

RESPONSE TO COMMENTS DOCUMENT

Introduction

On October 24, 2011, the U.S. Environmental Protection Agency (EPA) issued a notice of proposed reissuance of two National Pollutant Discharge Elimination System (NPDES) permits for discharges from the Lander Street Wastewater Treatment Facility (Lander Street) and the West Boise Wastewater Treatment Facility (West Boise) (collectively referred to as “Boise permits”). Both facilities are owned and operated by the City of Boise. The effluent from these facilities is discharged to the Boise River at approximately river mile 49.9 and 43.5 respectively. The public review and comment period ended on November 23, 2011. Significant comments were received from:

The City of Nampa (Nampa)
The City of Meridian (Meridian)
The City of Boise (Boise)
The Idaho Conservation League (ICL)
Idaho Rivers United (IRU)

The following summarizes the significant comments received and responds to each of them.

I. CITY OF NAMPA COMMENTS

Nampa Comment 1. The draft permit for the West Boise WWTP contains average monthly and maximum daily effluent limits for ammonia. The limits are partly based on the West Boise total ammonia concentration in the effluent being higher recently than in the past (Fact Sheet Table C-5). The higher effluent concentrations have increased the Reasonable Potential to Exceed (RPTE) water quality standards thus necessitating a permit limit. A recent study by the Water Environment Federation (WEF) and the Water Environment Research Foundation (WERF) found that “...the reliability of plants with ammonia limits less than 4 mg/L will be expected to be poor.” (Parker et al., January 2011). While the WWTPs analyzed in this study were able to achieve a high degree of nitrification on a long-term basis, there was higher variability in the nitrification performance than with other nutrient removal processes. Based on the conclusions in this study, the City recommends the EPA reevaluate the method for determining RPTE for total ammonia to account for variability in all WWTPs.

Nampa Response 1.

The EPA appreciates and understands the technical challenges and the expertise needed to run an efficient wastewater treatment plant. In general, the City of Boise does an excellent job at maintaining very low ammonia concentrations in its effluent and should be able to meet the effluent limitations in the West Boise permit. The EPA also appreciates the information provided in the WEF/WERF study. However, the RPTE analysis is a site specific analysis that determines if the ammonia concentration in the West Boise’s effluent is being discharged at concentrations toxic to the aquatic community in the receiving water near the outfall. The federal regulation governing how the reasonable potential analysis is to be performed specifically states that the variability of the pollutant in the effluent must be taken into account (See 40 CFR 122.44(d)(1)). It would not be appropriate to look at the variability of the pollutant in all facilities to determine if the West Boise’s effluent is impacting the aquatic community in

the Boise River. However, it should be noted that the variability of the West Boise effluent, which is very high, was taken into account when doing the RPTE calculations and developing effluent limitations.

The West Boise effluent limitations were triggered by the higher effluent concentrations of ammonia, however, the more relevant factors in developing the West Boise effluent limits were 1) the higher ammonia concentration upstream of the West Boise facility due to the Lander Street effluent discharge, and 2) the significantly lower river flows that exists in the South Channel of the Boise River. It is these factors that most significantly affected the development of the effluent limits in the West Boise permit.

While EPA understands the challenge operators face when required to meet limitation, the ammonia limits in the permit have been established consistent with the federal Clean Water Act to ensure that the aquatic community in the Boise River is not exposed to toxic concentrations of ammonia. The ammonia concentration in the City's effluent has been discharged at a magnitude (*i.e.*, level of pollutant usually expressed as a concentration), duration (*i.e.*, the averaging period over which the in-stream concentration is averaged for comparison with criteria concentrations), and frequency (*i.e.*, how often criteria may be exceeded without causing harm to the aquatic community) that is toxic to the aquatic community. These exceedances only occur periodically, however the recurrence rate is such that the aquatic community in the river does not have adequate time to fully recover before they are again hit with another toxic concentration of ammonia.

The intent of the effluent limits is to provide a cap on the allowable concentration of ammonia discharged to the Boise River to ensure that the aquatic community in the river is protected from the adverse impacts of high ammonia concentrations. The limits also inform the treatment plant operators of the upper bound of acceptable effluent quality so they can operate the facility accordingly.

Nampa Comment 2.

The draft Boise permits contain an instantaneous maximum limit for *E. coli* bacteria of 406 colonies/100 mL. Additionally, section I.B.5 states that "The permittee must report within 24 hours any violation of the maximum daily limits for the following pollutants: Total ammonia, Mercury, and for any violation of the instantaneous maximum limit for *E. coli*." The intent of this regulation is to protect the public from high levels of *E.coli*. However, the inclusion of a single exceedance value does nothing to mitigate the risk other than encouraging the discharger to avoid fines.

When using instantaneous maximum limits for *E. coli* in NPDES permits, other states, specifically Oregon, have included language requiring additional testing if the instantaneous maximum limit is exceeded. The additional testing typically consists of five consecutive re-samples at a defined interval. If the log mean of these re-samples is less than or equal to the monthly geometric mean limit a violation is not triggered. The City recommends adding the following language to the permit:

"If a single sample exceeds the instantaneous maximum limit for *E.coli* of 406 colonies per 100 mL, then five consecutive re-samples may be taken at four-hour intervals beginning within 28 hours after the original sample was taken. If the log mean of the five samples is less than or equal to 126 colonies per 100 mL, a violation shall not be triggered."

The City requests the same consideration be given to the maximum daily limits for total ammonia and mercury.

Nampa Response 2.

Bacteria Limitations

See response to the City of Boise's comment #3 for bacteria.

Ammonia and Mercury

The Oregon Department of Environmental Quality has primacy for the NPDES program and the EPA allows Oregon limited discretion in implementing its bacteria criterion. However, the EPA would not allow the same approach for toxic and bioaccumulative pollutants such as ammonia and mercury. The effluent limits for toxics express the upper bounds of acceptable effluent quality to ensure that neither short term (e.g., lethality) or long term (e.g., reduced reproduction) impacts occur to aquatic life. Since maximum daily limits ensure that there are no short term impacts to aquatic life, simply having additional monitoring to show that the facility is no longer exceeding its maximum daily limits is not sufficient to protect aquatic life.

Compliance Issues

The EPA disagrees that "...the inclusion of a single exceedance value does nothing to mitigate the risk other than encouraging the discharger to avoid fines." It is the EPA's experience that the majority of WWTP operators are well aware of the adverse risks to human health of high bacteria concentrations in rivers and streams and they would not put the public at risk by discharging high bacteria levels.

In general, when confronted with a high bacteria sample result the operator will determine the cause and make corrections to the facility as they deem necessary. Region 10 believes that it is appropriate to allow the treatment operator the discretion to determine how to best analyze and correct any effluent limit exceedance at the facility and to determine the appropriate sampling, if any, needed.

Additionally, having an exceedance of a bacteria effluent limit does not mean there will be an enforcement response from the EPA. The EPA uses its judgment to determine whether an enforcement response will be taken and what form the enforcement response takes. Responses can vary from an informal action such as a follow up phone call to a compliance order to criminal prosecution.

Nampa Comment 3.

The Boise draft permits contain average monthly and weekly limits for total phosphorus. The fact sheets note that the EPA has "...determined that the total phosphorus concentration of 70 µg/L from the Snake River Hell's Canyon TMDL is the appropriate value to interpret Idaho's narrative criterion for nutrients for the purposes of determining reasonable potential and, if necessary, for calculating effluent limits for total phosphorus." The Snake River Hells Canyon TMDL stated that "...beneficial uses in the Snake River could be attained if the concentration of phosphorus at the mouth of the Boise River was less than or equal to 70µg/L." (Fact Sheet, Page C-23). The City requests that it be noted that the intent of the Snake River Hells Canyon TMDL is to achieve a total phosphorus concentration of 70 µg/L at the mouth of the Boise River and that each WWTP should be evaluated based on its contribution to achieving this goal.

Nampa Response 3.

As explained in the fact sheets, to determine the appropriate total phosphorus criterion for the Boise River for purposes of the RTPPE and calculating an effluent limit, the EPA reviewed the recommendations provided in the EPA's *Quality Criteria for Water 1986* (EPA 440/5-86-001, hereafter referred to as the Gold Book), the EPA's *Ambient Water Quality Criteria Recommendations: Rivers and Streams in Nutrient Ecoregion III* (EPA 822-B-00-016), EPA's *Nutrient Criteria Technical Guidance Manual, Rivers and Streams* (EPA-822-B-00-002, July 2000) and the Idaho Department of Environmental Quality's (IDEQ's) *Snake River Hells Canyon TMDL*. Each of these four documents suggests a different ambient total phosphorus concentration that would be sufficiently stringent to control cultural eutrophication (*i.e.*, human-caused inputs of excess nutrients in waterbodies) and other adverse nutrient-related impacts in the Boise River downstream of the City of Boise's outfalls. For the reasons set forth in more detail in the fact sheets, the EPA believes 70 µg/L of phosphorus will be protective of the Boise River, the tributaries to the Boise River and the Snake River (See West Boise Fact Sheet, Appendix C, page C-23 for rationale of why 70 µg/L of phosphorus is protective of water quality standards, see also Lander Street Fact Sheet, Appendix C, page C- 20). See also IRU Response 7.

II. CITY OF MERIDIAN COMMENTS

Meridian Comment 1.

Meridian states that it is their understanding that the Boise permits may be used as templates for subsequent NPDES permits issued to other dischargers in the Lower Boise River watershed. The City states that this may not be appropriate.

Meridian Response 1.

It may not be appropriate to use the Boise permits as a template in all cases. Any conditions included in other NPDES permits to dischargers in the Lower Boise River watershed will be fully explained in the Fact Sheet for that permit and will be based on a site specific review of the facility discharge and the location of the discharge.

Meridian Comment 2.

Meridian supports the following conditions in the permit:

- The use of compliance schedules and interim limits for implementation of each city's wastewater facility plan.
- The use of seasonal average mass based effluent limits.
- The application of revised State Water Quality Standards for Temperature.
- The EPA approval of pollutant offsets and trading associated policy regulations adopted by the State of Idaho.

Meridian Response 2.

The EPA acknowledges the comment but would like to clarify that the permit contains average monthly and average weekly limits (concentration and mass) for total phosphorus. These limits are applicable from May through September, they are not seasonal average mass based effluent limits. Additionally,

the permits do not authorize offsets or trading projects. As discussed in the fact sheets for the permits if an offset is a viable project the permits would be re-opened and modified to include specific offset trading language. If this occurs the public will be given the opportunity to comment on the proposed offset trading language.

Meridian Comment 3.

The City of Meridian does not support the 70 µg/L phosphorus limit at this time. The Lower Boise River Watershed Council and the IDEQ agreed this past spring to develop a TMDL for phosphorus on the Lower Boise River. It seems prudent to allow this activity, which is intended to identify wasteload allocations for dischargers on the Boise River, to transpire prior to the prescription of ultra-low phosphorus limits being placed on dischargers via NPDES permits. As you may know, it can take many years to plan, design, and construct technological improvements intended to achieve ultra-low phosphorus concentrations and at considerable costs. The EPA's action to require municipalities to begin to meet the ultra-low phosphorus concentrations in advance of a nutrient TMDL for phosphorus on the Lower Boise River seems premature.

