



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10

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OFFICE OF
WATER AND
WATERSHEDS

OCT 27 2011

Mr. Barry Burnell
Administrator
Water Quality Programs
Idaho Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706-1255

Re: Approval of Revisions to Idaho's Water Quality Standards: Site Specific Salmonid Spawning Temperature Criterion and Thermal Treatment Requirements for the Lower Boise River Subbasin, Docket 58-0102-1101T

Dear Mr. Burnell:

The U.S. Environmental Protection Agency has completed its review of portions of Idaho's revised water quality standards (WQS) contained in Docket 58-0102-1101T which was submitted to the EPA on July 27, 2011. These revisions were adopted as temporary rules into Idaho's WQS regulations at IDAPA 58.01.02.278.05, 58.01.02.278.06, 58.01.02.278.07, and 58.01.02.401.01. These revisions include:

- site specific temperature criterion for the protection of salmonid spawning for three waterbodies in the Lower Boise subbasin;
- modification of the thermal treatment requirements throughout the Lower Boise subbasin; and,
- modification of the thermal treatment requirements statewide.

At this time the EPA is not acting on the part of the temporary rule which removes the thermal treatment requirements statewide as contained in IDAPA 58.01.02.401.01. By letter dated September 2, 2011, the EPA provided comments to this revision during the public comment period for the draft proposed permanent rule. We look forward to your consideration of these comments as you move forward with a final rule.

The EPA's review of Idaho's revised WQS regulations at IDAPA 58.01.02.278.05 through 278.07 is conducted pursuant to our authority under Section 303(c) of the Clean Water Act (CWA) and implementing regulations at 40 CFR Part 131. In accordance with these authorities, and as discussed in more detail below, the EPA approves Idaho's revised WQS at IDAPA 58.01.02.278.05, 58.01.02.278.06, and 58.01.02.278.07. These standards establish site specific salmonid spawning temperature criterion for Indian Creek (SW-3a), Boise River (SW-5), and Boise River (SW-11a), and modify the statewide thermal treatment requirements for the Lower Boise River subbasin. We commend IDEQ for its efforts in developing a protective site specific salmonid spawning temperature criterion for salmonid species inhabiting these three waterbody segments in the Lower Boise Subbasin.

Background

On May 4, 2011, IDEQ noticed a preliminary draft temporary rule that proposed statewide changes to the salmonid spawning temperature criteria and thermal treatment requirements. These proposed changes to Idaho's WQS were published in the Idaho Administrative Bulletin. IDEQ requested public comment and held a public meeting concerning the temporary rule on May 25, 2011. The comment period closed May 27, 2011.

By letter dated May 27, 2011, the EPA submitted formal public comments to IDEQ. In those comments, the EPA supported the proposed 13 degrees Celsius (13° C) as a statewide maximum weekly maximum temperature (MWMT) criterion for salmonid spawning and egg incubation. However, since the EPA was concerned with the lack of clear identification of when and where the 13° C criterion would be applied, the EPA stated that it could not approve the criterion as proposed. Specifically, the EPA stated that IDEQ's current approach in Appendix F of the Water Body Assessment Guidance (WBAG) for determining when and where the salmonid spawning criterion apply was incomplete.

With respect to removal of the thermal treatment requirements set forth in IDAPA 58.01.02.401.01, the EPA expressed concern in our public comments that the removal of this requirement statewide would reduce protection for ESA-listed salmonid species. Due to the time involved in addressing these concerns, the EPA did not recommend proceeding with the proposed temporary rule on a statewide basis. Instead, since there is an immediate need to address the temperature standards in the Boise River in the context of the upcoming NPDES permits for the City of Boise, the EPA encouraged IDEQ to focus the temporary rule on the Boise River or the Boise watershed.

As a result of public comments, IDEQ modified a portion of the draft temporary rule by scaling back the salmonid spawning temperature criterion revisions from statewide to a site-specific salmonid spawning temperature criterion (13° C MWMT) for three waterbody segments in the Lower Boise River Subbasin-- Indian Creek SW- 3a, Boise River SW-5, and Boise River SW-11a. These waterbody segments and the applicable designated uses are identified in the Idaho's WQS at IDAPA 58.01.02.140.12. These revisions change the spawning criterion from 13° C or less with a maximum daily average no greater than 9 ° C to 13 ° C as a (MWMT). In addition, IDEQ specified the time periods when the 13° C MWMT is applicable in these three waterbody segments.

