SUPPLEMENTAL EIS
RESPONSES TO COMMENTS

AQUATICS AND FISHERIES

FISH-600 Invertebrates and Algae

1. Require more baseline data, especially on macroinvertebrates, to enable assessment of future monitoring and impacts. (F1)(S4364)(S4891)(S4912)(S5051)(S5088)(S5555)(S5763)

Page 3-36 and pertinent tables: These data are haphazard at best; not adequate for baseline. It should also be noted that all data are 10 years old or older. How can these data be meaningful for a 1998 mining project much less one that is not likely to be proceed for at least 5 more years? Why has Asarco not been required to provide current baseline data? (S3462)

Page 3-36 para.2-7 The fact that there are complete data sets for ONLY two of nine stations is inexcusable. This is exemplary of the reason why the public has little to NO confidence in the data gathering and kinds of monitoring programs that the agencies devise to assure compliance with WQ objectives. That both of the sites with complete data sets are outside of the most critical and immediate zones (millsite, below tails pond) of proposed impacts is most suspect. It was this exact type of haphazard baseline data gathering at Troy that made a mockery of any and all the subsequent data gathered there and any conclusions derived from such. The public demands better and the agencies are in neglect to accept this service. (S614)

Response: The information presented in the supplemental EIS is a summary of the aquatics baseline data in a form that most readers can interpret. The missing baseline samples are a result of natural stream conditions on the specified sample date and imply nothing more than an inability to collect data at that point in time due to a lack of stream flow. Although regrettable, these missing data points reflect the true character of the stream (or the technology available to do the sampling). The two complete data sets are from the most important stream segments from this watershed, in that the two reaches support the vast majority of the beneficial uses present in Rock Creek. We also incorporated new data collected after the original baseline data period in our analysis of the project.

Monitoring and enforcement of permit requirements on such a project can rely on an affected-vs-unaffected or a change-vs-limits-of-change sample design as easily as it can a before(baseline)-vs-after(developed mine) sample design. The available baseline data are not a limitation to implementing an effective monitoring program.

2. Riparian vegetation is an essential component of bull trout habitat. Vegetation improves stream channel stability, acts as a sediment barrier, provides a source of woody debris and shades the stream thereby reducing water temperatures. The SDEIS states that an unaltered vegetation zone would be left between Rock Creek and the road and utility corridors, where possible, during new construction to protect bull and westslope cutthroat trout habitat. Unaltered vegetation zones are beneficial in buffering impacts to streams and aquatic communities but stipulating their presence where possible makes it impossible to determine the extent to which they will be left intact and therefore the benefits they will provide. It is necessary to clearly identify the width, length and location of unaltered vegetation zones in order to allow the decision maker to accurately assess the impacts to the fishery resources of Rock Creek.

The SDEIS notes that with alternative V, a greater portion of Road 150 would be further away from Rock Creek than proposed in other alternatives, yet some portions of the road remain immediately adjacent to the stream, and other portions appear to be well within the floodplain. Discussion of the impacts to hydrology and fishery habitat from the roads is limited (mostly to sediment production, which would have a negative impact on bull trout) and does not discuss effects to floodplain function, or to long term recruitment of large woody debris. On p. 3-33, the SDEIS notes that levels of large woody debris in Rock Creek are low when compared with other area streams. Large woody debris has been identified as an important component of bull trout habitat (Rieman and McIntyre 1993).

Roads located adjacent to streams and floodplains also typically reduce the amount of shade available to streams. Impacts to temperature from logging in the riparian zone are discussed but no mitigation is proposed. Rock Creek has a southerly exposure, and maintaining or providing conditions conducive to allowing shade trees to mature may be important from a temperature standpoint particularly since mine development is likely to reduce ground water recharge and increase temperatures of the stream.

These issues, identified in the SDEIS, underscore the importance of protecting the riparian corridor and the floodplain of Rock Creek. (S4711)

Response: We have included a map (see Figure 4-4) in the final EIS that illustrates the project features in relation to riparian areas. Riparian areas are mapped in accordance with Kootenai National Forest Plan standards (Inland Native Fish Strategy [INFS]). Some project features impinge on these riparian areas unavoidably (stream crossings). In other cases, a project development is simply an existing road that would be upgraded to minimize effects or conform to Forest Plan (INFS) standards (e.g. road paving). As the Aquatics/Fisheries discussion in Chapter 4 notes, the preferred alternative would not retard attainment of native fish riparian management objectives (including woody debris recruitment, floodplain function and stream temperatures). The minor effect on riparian functions results from a marginal increase in the road corridor width at stream crossings. Over the life of the mine project this loss would be offset by riparian growth in other reaches. Retaining portions of FDR No. 150 within the riparian area is preferable to construction of a wholly new road elsewhere and obliterating the old road, because effects are less with the former.

