

**AGENDA**  
**Utah Water Quality Standards Workgroup**  
**December 14, 2015 1:00-4:30**  
**Red Rocks Conference Room,**  
**3rd Floor Multi-Agency State Office Building**

<b>Time</b>	<b>Subject</b>	<b>Discussion Lead</b>	<b>Supporting Documents</b>
1:00-1:10	Welcome and introductions	Chris Bittner, DWQ	
1:10-1:20	Informational Items:	Kim Shelley, DWQ	Items: Reasonable Potential Guidance WET Implementation Guidance Interim Guidance for UPDES Great Salt Lake Permits
1:20-1:50	New EPA Standards Regulations	George Parrish, EPA8	<a href="https://www.federalregister.gov/articles/2015/08/21/2015-19821/water-quality-standards-regulatory-revisions">https://www.federalregister.gov/articles/2015/08/21/2015-19821/water-quality-standards-regulatory-revisions</a>
1:50-2:30	Draft EPA Selenium Criteria	Lareina Guenzel, EPA8	1a-2015selenium_UTWQlgg.pdf 1b-Draft-Aquatic-Life-Ambient-Water-Quality-Criterion-for-Selenium-Freshwater-2015-factsheet.pdf <a href="http://www2.epa.gov/wqc/aquatic-life-criterion-selenium">http://www2.epa.gov/wqc/aquatic-life-criterion-selenium</a>
2:30-2:45	Antidegradation Review Implementation Guidance	Chris Bittner, DWQ	<a href="http://www.deq.utah.gov/ProgramsServices/programs/water/wqmanagement/standards/AntiDegSubworkgroup.htm">http://www.deq.utah.gov/ProgramsServices/programs/water/wqmanagement/standards/AntiDegSubworkgroup.htm</a>  See documents posted under 2015
2:45-3:15	Blue Creek Site-specific TDS Standard and Natural Conditions	Chris Bittner, DWQ	2a-CommentsReceivedUtahBulletine39397.pdf 2b-Blue Creek Comments and ResponsesUtahBulletine39397.pdf
3:15-3:45	Proposed Changes for fluoride criterion and level II antidegradation requirements Class 1C waters	Chris Bittner	3a-drinkingwaterADRletter.pdf 3b-r317-002_MarkUp12162015.pdf
3:45:4:00-	Upcoming Standards Changes	Chris Bittner, DWQ	Jordan River Mussel Surveys status update DWQ statewide mussel characterizations Independent Scientific Reviews Proposed Legislation: 4-IndepenScientifReviewForWQB.pdf
4:00	Next Meeting	Chris	3/14/16 or 3/28/16

		Bittner	
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You need to check in with the 1<sup>st</sup> floor DEQ receptionist for a name badge prior to coming to the DWQ 3<sup>rd</sup> floor office.

# Draft Aquatic Life Ambient Water Quality Criterion for Selenium (Freshwater) 2015

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UTAH WATER QUALITY STANDARDS WORKGROUP 12/14/15

PRESENTED BY: LAREINA GUENZEL, REGION 8 WQU

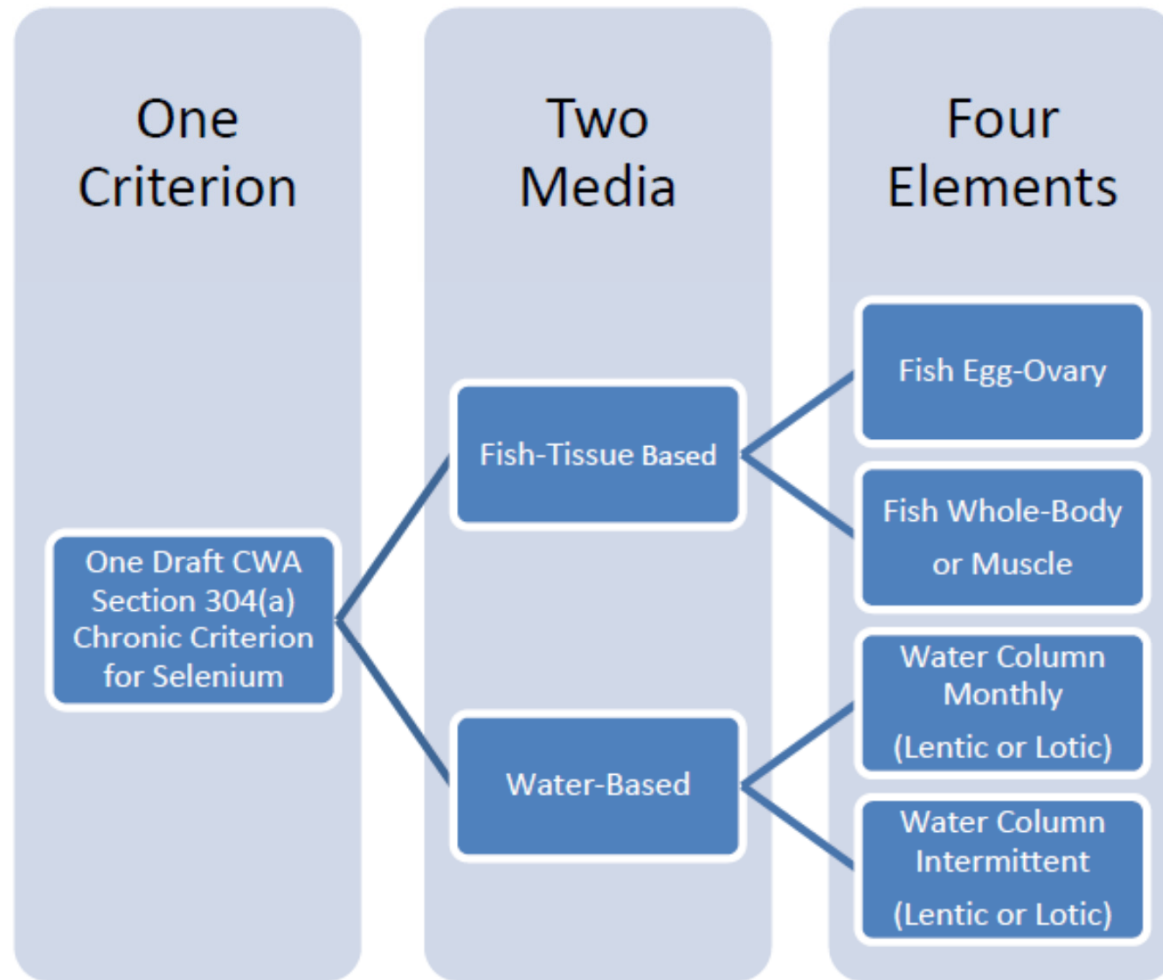
# Public Comment and Peer Review

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- Draft criteria document published in 2004
- External peer review draft published May 14, 2014
- Draft criteria document published July, 27, 2015
  - Public comment period closed October 30, 2015
- Draft criteria document and responses to peer review and public comments are available at:

<http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/selenium/index.cfm>

**Figure 1**



# Draft criteria values vs. external peer review values

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Version	Egg-Ovary mg/kg dw	Whole Body mg/kg dw	Muscle mg/kg dw	Water – Lentic ug/L	Water – Lotic ug/L
External Peer Review Draft (2014)	15.3	8.1	11.8	1.3	4.8
Draft Criteria (2015)	15.8	8.0	11.3	1.2	3.1

# What changed the numbers?

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## Reanalysis of the Simplot brown trout study

- Brown trout is no longer the most sensitive species

## Reanalysis of bluegill study (Hermanutz 1992-1996)

## New data for white sturgeon

- Most sensitive species in species-sensitivity distribution (SSD)

## Revised trophic transfer factors (TTFs) and enrichment factors (EF)

- More protective water column values

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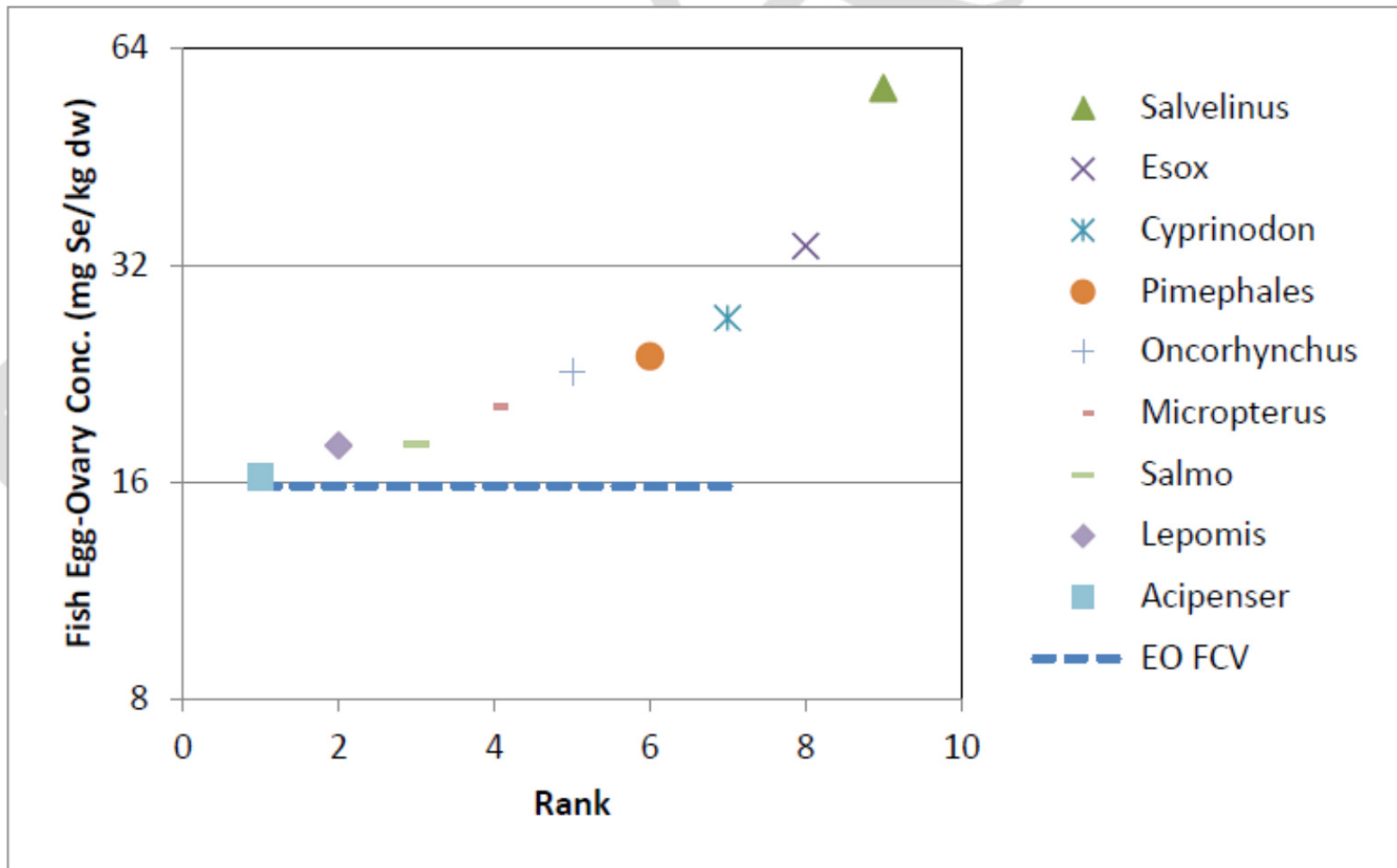
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**Figure 3.1. Distribution of reproductive-effect GMCVs for fish measured as egg-ovary concentrations.**

**Table 3.2. Ranked Genus Mean Chronic Values for Fish Reproductive Effects Measured as Egg or Ovary Concentrations.**

Rank	GMCV* (mg Se/kg dw EO)	Species	SMCV (mg Se/kg dw EO)
9	56.22	Dolly Varden, <i>Salvelinus malma</i>	56.22
8	< 34	Northern pike, <i>Esox lucius</i>	< 34
7	27	Desert pupfish, <i>Cyprinodon macularius</i>	27
6	< 23.85	Fathead minnow, <i>Pimephales promelas</i>	< 23.85**
5	22.71	Cutthroat trout, <i>Oncorhynchus clarkii</i>	24.45
		Rainbow trout, <i>Oncorhynchus mykiss</i>	21.1
4	20.35	Largemouth bass, <i>Micropterus salmoides</i>	20.35
3	18.09	Brown trout, <i>Salmo trutta</i>	18.09
2	17.95	Bluegill sunfish, <i>Lepomis macrochirus</i>	17.95
1	16.27	White sturgeon, <i>Acipenser transmontanus</i>	16.27

\* This table excludes *Gambusia*, which has a reproductive chronic value expressed as adult whole-body rather than egg-ovary, because it is a live bearer.