Meridian Response 3.

The EPA supports development of a TMDL for phosphorus on the Lower Boise River. In May of 2007, after deferring reissuance of the Boise permits to allow for the completion of a TMDL, EPA sent a letter to IDEQ to let them know that due to concerns about the direction and schedule of the Lower Boise TMDL, the EPA was moving forward with re-issuance of permits on the Lower Boise River prior to completion of a TMDL.

If a TMDL for phosphorus is developed by the IDEQ and approved by the EPA, the permits may be re-opened and modified to incorporate any new requirements in the TMDL (see 40 CFR 122.62).

The EPA appreciates the time and costs involved with achieving the phosphorus effluent limits at a wastewater treatment facility which is why the permits do not require the final effluent limits to be met until 10 years after the permit is issued. See also Nampa Response 3 for a discussion of how the 70 µg/L limit was established.

Meridian Comment 4.

Meridian supports EPA's approval of IDEQ's revisions to its water quality standards regarding water temperature. Additional review of the revised water temperatures to the Boise River system operation regarding natural background conditions is recommended. Meridian recommends that the EPA include the temperature limits associated with the new temperature criteria in the final permit and review revised water temperatures.

Meridian Response 4.

The EPA approved the revisions to the State's salmonid spawning temperature criteria on October 27, 2011, therefore, the temperature limits associated with the revised salmonid spawning temperature criteria are in the final permit. See Boise Response 7 for a discussion of the State's Natural Background Conditions as Criteria (IDAPA 58.01.02.200.09)

Meridian Comment 5.

The effluent limits are over-specific with the inclusion of both mass and concentration based limits for a weekly and monthly basis for all parameters.

Meridian Response 5.

The NPDES regulation at 40 CFR 122.45(f) requires pollutants to be limited in terms of mass. Additionally, the regulation also allows pollutants limited in terms of mass to also be limited in terms of other units of measurement such as concentration. The EPA has used this regulation to limit pollutants in terms of concentration and mass. The commenter did not provide information as to why they believe the limits are over specified therefore the comment cannot be evaluated further.

Meridian Comment 6.

Nutrients do not contribute acute toxicity and the methodology used to calculate permit limits for toxic compounds should not be applied to nutrients.

Meridian Response 6.

EPA agrees that acute toxicity is not a concern for nutrients and did not calculate the total phosphorus limits based on the *Technical Support Document for Water Quality Based Toxics Control* (EPA, 1991, hereafter referred to as the TSD, chapter 5, page 100). If EPA used the TSD, the average monthly limit would be 65 µg/L and a maximum daily limit would be 86 µg/L (Note: these limits are based on the procedures presented in chapter 5, page 100 of the TSD, and an effluent CV value of 0.2 was used). In this case, however, the total phosphorus limit was established using the wasteload allocation (*i.e.*, 70 µg/L) in the Snake River-Hells Canyon TMDL. The wasteload allocation was used as the average monthly limit.

Meridian Comment 7.

Algal growth in streams, especially nuisance algal growth, requires sustained concentrations of nutrients in amounts above growth limitations (among other factors such as light and temperature) for sustained periods of time, such as a season, to impair water quality. While the effluent limitations in Table 2 may be acceptable for the City of Boise, these effluent limitations would provide a disincentive for a permittee to develop a recycled water program and Meridian will request mass based seasonal effluent limitations in its NPDES permit. Alternative effluent limitations have been used by the EPA in recently released NPDES permits for other dischargers which have included mass limits for total phosphorus from May 1 through September 30.

Meridian Response 7.

The comment is noted. At the time EPA begins working on Meridian's permit, Meridian may submit any information it feels will assist EPA in permit development.

Meridian Comment 8.

Meridian is concerned about the frequency, duration, low detection limits (particularly for ammonia and mercury), and number of constituents to be monitored due to cost, burden on staff, and actual benefit to the environment. Meridian supports alternative monitoring requirements that are protective of the environment, but reduce the extent of monitoring. The proposed monitoring requirements represent a substantial increase in overall monitoring. These costs represent a significant per year increase. Specifically, after four consistent quarters or samples of non-detection, the sampling could be reduced to once per year. Examples of specific comments with potential suggestions include:

- a. Cyanide does not have a reasonable potential to exceed the water quality criteria and the monitoring frequency could be reduced. Reduce monitoring to 2 times per year or annually.
- b. Monitoring data for influent, effluent and surface water monitoring could potentially show no statistical difference for testing on a weekly, bi-weekly (every two weeks), or monthly basis. Inclusion of permit conditions which account for statistical significance of monitoring data would provide flexibility, and a potential reduction in testing frequency, yet instill confidence that permit compliance was sustained. This could help Boise avoid unnecessary monitoring costs which would otherwise have no statistical value. Meridian requests the following changes to Boise's permits:
 - Biweekly monitoring: After one year of weekly monitoring, the permittee may monitor the parameters listed above on a bi-weekly frequency during the second year of monitoring if, using a Student's t-test for equality of means, no statistically significant difference (at a 90 percent confidence interval) can be demonstrated between the arithmetic average of the weekly data during the first year and the arithmetic average of a bi-weekly subset (representing all twelve months) of the data collected during the first year, or
 - Monthly monitoring: After one year of weekly monitoring, the permittee may monitor the parameters listed above on a monthly frequency during the second year of monitoring, if using a Student's t-test for equality of means, no statistically significant difference can be demonstrated between the arithmetic average of the weekly data during the first year and the arithmetic average of a monthly subset (representing all twelve months) of the data collected during the first year.

Meridian Response 8.

The EPA appreciates Meridian's comments and has tried to balance the need for adequate information gathering with the cost of gathering that information. The City of Boise is the largest municipal discharger in the State of Idaho and has numerous industrial and commercial discharges to its wastewater treatment facilities. Monitoring frequencies are based on the nature and effect of the pollutant(s), as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. The monitoring in the proposed permits is, in fact, less rigorous than the monitoring requirements in Boise's current permits. EPA reviewed Boise's data in detail and, where it was appropriate, eliminated or reduced monitoring frequencies. The Fact Sheets for each of the permits provides additional explanation of why monitoring frequencies were reduced or in some cases eliminated.

The EPA has tried the statistical methodology suggested by Meridian in other NPDES permits. This type of monitoring regime did not adequately characterize the effluent. Additionally, wastewater treatment

plants change over time and any addition of a commercial or industrial effluent to a municipality's treatment plant can have an effect on the effluent discharge quality and this needs to be characterized adequately.

As to the detection limits, the ammonia detection limit has been commonly used for decades. The mercury detection limit is fairly new and it is necessary because the aquatic life mercury criteria are low and a low detection level is necessary to determine if mercury is impacting the aquatic life community in the receiving water.

Meridian Comment 9.

Meridian is concerned about changes and specificity in Section VI. Definitions. Meridian assumes that the EPA has a preference to have common definitions in NPDES permits for surrounding communities. Meridian is also concerned that some of the draft definitions would result in undue treatment facility operational changes. Examples include:

- The definition of "Grab" to allow for samples such as temperature and dissolved oxygen to be taken in stream versus collecting a "sample" and bringing it to the lab under the required time limits.
- The definition of "24-hour Composite" presents challenges for the plant staff since sampling 24-hour period leaves no margin for maintenance or repair of sampling equipment.

The City requests the text be revised to the following:

- "A grab sample is an individual sample or measurement collected over a period not exceeding 15 minutes. A grab sample, for monitoring requirements, is a single "dip and take" sample or measurement taken at a specific time or over as short a period of time at a representative point anywhere in wastewater treatment or biosolids land application processes, as feasible."
- A "grab composite" sample shall mean a mixture of not less than 6 discrete aliquots collected over an 18 hour period. Each aliquot shall be a grab sample of not less than 100 mL and shall be collected and stored in accordance with procedures prescribed in the most recent edition of *Standard Methods for the Examination of Water and Wastewater*.

Meridian Response 9.

The monitoring conditions in the permit are specific to the City of Boise permits. Meridian will have the opportunity to comment on sample collection methods applicable to the Meridian wastewater treatment plant when the draft permit for the Meridian facility goes to public notice. See also the Boise Response 15.

III. COMMENTS FROM THE CITY OF BOISE

Boise Comment 1.

The draft permits allow Boise to discharge excess solids to the South Boise Interceptor (SBI) during the period when the wastewater flow from the West Boise facility will be diverted to the Lander Street facility to accommodate construction and installation of treatment improvements at the West Boise facility.

Boise requests the following changes be incorporated into the permits:

1. Change the volume of solids allowed to be discharged from 40,000 gpd to 90,000 gpd. The addition of metal salts coagulants for phosphorus removal will increase solids volumes. The draft permit relied on early calculations provided by Boise which were in error. Primary Sludge at the Lander Street facility is pumped from the primary clarifiers directly to the anaerobic digesters. The two anaerobic digesters provide a total volume of 1,980,000 gallons. To maintain the 15 day time and temperature requirements for anaerobic digestion, a maximum of 132,000 gpd of sludge can be pumped to the digester. Boise predicts that approximately 220,000 gpd will be produced when using coagulants for phosphorus removal. Information on volume calculations is enclosed.
2. Expand the timeframe in which solids may be discharged in the SBI from May 1, 2013 through September 30 each year to March 1 (starting in 2013) through Nov 30 each year until November 30, 2017. The purpose of the change is to accommodate bringing the chemical phosphorus treatment process online. Chemical phosphorus treatment increases the biochemical oxygen demand (BOD) removal through the primary clarifiers, so organic loading to the aeration basins will be significantly reduced (e.g., one or two of the five normally operating basins will be taken out of service during the phosphorus removal season) to maintain the biological treatment process (e.g., appropriate food to microorganism ratio). Boise anticipates a 60 day schedule to gradually introduce the chemical phosphorus treatment process in approximately 10 mg/L increments to reach the design coagulant dose of 40 mg/L. One to two weeks operation is reasonable and planned at each gradual dose to avoid process upsets. At the end of the phosphorus removal season, the organic loading in the primary effluent increases, and time must be permitted to allow the biomass to grow and stabilize.

During the ramp up and ramp down periods, the amount of sludge production will not be as high as estimated at the design capacity of 15 mgd, so solids transfer will range from zero to 90,000 gpd over the period. Boise has no operating experience with the transition between normal biological treatment and chemical phosphorus treatment, so Boise requests the timeframe for transfer of solids be extended from March through November.

3. Move the start date for the transfer of Lander Street solids to the West Boise facility via the SBI to 2012 from 2013. Boise intends to pilot test the chemical phosphorus treatment during the summer period in 2012, the year prior to the phosphorus treatment requirement effective period. Boise anticipates partial and full scale pilot testing to ensure the chemical phosphorus treatment and procedures are well established and known prior to the interim compliance deadline for phosphorus.

4. Extend the final date of allowance for this activity to November 30, 2017 to coincide with the duration of the permit and to allow for unforeseen conditions that may necessitate this practice.

Boise Response 1.

