August 1, 2017

SENT VIA EMAIL TO: paula.wilson@deq.idaho.gov

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

Dear Ms. Wilson:

The Department of Environmental Quality (Department) has proposed statewide and site-specific selenium criteria for aquatic life beneficial use. One of the site-specific criterion being considered by the Department is a submittal by the J.R. Simplot Company (Simplot) for a site specific criterion for the Sage Creek drainage and for a portion of Crow Creek. Sage Creek and Crow Creek are part of the Salt River subbasin.

Simplot has received comments both from the Department and from the Environmental Protection Agency (EPA) on the proposed site-specific selenium criterion for Sage and Crow Creeks. Also, the Department has proposed Draft Number 3 of the proposed rule. Draft Number 3 of the proposed rule and some of the issues raised in the comment letters were discussed at the negotiated rulemaking meeting held by the Department on July 25.

Based on the discussion during the July 25 meeting and a review of the comments from both agencies, Simplot is proposing changes in the site-specific criterion. Specific changes include:

- Having the criterion include a water column element.
- Utilizing all calculated Bioaccumulation Factors (BAF) to calculate the water column value. [Previously, the BAF calculation utilized summer/fall data and did not include the very limited spring data.]
- Establishing separate water column criterion values for the Sage Creek watershed and for Crow Creek. This was done because these waters do have different BAFs.
- Footnotes for the site-specific criterion were modified to be more consistent with the use of footnotes throughout this rule.

These changes are reflected in Simplot’s proposed modifications to §287.02, Site-Specific Criteria for Selenium, Subsection of Salt Subbasin, as shown in Attachment A. Further information on the changes being proposed are found in Attachment B, which is the response to the comments provided by the Department and EPA.
The Department's consideration of these comments is appreciated. Please let me know of any questions that the Department has regarding the proposed changes to §287.

Sincerely,

[Signature]

Alan L. Prouty
Vice President, Sustainability & Regulatory Affairs

C: Sean Covington, Formation Environmental

Attachments
   A - Proposed Changes to §287.02
   B - Response to Comments
ATTACHMENT A

Proposed Site-Specific Criteria for Selenium

Salt Subbasin: Sage Creek and Crow Creek

August 1, 2017
Proposed Site Specific Criteria, §287, Sage and Crow Creeks

Water Quality Standards
IDAPA 58.01.02

**287. SITE-SPECIFIC CRITERIA FOR SELENIUM.**

Site-specific water column values (30-day average) are based on dissolved total selenium in water and are derived using a performance-based approach from fish tissue values via mechanistic or bioaccumulation modeling methods in Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater, EPA-822-R-16-006, Appendix K: Translation of a Selenium Fish Tissue Criterion Element to a Site-Specific Water Column Value (June 2016).

02.a. Subsection of Salt Subbasin Sage Creek – source to mouth (unit US-9) including Hoopes Spring channel downstream of the spring complex, South Fork Sage Creek downstream of the spring complex, Sage Creek downstream of the confluence of Hoopes Spring with Sage Creek to its confluence with Crow Creek, North Fork Sage Creek and tributaries (including Pole Canyon Creek).

<table>
<thead>
<tr>
<th>Chronic</th>
<th>Short-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg-Ovary (mg/kg dw)</td>
<td>Fish Tissue (mg/kg dw)</td>
</tr>
<tr>
<td>Egg-Ovary</td>
<td>Whole Body</td>
</tr>
<tr>
<td>19.9</td>
<td>13.6</td>
</tr>
</tbody>
</table>

*mg/kg dw – milligrams per kilogram dry weight, µg/L – micrograms per liter

1. Egg/ovary supersedes any whole body or water column element when fish egg/ovary concentrations are measured. Single measurement of an average or composite sample of eggs/ovaries from at least five (5) individuals of the same species.

2. Whole body fish tissue elements are expressed as a single arithmetic average of tissue concentrations from at least five (5) individuals of the same species.

3. Fish whole body tissues supersedes water column element when both fish tissue (whole body) and water concentrations are measured.

4. Water column values are based on dissolved total selenium concentrations derived from fish tissue values using the empirical bioaccumulation factor (BAF) approach.

5. Water column values are the applicable criterion element in the absence of steady-state condition fish tissue data. For fishless waters, selenium concentrations in fish from the nearest downstream waters may be used to assess compliance.

6. The 30-day average can be based on a single or multiple days of monitoring within a 30-day period. The geometric mean is used as the average.
7. Intermittent Exposure Equation =

\[
\frac{WQC_{30\text{-day}} - \text{C}_{\text{bkgrnd}} (1 - f_{\text{int}})}{f_{\text{int}}}
\]

where WQC_{30\text{-day}} is the water column monthly element, for either lentic or lotic waters; C_{\text{bkgrnd}} is the average background selenium concentration, and f_{\text{int}} is the fraction of any 30-day period during which elevated selenium concentrations occur, with f_{\text{int}} assigned a value ≥ 0.033 (corresponding to one day).

02.b. Subsection of Salt Subbasin. Crow Creek - Sage Creek confluence to Wyoming state line (US-8), Crow Creek downstream of its confluence with Sage Creek to the Wyoming Border.

<table>
<thead>
<tr>
<th>Chronic 1</th>
<th>Egg-Ovary (mg/kg dw)</th>
<th>Fish Tissue (mg/kg dw)</th>
<th>Water Column (µg/L)</th>
<th>Water Column (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg-Ovary</td>
<td>Whole Body</td>
<td>Water Lentic</td>
<td>Water Lotic</td>
<td>Water</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.91</td>
<td></td>
<td>13.62,3</td>
<td>--4,5</td>
<td>4.1 (30 day average)4,5</td>
</tr>
</tbody>
</table>

mg/kg dw – milligrams per kilogram dry weight, µg/L – micrograms per liter

1. Egg/ovary supersedes any whole body or water column element when fish egg/ovary concentrations are measured. Single measurement of an average or composite sample of eggs/ovaries from at least five (5) individuals of the same species.

2. Whole body fish tissue elements are expressed as a single arithmetic average of tissue concentrations from at least five (5) individuals of the same species.

3. Fish whole body tissues supersedes water column element when both fish tissue (whole body) and water concentrations are measured.

4. Water column values are based on dissolved total selenium concentrations and are derived from fish tissue values used using the empirical bioaccumulation factor (BAF) approach.

5. Water column values are the applicable criterion element in the absence of steady-state condition fish tissue data. For fishless waters, selenium concentrations in fish from the nearest downstream waters may be used to assess compliance.

6. The 30-day average can be based on a single or multiple days of monitoring within a 30-day period. The geometric mean is used as the average.