\*\* The fathead minnow SMCV is a conservative estimate because it does not include the higher EC<sub>10S</sub> for survival and deformities from GEI (2008), 35 – 65 mg/kg dw expressed as maternal whole body, as noted in Appendix E, Figures E-1 and E-2.

# Criteria Table Footnotes

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1 Overrides any whole-body, muscle, or water column elements when fish egg/ovary concentrations are measured, except in certain situations. See footnote 3.

2 Overrides any water column element when both fish tissue and water concentrations are measured, except in certain situations. See footnote 3.

3 Water column values are based on dissolved total selenium (includes all oxidation states, i.e., selenite, selenate, organic selenium and any other forms) in water. Water column values have primacy over fish tissue values under two circumstances: 1) “Fishless waters” (waters where fish have been extirpated or where physical habitat and/or flow regime cannot sustain fish populations); and 2) New (see glossary) or increased inputs of selenium from a specific source until equilibrium is reached.

4 Where WQC30-day is the water column monthly element, for either a lentic or lotic system, as appropriate.  $C_{\text{bkgrnd}}$  is the average background selenium concentration, and  $f_{\text{int}}$  is the fraction of any 30-day period during which elevated selenium concentrations occurs, with  $f_{\text{int}}$  assigned a value  $\geq 0.033$  (corresponding to 1 day). See Section 3.3.

5 Instantaneous measurement. Fish tissue data provide point measurements that reflect integrative accumulation of selenium over time and space in the fish at a given site. Selenium concentrations in fish tissue are expected to change only gradually over time in response to environmental fluctuations.

# Questions?

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Lareina Guenzel

Region 8 EPA

[guenzel.lareina@epa.gov](mailto:guenzel.lareina@epa.gov)

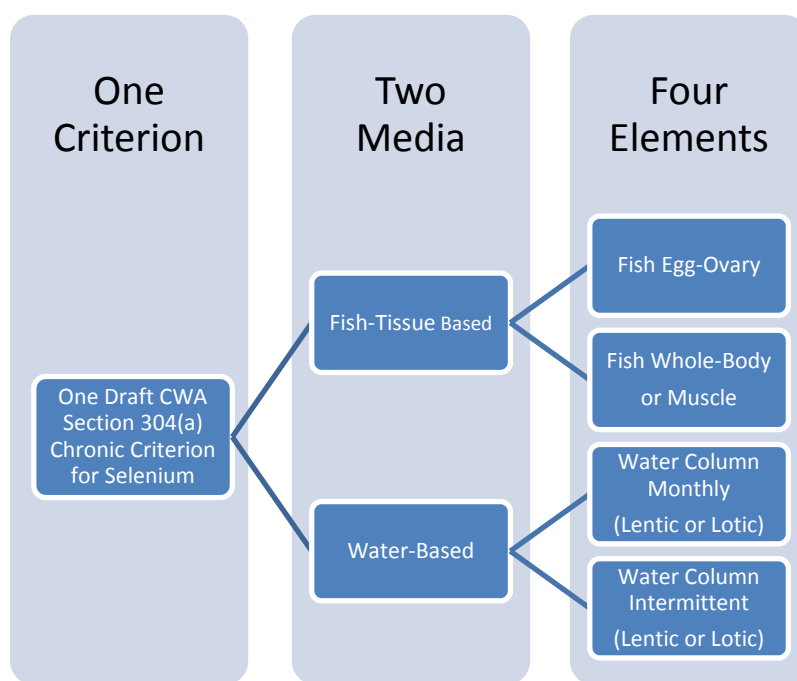
303-312-6610

# Draft Aquatic Life Ambient Water Quality Criterion for Selenium (Freshwater) 2015

## Summary

EPA is updating its national recommended chronic aquatic life criterion for selenium in freshwater to reflect the latest scientific information, which indicates that toxicity to aquatic life is driven by dietary exposures. EPA published an “External Peer Review” version of the draft criterion document in May 2014, accepted comments from the public, and submitted the draft to a contractor-led external expert peer review panel to ensure that the Agency was using the best available science. EPA incorporated changes reflecting comments from the peer review panel, as well as the public, and is accepting written comments from the public on a draft criterion document for 60 days. EPA will then revise the document and issue a final selenium criterion. As shown in Figure 1, the draft criterion has four elements, consisting of two fish tissue-based and two water column-based elements. The draft criterion document contains a recommendation that states and authorized tribes adopt into their water quality standards a selenium criterion that includes all four elements. EPA recommends that fish tissue elements be given precedence over the water column elements when both types of data are available, because fish tissue-based concentration is a more direct measure of selenium toxicity to aquatic life than water column concentrations. The draft selenium criterion is protective of the whole aquatic community, including fish, invertebrates, and amphibians.

**Figure 1**



## **Background**

EPA published the current national recommended chronic selenium water quality criterion for the protection of aquatic life (5 ug/L) in 1987. EPA sponsored an expert workshop on selenium in 1998 that recommended the fish-tissue criterion approach as more reliable than a water criterion. In 1999, EPA published the current recommended acute water column selenium criterion and reaffirmed the 1987 chronic criterion. In 2004, EPA published in the Federal Register a draft criterion expressed as a whole-body fish tissue concentration. Based on findings from the 2009 International Expert Workshop on selenium and collaboration with the U.S. Geological Survey (USGS) on a bioaccumulation model, EPA then revised the 2004 draft to include criteria based on egg-ovary tissue concentration and water column concentrations.

EPA developed the 2014 External Peer Review draft of the chronic freshwater selenium water quality criterion using the best available science. As shown in Table 1, the draft criterion has four elements, all originating from the egg-ovary criterion element in a hierarchical fashion. The translation of fish tissue to water was accomplished using a peer-reviewed model developed by the USGS. The External Peer Review draft was sequentially reviewed first by the public during the comment process, and then by an external expert peer review panel. EPA addressed comments made during these processes and developed the 2015 draft selenium criterion document.

## **Who is affected by this draft criterion document?**

Ambient water quality criteria for the protection of aquatic life are numeric concentrations of pollutants, with recommended duration and frequency, in surface waters that are protective of aquatic life designated uses. Under Clean Water Act section 304(a), EPA is required to develop and publish and, from time to time, revise, criteria for protection of water quality and human health that accurately reflect the latest scientific knowledge. EPA develops water quality criteria based solely on data and scientific information about the relationship between pollutant concentrations and environmental and human health effects. EPA's recommended water quality criteria are not rules, nor do they automatically become part of a state's water quality standards. States and authorized tribes must adopt into their standards water quality criteria that protect the designated uses of the water bodies within their area. The selenium criterion is recommended for adoption across the nation, but it may be particularly relevant for states that have more naturally-occurring selenium and for certain industry sectors.

## **Where can I find more information?**

EPA has established an official public docket for this action, Docket ID No. EPA-HQ-OW-2004-0019, which can be accessed via the Federal government regulations website at [www.regulations.gov](http://www.regulations.gov). You may also download the criterion document and supporting information from EPA's aquatic life website at <http://water.epa.gov/scitech/swguidance/standards/criteria/aqlife/selenium/index.cfm>. For other information on the criterion, contact Kathryn Gallagher by telephone at (202) 564-1398, by email at [gallagher.kathryn@epa.gov](mailto:gallagher.kathryn@epa.gov), or by mail at U.S. EPA, MC: 4304T, 1200 Pennsylvania Ave., N.W., Washington, D.C. 20460.



**Table 1. 2015 Draft Selenium Chronic Criterion (Freshwater)**

Criterion Element	Magnitude	Duration	Frequency
Fish Tissue (Egg-Ovary) <sup>1</sup>	15.8 mg/kg dw	Instantaneous measurement <sup>5</sup>	Never to be exceeded
Fish Tissue (Whole Body) <sup>2</sup>	8.0 mg/kg dw	Instantaneous measurement <sup>5</sup>	Never to be exceeded
Fish Tissue (Muscle) <sup>2</sup>	11.3 mg/kg dw	Instantaneous measurement <sup>5</sup>	Never to be exceeded
Water (Lentic) <sup>3</sup>	1.2 ug/L	30-day average	Not to be exceeded more than once in three years on average
Water (Lotic) <sup>3</sup>	3.1 ug/L	30-day average	Not to be exceeded more than once in three years on average
Water (Intermittent) <sup>4</sup>	$WQC_{int} = \frac{WQC_{30-day} - C_{bkgrnd}(1 - f_{int})}{f_{int}}$	Intermittent Exposure <sup>6</sup> Number of days fewer than 30 with an elevated concentration	Not to be exceeded more than once in three years on average

<sup>1</sup> Overrides whole-body, muscle, or water column elements when egg/ovary concentrations are measured except in certain situations (See footnote 3).

<sup>2</sup> Overrides any water column element when both fish tissue and water concentrations are measured, except in certain situations (See footnote 3).

<sup>3</sup> Water column values are based on dissolved total selenium in water. Water column values have primacy over fish tissue values under two circumstances: 1) "Fishless waters" (waters where fish have been extirpated, or where physical habitat and/or flow regime cannot sustain fish populations); and 2) New (see glossary) or increased inputs of selenium from a specific source until equilibrium is reached.

<sup>4</sup> Where  $WQC_{30-day}$  is the water column monthly element, for either a lentic or lotic system, as appropriate.  $C_{bkgrnd}$  is the average background selenium concentration, and  $f_{int}$  is the fraction of any 30-day period during which elevated selenium concentrations occur, with  $f_{int}$  assigned a value  $\geq 0.033$  (corresponding to 1 day).

<sup>5</sup> Instantaneous measurement. Fish tissue data provide point measurements that reflect integrative accumulation of selenium over time and space in the fish at a given site. Selenium concentrations in fish tissue are expected to change only gradually over time in response to environmental fluctuations.

<sup>6</sup> Where  $WQC_{30-day}$  is the water column monthly element, for either a lentic or lotic system, as appropriate.  $C_{bkgrnd}$  is the average background selenium concentration, and  $f_{int}$  is the fraction of any 30-day period during which elevated selenium concentrations occur, with  $f_{int}$  assigned a value  $\geq 0.033$  (corresponding to 1 day).

### **ATTACHMENT 3**

**Comments received for proposed amendments to R317-2 published in the June 1, 2015 *Utah Bulletin* No. 39397. Only written comments were received. No comments were received at the Public Hearing July 6, 2015.**



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8**

1595 Wynkoop Street  
Denver, CO 80202-1129  
Phone 800-227-8917  
www.epa.gov/region08

July 1, 2015

Ref:

Mr. Christopher Bittner  
Division of Water Quality  
Utah Department of Environmental Quality  
P.O. Box 144870  
Salt Lake City, Utah  
84114-4870

Re: Proposed revisions to R317-2

Dear Mr. Bittner:

This letter provides the comments of the U.S. EPA Region 8 Water Quality Unit (WQU) on the proposed revisions to R317-2 that were published for public comment on June 1, 2015 in the Utah State Bulletin (Volume 2015, No. 11). The Utah Department of Environmental Quality (UDEQ), Division of Water Quality (Division) proposes the following water quality standards (WQS) revisions:

- a natural background provision;
- revised site-specific total dissolved solids (TDS) criteria for Blue Creek, Box Elder County, Utah;
- changing the gross alpha aquatic life criterion to a pollution indicator;
- deletion of the hydrogen sulfide aquatic life criteria footnote; and
- typographical corrections to the hardness-based metals criteria.

The WQU reviewed the proposal and supporting information that was provided at the water quality standards workgroup on March 23, 2015.<sup>1</sup> The WQU has substantial concerns with the proposed natural background provision and the methods that were used to derive the maximum criterion for Blue Creek. We generally do not oppose adoption of the remaining WQS revisions in the proposal.

Please note that the positions described in our comments, regarding both existing and proposed water quality standards, are preliminary in nature and should not be interpreted as final decisions under the Clean Water Act § 303(c). The EPA approval/disapproval decisions will be made after adoption of water quality standards revisions and submittal to the EPA, and will consider all pertinent evidence including information submitted during the rulemaking process.

