Response to Comments on the Draft NPDES Permit for the City of Pierce

US Environmental Protection Agency, Region 10, Office of Water and Watersheds

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Overview

On November 21, 2017, the EPA issued a draft NPDES permit for the City of Pierce for public review and comment. The public comment period closed on December 21, 2017. The EPA received comments on the draft permit from the Idaho Conservation League (ICL).

Responses to Comments on the Draft Permit

Comment #1

While we appreciate the Fact Sheet's compliance history discussion for the City of Pierce Wastewater Treatment Plant (Pierce WWTP), as a public facing document, the compliance history discussion, as drafted, fails to convey the seriousness of the history and level of permit violations to the people in the Pierce community and surrounding watershed. A complete account of the compliance history is critical to the public's review of the draft permit, as this community has been and will be impacted by this facility's past and future actions.

Not only has the Pierce WWTP been in non-compliance status for 52 consecutive quarters (i.e. 13 years), the Pierce WWTP has regularly exceeded its E. coli limits by 400%, among the many other extreme exceedances of pollutants regulated by the current discharge permit. Moreover, the Fact Sheet failed to point out the Pierce WWTP's series of disturbing and ongoing permit schedule violations.

Reflecting this facility's compliance history thoroughly is necessary, so that the public can evaluate and determine whether the draft permit includes appropriate and enforceable effluent limits and other permit requirements. The history and level of violations also signal why closer attention and engagement from the EPA is desperately needed for the Pierce WWTP, even despite the recent administrative order on consent (AOC).

Response #1

The purpose of the Fact Sheet is to briefly set forth the principal facts and significant questions considered in preparing the draft permit (40 CFR 124.8). Therefore, the Fact Sheet will not be revised.

As stated in the Fact Sheet on Page 9, "The detailed facility report can be found through EPA's Enforcement and Compliance History Online (ECHO) system at: https://echo.epa.gov/detailed-facility-report?fid=ID0020206&sys=ICP." Since detailed enforcement and compliance history is available for this and other NPDES permitted facilities through ECHO, and the EPA has provided the uniform resource locator (URL) where enforcement and compliance information for this facility can be found, it is not necessary for the EPA to repeat this information in the Fact Sheet.

Comment #2

A copy of the Pierce WWTP's May 2017 AOC should also be made available as an attachment alongside the Fact Sheet and Draft Permit, so the public has an opportunity to consider the draft permit language in light of the potential consequences of this Order.

Response #2

The purpose of the Fact Sheet is to briefly set forth the principal facts and significant questions considered in preparing the draft permit (40 CFR 124.8). Therefore, the Fact Sheet will not be revised.

Summary information about the compliance order was provided on Page 8 of the Fact Sheet. Additional summary information is available in ECHO at https://echo.epa.gov/enforcement-case-report?id=10-2017-0092. That URL is accessible from the URL provided on Page 9 the Fact Sheet by expanding the "Enforcement and Compliance Section and clicking the link under "ICIS Case History (5 years)."

The complete compliance order is not posted on the EPA's website, but it is a public document which may be obtained by submitting a Freedom of Information Act (FOIA) request at https://foiaonline.regulations.gov.

Comment #3

EPA should conduct a more thorough review and analysis of the impacts of the Pierce WWTP Draft Permit on overburdened communities because the EJ Index for Wastewater Discharge is in the 76th percentile nationally and in the 81st percentile regionally.

EPA's June 2016 Technical Guidance for Assessing Environmental Justice in Regulatory Analysis at page 43 states that "...if any of the EJ indexes for the areas under consideration are at or above the 80th percentile nationally, then further review may be appropriate." As reflected in the EJSCREEN report for Pierce, ID, this community has a large population of people over the age of 64 and a large population of people with less than a high school education, relative to national and regional statistics.[1] Although the EJ Index for Wastewater Discharge nearly crests the 80th percentile nationally, this high index along with the high regional index should warrant more attention and a more thorough analysis from EPA of the potential impacts to the overburdened populations in Pierce.

EPA should consult page 46 of the June 2016 Technical Guidance document referenced above in order to develop a more thorough and transparent account of the environmental justice concerns regarding the renewal of the Pierce WWTP NPDES permit. A more thorough accounting would include, but is not limited to:

- Information about the specific populations and individuals affected by the regulatory action;
- Main exposure pathways and expected health and environmental outcomes;
- Evidence for why risk, exposure, or outcomes may vary by population group; and
- Descriptions of the main methods of analysis used.

Response #3

As explained in the Fact Sheet at Page 18, the Pierce WWTF is not located within or near a census block group that is potentially overburdened. As stated by the commenter, the EPA's *Technical Guidance for*

[1] See EJSCREEN Report attached.