Boise has provided the necessary information to support increasing the amount of solids from 40,000 gpd to 88,000 gpd (*i.e.*, additional sludge produced as a result of chemical addition for phosphorus removal is equal to 220,000 gpd – 132,000 gpd = 88,000 gpd). Therefore the final permit has been revised to allow up to 88,000 gpd of solids to be sent to the West Boise facility via the SBI. Since this process is new to Boise it is reasonable to allow Boise to pilot test the system in 2012. Additionally, it is important to ensure that the waste water treatment process does not experience any upsets which could diminish the efficacy of the treatment system, so the compliance schedule will be revised to allow the facility to ramp up and ramp down the chemical addition process. The final permit also includes language requiring Boise to inform the EPA and the IDEQ when pilot testing begins and ends in 2012. Further, solids may only be transferred to the West Boise facility headworks when the capacity of the anaerobic digesters at the Lander Street facility has been reached. Boise must provide the EPA and the IDEQ written notice when this occurs.

The final permit retains the end date of 2016 to transfer solids from the Lander Street facility to the West Boise facility. The terms of the compliance schedule are generous as written and unforeseen conditions that might occur at some future date can be dealt with at that time through a permit modification.

Additionally, since Boise has identified in their comment letter that they will be using ferric chloride in their chemical precipitation process at the Lander Street facility, the final permit includes weekly monitoring for iron at both the Lander Street facility and the West Boise facility. The monitoring is being included at the West Boise facility because Boise anticipates putting some of the solids from the Lander Street facility through the headworks for the West Boise facility so there is the chance that iron will be liberated and discharged in the West Boise effluent. Upstream monitoring will be required monthly.

Boise Comment 2.

The draft permit established an average weekly limit for total phosphorus. The methodology used to establish that limit appears to be based on a coefficient of variability based on the last ten years of effluent data. In the last ten years, Boise operated without a phosphorus limit and therefore without phosphorus removal technology.

Under the new permit, Boise anticipates that effluent variability will be greater upon implementation of enhanced biological phosphorus removal (EBPR). Boise requests that the weekly limit for phosphorus be calculated using a multiplier consistent with biological phosphorus removal and therefore an average weekly limit of 140 µg/L.

Boise Response 2.

The permit contains a final monthly limit of 70 µg/L and weekly limit of 84 µg/L for total phosphorus. A coefficient of variation of 0.15 was calculated to represent the variability of the effluent data (see Appendix D) and the coefficient was used to calculate the weekly limit. Boise requested, and received, a 10 year compliance schedule to meet the final effluent limits. Boise has stated, and the EPA agrees, that

using EBPR alone is not sufficient to meet the final effluent limits. Additional treatment requirements will be needed. It would not be appropriate to use an intermediate effluent quality (resulting from an intermediate treatment process step), as suggested by Boise, to characterize the final effluent that will result when the entire treatment train is in place. Additionally, the average monthly limit is low and it will require the treatment system to be run very precisely which means the effluent variability will be low. As a result, the coefficient of variation will be low. Therefore, the final permit has not been revised.

Boise Comment 3.

The draft permit contains an instantaneous maximum limit for *E.coli* of 406 cfu/100 ml. Boise requests that the monthly geometric mean be used because it is the only regulatory limit consistent with IDEQ's single sample maximum implementation approach for NPDES permitting.

Boise Response 3.

When developing water quality-based effluent limits the permitting authority must ensure that the limits are protective of water quality standards and are consistent with the assumptions and requirements of an approved TMDL¹.

The State developed the wasteload allocations for bacteria in the *Lower Boise River TMDL, Subbasin Assessment, Total Maximum Daily Load* and the EPA approved the TMDL on January 25, 2000. Furthermore, the *Lower Boise River TMDL, Five Year Review* (Idaho Department of Environmental Quality, 2009) found that the Lower Boise River *still* exceeds the water quality criteria for bacteria. The TMDL required monthly, weekly and daily limits for bacteria.

Since the time that the TMDL was established the State has revised its indicator organism for bacteria from fecal coliform to *E.coli*. The Idaho water quality standards state that waters of the State of Idaho that are designated for recreation are not to contain *E. coli* bacteria in concentrations exceeding 126 organisms per 100 ml based on a minimum of five samples taken every three to seven days over a thirty day period. Therefore, the draft permit contains a monthly geometric mean effluent limit for *E. coli* of 126 organisms per 100 ml (IDAPA 58.01.02.251.01.a.).

The Idaho water quality standards also state that a water sample that exceeds certain "single sample maximum" values indicates a likely exceedance of the geometric mean criterion, although it is not, in and of itself, a violation of water quality standards. For waters designated for primary contact recreation, the "single sample maximum" value is 406 organisms per 100 ml (IDAPA 58.01.02.251.01.b.ii.).

The goal of a water quality-based effluent limit is to ensure a low probability that water quality standards will be exceeded *in* the receiving water as a result of a discharge, while considering the

¹ The federal regulation at 40 CFR 122.44(d)(vii) states: When developing water quality-based effluent limits under this paragraph the permitting authority shall ensure that: (A) The level of water quality to be achieved by limits on point sources established under this paragraph is derived from and complies with all applicable water quality standards and (B) Effluent limits developed to protect a...numeric water quality criterion...are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by the EPA pursuant to 40 CFR 130.7.

variability of the pollutant in the effluent. Because a single sample value exceeding 406 organisms per 100 ml indicates a likely exceedance of the geometric mean criterion, the EPA has imposed an instantaneous (single grab sample) maximum effluent limit for *E. coli* of 406 organisms per 100 ml, in addition to a monthly geometric mean limit of 126 organisms per 100 ml, which directly implements the water quality criterion for *E. coli*. This will ensure that the discharge will have a low probability of exceeding water quality standards for *E. coli*.

Since Idaho's revised bacteria criteria does not address weekly values, weekly effluent limits were not included in the permit. The EPA believes that monthly and daily limits in the permits are consistent with the requirements of the EPA approved TMDL. Given that the Lower Boise River is still impaired for bacteria the EPA believes it is important to ensure that City's effluent does not further cause or contribute to the impairment.

Boise Comment 4.

The Lander Street facility and West Boise facility fact sheets and permits propose the need for mercury limits and monitoring based on one set of criteria. In its 401 certification, IDEQ identifies alternative criteria protective of state water quality standards that does not require a permit limitation for mercury. Boise requests that EPA and IDEQ reach concurrence on the appropriate criterion to use for NPDES permitting purposes.

Boise Response 4.

The EPA and the IDEQ have had discussions regarding the mercury criteria and its implementation. Although, the EPA has told the IDEQ that it is willing to assist the IDEQ with developing an alternate aquatic life water quality criteria for mercury, the only approved water quality standard is the one that the EPA used in developing this permit. Pursuant to the CWA and its implementing regulations, EPA is required to use the EPA-approved water quality standard.

A brief summary of the applicable mercury criteria, the EPA's regulatory requirements, and the State's draft 401 certification requirements are provided below.

Background Information

In 2004 the State published a proposed rule to update several numeric criteria for toxic pollutants. As part of the rulemaking, the State proposed removing the acute (0.2 µg/L) and chronic (0.012 µg/L) aquatic life criteria for mercury and proposed adding a footnote "g" to the toxic criteria table in its water quality standards which states, in part, that the narrative criteria for toxics apply and that the human health criterion for methylmercury will be protective of aquatic life in most situations. The State subsequently adopted the rule and made it effective for state purposes in August 2005. The State submitted the revised rule to EPA in 2005. EPA reviewed the revision removing the acute and chronic numeric water quality criteria for mercury, and footnote "g" as well as Idaho's supporting justification. In December 2008 the EPA disapproved the removal of the acute and chronic mercury criteria, as well as footnote "g" because it found that the human health criterion would not protect aquatic life.

The effect of the EPA's disapproval action is that for any Clean Water Act action (e.g., issuance of an NPDES permit) the numeric aquatic life mercury criteria (i.e., acute criterion of 0.20 µg/L and chronic criterion of 0.012 µg/L) are the applicable criteria for the State of Idaho.

Federal Regulations Implementing the NPDES Program

Effluent limitations in NPDES permits must be derived from and comply with the State's currently effective criteria under the Clean Water Act (see 40 CFR 122.4, and 40 CFR 122.44(d)). The effective criteria for the protection of aquatic life for mercury are a chronic criterion of 0.012 µg/L and an acute criterion of 2.1 µg/L. In addition to the aquatic life criteria, the State also has adopted, and EPA has approved, a human health criterion (*i.e.*, the criterion specifically adopted to protect human health against adverse impacts). This criterion is expressed as a fish tissue concentration. The effluent limitation in the NPDES permits are based on the numeric aquatic life criteria.

The NPDES program is an implementation program, it is beyond the authority of the NPDES program to revise or substitute the state adopted and federally approved aquatic life criteria for mercury. It may be possible that an alternative aquatic life criterion for mercury may be protective of aquatic life, however, in order for the NPDES program to use an alternative concentration in its analysis the State must adopt the criterion into its water quality standards and EPA must approve that criterion before it can be used in an NPDES permit.

Draft 401 Certification

The draft 401 certification stated that the mercury limits and monitoring can be removed because:

“...Based on concurrent fish tissue and water column sampling of mercury from major rivers in Idaho (Essig 2009), fish tissue methylmercury levels at Idaho's criterion is associated with a water column Hg level much less than 12 ng/L (0.012 µg/L). Specifically, regressing water total Hg on fish tissue with the 55 paired data from Essig's report, and using upper 99th percent confidence limits on both slope and intercept from that regression, shows a fish tissue methylmercury level of 0.3 mg/Kg corresponds to a water column total mercury level of 2.6 ng/L (0.0026 µg/L). In other words, there is only a 1 % probability of water total mercury being > 2.6 ng/L (0.0026 µg/L) when methylmercury levels in fish tissue from that water meets Idaho's tissue criterion. This correlated level of water column total mercury of 2.6 ng/L (0.0026 µg/L) is almost 100 times lower (more stringent) than the lowest estimated chronic toxicity value of 250 ng/L (0.250 µg/L) in EPA's 1995 aquatic life criteria updates. It is more than four times lower than the outdated chronic aquatic life criterion of 12 ng/L (0.012 µg/L) based on back calculation from the FDA action level for mercury in fish of 1.0 mg/Kg. This gives Idaho very high confidence in saying that its human health fish tissue criterion is the more stringent criterion, that human health is a more sensitive use than aquatic life for mercury, and that meeting Idaho's fish tissue criterion will be protective of aquatic life uses.”

First, the State provided a similar rationale when it deleted its aquatic life criteria from its water quality standards, and as discussed above, the EPA disapproved Idaho's removal of its aquatic life criteria.

Second, Boise submitted limited fish tissue data for the Boise River which shows that fish tissue levels are all below 0.3 mg/kg. However, the receiving water data above the Lander Street facility shows the river exceeded 2.6 ng/L (0.0026 µg/L) 16% of the time (based on currently available data from January 2005 – July 2009). A review of the data below the Lander Street facility shows the river exceeded 2.6 ng/L (0.0026 µg/L) 25% of the time. Based on this information the State's premise (*i.e.*, if the methylmercury fish tissue criterion is met there is only a 1% probability that the water column concentration will be greater than 2.6 ng/L (0.0026µg/L)) does not hold true.