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<sup>1</sup> <http://www.deq.utah.gov/ProgramsServices/programs/water/wqmanagement/standards/workgroup.htm>



## Natural Background

The Division's proposal includes the addition of the following sentence to the existing site-specific standards provision (R317-2-7.1):

*c. Site-specific standards may be adopted by rulemaking where biomonitoring data, bioassays, or other scientific analyses indicate that the statewide criterion is over or under protective of the designated uses or where natural or un-alterable conditions or other factors as defined in 40 CFR 131.10(g) prevent the attainment of the statewide criteria as prescribed in Subsections R317-2-7.2, and R317-2-7.3, and Section R317-2-14. When it is determined that natural background level of a pollutant is less stringent than the otherwise applicable criterion, the water quality criterion will be equal to the natural background concentration.*

The Division further explains in the summary of the proposed rule that the change is “per USEPA Guidance and is intended to allow Utah to delist or not list water where the exceedance of criteria is determined to be caused by natural conditions.” The proposed language would allow UT to disregard the numeric criteria when making assessment decisions, and since the language does not limit the application to assessment decision, it could also be used to supplant the numeric criteria with a value that reflects the natural background when issuing UPDES permits.

The WQU agrees that it may be appropriate to consider naturally occurring pollutant concentrations when establishing water quality criteria for a specific waterbody; however, the WQU disagrees with the Division that the proposed approach for considering natural background concentrations is consistent with EPA guidance. The 1997 EPA memorandum *Establishing Site Specific Aquatic Life Criteria Equal to Natural Background* provides the national policy that natural background may be taken into consideration when deriving site-specific numeric aquatic life criteria.<sup>2</sup> The memo also states that policy does not apply to human health uses. In 2015, the EPA issued additional guidance on natural background in *A Framework for Defining and Documenting Natural Conditions for Development of Site-specific Natural Background Aquatic Life Criteria for Temperature, Dissolved Oxygen, and pH: Interim Document*.<sup>3</sup> The interim framework is provided to assist states and tribes in developing a consistent, transparent, and scientifically-defensible approach for identifying natural conditions for temperature, dissolved oxygen, and pH, which can support the development of site-specific aquatic life criteria.

The 1997 memorandum recommends that the state WQS should include the following when adopting site-specific standards set to natural background:

- 1) A definition of natural background that only includes non-anthropogenic sources;
- 2) A provision that site-specific criteria may be set equal to natural background; and
- 3) A procedure for determining natural background, or alternatively, a reference in their WQS to another document describing the binding procedure that will be used.

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<sup>2</sup> [http://water.epa.gov/scitech/swguidance/standards/upload/2009\\_01\\_29\\_criteria\\_naturalback.pdf](http://water.epa.gov/scitech/swguidance/standards/upload/2009_01_29_criteria_naturalback.pdf)

<sup>3</sup> [http://water.epa.gov/scitech/swguidance/standards/library/upload/natural\\_conditions\\_framework.pdf](http://water.epa.gov/scitech/swguidance/standards/library/upload/natural_conditions_framework.pdf)

Utah's proposal only addresses one of the three recommendations. Regulations R317-1 and R317-2 do not provide a definition of natural background and UDEQ does not have an existing procedure for identifying natural conditions to support the proposed narrative approach. Without including provisions to address these recommendations, it is not clear how the proposed natural background provision will be implemented by the state. Additionally, since the provision is written so broadly, it could be used in situations beyond its original intent (e.g., to establish permit limits that exceed criteria to protect designated uses, include sources that are not truly natural, applied to parameters with human health concern, etc.). Considering natural sources of pollutants for the purposes of WQS at the time of assessment or when issuing permits would remove the public comment process and public hearing that is required by the CWA and the EPA's implementing regulations at 40 CFR Parts 25 and 131. Furthermore, the Division's proposed narrative approach to allow the background level of a pollutant to become the applicable water quality criterion if the background level is less stringent than the otherwise applicable water quality criterion constitutes a revision to the WQS and as such, the state is required to submit the new/revised WQS to EPA for review and action consistent with CWA 303(c)(2)(A).

It is possible that Division misinterpreted the EPA's integrated report (IR) guidance, which addresses CWA 303(d), 305(b) and 314 requirements as recommendations for state WQS. Several states requested that EPA clarify how to make a 303(d) listing decision for waterbody segments with natural background levels of a pollutant. The EPA responded by adding a discussion of natural background in the IR guidance, which states that applicable water quality standards are the basis for determining whether a waterbody must be included on a State's Section 303(d) list. For some states, this includes an EPA-approved natural conditions provision. In the absence of an EPA-approved natural background provision in state WQS, or site-specific criteria based on natural background, the otherwise applicable criteria would be the basis for determining whether a waterbody is impaired.<sup>4</sup> The clarification on natural conditions in the IR guidance is not an EPA recommendation that states should adopt a natural conditions provision into state water quality standards.

For these reasons, the WQU would recommend disapproval of the natural background provision if it is adopted by the Water Quality Board. Moving forward, we recommend UDEQ remove the revised language and instead include language that explicitly states that all site-specific criteria based on natural background shall be noticed for public comment and subjected to other applicable public participation requirements prior to being adopted by the state and submitted to EPA for review and action. We also recommend UDEQ include a definition for natural background due *only* to non-anthropogenic sources and a procedure for determining natural background consistent with the 1997 EPA memorandum.

### Blue Creek Site-specific TDS Criteria

#### *Background*

The Water Quality Board adopted new site-specific criteria for Blue Creek and Blue Creek Reservoir in 2014. The EPA provided public comments on the Division's proposed approach in a letter dated 4/4/14. In these comments, the WQU generally supported the adoption of site-specific criteria for Blue Creek and Blue Creek Reservoir; yet had several questions and concerns with the criteria derivation

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<sup>4</sup><http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/2014-memo.cfm#recommendations>

methodology and implementation, including the following.

- The methods used to derive the upper bound criteria combined with UT's default 10% exceedance frequency for assessment decisions may not protect the existing water quality and allow for substantial degradation prior to making an impairment decision.
- The WQU expressed concerns with data requirements to implement the 30-day average criterion and that expressing the criterion as a 30-day average could result in unnecessary listing since the criterion was set to the average of a two year dataset.
- We suggested that the Division use of a more robust dataset to characterize the annual variability of mean TDS concentrations and true range of expected TDS concentrations in Blue Creek.

In the response to comments, the Division acknowledged that the proposed duration restricted the state's ability to assess the criteria and deleted the 1-hour and 30-day requirements from the proposal. Our other concerns with the maximum criteria and the limited dataset used to derive the criteria were not addressed in the final WQS that were adopted by the Board in 2014. The site-specific criteria were submitted to Region 8 for review in a letter dated 8/18/2014. The Region has not acted on the submission knowing that the Division was considering additional revisions to the site-specific criteria.

#### *Summary of proposed revisions*

In this notice, UDEQ proposes the following revisions the site-specific TDS criteria for Blue Creek that were adopted in 2014:

*Blue Creek and tributaries, Box Elder County, from ~~Gunnison~~ Bear River Bay, Great Salt Lake to Blue Creek Reservoir: ~~maximum 6,300 mg/l and an average of 3,900~~ March through October daily maximum 7,200 and an average of 3,800 mg/l; November through February daily maximum 7,500 mg/l and an average of 4,700 mg/l. Assessments will be based on TDS concentrations measured at the location of STORET 4960740. At least 10 samples are required to assess compliance with the mean criteria. If the sample mean for samples collected in March through October is equal to or less than 4,100 mg/l and the sample mean for samples collected November through February is equal to or less than 5,300 mg/l, the average criteria are being met. Alternative scientifically defensible assessment methods may be applied for assessing the average criteria.*

The proposed criteria were derived from a robust dataset (1989-2010; N=349) and protect the conditions when TDS is generally lower (i.e., summer). The revisions also include implementation details for criteria that are expressed as an average. The summer and winter average criteria are set to the mean seasonal concentration (summer N = 235; winter N = 113). The maximum criteria are set to a statistical upper limit that is greater than the maximum concentration observed in that season. For summer the maximum criterion is set to the 95% upper simultaneous limit (USL95). For winter the maximum criterion is set to the 95% upper tolerance limit with 99% coverage (UTL95-99). All calculations were conducted with the EPA ProUCL software Version 5.0.

The WQU has the following comments on the proposed revisions to the Blue Creek site-specific criteria:

1. We thank UDEQ for using a more robust dataset and support the proposed seasonal approach.
2. We continue to support the Division's intent to adopt site-specific criteria that will protect both the average and maximum concentrations when the parameter of concern exhibits high seasonal variability. This tiered approach is an improvement over previous approaches to set site-specific standards since it protects the high quality conditions with an average, in addition to limiting the maximum concentrations that will be allowed.
3. We continue to have significant concerns with the methods used to derive the maximum criterion when R317-2-7.1 allows for a 10% exceedance of maximum TDS criteria when making assessment decisions. The Division's approach to deriving site-specific maximum criteria is to evaluate a wide range of upper percentile values that are intended to approximate the maximum. The Division has set maximum criteria to three different upper limit statistics. The criteria adopted in 2014 (Blue Creek and Blue Creek Reservoir) were set to the 95 % upper prediction limits (UPL95) for the next 5 observations. The revised seasonal maximum criteria for Blue Creek are set to the USL95 and UTL95-99 for summer and winter, respectively. The ProUCL 5.0 Technical Guide provides the following descriptions of these statistics (emphasis added):<sup>5</sup>

Upper Prediction Limit (UPL): The upper boundary of a prediction interval for an independently obtained observation (or an independent future observation). Based upon an established background data set, a 95% UPL (UPL95) represents that statistic such that an independently collected new/future observation from the target population (e.g., background, comparable to background) will be less than or equal to the UPL95 with CC of 0.95. **We are 95% sure that a single future value from the background population will be less than the UPL95** with CC= 0.95. A parametric UPL takes data variability into account.

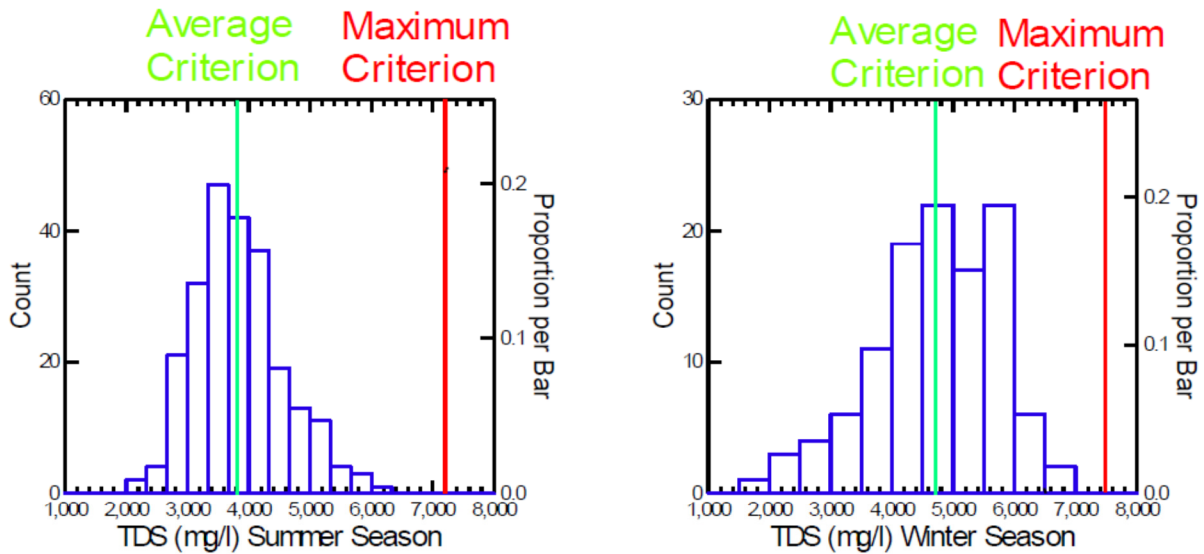
Upper Tolerance Limit (UTL): A confidence limit on a percentile of the population rather than a confidence limit on the mean. For example, a 95 % one-sided UTL for 95 % coverage represents the value below which 95 % of the population values are expected to fall with 95 % confidence. In other words, **a 95% UTL with coverage coefficient 95% represents a 95% UCL for the 95th percentile.**

Upper Simultaneous Limit (USL): The upper boundary of the largest value. Based upon an established background data set free of outliers and representing a single statistical population, a USL95 represents that statistic such that all observations from the "established" background data set are less than or equal to the USL95 with a CC of 0.95. A parametric USL takes the data variability into account. It is expected that **all current or future observations coming from the background population (comparable to background population, unimpacted site locations) will be less than or equal to the USL95** with CC, 0.95.