Assessing Environmental Justice in Regulatory Analysis states that, "if any of the EJ indexes for the areas under consideration are at or above the 80th percentile nationally, then further review may be appropriate," and the highest national percentile for any EJ index is the 76th percentile, for the wastewater discharge indicator. The next-highest national percentile is the 59th percentile, for traffic proximity and volume.

Because none of the EJ indices were at or above the 80th percentile nationally, the EPA concluded that no enhanced outreach, analysis, or additional permit conditions were necessary to address environmental justice.

The Fact Sheet provides an analysis of the environmental outcomes of the discharge, particularly in Appendices C, D, and E. Except for E. coli, for which water quality criteria are applied at the end-of-pipe (i.e., no mixing zone was authorized), no human health water quality criteria have been established by the State of Idaho for any of the pollutants of concern discharged by this facility. The water quality-based effluent limits for chlorine and ammonia are based on water quality criteria that protect aquatic life uses.

Comment #4

Given EPA guidance recommending the importance of a robust and transparent public process, we believe EPA should conduct a public hearing to ensure the community of Pierce understands the full compliance history of the Pierce WWTP and has the opportunity to benefit from an EPA analysis of the environmental justice concerns in this area, as they relate to Wastewater Discharge. Accordingly, ICL requests EPA extend the public comment period on the Draft Permit for the Pierce WWTP in order to accommodate an opportunity for a public hearing on the Draft Permit.

Response #4

40 CFR 124.11 states that any interested person may request a public hearing if no hearing has already been scheduled, and that a request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. 40 CFR 124.12 states that "The Director shall hold a public hearing whenever he or she finds, on the basis of requests, a significant degree of public interest in a draft permit(s)."

In this case, the EPA does not find that there is a significant degree of public interest in this draft permit, such that a public hearing is necessary. The comment letter submitted by ICL was the only comment letter that the EPA received. In addition, the City of Pierce WWTF is an NPDES minor facility discharging to a receiving water which is fully supporting its beneficial uses. Based upon this, the EPA concludes that there is not a significant degree of public interest to warrant a public hearing on this permit.

Comment #5

We request EPA reissue the Pierce WWTP Draft Permit with further discussion of the Standard of Error related to the low flow conditions EPA identified from the USGS StreamStats Program. We further request that the low flow conditions in this permit be reduced to more conservative estimates based on the high Standard of Error associated with the estimates and based on the fact that the USGS streamflow estimates rely on data and estimates from a report published in 2001.

EPA used the USGS StreamStats program to estimate critical low flows in Orofino Creek. However, EPA failed to discuss that the Standard of Error and Standard Error of Prediction ranges from 98 to 150 in some cases.[2] In addition, this StreamStats Report is based on a sixteen-year old report, which estimates streamflow statistics for ungauged sites in Idaho.[3] The age of this report explains the high Standard of Error and brings into question the extent to which we can safely rely on the low flow conditions the report predicts for 2017. Given the uncertainty of critical low flows in Orofino Creek, we request EPA use more conservative estimates for critical low flow conditions in the receiving water of the Pierce WWTP and adjust the effluent limits accordingly.

Response #5

The EPA acknowledges that there is uncertainty in the critical low flow rates of Orofino Creek that were estimated using the USGS StreamStats program. However, the EPA does not agree that it is necessary to use more conservative estimates of the critical low flow rates.

As explained on Page 97 of the Technical Support Document for Water Quality-based Toxics Control (TSD) (EPA 1991), the steady state modeling techniques used in the reasonable potential analysis and effluent limit calculations for the City of Pierce permit are inherently conservative, since they apply a combination of worst-case assumptions which each have a low probability of occurrence and therefore an even lower probability of occurring simultaneously. In addition to the use of estimated critical low stream flows to calculate dilution, other worst case assumptions used in the analysis include the use of the design flow for the effluent flow rate and the use of 95th percentile temperature, pH, and upstream ammonia concentration values in the reasonable potential and effluent limit calculations for ammonia.

The citation provided by the StreamStats program for estimated low flow statistics for Idaho streams is incorrect. The low-flow estimates are based on the report titled *Estimating Low-Flow Frequency Statistics for Unregulated Streams in Idaho: Scientific Investigations Report 2006–5035* (SIR 2006-5035) which was published in 2006 (personal communication with Ryan Thompson, USGS, January 3, 2018).

The error values listed in the StreamStats report are the average standard errors of the model (personal communication with Peter McCarthy, USGS, January 24, 2018). This is a different measure of the error than is used in SIR 2006-5035.