Finally, the State can use its 401 certification to make a condition of the permit less stringent so long as it does not violate the requirements of State law, including water quality standards (40 CFR

124.53(e)(3)). As discussed above, the aquatic life criteria are the applicable water quality standards, not the proposed alternative criteria the State included in its 401 certification. Therefore, the State cannot make the mercury limitations less stringent.

Boise Comment 5.

Boise has become aware of additional mercury fish tissue data for the Lower Boise River above and below the Boise wastewater treatment facilities collected by other agencies and those data are included in Attachment 3. Boise requests that they be included in the fact sheets and used in the evaluation of the need for mercury limitations in the Lander Street facility and West Boise facility permits.

Boise Response 5.

The fish tissue mercury data has been included in the Administrative Record for this permit issuance.

The mercury limitations in the permit are based on the aquatic life criteria currently effective for Clean Water Act purposes, not the human health criterion that are based on fish tissue concentration. In order to review the fish tissue data to see if it is more or less stringent than the aquatic life criterion a site specific bioaccumulation (BAF) factor would need to be developed for the Boise River to translate the fish tissue concentration to a water column concentration. This data does not exist so there is no mechanism available for the translation. Therefore the limits based on the aquatic life criteria are retained in the final permit (see also Response to Comment 4 above).

Boise Comment 6.

The draft permit requires Boise to meet a Minimum Level (ML) of 0.0005 µg/L for mercury. Boise has collected mercury data from influent, effluent and the Boise River since 2007. The effluent samples analyzed by Boise shows that only one effluent sample was below 0.001 µg/L. Receiving water sampling shows a higher non-detect rate using 0.001 µg/L at the two river locations where samples are collected.

Boise requests that the permits contain a 0.001 µg/L for influent and effluent sampling until such time as a lower ML is warranted and that the 0.0005 µg/L ML for receiving water sampling be effective within 8 months of permit issuance. The 8 month timeframe is needed to acquire new laboratory testing equipment and to implement new testing and quality assurance procedures.

Boise Response 6.

The final permit has been revised to allow an ML of 0.001 µg/L for weekly effluent samples (until such time as a more sensitive method is needed). Influent and effluent monitoring for pretreatment sampling will require the more sensitive method. The receiving water ML for mercury has been retained. The final permit allows an additional 6 months prior to starting the more sensitive monitoring for mercury (i.e., using the ML of 0.0005 µg/L).

Boise Comment 7.

The Lander Street facility fact sheet identifies that the July 16 – September 30 river temperature at Veteran’s Bridge is 20° C based on historic monitoring data. This temperature represents an upstream

segment of the river that has no wastewater inputs and natural vegetation at its maximum potential. The receiving water river temperature of 20° C upstream of the Lander Street facility does not meet the proposed numeric standard of 19° C during this time frame.

The Idaho Water Quality Standards include a natural background provision that is potentially applicable to the development of limitations for Boise’s wastewater treatment facilities. The background provision of state water quality standards should be considered and incorporated into the assessment and calculation of temperature limitations during the July 16 to September 30 timeframe.

Boise Response 7.

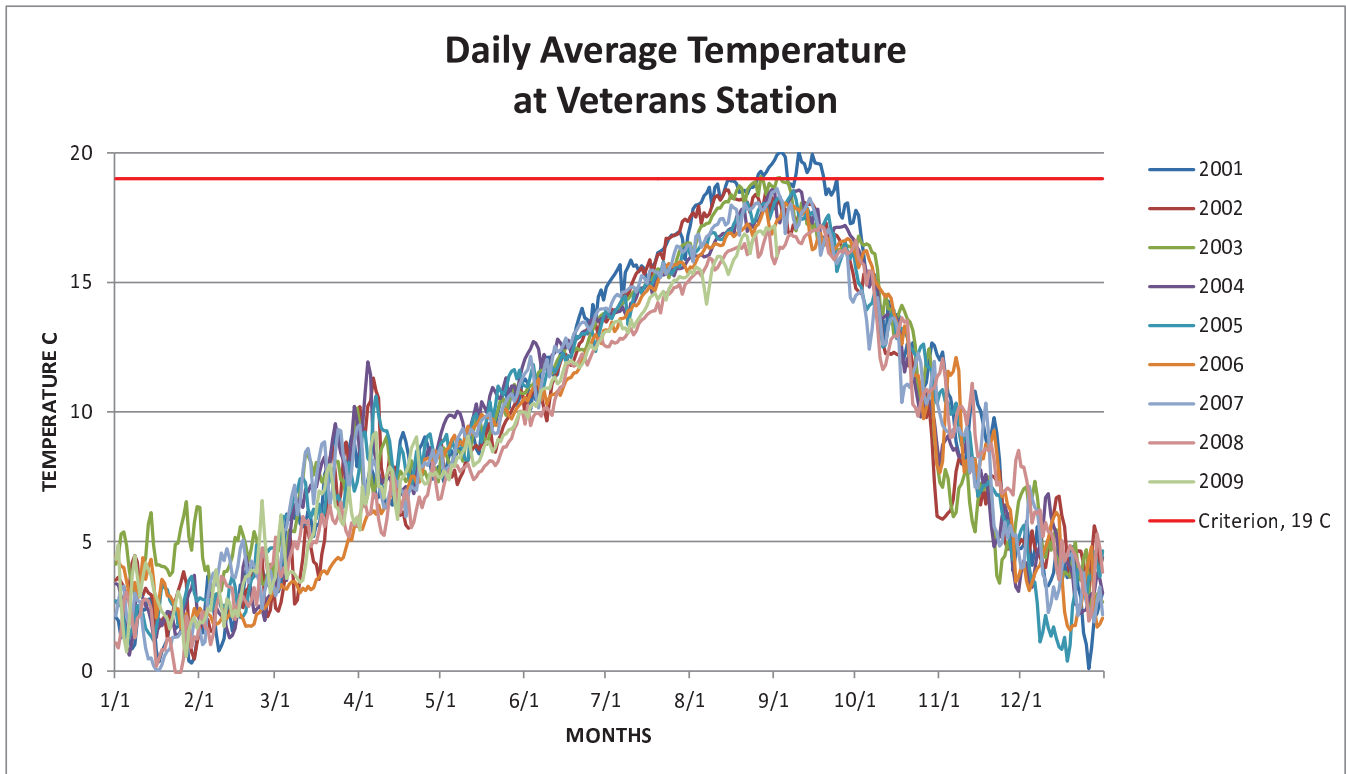
The Lander Street facility fact sheet identified the temperature of the Boise River at Veteran’s Bridge for the period of July 16 through September 30 as follows:

Table 2: Boise River Temperature Data, July 16 – September 30

	Range	50th percentile	75th percentile	95th percentile	Number of Samples
Daily Maximum Temperature	14.8 – 22.0 °C	18.8 °C	19.7 °C	21.0 °C	666
Daily Average Temperature	13.8 – 20.0 °C	16.9 °C	17.8 °C	18.8 °C	666

The above temperatures were used in the Reasonable Potential Calculation. The EPA uses the procedure outlined in the TSD when doing Reasonable Potential Calculations to determine if water quality-based effluent limits are needed for an effluent. The TSD recommends using critical conditions which means using the highest background condition. Region 10 represents the highest background concentration by using the 95th percentile of the background data set.

The graph below plots the temperatures collected at the Veterans Monitoring Station (from 2001 through 2009). As can be seen from the graph, while the temperatures during this time period are near the State adopted criterion of 19°C (so a mixing zone is not appropriate) the temperature generally is less than the criterion. Therefore, the State’s Natural Background Conditions as Criteria provision (IDAPA 58.01.02.200.09) is not applicable.



Boise Comment 8.

The Lander Street facility draft permit contains a November through April temperature limitation of 15.8° C. The Fact Sheet contains a calculation for the Lander Street facility RPTE for December – February that identifies the average daily temperature as 12.3°C. The EPA has approved the salmonid spawning temperature criterion of 13°C, the Fact Sheet calculations should now show that no reasonable potential to exceed the criteria exists at Lander during the December to February timeframe. We anticipate a similar analysis of the West Boise permit could result in similar conclusions.

Boise Response 8.

Appendix C of the fact sheets for the Lander Street facility and the West Boise facility provided a summary of the reasonable potential analysis for the IDEQ’s revised salmonid spawning temperature criterion of 13°C. These analyses show that there is reasonable potential for the Lander Street facility effluent and the West Boise facility effluent to exceed the salmonid spawning temperature criterion of 13°C and, as a result, effluent limitations are needed. The assumptions and full analysis are presented in Appendix A of this Response to Comments document.

Boise Comment 9.

Boise requests that winter temperature limits be evaluated on monthly time periods to determine if limits are needed.

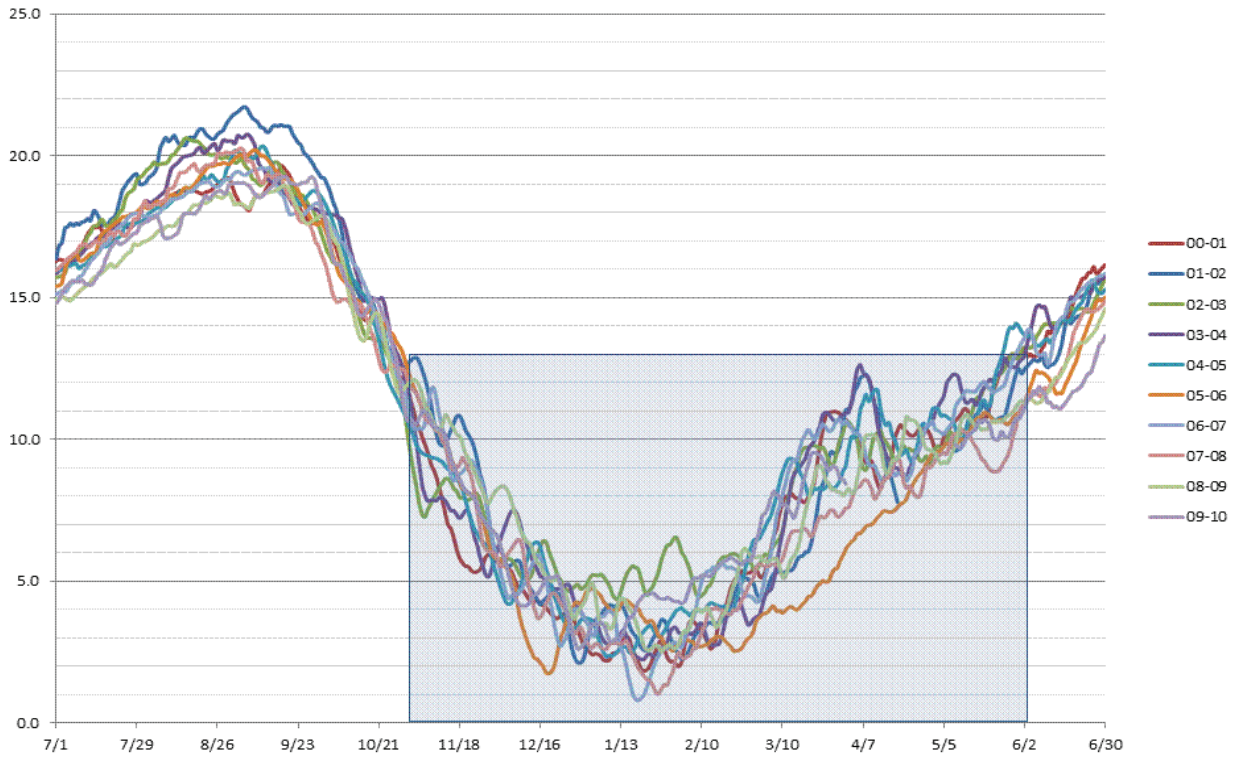
Boise Response 9.

