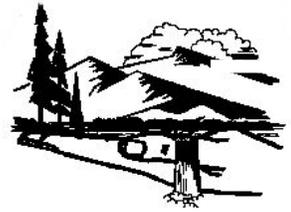




Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.



Matthew H. Mead, Governor

Todd Parfitt, Director

August 1, 2017

Paula Wilson
Idaho Department of Environmental Quality
1410 N. Hilton, Boise, ID 83706

Via email to: Paula.Wilson@deq.idaho.gov

Re: Negotiated Rulemaking to Update Selenium Criteria for Aquatic Life; Docket No. 58-0102-1701

Dear Ms. Wilson,

The Wyoming Department of Environmental Quality, Water Quality Division (WDEQ/WQD) is responsible for protecting and restoring surface water quality and administers the Clean Water Act in the State of Wyoming. Since approximately 2006, WDEQ/WQD has been aware of elevated selenium concentrations in Crow Creek in Wyoming and potential negative impacts to aquatic life due to the discharge of selenium from Smoky Canyon Mine in Idaho. To confirm this, WDEQ/WQD monitored Crow Creek between 2008 and 2012. Samples (N = 19) from three monitoring stations exceeded Wyoming's 5 ug/L aquatic life chronic criterion for total selenium and resulted in the addition of a 15.6 mile segment of Crow Creek from the Wyoming/Idaho border downstream to the confluence with the Salt River to Wyoming's 303(d) List in 2014. Additional samples (N = 14; unfiltered Se) from United States Geological Survey gage 13025500 near Fairview, Wyoming, also showed exceedances of the 5 ug/L criterion in Crow Creek from 2012 through 2016. WDEQ/WQD has therefore taken a keen interest in the Idaho Department of Environmental Quality's (IDEQ) negotiated rulemaking to update selenium criteria for aquatic life, particularly the proposed site-specific criterion for the Subsection of Salt Subbasin near Smoky Canyon Mine.

WDEQ/WQD has reviewed JR Simplot Company's (Simplot) study that describes IDEQ's proposed site-specific criterion for the Subsection of Salt Subbasin (i.e., Hoopes Spring, Sage Creek and Crow Creek) as identified in the Negotiated Rule Draft No. 3 dated July 21, 2017. WDEQ/WQD also participated in a July 25th meeting via webinar where additional information was presented. WDEQ/WQD is pleased to see that the proposed SSC for Crow Creek is based on a recalculation of the US Environmental Protection Agency's (EPA) 2016 selenium criterion and includes water column elements derived via the mechanistic modeling and bioaccumulation factor approaches. Nonetheless, WDEQ/WQD is concerned that IDEQ's proposed site-specific selenium criterion (SSSC) for Salt Subbasin does not account for Wyoming's current 5 ug/L chronic selenium criteria in downstream surface waters. Furthermore, it appears that the SSSC was derived from water quality data that do not represent steady-state conditions since the influence of past mining activities led to an increase in selenium concentration in Crow Creek during the study.

Protection of Downstream Waters

In implementing the Clean Water Act, federal regulations at 40 CFR § 131.10(b) require that:

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

Additionally, according to 40 CFR § 131.5 and 131.6, states should submit supporting documentation and any related analyses when revising water quality standards. After review of Simplot's proposal and IDEQ's Negotiated Rule Draft No. 3, WDEQ/WQD has not found any mention or analyses that consider Wyoming's downstream water quality standards. As such, WDEQ/WQD questions whether Simplot's proposed SSSC allow for the protection and maintenance of water quality standards in Wyoming. WDEQ/WQD therefore requests that IDEQ and Simplot provide additional analyses or information demonstrating that the proposed SSSC is protective of downstream Wyoming water quality standards.

During the July 25th webinar, Simplot stated that the water column elements for Crow Creek will be revised to more stringent concentrations. Simplot then commented that these lower values will address the downstream protection concerns in Wyoming. WDEQ/WQD requests any additional information regarding the Crow Creek revision when it becomes available.