3. Page 4-71 para.2 Why is no baseline biological data available on the upstream tributary? This is patently unacceptable, considering the proposal to channelize this area. This area contributes biologic activity to lower sections of Rock Creek and habitat dependent species, i.e. Bull Trout. (S614)

Response: Information on page 4-71 of the supplemental EIS is for Alternative II, the applicant-prepared alternative. These impacts to small tributaries, as well as other anticipated effects, are one of the reasons the Agencies formulated an alternative mill site (Alternatives IV and V) with substantially fewer impacts and risks.

4. Can they [Agencies] guarantee that there will not be an increase of algae growth in the lake and river, which is currently a problem in the lake as it is. Is there assurance that the temperature will not increase the algae and deplete the fish? (S4804)

I would like proof that there will be no measurable increases of pollutants where the Clark Fork River crossed into Idaho and that nutrient increases will not increase algae growth down stream. (S4431)(S4482)

Please take the time to further study the impacts of sedimentation and nutrient loads to the Clark Fork River. Please have detailed understanding of how much nutrients and waste brine water will be produced, and their ultimate fates. (S5159)

Response: The permitting agencies cannot guarantee that sediment, nutrients, temperatures and algal populations would not change in the Clark Fork River, Cabinet Gorge Reservoir, or Lake Pend Oreille even in the absence of the proposed mine. The proposed project as outlined in the preferred alternative would not impair these waters without an accidental discharge of some substance. With the enormous dilution provided by the Clark Fork River, the anticipated changes in sediment, temperature and nutrients from the mine could not be measurable outside the permitted mixing zone. This is not the same as "No Effect." The expected change in Clark Fork water quality would be an insignificant increase in existing "pollutant" loads, particularly when viewed in the context of the

present seasonal and year-to-year variations in water quality. The brine waste stream produced by the proposed water treatment plant would be hauled to an approved waste disposal facility, with the remaining treated water discharged to the Clark Fork River.

5. Page 3-36 - aquatic invertebrates baseline conditions. An improved discussion is presented. concern: The bug community composition of Rock Ck indicates a stressed ecosystem and it is NOT similar to other high quality streams in the region as stated on p 3-41. The community is dominated by a few species of mayflies. This stream has long dry-up periods in the majority of its length and this is a serious problem. The old timers claim Rock Ck didn't dry up so much in the past. (Pratt and Huston, 1993) The EIS should identify this as a major problem in Rock Ck and attempt to evaluate the cause. Furthermore, baseline information should be presented for Miller gulch and E Fk Bull River. (S5093)

Bull Trout Section p12, paragraph 3 The theory that Rock Creek is intermittent due to human impacts is not substantiated. The historic naming of the channel Rock Creek, argues that the highly permeable channel and depth to ground water (which are a function of the nature of the underlying alluvium) was going dry even at the time of early settlement.

Bull Trout Section p13, paragraph 4 The contention that the intermittent nature of Rock Creek might be a result of logging or fires is unsupported. The stream is intermittent because of the very high permeability of the streambed alluvium. This high permeability has been here for a long time and, if anything, would presumably be decreased by sediment produced from logging or fires. (S5)

Response: The Agencies stand by the characterization that Rock Creek supports an aquatic insect community similar to other high quality streams in the area. However, this community is stressed by highly variable stream flows. Dry streambeds mainly affect the numbers and weight of insects present in an area - the insect community is equivalent (but not identical) to conditions in similar reaches and watersheds that flow all year.

There are three prevailing theories on why Rock Creek dries up almost every year:

- Theory one claims dry streambeds are a natural condition. Supporters of this theory argue that old timers are remembering the effects of the 1910 wildfire, when a young forest stream flowed all year because the trees were not capable of using all the water that fell in the watershed. Part of the theory is that glacial Lake Missoula (10,000+ years ago) caused the dewatering problem by filling the Rock Creek valley full of large stones and very little fine sediment that would hold water tables higher.