As discussed in Appendix A of this document, and the Fact Sheets for the draft permits, when summarizing the temperature data, the EPA took into account information in the State's July 20, 2011 submittal package for the salmonid spawning criteria, in which it was stated:

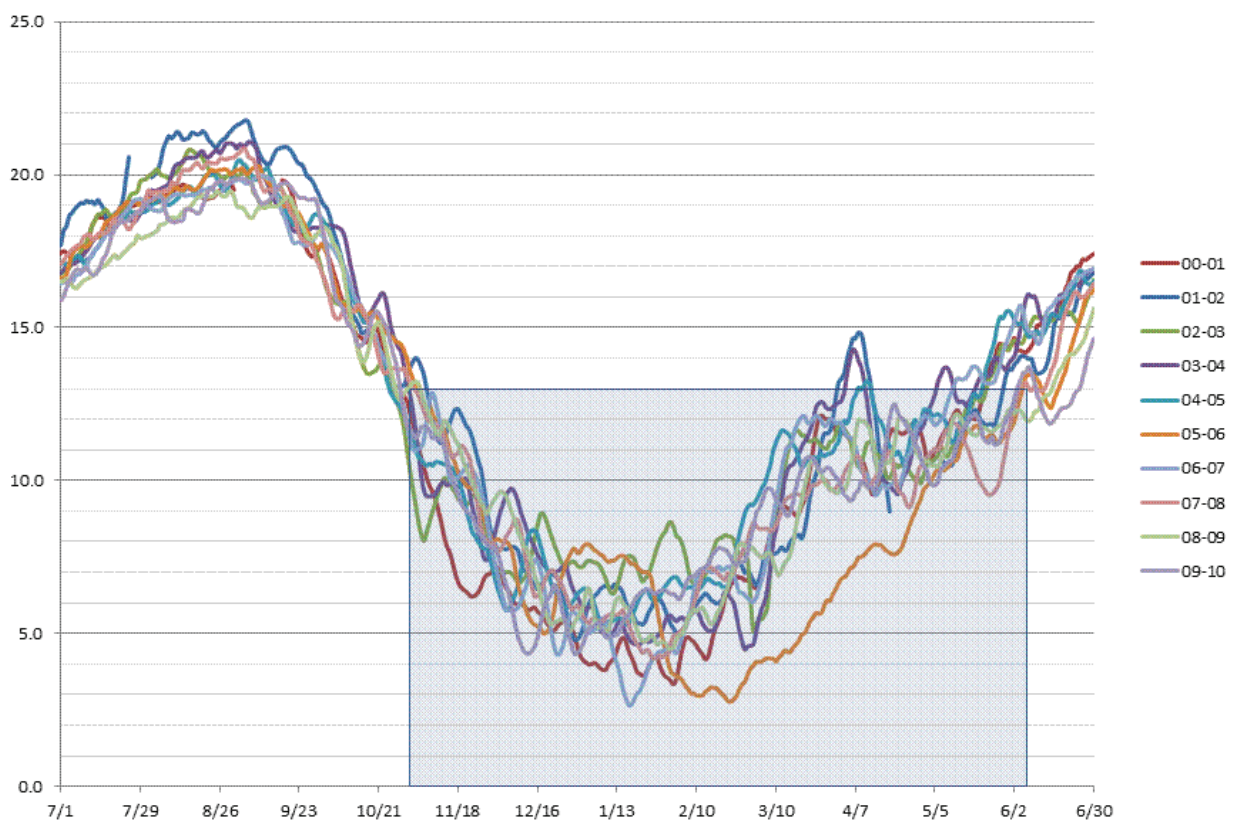
“...In order to maintain the thermal cycles fish are accustomed to, DEQ recommends that subdivision of regulatory spawning periods stated in the water quality standards be evaluated cautiously, e.g. for purpose of developing seasonal, monthly or flow-tiered thermal effluent limits. In most situations it will likely be best to take the whole spawning and incubation period as one time period, and develop a single thermal effluent limit based on meeting temperature criteria at the warmer end of this period. In this way normally cooler temperatures that occur within the spawning and incubation period will be maintained. This will be especially important to the protection of species, such as mountain whitefish, which require cooler mid-winter temperatures to be most successful in reproduction....”

As can be seen from the graphs below, the ambient temperature is noticeably warmer in the winter months at the Eagle Street Monitoring Station. Veterans Station (above the influence of both wastewater treatment plants) and Eagle Station (below the influence of both wastewater treatment plants) shows that the City's effluent noticeably increases the receiving water temperature in the winter when mountain whitefish spawn (*i.e.*, October 15 – March 15). The State has allowed mixing zones in the winter, however, the EPA believes that the State's approach of “...take the whole spawning and incubation period as one time period, and develop a single thermal effluent limit *based on meeting temperature criteria at the warmer end of this period...*” is appropriate, and effluent limits were developed using the State's recommendation.

MWMT @ Veterans Bridge



MWMT @ Eagle Island



Boise Comment 10.

Boise requests that the completion date for the Struvite Production Facility be changed to April 26, 2013 rather than July 1, 2012. Boise is making this request because it has a contract with a Design-Build for the construction of this project. The facility is under construction, with a contract completion date of April 26, 2013. Boise hopes to have the project completed ahead of schedule, but would like the permit to reflect the contract date.

Boise Response 10.

The language in the final permit has been changed to reflect the contract completion date.

Boise Comment 11.

Boise requests that the exact tank volumes in the draft permit for the fermentation and phosphate release tanks associated with the EBPR improvements at the West Boise facility not be considered as an element of compliance. These volumes are current engineering estimates based on the assumption that 39 mgd will be treated at the West Boise facility. Boise requests that due to the possibility of retaining and upgrading the Lander Street facility, the tank volumes be removed from the schedule of compliance or are denoted as estimated volumes in the final permit.

Boise Response 11.

The language in the final permit has removed the tank volume information.

Boise Comment 12.

On page 7 of the West Boise facility permit (section C.1.(b)(iii)) there is a bullet item list of treatment modifications. The third bullet item should read "South plant secondary clarifier mechanisms and weirs." Delete reference to the North Plant. In addition, a new bullet item should be added to read "modifications of the aeration basins in both the North and South plants to Enhanced Biological Phosphorus Removal process."

Boise Response 12.

The final permit reflects the above changes.

Boise Comment 13.

The draft permit for the West Boise facility includes a provision for continuous influent and effluent flow monitoring. The West Boise facility currently does not have an effluent flow meter, but instead reports flows based on adjusted influent flow measurements. Boise has evaluated options to satisfy the flow monitoring requirement and intends to do flow data collection in the ultraviolet disinfection channels. A third ultraviolet channel is currently being added and is identified in the schedule of compliance for completion no later than April 23, 2013. Because Boise cannot meet the requirement until the ultraviolet disinfection system improvements are complete, Boise is requesting a schedule of compliance for the West Boise facility flow monitoring requirement that is concurrent with the ultraviolet disinfection channel completion to be on or before April 23, 2013.

In the interim, the flow will be monitored and recorded by summing flow measurements from all operating downward opening weir gates (up to 3 gates) and then subtracting plant utility water which is withdrawn downstream from the weir gates. The plant utility water flow is measured by an electromagnetic flow meter.

Boise Response 13.

The final permit has been changed to allow the facility to complete the ultraviolet upgrade to the facility prior to installing a flow meter for the effluent.

Boise Comment 14.

The draft permit for the Lander Street facility permit includes continuous monitoring of influent and effluent flow. The Lander Street facility monitors effluent flow but does not have a single point that influent flow can be monitored due to multiple recycle and collection system inputs. The cost and time necessary to reconfigure the inflows and recycle streams are significant. Boise requests that the influent monitoring requirement be removed from the plant.

Boise Response 14.

The EPA will revise the final permit to indicate that the influent flow at the Lander Street facility is an estimate. The EPA is making this allowance because Boise has not yet determined if the Lander Street facility will remain on line or will be taken off line. If Boise decides to keep the Lander Street facility operational, Boise must make the necessary changes such that influent flow can be accurately monitored. The final permit includes this condition.

Boise Comment 15.

The permits require that “composite grab samples must consist of three grab samples, one from each side of the river and one from the middle of the river.” Boise uses the USGS Equal Width Increment method for collection of some parameters (*i.e.*, metals) and the three grab sample method for others (e.g., pH). Boise requests the grab sample definition be modified to “at least three grab samples” to allow for continued use of the more rigorous sampling method for some composite grab sample parameters. Subsequently the City found that grab composites samples increase the likelihood of mercury contamination of the sample, therefore the City requested that sampling for mercury be a single grab sample (see March 12, 2012 letter from Paul Woods, City of Boise to Kathleen Collins, EPA).

Boise Response 15.

The final permit language requires that “composite grab samples must be consist of at least three grab samples, one from each side of the river and one from the middle of the river.” Given the potential for mercury contamination through composite sampling the final permit requires a single grab sample for mercury. Additionally, the permit has been corrected to require grab samples for bacteria, pH and oil and grease (these parameters cannot be as grab composite samples).

Boise Comment 16.

The permits require continuous upstream and downstream monitoring for dissolved oxygen and temperature. The requirement is effective 60 days from the effective date of the permit. Boise requests 180 days to allow for the installation of USGS-type monitoring stations at two of the three required monitoring sites to minimize the risk of high flows or debris taking out a monitoring device.

Boise Response 16.

The final permit has been revised to allow the facility 180 days from the issuance date of the permit to get the continuous recorders in place.

Boise Comment 17.

The draft permits require weekly monitoring for cyanide. Boise has conducted influent and effluent monitoring for cyanide and has a ten plus year record of cyanide results that show cyanide is generally at or below the detection limit. Boise requests that weekly monitoring requirements be reduced to monthly or possibly removed because the long term record shows cyanide is not a water quality pollutant that is detected at levels of concern in the wastewater system. The pretreatment monitoring requirements contained in the permit will include sufficient cyanide monitoring data to determine if cyanide is being discharged at levels of concern.

Boise Response 17.

The EPA agrees that cyanide is at or below detection, therefore, monitoring has been reduced to once per month in both permits.

Boise Comment 18.

