPA prior to investing resources.

Dams and UAAs

> **Note to reviewers:** Draft language for dams and UAAs is currently being prepared for separate posting on the Ecology web site.

Effluent dominated ecosystems: net ecological benefit

The federal regulations [40 CFR 131.10(g)(3)] establish that one basis for removing a designated use, or to establish subcategories of uses or seasons of application, would be when:

> Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place;

This federal provision provides the basis for performing a net ecological benefit (NEB) comparison in setting levels of use protection. That process is described here, in reference to effluent dominated systems, as the Effluent Dependent Ecosystem (EDE) guidance (Appendix X, Link LLL to appendix containing this guidance).

Effluent dependence generally arises in streams with ephemeral or low-flow regimes that occur as a result of natural weather patterns or water withdrawals for human use. Low-flow streams

containing discharges from sources such as wastewater treatment plants or irrigation return flows are often dominated by the discharge. While effluent flows can help to maintain aquatic, riparian, and wetland habitat; it is often difficult for the discharger to meet the water quality criteria necessary to fully support the fishable-swimmable goal of the CWA. In some situations where the water quality criteria are not being met, the discharger might consider removing the effluent from the waterbody rather than providing additional treatment. This UAA provision is intended to allow consideration of whether the removal of the effluent from the waterbody would result in a greater loss of important aquatic or riparian habitat then allowing the effluent to continue to be discharged, even though it might not meet all the established state water quality criteria.

Ecology will evaluate whether all of the following seven conditions are demonstrated in order for a NEB UAA to be used as the basis of rule-making:

1. The water body is in an arid area (typically less than 15 inches per year) where aquatic resources are limited and ecologically valuable.

2. The water body supports an ecologically desirable aquatic, wetland, or riparian ecosystem and supports native plant and wildlife species.

3. The discharges do not contain quantities of persistent or bioaccumulative pollutants that could harm the health of humans or wildlife directly or through food chain magnification.

4. Removal of the discharge from the waterbody is the only remaining feasible option to meet WQS.

5. The continued discharge to the water body will not interfere with the maintenance of down-gradient surface water quality standards.

6. All practicable pollution prevention programs, such as pretreatment and source reduction, are or will be implemented.

7. A legal commitment to provide effluent in sufficient amount and quality to maintain the aquatic ecological benefits identified through this process.

Refer to **Appendix X** for more specific guidance on conducting UAAs on effluent dependent ecosystems

Public and intergovernmental review of UAA determinations

Changes in designated use assignments require a formal revision of the state water quality standards regulations. As such, these actions require thorough public and intergovernmental review and must be made in compliance with the state Administrative Procedures Act (APA;) (Chapter 34.05 RCW; LINK LLL). Ecology is the responsible party for modifying the WQS Rule and complying with the APA.

In preparation for the required public hearings, the technical basis (the waterbody survey and assessment documentation) for the recommended changes to the state standards must be made available for review by interested parties. While changes in state standards that add more protective criteria are not required to go through the formal UAA process, these changes nevertheless are alterations of the state regulation and thus require the same high level of public review as changes that would make the criteria assigned to a waterbody less stringent.

The following formal steps must occur before a use can be modified or removed:

1. An acceptable UAA must be submitted to Ecology (because of resource constraints UAAs will be generated by Ecology very infrequently).
2. The UAA must contain adequate information to demonstrate to Ecology that the designated use is not existing or attainable.
3. The UAA must demonstrate the attainable replacement use for any use or uses being evaluated.
4. Ecology must remove or modify the designated use in the water quality standards through a formal and public rule revision process.
5. Ecology must submit the revised rule to the EPA for approval.
6. EPA must approve the rule, after appropriate ESA consultation with federal resource agencies.

Part 5. Economic analyses for UAAs

Economic considerations are taken into account when a UAA is based on the federal rule provisions [40 CFR 131.10(g)(4) and (6)]:

> *"(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use"*
>
> Note: Guidance on a final working definition of the term "feasible" is not available at this time. Ecology and the USEPA are working to develop a working definition of feasible that will fulfill the 40CFR131(10)(g)(4) condition for hydrologic modifications (UAA approach) and the WAC 173-201A-510 compliance schedule for dams.
>
> *"(6) Controls more stringent than those required by § 301(b) and 306 of the Act would result in substantial and widespread economic and social hardship."*
>
> Note: In simple terms, this means that if a use could be attained with funding, but the effect of requiring that funding to be spent on attaining the use would result in substantial and widespread economic and social hardship, the use need not be attained in the waterbody (unless it is an existing use).

Where human activities (pollution, dams, mining, etc.) contribute to the limitation of what uses are attainable, economic and social factors associated with repairing the stream must be examined in determining what is attainable.

Applicants should be aware that an economic analysis done as part a UAA (as summarized below) is only one of three economic analyses that would be conducted in order to change a use based on economics. Ecology is required to comply with the Administrative Procedure Act (APA) (citation and Link), which requires that any significant legislative rule be accompanied by both a Small Business Economic Impact Statement and a Cost Benefit Analysis (these additional analyses are done by Ecology). Changing a water body use fits the criteria for a significant legislative rule**. The economic analysis done as part of the UAA looks only at the costs of controlling pollution, while the Cost Benefit Analysis required by the APA includes an analysis of the costs and benefits of both pollution control and environmental quality**.

> [Much of the following summary text in this section is taken from USEPA (1995) *Interim Economic Guidance for Water Quality Standards*.(LINK LLL). The EPA guidance document is extensive, and is not replicated here. Readers who are interested in more specific information about economic analysis in the context of UAAs are urged to read the EPA guidance.]

Pollution Sources

The choice of methods used to evaluate the economic impacts of meeting water quality standards depend, in part, on whether pollution control is the responsibility of a privately or a publicly owned entity. Since the polluting entity or party may not be the one to pay for reduction, the analyses must focus on the party that pays for pollution control. Some of the more common privately owned entities include, but are not limited to: manufacturing facilities, agricultural operations, shopping centers, and other commercial development, residential developments, and recreational developments. Publicly owned entities include: publicly owned sewage treatment works, roads, and other municipal infrastructure.

In an economic analysis the distinction between private sector and public sector entities is important as it determines not only who will pay for the necessary pollution control, but also the types of funding mechanisms available. For example, in the case of a privately owned entity, the facility can raise the money through loans and equity funds but may try to pass some or all of the cost on to the consumer in the form of higher prices. In the case of a publicly owned entity the community can float bonds to pay for the capitol costs, with the cost of the bonds and operating expenses covered by user fees and/or tax revenues.

Whether publicly or privately owned, polluting entities can be point or non-point sources of pollution. Attainment of water quality standards is not limited to controls placed on point sources. Water quality standards are applicable to non-point sources of pollution despite the fact that there might be no direct implementation mechanisms for non-point sources. Although pollution control approaches used by non-point sources may differ substantially from approaches typically employed by point sources, analysis of the ensuing economic impacts still depends on whether the entity providing the pollution is privately or publicly owned.

Substantial Impacts

A financial analysis of the discharger should be conducted to determine if the capital and the operating and maintenance costs of pollution control will have a substantial impact. This analysis can be broken down into the following steps:

(1) Estimate costs of complying with standards
(2) Determine how the entity will finance the necessary reductions
(3) Determine if impact is substantial

Demonstration of substantial financial impacts is not sufficient to modify a use or grant a variance. Rather, the applicant must also demonstrate that compliance would create widespread socioeconomic impacts on the affected community.

Widespread Impacts

States and dischargers will need to consider the possibility that financial impacts could cause far reaching and serious impacts to the community. An important factor in determining the magnitude of these impacts is defining the geographical area affected. The unaffected area might be a town, city, region, county, or some combination of these geographical units.

Equally important are the types of impacts that might occur. There are not economic ratios or tests *per se* to evaluate socioeconomic impacts. Instead, the relative magnitude of a group of indicators should be taken into account. For public sector entities, the applicant will need to estimate the change in socioeconomic conditions that would occur as a result of compliance. Of particular importance are changes in factors such as median household income, unemployment, and overall net debt as a percent of full market value of taxable property. For private sector entities, the assessment of widespread impacts should consider many of the same socioeconomic conditions. The analysis should also consider the effect of decreased tax revenues if the private sector entity were to go out of business, income losses to the community if workers lose their jobs, and indirect effects on other businesses.

In some instances, several entities potentially might suffer substantial impacts. For example, this situation can arise where several facilities are discharging to a stream segment that is being considered for a change in designated use. While a separate financial analysis should be performed for each facility, the impacts on all the facilities should be considered jointly in the analysis of widespread impacts.

Calculating the Economic Impacts

Ecology recommends that applicants who wish to address the federal rule provision which reads *"Controls more stringent than those required by § 301(b) and 306 of the Act would result in substantial and widespread economic and social hardship [40 CFR 131.10(g)(6)]"* use guidance from U.S. EPA (USEPA, 1995) to assist in determining what controls are considered affordable

and whether the costs would result in widespread economic and social hardship. Using this guidance is likely to result in a UAA submittal that:

(1) contains the information Ecology will need to evaluate whether a rule-making is appropriate, and (if rulemaking is appropriate);
(2) provides economic data that will support a rulemaking and eventual approval by USEPA.

Ecology has placed the worksheets contained in the federal guidance in an electronic file, LINK LLL. This site also contains internet links to many public sources of economic information that could assist entities who use the USEPA guidance. A link to the complete version of the USEPA guidance can also be found at this site.

Part 6. Use-specific guidance for UAAs

This section provides guidance to persons or groups interested in evaluating the specific uses of surface water bodies in Washington. An evaluation of uses is termed a "Use Attainability Analysis" (UAA), defined as:

> *40CFR131.3(g) Use attainability analysis is a structured scientific assessment of the factors affecting the attainment of uses which may include physical, chemical, biological, and economic factors as described in 131. 10(g).*

This section focuses on the scientific and technical assessment of the uses of a waterbody, and is intended to be used in the following manner:

- As a project planning guide and checklist for specific types of information that should be considered when a UAA is in the design phases. Each study area will need a study tailored to area-specific concerns, and this document provides a "checklist" of the types of data, discussion of indicators, and data sources and data quality goals that should be considered by anyone designing a UAA. **All of the data types discussed in this section may not be necessary for a specific water-body, but using the checklists and indicator information during planning will help ensure that the study focuses on data that are relevant and necessary for the evaluation, and that important types of information are not overlooked.**

- As an aid to regulatory and resource agencies when reviewing final studies.

Not every data type or source that might need evaluation is necessarily contained in this guidance. Ecology strongly recommends that any person or group interested in conducting a UAA discuss the proposed study with Ecology and EPA prior to development of the study design.

The information in a UAA report must be acceptable to both Ecology and the EPA before it can be used as the basis of removal or modification of a use. This means that the applicant should work with the approval agencies to determine the data needs. UAAs can range from simple to

complex, and moving forward with a UAA that does not adequately address the federal requirements and state guidance can result in large costs and little or no benefit to the applicant.