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<sup>5</sup> [http://www2.epa.gov/sites/production/files/2015-03/documents/proucl\\_v5.0\\_tech.pdf](http://www2.epa.gov/sites/production/files/2015-03/documents/proucl_v5.0_tech.pdf)

These statistics either provide high confidence that future samples will be less than the limit (i.e., UPLs and UTL – both with a low false positive rate) or are statistics that are typically used to estimate the true maximum of a given distribution (i.e., USL). Figure 7 from the Division’s support document clearly shows that the proposed maximum criteria are greater than what has been observed in Blue Creek over the last 20+ years. We question why the Division is interested in setting the criterion to an estimate of the true maximum, rather than a percentile of the distribution? Estimating a true maximum is a challenging task that inflates the limit and results in less protective criteria. It is also worthy to note the statistical outlier in the dataset (7,180 mg/L, not presented in these figures) is less than the proposed maximum criteria. Use of the proposed maximum criteria to establish permit limit or when making assessment decisions, which allows for a 10% exceedance, will not protect the existing water quality conditions in Blue Creek.



**Figure 7. Histograms of Blue Creek summer and winter seasons total dissolved solids concentrations with proposed average and maximum criteria**

To resolve our concerns with the proposed approach, we suggest that the Division consider adding an additional statement to the site-specific standard that when making assessment decisions, the 10% exceedance frequency in R317-2-7.1 does not apply to the maximum criteria. This approach would only address the concerns with assessment decisions and does not address the implementation in UPDES permits; however, it is likely that permit limits derived using the average criteria will control effluent concentrations such that the maximum criterion will never be observed.

Alternatively, the Division could consider an approach similar to what is proposed for the average criteria where the statistical uncertainty with the dataset is taken into consideration in the assessment thresholds, rather than the water quality criterion. The UPL/UTL/USL limits are



more akin to the assessment thresholds than values that are expected to protect the existing water quality of Blue Creek. The maximum criterion could then be set to a more protective limit that is compatible with R317-2-7.1 (e.g., 90<sup>th</sup> percentile or potentially maximum observed, depending on the robustness of the dataset).

We recommend that the Division address our concerns with the proposed natural conditions provision and the maximum TDS criteria for Blue Creek prior to presenting the proposal to the Water Quality Board for adoption. We appreciate the efforts of the Division to coordinate with the WQU when developing proposed revisions to state WQS. If there are questions concerning our comment, please contact me at (303) 312-6947 or Lareina Guenzel at (303) 312-6610.

Sincerely,

A handwritten signature in cursive script that reads "Sandra Spence".

Sandra Spence, Chief  
Water Quality Unit

## ATTACHMENT 2 to WQB Meeting 9/23/15

**Comments and responses for proposed amendments to R317-2 published in the June 1, 2015 Utah Bulletin No. 39397. Only written comments were received. No comments were received at the Public Hearing July 6, 2015.**

- 1. Comment:** A comment raises a concern regarding the proposed revision to R317-2-7.1 regarding not listing lakes and streams as impaired when the water quality exceedance was due to background conditions. USEPA Region 8 (USEPA8) notes that the language does not limit the determination that a criterion exceedance is due to background to assessments but would also be applicable to other programs such as permitting.

**DWQ Response:** DWQ agrees with the comment and is proposing to withdraw the provision as shown below to develop wording that will limit the implementation of this provision to assessments.

~~R317-2-7.....Site-specific standards may be adopted by rulemaking where biomonitoring data, bioassays, or other scientific analyses indicate that the statewide criterion is over or under protective of the designated uses or where natural or unalterable conditions or other factors as defined in 40 CFR 131.10(g) prevent the attainment of the statewide criteria as prescribed in Subsections R317-2-7.2, and R317-2-7.3, and Section R317-2-14. When it is determined that natural background level of a pollutant is less stringent than the otherwise applicable criterion, the water quality criterion will be equal to the natural background concentration.~~

- 2. Comment:** A comment raises a concern regarding the proposed revision to R317-2-7.1 regarding not listing lakes and streams as impaired when the water quality exceedance was due to background conditions. USEPA specifically identifies 2 components (out of 3) that are recommended in USEPA guidance as missing in Utah's standards:
  1. A definition of natural background that only includes non-anthropogenic sources;
  2. A procedure for determining natural background, or alternatively, a reference in their WQS to another document describing the binding procedure that will be used.

**DWQ Response:** DWQ agrees that a definition for natural background is necessary. DWQ proposes to withdraw the revisions to R317-2-7 regarding background conditions at this time. DWQ will develop a definition for background conditions with the Water Quality Standards Workgroup. With regards to the binding procedures, further discussion with USEPA8 and the Water Quality Standards Workgroup are necessary because of the lack of similar USEPA guidance or specific regulations.

- 3. Comment:** *"We continue to have significant concerns with the methods used to derive the maximum criterion when R317-2-7.1 allows for a 10% exceedance of maximum TDS criteria when making assessment decisions. The Division's approach to deriving site-*

*specific maximum criteria is to evaluate a wide range of upper percentile values that are intended to approximate the maximum. The Division has set maximum criteria to three different upper limit statistics. The criteria adopted in 2014 (Blue Creek and Blue Creek Reservoir) were set to the 95 % upper prediction limits (UPL95) for the next 5 observations. The revised seasonal maximum criteria for Blue Creek are set to the USL95 and UTL95-99 for summer and winter, respectively. The ProUCL 5.0 Technical Guide provides the following descriptions of these statistics...*

*...These statistics either provide high confidence that future samples will be less than the limit (i.e., UPLs and UTL – both with a low false positive rate) or are statistics that are typically used to estimate the true maximum of a given distribution (i.e., USL). Figure 7 from the Division’s support document clearly shows that the proposed maximum criteria are greater than what has been observed in Blue Creek over the last 20+ years. We question why the Division is interested in setting the criterion to an estimate of the true maximum, rather than a percentile of the distribution? Estimating a true maximum is a challenging task that inflates the limit and results in less protective criteria. It is also worthy to note the statistical outlier in the dataset (7,180 mg/L, not presented in these figures) is less than the proposed maximum criteria. Use of the proposed maximum criteria to establish permit limit or when making assessment decisions, which allows for a 10% exceedance, will not protect the existing water quality conditions in Blue Creek.”*

**DWQ Response 3a.** USEPA8 comments that: *“Use of the proposed maximum criteria to establish permit limit or when making assessment decisions, which allows for a 10% exceedance, will not protect the existing water quality conditions in Blue Creek.”*

DWQ disagrees with this conclusion. The Blue Creek TDS seasonal criteria include both an average and a maximum which provides much more rigorous protection than just the maximums currently applied everywhere else in Utah for TDS criteria. The promulgation of the average criteria alone are sufficient to address all of the concerns regarding protectiveness in USEPA8’s comments because hypothetically even if the proposed maximum criteria were too high, the average criteria would protect the water quality of Blue Creek.

However, USEPA8 comments indicate that disapproval would be likely, so DWQ evaluated the impacts of lowering the maximum criteria to decrease the probability of a USEPA8 disapproval. The potential impacts of lower maximum criteria to permits as well as water quality assessments were evaluated and DWQ concluded that impacts of reducing the maximum criteria are acceptable.

As shown in the following text, the maximum seasonal criteria for both Blue Creek and Blue Creek Reservoir were reduced by basing them on the 95% upper tolerance limits of the 90<sup>th</sup> percentiles. For Blue Creek Reservoir, the revised maximum criterion is 2,100 mg/l (previously 2,200 mg/l). The revised maximum criteria for Blue Creek are 4,900 mg/l (previously 7,200 mg/l) for the summer season summer and 6,700 mg/l (previously 7,500 mg/l) for the winter season.

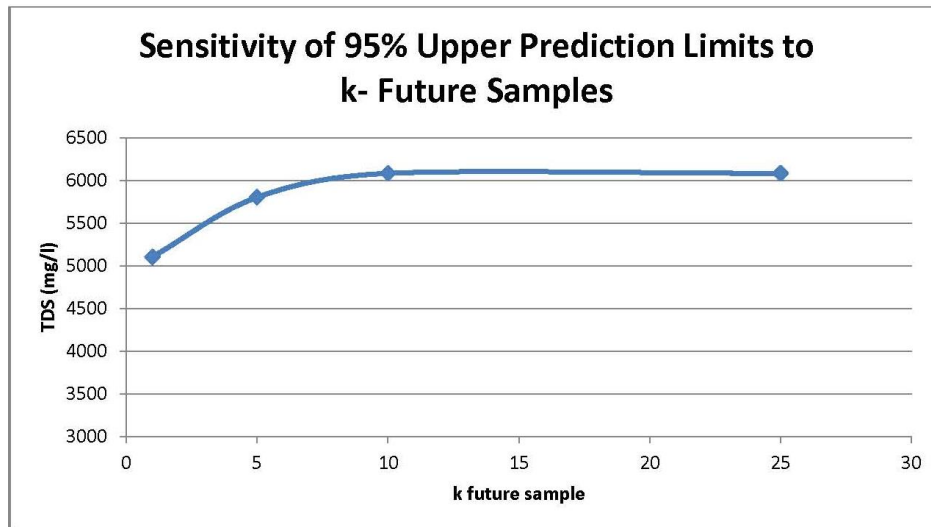
For permits, the average criteria are expected to remain the primary criteria for protecting water quality. The maximum criteria are more stringent than the previously proposed maximums but based on discussions with the permittee, the impacts are expected to be minimal.

For assessments, the primary concerns with the reduced maximum criteria are false-positive water quality impairments. In simulations, additional sampling, although an undesirable expenditure of resources, appears to be sufficient to address false positive water quality impairments if they occur in the future.

Upper prediction limits were also considered but rejected for the revised maximum criteria. Staff evaluated the effects of the k-number of future comparison samples (e.g., samples collected for assessment) on the upper prediction limits. As shown on the following figure, the prediction limits change depending on the number of future samples. Based on these observations, upper prediction limits were not considered optimal for the maximum criteria. For the same reason, the upper prediction limits included in the average criteria for assessment were deleted. The *Site-Specific Standard for Total Dissolved Solids Blue Creek Reservoir and Blue Creek, September 3, 2015* (2015 criteria support document) was revised to provide information and data for statistically rigorous future assessments of the average criteria. This approach will allow assessment methods to be optimized based on the number of samples of available. The assessment methods will be documented in *Integrated Reports*.

Blue Creek and tributaries, Box Elder County, from ~~Gunnison~~ Bear River Bay, Great Salt Lake to Blue Creek Reservoir: maximum ~~6,300 mg/l~~ and an ~~average of 3,900 mg/l~~, March through October daily maximum 4,900 7,200 mg/l and an average of 3,800 mg/l; November through February daily maximum 6,300 7,500 mg/l and an average of 4,700 mg/l. Assessments will be based on TDS concentrations measured at the location of STORET 4960740. ~~At least 10 samples are required to assess compliance with the average criterion. If the sample average for samples collected from March through October is equal to or less than 4,100 mg/l and the sample average for samples collected from November through February is equal to or less than 5,300 mg/l, the average criteria are met. Alternative scientifically defensible assessment methods may be applied for assessing the average criteria.~~

Blue Creek Reservoir and tributaries, Box Elder County,  
daily maximum 2,100 2,200 mg/l



**DWQ Response 3b.** EPA comments that *“These statistics either provide high confidence that future samples will be less than the limit (i.e., UPLs and UTL – both with a low false positive rate) or are statistics that are typically used to estimate the true maximum of a given distribution (i.e., USL).”* And *“We question why the Division is interested in setting the criterion to an estimate of the true maximum, rather than a percentile of the distribution? Figure 7 from the Division’s support document clearly shows that the proposed maximum criteria are greater than what has been observed in Blue Creek over the last 20+ years.”*

USEPA8 appears to have misinterpreted the statistical parameters proposed. The ProUCL statistical program was developed to be used primarily by the Superfund Program for cleaning up abandoned hazardous waste sites. At these sites, background concentrations of highly toxic metals and metalloids (for instance, arsenic) often need to be characterized to limit any clean up to contamination. In these situations, false negative decision errors (concluding that an area is not contaminated when it is) are highly undesirable and the methods recommended by ProUCL balance the potential for both false positive and negative decisions. This is apparent from the following statements in the USEPA (2013) ProUCL guidance:

*“Caution: To provide a proper balance between false positives and false negatives, the upper limits described above, especially a 95% USL (USL95) should be used only when the background data set represents a single environmental population without outliers (observations not belonging to background). Inclusion of multiple populations and/or outliers tends to yield elevated values of USLs (and also of UPLs and UTLs) which can result in a high number (and not necessarily high percentage) of undesirable false negatives, especially for data sets of larger sizes (e.g.,  $n > 30$ ).”*[p. 86]

*“Notes: The user specifies the allowable false positive error rate,  $\alpha (=1-CC)$ , and the false negative error rate (declaring a location clean when in fact it is contaminated) is controlled by making sure that one is dealing with a defensible/established background data set representing a single background population and the data set is free of outliers.”* [p. 87]

As documented in the revised 2015 criteria support document, the analyses for Blue Creek adhered to these recommendations. DWQ acknowledges that the maximum, or any criterion, are more protective the lower they are set. The minimum requirement for this site-specific standard is to be as protective of the natural conditions as modified by irreversible conditions. By meeting this requirement, the criteria will not allow water quality to be degraded and hence will be protective. Setting the criteria more stringent will provide additional protection but also may result in undesirable outcomes such as false-positive impairment decisions that result in resources being unnecessarily diverted to address the “impairment”. Setting the criteria too low could also result in unnecessarily stringent permits resulting in permittees incurring unnecessary treatment costs. Therefore, and as documented in the 2015 criteria support document, DWQ has applied methods that balance both false positive and negative decision errors.