With respect to the thermal treatment requirements, IDEQ included a site specific provision for the Lower Boise Subbasin (278.07) that specifies that the point source treatment requirements in IDAPA 58.01.02.401.01.a and 401.01.b as well as the temperature limitation relating to natural background conditions apply to discharges to any waterbody within the Lower Boise Subbasin.

In addition to the site-specific provisions IDEQ removed the statewide thermal treatment requirements contained in 58.01.02.401.01.c. and d, which limits the rise in water temperature due to wastewater treatment plants. As noted above the EPA is not taking action on the removal of the statewide thermal treatment requirement revision.

All of these changes were adopted by the Idaho Board of Environmental Quality on June 29, 2011, and became effective under the State of Idaho administrative procedures on June 30, 2011. By letter dated July 20, 2011, IDEQ submitted these revisions to the EPA for formal review under the Clean Water Act.

EPA Review and Action

Section 303(c) (2) of the CWA requires that States and authorized Tribes submit new or revised WQS to the EPA for review. Under Section 303(c) of the CWA and its implementing regulations found at 40 CFR 131.5, the EPA must review these WQS to ensure the adopted designated water uses are consistent with the CWA, the adopted criteria protect the designated water uses and the State has followed its own procedures for adopting such standards.

The federal WQS regulations at 40 CFR 131.11(a) (1) requires States to adopt water quality criteria that protect designated uses. Criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. In addition, 40 CFR 131.11(b) states that in establishing criteria, States should set numerical values based on the EPA's 304(a) Guidance modified to reflect site-specific conditions, or other scientifically defensible methods.

The EPA has reviewed Idaho's revised numeric temperature criterion of 13°C MWMT for the protection of salmonid spawning in three waterbody segments of the Lower Boise Subbasin, (Indian Creek SW-3a, Boise River SW-5, and Boise River SW-11a), the associated timeframes that the temperature criterion apply, and the revisions to the thermal treatment requirements for the Lower Boise Subbasin. The EPA has also reviewed the justification document prepared by Don Essig, IDEQ staff, in support of these revisions.¹ This document presents an analysis of the information IDEQ reviewed as well as information obtained from the Idaho Department of Fish and Game (IDFG) in determining the salmon and trout species that are present in these waterbody segments and the appropriate timeframes for applying the spawning criterion. It also presents a justification for revising the thermal treatment requirements for the Lower Boise Subbasin. As previously stated, the EPA has not reviewed the statewide thermal treatment requirements and, instead, will review these statewide requirements when they are re-submitted to the EPA for approval.

Based on the EPA's review of the information and analysis contained in IDEQ's submittal, the recommendations contained in the EPA's Temperature Guidance, and the relevant literature, the EPA has determined that the site specific temperature criterion and associated timeframes to protect the salmonid spawning designated use in waterbody segments SW-3a, SW-5, and SW-11a of the Lower Boise Subbasin are protective of the salmonid species (brown trout, rainbow trout, and mountain whitefish) which spawn in these waters.

Therefore, the EPA is approving the revisions found in the Idaho WQS at IDAPA 58.0102.278.05 and 58.0102.278.06.

1. Site Specific Temperature Criterion (IDAPA 58.01.02.278.05 and 58.01.02.278.06)

The following are the provisions as they appear in Idaho's WQS:

278. Lower Boise River Subbasin, HUC 17050114 Subsection 140.12

¹ July 19, 2011. Don Essig. Idaho Department of Environmental Quality. Justification, Idaho Rulemaking Docket 58-0102-1101T, Site Specific Temperature Criteria for Salmonid Spawning and Application of Thermal Treatment Requirements in Lower Boise Subbasin; Statewide Revision of Thermal Treatment Requirements.