7. Intermittent Exposure Equation =

\[
\frac{WQC_{30\text{-day}} - \text{C}_{\text{bkgrnd}} (1 - f_{\text{int}})}{f_{\text{int}}}
\]
\[
WQC_{30\text{-day}} \cdot f_{\text{int}}
\]

where \(WQC_{30\text{-day}}\) is the water column monthly element, for either lentic or lotic waters; \(C_{\text{bkgd}}\) is the average background selenium concentration, and \(f_{\text{int}}\) is the fraction of any 30-day period during which elevated selenium concentrations occur, with \(f_{\text{int}}\) assigned a value \(\geq 0.033\) (corresponding to one day).

Section 287 is not effective for CWA purposes until the date EPA issues written notification that the revisions adopted under Rule Docket No. 58-0102-1502 have been approved.
ATTACHMENT B

Responses to Comments from Idaho DEQ and EPA on Simplot’s Draft Proposed Site-Specific Selenium Criterion for Hoopes Spring, Sage Creek, and Crow Creek near the Smoky Canyon Mine

August 1, 2017
General Comments

IDEQ General Comment 1: Please provide additional details for deriving the chronic criterion value of 19.9 mg/kg dw in Table 4 (see specific comment 12) and review the calculation of the SMCV for fathead minnow (see specific comments 8 and 11).

Comment Response:

Comment acknowledged. Please see the explanation and references provided in the responses to specific comments.

IDEQ General Comment 2: The document includes different terminology when referring to the egg/ovary element (e.g., egg tissue; see specific comment 2). Additionally, the term ‘criterion’ is used to describe both the proposed site-specific criterion and the 2016 EPA recommended criterion (e.g., page 38, paragraphs 1 and 3). To avoid confusion, use consistent terminology throughout the text.

Comment Response:

Comment acknowledged. The term egg/ovary will be used throughout. The National criterion will be referred to as the 2016 National Criterion and the Site criterion will be referred to as the proposed site-specific selenium criterion (SSSC). In terms of the 2016 National Criterion document as a whole or in part, it will be referred to as USEPA (2016).¹

Specific Comments

EPA, Executive Summary, (p. 8) Table ES-1: The frequency proposed for the fish tissue samples is "not more than once in three years on average". This is not consistent with EPA's recommendation, which is a frequency of "not to exceed". The 1985 Guidelines' (EPA PB85-227049) recommendation for a return frequency of once in three years on average is based on the ability of an aquatic ecosystem to recover from a toxic insult when pollutant impacts are associated exclusively with a water column exposure. The frequency component of the fish tissue elements of the selenium criterion differs from the typical "once-in-three years on average" frequency of water column criteria because selenium is a bioaccumulative and the pathway for exposure is through the food web. Studies have shown that it can take in excess of 10 years for selenium concentrations in fish tissue to return to an acceptable level after fish tissue

concentrations have reached concentrations associated with reproductive impacts (Chapman et al. 2010, Finley and Garrett 2007). As fish tissue concentrations have a much longer recovery time than water column concentrations, the EPA recommends a frequency of "not to be exceeded" for fish tissue criterion elements, consistent with the EPA's 2016 national recommended selenium criterion.

**Comment Response:**

Consistent with the overall IDEQ treatment of the frequency component in adoption of the 2016 National selenium criterion, the frequency component will be removed from the SSSC proposal. IDEQ intends for the selenium criterion to be consistent with all of the State's chronic criterion language.  IDAPA 58.01.02.010.15 defines the frequency of chronic criteria exceedance as follows “...Chronic criteria are expected to adequately protect the designated aquatic life use if not exceeded more than once every three (3) years...”  This change in the new draft rule for the chronic criteria exceedance frequency is consistent with EPA’s guidance that indicates “not to be exceeded” language is not appropriate for a criterion2 (Stephan et al. 1985)3.

EPA’s rationale for the “not–to-be-exceeded” language is based on selenium being bioaccumulative and assuming that recovery from elevated selenium bioaccumulation can take 10 years. EPA’s rationale is based on centrarchid species, and observations for Belews and Hyco reservoirs which are lentic systems where selenite was the dominant form of selenium present. Those sites are not comparable to this Site, which is a lotic system where selenate is the dominant form of selenium.

There are two important considerations in evaluating the recovery time from elevated selenium concentrations: (1) the rate at which bioaccumulated selenium is depurated after reducing exposures, and (2) whether the habitat is lentic or lotic.

Hardy et al. (2009)4 examined selenium depuration from cutthroat trout fed a range of selenium diets, then converted the feeding regime to the basal low selenium diet. Fish were fed diets with selenium concentrations of 5.2, 7.2, 9.2, and 11.2 ug/g selenium for 44 weeks, then switched to a control diet (1.2 ug/g) for 32 weeks. Whole-body selenium concentrations for the highest-concentration diet reached approximately 12.5 ug/g dw, which is similar to the whole-body

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2 Rationale provided in Stephan et al (1985) for the not to exceed language is as follows, “A statement of a criterion as a number that is not to be exceeded any time or place is not acceptable because few, if any, people who use criteria would take it literally and few, if any, toxicologists would defend a literal interpretation. Rather than try to reinterpret a criterion that is neither useful nor valid, it is better to develop a more appropriate way of stating criteria.” "The frequency of allowed exceedances should be based on the ability of aquatic ecosystems to recover from the exceedances, which will depend in part on the magnitudes and durations of the exceedances."


selenium concentrations being proposed in the proposed SSSC. The depuration half-life values corresponding to the dietary treatments were 73.56, 18.73, 14.75, and 11.51 weeks, respectively. These data show that fish with whole-body selenium concentrations similar to the proposed criterion will depurate to concentrations below the criterion within 3 months after dietary selenium concentrations are reduced to low levels.

Habitat is important because it affects selenium geochemistry and cycling. Lotic habitats, like those at the Site, recover quicker than lentic systems after selenium concentrations are reduced. Lentic systems, like the Belews and Hyco sites, will retain selenium because of lower flows and selenium cycling between sediment, water, and food web elements. They tend to be dominated by selenite, which is much more bioavailable. In lotic systems, selenium in the water column is flushed downstream and diluted. This is important because selenium concentration can fluctuate due to changes in load from a source or due to changes in stream flows. If selenium tissue concentrations in fish exceed the criterion during periods of elevated environmental selenium concentrations, they may return to concentrations below the criterion after a relatively short period of time (weeks) if environmental selenium concentrations are reduced. Therefore, recovery periods that are much shorter than one year (as opposed to 10 years cited by EPA) are a much better assumption (based on Hardy et al. 2009) for the proposed SSSC, and the once-in three year exceedance frequency that is generally assumed for chronic criteria is appropriate.

**EPA, Executive Summary (p. 8, Table ES-1, Footnote 1):** The EPA recommends sampling and monitoring recommendations be addressed more comprehensively and separate from the regulatory language for the criteria. The EPA suggests more detailed information on monitoring and sampling considerations would be helpful and that DEQ provide such information in separate technical support materials.