- Theory two claims that dry streambeds are an unnatural condition due to the after-effects of the 1910 wildfire. Supporters of this theory argue that wildfires in the later 1800s and 1910 resulted in a large increase in year-round flows. These higher flows (that old-timers remember), and a major flood event in the 1930s, moved enormous amounts of large rocks from tributaries of Rock Creek down to the main channel. As a result, the main channel of Rock Creek is not capable of holding water when flows decline because the water sinks into the thick deposit of stones brought down river.

- The third theory claims that dry streambeds are the result of human activities in the watershed. Supporters of theory three believe that historic logging practices, and perhaps a post-1910 flood, removed nearly all of the wood and very small rocks (sand, silt and clay) from Rock Creek channels. Riparian and streambed changes, together with increased flows

from logging, flushed the small sediments that once sealed the streambed out of the stream channel. Once the logging-caused high flows (that old-timers remember) declined as trees returned, the stream was unable to hold water all year because the sediment-free channel "leaked" and too much water was being used by vigorous young trees.

At present there is no apparent way to test these competing theories. The present-day flow intermittency in Rock Creek also occur in many other Clark Fork tributaries in the vicinity. We do know that all the "leaky" tributaries are in the area burned in 1910, they were all logged extensively along the streams, and they were affected by glacial events many thousands of years ago. We also know that the Rock Creek valley is filled with a deposit of stones and gravel over 200 feet deep, and has a significant ground water aquifer.

Miller Gulch could not be sampled biologically because there is no continuous flow anywhere other than several springs. Some baseline data for Miller Gulch water and wetlands were considered in the analysis. The East Fork of Bull River was not sampled because no project effects are expected in this watershed, and no activities are proposed there.

6. Page 3-36, last paragraph - If the "impairment" designations imply no specific biological condition, why use the term. If appears Tables 3-14 through 3-17 simply illustrate the number of organisms, taxa and percentage of particular taxa. It would be more appropriate to use the term "baseline conditions" and delete Table 3-17. (S3058)

DEIS p. 2-117/ SDEIS p. 2-99. Issue 1, 1st bullet: "aquatic invertebrates from sediment and nutrient loads (alternatives II and III)" should read "(all action alternatives)." What about Alt V? (S3462)

Response: The "impairment" label indicates the observed macroinvertebrate conditions are significantly different than what would be expected. Because the evaluation technique has not been extensively evaluated under natural and "polluted" conditions, the State of Montana suggests that you not infer that scores less than 0.75 or 0.25 mean human-caused degradation. We could as easily call scores less than 0.75 "undesirable" and a score less than 0.25 "very undesirable." However, because the evaluation technique is being considered for use in water quality management (especially degradation regulations), we elected to use the technique as currently written but to suggest caution in how you interpret the data.

The reader raises a good argument about the meaning of Tables 3-14 to 16 in the supplemental EIS. However, because the State of Montana classifies Rock Creek as impaired, we must evaluate whether the proposed project meets the test of no additional impairment. This requires an independent evaluation of the data to confirm or refute the impairment classification. The baseline water quality data, together with Tables 3-14 to 16 in the supplemental EIS, suggests the classification "impaired" is at best marginally warranted. Overall, suspended sediment is very low, and deposited sediment is rare except in two localized areas associated with natural sediment sources. The metals load in Rock Creek is likewise very low, but does exceed standards on occasion partly because the water is extremely soft, and apparently because the mountains naturally release minor levels of some metals.

Unlike Alternatives II and III, Alternatives IV and V would not significantly affect nutrient conditions. Only Alternative V would not significantly affect invertebrates and stream sediment loads. The test has been modified accordingly. Please see Chapter 4 of the final EIS for further details.

7. Page 3-23 under (c.) "There was some evidence ...". What is this evidence? Where is this information detailed? Where do the heavy metals come from? I thought page 3-50 (Priscu 1989) stated that algae are limited by P or N deficiency. On Page 3-23 the EPA 1993 report states that heavy metals inhibited algal growth. Is it metals (ambient?) or N or P from upstream discharges? (S4832)(S4833)

Response: The Lake Pend Oreille information is contained in the cited Priscu report. The reduced growth in algae was not consistently linked to metals concentrations in the same locations, thus the statement "some evidence." In almost all waters, either nitrogen, phosphorus or the balance of the two, controls algal production. The nutrient and metals loading in Pend Oreille is primarily due to contributions from the Clark Fork River basin in Montana, both natural and human-caused. However, the data for nutrients also show that a higher than expected amount of phosphorus is coming from lake tributaries and residential developments in Idaho. In these waters phosphorus is the limiting factor under almost all prevailing conditions - the effect of metals is inconclusive.