05. *Indian Creek, SW-3a – Site Specific Criteria for Water Temperature. A maximum weekly maximum temperature of thirteen degrees C (13°C) to protect brown trout and rainbow trout spawning and incubation applies from October 15 through June 30.*

06. *Boise River, SW-5 and SW-11a - Site Specific Criteria for Water Temperature. A maximum weekly maximum temperature of thirteen degrees C (13°C) to protect brown trout, mountain whitefish and rainbow trout spawning and incubation applies from November 1 through May 30.*

In order to determine the protectiveness of these revisions the EPA evaluated (a) the 13°C MWMT temperature criterion for protection of the salmonid species spawning and incubating in the Lower Boise Subbasin, (b) where the criterion applies and (c) when the criterion applies.

a. 13°C Criterion for Rainbow Trout, Brown Trout, and Mountain Whitefish

As the EPA discussed in the EPA’s Temperature Guidance, salmon populations and life histories are closely tied to water temperatures.² Salmonid spawning is initiated when water temperatures decrease to suitable temperatures. Eggs generally incubate over the winter or early spring when temperatures are coolest. As put forth in the Temperature Guidance, the EPA’s recommended numeric temperature criteria to protect for salmon and trout spawning, egg incubation, and fry emergence is 13°C as a maximum 7-day average of daily maximums (7DADM). The MWMT is the same metric as the 7DADM, which is the warmest seven-day average of the daily maximum temperatures. Therefore, Idaho’s adoption of 13°C as a MWMT for salmonid spawning in segments of the Boise River and Indian Creek is consistent with the EPA’s numeric criteria recommendation for the protection of salmonid spawning in the EPA’s Temperature Guidance.

The EPA reviewed IDEQ’s justification document along with a U.S. Geological Survey scientific report summarizing the current status of the Lower Boise River’s fish communities.³ Based on our review of this information, IDEQ has appropriately identified brown trout, rainbow trout, and mountain whitefish as the salmonid species residing in the Lower Boise Subbasin.

Rainbow trout

Although the 13°C temperature criterion recommended in the EPA’s Temperature Guidance was focused on Pacific salmon species, this criterion value is considered to be protective of other non-migratory salmonid species such as rainbow, cutthroat, and brook trout.⁴ Thus, Idaho’s 13°C MWMT temperature criterion is protective of rainbow trout spawning and egg incubation.

Brown trout and mountain whitefish

The salmonid species, mountain whitefish, and the introduced brown trout are not specifically addressed in the EPA’s Temperature Guidance. However, the EPA’s Temperature Guidance addressed cold water

² April 2003. U.S. EPA Region 10, Office of Water. *EPA Region 10 Guidance for Pacific Northwest State and Tribal Water Quality Standards*, EPA 910-B-03-002 (“Temperature Guidance”)

³ 2006. MacCoy, Doreen. U.S. Dept. of the Interior, U.S. Geological Survey. *Fish Communities and Related Environmental Conditions of the Lower Boise River, Southwestern Idaho, 1974-2004*.

⁴ USEPA 2001. *Issue Paper 5: Summary of Technical Literature examining the physiological effects of temperature on salmonids*. EPA 910-D-01-005. U.S. EPA Region 10. Seattle WA.

salmonid species and indicated that the recommendations in the Guidance are generally applicable to other coldwater salmonid species that are not explicitly addressed in the EPA's Guidance. Brown trout and mountain whitefish are coldwater salmonid species and, as discussed further below, studies of a limited nature indicate they have similar spawning and egg incubation temperature tolerances and preferences as the Pacific salmon species addressed in the EPA's Temperature Guidance.

Spawning for both brown trout and mountain whitefish begins in the mid-fall as temperatures cool and eggs incubate over the winter. Brown trout initiate spawning in the 6-12.8°C range⁵ and optimal egg incubation temperatures is in the 2-13°C range.⁶ In laboratory tests mountain whitefish prefer adult pre-spawning temperatures of 17.7°C and adult post spawning temperatures of 11.9°C.⁷ Mountain whitefish are typically observed spawning in the field when temperature are at or below 8°C and have an upper optimal incubation temperature of 6°C.^{8 9 10 11} These temperature ranges for spawning and egg incubation are consistent with those of the Pacific salmon species addressed in the EPA's Temperature Guidance.