One of the steps in the USGS's development of the regression equations for estimation of critical low flows in Idaho was to perform a base-10 logarithm transformation on the data. This means that the error terms in the regression equations are originally logarithms as well, and must be transformed back into arithmetic units. SIR 2006-5035 provides the base-10 logarithms of the standard errors as well as the standard errors transformed back into arithmetic units and expressed as both positive and negative percentages. On Page 11, SIR 2006-5035 states, "It is important to note that because of the transformation from log to back to arithmetic units, the standard error values will always have larger positive values than negative values."

SIR 2006-5035 includes standard error values of both the model and of the prediction, and explains that "The standard error of the model measures how well the regression model fits the data used to develop it. The standard error of prediction includes the model error as well as an estimate of the sample error

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[2] See Orofino StreamStats Report attachment.

[3] The following report is listed as the citation for the Low-Flow Statistics for Orofino Creek: Hortness, J.E., and Berenbrock, Charles,2001, Estimating Monthly and Annual Streamflow Statistics at Ungaged Sites in Idaho: U.S. Geological Survey Water-Resources Investigations Report 01–4093, 36 p.

and is a better indicator of the model's overall predictive ability." Therefore, in this response, the EPA has used the standard error of prediction rather than the standard error of the model.

The standard errors are unrelated to the age of the report which is the source of the low flow estimating equations. Rather, the standard errors result from the differences between the flows predicted by the regression equations and the data used to develop the equations, and, in the case of the standard error of prediction, it also results from the sample error.

As stated on the StreamStats report, the drainage basin for the City of Pierce's point of discharge is entirely within low flow region 4. The standard errors of prediction for low flow region 4 are listed in Table 4 in SIR 2006-5035 and reproduced in Table 1, below.

Table 1: Standard Errors of Prediction for Low Flows in Region 4

Flow Statistic	Standard Error of Prediction		
	Log_{10}	Positive %	Negative %
1Q10	0.471	195%	66.2%
7Q10	0.449	181%	64.4%
30Q5	0.375	137%	57.8%

The predicted range of the actual values for the low flow statistics, based on the standard errors of prediction in Table 1, are as follows (see SIR 2006-5035 at Example 2, on Page 13):

- 1Q10: 1.99 – 17.5 CFS (5.9 CFS -66.2%/+196%)
- 7Q10: 2.49 – 19.7 CFS (7.0 CFS -64.4%/+181%)
- 30Q5: 4.04 – 22.7 CFS (9.57 CFS -57.8%/+137%)

There is about a two-thirds (67%) chance that the true values of the flow statistics are within the ranges listed above and about a one-third (33%) chance that the true values are outside of this range (StreamStats Version 4 User Instructions and Riggs 1968). However, since the purpose of estimating the low flow conditions of the receiving water is to determine the minimum amount of dilution available, the fact that the predicted 1Q10, 7Q10, and 30Q5 flow rates may be greater than the values predicted by StreamStats is immaterial. The negative standard errors are smaller than the positive standard errors.

The mean value of the logarithmic transformed errors is zero (see SIR 2006-5035 at Pages 7-8), so there is a 50% chance that the actual critical low flows are less than the values predicted by StreamStats. Stream flows less than or equal to the critical low flows are, by definition, rare events, occurring once every ten years on average for the 1Q10 and 7Q10 and once every five years on average for the 30Q5. Thus, even though there is uncertainty inherent in estimating low flow statistics for ungauged streams, there is still a low probability, at any given time, that the actual stream flows will be less than the critical low flows estimated by StreamStats.

Based on the discussion above, the use of the estimated critical low flows for Orofino Creek will ensure that the water quality-based effluent limits in the permit will ensure compliance with water quality standards, even though there is uncertainty in such estimated low flow conditions.

Comment #6

We request EPA increase the critical effluent flow of the Pierce WWTP to reflect the fact that this facility experiences regular overflows and is in the process of installing a supplemental treatment plant for that reason.

Currently, the critical effluent flow is identified as 0.3 million gallons per day. This does not accurately represent the critical effluent flow the Pierce WWTP presently handles and the critical effluent flow this facility is adjusting to handle, per the requirements in the May 2017 AOC. We request EPA reevaluate the critical effluent flow, recognizing the regular overflows, and include the capacity of the supplemental treatment plant. We further request EPA set the critical effluent flow to a higher, more accurate level and adjust the permit accordingly.

Response #6

The EPA agrees that the actual flows from the Pierce WWTF sometimes exceed 0.3 mgd. The actual monthly average flow has exceeded 0.3 mgd about 26% of the time between December 2004 and March 2017. However, the use of the design flow is nonetheless appropriate, as explained below.

Steady State Modeling is Inherently Conservative

As explained on Page 97 of the TSD, the steady state modeling techniques used in the reasonable potential analysis and effluent limit calculations for the City of Pierce permit are inherently conservative, since they apply a combination of worst-case assumptions which each have a low probability of occurrence and therefore an even lower probability of occurring simultaneously.