**Comment Response:**

Comment acknowledged.

**IDEQ, Page 8, Table ES-1 and throughout the text:** For consistency, use the same number of significant figures. EPA rounds values of the selenium aquatic life criterion to one decimal place.

**Comment Response:**

Comment acknowledged. The values will be rounded to one decimal place in the revised proposed SSSC table.
IDEQ, Page 9, footnote 1: Footnote 1 refers to egg criterion; however, Table ES-1 indicates egg/ovary criterion. Use consistent terminology throughout the document.

Comment Response:
Comment acknowledged. The term egg/ovary will be used throughout the revised SSSC proposal.

EPA, Section 1.0 Introduction (p.11): The sentence ‘the [EPA 1987] criterion was based on bluegill sunfish in lentic habitats which are not found in southeast Idaho’ is unclear. If the bluegill sunfish are not present in southeast Idaho, then survey data should be provided to justify the claim. If the lentic habitats (e.g., lakes, oxbow stream segments, or reservoirs) are not present in southeast Idaho then that statement too should be supported in order to corroborate the latter part of the paragraph justifying the chronic criterion recalculation.

Comment Response:

The sentence will be revised: ‘the [EPA 1987] criterion was based on bluegill sunfish in lentic habitats. The Site consists of lotic, cold water habitats and eleven years of fish survey data show that bluegill sunfish are not found at this Site. This is not surprising since bluegill are a warm water fish species. In Idaho and most western US states, bluegill are a non-native species that tend to be isolated in small impoundments and reservoirs that are stocked as part of panfish fishing opportunities. IDFG stocking data (1975 to 2005) for Southeast Idaho and the Upper Snake River basin indicates that bluegill sunfish have been stocked in McTucker Pond, Lamont Reservoir, Saint Johns Reservoir, Twin Lakes Reservoir, Rexburg City Pond, Gem State Pond, Mud Lake, and Jim Moore Pond. None of these areas fall within the Crow Creek drainage’.

IDEQ, Page 11, section 1, second-to-last sentence: The sentence states: “Sage Creek flows into Crow Creek which flows north, northeast and crosses the Idaho-Wyoming border before discharging into the Salt River.” Please mention if you are coordinating with the Wyoming Department of Environmental Quality concerning this site-specific criteria proposal.

Comment Response:

Simplot will be providing an update to the Wyoming Department of Environmental Quality on activities related to addressing selenium releases from historical mining practices. This update will include the site-specific water quality criterion proposed for Crow Creek as well as the pilot water treatment plant.

IDEQ, Page 11, first paragraph, first sentence: For consistency, use the language from section 7, first paragraph, last sentence.

Comment Response:

Comment acknowledged. The language from Section 7 will be used.

IDEQ, Page 11, Section 1, second paragraph, second-to-last sentence: Please provide a citation for the statement “Additional studies suggested that cold water species (i.e., trout) were less sensitive to selenium than were warm water species (i.e., blue gills).”

Comment Response:

The revised text will be as follows: “Investigators have found that trout species, including brook and cutthroat trout are generally less sensitive to selenium than bluegill sunfish (Holm 2002; Holm et al. 2003; Hardy et al. 2009; Kennedy et al. 2000; USEPA 2004, USEPA 2016).”

EPA, Section 2.2 Study Area (p. 13, Footnote 4): The EPA regulations at 40 CFR 131.10(b) provide that “[i]n designating uses of a waterbody and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.” Additional information needs to be provided to describe how the currently proposed criterion, particularly the water column criterion element of 13.55 ug/L for Crow Creek, is protective of downstream uses in Wyoming, which has a water column Se criterion of 5 ug/L.

Comment Response:

The revised SSSC proposal will include two water column criteria, with a new value of 4.1 ug/L proposed for Crow Creek. The revised value of 4.1 ug/L will be protective of downstream uses in Wyoming since it is lower than the Wyoming water quality standard of 5 ug/L.

IDEQ, Page 14, section 2.2, first complete paragraph after the bulleted section, last sentence: Indicate the range of selenium concentrations in the unnamed springs.
Comment Response:

Ranges of selenium in springs, not associated with Hoopes Spring or South Fork Sage Creek Springs are as follows:

- Lower Valley Spring #1: Total Se = 1 to 3.6 ug/L
- North Sage Valley Spring (NSV-2): Total Se = <0.0002 to 0.00093 ug/L
- North Sage Valley Spring #3: Total Se = 0.0003 ug/L

EPA, Section 2.3 Scope of Applicability (p. 16-17): The EPA has concerns regarding the application of the proposed SSC to North Fork Sage Creek and Pole Canyon Creek; areas that have not been sufficiently characterized. The report lacks the necessary detail for applying the proposed site specific criteria to these two additional water bodies as they were not included in the initial development of the study design and therefore have not been characterized. The EPA suggests inclusion of data that would corroborate the statement in the report that the SSC is likely applicable to these streams even though they have not been characterized.

IDEQ, Page 17, section 2.3, second paragraph, last two sentences: Please provide supporting information by referencing other sections in the document or other documents that support these conclusions.

Comment Response:

North Fork Sage Creek and Pole Canyon Creek have been well characterized in association with the RI/FS and historical monitoring studies for the Smoky Canyon Mine. The characterization includes water quality, habitat quality, and fish surveys. Surveys show (current monitoring as well as historical monitoring from 1979 and 1981) that Pole Canyon Creek both upstream of the ODA and downstream of the ODA lacks fish. Down gradient of the ODA, Pole Canyon Creek is intermittent with flow reaching North Fork Sage Creek only during wet years. Upper North Fork Sage Creek, near where one of the springs originates, was found to contain brown trout and high numbers of sculpin (Mariah and Associates 1980)6. Sampling in the upper North Fork during the RIFS in 2009 was hampered by poor visibility and excessive algal growth due to large numbers of cattle present in the stream and muddy bottoms. The lower section of North Fork Sage Creek near the confluence with Sage Creek has been observed to contain fish, although the lower North Fork Sage Creek was not sampled as part of the SSSC effort or the RIFS. Historical records as

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reported in the Draft EIS for the Smoky Canyon Phosphate Mine\(^7\) from Heiner (1979), Mariah Associates (1980), and Collins (1981) indicate that brown trout and YCT were present.

Water from both streams enters Sage Creek in the lower part of Sage Valley. The proposal to apply the Lower Sage Creek water criteria to these two upstream segments is consistent with EPA national guidance to apply criteria that are appropriate for waters that are protective for downstream areas.

The revised SSSC proposal will cite relevant documents showing data for Pole Canyon Creek and North Fork Sage Creek. These documents include the Site-Specific Ecological Risk Assessment, RI/FS for the Smoky Canyon Mine, and historical documentation from Idaho Department of Fish and Game (IDFG) and baseline characterization studies.