UAAs address the following four questions:

1. Are the designated uses attained in the waterbody?
2. What are the *existing* uses in a waterbody?

   Existing uses are those uses in existence after November 28, 1975, whether or not they have been designated in state water quality standards. Existing uses cannot be removed, even with a UAA.

3. What are the causes of any impairment of the uses

4. What are the *attainable* uses of a waterbody?

   The attainable level of water quality needs to be determined taking into account the capability of the natural system as well as the technical and economic limitations of human sources throughout the basin that affect the site. (Note: separate guidance to determine substantial and widespread economic and social impacts is included in this guidance document)

Aquatic Life Uses

Fresh Water Designated Uses in Washington

Aquatic life uses are designated for protection in fresh surface waters using the following categories of key species **(**WAC 173-201A-200). It is required that all indigenous fish and non-fish aquatic species be protected in waters of the state in addition to the key species described below.

The categories for aquatic life uses in fresh surface waters are:

- **Char.** For the protection of spawning and early tributary rearing (e.g., first year juveniles) of native char (bull trout and Dolly Varden), and other associated aquatic life.

- **Salmon and trout spawning, core rearing, and migration.** For the protection of spawning, core rearing, and migration of salmon and trout, and other associated aquatic life.

- **Salmon and trout spawning, noncore rearing, and migration.** For the protection of spawning, noncore rearing, and migration of salmon and trout, and other associated aquatic life.

- **Salmon and trout rearing and migration only.** For the protection of rearing and migration of salmon and trout, and other associated aquatic life.

- **Non-anadromous interior redband trout.** For the protection of waters where the only trout species is a non-anadromous form of self-reproducing interior redband trout (*O. mykis*), and other associated aquatic life.

- **Indigenous warm water species.** For the protection of waters where the dominant species under natural conditions would be temperature tolerant indigenous nonsalmonid species. Examples include dace, redside shiner, chiselmouth, sucker, and northern pikeminnow.

Marine Water Designated Uses in Washington

Aquatic life uses are designated for protection in marine surface waters using the following categories of key species **(**WAC 173-201A-210). It is required that all indigenous fish and nonfish aquatic species be protected in waters of the state in addition to the key species described below.

The categories for aquatic life uses in fresh surface waters are:

- **Extraordinary quality** salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.

- **Excellent quality** salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.

- **Good quality** salmonid migration and rearing; other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning.

- **Fair quality** salmonid and other fish migration.

Determine if the designated uses have been attained.

A UAA cannot be used to remove a designated use that is also an existing use. If the named uses are present in the waterbody, at the healthy levels corresponding to the full protection provided by the criteria (the criteria associated with the designated uses are met), then the use is considered to be attained. If the use-type is present but the criteria are not met, then the use is not fully protected and the use is not considered to be attained.

Determining the Existing Uses for Aquatic Life

Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards. There are various sources where

historical records may exist that would help evaluate the presence of a use on or after this date. These sources are discussed under "Data Sources" below.

Assess the existing uses: Existing aquatic life uses can sometimes be determined, though not easily ruled out, with the aid of scientific surveys that have previously been conducted by numerous sources. Federal, state, tribal, and local governmental planning and resource agencies; conservation districts; universities; libraries; private conservation groups and sporting clubs; corporations, and discharger groups are all potential sources of information on aquatic life uses and aquatic habitat**.** The evaluation should describe the overall biotic and abiotic health of the waterbody, identify the species and community types that currently exist in the water body, identify the species and community types that have been attained in the water body on or after November 28, 1975, and identify any existing species that have been specifically targeted for protection (e.g., ESA species).

An evaluation of similar nearby waterbodies should also be conducted. In the event that information for the waterbody of interest is unavailable, information on similar waters located nearby can be used to make an evaluation of the existing uses for the waterbody.

How levels of use affect the existing use determination: For instance, is one fish wandering into a waterbody on an occasional basis sufficient to justify a use? What threshold of use should be met in order to determine whether a use is existing? The water quality criteria are based on providing full protection for aquatic communities. The designated uses accompanying the criteria describe healthy communities. In general, one fish wandering into a waterbody will not be considered to represent the healthy aquatic community best characterizing the site. Instead, the highest quality aquatic community that has been attained in the water body on or after November 28, 1975 will be considered the existing use for the site.

Identifying Causes of Impairment

The UAA should contain an assessment of any impairments to the system that currently occur, or any past causes of impairment that continue to exert an effect on the system. Examples of impairments include natural or man-made physical structures, point and non-point sources of pollution, natural sources of contamination, and historic sites of pollution that are still emitting pollutants. All causes of impairment to the system should be accounted for in the analysis.

In many cases a wasteload allocation model will be needed to quantitatively determine how the varying causes of impairment affect the waterbody. A waste load allocation uses mathematical models and relationships to predict the amount of reduction in pollutant loading necessary to achieve protection for the designated use(s). This general method of analysis can also be used to define the natural potential water quality, because such modeling can be used to remove human sources of pollutants and physical changes to the stream system.

Determining the Attainable Uses

Determining the attainable uses for an aquatic life UAA combines (1) information on biological potential, (2) various approaches to restoration, and (3) in many cases economic information. The determination can be more or less complex, depending on the waterbody being evaluated.

The discussion below describes how different types of information can be used in the determination of attainable uses.

Determining the biological potential of the area. The mechanism for determining the biological potential attainable in a stream should address the abiotic components (see checklist of indicators, Link LL) that currently limit the biological resources in the system. In effect, the system should be examined to determine the human caused effects as well as the potential natural conditions if all human effects were removed. This should be followed by an assessment of the biota that would normally occur in the waterbody if all human sources of degradation were removed. Due to infinite combinations of environmental factors that may possibly exist in a waterbody, no precise formula can be devised to accurately predict and describe the biological community that should exist there. However, comparison with other similar watersheds, stream habitats, water qualities, and biological factors can help in developing a reasonable picture of the aquatic life uses that would occur in a given set of environmental conditions. Establishing reference conditions can help greatly in the assessment of biological potential.

Use of reference sites in determining biological potential. If reference sites are used in the UAA study to distinguish natural versus human-caused influence, Ecology recommends that indicator data should be collected at reference sites and at degraded sites over a period of time.

Reference sites are intended to represent one of two reference stream conditions: 1) minimally disturbed, or 2) least disturbed. Minimally disturbed conditions reflect sites that have experienced very little historical activity that alters stream integrity. Least disturbed sites had been degraded historically, but have exhibited some level of recovery. We use these reference sites to describe natural biological variability in time and space. Reference site information is used as a measure of biological potential for particular stream settings. Identifying a response in the biological community to environmental degradation is determined by comparison to reference sites. For consistency, identification of reference sites should follow these guidelines:

- Map potential areas where reference sites are expected.
- Evaluate whether candidate reference areas are concentrated in one part of a watershed or are in a variety of locations (candidate sites may not be physically comparable to degraded sites if they are unique to a small portion of a watershed).
- Eliminate areas with relatively high human modifications (past and present).
- Conduct field visits to verify current condition of each site.
- Choose reference sites that approximate stream type and setting as those that will be surveyed for suspected degradation.

Evaluation of regional patterns and variability is most effective in the absence of any human degradation. Degraded sites may introduce error into observed regional patterns, unless there are intrinsic biological attributes within a stream class that persist over a degradation gradient. If all streams in the region have been disturbed to a certain degree, however, a least disturbed condition must be identified and used for that region. We suspect this situation to occur in the Columbia Plateau, Coastal Lowlands, and Puget lowlands.

Ecology has established an effective base of information from reference conditions across the Washington landscape. Ecology adds new reference streams each year to the list (Link LLL) as

well as revisits a select group on an annual basis. Ecology currently monitors reference sites throughout the state once per year. These sites represent a variety of stream settings that are used for evaluating severity of biological impairment at nearby sites.

Biological potential will not always correspond perfectly with the uses currently designated in the standards. For instance, when biological potential is determined based on comparison with reference conditions or modeling, some gradations of biological potential that lie between the current designated uses might be determined to be the correct biological potential of the area. This is an expected outcome of this assessment, and is important information used to determine the attainable use.

Identify how the area could be restored. Once the applicant has identified any limitations to the system based on evaluating physical and chemical parameters and the causes of impairment to the system, careful consideration of "reversibility" or the ability to restore the physical integrity of the water body should be made. If the waterbody impairment is due to pollutant loading, pollution control options should be developed. If the impairment is due to habitat degradation, habitat restoration alternatives such as changes in land management activities, implementation of best management practices, and direct habitat restoration alternatives (e.g., revegetation) should be considered. In general, assessment should look at all ways to restore the area. If the impairment reflects the natural condition, then that should be shown. Whether uses can be restored or attained using these methods will be examined as part of the attainability analysis (see below).

Determining the attainable uses. This step uses all the information developed in determining (1) whether designated uses are met, (2) the existing uses, (3) causes of impairment, and (4) restoration alternatives to determine the attainable use. The six conditions (below) in 40CFR are used to demonstrate what uses *are not* attainable. The applicant should also use these same factors to determine what *is* attainable. Ecology will use these same factors during public rule-making to demonstrate which uses *are* attainable. Only one of the conditions below must be met to remove or modify a use.

> *40 CFR 131.10 (g) States may remove a designated use which is not an existing use, as defined in § 131.3, or establish sub-categories of a use if the state can demonstrate that attaining the designated use is not feasible because:*
>
> *(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or*
>
> *(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or*
>
> *(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or*

(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(5) Physical conditions related to the natural features of the water body, such as lack of a proper substrate, cover, flow; depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(6) Controls more stringent than those required by sections 301 (b) and 306 of the Act would result in substantial and widespread economic and social impact.

The sixth factor above refers to use of economic information to determine attainability. Information about this specific economic analysis is contained in Part 5 of this guidance document.

Indicators Related to Aquatic Life Uses

Information on physical, chemical, habitat, and biota characteristics will be considered in Ecology's review of any aquatic life UAA, and thus should be considered when a UAA study is being considered or planned. The types of information that might be needed to characterize the waterbody are discussed below, and are summarized in a checklist.

Applicants are urged to discuss the study design with both Ecology and the USEPA prior to any field work. In some complex water bodies a large number of the information types within this section might be necessary in order for Ecology and USEPA to take regulatory action, but **in others a smaller list of data needs might fulfill information needs**. Each water body will be different, and focusing on the needed information will save applicants both time and money.

Some information about indicators can be found in existing databases or publications. Some can be derived from existing information (e.g., maps). However, in most cases, not all of the information needed to assess use attainment will be available, and further monitoring of relevant indicators will be needed to provide adequate data to support a determination to change a use. The indicators measured will be different according to the type of waterbody (e.g., marine, streams, lakes).