8. Page 3-36, paragraph 6 - The TMDL discussion needs to be revised. (S5)

Response: The Chapter 3 discussion of impaired waters and biological criteria is accurate for Montana. The referenced procedure is not part of the formal total maximum daily load (TMDL) rule-making process in Montana. The lower Clark Fork in Montana is not presently being subjected to a TMDL regulatory process (see Chapter 4 Hydrology - Water Quality Standards Introduction).

9. Neither the EIS nor the SEIS address nutrient impacts to beneficial uses in Idaho. The SEIS does state: Limited impacts from nutrients to aquatic life in the Clark Fork River and Lake Pend Oreille are anticipated~ (p. 4-75) but fails to describe those impacts. The SEIS predicts increases in nutrient loading to the Clark Fork River and Lake Pend Oreille (p. 4-56, 4-57) but fails here again to qualify and quantify associated impacts.

To make matters worse, the SEIS attempts to undermine potential impacts and consequences. The SEIS downplays nitrogen's role in algal productivity in the river and lake. At least seasonally, nitrogen is thought to be a co-limiting factor affecting algae growth in Lake Pend Oreille. [The SEIS] assumes that nitrogen loads will not be allocated in the TMDL. The pending Lake Pend Oreille Problem Assessment for the TMDL will determine which pollutants of concern need load allocations. [The SEIS] states "Algal blooms in Lake Pend Oreille are not expected under Alternative V." Overall increases in algal productivity is the primary concern, not major bloom events. [This statement] assumes that a small increase in algal productivity can be consistent with Idaho water quality standards. Given the legal and "threatened" status of the lake, any increase in nutrient loading or algae growth would constitute a violation of Idaho water quality standards. (S6337)

Response: Surface water quality impacts disclosed in Chapter 4, Hydrology (Surface Water Quality) for all alternatives indicate minimal impacts to the Clark Fork River that are well within both the Montana water quality standards and the Clark Fork River Voluntary Nutrient Reduction Program of the Tri-State Council. Also, impacts to Lake Pend Oreille are detailed at the end of the Surface Water Quality effects section for each alternative. As noted, there will be an increase in nutrient loading, but it would not be measurable and not result in significant changes in aquatic communities. This water quality effects assessment drives the biological findings - that minor changes in algae production and insect communities and beneficial uses may occur, but the outcome would not be detectable or significant (see Chapter 4, Aquatics/Fisheries).

The effects analysis was not intended to diminish the issue of impacts on Idaho. The analysis used the best information and tools available, and indicates that there is a minor impact on productivity that diminishes to insignificance outside the mixing zone and into Idaho. That change is not expected to be measurable, and no algal blooms or significant changes in productivity attributable to the mine are anticipated. The State of Idaho participated in the analysis and development of the MPDES permit and this EIS.

10. Page 207, Table 2-18. "Nitrogen loads would temporarily increased in Rock Creek and the West Fork during mine construction and would impact aquatic invertebrates and algae in the short term." It is inappropriate to say that nitrogen loads would impact algae. Do you mean an impact on algae (increased growth of certain algal species?) would impact the overall health of the watershed? What is "short term?" (S3462)

Response: This summary statement is correct as written. Minor nitrogen increases are expected due to leaching from adit waste rock used to construct facilities. This nutrient increase would trigger an increase in algal production and possibly a minor change in algal community composition - both effects are impacts from mine development. The magnitude of these impacts will not be so great as to adversely affect "watershed health," and are expected to be unmeasurable before returning to existing conditions within five years. We expect a concurrent response by the insect community to these water and plant effects in the form of a small increase in productivity and minor change in community composition for insects.