**EPA, Section 4.0 Background and Chronology for the Current SSC Proposal (pg. 23):**
Please provide data that demonstrates that bluegill sunfish and white sturgeon, or any surrogates that could be represented by these species, are not present at the site. In addition, please demonstrate that the proposed criterion will be protective of uses downstream, including noting how any waters that may contain sturgeon downstream are protected.

**Comment Response:**

Simplot has monitored fish populations and communities at the Site since 2006. Annual fish population and community surveys have been conducted in Hoopes Spring, Sage Creek, and Crow Creek for 11 years. No sturgeon or bluegill sunfish have been found at any locations monitored. Data to support this are provided in the annual Scientific Permit collection data reports provided to Idaho Game and Fish following each monitoring event. A summary of the species collected at locations within the Site and upstream of the Site is provided in Table 1 of this attachment.

A revised SSSC will include a Crow Creek water column value of 4.1 ug/L which will provide for protection of downstream uses into Wyoming, where the State water quality standard is 5 ug/L.

Sturgeon are not present in Crow Creek or in the Salt River. Crow Creek discharges to the Salt River approximately 16 river miles downstream from the State line. The Salt River flows into Palisades Reservoir, approximately 47 river miles downstream of the confluence with Crow Creek. The Idaho Falls Dam on the Snake River is approximately 103 river miles downstream of Palisades reservoir. The closest water that contains sturgeon is the Snake River downstream of

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Palisades reservoir at the Idaho Falls Dam (Personal Communication, Dave Teuscher, IDFG Southeast Regional Biologist).

The mean flow in the Salt River near Palisades reservoir (Etna, WY) is 673 cfs, and represents less than 10 percent of the total inflow into Palisades reservoir (NRCS 2008). The mean annual flow in Crow Creek near the Wyoming State line is 51 cfs, which represents less than 8 percent of the Salt River flow into Palisades Reservoir, and less than 0.9 percent of the overall flow into Palisades Reservoir. The proposed SSSC for Crow Creek is below the Wyoming water quality standard which would be applicable to the Salt River at its confluence with Palisades Reservoir. The Wyoming water quality standard is also just above the standard proposed by IDEQ for sturgeon waters (3.1 ug/L). Given that the amount of additional flow added to Crow Creek and the Salt River in the Star Valley (Wyoming), it is unlikely that contribution from Crow Creek is a source of effects on sturgeon downstream of the reservoir.

EPA, Section 5.2 Field Monitoring (p. 27): In describing trends of selenium concentrations in Hoopes Spring, the report states that there are no seasonal effects, but then in the next sentence it states that during the spring runoff selenium concentrations decline and then they increase during low flow periods in summer and fall. These seem to be seasonal effects. Please clarify the trends of selenium concentrations and selenium loads within this stream throughout the year.

Comment Response:
The text will be revised to clarify that there are no seasonal trends in Hoopes Springs, but there are in Sage Creek. The third sentence of the paragraph will be revised to read: “In Sage Creek and downstream Crow Creek, selenium concentrations are typically highest during the summer/fall low flow periods, and lowest during high spring runoff.”

IDEQ, Page 32, section 5.3.1, second paragraph, last sentence: Please confirm what values were used in the calculation of the SMCV for the fathead minnow. Using ovary tissue LOEC concentration of 5.89 μg/g ww Se in ovaries from the Schultz and Hermanutz study, a moisture content of 75.3%, and a conversion factor of 1.4, the resulting concentration is 17.03 μg/g dw Se in whole body. Thus, the geometric mean of the Schultz and Hermanutz study (17.03 mg/kg dw Se in whole body) and the GEI (2008) study (42.07 mg/kg dw Se in whole body) is 26.77 mg/kg dw Se in whole body, which is equivalent to 37.48 mg/kg dw Se not 38.73 mg/kg dw Se.

Comment Response:

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Simplot used the USEPA (2016) reported value of 25.6 mg/kg dw as LOEC for egg from the Schultz and Hermanutz (1990) study. Page C-20 of USEPA (2016) states, “The Se concentration in embryos from the 10 μg/L treatment stream of 3.91 mg/kg ww converts to 25.6 mg/kg dw using 15.3% dw (N=3 range 14.7 – 15.6%) for fathead minnow eggs (R. Erickson, pers. comm).”

As noted in one of IDEQ’s comments, the GEI (2008) study reported an egg/ovary value of 58.89 mg/kg dw based on a conversion from whole body tissues (42.07 mg/kg dw) using a conversion factor of 1.4. Our calculation incorrectly used an egg/ovary value of 58.59 mg/kg dw for the egg/ovary value from the GEI study. The geometric mean of 58.89 and 25.6 mg/kg dw egg/ovary is 38.83 mg/kg. The value in Table 4 will be corrected to reflect the new value of 38.83 mg/kg dw egg/ovary.

**IDEQ, Page 32, section 5.3.1, second paragraph, last sentence:** Please revise the statement ‘…geometric mean of the two EC10 values cited above…’ to reflect that one study derived a LOEC, not an EC10.

**Comment Response:**

Comment acknowledged. The requested changes will be made in the revised SSSC, particularly Table 4. The revised sentence will read as follows:

A SMCV can be derived for fathead minnows by calculating the geometric mean of the GEI (2008) study EC\textsubscript{10} and the Schultz and Hermanutz (1990) study LOEC, which equals 38.83 mg/kg dw egg selenium.

**EPA, Section 6.2 Whole Body:** In order to determine a whole body criterion element, a conversion factor (CF) calculated from the brown trout data was used to convert the egg-ovary criterion element into a whole body criterion element. The EPA has some concerns about this method of calculating a whole body criterion element value. Conversion factors are based on physiological processes and tend to be driven more by the species than the site. Therefore, it is more appropriate to create a new SSD of whole body SMCVs. The whole body SMCVs could be calculated by converting each egg-ovary SMCV to a whole body SMCV using a species specific CF or a whole body SMCV that was directly measured could be used. This whole body SSD should be used to calculate the whole body criterion element using the 4 most sensitive species as described in the 1985 Guidelines (EPA PB85-227049).

**Comment Response:**

The method chosen in the SSSC proposal was used because it best represents the Site and species present. The approach used to derive the whole body 2016 National Criterion must consider a large scale where species present and their relative sensitivities are unknown or not
Fully characterized, and when egg/ovary data are not available. The 2016 National Criterion notes that “Adopting the fish whole-body or muscle tissue element into water quality standards ensures the protection of aquatic life when measurements from fish eggs or ovary are not available…” For this Site, comprehensive egg/ovary effects data are available and the egg/ovary element of the criterion has primacy over all other elements because “the concentration of selenium in eggs and ovaries is the most sensitive and consistent indicator of toxicity.” The data for brown trout show they are the most sensitive species and that the egg/ovary selenium concentration is the best to assess the risk of effects on this species.