Based on the above information, the EPA has determined that 13°C MWMT temperature criterion will provide protection for brown trout and mountain whitefish spawning and incubation.

b. Where the 13°C Criterion Applies

The 13°C spawning criterion for the Lower Boise Subbasin applies in the segment of Indian Creek identified as SW-3a and in the segments of the Boise River identified as SW-5 and SW-11a. Segment SW-3a of Indian Creek is described in Idaho's WQS regulations at IDAPA 58.01.02.140.12. This segment is located from the split between the New York Canal and the historic creek bed to Sugar Avenue (Nampa). Segments SW-5 and SW-11a of the Boise River are described in Idaho's WQS regulations at IDAPA 58.01.02.140.12. These two segments together include the part of the Lower Boise River from Diversion Dam to Indian Creek (approximately River Mile 62.6 to River Mile 19.7).

USGS discussed the occurrence and distribution of fish species in the Lower Boise River using data collected by IDFG and USGS.¹² This report identifies brown trout, rainbow trout, and mountain whitefish as occurring in the Lower Boise Subbasin below Diversion Dam. Although available data did not include spawning information, such as redd observations, it included data on fish presence and

⁵ Bell, J.M 2006. *The Assessment of Thermal Impacts on Habitat Selection, Growth, Reproduction and Mortality in Brown Trout (Salmo trutta L.):A Review of the Literature*. Rep. No. EPA Grant #WS97512701-0. Applied Ecological Services Inc. Minnesota.

⁶ Raleigh, R.F., L.D. Zuckerman, and P. C. Nelson. 1986. *Habitat suitability index models and instream flow suitability curves: brown trout, revised*. U.S. Fish Wildlife Service FWS/OBS -82/10.71 65pp.

⁷ Ihnat, J. M. and R. V. Bulkley (1984). "Influence of acclimation temperature and season on acute temperature preference of adult mountain whitefish, *Prosopium williamsoni*" *Environmental Biology of Fishes* **11**(1): 29-40.

⁸ Simpson, J. C.; Wallace, R. L. 1978. *Fishes of Idaho*. Northwest Naturalist Book. University Press of Idaho, Moscow, Idaho. 237 p

⁹ Wydoski, R. S. and R. R. Whitney (2003). *Inland fishes of Washington*. Seattle, University of Washington Press

¹⁰ Northcote, T. G., and G. L. Ennis. 1994. *Mountain whitefish biology and habitat use in relation to compensation and improvement possibilities*. Reviews in Fisheries Science 2: 347-371.

¹¹ Ford, B.S., P.S. Higgins, A.F. Lewis, K.L. Cooper, T.A. Watson, C.M. Gee, G.L. Ennis, and R.L. Sweeting. 1995. *Literature reviews of the life history, habitat requirements and mitigation/compensation strategies for thirteen sport fish species in the Peace, Liard, and Columbia river drainages of British Columbia*. Canadian Manuscript Report, Fisheries and Aquatic Sciences. 2321: xxiv + 342 p

¹² 2006. MacCoy, Dorene. U.S. Dept. of the Interior, U.S. Geological Survey. *Fish Communities and Related Environmental Conditions of the Lower Boise River, Southwestern Idaho, 1974-2004*.

abundance and habitat quality in the Lower Boise River. Based on the information regarding habitat and species density the spawning of these species is likely to be isolated to those segments IDEQ identifies as spawning.

Based on the EPA's review of available information, the EPA has determined that the application of the 13°C MWMT criterion to SW-3a, SW-5 and SW-11a of the Lower Boise Subbasin, is an appropriate area in which to provide protection for mountain whitefish, brown trout, and rainbow trout spawning incubation.

c. When the 13°C Criterion Applies

IDAPA 58.01.02.278.05 specifies that the 13°C temperature criterion applies in SW-3a of Indian Creek from October 15 through June 30, in order to protect brown trout and rainbow trout spawning and incubation. IDAPA 58.01.02.278.06 specifies that the 13°C criterion applies to SW 5 and SW-11a of the Boise River from November 1 through May 30 in order to protect brown trout, mountain whitefish, and rainbow trout spawning and incubation.

Mountain whitefish are generally nocturnal autumn spawners that spawn from October into December.¹³ The generally late spawning habit of the mountain whitefish assists in their protection. Eggs incubate throughout the winter months and hatching typically occurs in March and April. According to information presented in the USGS report, the condition of mountain whitefish throughout the Lower Boise River was good and was similar to the condition of mountain whitefish from least-disturbed rivers in southern Idaho.¹⁴ Brown trout have been introduced widely in the western United States. Brown trout are fall spawners and spawn generally from October through December.