All of the potential parameters considered by DWQ were percentile estimates and no estimates of the maximum were proposed by DWQ, nor are methods for estimating the maximum provided in the ProUCL guidance (USEPA, 2013). The 2015 criteria support document does indicate that the true maximum would be appropriate for the maximum criterion. The 2015 criteria support document was revised to indicate that estimates of the corresponding duration and frequency are desirable parameters along with the true maximum. Because a maximum could not be determined, DWQ proposed statistical estimates of the 95<sup>th</sup> percentile or higher. USEPA8 appears to believe that because the proposed maximum criteria are higher than any of the existing observations that the proposed maximums are too high. DWQ disagrees because it is statistically improbable that the maximum was sampled and is therefore included in the existing data.

Consider the following simplified example. There would only be a 4% chance that a sample was collected on the day with the maximum TDS concentration if samples are collected on 349 days out of 8,740 possible days (sampled days and possible sample days for Blue Creek data). Therefore, it is highly unlikely that the sample data set includes the daily true maximum.

4. **Comment:** “To resolve our concerns with the proposed approach, we suggest that the Division consider adding an additional statement to the site-specific standard that when making assessment decisions, the 10% exceedance frequency in R317-2-7.1 does not apply to the maximum criteria. This approach would only address the concerns with assessment decisions and does not address the implementation in UPDES permits; however, it is likely that permit limits derived using the average criteria will control effluent concentrations such that the maximum criterion will never be observed. Alternatively, the Division could consider an approach similar to what is proposed for the average criteria where the statistical uncertainty with the dataset is taken into consideration in the assessment thresholds, rather than the water quality criterion. The UPL/UTL/USL limits are more akin to the assessment thresholds than values that are expected to protect the existing water quality of Blue Creek. The maximum criterion could then be set to a more protective limit that is compatible with R317-2-7.1 (e.g., 90<sup>th</sup> percentile or potentially maximum observed, depending on the robustness of the dataset).”

**DWQ Response.** DWQ has elected not to exclude the Blue Creek site-specific standards from the 10% allowance in R317-2-1 because this provision is clearly intended to apply to site-specific TDS standards:

“For water quality assessment purposes, up to 10 percent of the representative samples may exceed the minimum or maximum criteria for dissolved oxygen, pH, E. coli, total dissolved solids, and temperature, including situations where such criteria have been adopted on a site-specific basis.”

Instead, DWQ has set the maximum criteria at the 90<sup>th</sup> percentile (95% upper tolerance limit of the 90<sup>th</sup> percentile). For the reasons discussed in response to comment 3, the upper prediction limit assessment thresholds have been deleted from the average criteria for Blue Creek. Specific assessment methods will be consistent with how the average criteria were derived and based on the assessment sampling design.



State of Utah

GARY R. HERBERT  
*Governor*

SPENCER J. COX  
*Lieutenant Governor*

Department of  
Environmental Quality

Amanda Smith  
*Executive Director*

DIVISION OF WATER QUALITY  
Walter L. Baker, P.E.  
*Director*

FILE COPY

March 23, 2015

DAN MATTHEWS  
JORDANELLE SSD  
PO BOX 519  
HEBER CITY, UT 84032

Document Date 3/23/2015



DWQ-2015-004306

Dear Water Provider:

**Subject: Proposed Changes to Surface Water Standards that affect the Class 1C Drinking Water Use**

I am writing to inform you about two proposed changes to Utah's water quality standards that affect the Class 1C drinking water use. Waters that are designated as Class 1C are protected for domestic purposes with prior treatment processes approved by the Utah Division of Drinking Water.

Prior to proposing these changes to the Utah Water Quality Board, I am seeking feedback from you, the water providers. Ultimately, if changes to the standards occur, the changes will be made in accordance with the required rulemaking procedures. These procedures include initial permission from the Utah Water Quality Board to initiate rulemaking, public notice and comment, and finally, formal adoption of the changes by the Water Quality Board.

The first proposed change is to the fluoride criterion. The existing fluoride criterion ranges from 1.4-2.4 mg/l depending on the maximum air temperature (UAC R317-2-14, Table 2.14.1). This range is based on the assumption that the higher the air temperature, the more water people will drink. The more water that people drink, the lower the criterion is to provide equivalent protection from the adverse effects of fluoride. However, the current USEPA maximum contaminant level (MCL) and maximum contaminant level goal (MCLG) for fluoride in finished culinary water is 4.0 mg/l and a temperature correction is no longer recommended. The proposed change is to revise the fluoride criterion for Class 1C waters to 4.0 mg/l with no temperature correction.

The second proposed change is to the procedures for conducting antidegradation reviews (UAC R317-2-3). Antidegradation is a complicated topic. In summary, degradation occurs when the concentration of a pollutant in a discharge is higher than the background concentration in the receiving water. When degradation is permitted, the antidegradation review is intended to ensure that the least degrading, feasible treatment option is used. The existing requirements for conducting antidegradation reviews include special procedures for Class 1C waters (UAC R317-2-3.5.d.):

An Antidegradation Level II Review will be required by the Director for discharges to waters with a Class 1C drinking water use assigned.

Depending upon the locations of the discharge and its proximity to downstream drinking water diversions, additional treatment or more stringent effluent limits or additional monitoring, beyond that which may otherwise be required to meet minimum technology standards or in stream water quality

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standards, may be required by the Director in order to adequately protect public health and the environment. Such additional treatment may include additional disinfection, suspended solids removal to make the disinfection process more effective, removal of any specific contaminants for which drinking water maximum contaminant levels (MCLs) exists, and/or nutrient removal to reduce the organic content of raw water used as a source for domestic water systems.

Additional monitoring may include analyses for viruses, Giardia, Cryptosporidium, other pathogenic organisms, and/or any contaminant for which drinking water MCLs exist. Depending on the results of such monitoring, more stringent treatment may then be required.

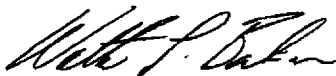
The additional treatment/effluent limits/monitoring which may be required will be determined by the Director after consultation with the Division of Drinking Water and the downstream drinking water users.

The proposed change is deletion of the requirement that "An Antidegradation Level II Review will be required by the Director for discharges to waters with a Class 1C drinking water use assigned." All of the remaining special procedures will be retained. At the time that this provision was added to the antidegradation review requirements, the requirements included several exceptions or "off ramps." The vast majority of discharge permits were issued based on these exceptions and antidegradation reviews were not required. At the explicit request of some of Utah's water providers, the requirement was added to conduct an antidegradation review and ensure the least degrading, feasible, treatment option for all discharges to Class 1C waters.

In 2010, the antidegradation review requirements were revised in response to court decisions in other states. One of these changes was to eliminate the previous exceptions to when an antidegradation review was required. Under the current requirements, an antidegradation review is required for all new discharges and for any increases in concentration or loading for existing discharges. Therefore, antidegradation reviews are required for all new or increased discharges to Class 1C waters. However, because of the requirement that "An Antidegradation Level II Review will be required by the Director for discharges to waters with a Class 1C drinking water use assigned," dischargers to Class 1C waters are still required to do an antidegradation review every time a discharge permit is renewed (every 5 years) even when the concentrations or volume of the discharge has not changed. These antidegradation reviews are perfunctory because they simply reiterate the previous antidegradation review and constitute an unnecessary regulatory burden.

Like you, the Division of Water Quality is committed to providing the highest level of protection to our drinking water source waters and these proposed changes do not decrease the existing protections for Class 1C waters. If you have any questions or concerns regarding these proposed changes, please contact Mr. Chris Bittner who is the Standards Coordinator (801-536-4371 or [cbittner@utah.gov](mailto:cbittner@utah.gov)) by April 17, 2015. After this date, the revisions may be proposed to the Utah Water Quality Board.

Sincerely,



Walter L. Baker, P.E.  
Director

WLB:cb:mc

cc: Ken Bousfield, Utah Division of Drinking Water

DWQ-2015-004066

**R317. Environmental Quality, Water Quality.**  
**R317-2. Standards of Quality for Waters of the State.**  
**R317-2-3. Antidegradation Policy.**

.....BREAK.....

social and economic importance of the proposed surface water discharge.

4. The applicant may submit a proposal to mitigate any adverse environmental effects of the proposed activity (e.g., instream habitat improvement, bank stabilization). Such mitigation plans should describe the proposed mitigation measures and the costs of such mitigation. Mitigation plans will not have any effect on effluent limits or conditions included in a permit (except possibly where a previously completed mitigation project has resulted in an improvement in background water quality that affects a water quality-based limit).

Such mitigation plans will be developed and implemented by the applicant as a means to further minimize the environmental effects of the proposed activity and to increase its socio-economic importance. An effective mitigation plan may, in some cases, allow the Director to authorize proposed activities that would otherwise not be authorized.

5. Will water quality standards be violated by the discharge?

Proposed activities that will affect the quality of waters of the state will be allowed only where the proposed activity will not violate water quality standards.

6. Will existing uses be maintained and protected?

Proposed activities can only be allowed if "existing uses" will be maintained and protected. No UPDES permit will be allowed which will permit numeric water quality standards to be exceeded in a receiving water outside the mixing zone. In the case of nonpoint pollution sources, the non-regulatory Section 319 program now in place will address these sources through application of best management practices to ensure that numeric water quality standards are not exceeded.

7. If a situation is found where there is an existing use which is a higher use (i.e., more stringent protection requirements) than that current designated use, the Director will apply the water quality standards and anti-degradation policy to protect the existing use.

Narrative criteria may be used as a basis to protect existing uses for parameters where numeric criteria have not been adopted. Procedures to change the stream use designation to recognize the existing use as the designated use would be initiated.

d. Special Procedures for Drinking Water Sources

~~An Antidegradation Level II Review will be required by the Director for discharges to waters with a Class 1C drinking water use assigned.~~

Depending upon the locations of the discharge and its proximity to downstream drinking water diversions, additional treatment or more stringent effluent limits or additional monitoring, beyond that which may otherwise be required to meet minimum technology standards or in stream water quality standards, may be required by the Director in order to adequately protect public health and the environment. Such additional treatment may include additional disinfection, suspended solids removal to make the disinfection process more

effective, removal of any specific contaminants for which drinking water maximum contaminant levels (MCLs) exists, and/or nutrient removal to reduce the organic content of raw water used as a source for domestic water systems.

Additional monitoring may include analyses for viruses, Giardia, Cryptosporidium, other pathogenic organisms, and/or any contaminant for which drinking water MCLs exist. Depending on the results of such monitoring, more stringent treatment may then be required.

The additional treatment/effluent limits/monitoring which may be required will be determined by the Director after consultation with the Division of Drinking Water and the downstream drinking water users.

e. Public Notice

The public will be provided notice and an opportunity to comment on the conclusions of all completed antidegradation reviews. When possible, public notice on the antidegradation review conclusions will be combined with the public notice on the proposed permitting or certifying action. In the case of UPDES permits, public notice will be provided through the normal permitting process, as all draft permits are public noticed for 30 days, and public comment solicited, before being issued as a final permit. The Statement of Basis for the draft UPDES permit will contain information on how the ADR was addressed including results of the Level I and Level II reviews. In the case of Section 404 permits from the Corps of Engineers, the Division of Water Quality will develop any needed 401 Certifications and the public notice may be published in conjunction with the US Corps of Engineers public notice procedures. Other permits requiring a Level II review will receive a separate public notice according to the normal State public notice procedures.

f. Implementation Procedures

The Director shall establish reasonable protocols and guidelines (1) for completing technical, social, and economic need demonstrations, (2) for review and determination of adequacy of Level II ADRs and (3) for determination of additional treatment requirements. Protocols and guidelines will consider federal guidance and will include input from local governments, the regulated community, and the general public. The Director will inform the Water Quality Board of any protocols or guidelines that are developed.