The draft permits require Discharge Monitoring Reports (DMR) due on the 10th of the month. The permit contains monitoring requirements for multiple parameters that are weekly and it will be difficult to process through the lab and include on the DMR with a 10th of the month reporting date. Boise requests that reporting date be the 20th of the month to provide sufficient time for samples collected the last week of the month to be processed, receive the appropriate quality assurance and control, and be included in the DMR.

Boise Response 18.

The final permit has been revised to require the DMR reporting date to be the 20th of the month.

Boise Comment 19.

Boise concurs and supports the development of local limits as a necessary component of a local pretreatment program when certain thresholds are exceeded. However, some pollutants may be better addressed with control measures rather than local limits, for example mercury through development of a Mercury Minimization Program (MMP) as prescribed in the permit or EPA's effluent guidelines. Boise suggests that the local limit development requirement be expanded to include, where appropriate, alternative control measures, such as development and implementation of MMP.

Boise Response 19.

The federal regulations at 40 CFR 403.5(c) require publicly owned treatment works to develop and enforce specific limits to implement the prohibitions listed in 40 CFR 403.5(a)(1) and (b). If the analysis Boise performs shows that numeric local limits are necessary for mercury, then they must be developed and implemented. The mercury minimization plan cannot be used as a substitute for the numeric local limit.

Boise Comment 20.

Boise will make a decision during this permit cycle concerning consolidation of facilities at West Boise, or retention and upgrade of both facilities to meet the new permit requirements. During the schedule of compliance period, the Lander Street facility will likely receive loads greater than 80% of design capacity for BOD, TSS and ammonia to accommodate improvements at the West Boise facility. If Boise decides to discontinue operation of the Lander Street facility, the development of local limits for the Lander Street facility based on the permit conditions requiring this action, the analysis will be based on interim loading conditions not representative of the facility in the future. Therefore, the development of local limits under this scenario would not serve any useful purpose. Similarly, if the City chooses to retain and improve the Lander Street facility, short term headworks loading at the West Boise facility may trigger greater than 80% of design for BOD, TSS and ammonia creating the same abnormal situation. Boise requests additional flexibility be incorporated into the triggers for development of local limitations as necessary to account for temporary shifting of flows during facility upgrades.

Boise Response 20.

The General Pretreatment Regulations (40 CFR 403) require that each POTW with an approved pretreatment must develop and enforce local limits to protect against pass through and interference which may be caused by industrial discharges to the treatment facilities. If local limits are not developed the POTW must demonstrate that limits are not necessary (40 CFR 403.8(f)(4)). The federal regulations at 40 CFR 403.8(f)(4) also require that POTWs "...continue to develop these limits as necessary." Since conditions at POTWs change with time the EPA believes it is reasonable that an evaluation be completed at least every 5 years.

The last evaluation conducted by Boise was over 10 years ago. Additionally, a review of Boise's past DMR reports for the Lander Street facility shows that the city has already exceeded the 80% of the design capacity for TSS and BOD. Given this information the EPA believes it is reasonable for Boise to conduct an evaluation as soon as possible. The final permits retain the condition to submit the results of the local limit evaluations within one year of the effective date of the permits. Additionally, a condition has been added to each permit that requires the City to submit the results of a local limits evaluation within 5 years of the last evaluation. This should provide the City with the flexibility they need as well as meet the intent of the pretreatment regulations such that the City does not let 10 years lapse before re-evaluating its local limits.

IV. IDAHO CONSERVATION LEAGUE (ICL)

ICL Comment 1.

The ICL supports not removing the mercury effluent limitations from the permits based on IDEQ's 401 certification.

ICL Response 1.

Comment noted.

ICL Comment 2.

The ICL believes it is inappropriate for the 401 certification and the NPDES permit to provide mixing zones for pollutants that do not have assigned effluent limits. If pollutants are to be discharged in such quantity or concentration that a mixing zone is required to provide that Idaho water quality standards are not violated, then it would seem that an effluent limit is needed. To this end, the EPA needs to create limits for zinc and copper or the IDEQ (and the EPA) need to eliminate the mixing zones for these parameters.

ICL Response 2.

The federal regulation at 40 CFR 131.13 allows a State to adopt certain policies in their water quality standards affecting the application and implementation of standards (*e.g.*, mixing zones). Mixing zones allow ambient concentrations above the criteria in areas near outfalls.

The State's water quality standards has a general provision allowing consideration of mixing of effluent and receiving water (*i.e.*, mixing zones) when determining the need for and calculating effluent limits. The federal regulations at 40 CFR 122.44(d) puts forth the regulatory requirements for determining if a water quality based effluent limit is needed for an effluent discharge. This regulation states that:

“When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a ... criteria ... the permitting authority shall use procedures which account for existing controls on point and non-point sources of pollution, the variability of the pollutant or pollutant parameters in the effluent... and where appropriate, the dilution of the effluent in the receiving water.” (40 CFR 122.44(d)(1)(ii)).”

Because the State has a mixing zone policy in their water quality standards and the federal regulations states that dilution should be taken into account, the EPA used the mixing zones allowed by the State when doing the Reasonable Potential Calculations for the West Boise and Lander Street facilities' effluent (see Appendices C of the fact sheets). Using mixing zones in the Reasonable Potential Calculations showed that some parameters (*e.g.*, ammonia) still had a reasonable potential to cause or contribute to an excursion of the water quality standards outside of the mixing zone, while others (*e.g.*, zinc) did not.

The federal regulation at 40 CFR 122.44(d)(1)(iii) provides the EPA with the legal authority to include effluent limits in NPDES permits. This regulation states that a permit must contain limits for a pollutant if the pollutant has the reasonable potential to cause, or contributes to an in-stream excursion above the

allowable ambient concentration of a State numeric criteria within a State water quality standard. The regulations do not require, and the EPA did not include, effluent limitations in permits if the EPA could not show that there is a reasonable potential for the effluent to cause or contribute to an excursion of the water quality standards.

ICL Comment 3.

The ICL supports that no mixing zone was authorized for mercury.

ICL Response 3.

Comment noted.

ICL Comment 4.

The ICL is not supportive of the 10 year compliance schedule for Total Phosphorus, and does not believe it is lawful for compliance schedules to extend beyond the life of a single permit. Compliance schedules have been deemed to be appropriate only in those instances when an effluent limit is in a permit for the first time. If a compliance schedule spans from one permit to the next, by definition the effluent limit in question cannot be in the second permit for the first time limit (since it made its appearance for the “first” time in the first permit).

The ICL does not think the five year hiatus that is built into the Lander Street facility phosphorus compliance schedule is consistent with the notion that final compliance be achieved “as soon as possible.” This 5-year break is also devoid of interim requirements and obligations to ensure the timely achievement of measures needed to achieve the final limit.

The ICL believes the 10-year compliance schedules (in both the Lander Street and West Boise facilities) should be reduced to a schedule within the bounds of a single permit – 4 years and 11 months.

ICL Response 4.

The Idaho Water Quality Standards state “Discharge permits for point sources may incorporate compliance schedules which allow a discharger to phase in, over time, compliance with water quality based effluent limits when new limitations are in the permit for the first time.” (IDAPA 58.01.02.400.03). The language in the State’s water quality standards do not specifically limit compliance schedules to any specific time frame.

The EPA’s memo on compliance schedules (*Compliance Schedules for Water Quality Based Effluent Limits in NPDES permits*, May 10, 2007) states that “...Any compliance schedule that extends past the expiration date of a permit must include the final effluent limit in the permit in order to ensure enforceability of the compliance schedule as required by Clean Water Act section 502(17) and 40 CFR 122.2 (definition of schedule of compliance).” This statement recognizes that compliance schedules can be longer than 5 years. Moreover, the EPA has included the final effluent limit for total phosphorus in the permit. Therefore, no change has been made to the permit.

ICL Comment 5.

The ICL supports the notion that this permit may be modified at some future date to allow for the possibility of a Dixie Drain offset project. However, the ICL is withholding judgment as to the relative merits of the Dixie Drain project until more specific information is available. Generally speaking, the ICL is more likely to look favorably on the Dixie Drain project if the benefits to the river are significant and the offset ratios far exceed the minimum required.

ICL Response 5.

Comment noted.

V. IDAHO RIVERS UNITED (IRU)

IRU Comment 1.

The CWA and supporting federal regulations authorize EPA to issue an NPDES permit for a term of five years. The *National Water Program Strategy: Response to Climate Change Key Action Update for 2010 – 2011* reinforces the importance of reviewing NPDES permits on a five-year cycle, “The five-year permitting cycle provides permit writers with a significant amount of flexibility to adapt to changing conditions.” The five year term is more important than ever as climate change has the potential to impact water quality based effluent limitations and other permit conditions.

IRU supports the five year permit term because it allows new information to be considered in a timely manner. This results in better protection for waters of the United States. IRU is concerned that this draft permit contains actions to be carried out after the term of this permit expires. IRU requests that this permit be limited to actions to be taken during this permit term.

IRU Response 1.

The only actions which extend beyond the term of the permits are the compliance schedule requirements for total phosphorus and temperature. The EPA believes the schedules are appropriate. However, all permit conditions will be re-evaluated when the permits are re-issued and if more stringent or alternative requirements are necessary, they will be included in the permits at the time of re-issuance. See also response to ICL Comment 4.

IRU Comment 2.

Page 10 of the Lander Street facility Fact Sheet states that “...the 1994 permit was administratively extended and continues to be in effect until a new permit is issued.” Is the Lander Street facility operating under the 1994 permit or the 1999 permit as modified.

IRU Response 2.

The Lander facility is currently operating under the terms and conditions of the 1999 permit as modified in 2001 and 2003.

IRU Comment 3

IRU supports the EPA's determination that the effluent flow from the Lander Street facility not exceed 15 mgd as the monthly average. This is especially important as the permit for the Lander Street facility allows the facility to discharge 1 mg/L of Total Phosphorus throughout the term of the permit. 1 mg/L is fourteen times greater than the average monthly limit of 0.07 mg/L that the EPA has determined is necessary to meet water quality standards in the Boise River. An excess of more than 89,045 lbs of Total Phosphorus is allowed to be discharge to the Boise River during the term of the permit. A higher effluent flow would result in an even larger excess of Total Phosphorus entering the Boise River.

IRU Response 3.

Comment noted.

IRU Comment 4.

EPA does not sufficiently explain why the gaging station flow data from March 12, 1982 through December 31, 2009 "more accurately reflects the flows that have occurred since the completion of several dams, diversions and reservoirs." Lucky Peak dam was completed, as noted in 1955, 27 years before 1982. Stream flow maintenance flows were claimed by the Bureau of Reclamation in 1984 and affirmed by the court in 2008, but those dates and that issue were not discussed by the EPA.

The EPA needs to further explain their use of that time period to establish low flow conditions for the term of the permit.

IRU Response 4.

Flow data at the Glenwood gaging station was collected from January 1939 through September 1940 and from March 1982 onward (flow data was not collected from October 1940 through February 28, 1982). The EPA does not believe the 1939 through 1940 data is representative of current conditions therefore it was not used in our analysis.

IRU Comment 5.