Data Quality

A new law, the Water Quality Data Act, was enacted by the State of Washington in 2004. It relates to the collection and use of water quality data. The law requires that data, meeting the credible data principles laid out in the law, shall be used for certain water quality activities. The law further requires Ecology to develop policy regarding water quality data use and collection. The three main areas are:

1. explaining how data is used to inform decisions about water quality and water cleanup plans,
2. describing criteria to establish data credibility, and

3. recommending appropriate training and experience for data collection.

Ecology will be developing the policy with the assistance of an advisory group of stakeholders. The policy is to be developed over the next two years, with a final report to the legislature in late 2006. Progress and updates will be posted on Water Quality Program website as the policy is developed.

Ecology's Water Quality Program (WQP) policies and procedures for data quality, which were designed to improve the quality of the data on which water quality decisions are, can be found at: http://www.ecy.wa.gov/programs/wq/qa/index.html. Most of the data used by the Water Quality Program is generated by the Environmental Assessment Program (EAP) of the Department of Ecology. The quality assurance methods that EAP employs are also presented here. Some of these documents may be used by organizations and individuals who wish to submit data to Ecology supporting use changes.

Ecology strongly recommends to all groups conducting UAAs that the level of quality of both sampling techniques and analytical tools that are used in new UAA studies should be equivalent to those described in the guidance above. New data that does not have this level of quality will be considered less reliable than data collected and analyzed using these methods.

The following brief discussion of aquatic life indicators and their descriptions was derived largely from *The Washington Comprehensive Monitoring Strategy for Watershed Health and Salmon Recovery, Vol. 2 of 2, Dec. 2002*.. The checklist of indicators (see checklist of indicators Link LLL) that follows the discussion was also developed from information in the Comprehensive Monitoring Strategy.

Physical Indicators

This category includes information on physical characteristics such as hydrology, channel morphology and structure, streambed composition, and bank and riparian condition
The collection of physical habitat indicators and metrics identified in the Comprehensive Monitoring Strategy is large. Not all indicators will be needed for all studies. Indicators include banks and riparian zone characteristics require evaluating streamside cover by estimating percent composition of grasses, shrubs, trees, or other cover, shading by overhead canopy cover, bank material composition, bank slope, and presence of bank erosion. Channel morphology and structure characteristics describe the macrohabitats and large features of the stream by estimating what percentage of each stream is comprised of pools, riffles and runs, descriptions of undercuts, and presence of large in-stream structures and channel alterations. Streambed composition characteristics describe microhabitats by estimating percent composition of streambed material, percent embeddedness, and presence of small and particulate organic material. Watershed description characteristics include stream length, watershed area, recent precipitation and rural and urban land use descriptions. Some of this data is entered on site and some completed with the aid of U.S. Geological Survey topographical maps. Stream Order is determined with 7½ minute (1:24,000) USGS maps including intermittent and ephemeral channels (Strahler, 1957). It is recommended that physical habitat status information be obtained using both remote sensing and on-the-ground field sampling methods, as appropriate.

All physical characteristic information should be supplemented by photographic documentation. Include photos of the area surrounding the waterbody and any unusual characteristics or evidence of impact.

Chemical Indicators

Chemical components (see checklist of indicators Link LLL) of the stream are measured to obtain existing water quality information. For a UAA, water quality is measured to detect natural and man-induced limitations to attaining aquatic life uses.

Biological Indicators

Biota sampling might be needed to accurately assess the aquatic uses of a waterbody. Aquatic macroinvertebrates, fish, aquatic macrophytes, and algae should be sampled if appropriate.

Fish samples can be analyzed to determine fish community composition. If the sample consists of game fishes or other sensitive species that require specific or narrow ranges of high quality environmental conditions, those conditions should be determined from the literature.

Stream dwelling invertebrates respond to changes in the physical and chemical environment. Benthic macroinvertebrates generally inhabit a localized area of a stream throughout their life cycle. Therefore, the individual organisms are continually exposed to any changes that occur in the chemical and physical environment (Rosenberg and Resh 1996). Continuous exposure to the localized condition presents an historical view of a stream's quality.

Detecting degradation through evaluation of invertebrate communities requires establishment of a description for reference condition. This is the focal point for developing analytical tools commonly used to evaluate stream condition and "biological integrity". Reference conditions are discussed earlier in this section.

Habitat Assessment

The information above can be used in conjunction with habitat assessment tools to gain an overall picture of the existing waterbody habitat. Habitat assessment of Pacific Northwest streams abound (e.g. Overton *et al.* 1997, Pleus and Schuett-Hames 1998, Barbour *et al*. 1999). Many agencies in the region have developed their own protocols that use unique suites of channel features and channel feature definitions for the assessments. Ecology uses the protocols identified in the Comprehensive Monitoring Strategy. To be considered appropriate to support regulatory actions, Ecology urges the applicant to use the sampling protocols identified in Lazorchak et al. (2000), Lazorchak et al. (1998), or protocols of equivalent quality and applicability.

Survey segments should be identified using TFW methodology and gradient and confinement categories described in Pleus and Shuett-Hames (1998). The Salmon and Steelhead Habitat Inventory and Assessment Project (SSHIAP) has developed a GIS layer with these segment breaks.

Checklist of Aquatic Life Indicators

The following checklist summarizes the categories of indicators discussed above, and should be used by the applicant during the planning phases of a UAA. This list does not include all possible types of information that might be needed to support a UAA. **For most UAA studies not all categories of information will be relevant or needed**. Ecology urges the applicant to discuss the elements within the checklist with both Ecology and EPA prior to spending any money on field sampling or literature searches.

Aquatic Habitat Checklist. After *The Washington Comprehensive Monitoring Strategy for Watershed Health and Salmon Recovery, Vol. 2 of 2, Dec. 2002*.

General Watershed Information	
	Eco-region Gradient Elevation Area and relief Stream order Channel type Valley bottom and containment Hydrologic layers
Physical Information	
	Land use/land cover, including impervious surfaces. Includes type and stage of vegetative cover (e.g., non-forest, mixed, conifer, seral stage) and type of land use (e.g., forested, urban, agriculture, open) across the landscape. Hard surfaces such as roads, rooftops, and parking lots which affect the pattern and extent of factors such as surface run-off (hydrograph), sedimentation, and stream temperature.)
	Geomorphology/geomorphic index (including floodplain lateral connectivity) (Characterizes stream channel structure in floodplain areas and connectivity to floodplain.)
	Road density
	Landslides
	Wetlands
	Riparian cover and condition – banks and other riparian characteristics (Riparian areas are complex ecological systems that are important for maintaining the vitality of streams. The assert strong influences on streams by influencing hydrological patterns, recruitment of LWD, stabilizing banks, sequestering nutrients, control of light regime, and seasonal nutrient contribution to organisms.)
	Large wood (Large wood affects channel hydraulics, energy dissipation and sediment effect on channel complexity. The location, number, area, and volume of pools and substrate/gravel are affected by large wood.)
	Pools and other channel morphology structures (Important habitat features where channel deepens and flow slows.)
	Stream substrate – streambed composition (Result of geomorphology and interacting habitat-forming processes. Substrate composition (e.g. gravel,

	embeddedness) can be highly variable across small spatial scales.)
Marine physical parameters – some may be applicable to freshwater and estuarine systems	
	Shoreline modifications (fill, bulkheads, overwater structures, clearing, diking)
	Status and trends of substrate
	Intertidal vegetation
Biological Parameters - Freshwater	
	Fish and other vertebrates
	Aquatic macroinvertebrates (infaunal and/or epifaunal)
	Aquatic macrophytes
	Algae
Biological Parameters - Marine-	
	Submerged vegetation (eelgrass, kelp, general seaweeds)
	Floating kelp canopy
	Infaunal biota
	Substrate
	Emergent vegetation (salt marsh, spit/berm, forested wetlands
Chemical Parameters- Freshwater (with density stratification of monitoring parameters, if appropriate)	
	Dissolved oxygen
	Temperature
	pH
	Turbidity
	Total phosphorus
	Total nitrogen
	Cholorphyll-a
	Water clarity
	Toxic substances in water
	Toxic substances in sediment
	Toxic substances in tissue
Chemical - Marine (with density stratification of monitoring parameters, if appropriate)	
	Dissolved oxygen
	Temperature
	pH
	Turbidity
	Total phosphorus
	Total nitrogen
	Cholorphyll-a
	Water clarity
	Nutrients
	Ammonium concentrations
	"DIN" (Dissolved inorganic nitrogen)
	Toxic substances in water
	Toxic substances in sediment
	Toxic substances in tissue

Data Sources

The following databases, at a minimum, should be queried for physical, chemical, or biologic information relevant to the water body:

Fish Distribution and Use
This Washington Department of Fish and Wildlife (WDFW) draft database built upon a 1:24,000 hydrography GIS layer contains generalized fish distribution for salmon, steelhead, and bull trout consisting of known, presumed, potential, and undetected presence plus known spawning and known juvenile rearing areas.

Salmonid Stock Inventory (SaSI)
This Washington Department of Fish and Wildlife (WDFW) database built upon a 1:100K hydrography GIS layer contains salmon, steelhead, coastal cutthroat, and bull trout/Dolly Varden stock assignments, stock status, origin, run strength indicators, and other related data.

Salmon and Steelhead Habitat Inventory and Assessment Program (SSHIAP)
SSHIAP is a co-managed program between the Washington Department of Fish and Wildlife (WDFW) and the Northwest Indian Fisheries Commission (NWIFC). NWIFC is the primary SSHIAP data steward in WRIAs 1 - 23; and WDFW is the primary data steward in WRIAs 24 - 62. The SSHIAP data system compiles and develops information that is relevant for salmon recovery from a variety of sources built upon a 1:24,000 hydrography GIS layer. Other core data are linked to this layer, including stream gradient, water body type, fish distribution, barriers to fish passage, and preservation and restoration priorities. Secondary attributes such as confinement, Rosgen channel classification, floodplain delineation, and hydrologic modifications are available for some WRIAs.

Spawning Survey Databases. WDFW offices maintain the records from field investigations that record the extent, timing, and location of spawning in many areas of the state.

Shore Zone Inventory (DNR 2000) provides a statewide baseline of marine shoreline conditions.

The Natural Resources Information Portal (http://www.swim.wa.gov/)

The goal of this website is to provide a single place to discover, learn about, and access available salmon and watershed data in Washington State. This portal includes a searchable catalog with simple links to datasets and their associated metadata ("data about the data"). If a dataset is not available for download or on-line viewing, contact information is provided. This catalog currently includes spatial datasets, tabular datasets, reports and studies.

Tribal Fish Biologists. In Washington many of the tribes collect comprehensive information on the fisheries uses of water bodies throughout the state. Much of this information is not documented in other data bases or in the public literature, so direct contact should be made with tribes in the region of interest anytime a UAA is being contemplated.