USEPA (2016) states that “Using the most sensitive assessment endpoint (based on the state of the science) reduces uncertainty in the ability of the criterion to protect aquatic life.” The egg/ovary metric for brown trout is the ultimate measure in the criterion. The other metrics to be included in the criterion should be selected from the best predictors of brown trout egg/ovary selenium concentration.

Finally, future monitoring to assess compliance with the whole body criterion will be conducted based on collection and chemical analysis of brown trout whole body tissues. Brown trout are one of two recreationally important game species found at all locations within the Study area (except Deer Creek) where tissue monitoring will be conducted for compliance monitoring. It is numerically the most predominant of the two trout species found and is also a non-native species, thus to minimize potential impacts of using the native Yellowstone cutthroat trout (YCT) as a monitoring species for tissue analyses, and because the predominant tissue data base for the study area is for brown trout, brown trout is the logical target species for monitoring. As recommended by USEPA (2016), “Selection of the fish species in the aquatic system with the greatest selenium sensitivity and bioaccumulation potential is recommended.”

For this SSSC proposal, derivation of the whole body tissue criterion based on the most sensitive species, from a sensitive effects threshold (egg/ovary) with effects data derived directly from the Site, and using that same species as the compliance monitoring target species is the most scientifically defensible and unbiased approach available.

**EPA, Section 6.3.3 Site-Specific Water Value:** Simplot proposed to use the BAF derived water column value generated from data from the summer/fall seasons due to the ease of data collection for future evaluations. While the report says that this is the sole reason they selected this value, the section and associated foot note also say that the summer/fall data best simulate when maternal brown trout will be accumulating dietary selenium and that it is the time of year when selenium concentrations in the water column are highest. However, this value is the highest derived criterion element of all the situations presented (mechanistic model: all seasons and spring/fall; BAF: all seasons and spring/fall), which appears to make it the least conservative option rather than the most conservative option for a water column criterion element. As accumulation rates change with physiological requirements as well as selenium availability, it is
most prudent to capture the spectrum of accumulation rates to ensure the protection of the most sensitive conditions. Given this, EPA recommends calculating the BAF with the all seasons data rather than with the spring/fall data. [Note: we assume EPA intended to indicate summer/fall as opposed to spring/fall as shown in the comment].

**Comment Response:**

In its SSSC proposal, Simplot derived the BAFs from paired surface water and whole body tissue concentration data collected from the summer/fall period because it:

- represents the bulk of the available data for this Site,
- introduced the least uncertainty due to potential seasonal shifts,
- represents the time frame best associated with when adult brown trout would be feeding and accumulating dietary selenium and storing it prior to spawning,
- represents the worst case conditions with respect to the highest selenium concentrations being present (e.g., low flow), and,
- represents the time period when future monitoring will be conducted for compliance purposes.

We disagree that inclusion of the spring data represents sensitive conditions or exposures since brown trout in this system spawn in November. Simplot understands that these conditions are less conservative, but are more accurate due to the nature of selenium bioaccumulation. Higher BAFs will result when selenium concentrations are lower and lower BAFs will result when selenium concentrations are higher. When deriving a water column criterion, dividing the criterion by a lower BAF will result in a higher water column concentration and conversely dividing the criterion by a higher BAF will result in a lower criterion. These data were all shown in Table 6 of the SSSC proposal.

While we disagree with EPA’s suggested approach because it does have the effect of lowering the water column criterion, potentially to a level more conservative than necessary, Simplot will reassess the data and include the spring data together with the summer fall data to derive the BAFs. The water column value, while cited as a criterion, is superseded by the tissue criteria when tissue data are available, whether it be whole body or egg/ovary. New BAFs and water column criterion values will be derived as part of Simplot’s revised SSSC proposal using the spring, summer, and fall data.

**IDEQ, Page 44, section 7, last paragraph, first sentence:** Please clarify which document includes Appendix D.

**Comment Response:**
The sentence will be revised as follows: Appendix D of this SSSC proposal provides a detailed implementation plan for the Site which is summarized in this section and illustrated in Figure 12.

**EPA, Section 7.0 Proposed Criterion Implementation:** The reports states that the elevated selenium concentrations at the site are due to historical mining activities. Are there not additional impacts from current mining activities? Are the mines in this area not currently active?

**Comment Response:**

Simplot’s Smoky Canyon mine began operation in 1984 and is still in operation. The mine-related selenium currently present in streams is primarily due to the cross valley fill at Pole Canyon, which was a historical mining practice and part of the original federal land management agency mine operation approval. Additional selenium sources may have been from the overburden disposal areas at Panels A, D and E. Since the early 2000’s, mining practices have changed considerably to minimize the potential for selenium releases from phosphate mining.

**EPA, Section 7.0 Proposed Criterion Implementation:** The EPA does not support the use of the water column criterion element as a trigger value. As the water column criterion element is derived from the fish tissue criterion element, it is appropriate to use it as a criterion element. The accumulation of selenium within fish tissue often starts with a release of selenium into the water column, where it then is incorporated in the algae, detritus, and particulate matter of the environment. From there, the Se moves up the food web into higher trophic levels. Using the water column element as a criterion rather than a trigger value allows for the detection and prevention of a water column concentration that could lead to detrimental concentrations in fish in the future, after the selenium has accumulated in the food chain. If we wait until fish downstream from the site have selenium concentrations in their tissues that exceed the criterion, then the fish are already experiencing effects and an impairment has already occurred. After fish are experiencing effects, it can take 10 years or longer for those fish to recover from those effects after corrective actions are taken. Given this, waiting until fish tissue concentrations are greater than the criterion is not protective of the community. Instead, the water column criterion element is better suited to establish appropriate permit limits and controls for selenium sources, and excursions of the water column criterion element should prompt corrective actions to prevent use impairments from occurring.

**Comment Response:**

Comment acknowledged. Simplot will revise the text, figures and table that refers to the water column element as a trigger value and refer to it as the water column criterion.
Table 4: It appears there is a typo in Table 4 and 58.59 mg/kg dw Se egg should be 58.89 mg/kg dw Se egg as it is stated on page 32, second paragraph.

Comment Response:

Comment acknowledged. There is a typo in Table 4 that will be corrected in the revised SSSC proposal.

IDEQ, Table 4: Please define the parameters: S2, S, L, and A. Also, please clarify footnote 1 by equating the terms “FCV” located in footnote 1 with the term “Chronic Criterion (mg/kg dw)” in the table.