The EPA seemingly failed to account for the impact that climate change will have on flows in the Boise River, particularly low flows. It is imperative that CWA permit writers use climate change science to inform decisions. Information available from the USBOR indicates that flow in the Boise River may not repeat the historical patterns captured in the EPA's calculations. The EPA must address the impacts that climate change is having and will have on low flow conditions in the Boise River in order to establish appropriate effluent discharge limits.

IRU Response 5.

At this time, protocols do not exist for incorporating climate change into the analyses performed. If, in the future, protocols are developed to incorporate climate change in the analyses, the EPA will use these protocols when permits are reissued so corrections can be made as we get new and better information.

IRU Comment 6.

It would be helpful if the information on Table 2, page 11 was converted to cfs like in Table 1. Correction – in the footnote 7Q10 should have a return period of 10 years not 10 days.

IRU Response 6.

Comment noted

IRU Comment 7.

IRU supports the Total Phosphorus limit of 0.07 mg/L. We are concerned that those limits only apply from May 1 – September 30 and question the rationale for setting those limits. The situation is complicated because phosphorus pollution problems commonly manifest at a temporal and geographic distance from the discharge. The explanation that “phosphorus is most likely to adversely impact the receiving water” during this period is weak and needs to be explained in more detail.

IRU Response 7.

The EPA based the total phosphorus limits on requirements found in the Snake River-Hells Canyon (SR-HC) TMDL. In that document the phosphorus target (70 µg/L) applies from May through September. The EPA has completed a more thorough review of that document and found that the SR-HC TMDL does not provide an adequate basis for limiting the phosphorus target to the May through September time period. Based on our review EPA has determined that effluent limitations for phosphorus are needed year-round. Additional analysis of the seasonal nature of nutrient discharge and allocations for point and non-point sources of phosphorus for the Boise River and Snake River are necessary in light of this information. The EPA is not including October through April limits in the permit at this time. The EPA will be reviewing information and data and determining the appropriate phosphorus limits to apply to the effluent from October through April and these limits will be incorporated into the next permit that is issued to the facilities. The discussion below presents some of the information the EPA used to determine that year-round limits are necessary.

High levels of nutrients such as phosphorus and nitrogen can excessively stimulate the growth of algae, both in the water column and attached to the streambed as periphyton. The nutrients also encourage growth of aquatic weeds (macrophytes), resulting in severe water quality problems. In the Snake River (of which the Boise River is a tributary), phosphorus has been identified as the primary nutrient causing water quality degradation. Phosphorus takes many forms in the aquatic environment, and phosphorus pollution is not readily attenuated by physical, chemical, and biological processes (i.e., phosphorus does not degrade in the aquatic environment). The persistence of phosphorus is particularly problematic in reservoirs. When a river enters a reservoir, the water velocity slows and the surface temperatures increase due to thermal stratification. This provides an ideal environment (abundant nutrients, warm temperatures) for rapid and excessive growth of floating and/or suspended algae. When algae die they sink, decaying and drawing oxygen from the middle and lower depths of the reservoir creating an environment that is harmful to aquatic life. In simple terms, phosphorus pollution is converted to oxygen demanding algae. In addition, when the dissolved oxygen at the bottom of the reservoir is very low (typically < 2 mg/L), chemical reactions in the sediments release the previously-sequestered phosphorus in a dissolved form. This dissolved phosphorus mixes into the overlying water column and becomes

available for uptake by algae. This “internal loading” (recycling) process is a common, long-term problem in lakes and reservoirs impacted by human activities.

Water quality problems associated with high nutrient levels (e.g., excessive algae levels, low DO) are often most severe during spring and summer conditions. However, due to the complex cycling processes between water column phosphorus, algae, macrophytes and reservoir sediments, it is important to consider the potential impacts of phosphorus discharge throughout the year:

1. While algae growth is greatest in the late spring and summer, algae can grow and even bloom (i.e., the rapid, excessive growth of algae) in winter and early spring, and fall blooms are common after reservoir turnover, when phosphorus released from sediments is mixed into the surface layer.
2. Travel time for upstream discharges and long residence times in a reservoir may result in a significant delay effect from the time of discharge to the time of effect. For example, winter discharges in a watershed can affect spring algae growth in a downstream reservoir.
3. Periphyton and macrophyte biomass from year-round growth can slough and float downstream to the reservoir in any season. Again, this may link a discharge in one season to an effect in another.
4. Phosphorus can bind to particulate matter in the water column. As a result, even when algae growth is low in the winter, some portion of the phosphorus discharged to the reservoir will settle to the bottom of the reservoir, either attached to sediment or as dead algal cells, and increase the mass available for re-cycling from the sediments to the water column.

The USGS recently released a report with new water quality data for the Boise River at Parma and Snake River at locations upstream and downstream of the Boise River confluence (Wood, M., and Etheridge, A. Water Quality Conditions near the Confluence of the Snake and Boise Rivers, Canyon County, Idaho. USGS Report 2011-5217). Several findings in this report indicate that October through April discharges of phosphorus to the Boise River affect dissolved oxygen conditions in Brownlee Reservoir, including:

1. Algae blooms have been observed in March in the Snake River.
2. The Boise River contributes 30% of the phosphorus to the Snake River at the confluence, and 72% of the orthophosphate, which is the form of phosphorus that directly fuels algae growth.
3. High chlorophyll-*a* concentrations were observed in both the Boise and Snake Rivers in the winter and spring. In the Boise River, it is likely that this chlorophyll-*a* spike is caused by sloughed periphytic algae from upstream river reaches.

With these facts in mind, EPA has reviewed the basis for the dissolved oxygen portion of the SR-HC TMDL, which is focused on conditions in Brownlee Reservoir. The reservoir analysis involved the use of a water quality model to evaluate whether phosphorus allocations and targets for the mainstem Snake River (and tributaries including the Boise River) would be sufficient to meet dissolved oxygen standards in the reservoir. The analysis found that upstream river controls would not be sufficient, and the TMDL required that the dam owner, Idaho Power, augment the oxygen levels in the reservoir. This responsibility was expressed as a required increase in oxygen tonnage per day in the middle depths (metalimnion) of the reservoir (See SN-HC TMDL, page 449).

The model analysis supporting the TMDL involved continuous, year-long simulations of dissolved oxygen in Brownlee Reservoir using the CE-QUAL-W2 model. Boundary inputs of phosphorus loading

to the reservoir (i.e., inputs of phosphorus from the Snake River and its tributaries and other external sources of phosphorus) were set to reduced levels (40-70 ug/L) consistent with the TMDL target level (<70 ug/L). Importantly, these reduced levels were assumed for the entire year, not just the months of May through September (see SR-HC TMDL, Appendix F, page 12). The allocations established in the SR-HC TMDL for the mainstem and tributaries did not align with these assumptions of the underlying modeling analysis. Instead, the TMDL established May-September allocations only, and included no allocations (reductions) for the October-April period, based on a qualitative view that only summer discharges of phosphorus contribute to water quality problems in the system. Given the discrepancy between the supporting modeling analysis which assumed year-around reductions, and the seasonal nature of the TMDL allocations, the adequacy of the oxygenation requirement established for Idaho Power and other components of the TMDL allocations are not supported.

Furthermore, as discussed above, October-April loadings have an effect on the long-term quality of the sediments in the reservoir. The TMDL assumptions for future sediment quality established an implicit and ambitious future goal of near-zero sediment enrichment. Specifically, the model simulation that established Idaho Powers oxygenation requirement assumed pristine sediment conditions in the reservoir in the future (0.1 mg O₂/m²-day² in the lacustrine zone of the reservoir) compared to highly enriched sediments today (2-8 mg O₂/m²-day in the lacustrine zone of the reservoir, see SR-HC TMDL, Appendix F, page 14). For the suite of allocations in the TMDL to meet water quality standards, this pristine sediment condition must be viewed as a target condition necessary to meet water quality standards (in conjunction with tributary allocations and Idaho Power's oxygenation requirement). In this light, it would be inconsistent to allow high phosphorus loadings from tributaries during October to April, which could contribute to enriched sediments either directly or via algal growth and die-off.

IRU Comment 8.

The EPA fails to account for the fact that a TMDL for phosphorus for the Boise River is long overdue and is scheduled to be developed during the term of this permit. The TMDL will have great bearing on the WLA for the Lander Street and West Boise facilities and other dischargers. The EPA needs to explain how they will incorporate the Boise River phosphorus TMDL into this permit.

IRU Response 8.

The NPDES regulations at 40 CFR 122.62 allow permits to be modified and re-issued during the term of the permit if cause exists. Causes for modification of a permit exists when new information is received which was not available at the time of permit issuance and would have justified the application of different permit conditions at the time of issuance (see 40 CFR 122.62(a)(c)). If a total phosphorus TMDL is completed for the Lower Boise River during the term of this permit, this would constitute new information and the permit may be modified, if warranted.

IRU Comment 9.

Climate change was not addressed in establishing any of the effluent limits. According to the *National Water Program Strategy: Response to Climate Change Key Action Update for 2010-2011*, NPDES permit writers need to consider changes to water quality standards, effluent guidelines and standards,

² 0.1 mg O₂/m²-day means that for every square meter of bottom sediment there will be 0.1 mg/L of oxygen pulled from the overlying water each day.

and TMDLs resulting from climate change. The discussion should be presented via the Fact Sheet and the conclusions should be reflected in the permit.

IRU Response 9.

To date none of the water quality standards in Idaho, or the federal effluent guidelines and standards applicable to this permit, or the TMDL applicable to the Lower Boise River have been revised in Idaho due to climate change, therefore they were not considered in the analyses for the permit.

IRU Comment 10.

IRU agrees that a compliance period is allowed for effluent limits that are permitted for the first time. However, the compliance schedule must not exceed the five year term of the permit. Effluent limits can only be permitted for the first time once. The draft permits must be revised to mandate full compliance with the permitted limits by the end of the five year term.

IRU Response 10.

See Response to comment #4 from Idaho Conservation League

IRU Comment 11.

Under the terms of this draft permit the West Boise facility is allowed to discharge eighty two times the amount of Total Phosphorus EPA determined is necessary to meet water quality standards in the Boise River. Over the four years this discharge is allowed, an excess of 701,920 lbs of Total Phosphorus will enter the Boise River. This is in addition to the eight years worth of phosphorus that has entered the Boise River since the current permit expired in 2004.

Nancy Stoner, the Acting Administrator of the EPA issued a memo in March 2011 that states, in part, “States, EPA and stakeholders, working in partnership, must make greater progress in accelerating the reduction of nitrogen and phosphorus loadings to our nation’s waters.” Ms. Stoner referenced the 2009 Urgent Call to Action of the EPA Nutrient Innovations Task Group that said, “nutrients now pose significant water quality and public health concerns across the United States.” The compliance schedule in this draft permit does not reflect the urgency with which this serious pollution problem must be eliminated.

The proposed limit for phosphorus is not harsh and should not be described as stringent. While the limit is much smaller than the current effluent load, a limit of 0.07 mg/L is not uncommon and is being met by POTWs across the nation. More importantly, the proposed limit is what EPA has determined is needed to return the Boise River and other downstream waters to fishable and swimmable conditions. This more restrictive limit was anticipated by the City of Boise for years and it’s technologically achievable. The City has had years to explore cost effective alternatives to reduce the pollution of the Boise River.