Federal Regulations Require the Use of the Design Flow

Federal regulations state that, "In the case of POTWs, permit effluent limitations, standards, or prohibitions shall be calculated based on design flow" (40 CFR 122.45(b)(1)). As stated in the Fact Sheet at Page 7, the design flow of the Pierce WWTF is 0.3 mgd.

As stated in the Fact Sheet at Page 8, the AOC does require the City to construct a redundant WWTP to supplement the existing facility. However, this additional facility has not yet been constructed. The deadline for construction of this facility is October 31, 2021. In addition, the AOC does not specify the capacity of this additional WWTP. Thus, until the additional WWTP is operational, the design flow of the Pierce WWTF remains at 0.3 mgd, and the future capacity (following completion of the redundant WWTP) is unknown. Therefore, in accordance with 40 CFR 122.45(b)(1), the effluent limits in the permit have been calculated based on the design flow of the existing facility.

The Design Flow is an Appropriate Critical Condition for Calculating Dilution

In cases where a mixing zone is authorized, the effluent flow rate is an important factor in calculating dilution factors, which, in turn, influence the reasonable potential analysis and water quality-based effluent limit calculations. However, as explained below, even though the actual effluent flows sometimes exceed the design flow, the use of the design flow, paired with annual critical low stream flows, is nonetheless an appropriate critical condition for dilution.

StreamStats can only estimate critical low flow statistics such as the 1Q10, 7Q10 and 30Q5 on an annual basis. However, StreamStats can estimate the daily mean stream flow that is exceeded 80% of the time (i.e., the 20th percentile daily mean flow) for each month. Although the 20th percentile daily mean flows are not the same as 1Q10, 7Q10, or 30Q5 flows, they nonetheless illustrate seasonal trends in relatively low stream flows. The EPA has compared the monthly estimated 20th percentile daily mean stream flows to the maximum monthly average flow reported by the City of Pierce for each month, based on effluent data collected between December 2004 and March 2017.

As shown in Table 2, below, monthly average effluent flows greater than 0.3 mgd (0.464 CFS) occur when stream flows are relatively high. The lowest stream flows occur in August, September, and October, when the maximum monthly average effluent flow has been less than the design flow of 0.3 mgd (0.464 CFS). Pairing the design flow with the annual 1Q10 and 7Q10 flows results in a dilution ratio less than any ratio calculated from the measured effluent flows and the estimated 20th percentile stream flows for any given month. The dilution ratio for the design flow paired with the 30Q5 flow rate (20.6) is somewhat greater than the dilution ratios calculated from the measured effluent flows and the estimated 20th percentile stream flows for February, October, and November, (18.9, 19.4, and 19.5, respectively), however, this is not unexpected since the 30Q5 (i.e., the 30-day average low flow, with a 5-year return period) is, by definition, a higher flow rate than the 20th percentile 1-day mean flow rate.

Therefore, even though actual effluent flows sometimes exceed the design flow, such exceedances occur when stream flows are relatively high, such that the design flow paired with the annual critical low flows is nonetheless an appropriate critical condition for dilution.

Table 2: Comparison of Effluent and Stream Flows

Month	20th Percentile Stream Flow (CFS)	Maximum Monthly Average Effluent Flow (CFS)	Dilution Ratio
January	12.9	0.588	21.9
February	17.7	0.938	18.9
March	33.2	1.173	28.3
April	134	0.956	140
May	146	0.704	207
June	37.5	0.526	71.3
July	12.3	0.347	35.5
August	8.17	0.317	25.8
September	7.04	0.334	21.1
October	7.82	0.404	19.4
November	10.0	0.512	19.5
December	10.8	0.475	22.7
Critical Flows			
Statistic	Stream Flow	Design Flow (CFS)	
1Q10	5.9	0.464	12.7
7Q10	7.0		15.1
30Q5	9.57		20.6

The Permit Includes Conditions Limiting the Impact of Design Flow Exceedances

In addition, the permit includes conditions which limit the impact of discharges exceeding the design flow. Specifically, the permit includes effluent limits for BOD_5, TSS, total residual chlorine, and ammonia, which are expressed in terms of both mass and concentration. The mass effluent limits are equivalent to the mass that would be discharged if the effluent concentrations were equal to the effluent concentration limits and the effluent flow were equal to the design flow of 0.3 mgd. Thus, when the actual effluent flows exceed the design flow, the permittee would need to reduce their effluent concentrations below the effluent concentration limits, in order to maintain compliance with the mass effluent limits.

References

EPA. 1991. Technical Support Document for Water Quality-based Toxics Control. US Environmental Protection Agency, Office of Water, EPA/505/2-90-001. March 1991. https://www3.epa.gov/npdes/pubs/owm0264.pdf

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