The EPA has determined that application of the 13°C MWMT criterion starting on October 15 for Indian Creek and on November 1 for in the Lower Boise River is sufficient to provide protection of mountain whitefish and brown trout spawning. The EPA recognizes that some spawning for these non migratory and non-ESA listed fish may occur before these dates in the Lower Boise River, however, temperatures will be declining steadily due to the natural fall-winter cooling and the majority of spawning will likely occur after the specified dates.

Rainbow trout are the residualized form of migratory steelhead. Therefore, they have thermal requirements similar to steelhead and like steelhead they are spring spawners. According to the Temperature Guidance, the application of the 13°C MWMT criterion must extend late enough into the spring so that as stream temperatures warm the temperatures remain cool enough late enough into the season to be protective of incubating eggs. Therefore, since rainbow trout spawn later in the winter, the start dates of October 15 for Indian Creek and November 1 for in the Lower Boise River are sufficient to provide protective temperatures when rainbow trout spawn due to the natural fall-winter cooling.

The EPA has determined that the application of the 13°C MWMT ending June 30 for Indian Creek and May 31 for the Lower Boise River is sufficient to protect rainbow trout incubating eggs and fry

¹³ 2002. Washington Department of Ecology. Evaluating Standards for Protecting Aquatic Life in Washington's Surface Water Quality Standards, Temperature Criteria, Draft Discussion Paper and Literature Summary. Publication Number 00-10-070. December 2002

¹⁴ 2006. U.S. Dept. of the Interior, U.S. Geological Survey. *Fish Communities and Related Environmental Conditions of the Lower Boise River, Southwestern Idaho, 1974-2004* by Dorene E. MacCoy

emergence. The selection of June 30 for Indian Creek is based on information from an IDFG biologist that rainbow trout emergence extends through June. In assessing May 31 as an appropriate end date for rainbow trout spawning and incubation in the Lower Boise River, the EPA compared this to what the EPA approved in Oregon for steelhead incubation and fry emergence for the Grande Ronde River basin (May 15) and in Washington for the Middle Snake basin (June 1), which are similar lower main stem rivers. Based on this information, the EPA concludes that May 31 is appropriate and protective for rainbow trout in the Lower Boise River. Further, since mountain whitefish and brown trout emerge in April and May, the above dates are sufficiently protective for these species.

Based on the EPA's review of the information and analysis contained in IDEQ's submittal, the recommendations contained in the EPA's Temperature Guidance, and the relevant literature, the EPA has determined that the associated timeframes to protect the salmonid spawning designated use in waterbody segments SW-3a, SW-5, and SW-11a are protective of the salmonid species (brown trout, rainbow trout, and mountain whitefish) which spawn in these waters.

2. Site Specific Thermal Treatment Requirement (IDAPA 58.01.02.278.07)

The following is the regulation as it appears in Idaho's WQS:

278. Lower Boise River Subbasin, HUC 17050114 Subsection 140.12

07. Point Source Thermal Treatment Requirement . With regard to the limitations set forth in Section 401 relating to point source wastewater discharges, only the limitations of Subsection 401.01.a. and 401.01.b. and the temperature limitation relating to natural background conditions shall apply to discharges to any water body within the Lower Boise River Subbasin.

The regulations at IDAPA 58.01.02.401.01.a. and b. are as follows:

401. Point Source Wastewater Treatment Requirements.

Unless more stringent limitations are necessary to meet the applicable requirements of Section 200 through 300, or unless specific exemptions are made pursuant to Subsection 080.02, wastewaters discharged into surface waters of the state must have the following characteristics:

01. Temperature. The wastewater must not affect the receiving water outside the mixing zone so that:

a. The temperature of the receiving water or of downstream waters will interfere with designated beneficial uses.

b. Daily and seasonal temperature cycles characteristic of the water body are not maintained.