11. Page 3-47 Aquatic Plants: In which category of algae do the agencies place dinoflagellates? Are they included in the algal groups recognized by the SDEIS or DEIS? I raise this point because of doubts it raises about the lack of thorough biological analysis of waters affected by the proposed mining project. The following is consistent with the high frequency of "Personal Communication" citations in both the DEIS and SDEIS: Please consider the following: L. Mitchell, 1996 and 1997 (pers. comm) suggests that dinoflagellates are a significant component of lower Clark Fork biota. Single-species dinoflagellate blooms (tentatively identified as Glenodinium) in the Cabinet Gorge Reservoir have been confirmed by microscopic analysis. During August of 1996 and 1997, dinoflagellate blooms turned extensive areas of Elk Creek bay and areas immediately downstream dark red. Literature on toxic dinoflagellate blooms in brackish waters of U.S. mid-Atlantic coast suggest nutrient pollution is a causative factor. Has MT DEQ or other agencies compiled any data on seasonal spikes of nutrients to Cabinet Gorge Reservoir and consequent algal (photosynthetic protist or bacteria) blooms? Seasonal spikes coupled with Asarco's new, more-or-less continuous point source could seriously affect the dynamics of the lower Clark Fork and Lake Pend Oreille ecosystems.

Also on p. 3-47 (a petty comment in some circles; not in others): You might consider listing and discussing 'blue-green algae' in a separate category from aquatic plants. Cyanobacteria ("Cyanophyta") = bacteria=prokaryotes; not plants. (S3462)

Response: Dinoflagellates are members of the pyrrhophyte family of algae, which were not discussed in the draft EIS and supplemental EIS. We considered the data available from the State of Montana and Avista, as well as the baseline data provided by the applicant. Dinoflagellates were included in several reports on the reservoir periphyton community. The reader is correct about dinoflagellate blooms and nutrients in salt water environments, but these phenomena should not be extrapolated to this project. Brief algae blooms are known to occur in the Clark Fork reservoirs during the fall turnover period, but they do not result in water quality problems, fish kills or oxygen depletion problems. Without nutrient loading data for Elk Creek and the reservoir bay area, we cannot judge the significance of the dinoflagellate bloom you report. It is possible that the bloom you report has more information value for landuse management in Elk Creek than it does for management of Clark Fork river quality and permitting of the mine. Given the known nutrient state of the river and reservoirs, what is known about the reservoir periphyton community, the flushing rate of the reservoirs, and the probable water quality effects from the mine, no significant effects from the mine are expected. There will be no sudden, or dramatic, shifts in the physical and biological condition of the river and reservoirs. Avista is monitoring nutrient dynamics in Cabinet Gorge with supervision by the states of Idaho and Montana. To date only one nutrient "spike" has been observed in Noxon Reservoir, and that is believed to have been either a sampling error or a transient event following an algae bloom in the upper reservoir.

Our effects analysis indicates insignificant (and unmeasurable) impacts on reservoir and river water quality due to mine water treatment, the enormous dilution capacity of the river, and the relatively small change contributed by the mine. There should be no significant impact on algae except in the immediate vicinity of the point-source discharge. We do not anticipate a significant effect on reservoir dinoflagellates because of the relatively minor change in water quality under all but the most extreme (and highly unlikely) reservoir conditions, and the absence of any reports of extensive algal blooms in past years when phosphorus loading was higher in the Clark Fork system. There will be extensive monitoring required to evaluate the effectiveness of the water quality and beneficial use protection measures. Data would be used to trigger needed project modifications if impacts were to occur.

Blue-green algae are members of the Cyanophyta. Since they exhibit characteristics of both plants and animals, there is still debate on whether they are plants, animals or something in between. Rather than take sides, we include them where they are officially classified.

12. The SEIS rightly provides an in-depth examination of Rock Creek baseline macroinvertebrate data, including an assessment of biological impairment based on various metric scores (Table 3-17). This assessment indicates moderate impairment at all of the Rock Creek stations on one or more sampling dates. The SEIS does not, however, present any bioassessment based on periphyton metrics. The 1985 Rock Creek periphyton data can and should be evaluated according to the State of Montana periphyton bioassessment procedures (Bahls 1993). We also note that only one year of baseline periphyton data were collected in contrast to four years of baseline macroinvertebrate data. If DEQ is serious about using periphyton for bioassessment at Rock Creek, more than one year of seasonal baseline data will be required to establish inter-annual variation.

Priscu (1989) reports that nitrogen limits summertime algal growth in the Clark Fork River below Noxon Dam and that nutrient bioassays below Noxon Dam indicate "moderately high" algal growth potential in the river. This is substantiated by the abundance of nuisance algae (Oscillatoria) observed below Cabinet Gorge Dam in 1985 (Priscu 1989) and by blooms of another blue-green alga (Anabaena) in Noxon Reservoir (Vicki Watson, pers. comm.).