WDEQ/WQD is also concerned that, as outlined in the final section of the document (Appendix D, Implementation Plan), the proposed SSSC is currently being exceeded and Simplot expects exceedances to occur for the next several years until steady state conditions are achieved. Simplot states that it has already implemented two remedial actions to address releases of selenium from overburden disposal areas, but due to groundwater travel time, it may be years before reductions in selenium are realized at the springs. In addition, Simplot plans to install a pilot water treatment system to further mitigate the selenium contributions at the springs. Though these actions are encouraging, WDEQ/WQD is concerned that their influence on future selenium reductions are insufficient and largely speculative at this point. As a result, the derivation and adoption of the site-specific criterion may be premature since the dataset largely reflects these elevated selenium concentrations (discussed more below) and future steady-state conditions remain unknown in the Salt Subbasin and downstream into Wyoming. WDEQ/WQD therefore recommends that IDEQ and Simplot consider collecting supplementary data once the system reaches steady state and evaluate how these conditions may influence the proposed criterion elements as well as downstream waters.

In addition to an analysis demonstrating that Idaho's criterion will be protective of Wyoming surface water quality standards, WDEQ/WQD has a number of other concerns related to the development of the site-specific criterion.

Development of the Site-Specific Criterion

Similar to EPA's 2016 national recommended selenium criterion, Simplot and IDEQ's proposed SSSC for the Salt Subbasin include: a fish egg-ovary concentration, a fish whole-body or muscle concentration, a water column concentration, and an intermittent exposure water column concentration. The proposed SSSC for the Crow Creek watershed is a recalculation of EPA's 2016 national recommended criterion in which toxicological data for the two most sensitive fish species (i.e., white sturgeon and bluegill sunfish) were removed from the derivation process and the egg-ovary of the four most sensitive resident species was used as the basis for the recalculated criteria. The egg-ovary concentrations for brown trout and co-occurring Yellowstone cutthroat trout were derived by Simplot after conducting a series of laboratory studies that evaluated the effects of selenium on fish reproduction and early life stages.

Although the recalculation and revised deletion process is an acceptable EPA procedure for deriving site-specific criteria based on the sensitivity of species known to occur at a site, the 2013 Revised Calculation Procedure also requires states to demonstrate the absence of those sensitive taxa that were removed from the analysis, and 40 CFR § 131.10(g) requires states to consider the highest attainable use of the water body (i.e., what species could potentially occur). WDEQ/WQD was unable to find such demonstration or consideration in Simplot's proposal and therefore requests that this analysis be conducted prior to finalizing the site-specific criterion.

Regarding the taxa EPA used for deriving the national criterion, WDEQ/WQD recommends that Simplot remove a misleading statement from the proposal. Simplot states that the, "2016 National Criterion exceeds the [minimum data requirements (MDRs)] with an N = 15" (p. 37); however, EPA almost exclusively used fish toxicity data when deriving the national criterion and many of the required toxicological data for other taxonomic families (e.g., invertebrates, crustaceans) were not included. As such, the eight MDRs for criterion derivation were not met.

Field monitoring was conducted from 2006 to 2016 in the Crow Creek watershed to evaluate selenium concentrations in the water column, sediment, periphyton, benthic invertebrates and fish tissues. The system appeared to be in "steady state" conditions until a notable increase in selenium water column concentrations began in 2008. Selenium concentrations remained elevated from 2012 to 2016, during which time there was an observed shift in fish community structure as brown trout populations declined. Simplot acknowledges that the decrease in brown trout corresponds to increases in selenium water column concentrations, but affirms that field data from this period were not used directly in the derivation of the SSSC egg-ovary element. Field data from this period were, however, used when deriving the whole-body and water column elements of the SSSC. WDEQ/WQD discusses this and other concerns for each criterion element below.

Egg-ovary element

WDEQ/WQD agrees that the SSSC egg-ovary element (19.9 mg/kg dw) was derived independently of the field monitoring studies and prior to the increase in stream selenium concentrations. However, WDEQ/WQD did note in Table 1 that much of the 2006 to 2008 fish data were collected from locations that already exceeded IDEQ's current water quality standard for total selenium, 5 ug/L, as well as the newly proposed water column concentration of 13.55 ug/L. WDEQ/WQD wonders whether eggs from these specimens were used in the laboratory experiments. If so, WDEQ/WQD recommends that Simplot clarify this point in the documentation as well as discuss any potential influences of using egg specimens that were collected from sites with varying concentrations of ambient selenium.