.....BREAK.....

**R317-2-14. Numeric Criteria.**

TABLE 2.14.1  
 NUMERIC CRITERIA FOR DOMESTIC,  
 RECREATION, AND AGRICULTURAL USES

Parameter	Domestic Source	Recreation and Aesthetics		Agri- culture
		1C	2A 2B	
BACTERIOLOGICAL (30-DAY GEOMETRIC MEAN) (NO.)/100 ML)	(7)			
E. coli	206	126	206	

MAXIMUM  
(NO.)/100 ML) (7)  
E. coli

668 409 668

PHYSICAL

pH (RANGE) 6.5-9.0 6.5-9.0 6.5-9.0 6.5-9.0  
Turbidity Increase  
(NTU) 10 10

METALS (DISSOLVED, MAXIMUM  
MG/L) (2)

Arsenic 0.01 0.1  
Barium 1.0  
Beryllium <0.004  
Cadmium 0.01 0.01  
Chromium 0.05 0.10  
Copper 0.2  
Lead 0.015 0.1  
Mercury 0.002  
Selenium 0.05 0.05  
Silver 0.05

INORGANICS  
(MAXIMUM MG/L)

Bromate 0.01  
Boron 0.75  
Chlorite <1.0  
Fluoride ~~(3)~~ 1.4=2.44.0  
Nitrates as N 10  
Total Dissolved  
Solids (4) 1200

RADIOLOGICAL

(MAXIMUM pCi/L)  
Gross Alpha 15 15  
Gross Beta 4 mrem/yr Radium 226, 228  
(Combined) 5  
Strontium 90 8  
Tritium 20000  
Uranium 30

ORGANICS  
(MAXIMUM UG/L)

Chlorophenoxy  
Herbicides  
2,4-D 70  
2,4,5-TP 10 Methoxychlor 40

POLLUTION  
INDICATORS (5)

BOD (MG/L) 5 5 5

Nitrate as N (MG/L)	4	4
Total Phosphorus as P (MG/L) (6)	0.05	0.05

FOOTNOTES:

(1) Reserved

(2) The dissolved metals method involves filtration of the sample in the field, acidification of the sample in the field, no digestion process in the laboratory, and analysis by approved laboratory methods for the required detection levels.

(3) ~~Maximum concentration varies according to the daily maximum mean air temperature.~~

<del>TEMP (C)</del>	<del>MG/L</del>
<del>12.0</del>	<del>2.4</del>
<del>12.1-14.6</del>	<del>2.2</del>
<del>14.7-17.6</del>	<del>2.0</del>
<del>17.7-21.4</del>	<del>1.8</del>
<del>21.5-26.2</del>	<del>1.6</del>
<del>26.3-32.5</del>	<del>1.4</del> <u>Reserved</u>

(4) SITE SPECIFIC STANDARDS FOR TOTAL DISSOLVED SOLIDS (TDS)

.....Break.....

**KEY: water pollution, water quality standards**

**Date of Enactment or Last Substantive Amendment: July 2, 2014**

**Notice of Continuation: October 2, 2012**

**Authorizing, and Implemented or Interpreted Law: 19-5**



State of Utah

GARY R. HERBERT  
*Governor*

SPENCER J. COX  
*Lieutenant Governor*

Department of  
Environmental Quality

Alan Matheson  
*Executive Director*

DIVISION OF WATER QUALITY  
Walter L. Baker, P.E.  
*Director*

**MEMORANDUM**

TO: Water Quality Board

THROUGH: Walter Baker

FROM: Erica Gaddis

DATE: November 30, 2015

SUBJECT: Independent Scientific Review

Independent peer review is an integral part of the scientific process. Legislation has recently been drafted that would require independent peer review of virtually all future water quality actions and initiatives (Attachment 1). The purpose of this memorandum is to provide the Water Quality Board with context to this proposed legislation and to initiate dialogue about several important aspects that need to be considered if formal peer review requirements are to be initiated. To illustrate these considerations the Division has drafted administrative rules (Attachment 2) for independent scientific review with alternative language that addresses several concerns with the current legislative proposal. We are not asking the Water Quality Board for authorization to initiate rule-making as we continue to refine our rule language and intent. Instead, we are sharing the draft rule language, as well as the draft legislation, with the Water Quality Board as an informational item because it could significantly affect the processes that govern the work of the Board.

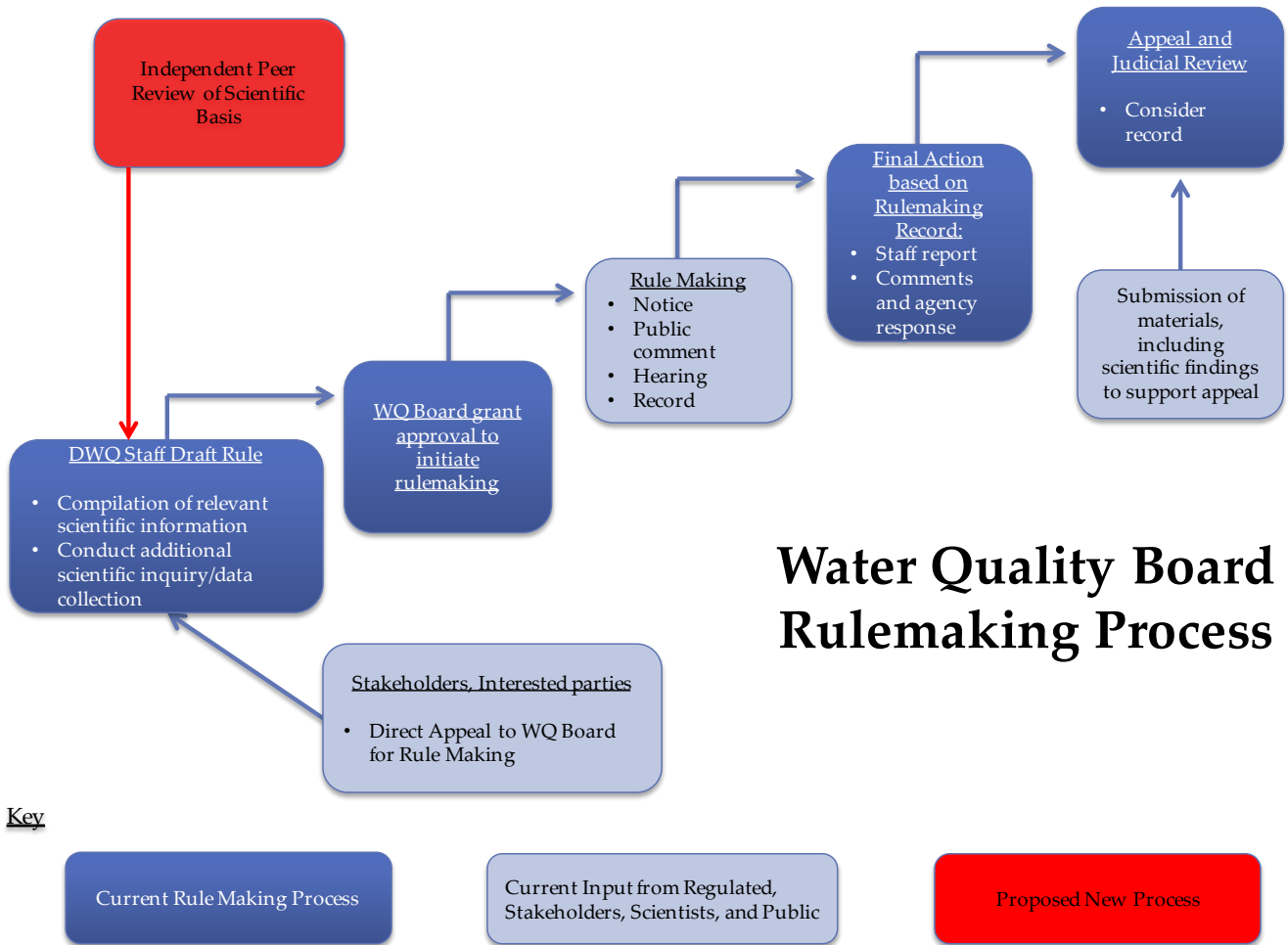
**Background**

Publicly Owned Treatment Works (POTWs) that discharge wastewater to the Jordan River, Great Salt Lake, and Utah Lake are proposing a statutory change that would allow permittees to challenge the science behind Division of Water Quality (DWQ) studies, proposed rules, permits, TMDLs, and other initiatives through a peer-review process. DWQ supports an independent scientific review process and believes it can be an important aspect of good governance. DWQ sees merit in independent scientific reviews and has always welcomed outside review via numerous technical workgroups and public comment on any new water quality proposals. There is potential merit in formalizing these current practices. However, we see several shortcomings with the legislative approach the POTWs have proposed. In this white paper, DWQ outlines how an independent scientific review process could fit into the current administrative rule-making process, elements of peer review that should be considered to better meet the intent of the proposed legislation without running afoul of existing water quality processes, and potential ways

to strengthen the existing legislative proposal to address the concerns of DWQ staff and the office of Utah’s Attorney General. To provide additional context we also provide background into the successes and failures of similar proposals that have been implemented in other states.

**Incorporating Independent Scientific Review into the Current Administrative Process**

The Division is governed by both the state Utah Water Quality Act (Title 19, Chapter 5) and the federal Clean Water Act (CWA), both of which include administrative procedures designed for public comment, judicial and executive review, and regulatory transparency. The Division suggests that a new scientific review process not interfere or constrain the existing process as outlined in the following diagram.



**Water Quality Board Rulemaking Process**

The Utah Water Quality Board (WQB) is a citizen board whose members are appointed by the governor and confirmed by the legislature. All DWQ administrative rules must be approved by the WQB following the process described in UCA §63G-3. The WQB is statutorily responsible for:

- Developing programs for the control of pollution to Utah’s waters (UCA §19-5-104(3)(a))
- Making rules governing wastewater treatment works (UCA §19-5-104(2))
- Adopting water quality standards (UCA §19-5-104(3)(b))

Any new independent scientific review requirements should complement rather than contradict the following existing opportunities for stakeholders to provide scientific input to the rule-making process:

- DWQ convenes technical advisory committees to ensure that proposed rules are scientifically defensible. Examples include: nutrient technical committee, Jordan River technical committee, Rockport and Echo Reservoir TMDL technical committee. Permittees are always invited to serve on these committees.
- DWQ relies on workgroups composed of diverse stakeholder interests to inform policy making. Examples include: Nutrient Core Team, Water Quality Standards Workgroup, and Water Quality and Health Advisory Panel.
- Any person may propose a rule to the WQB for consideration (UCA §63G-3-601(2))
- During the rule making process, DWQ solicits and responds to comments (UCA §63G-3-301).
- Following rulemaking, any person aggrieved by a rule may obtain judicial review by filing a complaint in District Court (UCA §63G-3-602). Individuals may also petition the Water Quality Board to initiate rulemaking.
- The Utah Legislature’s Administrative Rules Review Committee oversees rule making and rule impact.

### Benchmarking with Other States

DWQ conducted a survey through the national Association of Clean Water Administrators regarding peer-review processes in other states. The overwhelming majority of states do not have a mandated peer-review process. Three states have mandated peer-review processes, summarized in Table 1 below.

**Table 1. Summary of peer review process in other states**

	Mandated in Statute/Rule	Year	Detailed process	Binds agency decisions	Applicability	Process
Minnesota	Statue: Section 100. [115.035]	2015	TBD	No	Any water quality standard at discretion of commissioner.	TBD
California	Statue: Section 57004	1997	Guidance document	No	Any rule passed by CalEPA boards	Administered by the Office of Peer Review with a contract with University of California
New Jersey	Rule: Admin Order No. 2009-05	2009	Guidance documents	No	Any issue facing NJDEP at discretion of commissioner.	Administered by Office of Science through a standing Science Advisory Board appointed by Commissioner

Although the processes are generally positive, we received the following comments from agency staff in California and Minnesota.