Comment Response:

Comment acknowledged. The requested changes will be made in the revised SSSC proposal and include the following:

\[ S^2 = \frac{\sum((\ln SMCV)^2) - ((\sum \ln SMCV))^2 / 4}{\sum F - ((\sum P))^2 / 4} \]

\[ S = \sqrt{S^2} \]

\[ L = \frac{\sum(\ln smcv) - S(\sum(\sqrt{P})) / 4}{1} \]

\[ A = S(\sqrt{0.05}) + L \]

Chronic Criterion (FCV) = \[ e^A \]
EPA, Table 4: The EPA has several concerns about the species sensitivity distribution (SSD) that was used to derive the egg-ovary selenium criterion element. First, the EPA has concerns over the use of species mean chronic values (SMCVs) in this SSD as opposed to using genus mean chronic values (GMCVs). When creating an SSD, EPA recommends using GMCVs rather than SMCVs as species within a genus tend to be more similar toxicologically than species in different genera. Using GMCVs rather than SMCVs prevents data sets from being biased by an overabundance of species in one or a few genera. The EPA also has concerns about some of the species that were included in the SSD. Simplot included some species in their SSD that EPA did not include in the criterion derivation due to the inability to effectively characterize an ECw value for the species. These include the Yellowstone cutthroat trout and white sucker. The EPA found that the Yellowstone cutthroat trout data were highly variable and therefore a clear effect value could not be calculated from these data. The EPA also decided not to include the white sucker data in the criterion derivation, as this study did not have a control and a clear effect level was not observed in this study. Lastly the EPA is concerned about the inclusion of the sculpin data, which is >22 mg/kg dw for a NOEL. This lower bound is lower than all the Oncorhynchus genera, so while we know that there is no effect below 22 mg/kg dw, we do not know when that effect begins. Given that this is unknown and that there is a small chance it may be lower than the trout (solely based on the fact that we don't have information showing otherwise), it may not be appropriate to include this information in the SSD. In addition, this study was not considered for the 2016 criterion and the quality of the data has not been evaluated by the EPA. As only a summary of the study was included in the proposal, the EPA requests that additional information about this study be presented so that the quality of these data can be verified.

Comment Response:

This multipart comment addresses two primary issues: (1) use of species mean chronic values (SMCVs) versus genus mean chronic values (GMCVs) and, (2) inclusion of species in the derivation process that EPA has some concerns about, namely YCT, white sucker, and sculpin.

Use of SMCVs vs GMCVs

EPA states that using GMCVs rather than SMCVs prevents data sets from being biased by an overabundance of species in one or a few genera and that the GMCVs should be used for criteria derivation. Simplot disagrees and the use of SMCVs in place of GMCVs for a site-specific criterion are applicable for several reasons:

1. The current selenium dataset for maternal reproductive studies, particularly with fish is limited. Of the eight fish maternal reproductive studies utilized to derive the species sensitivity distribution in USEPA (2016), only two were GMCVs (Lepomis and Oncorhynchus), while the remaining six were SMCVs.

2. When small streams are being evaluated with limited species diversity, there simply are not enough species to use when EPA’s recalculation procedure is the process being used
to derive site-specific criteria. Of the 15 GMCVs utilized to compile the overall number of species in the 2016 National Criterion derivation, the SSSC proposal eliminated five genera as either not found within the Site or not being representative as a surrogate for another similar sensitive species. Simply recalculating the SSSC based on 10 GMCVs (all of which are SMCVs except for *Oncorhynchus*) severely limits the potential available data set and will result in an unrealistic criterion as described in further detail below.

(3) The recalculation procedure is “conducted on a species level rather than a genus level, making it more acceptable to utilize the SMAVs for the FAV calculation” (GLEC 2005)\(^1\). This same logic for species mean acute values (SMAVs) and final acute values (FAVs) also applies to SMCVs and final chronic values (FCVs). As noted in the Draft Compilation of Existing Guidance for the Development of Site-Specific Water Quality Objectives in the State of California, “when the recalculation procedure is used with species deletion, there should be no species left in the dataset that is not either a resident species or a species that is the most appropriate surrogate for a resident species. For this reason, it should be acceptable to utilize SMAVs for the calculation of FAVs when an SSO is developed using the recalculation procedure with species deletion. Where there is only one species in each genus remaining in the dataset, this is the same as using GMAVs” (GLEC 2005). For this SSSC proposal, there is only one genus with more than one species left in the database for the criterion derivation.

(4) Use of the GMCV may actually bias the dataset due to dilution of sensitive species effects information (Parametrix et al. 2006).\(^2\) The genus *Oncorhynchus* represents three of the four most sensitive species in the SSSC derivation process with brown trout, genus *Salmo*, representing the most sensitive species. Not using the SMCV in this case dilutes the most sensitive species information.

Rainbow trout are included, because it has the potential to be present and represent a sensitive species. At least one hybrid rainbow x cutthroat trout has been captured within the Site over the 11 year monitoring period. Westslope cutthroat trout are not present at this Site, but are included to represent another salmonid that is present for which there are no data, the Mountain whitefish. Yellowstone cutthroat trout is the second most abundant trout species present behind brown trout. For these three species in the genus *Oncorhynchus*, the EC\(_{10}\)s are as follows:

- Rainbow trout – 24.5 mg/kg dw
- Westslope cutthroat trout – 26.2 mg/kg dw
- YCT – 28.4 mg/kg dw

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If these data were combined as a geometric mean to derive a GMCV, the value would be 26.32 mg/kg dw. There is a dilution of the most sensitive species information when these data are combined into a GMCV rather than using them independently as SMCVs. Parametrix et al. (2006) states that, “while within-genus toxicity values are relatively consistent (at least more so than higher taxonomic levels), toxicity of a contaminant to different species within the same genus is not always equivalent. Even though the difference in toxicity between species may be small (< a factor of 10; e.g., Physa sp. for zinc), using a GMAV dilutes the sensitivity of the more sensitive species”.

(5) For this SSSC proposal, not only would use of a GMCV for Oncorhynchus dilute the sensitive species information, it would reduce the number of chronic values available for use and the process loses representation of other potentially sensitive species for which there are no data. Loss of chronic values (e.g., SMCVs) for use in the overall number of chronic values represented results in lowering the derived criterion. This is because the derivation procedure is designed to calculate a more conservative criterion when database size is small (Erickson and Stephan 1988).

Inclusion of the Oncorhynchus data as individual SMCVs versus a single GMCV in this SSSC proposal provides for sensitive species representation without being under or over protective by resolving the effect of sample size for the chronic values. The resulting chronic criterion of 19.9 mg/kg dw for this SSSC proposal is less than the most sensitive species EC$_{10}$ of 20.5 mg/kg dw due to how the criterion calculations are weighted towards protection of 95 percent of the species.