Literature Searches Existing uses should also be evaluated through literature surveys of each water body. The literature review involves the review of historical, chemical, physical and biological data. University libraries and literature databases should be used to conduct thorough literature reviews for relevant information on the specific water body. Much of this literature is likely to be found in the government collections of the Universities.

In addition to published information and government databases, information on existing uses and other historical relevant factors can be found in a variety of places. Anecdotal information (e.g., eyewitness accounts) may be used in support of other information to help reconstruct historical uses and conditions (Banse, 1990). Supporting information may also be found as photographic evidence, in museum collections, or in a monitoring agency field notes.

Indicator Measurement: Planning, Sampling and Analysis

If adequate information does not exist for the indicators of interest, then data might need to be collected through water body monitoring. The major steps involved in developing a successful data collection effort for UAAs are discussed briefly below:

Planning

A Quality Assurance Project Plan (QAPP) should be prepared for each environmental study/activity that acquires new environmental measurement data. The QAPP lists the objectives of the study/activity; identifies the data needed to achieve those objectives; and describes the sampling, measurement, quality control, and data assessment procedures needed to obtain the data. The size and complexity of the project plan should be cost effective and in proportion to the magnitude of the study per Ecology Document No. 91-16, "Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies" (LINK LLLL).

A QAPP should be developed by each entity conducting monitoring. The QAPP describes the objectives of the study and the procedures to be followed to achieve those objectives. The preparation of a QAPP helps focus and guide the planning process and promotes communication among those who contribute to the study. The completed plan is a guide to those who carry out the study and forms the basis for written reports on the outcome. Lombard and Kirchmer (2001) present detailed guidance on the preparation of QAPPs. It describes 14 elements to be addressed in the plan and provides supporting information and examples relevant to the content of each element. Ecology recommends that entities conducting monitoring to support a UAA follow this guidance as the QAPP is developed.

Sampling and Analysis

New monitoring for UAAs should use the sampling protocols identified below, or protocols of equivalent quality, to be considered appropriate to support a change in a regulation:

Chemical and Physical Parameters

Dissolved oxygen, temperature, pH, turbidity, total phosphorus, and total nitrogen in streams:

- Ward, W.J. et al. 2001. Stream Sampling Protocols for the Environmental Monitoring and Trends Section. Washington Dept. of Ecology, Publication No. 01-03-036. Olympia, WA.

Conventional indicators for lakes

- Smith, K.A., J. Parsons, and D. Hallock. 2000. Water Quality Assessments of Selected Lakes within Washington State: 1997. Washington Dept. of Ecology, Publication No 00-03-009. Olympia, WA

- Baker, John R., David V. Peck, and Donna W. Sutton (editors). 1997. Environmental Monitoring and Assessment Program Surface Waters: Field Operations Manual for Lakes. EPA/620/R-97/001. U.S. Environmental Protection Agency, Washington D.C.

Marine water indicators:

- Puget Sound Water Quality Action Team. 1997. Recommendations for Sampling Marine Sediment, Water Column, and Tissue in Puget Sound. Olympia, WA.

- Janzen, C.D. 1992. Marine Water Column Ambient Monitoring Plan. Washington Dept. of Ecology, Olympia, WA.

Toxics:

- Puget Sound Water Quality Action Team. 1997. Recommendations for Measuring Metals in Puget Sound Marine Water, Sediment and Tissue Samples. Olympia, WA.

- Puget Sound Water Quality Action Team. 1997. Recommendations for Measuring Organic Compounds in Puget Sound Marine Water, Sediment and Tissue Samples. Olympia, WA.

- Cusimano, B. 1994. Technical Guidance for Assessing the Quality of Aquatic Environments. Washington Dept. of Ecology, Publication No. 91-78. Olympia, WA

Biological Parameters

Stream benthic macroinvertebrates:

- Plotnikoff, R. and C. Wiseman. 2001. Benthic Macroinvertebrate Biological Monitoring Protocols for Rivers and Streams: 2001 Revision. Washington Dept. of Ecology, Publication No. 01-03-028. Olympia, WA

- Shoreline Classification and Landscape Extrapolation (SCALE) protocol for marine macroinvertebrate sampling (Schoch and Dethier 1997, 1999a, 1999b).

Habitat Assessment

To be considered appropriate to support regulatory actions, Ecology urges the applicant to use the sampling protocols identified in Lazorchak et al. (2000), Lazorchak et al. (1998), or protocols of equivalent quality and applicability.

Survey segments should be identified using TFW methodology and gradient and confinement categories described in Pleus and Shuett-Hames (1998). The Salmon and Steelhead Habitat Inventory and Assessment Project (SSHIAP) has developed a GIS layer with these segment breaks.

Laboratories

Ecology Executive Policy 1-22 mandates that water quality analyses used for development of regulations are performed by laboratories accredited by the State. Applicable water quality data includes results of analyses of sediment, dredging, and sludge, point source and non-point source pollution samples, and surface, marine and ground waters. Applicable analyses include chemical, physical, biological, microbiological, radiological, or other scientific determinations which provide recorded qualitative and/or quantitative results. This policy is implemented to assure that laboratories performing water quality analyses are capable of providing accurate data for use by Ecology in making decisions concerning the environment.

For purposes of reviewing UAAs, Ecology will want to see appropriate QA/QC information for all laboratory derived data in order to help gauge the quality of the data.

Information Assessment

The applicant should use the biotic, abiotic, and economic information gathered for the assessment to summarize the existing, unattainable, and attainable uses in the waterbody. The assessment should clearly support a specific recommendation for a modification of the uses in the water quality standards. Approvable UAAs must not interfere with downstream uses and criteria.

Ecology urges the applicant to continue public information and communication activities throughout the planning, development, and finalization of the UAA report. The applicant should include the public in the process of information assessment and development of recommendations prior to submitting the document to Ecology.

Recreational Uses

Section 101(a)(2) of the CWA sets out as a national goal that all waters of the United States provide for the protection of recreation "in and on the water". This goal calls for primary contact recreation (activities that result in the immersion of eyes, ears, nose, and mouth) to be protected wherever attainable.

This section will discuss the information used by Ecology when it makes a determination on the attainable recreational use for a waterbody. Recreational UAAs should be written to answer these questions:

1. Is extraordinary primary contact recreation an existing use?
2. Is extraordinary primary contact recreation a potential use?
   a) Is potential limited by water quality factors?
      If yes, are the problems correctable?
   b) Is potential limited by non-water quality factors?
      If yes, are the factors correctable?

3. Is primary contact recreation an existing use?
4. Is primary contact recreation a potential use?
   a) Is potential limited by water quality factors?
      If yes, are the problems correctable?
   b) Is potential limited by non-water quality factors?
      If yes, are the factors correctable?

Additional factors to consider in determining the appropriate use-support status include:

1. Existing recreation uses;
2. Water body characteristics (substrate, bank slope, pollution, human modifications);
3. Access to the waterbody (e.g., roads, trails, enclosures);
4. Facilities that support primary contact recreation activities (e.g., parks, boat ramps, beaches);
5. Location of the waterbody and its proximity to people;
6. Costs associated with achieving compliance with the swimmable goal standards (substantial and widespread economic and social impacts).

Designated Recreational Uses in the Water Quality Standards

WAC 173-201A-020 defines the three principal levels of recreational use designated for surface waters in Washington state:

> **"Extraordinary primary contact recreation"** means waters providing extraordinary protection against waterborne disease or that serve as tributaries to extraordinary quality shellfish harvesting areas.
>
> **"Primary contact recreation"** means activities where a person would have direct contact with water to the point of complete submergence including, but not limited to, skin diving, swimming, and water skiing.
>
> **"Secondary contact recreation"** means activities where a person's contact would be limited (e.g., wading or fishing) to the extent that bacterial infections of eyes, ears, respiratory or digestive systems, or urogenital areas would normally be avoided.

WAC 173-201-600, 602, 610, and 612 (Part VI – Use Designations for waters of the state) lists the designated uses and waterbodies where those designated uses apply.

Determining the Existing Uses

The first step in conducting a UAA is to determine the existing uses of the waterbody. The focus of this assessment is to determine whether primary contact recreation is an existing use, and if so whether the waterbody would be have "extraordinary primary contact recreation" or "primary contact recreation". Recreational use can be determined, though not easily ruled out, by looking for formal points of access or evidence of use, discussing the issue with local park and recreation centers or public employees in the recreation management field, and by searching maps of recreational opportunities. This step should include an examination of historical resources. If the supposition is that a use, such as swimming, does not currently exist because it has not been observed over the past few years, then the entity interested in conducting should search for information that would help to determine whether the use has existed since November 28, 1975.

Identifying Causes of Impairment

The UAA should contain an assessment of any impairments to the system that currently occur, or any past causes of impairment that continue to exert an effect on the system. These include flow modifications, storm drain discharges, upstream pollution sources, etc.

Determining the Attainable Uses

Identify how the area could be restored. Impairment of a recreational use could occur for many reasons, including both water quality and non-water-quality factors (e.g., increased concentrations of bacteria, impaired access to the site, and modified flow regimes). Once the applicant has identified any limitations, careful consideration of "reversibility" or the ability to restore the recreational uses of the water body should be made. If the waterbody impairment is due to pollutant loading, pollution control options should be developed. If the impairment is due to degradation of access, access restoration alternatives such as changes in land management activities should be developed. In general, assessment should look at all ways to restore recreational uses to the area. Whether uses can be restored or attained using these methods will be examined as part of the attainability analysis (see below).

Determining the attainable uses. Designated uses are considered attainable if, at a minimum, they can be achieved by implementing the effluent requirements of Section 301(b) and 306 of the Clean Water Act (i.e., technology-based limits) and cost-effective and reasonable best management practices for non-point sources. If the water quality criteria for a designated use would be met based on these control technologies, the use is considered attainable, regardless of whether that use actually exists or is designated in the water quality standards. If a smaller-scale physical barrier (i.e., a culvert) is the cause of the use not being attained in the waterbody, the use should generally be considered attainable. **Where human activities (pollution, dams, mining, etc.) contribute to the limitation of what uses are attainable, economic and social factors associated with repairing the stream must be examined in determining what is attainable.**

The federal regulations [40 CFR 131.10(g)] establish conditions for states to use to determine what uses *are not* attainable. These same factors must also be used to determine which uses *are* attainable. A state can remove a designated use, if it is not an existing use, if:

(1) Naturally occurring pollution concentrations prevent the attainment of the use; or

(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or

(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(5) Physical conditions related to the natural features of the water body, such as lack of proper substrate, cover, flow; depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(6) Controls more stringent than those required by § 301 (b) and 306 of the Act would result in substantial and widespread economic and social hardship.

The last factor above refers to use of economic information to determine attainability. Information about this specific economic analysis is contained in Part 5 of this guidance document.