Another way to gauge algal growth potential in the Clark Fork River is to compare ambient nutrient concentrations with numeric guidelines to prevent nuisance algal growths. The USEPA (1986) advises that total phosphorus should not exceed 0.025 mg/L within a lake or reservoir. [The Clark Fork at Noxon is the tailwater of Noxon Reservoir and the headwater of Cabinet Gorge Reservoir; nutrient concentrations are very uniform from below Noxon Dam to below Cabinet Gorge Dam (Priscu 1989)]. Aquatic plants require N and P in a ratio of about 7:1 (Redfield 1958). Hence the amount of N that may be expected to cause nuisance algal problems in Cabinet Gorge Reservoir is 7 X 0.025 mg/L = 0.175 mg/L. Average baseline TIN concentrations in the Clark Fork River at Noxon Bridge (Table 3-4) are about 20% of this guideline and maximum concentrations (0.18 mg/L) are now over 100% of this guideline.

Given the potential for nitrogen-stimulated algal growth in the river and the release of biologically-available nitrogen from outfalls 001, 002, and 004, algal nutrients and standing crop in the river need to be monitored. However, no baseline data for algal standing crops in this reach of the Clark Fork River appear to be available at this time. Such data need to be generated before construction commences. Priscu (1989) predicts a 41 mg/m^2 increase in chlorophyll standing crop below the Rock Creek Mine. This amount should be added to measured baseline values and compared to criteria presented by Biggs (1996) in order to judge whether objectionable growths are likely to occur.

Experience with periphyton monitoring at the Troy Project dictates that much more rigor is required in sampling and analysis in order to ascertain site-to-site and year-to-year differences in metrics and to separate natural

variation from anthropogenic variation in highly variable systems like Stanley Creek, Lake Creek and Rock Creek. Indeed, Protocol II (Bahls 1993) may not work at all in Rock Creek because it requires close physical similarity between the reference site and study sites. The best approach, and perhaps the only viable approach, may be to compare post-mining data with pre-mining data at each site and to monitor changes at a each site from year to year.

If periphyton are to be used successfully as biological monitors in Rock Creek, the following steps need to be taken: Three additional years of baseline data are needed to match the four years of macroinvertebrate baseline data already collected. As with macroinvertebrates and sediment core samples (Thomas 1994), five replicate samples should be collected for both periphyton species composition/community structure and periphyton standing crop. [Standing crop (chlorophyll and AFDM; APHA 1992) should be measured rather than the "primary productivity" measurements suggested in the Fisheries and Aquatics Monitoring Plan (Thomas 1994).] The relative abundance of non-diatom ("soft") algae cells should be quantified. This may be done by homogenizing the samples and counting the cells (or cell units) using a Palmer-Maloney counting chamber (see Barbour et al. in press). More rigorous QA/QC procedures need to be applied to periphyton sampling and analysis (see Barbour et al. in press). Diatom species composition and abundance data for each sample should be used to compute a suite of metrics, including species richness, Shannon diversity index, disturbance index, pollution index, siltation index, and (if appropriate) community similarity index. These metrics should be scored and used to assess impairment in the same manner as macroinvertebrates (Table 3-17). Periphyton standing crop data should be compared to criteria presented in Biggs. (1996).

In addition, two periphyton sampling sites need to be established on the Clark Fork River, one above and one below the zone of mine impact. These sites should correspond to water quality monitoring sites. Both species composition/community structure data and periphyton standing crop data should be collected, including a minimum of four years of seasonal baseline data. (S5087)

Response: The reader has contributed some valuable insights and recommendations regarding periphyton. The baseline periphyton data for this project meet the regulatory requirements established by the State of Montana. The baseline data will indeed influence how the monitoring requirements are structured. The reader also succinctly illustrates the water management challenges Montana and Idaho face in the Clark Fork basin. As the final EIS indicates, a host of water quality parameters (including nitrogen) have strict limits applied in this project. Please examine the monitoring requirements in the final Appendix K, and revisions to the effects analysis (final EIS Chapter 4), to find the revisions we have made based on these and other comments. As noted in the revised Fact Sheet/Statement of Basis, final effluent wastewater limits for outfall 001A are flow nondependent and equal to 232 pounds per day for total inorganic nitrogen (average monthly load) and 23.2 pounds per day for total phosphorus (average monthly load). Predicted changes in concentrations at the Montana-Idaho state line under 7-day, 10-year low flow conditions will not exceed the method detection limit or the minimum level and therefore, by definition, will not cause a measurable change in concentration based on these criteria.