**Species concerns**

**YCT**

Use of the YCT data is questioned due to the USEPA (2016) National Criterion suggesting that the YCT data were highly variable and therefore a clear effect value could not be calculated from these data. Based on the information presented in USEPA (2016), EPA only looked at the data for the survival and deformities endpoints, each independently. In their assessment of these data, EPA suggest no observed effects concentration (NOEC) based on the individual endpoints up to 30 mg/kg dw in eggs with one treatment or egg batch showing 100 percent mortality at 30 mg/kg dw. EPA’s evaluation of the data examined the hatch to test end dataset.

Simplot reassessed the YCT data by examining the hatchery data (e.g., a wild run of YCT from Henry’s Lake) and Site wild fish data for the test period hatch to swim up to assess if some of the variability may be reduced. In addition, the YCT data were examined using the surviving and

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normal endpoint, which had been used for the brown trout data in earlier drafts of the 2016 National Criterion. EPA notes that eggs failed to hatch for one of the field treatments (SFTC-1), and six of the hatchery treatments, resulting in a final dataset of eggs fertilized from 14 field collected fish and 10 hatchery fish. Eggs from two additional hatchery fish also had very low hatch success (HL002 and HL015) which had egg mortalities of 88.5 and 89.7 percent, respectively. Poor hatch success in these two additional hatchery fish are likely due to the same reasons that six other hatchery fish eggs failed to hatch or had less than 1% hatch (e.g., HL010 with 0.7 percent hatch, 99.3% egg mortality). These two additional hatchery treatments were eliminated from the analyses resulting in eight low selenium exposure hatchery fish for comparison (hatch of 56% or greater). Eggs from one wild fish with an egg selenium concentration of 47.6 mg/kg dw had an unexpectedly high survival at hatch of 70.3 percent which was contradictory to all the available cutthroat trout data and brown trout data for this Site. This data point was also eliminated from the analysis as described on page 26 of the SSSC proposal. The surviving and normal EC$_{10}$ for YCT from hatch to swim up was derived to be 28.4 mg/kg dw egg selenium as shown in Figure 4 of the SSSC proposal.

Using this dataset for YCT (e.g., surviving and normal, hatch to swim up) provides for a reasonable yet conservative dose response estimate. It is conservative in that the combined endpoint takes into account two sensitive endpoints. The potential NOEC suggested by EPA of 30 mg/kg dw was based on survival only. Addition of the normal endpoint adds a layer of conservatism in that the deformity data were not simply developed based on a fish being normal or not normal, rather they were developed based on the Graduated Severity Index (GSI) where completely normal fish were ranked as zero, slightly deformed fish were ranked as 1, moderately deformed fish were ranked as 2, and severely deformed fish were ranked as 3. When the deformity data were examined, it was clear that the distinction between fish ranked as zero and those ranked as 1 resulted in a high number of fish, particularly the hatchery fish being classified as 1. In other words, fish with low selenium exposure from their parent, still showed some slight deformities when evaluated under a microscope. Given the number of fry assessed as part of this study for YCT, it is within a reasonable expectation of natural variability that some fish may be classified as slightly deformed. Thus using the fry that were classified only as zero (i.e., free from any deformities) is conservative. Combining the endpoints of survival and normal fish thus should yield a lower EC$_{10}$ than the potential NOEC suggested by EPA.

EPA did not pursue these additional types of analyses because they didn’t have the raw data to examine the hatch to swim up endpoint for YCT and combined information for survival and normal fish. Furthermore, it is possible that EPA did not need these additional data, given they already had sufficient information for the genus *Oncorhynchus*. For this Site, however, with YCT being a resident native species of high management importance, deriving a best estimate of the selenium dose response is critical. The approach described above to focus the data set and eliminate extreme outliers to reduce the overall variability of the potential dose response is transparent, reproducible, conservative, and scientifically defensible.
**White Sucker**

EPA reviewed (page E-30) but did not estimate an effect concentration for the de Rosemond et al. (2005) study for white sucker because a reference condition with low selenium exposure was not sampled. Two hundred eggs from four fish were used in the study. Eggs were randomly separated into groups of 100 eggs for rearing yielding an n of 8 treatments/egg batches. Egg selenium concentrations ranged from 8.4 to 48.3 mg/kg dw. The authors acknowledge that the lack of controls negates interpretation of definitive endpoints and confounds the assessment of the developmental deformities as to whether or not they are typical for this population of white suckers. Muscatello and Janz (2009) examined northern pike and white suckers from an area similar to that in the de Rosemond et al. (2005) study, lentic habitats downstream of a uranium mine. In this study, five reference site fish and four exposure site fish were utilized. Selenium concentrations from the exposure site in white sucker eggs (4.86±0.52 mg/kg dw) were significantly higher than reference site eggs (1.94±0.25 mg/kg dw). Among the four categories of evaluated deformities (spinal curvatures, craniofacial deformities, fin deformities, and edema), only edema in white sucker fry was significantly higher (~3%, p <0.05) compared with the reference site. McDonald and Chapman (2007) indicate edema inclusion as a diagnostic deformity metric is debatable since it is reversible and not strictly a teratogenic effect. Muscatello and Janz (2009) found no significant differences in the frequencies of total deformities were observed nor in the cumulative time to 50% eyed embryo, 50% hatch, and 50% swim-up between treatments. The authors concluded that white sucker fry originating from the exposure site displayed a slight increase in the incidence of edema that also could be associated with several factors (e.g., other metals, organic compounds, and ammonia) other than selenium and that overall, based on total deformities, no significant effects occurred.

The collective evidence indicates that no effects to white sucker are evident up to the EPA suggested NOEC of 40.3 mg/kg dw when considering both the de Rosemond et al. (2005) and the Muscatello and Janz (2009) study. While a definitive EC$_{10}$ cannot be readily derived from these published studies, the range of exposures, including reference site, low, and high concentrations is more than adequate to arrive at a conclusion that effects occur at some level greater than 40.3 mg/kg dw. Effect information such as an EC$_{10}$ is not needed, because the no effect concentration is greater than the four most sensitive species utilized for the SSSC proposal derivation.

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**Sculpin**

Lo et al. (2010) provided a NOEC of greater than 22 mg/kg dw eggs. The study is summarized in the SSSC proposal on page 32. Given that the NOEC for sculpin is currently within the range of the four most sensitive species, understanding the potential upper bound of sculpin sensitivity is important to determine whether it should be included within the four most sensitive species. Simplot included this unbounded EC\(_{10}\) in its SSSC proposal with the site-specific knowledge that sculpin populations are thriving at many locations within the Site where selenium concentrations are elevated, not only in environmental media but also within the sculpin whole body tissues. Simplot will be submitting as part of its revised SSSC proposal sufficient evidence to support this fact. In a review of existing sculpin data, Simplot concluded:

- Long term population density is high despite elevated selenium concentrations.
- Multiple age classes are consistently present even at whole body concentrations in excess of the whole body EC\(_{10}\) for YCT (14.5 mg/kg dw) derived as the EC10 (28.4 mg/kg dw divided by the YCT conversion factor of 1.96).
- Important recruitment age classes (years 1-3) are present at sites with the highest selenium concentrations in water and dietary media.
- Young fish are surviving the critical life stages where selenium toxicity is typically lethal, and adult fish are remaining abundant and reproducing.