In some cases institutional restrictions, such as local ordinances or no trespassing signs, might be set up to discourage use of the water body. These types of institutional restrictions, as well as some physical features (as discussed later in this section), will not be sufficient in and of themselves, to affect the demonstration of whether a recreational use is existing or attainable. However, in areas where safety is a concern it does not make sense to encourage primary recreational uses. In some cases a designated use of primary recreation could be interpreted as encouraging these types of activities. In determining the level of use that exists or is attainable in the water body Ecology will look to language in the preamble to the federal 1982 water quality standards modifications and to EPA's 1994 Water Quality Standards Handbook:

> *"FRVol.48No.217, 51401: States need to give consideration to the incidental uses which may be made of the water body. Even though it does not make sense to encourage use of a stream for swimming because of the flow, depth or the velocity of the water, the States and EPA must recognize that swimming and/or wading may occur anyway. In order to protect public health, States must set criteria to reflect recreational uses if it appears that recreation will in fact occur in the stream"*

"EPA Water Quality Standards Handbook, 1994, p.2-2: EPA believes that a secondary contact recreational use (with criteria sufficient to support primary contact recreation) is consistent with the CWA section 101(a)(2) goal. The rationale for this option is discussed in the preamble to the Water Quality Standards Regulation, which states:"…even though it does not make sense to encourage use of a stream for swimming because of the flow, depth or the velocity of the water, the States and EPA must recognize that swimming and/or wading may occur anyway. In order to protect public health, States must set criteria to reflect recreational uses if it appears that recreation will in fact occur in the stream"

The language above indicates that a use change could occur in areas that are unsafe for primary contact activities, but that the criterion set for the water body should be protective of incidental uses as well. Therefore, in these situations, the possibility exists that a use could be downgraded from primary to secondary, but that the criterion for the water body would need to remain at a level that would be protective of primary recreation.

Indicators that Characterize Recreational Uses in Washington

The different surface water recreational use designations in Washington are characterized by different activities that occur on the waterbodies as well as by the location of the waterbodies. The following lists include indicators that characterize these uses. These lists are not exhaustive.

Extraordinary primary contact recreation

"Extraordinary primary contact recreation" means waters providing extraordinary protection against waterborne disease or that serve as tributaries to extraordinary quality shellfish harvesting areas.

The following list of activities and qualities indicate this use:

- Mussel, clam, or other invertebrate harvesting
- Tributaries to waters supporting mussel, clam, or other invertebrate harvesting
- Extremely high quality waters with minimal sources of anthropogenic or non-anthropogenic bacteria

Ecology recognizes that distinguishing "extraordinary primary contact recreation" from "primary contact recreation" will in some cases be challenging. All of the characteristics listed below under Primary Contact Recreation can be used to help identify areas of "extraordinary primary contact recreation", along with the added activities and qualities listed above. In some cases the appropriate use for the area that is being examined will be uncertain. In these situations Ecology will work with the applicant, the public, other agencies and tribes, and the EPA to determine the appropriate use.

Primary contact recreation

"Primary contact recreation" means activities where a person would have direct contact with water to the point of complete submergence including, but not limited to, skin diving, swimming, and water skiing. In assessing where to apply the primary contact use, it is important to recognize that *the criteria are designed to reduce the incidence of gastrointestinal illness and it*

is the ingestion of the water rather than the actual submergence of a person's body that creates the risk. Where children are reasonably expected to engage in water-play, there is a high risk of ingestion, and the primary contact use should be applied.

Activity:
The following list contains some of the activities that indicate primary contact recreation use:

- Swimming
- White-water boating
- Rafting
- Skin diving
- Water-skiing
- Windsurfing
- Children's waterplay (children splash and play in a manner that commonly results in ingestion and considerable exposure to their eyes, ears, and throat.)

Location:
Because of the potential for public exposure, waters in or along the following areas will generally be considered to qualify for the existing use of primary contact recreation. However, in some cases, because of seasonal flow issues or other situations that could preclude contact, these areas might not represent primary contact areas, or will be areas where seasonal primary contact uses are more appropriate:

- Public parks
- Public parkways
- Urban or rural residential areas where children would live or play.
- Camping areas
- Nature trails
- Any area where rope swings, campfire rings, trails to the water, or other evidence of points of access to water use are present

Water quality:

- All waterbodies that meet the numeric criteria for protection of primary contact recreation are considered to qualify for the existing use of primary contact recreation, unless such factors as unsafe conditions exist. Those waters that do not meet the numeric criteria for primary recreation should be evaluated to determine the attainable water quality and use.

Physical characteristics:

- In general, waters that have flows that would allow for activities characteristic of primary contact recreation will be considered to qualify for the existing use of primary contact recreation. In this case both low and high flow levels should be considered. For instance, is enough water present to allow wading and splashing by children? **Low flows that would make swimming improbable for adults makes the waters even more attractive for younger children.** During high flow times, is the water depth and speed high enough to preclude activities characteristic of primary contact recreation? If

extremely dangerous high flow conditions exist, could the water be used for white-water rafting, kayaking, or other seasonal high-flow activities? In some cases, because of access or locational issues, or other situations that could preclude contact, these areas will not represent primary contact areas, or will be areas where seasonal primary contact uses are more appropriate.

Note: In some **constructed systems** physical structures such as diversions, pipes, or other extremely dangerous structures, or currents, exist. If these waterbodies were designed and constructed in a manner that generally limits activities to those having lower exposure than those characterizing primary contact recreation, or if the conditions are extremely dangerous for recreational activities (as, for example, in the case of irrigation supply canals), it may be appropriate to classify the waterbody as secondary, as long as this does not contribute to lack of protection of a downstream use. **Modified natural systems should be treated as unmodified natural systems for the purpose of evaluating existing and attainable uses.**

The characteristics described above are also used to help determine areas of "extraordinary primary contact recreation" so efforts to determine a recreational use should take into account the possibility that the water body that qualifies for "primary contact recreation" might also qualify for "extraordinary primary contact recreation."

Secondary contact recreation

"Secondary contact recreation" means activities where a person's contact would be limited (e.g., wading or fishing) to the extent that bacterial infections of eyes, ears, respiratory or digestive systems, or urogenital areas would normally be avoided.

Activities or locations that do not qualify for primary or extraordinary recreational uses would typically qualify for secondary contact recreation. The following list of activities contains some of the uses that could indicate secondary recreation:

- Adult-only wading opportunities (if children have the opportunity to wade, then exposure of ears, eyes, respiratory, digestive, or urogenital systems to water is likely) typically associated with limited forms of industrial and commercial waterways.
- Fishing
- Activities where an exposure of ears, eyes, respiratory, digestive, or urogenital systems to water is very unlikely.

Data Sources

The following sources should be searched or contacted for historical and present use information:

- Photographic evidence
- Museum collections
- Published reports or papers
- Resource agency data bases, reports, field notes
- Eyewitness accounts

- Boat shops
- Local department of health offices
- Long-term residents of the locality

In addition, field surveys should search for and photograph indications of recreational use (as discussed above). In areas where seasonal uses could exist (e.g., rafting or whitewater kayaking, swimming, low-flow wading opportunities for younger children) the surveys should be done in all four seasons in order to determine whether the use is occurring or could occur, or whether the use is unlikely to occur

Indicator Measurement: Planning, Sampling, and Analysis

If adequate information does not exist for the indicators of interest, then data might need to be collected through water body monitoring of bacteria or through use surveys. The major steps involved in developing a successful data collection effort for UAAs are discussed briefly below:

Planning

A Quality Assurance Project Plan (QAPP) should be prepared for each environmental study/activity that acquires new environmental measurement data. The QAPP lists the objectives of the study/activity; identifies the data needed to achieve those objectives; and describes the sampling, measurement, quality control, and data assessment procedures needed to obtain the data. The size and complexity of the project plan should be cost effective and in proportion to the magnitude of the study per Ecology Document No. 91-16, "Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies **(LINK LLL)."**

A QAPP should be developed by each entity conducting monitoring. The QAPP describes the objectives of the study and the procedures to be followed to achieve those objectives. The preparation of a QAPP helps focus and guide the planning process and promotes communication among those who contribute to the study. The completed plan is a guide to those who carry out the study and forms the basis for written reports on the outcome. Lombard and Kirchmer (2001) present detailed guidance on the preparation of QAPPs. It describes 14 elements to be addressed in the plan and provides supporting information and examples relevant to the content of each element: Ecology recommends that entities conducting monitoring to support a UAA follow this guidance as the QAPP is developed.

Sampling and Analysis

New monitoring for UAAs should use the sampling protocols identified below, or protocols of equivalent quality, to be considered appropriate to support a change in a regulation:

Bacteria sampling and analytical methods:

- *Manchester Environmental Laboratory, Lab Users Manual, 7th Edition, July 2003. Washington State Department of Ecology. 230 pp.*

Laboratories

Ecology Executive Policy 1-22 mandates that water quality analyses used for development of regulations are performed by laboratories accredited by the State. Applicable water quality data includes results of analyses of sediment, dredging, and sludge, point source and non-point source pollution samples, and surface, marine and ground waters. Applicable analyses include chemical, physical, biological, microbiological, radiological, or other scientific determinations which provide recorded qualitative and/or quantitative results. This policy is implemented to assure that laboratories performing water quality analyses are capable of providing accurate data for use by Ecology in making decisions concerning the environment.

For purposes of reviewing UAAs, Ecology will want to see appropriate QA/QC information for all laboratory derived data in order to help gauge the quality of the data.

Information Assessment

The applicant should use the biological, physical, and economic information gathered for the assessment to summarize the existing, unattainable, and attainable uses in the waterbody. The assessment should clearly support a specific recommendation for a modification of the uses in the water quality standards. Approvable UAAs must not interfere with downstream uses and criteria.

Water Supply Uses

This section has not been drafted. Ecology expects to draft this section after the first final version of the guidance has been released for use. As drafts of this section become available they will be announced on the Water Quality Standards list serve, and opportunities to comment on the drafts will be available. This section will be included in the guidance when it is finalized, and will then be subject to revisions as the larger UAA document undergoes revisions over time. If you are interested in considering a UAA for water supply uses please contact Ecology to discuss how to develop the approach.

Wildlife Uses

This section has not been drafted. Ecology expects to draft this section after the first final version of the guidance has been released for use. As drafts of this section become available they will be announced on the Water Quality Standards list serve, and opportunities to comment on the drafts will be available. This section will be included in the guidance when it is finalized, and will then be subject to revisions as the larger UAA document undergoes revisions over time. If you are interested in considering a UAA for wildlife uses please contact Ecology to discuss how to develop the approach.

Fish Harvest Uses

This section has not been drafted. Ecology expects to draft this section after the first final version of the guidance has been released for use. As drafts of this section become available they will be announced on the Water Quality Standards list serve, and opportunities to comment on the drafts will be available. This section will be included in the guidance when it is finalized, and will then be subject to revisions as the larger UAA document undergoes revisions over time. If you are interested in considering a UAA for fish harvest uses please contact Ecology to discuss how to develop the approach.