“The peer review process can be very inefficient. One person identifies and assigns potential reviewers for the entire State. This is a lengthy process that considers the expertise of the possible reviewers and includes measures to avoid conflicts of interest. Then those engaged in the rule-making work directly with the reviewers. Reviewers may or may not be available when the State needs them. They are often professors and their schedules and priorities do not necessarily align with ours. Their understanding of their role varies too. Nevertheless, sometimes the process works quite well, and invariably, it helps to be able to tell stakeholders and decision-makers that



proposed rules have been subjected to scientific peer review. (Note that we are not required to make changes based on these reviews, but we must respond in writing for the record and may make changes if we agree.)” – *Bill Johnson, California State Water Board*

“MPCA has typically relied on the scientific peer-reviewed literature for the scientific underpinning for standards development. Sometimes we [MPCA] get questions/challenges that are framed as scientific concerns, but are really more policy concerns. In that case I don’t think that convening a panel of scientists to conduct a peer review is all that useful, since we aren’t faced with a science question, it’s a policy question. Sometimes there are multiple approaches we could take and we need to show that the approach we took was needed and reasonable. Science can help us understand the implications of policy decisions and various approaches, but it doesn’t tell us which policy choice to make. Scientific peer review of a policy question could be time-consuming and costly, and not all that helpful if it isn’t really a scientific question. We also hear concerns that are more about implementation than about the standard. I used mercury as an example of a very low standard that is based on what level of mercury is too much for human health. The standard is what we need to achieve, but we can’t always get there right now due to technology limits. Those are two different questions, and doesn’t mean that the standard is wrong.” – *Shannon Lotthammer, Minnesota Pollution Control Agency*

### **Elements of a Good Independent Scientific Review Process**

Scientific review is integral to sound science. Traditionally peer review involves the selection of independent scientific experts, who are asked to review and critique the methods, results and findings of scientific research. Typically reviewers focus on the extent to which findings are novel, follow accepted scientific practices, and are of interest to other scientists. The peer review process is integral to scientific inquiry as the best available quality assurance procedure available to modern science. The peer review processes can be adapted to inform the scientific basis of regulatory decisions, but if this is to occur, the requirements should explicitly address the following considerations:

- **Independent process.** There should be no real or perceived conflict-of-interest by any member of the scientific review panel. Most of the qualified scientists in Utah have partnered with DWQ and/or the regulated community on scientific projects that support DWQ initiatives. Thus, reviewers will likely need to be qualified scientists from outside of Utah. To avoid bias, the reviewers should also be mutually agreed upon by DWQ and the party requesting peer review.
- **Science-oriented not policy-oriented.** Regulatory decisions are informed by sound science, but science alone is incapable of accounting for the many important social, economic and political considerations that are integral to crafting sound policy. Technical regulatory reviews need to be limited to the scientific basis of the proposal. Technical experts should not be tasked with making determinations on policy matters.
- **Reflect the limits of science.** Science is not black and white and it is important for the review panel to reflect its limits. DWQ will always need to make decisions with uncertain and imperfect science. Scientific review could help quantify and characterize uncertainty as it relates to the scientific underpinnings of policies, however black-and-white

recommendations are unlikely because such decisions are inconsistent with the tenets of scientific inquiry.

- **Inform but not prescribe policy decisions.** The existing rule-making process (UCA §63G-3-301(3)) requires agencies to develop and use flexible approaches in drafting rules. Such flexibility should be preserved and policy decisions should not be delegated from the agency or governing board to a group of scientists that are most likely non-Utahns. No other state or federal agency binds policy recommendations or decisions by comments obtained through scientific review processes.
- **Independent scientific review should be open to all stakeholders.** If the independent scientific review concept is sound, DWQ believes that it should be made available to all stakeholders who are potentially affected by proposed water quality actions. No other state limits the process of scientific review or challenges solely to the regulated community.
- **Established in Rule rather than in Statute.** The Division already has statutory authority to establish a scientific review process (63G-3-301(3) and 19-5-106(g)). Establishing the details of the process in administrative rule will provide more flexibility in how to execute an independent scientific review as the initiatives of DWQ change over time. This template is followed in California and Minnesota. New Jersey's program was formed under administrative rule. No state currently defines the details of a scientific review process in statute.
- **Maintain government efficiency.** Changes to the current rule-making process must be carefully evaluated to ensure that they do not add unnecessary costs or delays in program implementation. DWQ suggests placing a limit on the amount of time available for peer review (e.g., 6 months to 1 year). California agency staff indicates that the peer-review process is very inefficient and can result in significant delays in the rule-making process. The fact that the current proposal includes changes to permits means that such delays could potentially be translated to permitting, with a corresponding potential to hamper economic development.

### **Comparison of POTW and DWQ Proposed Peer-review**

There are some very important differences related to scope and process between the legislation proposed by the POTW group and the administrative rules that have been drafted by Division staff. These differences are summarized in a table provided as Attachment 3 to this memorandum.

### **References**

To explore these issues and concerns further, we highly recommend the following reports related to integration of scientific review with policy making.

OECD (2015), "Scientific Advice for Policy Making: The Role and Responsibility of Expert Bodies and Individual Scientists", OECD Science, Technology and Industry Policy Papers, No. 21, OECD Publishing, Paris. Available at <http://dx.doi.org/10.1787/5js3311jcpwb-en>

Salzman, J. and J.B. Ruhl, In Defense of Regulatory Peer Review, 84 *Washington University Law Quarterly* 1-48 (2006). Available at: [http://scholarship.law.duke.edu/faculty\\_scholarship/1599](http://scholarship.law.duke.edu/faculty_scholarship/1599)

USEPA. Peer Review Handbook: 4th Edition. Available at:  
[http://www2.epa.gov/sites/production/files/2015-09/documents/final\\_epa\\_peer\\_review\\_handbook-4th\\_ed\\_091415\\_dummy\\_link.pdf](http://www2.epa.gov/sites/production/files/2015-09/documents/final_epa_peer_review_handbook-4th_ed_091415_dummy_link.pdf)

**Attachment 1. Legislation Proposed by POTW Community**

## WATER QUALITY AMENDMENTS

### Section 1

#### **19-5-105.3 Independent Peer Review of Water Quality Studies and Standards.**

(1) For the purposes of this chapter:

- (a) “Independent peer review” means a technical or scientific peer review conducted by experts having technical expertise in the the work being reviewed who are not;
  - i. Currently conducting research funded by the Utah Division of Water Quality (UDWQ) or the Challenging Party;
  - ii. Employed by an entity that is regulated under the Utah Water Quality Act;
  - iii. A spouse or close family member of someone who is employed by UDWQ or the Challenging Party;
  - iv. An active, participatory member of a non-profit organization that advocates positions or otherwise lobbies on UDEQ issues or proposals.
- (b) “Challenging Party” means a permittee regulated under the Utah Water Quality Control Act
- (c) “Proposal” means an initiative to change water quality standards, impose TMDL’s, modify permits, or other regulatory guidance, including reinterpretations of water quality standards or other changes that will financially impact citizens or businesses within the State of Utah; and,
- (d) “Study” means a study, analysis, or other technical or scientific work that was conducted, contracted, available, or otherwise relied upon by the Division and that is or will be used to support or otherwise inform a regulatory or permitting decision-making process.
- (e) “Technology based effluent limits” are numeric limitations included in a permit based on the availability of technology to reach the permit limit rather than on a water quality standard or TMDL.

(2) The Director shall ensure that any study or proposal prepared by or under the direction of the Division or used to support permits or proposed rules, including technology based effluent limits, considered by the Board in accordance with Title 63G, Chapter 3, Utah Administrative Rulemaking Act is subject to an independent peer review when the following conditions are met;

- (a) A Challenging Party challenges the technical or scientific basis upon which the proposal, study, technology based effluent limits, permit condition, or proposed rule is based; and
  - (b) The Challenging Party agrees to and provides the funding necessary to pay for the peer review process.
  - (c) The peer review process is completed within one year from the date the peer review panel is selected such that it does not result in inordinate delays with respect to the permitting or regulatory process.
- (3) If there are more than one Challenging Party challenging the technical or scientific basis of the same proposal, their specific challenges will be consolidated for the peer review process. Those challenging and requesting the peer review will be responsible for the costs of the peer review and the allocation of the costs to the challenging parties. They will also have the responsibility of selecting a sole independent expert to represent the challenging entities in accordance with 19-5-105.3(4).
- (4) When a peer review is conducted, there shall be three independent experts appointed by the director to the peer review panel that are mutually agreeable to both UDWQ and the Challenging Party. In the event that the Peer Review Panel is not appointed within thirty to sixty (30-60) days from the time that the Director receives the request for a Peer Review panel, the following default provision for Peer Review Panel selection will be activated:
- (a) One independent expert selected by the Division;
  - (b) One independent expert selected by the point or non-point source entity(ies) challenging the proposal or study; and
  - (c) One independent expert mutually agreeable to the independent experts identified above in (a) & (b).
- (5) The peer review panel shall ensure that a proposal, study or proposed rule, including a technology based effluent limit, subject to an independent peer review under this section is reviewed in general accordance with the guidance contained in the United States Environmental Protection Agency's Peer Review Handbook. As part of the independent peer review process, the Peer Review Panel shall allow for public comment, including written and oral public comments, on the proposal, study, permit condition, or proposed rule.
- (6) Findings of the Peer Review Panel shall be incorporated into the proposal, study, permit, TMDL or proposed rule as needed to ensure the scientific accuracy of the proposal and shall become a part of the record related to the proposed study, TMDL or rule.
- (7) The Peer Review Panel shall conclude with written findings supported by at least two of members of the Panel finding one of the following:

- (a) The proposal reviewed is not scientifically defensible;
- (b) The proposal reviewed is scientifically defensible; or,
- (c) The proposal reviewed is scientifically defensible with conditions developed by the Peer Review Panel.

(8) If the Peer Review Panel is examining a technology based effluent limit for a specified downstream water body or series of hydrologically connected water bodies, the Peer Review Panel shall conclude with written findings supported by at least two of the Peer Review Panel members finding one of the following:

- (a) The technology based effluent limit is not scientifically necessary to protect the designated beneficial uses of specified downstream water body or series of hydrologically connected water bodies; or,
- (b) The technology based effluent limit is scientifically necessary to protect the designated beneficial uses of a specified downstream water body or series of hydrologically connected water bodies.

(9)(a) Those proposals reviewed and found scientifically defensible or scientifically defensible with conditions may be forwarded to the Water Quality Board for further consideration.

(b) Challenging Party(ies) with technology based effluent limits that are not scientifically necessary to protect identified downstream water bodies are exempt from compliance with technology based effluent limitation evaluated.

**Attachment 2. Example of Administrative Rules for Independent Scientific Review drafted  
by Division of Water Quality**



**R317. Environmental Quality, Water Quality.**

**R317-1. Definitions and General Requirements.**

**R317-1-1. Definitions.**

"Assimilative Capacity" means the difference between the numeric criteria and the concentration in the waterbody of interest where the concentration is less than the criterion.

"Biological assessment" means an evaluation of the biological condition of a water body using biological surveys and other direct measurements of composition or condition of the resident living organisms.

"Biological criteria" means numeric values or narrative descriptions that are established to protect the biological condition of the aquatic life inhabiting waters that have been given a certain designated aquatic life use.

"Board" means the Utah Water Quality Board.

"BOD" means 5-day, 20 degrees C. biochemical oxygen demand.

"Body Politic" means the State or its agencies or any political subdivision of the State to include a county, city, town, improvement district, taxing district or any other governmental subdivision or public corporation of the State.

"Building sewer" means the pipe which carries wastewater from the building drain to a public sewer, a wastewater disposal system or other point of disposal. It is synonymous with "house sewer".

"CBOD" means 5-day, 20 degrees C., carbonaceous biochemical oxygen demand.

"COD" means chemical oxygen demand.

"Conflict of interest" means any financial or other interest which conflicts with the service of an expert because it: 1) could impair the individual's objectivity or 2) could create an unfair competitive advantage for any person or organization.

"Deep well" means a drinking water supply source which complies with all the applicable provisions of the State of Utah Public Drinking Water rules.

"Digested sludge" means sludge in which the volatile solids content has been reduced to about 50% by a suitable biological treatment process.

"Director" means the Director of the Division of Water Quality.

"Division" means the Utah State Division of Water Quality.

"Domestic wastewater" means a combination of the liquid or water-carried wastes from residences, business buildings, institutions, and other establishments with installed plumbing facilities, together with those from industrial establishments, and with such ground water, surface water, and storm water as may be present. It is synonymous with the term "sewage".

"Effluent" means the liquid discharge from any unit of a wastewater treatment works, including a septic tank.

"Existing Uses" means those uses actually attained in a water body on or after November 28, 1975, whether or not they are included in the water quality standards.