These conclusions based on eleven years of sculpin population monitoring support the approach of including the unbounded Lo et al. (2010) study NOEC of greater than 22 mg/kg dw eggs as there is a sufficient weight of evidence that the upper bound effects threshold for sculpins is higher than the four most sensitive species used for the SSSC proposal criterion derivation.

**EPA, Table 6**: The selenium water column element concentrations calculated using the empirical BAF indicate very different criteria would be appropriate for Crow Creek (4.5 µg/L) than for Hoopes Spring and Sage Creek (17 µg/L). These values indicate that it is likely more appropriate to consider these two different sites, one site that is Hoopes Spring, Sage Creek, and possibly South Fork Sage Creek and then another site that is just Crow Creek. In addition, the EF values and the TTF values calculated for these water bodies are also very different, again indicating that the same criterion may not be appropriate for all of these water bodies.

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\(^{17}\) Lo, B.P. and V.L. Marlatt, Univ of the Fraser Valley / Biology; J. Baker, J.R. Elphick, Nautilus Environmental; A.M. deBruyn, Golder Associates Ltd; M. Patterson, Anglo American Coal; B. Leighton, Simon Fraser Univ; C.J. Kennedy, Simon Fraser Univ / Dept of Biological Sciences; H.C. Bailey, Nautilus Environmental. SETAC North America 35th annual meeting, Vancouver, British Columbia, November 2014.
**Comment Response:**

The revised SSSC proposal will include two water column values, one for Crow Creek downstream of Sage Creek (4.1 ug/L), and one for Hoopes Spring, South Fork Sage Creek Springs, and Sage Creek (16.2 ug/L). These values are derived by including the spring data with the summer and fall data for the respective areas.

**Figures**

**EPA, Figure 2:** Please include a legend on the second figure that indicates what the brown-orange lines represent.

**Comment Response:**

The legend for Figure 2 identifies that the brown-orange line represents the mine disturbance areas.

**EPA, Figure 3:** On the third figure, please include all sampling locations that are referenced in the graphs in Figures 5 and 6.

**Comment Response:**

Comment acknowledged. The figures will be revised to include these sample locations in the revised SSSC proposal.

**EPA, Figure 4:** Please indicate what the open diamonds represent.

**Comment Response:**

Comment acknowledged. The open diamonds represent outliers in the dataset and will be identified in the revised SSSC proposal.

**EPA, Figure 5:** In the text, the report indicates that some control measures were being put into place to help reduce the amount of selenium that is being discharged into the surrounding water bodies. Please indicate either in the text or on these graphs when these measures were put into place or will be put into place. Does Simplot anticipate that control measures installed at Pole Canyon will impact/have impacted the selenium concentrations in any of the water bodies in this proposal?
Comment Response:

Two Non-Time-Critical Removal Actions (NTCRAs) have been implemented at the Pole Canyon Overburden Disposal Area (ODA); to isolate the ODA from Pole Canyon Creek (2006) and to reduce infiltration into the ODA by installation of a cover (2013). Together these actions have reduced the release of selenium to the environment by approximately 90 percent. The majority of the selenium released before the NTCRAs were implemented was to Wells Formation groundwater. This groundwater flows south and discharges to surface water at Hoopes Spring. The travel time for groundwater is in the range of 20 years. Therefore, reductions in selenium loading at Hoopes Spring due to the Pole Canyon NTCRAs are predicted to begin around the 2026 time period. Simplot began operation of a 250 gpm treatment system to remove selenium from Hoopes Spring water in 2015. This system is being expanded to 2,000 gpm capacity and is scheduled to be brought on line in August 2017. Once operational, it is expected to cause a significant reduction in selenium loading and downstream concentrations (in the range of two-thirds reduction). These actions, along with other remedial actions at historical mining locations to be selected by the Forest Service and documented in a Record of Decision, are predicted to continue to reduce selenium concentration in streams over time.

EPA, Figure 5: As the proposed water column criterion elements are in ug/L, it may be more effective for these graphs to also present total selenium concentration as ug/L, so that the reader can easily compare the data presented with the criterion proposed.

Comment Response:

Comment acknowledged. The requested changes will be made in the revised SSSC proposal.

EPA, Figure 5: What occurred in 2006 that has led to the increase in selenium concentrations? Is this when the mine became operational?

Comment Response:

The mine started operations in 1984. Mining has occurred at different panels since. Selenium released from historical mining activities migrates through Wells Formation groundwater and discharged to surface water at Hoopes Spring and South Fork Sage Creek Springs. Transport time in groundwater from the historical mining areas to the springs ranges from 5 to 35 years (depending on mine panel distance). The mining sequence from 1984 through 2000 was generally a large distance from the springs initially, becoming closer with time. Selenium loading at the springs in 2006 reflected the arrival of effects from historical mining, rather than any specific event.
EPA, Figure 7: Please correct legend to indicate that Upstream Brown trout are represented by the blue bars. Also it would be helpful to include on the map where these fish were collected.

Comment Response:

The upper figure represents brown trout standing crop, so all the bars represent brown trout. The lower figure represents Yellowstone cutthroat trout, so all the bars represent YCT. The figure will include the sampling locations included in the categories: upstream, Hoopes and Sage, and Downstream. These locations are currently shown on Figure 3.

Appendix B

EPA, Appendix B: Every other page of this report is missing from the pdf. Please include all the pages of this report.

Comment Response:

The pdf uploaded by IDEQ and referenced in their email on July 19th included a hyperlink to Simplot’s SSSC proposal. It appears that all of the pages of Appendix B are present upon further review. The hyperlink is provide below to access the document and Appendix B.

J.R. Simplot Company Draft Proposal for Site-Specific Selenium Criterion for Hoopes Spring, Sage Creek, and Crow Creek near the Smoky Canyon Mine, April 2017
### Table 1 Species presence and absence within the Site (2006 to 2016)

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>Crow Creek (Upstream)</th>
<th>Crow Creek (Downstream)</th>
<th>Deer Creek</th>
<th>Hoopes Spring</th>
<th>Sage Creek</th>
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<td>CC-150</td>
<td>CC-350</td>
<td>CC-1A</td>
<td>CC-3A</td>
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<td></td>
</tr>
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<tr>
<td>Brown trout (<em>Salmo trutta</em>)</td>
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<td>✓</td>
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<tr>
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