Part 7. Submittal of the UAA to Ecology

The investigating entity should compile a report for review and approval by Ecology staff. This report should present:

- Summary – Contains a description of the water body, a statement of the problem being addressed, and a summary of the methods and results.
- Public Involvement - A description of the public involvement process used during the UAA, including a summary of the involved parties and their opportunities for input into the process.
- Designated Uses of the waterbody and downstream waters.
- Existing Uses – contains a description of the existing uses and the methods and data sources used to determine the existing uses.
- Causes of Impairment – contains a description of any causes of impairment to the water body.
- Economic Analysis – if used.
- Attainable uses – Contains a description of the attainable uses and the methods and data sources used to determine the attainable uses.
- Recommendations for modifying designated uses – Based on the information above, this section contains the recommended changes (and underlying rationale based on 40CFR131.10(g)(1-6)) to the designated use being examined. <u>This section must show how a change in designated uses will be protective of both the existing uses in the water body and downstream uses.</u>

Appendix X contains the outlines for two UAAs that were submitted to the USEPA. They represent reasonable approaches to organization and submittal of information.

Part 8. Ecology Review and Actions

Ecology and tribal consultation on UAAs

To be drafted.

Ecology Review of Submitted UAAs

Ecology is required to respond, within 60 day of receiving a UAA, with a decision on whether to proceed toward rulemaking (WAC 173-201A-440(6), Link LLL). Ecology's decision will be based on an initial review of the submittal. In this case, a decision to proceed toward rulemaking means that the initial review indicates the submittal has enough information in it to support further review, and the response will give Ecology's schedule for further review and potential rule-making. Ecology's review of the UAA will be dependent on available staff resources. A decision not to proceed towards rule-making means that the submittal is clearly deficient in

necessary information, in which case Ecology will be available to discuss the information needs with the applicant.

If Ecology has chosen to proceed with full review of and potential rule-making based on the UAA submittal, then Ecology will proceed according to the schedule outlined in the response. If the UAA was planned and conducted according to the steps outlined in Part 2 of this document, the formal review of the final document should be able to be accomplished in a relatively short timeframe (within 3 months). If the document does not conform to the recommended approach the review time is likely to be considerably longer and the chances of rulemaking considerably less.

During the review period Ecology will confer with the tribes, resource agencies, USEPA, and other groups that have specific information or interests in the area being addressed.

After a full review of the UAA, Ecology will inform the UAA applicant, USEPA, resource agencies, interested tribes, and other interested parties of its conclusion. Ecology's conclusion could be any of the following:

- Unable to complete a thorough review because necessary information is missing.
- UAA supports a thorough review, and Ecology agrees with the applicant's recommendations.
- UAA supports a thorough review, but Ecology determines that a use change other than that recommended by the applicant is appropriate.
- UAA supports a thorough review, but a use change is not appropriate. Some other regulatory tool such as site-specific criteria or variance is recommended by Ecology.
- UAA supports a thorough review, but a use change is not appropriate. No further action.

Ecology will confer with the applicant, interested tribes, and the USEPA prior to taking further actions such as initiating rulemaking and formal public review based on the UAA report.

Ecology Rule-making

Because of the large costs involved with rule-making Ecology will only propose a formal use change if it appears that the rule change would be successful in changing the state standards and likely to gain USEPA's Clean Water Act approval.

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Plotnikoff, R.W. and C. Wiseman. 2001. Benthic Macroinvertebrate Biological Monitoring Protocols for Rivers and Streams: 2001 Revision. Washington Department of Ecology, Olympia, WA. Ecology Publication no. 01-03-028.

Stribling, J.B., B.K. Jessup, and J. Gerritsen. 2000. Development of biological and physical habitat criteria for Wyoming streams and their use in the TMDL process. Tetra Tech. Prepared for U.S. EPA Region 8, Denver, CO.

Appendix X – Other Resources

EPA Guidance

Water Quality Standards Handbook (second edition, 1993) - Chapter 2 and Appendix T (for UAA case studies).

Reviews the six "use removal criteria" and components of UAAs - *water body survey and assessment* (biological, physical and chemical evaluations are briefly reviewed), and *analysis of economic factors* (no review of economic analysis).
http://www.epa.gov/waterscience/standards/handbook.pdf

Technical Support Manual: Waterbody Surveys and Assessments for Conducting Use Attainability Analyses (Volume 1 applies to Rivers, Volume 2 applies to Estuaries, and Volume 3 applies to Lakes) 1983, 1984

Technical support manuals cover physical and chemical components of UAAs for fish, aquatic life and wildlife uses only. New biocriteria guidances are more applicable to the biological component.
http://www.epa.gov/waterscience/library/wqstandards/uaavol123.pdf

Biocriteria Guidance Documents

Build on the biological evaluation components in the technical support manuals; provide details on conducting bioassessments for various waterbody types.
http://www.epa.gov/OST/biocriteria/technical/

Draft Implementation Guidance for Ambient Water Quality Criteria for Bacteria - 1986 (2000 draft) - Chapter 5

Specifies where primary contact recreation use and criteria should apply, when to designate recreation uses other than primary contact, and what information is needed for UAAs for subcategories or removal of primary contact recreation use.
http://www.epa.gov/ost/standards/bacteria/

Guidance on Implementing the Water Quality-based Provisions of the CSO Control Policy -July 2001.

Discusses use attainability for CSO receiving waters and waters impacted by wet weather pollution. Discusses refinement of aquatic life uses, use subcategories, application of monitoring and modeling information, and simplifying UAAs for wet weather conditions.
http://epa.gov/npdes/pubs/wqs_guide_final.pdf

Interim Economic Guidance for Water Quality Standards Workbook (1995).

Technical support for the economic component of UAAs - suggests measures and tests to verify "substantial and widespread economic and social impacts," but notes that additional analyses and tests may be desirable in some cases.
http://www.epa.gov/ost/econ/

Federal Regulations

40 CFR Part 131.10

Federal regulation that specifies when states must conduct UAAs (i.e., when designating a non-101(a) use, removing a 101(a) use, or specifying a subcategory of 101(a) use that requires less stringent criteria). Part 131.10 also lists the six *use removal criteria* that can be used to show that attaining designated uses is not feasible: (1)natural pollution levels, (2) natural flows, (3) human caused sources that can't be remedied, (4) Dams+other diversions, (5) lack of supporting physical conditions, and (6) economic+social impacts.
http://www.access.gpo.gov/nara/cfr/index.html

ANPRM - Water Quality Standards Proposed Regulation (FR Vol. 63, No. 129, July 7, 1998)

Section III(4) - *Request for Comments on Use Removal and Use Attainability* - EPA sought comment on the "use removal criteria," minimum requirements for UAAs, defining "new information" to review new uses, the need for UAAs when non-101(a) use is designated, the need for periodic review of marginal aquatic life uses, etc.
http://www.epa.gov/ost/standards/anprm.html

DRAFT Version 1.2, July 2005

Appendix X – Draft Use Attainability Analyses for Effluent Dependent Ecosystems

A Net Ecological Benefit Determination

Prepared by Mark Hicks,
Washington Department of Ecology
November, 2004

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Part I: Introduction to NEB UAAs

Origin and Status of the NEB UAA Concept: The concept of a Net Ecological Benefit (NEB) Use Attainability Analysis (UAA) was developed by EPA Region 9 to help that Region's states deal with the issues surrounding effluent dominated and effluent dependent streams. The program as established in guidance by EPA Region 9 has not undergone national review and has not been adopted by EPA at the national level as guidance for meeting the federal Clean Water Act (CWA) or the EPA regulations governing application of Use Attainability Analyses (UAA) to change designated uses in state water quality standards. The Washington State Department of Ecology cannot find a legal basis for some of the specific provisions and allowances contained in the Region 9 guidance, but find that the fundamental concept is sound and is of value to our state.

Currently, EPA is participating in a forum sponsored by the Western States Water Council (WSWC) to explore the use of NEB UAAs, in addition to addressing numerous other issues

surrounding the application of water quality standards to waterbodies in the arid west. Washington is one of the western states participating in the forum, and hopes to use it to help answer some of the more critical questions surrounding the application of water quality standards to effluent dependent ecosystems (EDE). The following general draft guidance introduces the concept of NEB UAAs, and initiates a NEB UAA program for Washington that appears well supported by state and federal laws and regulations. Washington's draft NEB UAA guidance will be updated in response to changes in Ecology's understanding of the state's options and responsibilities, particularly as clarified through ongoing discussions in the WSWC forum.

Purpose of Guidance: This NEB UAA guidance is not to be interpreted as superceding the requirements of the federal UAA regulations at 40 CFR 131.10(g). The purpose of this guidance is to clarify how those federal regulations may be met in developing UAAs for effluent dependent ecosystems (EDE). This guidance is intended to clarify and support the use of one of the federal UAA provisions for allowing a change to a designated use in situations where a discharge is creating beneficial flow augmentation. The relevant federal provision states that:

> *"human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place" [40 CFR §131.10(g)(3)].*

This federal provision allows states to modify designated uses and associated criteria where the use protection goals of the Clean Water Act are better served by allowing a human caused condition to continue. In the context where a discharge creates or enhances stream flows, this federal provision may be alternately read to allow that:

> *Where the ecological benefits of continuing a discharge to a stream channel outweigh the benefits of removing the discharge, the designated uses may be changed to accommodate the continuance of that discharge.*

In such a case, the designated uses and associated criteria would be changed to reflect the highest level of pollution control and treatment that can be attained in the waterbody. This approach generally ensures the highest attainable use would also be protected. Therefore, **a successful NEB UAA study should seek to identify and establish the highest level of protection of water quality that would not force the removal of the discharge from the waterbody.**

A NEB UAA is not limited to consideration of only municipal or industrial wastewater discharges (i.e., point sources). However, there is a need to demonstrate the highest attainable level of treatment will be provided, and for existing discharges, an additional need to demonstrate removal of the flow is the only other valid option to avoid exceeding the assigned water quality criteria for the waterbody. These requirements combine to generally prohibit the use of a NEB UAA for other human activities.

Conditions for a NEB UAA**:** Ecology cannot support any UAA that does not meet the federal UAA regulations. Whenever a designated use and its associated water quality criteria can be attained (technically and economically), then the federal regulations provide no basis for

allowing a change in that designated use. A UAA cannot be approved if it would remove existing uses or impair downstream uses or criteria. Changing from naturally intermittent streams to perennial streams does not in and of itself demonstrate a net benefit. Both ephemeral species and their habitats and perennial species and their habitats are resources that require protection under state and federal laws and regulations. Since even an ephemeral community of stream insects is of ecological value, the UAA analysis needs to carefully examine the net ecological benefit from a watershed-wide perspective. This would include demonstrating that the habitat that would be created is in short supply and would not be replacing other limited habitat types.