"Expert" means a person with technical expertise, knowledge, and/or skills in a subject matter of relevance to a specific water quality investigation including persons from other regulatory agencies, academia, or the private sector.

"Highly Influential Scientific Assessment (HISA)" is a

scientific assessment (i.e., an evaluation of a body of scientific or technical knowledge, which typically synthesizes multiple factual inputs, data, models, assumptions and/or applies best professional judgment to bridge uncertainties in the available information) that the Director reasonably can determine could have a potentially significant financial impact on either the public or private sector or is novel, controversial, or precedent-setting.

"Human-induced stressor" means perturbations directly or indirectly caused by humans that alter the components, patterns, and/or processes of an ecosystem.

"Human pathogens" means specific causative agents of disease in humans such as bacteria or viruses.

"Independent Scientific Review" means a technical or scientific review conducted by expert(s) in an area related to the material being reviewed who were not directly or indirectly involved with the development of the material to be reviewed and who does not have a real or perceived conflict of interest.

"Industrial wastes" means the liquid wastes from industrial processes as distinct from wastes derived principally from dwellings, business buildings, institutions and the like. It is synonymous with the term "industrial wastewater".

"Influent" means the total wastewater flow entering a wastewater treatment works.

"Influential Scientific Information (ISI)" means scientific information that the Director reasonably can determine will have or does have a clear and substantial impact on rule making or regulatory decisions. ISI may include information submitted by external organizations. Examples of ISI include work that establishes a significant precedent, model, or methodology; addresses significant controversial issues; focuses on significant emerging issues; or considers an innovative approach for a previously defined problem, process or methodology.

"Great Salt Lake impounded wetland" means wetland ponds which have been formed by dikes or berms to control and retain the flow of freshwater sources in the immediate proximity of Great Salt Lake.

"Large underground wastewater disposal system" means the same type of device as an onsite wastewater system except that it is designed to handle more than 5,000 gallons per day of domestic wastewater, or wastewater that originates in multiple dwellings, commercial establishments, recreational facilities, schools, or any other underground wastewater disposal system not covered under the definition of an onsite wastewater system. The Division controls the installation of such systems.

"Onsite wastewater system" means an underground wastewater disposal system for domestic wastewater which is designed for a capacity of 5,000 gallons per day or less and is not designed to serve multiple dwelling units which are owned by separate owners except condominiums and twin homes. It usually consists of a building sewer, a septic tank and an absorption system.

"Operating Permit" is a State issued permit issued to any wastewater treatment works covered under Rules R317-3 or R317-5 with the following exceptions:

A. Any wastewater treatment permitted under Ground Water Quality Protection R317-6.

B. Any wastewater treatment permitted under Underground Injection Control (UIC) Program R317-7.

C. Any wastewater treatment permitted under Utah Pollutant Discharge Elimination System (UPDES) R317-8.

D. Any wastewater treatment permitted under Approvals and Permits for a Water Reuse Project R317-13.

E. Any wastewater treatment permitted by a Local Health Department under Onsite Wastewater Systems R317-4.

"Person" means any individual, corporation, partnership, association, company, or body politic, including any agency or instrumentality of the United States government (Section 19-1-103).

"Point source" means any discernible, confined and discrete conveyance including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, concentrated animal feeding operation, or vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flow from irrigated agriculture.

"Pollution" means such contamination, or other alteration of the physical, chemical, or biological properties of any waters of the state, or such discharge of any liquid, gaseous or solid substance into any waters of the state as will create a nuisance or render such waters harmful or detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.

"Requesting Party" is an entity regulated under the Utah Water Quality Act or a stakeholder representing a public or private interest that is requesting review the scientific basis of a proposed rule.

"Scientific basis" means the foundations of a rule, regulatory guidance, or a regulatory tool that are premised upon, or derived from, empirical data or other scientific findings, conclusions, or assumptions.

"Sewage" is synonymous with the term "domestic wastewater".

"Shallow well" means a well providing a source of drinking water which does not meet the requirements of a "deep well".

"Sludge" means the accumulation of solids which have settled from wastewater. As initially accumulated, and prior to treatment, it is known as "raw sludge".

"SS" means suspended solids.

Total Maximum Daily Load (TMDL) means the maximum amount of a particular pollutant that a waterbody can receive and still meet state water quality standards, and an allocation of that amount to the pollutant's sources.

"Treatment works" means any plant, disposal field, lagoon, dam, pumping station, incinerator, or other works used for the purpose of treating, stabilizing or holding wastes. (Section 19-5-102).

"TSS" means total suspended solids.

"Underground Wastewater Disposal System" means a system for underground disposal of domestic wastewater. It includes onsite wastewater systems and large underground wastewater disposal systems.

"Use Attainability Analysis" means a structured scientific assessment of the factors affecting the attainment of the uses specified in R317-2-6. The factors to be considered in such an analysis include the physical, chemical, biological, and economic use removal

criteria as described in 40 CFR 131.10(g) (1-6).

"Wastes" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water. (Section 19-5-102).

"Wastewater" means sewage, industrial waste or other liquid substances which might cause pollution of waters of the state. Intercepted ground water which is uncontaminated by wastes is not included.

"Waters of the state" means all streams, lakes, ponds, marshes, water-courses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion thereof, except that bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife, shall not be considered to be "waters of the state" under this definition (Section 19-5-102).

### **R317-1-10. Independent Scientific Review.**

#### 10.1 Applicability

(a) Independent scientific review applies to the scientific basis used to inform rule making by the Utah Water Quality Board in accordance with Title 63G, Chapter 3, Utah Administrative Rulemaking Act (e.g., water quality standards, TMDLs, technology based limits), or regulatory tools or guidance. Scientific review associated with permit issuance will be governed by the Administrative Procedures Act (Title 63G-4).

(b) The Director shall ensure that an independent scientific review will be conducted for Highly Influential Scientific Assessments (HISAs). The Director may conduct an independent scientific review on influential scientific information (ISI).

(c) The Director shall facilitate an independent scientific review of other scientific information when the following conditions are met:

i. A requesting party requests the review in writing.

ii. The requesting party agrees to provide the necessary funding for the independent scientific review.

iii. The scientific basis used to support the rule, regulatory guidance, or regulatory tool has not already been subject to an independent scientific review.

#### 10.2 Review process

(a) An independent scientific review shall be conducted by at least three independent experts appointed to a review panel by the Director.

(b) The Director shall develop clear charge questions with input from stakeholders that define the scope of the review. The questions shall focus on the degree of certainty with respect to the

interpretation or application of the scientific basis of a proposed rule, regulatory guidance, or regulatory tool.

(c) If the independent scientific review is initiated through 10.1 (c), the panel members and the charge questions shall be mutually agreed to by both the Director and the requesting party within 90 days of the request to conduct an independent review process. If panel members or charge questions cannot be agreed upon by both parties, the Water Quality Board will make the independent expert selections and finalize the charge questions.

(d) Experts shall not have a real or perceived conflict of interest nor shall they have participated in the development of the material undergoing review.

(e) The process of managing the independent scientific review may be any of the following: directly by the Director; through the United States Environmental Protection Agency's formal peer review process; an independent contractor; or through a blind review process administered by an independent organization such as a the editorial board of a relevant scientific journal, an appropriate trade organization, or a research institute.

(f) The independent scientific review process will be conducted in general accordance with the guidance contained in the United States Environmental Protection Agency's Science and Technology Policy Council Peer Review Handbook 4<sup>th</sup> Edition.

(g) To avoid inordinate delays in rulemaking or other regulatory decisions, the independent scientific review must be completed within one year following a formal request to be considered.

### 10.3 Use of independent scientific review results

(a) Each expert on the review panel will submit a written report with responses to the charge questions and an evaluation of the scientific basis of the proposed rule, regulatory guidance, or regulatory tool. If the majority of the review panel experts conclude that the Director has failed to demonstrate that the proposed rule, regulatory guidance, or regulatory tool has a sound scientific basis, the report shall state that finding and the underlying rationale for making the determination and any applicable and reasonable remedies to their concerns. If expert concerns are based on scientific uncertainty, then the report should estimate the relative extent of this uncertainty and the potential for this uncertainty to impact the charge questions or proposed rule.

(b) Recommendations from the review panel will be considered by the Director in the finalization of proposed rules, regulatory guidance, or regulatory tool, or by the Water Quality Board to inform rule making.

(d) The Director will document how the findings of the experts were applied to the proposed rule, regulatory guidance or tool.

(e) The Director shall ensure that the findings of the independent scientific review process are made available during any public comment period associated with the proposed rule or regulatory guidance or tool.

(f) Findings of the independent scientific review shall become part of the administrative record.

### Attachment 3. Comparison of POTW and DWQ Proposed Scientific Review Process

Issue	POTW Legislation	DWQ Draft Admin Rules	Comments
Administrative process	Establishes details in statute.	Uses existing statutory authority and provides details in administrative rule.	DWQ prefers that the scientific review process be specified in rule because statutory authority is already provided for this activity (63G-3-301(3) and 19-5-106(g)).
Scope (water quality initiatives)	<ul style="list-style-type: none"> <li>• Water quality standards (new, changes, and reinterpretation)</li> <li>• TMDL development</li> <li>• Technology based limits</li> <li>• Variance requests for technology based limits</li> <li>• Regulatory guidance</li> <li>• Implementation of previously approved TMDLs and standards</li> <li>• Permitting (modification)</li> <li>• Study or technical analyses</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality standards (new or changes to existing)</li> <li>• TMDL development</li> <li>• Technology based limits</li> <li>• Variance requests for technology based limits</li> <li>• Regulatory guidance and tools</li> </ul>	<p>Changes to permits should be addressed via existing administrative appeal processes.</p> <p>The scope should not be retrospective. That is, previously adopted standards, TMDLs, etc., should not be subject to additional peer review.</p>
Limits to review scope	None, provided challenging party pays costs.	Focus on “Highly Influential Scientific Assessments (HISA)” and “Influential Scientific Information (ISI)” with inclusion of other scientific information at request of external party.	Independent reviews should be required for work products that meet a significance test. A mechanism for avoiding trivial reviews is needed to ensure that agency resources are used efficiently.
Requests for review	Limited to permittees.	<p>Any stakeholder can make a request.</p> <p>Requires DWQ to conduct independent reviews for expensive or controversial initiatives.</p>	<p>There are several rationales for allowing any affected stakeholder to challenge the scientific basis of agency rules, guidance, and tools, including:</p> <ul style="list-style-type: none"> <li>• Fairness and equitable access to governing processes</li> <li>• Stakeholders, other than permittees, are impacted by agency actions including non-regulated sectors such as agriculture, recreationists, and the general public</li> </ul>
Panelist selection	3 reviewers mutually agreed upon.	Minimum of 3 reviewers mutually agreed upon.	

Applicable Content	Does not distinguish between science and policy considerations.	Limits reviews to the scientific basis of initiatives.	DWQ actions are informed by both science and policy. The agency should not delegate its responsibility for making policy decisions to largely out-of-state scientists.
Development of review charge questions	Not included.	Developed in consultation with requesting party (if applicable) and framed to address questions of uncertainty.	Framing questions are important because they: <ul style="list-style-type: none"> <li>• define the scope of reviews</li> <li>• ensure continuity among reviewers responses</li> <li>• increase the likelihood that reviews result in actionable material</li> </ul>
Resolving disagreement	1 reviewer selected by permittee 1 reviewer selected by DWQ 1 reviewer mutually agreed upon	Water Quality Board resolves disputes.	There is a need for independent arbitration by a breadth of stakeholders, which is an important role for the Board.
Results of Peer Review	Requires black and white determination of scientific defensibility.	Encourages reviews that highlight the uncertainty associated with complex scientific questions in the context of specific charge questions.	Technical experts should not be limited, particularly in statute, to responses that ignore the nature of scientific inquiry. Limiting the reviews to a limited number of responses may obscure important nuances that the reviews would otherwise ignore.
Funding	Challenging party pays cost.	DWQ pay for review of all HISA documents and some ISI at discretion of Director. If review is requested by external party, the requesting party will pay cost of review.	Proactive, independent reviews of the underlying technical basis of agency decisions should be routinely conducted if the ramifications are potentially expensive or expansive in the context of regulatory policy.
Authority	Binds agency staff to findings of peer review in making policy recommendations to the WQB including items for which the board does not have statutory authority over (e.g., permits).	Informs the rule and policy-making processes but does not dictate to them.	Agency decisions should be informed by science, but also should not ignore other important considerations (e.g., state or federal rules, economic impacts).