Portions of the Boise River and the Snake River downstream of the West Boise facility are seriously polluted. The high levels of phosphorus make it impossible for members of IRU and the public to enjoy

the beneficial uses of these incredible river reaches. The draft permit should be revised to require all effluent limits be met in five years.

IRU Response 11.

The EPA agrees the total phosphorus limit in each permit is new, but the limits are not overly stringent and there are technologies available to meet the limits. The EPA believes that the compliance schedule is reasonable. See also response to comment #4 from ICL.

APPENDIX A
Reasonable Potential Analysis for Salmonid Spawning

I. Lander Street Reasonable Potential Analysis for Temperature

The State's temperature criteria are as follows:

Salmonid Spawning: Maximum Weekly Maximum Temperature³ of 13°C
This criterion is applicable from November 1 – May 31

Cold Water Aquatic Life: Daily Average = 19°C; Max Daily = 22°C
This criterion applies from June 1 – October 30.

Point Source Thermal Requirement: Wastewater must not affect the receiving water outside the mixing zone so that (1) the temperature of the receiving water or of downstream waters will interfere with designated beneficial uses, and, (2) daily and seasonal temperature cycles characteristics of the water body are maintained.

The tables below provide a summary of the temperature data for the Lander Street effluent (Table 1) and for Veterans Station (Table 2) as well as the mixing zones authorized in the State's certification. When summarizing the temperature data, the EPA took into account information in the State's July 20, 2011 submittal package for the salmonid spawning criteria, in which it was stated:

“...In order to maintain the thermal cycles fish are accustomed to, DEQ recommends that subdivision of regulatory spawning periods stated in the water quality standards be evaluated cautiously, e.g. for purpose of developing seasonal, monthly or flow-tiered thermal effluent limits. In most situations it will likely be best to take the whole spawning and incubation period as one time period, and develop a single thermal effluent limit based on meeting temperature criteria at the warmer end of this period. In this way normally cooler temperatures that occur within the spawning and incubation period will be maintained. This will be especially important to the protection of species, such as mountain whitefish, which require cooler mid-winter temperatures to be most successful in reproduction....”

In this case, the entire season over which salmonid spawning occurs, November 1st through May 31st, was reviewed when determining the minimum, maximum and 95th percentile data for November through May 31 period. Analyzing the temperature data in this manner is consistent with the IDEQ's recommendations and should ensure that normally cooler temperatures that occur within the spawning and incubation period will be maintained. This will be especially important to the protection of species, such as mountain whitefish, which require cooler mid-winter temperatures to be most successful in reproduction.

³ The Maximum Weekly Maximum Temperature (MWMT) is the 7-day average of the maximum recorded temperature on each day. For example, the MWMT of May 15 is calculated by averaging the highest temperature recorded on each day from May 9 through May 15.

TABLE 1: Lander Street Summary of Effluent Temperature in °C

	Minimum	Maximum	Median	95 th percentile
Nov 1 – May 31, MWMT	15.9	22.0	18.1	20.6
June – July 15	19.6	24.2	21.8	23.4
July 16- Sept 30	21.9	25.5	23.7	24.6
Oct	20.2	23.9	21.9	23.1

TABLE 2: Veteran Station Summary of Temperature in °C

	Minimum	Maximum	Median	95 th percentile	Mixing Zone Size
Nov 1 – May 31, MWMT	0.8	14.1	10.7	11.8	Nov -Apr 50% May 25%
June – July 15	9.5 (daily avg) 10.3 (daily max)	15.9 (daily avg) 18.4 (daily max)	12.7 (daily avg) 15.1 (daily max)	14.9(daily avg) 17.4 (daily max)	25%
July 16 – Sept 30	13.8 (daily avg) 14.8 (daily max)	20.0 (daily avg) 22.0 (daily max)	16.9 (daily avg) 18.8 (daily max)	18.8 (daily avg) 21.0 (daily max)	0%
Oct	6.0 (daily avg) 6.8 (daily max)	16.8 (daily avg) 18.2 (daily max)	13.0 (daily avg) 14.1 (daily max)	16.2 (daily avg) 17.4 (daily max)	25%

The Reasonable Potential to exceed the water quality criterion is based on the following equation:

$$C_d = \frac{(C_e \times Q_e) + (C_u \times (Q_u \times \%MZ))}{Q_e + (Q_u \times \%MZ)}$$

Where,

C_e = maximum MWMT effluent temperature for salmonid spawning period (November 1 – May 31); and the maximum of the effluent temperature for cold water biota periods (June 1 – Oct 31)

Q_e = maximum effluent flow = 15 mgd

C_u = represented by the 95th percentile of the MWMT data set at Veterans Station for salmonid spawning period (November 1 – May 31), and the 95th percentile of the data set at Veterans Station for cold water biota periods.

Q_u = upstream flow = Oct – April: 68.9 mgd (7Q10 flow); and May – Sept: 171 mgd (7Q10 flow)

$\%MZ$ = allowable mixing zone size as a percentage of the upstream low flow

If C_d is greater than the criterion an effluent limit is needed. The specific calculation for the period November through April is as follows:

$$C_d = \frac{(22 \times 15) + (11.8 \times (68.9 \times 0.5))}{15 + (68.9 \times 0.5)} = 14.9^\circ\text{C}$$

Since 14.9°C is greater than 13 °C an effluent limit is needed. (Note: The above calculation applies to the December through February period which the City of Boise specifically asked about in their comment #8). Table 3 below presents a summary of the calculations used for each time period analyzed.

Table 3: Reasonable Potential Summary for the Lander Street Facility

	Ce	Qe	Cu	Qu	MZ	Cd	Criterion	Is Cd greater than the Criterion?
Nov 1 – Apr 30,	22°C	15 mgd	11.8°C	68.9 mgd	0.50	14.9°C	13°C	Yes
May 1 - 31	22°C	15 mgd	11.8°C	171 mgd	0.25	14.5°C	13°C	Yes
June – July 15	24.2°C	15 mgd	14.9°C	171 mgd	0.25	17.3°C	19°C	No
July 16 – Sept 30	25.5°C	15 mgd	18.8°C	171 mgd	0	25.5°C	19°C	Yes
Oct 1 - 31	23.9°C	15 mgd	17.4°C	68.9 mgd	0.25	20.4°C	19°C	Yes

Notes:

1. Temperature values for the time periods Nov 1- Apr 30, and May 1 – 31 are expressed as MWMT.
2. Temperature values for the time periods Nov 1- Apr 30, and May 1 – 31 are expressed as daily averages.

II. West Boise Reasonable Potential Analysis for Temperature

The tables below provide a summary of the temperature data for the West Boise effluent (Table 4) and for Glenwood Station (Table 5) as well as the mixing zones authorized in the State’s certification.

TABLE 4: West Boise Summary of Effluent Temperature in °C

	Minimum	Maximum	Median	95 th percentile
Nov - May, MWMT	13.4	20.9	7.4	12.5
June – July 15	18.8	23.1	20.9	22.5
July 16- Sept 30	19.3	25.3	23.0	23.9
Oct	12.9	23.0	18.7	23.6

TABLE 5: Glenwood Station Summary of Temperature in °C

	Minimum	Maximum	Median	95 th percentile	Mixing Zone Size
Nov - May, MWMT	1.4	14.5	7.4	12.5	Nov-Mar: 50% Apr-May:25%
June – July 15	9.9 (daily avg) 10.8 (daily max)	16.8 (daily avg) 19.3 (daily max)	13.4 (daily avg) 15.7 (daily max)	15.7 (daily avg) 18.2 (daily max)	25%
July 16 – Sept 30	12.8 (daily avg) 15.3 (daily max)	20.3 (daily avg) 31.9 (daily max)	17.2 (daily avg) 19.1 (daily max)	19.2 (daily avg) 21.2 (daily max)	0%
Oct	6.7 (daily avg) 7.5 (daily max)	18.0 (daily avg) 19.4 (daily max)	13.4 (daily avg) 14.4 (daily max)	16.4 (daily avg) 17.7 (daily max)	25%

Reasonable Potential to exceed the water quality criterion is based on the following equation:

$$C_d = \frac{(C_e \times Q_e) + (C_u \times (Q_u \times \%MZ))}{Q_e + (Q_u \times \%MZ)}$$

C_e = maximum MWMT effluent temperature for salmonid spawning period (November 1 – May 31); and the maximum of the effluent temperature for cold water biota periods (June 1 – Oct 31)

Q_e = maximum effluent flow = 24 mgd

C_u = represented by the 95th percentile of the MWMT data set at Glenwood Station for salmonid spawning periods, and the 95th percentile of the data set at Glenwood Station for cold water biota periods.

Q_u = upstream flow = Oct – April: 47.9 mgd (7Q10 flow): and May – Sept: 103.4 mgd (7Q10 flow)

MZ = allowable mixing zone

If C_d is greater than the criterion an effluent limit is needed. The specific calculations for the period November through April are below (Note: There are two calculations because the State has authorized different mixing zone sizes).

$$C_d = \frac{(20.9 \times 24) + (12.5 \times (47.9 \times 0.5))}{24 + (47.9 \times 0.5)} = 16.7 \text{ } ^\circ\text{C} \text{ (for the period Nov 1 – Mar 31)}$$

$$C_d = \frac{(20.9 \times 24) + (12.5 \times (47.9 \times 0.25))}{24 + (47.9 \times 0.25)} = 18.1 \text{ } ^\circ\text{C} \text{ (for the period Apr 1 – 30)}$$

Since 16.7°C and 18.1°C are greater than 13 °C effluent limits are needed. (Note: The above calculations apply to the December through February period which the City of Boise specifically asked about in their comment #8). Table 3 below presents a summary of the calculations used for each time period analyzed.

Table 6: Reasonable Potential Summary for the West Boise Facility

	Ce	Qe	Cu	Qu	MZ	Cd	Criterion	Is Cd greater than the Criterion?
Nov 1 – Mar 31	20.9°C	24 mgd	12.5°C	47.9 mgd	0.50	16.7 °C	13°C	Yes
Apr 1- 30	20.9°C	24 mgd	12.5°C	47.9 mgd	0.25	18.1 °C	13°C	Yes
May 1 - 31	20.9°C	24 mgd	12.5°C	103.4 mgd	0.25	16.5°C	13°C	Yes
June – July 15	23.1°C	24 mgd	15.7°C	103.4 mgd	0.25	19.3°C	19°C	Yes
July 16 – Sept 30	25.3°C	24 mgd	20.3°C	103.4 mgd	0	25.3°C	19°C	Yes
Oct 1 - 31	23.0°C	24 mgd	18°C	47.9 mgd	0.25	21.3°C	19°C	Yes

Notes:

1. Temperature values for the time periods Nov 1- Apr 30, and May 1 – 31 are expressed as MWMT.
2. Temperature values for the time periods Nov 1- Apr 30, and May 1 – 31 are expressed as daily averages.