At this time, there are only two general situations where Ecology finds that the use of a NEB UAA meets federal and state laws and regulations:

1. To allow discharges to flow limited waterbodies to continue where meeting all established water quality criteria would otherwise result in removal of the discharge and subsequent harm to the aquatic ecosystem.
2. To allow new discharges to flow limited waterbodies in order to restore or expand ecologically important aquatic habitat in the watershed.

NEB UAAs that cannot defensibly demonstrate they satisfy the above two situations run a substantial risk of not being supported by Ecology and not being successful in changing the designated uses and criteria in the state water quality standards.

It is important to recognize that a NEB UAA is a very specialized form of UAA. As such it has greater restrictions on its use and may create some long-term obligations for the project proponent in terms of follow-up monitoring and maintenance of the higher quality habitat conditions.

<u>Basis for allowing an alteration to a natural biological community in a NEB UAA:</u>

The concept of a NEB UAA is not directly discussed in federal laws and regulations governing state water quality standards and related programs. There are, however, several provisions that provide strong support for certain NEB UAA determinations:

- The objective of the federal Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biologic integrity of the Nation's waters. The interim national goal is that wherever attainable water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in an on the water be achieved. These provisions are not intended to just protect existing conditions, but to look for methods to restore the health of our nation's waters. They also provide a basis for examining health on a system-wide basis as well as an individual stream segment basis in evaluating that health.
- Federal rules [40 CFR 131] require that designated uses and their associated criteria be supported wherever attainable. Designated uses can be those that require more stringent water quality criteria than what would have been attained in the natural system. In such situations, the Federal UAA rules require consideration of whether a use can be attained through the discharge of sufficient volumes of effluent [40 CFR 131.10(g)(2)]. These facts together show that the federal regulations are not opposed in general to shifting natural

biological communities, in this case a shift towards more sensitive uses and more stringent criteria. Also in this case, an explicit requirement was created to consider the role of the effluent in creating the habitat conditions that would support the designated uses – indirectly assuming that the natural community that would exist without the discharge need not be the target under the standards.

- Federal rules establish a precedence for uses that require more stringent water quality criteria [e.g., 40 CFR 131.10(i), and (j)(2)]. What is more stringent, however, will depend on the actual mix of criteria; as an effluent may increase oxygen, neutralize pH , improve and expand the physical habitat, and decrease temperature, while at the same time be incapable of meeting one or more chronic toxics criteria. Determining what is more stringent in this case is a matter of judgment on the impact of the mixture on the designated uses.

Situations will arise where a discharger is persuaded by economic, social, or technological limitations to take its effluent out of a river rather than to meet all of the water quality criteria established to protect the designated uses. Without the ability to consider the NEB of the wastewater under 40 CFR 131.10(g), that discharge would need to be removed even if its flow was critical to the continued existence of the aquatic community. Similarly, in some watersheds the loss of flows due to human withdrawals has detrimentally altered the natural biologic communities and bringing in well treated wastewater would be one method (in addition to using voluntary means to redirect some of the appropriated waters back to the stream) to restore the flows needed to bring back more of the natural health of the stream. These situations are clearly consistent with the use protection goals of the Clean Water Act (CWA), and when paired with the need to use state of the art treatment, also support the technology-based pollution control objectives of the Act. The CWA and federal rules also direct that toxics in toxic amounts be prohibited and that the discharge of pollutants into navigable waters be eliminated. Thus, any NEB UAA approved by Ecology should be designed to identify the discharge conditions that best satisfy both the aquatic habitat and use protection goals of the Act <u>and</u> the goal to eliminate toxic and other pollutants.

The Focus on Flow: In arid regions of the state, natural intermittent or low flow conditions may limit the possible uses supported by a waterbody. The focus of a NEB UAA is on the ecological benefits of human induced flows. When conducting a NEB UAA it must be demonstrated that greater ecological benefits result from allowing a wastewater discharge then would otherwise exist without the wastewater. Thus, the NEB UAA must demonstrate that the flow conditions which would occur without the wastewater prevent attainment of designated or ecologically important uses. In doing so, the UAA must describe the long-term flow patterns and the minimum flows required to maintain such uses. While intuitively appealing, it is not sufficient to assume that the addition of water will result in ecological improvement. For example, even a shallow or intermittent waterway may support essentially the same composition of uses as it would with more water if summer temperature and oxygen conditions still limit available habitat. And such altered conditions (warmer, less oxygen, increased plant and algae growth) may in some cases provide greater opportunities for invasive species to harm the existing uses.

Historic data on aquatic life uses in the waterbody may be useful in demonstrating the role of the non-supplemented flows on use attainment. Where possible, information should be obtained to determine the distribution of stream flows and stage-flow relationships. Flow data can be

obtained from USGS records, local flood control districts, from the daily flow file in the STORET database, and in some cases directly from Ecology.

Part II: Conducting NEB UAAs

The intent of the net ecological benefit (NEB) use attainability analysis (UAA) process is to help preserve or restore scarce aquatic or riparian habitat in arid regions. Even wastewater treated using state of the art methods may have trouble meeting certain water quality criteria if discharged to intermittent or low flow waterways. In the arid regions of the state, the discharge of highly treated waste water may be permissible even where not all water quality criteria are fully being attained if it is determined to provide a substantial net ecological benefit (i.e., the benefits must be clear and distinctly greater than the alternative conditions would provide). The establishment of a NEB UAA follows the allowances in the federal regulations for establishing a subcategory of a designated use that has less stringent water quality criteria [40 CFR 131.10(g)].

In situations where the costs and technical limitations of treating wastewater to levels that meet water quality criteria would cause the removal of wastewater that provides such overriding ecological benefits, a net ecological benefit (NEB) use attainability analysis (UAA) for the effluent dependent ecosystem (EDE) may be used as the basis for allowing wastewater to continue to be discharged. While such a determination is permissible under state and federal laws and regulations, the unique nature of this process will require a comprehensive evaluation of the factors that make the discharge necessary and that provide a NEB. Consistent with federal rules governing UAAs, all existing uses and all attainable designated uses must be maintained and protected through any NEB UAA approved by the department. In addition, state and federal regulations require that downstream uses and water quality criteria be protected.

Use of a Net Ecological Benefit Use Attainability Analysis: Based on a current analysis of state and federal laws and regulations, Ecology is likely only to support NEB UAAs for effluent-dependent ecosystems (EDE):

1. (a) To allow discharges to flow limited waterbodies to continue where meeting all established water quality criteria would otherwise result in removal of the discharge and subsequent harm to the aquatic ecosystem; or
   (b) To allow new discharges to flow limited waterbodies in order to restore or expand ecologically important aquatic habitat in the watershed; and
2. Where those benefits will be maintained long-term, and
3. Where approval of the NEB UAA represents protection of the highest attainable uses for the waterbody.

Nothing in this guidance is to be read as inferring that lower requirements for pretreatment or wastewater treatment is acceptable for a NEB UAA then would be acceptable under any other UAA that could be authorized under state and federal laws and regulations. Practically, this means that a discharger must demonstrate that all feasible methods to improve wastewater quality will be used short of those options that would either a) result in widespread and substantial social and economic impact [40 CFR 131.10(g)(6)], or b) would realistically result in the removal of the beneficial discharge from the waterbody.

Ecology intends to generally limit the use of a NEB UAA to waterbodies that occur in the arid regions of the state (typically less than 15 inches per year of precipitation) where perennial waters are a limited and dwindling resource. Ecology further intends to restrict the use of NEB UAAs to discharges that do not contain quantities of persistent bioaccumulative pollutants that could harm wildlife or humans due to bioaccumulation in the food chain. This restriction would generally limit the application of a NEB UAA to discharges that do not contain quantities of chemicals that would predictably accumulate in the environment and the tissue of aquatic life, wildlife, or humans to potentially harmful levels. Every effort should be made to bring effluent concentrations of toxic substances down to levels that meet both the acute and chronic water quality criteria in 100% effluent since the stream may consist almost entirely of effluent for the summer period. Where detectable concentrations of persistent bioaccumulative toxics are associated with the discharge, the NEB UAA should include reasonable estimates of the fish tissue concentrations that could develop over time and compare these to concentrations likely to cause health effects in wildlife and human consumers. Where acute or chronic aquatic life toxic criteria are not met in 100% effluent, the NEB UAA needs to assess the risk to aquatic organisms.

It is important to recognize the initial UAA study will need to overcome a substantial burden of proof to demonstrate toxic effects will be avoided or be maintained at insignificant levels. It is also important to recognize the NEB proponent may need to commit to long-term monitoring and adaptive management designed to assess and respond to changes in toxic chemical concentrations or their effects not expected in the UAA report.

It is important for the proponent to gain commitments to early and continued participation by local, state (WDOE, WDFW, DNR), and federal agencies (EPA, NOAA, USFWS), native tribes, local irrigation and drainage districts, and environmental interest groups. Involving these groups at least during the study plan design stage and the final assessment and conclusion stage will improve the likelihood of a successful UAA. Participation and consensus reached by these parties fortifies the assessment and ensures that few "surprises" will arise later during formal public and intergovernmental review phases. A NEB UAA is a change in state water quality standards that requires approval under the federal Clean Water Act and the federal Endangered Species Act, and that must meet the state Administrative Procedures Act requirements for rule revisions. Obtaining these approvals will require substantial demonstration of the environmental, social, and economic consequences of making the change.

NEB Comparison Elements: The following nine elements should be considered minimum components to include in any NEB UAA submitted to Ecology:

1. Demonstrate the basic conditions for a NEB UAA are met

A NEB UAA report should adequately demonstrate the following conditions exist:

- The water body is in an arid area (typically less than 15 inches per year) where aquatic resources are limited and ecologically valuable.

- The water body supports an ecologically desirable aquatic, wetland, or riparian ecosystem and supports native plant and wildlife species.

- The discharge does not contain quantities of persistent or bioaccumulative pollutants that may harm the health humans or wildlife directly or through food chain effects.

- Removal of the discharge from the waterbody is the only remaining feasible option to prevent the discharge from violating the water quality standards.

- The continued discharge to the water body will not interfere with the maintenance of down-gradient surface water quality standards.

- All practicable pollution prevention programs, such as pretreatment and source reduction, are or will be implemented.

- A formal commitment to provide effluent in sufficient amounts and qualities to maintain the ecological benefit is identified through this process.

2. Describe the waterbody and watershed processes

A fundamental understanding of waterbody resources, processes, and factors controlling ecosystem interactions is required to conduct a successful NEB comparison. The key waterbody properties that govern aquatic, wetland, and riparian community structure and function include: water chemistry (e.g., temperature, dissolved oxygen, nutrients, pH, toxics); amounts, timing, and flow rates of available water; and channel and substrate characteristics.