The temperature limitation related to natural background, currently in IDAPA 58.01.02.401.e. is as follows:

e. If temperature criteria for the designated aquatic life use are exceeded in the receiving waters upstream of the discharge due to natural background conditions, then Subsections 401.01.c. and 401.01.d. do not apply and instead wastewater must not raise the receiving water temperatures by more than three tenths (0.3) degrees C.

IDEQ has removed IDAPA 58.01.02.401 c. and d. from applying to the Lower Boise Subbasin. These regulations are as follows:

- c. If water is designated for warmwater aquatic life, the induced variation is more than plus two (+2) degrees C.*
- d. If the water is designated for cold water aquatic life, seasonal cold water aquatic life, or salmonid spawning, the induced variation is more than plus one (+1) degree C.*

Based on the EPA's review of the information and analysis contained in IDEQ's submittal, the provision at IDAPA 58.01.02.228.07 which limits the thermal treatment requirements for the Lower Boise Subbasin to those related to ensuring protection of the designated use (401.01.a), protecting the daily and seasonal temperature cycles (401.01.b), and natural background conditions, will protect the salmonid species in this system and thus the coldwater aquatic life and salmonid spawning designated uses in the Lower Boise Subbasin.

As noted in the EPA's Temperature Guidance and in the EPA's September 11, 2011 letter to IDEQ, the EPA recommends provisions in temperature standards to limit the amount of allowable warming for waters colder than the numeric criterion that contain Pacific salmon species listed under the ESA. However, rainbow trout, mountain whitefish, and brown trout are not listed under the ESA.

As a result, the EPA does not believe the two thermal treatment requirements that IDEQ has removed are necessary to protect cold water species residing in the Lower Boise River Subbasin. Based on the information the EPA has reviewed regarding the occurrence of cold water salmonids in the Lower Boise River Subbasin, Idaho's removal of 401.01 c and d from applying to this subbasin is reasonable. Therefore, the EPA is approving the revisions found in the Idaho WQS at IDAPA 58.0102.278.07.

In summary, the EPA has determined that the temperature criterion of 13°C MWMT applied from November 1 through May 30 in SW-5 and SW-11a of the Lower Boise River and from October 15 through June 30 in SW-3a of Indian Creek is protective of salmonid spawning in these water body segments. In addition, the retention of IDAPA 58.01.02.401.01 a., b., and the natural background provision will protect salmonid species in these segments of the Lower Boise River Subbasin. The EPA has also determined that the removal of 58.01.02.401.01.c. and d. does not alter the protection provided to brown trout, rainbow trout, and mountain whitefish by the temperature criterion. Therefore, the revised WQS at IDAPA 58.01.02.278.05, 58.01.02.278.06, 58.01.02.278.07 are protective of the coldwater aquatic life and salmonid spawning designated uses for water body segments SW-5, SW-11a, and SW-3a of the Lower Boise Subbasin.

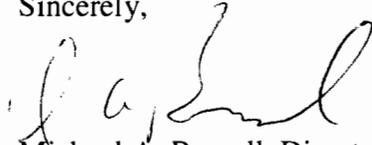
3. Statewide Thermal Treatment Requirement (IDAPA 58.01.02.401.01)

As previously stated, the EPA is not taking action on the removal of statewide thermal treatment requirements at this time. The EPA expects that IDEQ will re-submit the statewide thermal treatment requirement after it has made final the permanent rulemaking action. Again, the EPA recommends IDEQ revise the statewide thermal treatment requirements consistent with the comments provided in the EPA's September 2, 2011 letter.

The EPA understands that these site-specific temperature criteria provisions for the Lower Boise Subbasin will be submitted for review and final adoption to the Idaho Legislature in early 2012. Presuming the Legislature adopts this temporary rule as a final rule without changes; the EPA's approval will apply to the final rule. If the Legislature modifies these provisions, IDEQ will need to submit those modifications to the EPA for our review and action.

Please feel free to contact me at (206)553-4198 if you have questions concerning this letter or Lisa Macchio, Idaho WQS Coordinator, at (206) 553-1834.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Bussell", written in a cursive style.

Michael A. Bussell, Director
Office of Water and Watersheds

cc: Mr. Michael McIntyre, Surface Water Program Manager
Idaho Department of Environmental Quality

Mr. Don Essig, Water Quality Standards Manager
Idaho Department of Environmental Quality