Whole-body element

The proposed whole body concentration (13.63 mg/kg dw) was derived by applying a conversion factor (CF) to the egg-ovary element. The CF value is the median ratio of egg-ovary to whole body selenium concentrations in brown trout tissue pairs (N = 40) collected within the Salt Subbasin. Simplot states that six pairs of data were collected in late October 2007, but it is unclear when the remaining data were collected (the referenced Table 5 does not include dates). WDEQ/WQD therefore recommends that Simplot include sampling dates for the CF data. In addition, if data were collected during the period of elevated selenium concentrations (i.e., after 2008), WDEQ/WQD

requests Simplot elaborate on how non-steady state conditions may affect CF values and the corresponding criterion values.

WDEQ/WQD is also concerned with the validity of applying a CF value based solely on brown trout sensitivity to an egg-ovary concentration derived from the four most sensitive fish species. Though this may be a more conservative approach since brown trout are the most sensitive species in the study area, WDEQ/WQD questions whether it would be more appropriate to develop a CF value based on the four species that were used to derive the egg-ovary element.

Water column elements

Simplot explored EPA's two recommended approaches for deriving water column values: the mechanistic trophic model approach and the empirical bioaccumulation factor approach. For the mechanistic model approach, Simplot calculated enrichment factor (EF) values based on selenium concentrations found in the water column and in particulate matter (i.e., sediments and periphyton). A composite trophic transfer function (TTF) was also calculated by determining selenium concentrations in the tissues of representative species per trophic level of the brown trout food web; in this case, TTF values were calculated for benthic invertebrates, sculpin and brown trout. The egg-ovary element and the previous CF value were then used in the model to determine the aqueous selenium concentration.

Contrary to mechanistic modeling, the bioaccumulation factor (BAF) approach avoids assumptions regarding dietary uptake and evaluates selenium concentrations in the water relative to animal tissue. To utilize the BAF approach, Simplot collected paired water column and brown trout tissue samples from 2006 to 2011 (N = 294) and stratified data by site and time period. Simplot ultimately selected the BAF value for all sites during baseflow conditions (13.55 ug/L) as the SSSC water column element for the following reasons: the value represents brown trout tissue measurements exposed to a range of selenium concentrations at locations where the criterion will apply; baseflow occurs during the summer and fall when selenium water concentrations are highest; bioaccumulation is greatest during this time due to engorgement; and brown trout spawning occurs during this time.

WDEQ/WQD commends Simplot for the extensive collection and interpretation of field data. Even so, WDEQ/WQD continues to have concerns with the increase in stream selenium concentrations during data collection. This increase has the potential to affect EF, TTF and BAF values and ultimately the water column elements. WDEQ/WQD therefore recommends evaluating the influence of data collected during these non-steady state conditions. WDEQ/WQD also questions the exclusive use of a sculpin TTF value and suggests exploring other fish prey TTF values to better represent the opportunistic feeding behaviors of brown trout. Finally, WDEQ/WQD is concerned with the application of TTF and BAF values based solely on brown trout to an egg-ovary value that is derived from the sensitivity of four different fish species. As with the CF value, WDEQ/WQD recommends that Simplot develop TTF and BAF values that consider the sensitivity of the other fish species represented by the egg-ovary element.

WDEQ/WQD appreciates the opportunity to comment on IDEQ's negotiated rulemaking to update selenium criteria for aquatic life and looks forward to reviewing additional drafts of proposed criteria. To this end, WDEQ/WQD requests the IDEQ continue to communicate and coordinate with WDEQ/WQD as the rulemaking process proceeds. Likewise, WDEQ/WQD requests updates regarding any potential changes to the mine and other activities in Idaho that may impact surface water quality in Wyoming.

WDEQ/WQD is particularly interested in any water quality data from future monitoring, as described in Simplot's implementation plan. Please contact Michael Thomas on my staff at Michael.Thomas@wyo.gov or (307) 777-2073 with any questions or clarifications regarding these comments.

Sincerely,

A handwritten signature in blue ink, appearing to read "David Waterstreet", with a long horizontal flourish extending to the right.

David Waterstreet, Manager
Watershed Protection Program

lp/mt/17-0485

cc: Kevin Frederick, Administrator, Water Quality Division, DEQ
Sol Brich, TMDL Program, Water Quality Division, DEQ