The proponent should construct a succinct description of the affected waterbody summarizing the key physical, chemical, and biological components and processes. The purpose of the waterbody description is to assist in:

- Determining how the discharge affects waterbody resources;
- Identifying the key underlying factor, or combination of factors, governing the extent the discharge affects waterbody resources; and
- Delineating what data are required to conduct the NEB comparison.

Physical Attributes – In arid systems, three physical components often govern community structure and function and should be the focus of a physical analysis:

- Hydrology (e.g., water properties, distribution, water table elevation, and circulation);
- Substrate characteristics (e.g., sediment grain size); and
- Channel configuration and incision.

In addition to providing information needed to assess habitat quality, hydrologic information is often necessary to interpret other information (e.g., fate and transport of contaminants). Substrate composition, grain size, and organic content play key roles in determining the vegetation types occurring in and around a waterbody, general habitat suitability, channel stability, and use for spawning and rearing.

Chemical Attributes – All known sources of contaminants to the waterbody should be characterized. This information is useful for evaluating the attainability of beneficial uses. Temperature, dissolved oxygen, pH, turbidity, and nutrients are often principal determinants of aquatic, wetland, and riparian community structure, function, and overall health. In addition to providing information on the basic water chemistry components, waterbody descriptions should also provide any available information regarding sediment chemistry within the system.

NEB comparisons must consider the risks of toxic pollutants. A common ecological concern of discharges to effluent-dependent waterbodies is discharge of toxic chemicals and the bioaccumulation of toxic contaminants in valued resources. Where bioaccumulation may occur in humans or animals, the potential negative effect of allowing the discharge must be factored into the NEB comparison.

Biological Attributes -- Net Ecological Benefit is evaluated with respect to biological resources (e.g., rare or endangered species, unique or special habitats). The proponent's description of the water body's biotic structure and function should include assemblages of plants and animals that are supported by the discharge.

Rare, threatened or endangered species, candidate species, and native species occurring in or dependent on the waterbody should be identified. Biological indices and relationships affecting animal community structure or function should be described where possible. Based on the location and habitat requirements of key species, the proponent should then evaluate the suitability of habitats provided as a result of the discharge.

Special consideration should be given to the value of preserving existing habitats and wildlife associated with naturally intermittent or ephemeral streams. The NEB evaluation needs to demonstrate why the effluent-dependent waterbody is more ecologically desirable than the existing habitat.

3. Inventory of regional and local ecological concerns and needs

The intent of this requirement is to inventory the watershed and describe the importance of the aquatic habitat type provided by the discharge. This step should be done in conjunction with step 2 above and used to show why the perennial waterway created by the discharge supports ecologically beneficial attributes. In inventorying ecological needs, the NEB evaluation should also describe the qualities of perennial waters that occur in the basin or region which are similar to the one that would be facilitated by allowing the discharge. This will assist in describing the expected benefits and potential harm that will need to be evaluated in the UAA.

4. Description of the hypothesized environmental benefits and possible harm

A list of environmental benefits and a list of potentially harmful consequences should be generated. These lists should form the basis for hypothesis testing and any scientific theses on the overriding benefits of allowing the discharge to continue under a NEB UAA.

In the NEB UAA, statements of ecological benefit or harm should be further refined to identify specific, predicted beneficial or detrimental consequences to specific waterbody or watershed resources. For example, the general concern that "removing the discharge may harm resident endangered species" should be refined to state that "removing the discharge will result in the loss spawning habitat for native cool water fisheries." Precise statements of ecological concerns provide specific definitions of ecological benefits and are necessary prior to constructing a succinct, practical, systematic description and developing specific NEB comparison objectives.

Where appropriate, vegetation planting, restoration of channel morphology, or other efforts to enhance an ecological benefit are encouraged. In describing the ecological benefit, the NEB UAA report should discuss the overall strategy for creating, enhancing, managing, and preserving the habitat. For example, the benefits of flow enhancement could be compromised by a lack of riparian protection, thus a program combining flow enhancement with riparian protection is better able to demonstrate that the benefits will actually occur.

5. Specific NEB Comparison Objectives

Since it is not usually feasible to assess all the benefits and potential harm associated with the discharge, the proponent must select a reasonable set of ecological benefits and detriments. Explicit and succinct NEB comparison objectives define what benefits and harm will be assessed and how they will be assessed. It is recommended that, whenever possible, quantifiable amounts of ecological benefits and harm be specified as NEB comparison objectives. For example, if it is known that "x" stream miles of rearing habitat is needed to adequately support an indigenous cool water fishery, then the NEB comparison objective should examine whether "x" stream miles will be produced. It is strongly recommended that the quantity and quality of data needed to meet NEB comparison objectives should be agreed upon by affected federal, state, and tribal resource agencies prior to data collection and analyses.

6. Testable Hypotheses and Statistical Methods

The proponent should establish testable hypotheses and select the statistical methods that they will use for analysis prior to the collection of any data.

The progression from statements of ecological concerns, to NEB comparison objectives, to testable hypotheses is demonstrated in the following example:

Benefit 1: The presence of the discharge results in summer rearing habitat critical to supporting the resident speckled dace.

Objective B.1: Demonstrate flows contributed by the discharge result in velocities and depths suitable for rearing of speckled dace downstream of the discharge.

NULL HYPOTHESIS B.1: There is no significant difference in the spatial extent of rearing habitats found in areas influenced by the discharge.

Comparing areas influenced by the discharge to areas not influenced by the discharge but ecologically similar in every other way (i.e., reference sites), permits evaluation of whether the discharge creates an ecological benefit. Using the above example, the proponent may seek to demonstrate there is a significant difference in the spatial extent of aquatic habitats found in areas influenced by the discharge. This comparison provides supporting evidence that the discharge results in the maintenance of the critical habitat.

7. Data and methods used in the analysis

A NEB UAA is not limited to the use of available information, however, use of existing data decreases the cost of performing an NEB comparison. Thus an evaluation of whether existing physical, chemical, and biological data are sufficient to adequately evaluate NEB hypotheses should be conducted. The following questions should be considered:

- Do data exist to evaluate identified hypotheses?
- Is the quality of data sufficient to evaluate the NEB hypotheses?
- Do existing data provide sufficient statistical power to evaluate the hypotheses?

If existing data is not adequate to address the critical questions, which is likely to be more common than not, supplementary data and information will need to be collected.

The field survey methods employed and the quality assurance quality control plans used to ensure the results are defensible need to be included in the NEB study report. Interpretation of statistical tests and consequences to the evaluation of NEB should also be discussed in the UAA. Furthermore, the power of the test to detect relationships should be reported with all statistical test results.

8. Summary evaluation of NEB and recommended actions

The final evaluation of NEB should be conducted based on information provided by all NEB comparison analyses. In some cases, an evaluation of NEB may be relatively straightforward. For example, if analyses indicate: 1) the discharge is a significant, or sole, contributor of water to the waterbody; 2) the water provided by the discharge creates healthy aquatic and riparian habitats; and 3) these habitats are limited in the watershed and are needed to support endangered species, it relatively easy to demonstrate the discharge provides a significant NEB. Most evaluations of NEB, however, are unlikely to be so straightforward. For example, the habitat which supplies a haven for endangered riparian species may also pose a risk of contaminant biomagnification to these sensitive species (in essence an attractive nuisance). The determination of NEB, therefore, depends upon the degree each factor poses a benefit or threat to valued resources.

Knowledgeable and interested parties should be involved throughout all stages of developing a NEB UAA. It is particularly valuable, however, to involve governmental agencies, tribes, and other knowledgeable scientists in developing the NEB conclusions. Formal peer review of the NEB analysis by selected members of the scientific community may also be an effective approach to gaining further support for the NEB UAA.

The findings of the NEB comparison; a discussion of the NEB comparison's conclusion, how the information was used to reach the conclusion, and the confidence in making the determination should be clear. Since public participation and review of NEB will be required prior to adopting any change to the state standards, it will be particularly necessary to present the material in a clear and complete manner.

It is up to Ecology to revise the standards in the water body to reflect the uses that are attainable. If the rule revision is successful, a discharger's NDPES permit may be revised to reflect the new limits associated with the revised criteria. It is likely, however, that the discharger may still need to undertake some additional controls to meet the revised effluent limits. This is in conformance with the UAA goal to identify and protect the highest attainable uses. Ecology or the proponent must determine what is the most protective pollution reduction technique the entity can afford that would not result in the removal of the discharge from the waterbody.

Certain restorative enhancements to the waterbody or watershed may be used by a proponent to enhance a NEB. For example, native seed planting, riparian buffer protection, wetland restoration projects, and channel modifications are examples of enhancements that may help lead to a positive NEB determination by providing more confidence that the full benefits of leaving the water in the channel will be realized. Where these improvements occur, a legal mechanism that commits to maintaining their values should be included.

If a NEB is not demonstrated, the proponent may alternately consider:

a) Developing site-specific criteria in accordance with EPA guidance;
b) Examining other remaining 40 CFR §131.10(g) UAA factors;
c) Offsetting the discharge through upstream pollution controls; or
d) Increasing treatment of waste;

<u>Economic costs and benefits must be determined</u>

Since it is necessary under the State Administrative Procedures Act (Chpt 34.05 RCW) to demonstrate that the financial benefits of changing the water quality standards are greater than the costs, testable hypothesis on the financial costs and benefits should be included along with ecological ones in any NEB UAA.

<u>9. Monitoring program to verify the NEB</u>

If the NEB UAA study concludes that designated uses and criteria should be changed for a waterbody, a monitoring program should be included. The objectives of the NEB monitoring program are to provide the data necessary to:

- Verify the Net Ecological Benefit identified is occurring; and
- Assess attainment of any modified designated uses.

Because contaminant loading and bioaccumulation in valued waterbody resources is often a potential concern (detriment) in effluent dominated waters, monitoring of contaminant sources and concentrations in aquatic habitats and the tissues of prey species should be conducted.

The individual tasks involved in designing the monitoring program are:

1. Define monitoring objectives and performance criteria;
2. Establish testable hypotheses and select statistical analyses;
3. Select sampling and analytical methods, and define QA/QC protocols;
4. Evaluate monitoring program performance and select sampling design;
5. Implement monitoring program and data analysis; and
6. Verify Net Ecological Benefit and determine subsequent actions.

Monitoring objectives, program performance criteria, testable hypotheses, and statistical methods can be derived directly from completed NEB comparison tasks, since the purpose of the monitoring program is to provide information needed to assess whether the NEB identified is preserved.

Verify Net Ecological Benefit and determine subsequent actions -- The findings of the NEB comparison monitoring program should be regularly reported; a discussion of the program's conclusion, how information was used to reach the conclusion, and confidence in making the determination should be clearly presented. Discussions between Ecology, the discharger, representatives of regulating government agencies, tribal governments, and the public will be essential during these review cycles.