13. The original DEIS and the SDEIS both imply that acidification and nitrate are the only problems with the waste rock dumps, tailings and adit drain water. This is certainly not the case, and drainage from disturbed, mineralized rock is likely to release a variety of contaminants. These contaminants (selenium, arsenic, sulfate, thallium, antimony manganese and nickel) are commonly observed from precious metals (non-acidic) rock and can adversely affect sediment in the receiving water. Although the overlying water quality may not always reflect contamination, the sediments, which contain important food web macroinvertebrates, can accumulate these contaminants, and become less able to support those organisms. As such, the monitoring program for the mine should include chemical and macroinvertebrate sampling above and below the mine. The macroinvertebrates are integrators of contaminants in the system and changes in those populations can provide the best indicators of environmental stress. (S6301)

Response: A complete analyses of potential impacts to surface and ground water quality and aquatic invertebrates is presented in Chapter 4 of the EIS (see Hydrology and Aquatics/Fisheries). Benthic macroinvertebrate sampling would occur at approximately ten stations (largely matching locations sampled during baseline surveys) three times per year.

14. Page 3-50: I find it difficult discussing the information presented on Lake Pend Oreille without being strident. How can federal agencies justify permitting the Rock Creek mining project without any meaningful baseline data on the biota of this major freshwater ecosystem directly downstream? Arguably, this is the single most damning aspect of the entire Rock Creek proposal, and the one that the public, once informed, would likely hold a permitting agency most culpable for. (S3462)

Response: Additional data on the aquatics and fisheries resources in Lake Pend Oreille was added to this section of the EIS.

FISH-601 General Fish Species and Habitat

1. Alternative V does not comply with INFISH standards and guidelines. Standard MM-2 specifies that adverse impacts to riparian zones and fish from the construction of roads and facilities should be avoided. It is likely that some sediment would be deposited in mainstem Rock Creek from construction activities within the riparian zone. Because sediment fines are already high, increased short-term sediment loading could adversely affect fish. INFISH has been amended to the Kootenai Forest Plan. Will Alternative V require a Forest Plan amendment to allow for this non-compliance with INFISH? (S22)

Page 4-75 of the SEIS discusses INFISH standards, and notes that Alternative V will violate them. INFISH Standard MM-2 specifies that adverse impacts to riparian zones and fish from the construction of roads and facilities should be avoided. Yet the SEIS admits that "it is likely that some sediment would be deposited in mainstem Rock Creek from construction activities within the riparian zone. Because fine sediments are already relatively high in Rock Creek spawning gravels, increased short-term sediment loading could adversely affect inland native fish."

Additionally, p. 4-75 states "there would be some direct disturbance of stream habitat of Rock Creek during mine facility construction," and "there would be some limited impacts to stream habitat in Rock Creek under Alternative V in the short term."

Clearly, project-related impacts will violate INFISH standards, and will threaten the continued existence of native fish in the Rock Creek drainage. Additionally, we disagree with the statement on p. 4-73, which states that "the road construction design could satisfy the overall goals and objectives of INFISH even if the specific standard is not met."

Additionally, Appendix B acknowledges that: "The ASARCO/Rock Creek project is in compliance with INFISH [Inland Native Fish Strategy] standards and guidelines except where noted below." Bull Trout Section 10. As one example, the document states that: "The proposed project and other concurrent activities may jeopardize the continued existence of adfluvial bull trout in Rock Creek by increasing sediment loads during mine construction or in the event of a severe mine-related accident." Id. at 16. The document notes that this increased sediment would occur "within the riparian zone." Id. at 11.

On July 28, 1995, Regional Forester Hal Salwasser signed the Record of Decision and Finding of No Significant Impact for the Inland Native Fish Strategy Environmental Assessment (INFISH). Compliance with these standards is especially important at Rock Creek because the KNF has not adopted standards and guideline for sensitive species, and instead use INFISH as a surrogate. The INFISH ROD created interim protection for inland native fish on 22 National Forests, including the Kootenai National Forest. As part of that protection strategy, six standards for Mineral Management were established, MM1-MM6. Of particular interest are standards and guidelines MM1 to MM3.

MM1: Minimize adverse effects to inland native fish species from mineral operations.

MM-2: Locate structures, support facilities, and roads outside Riparian Habitat Conservation Areas. Where no Alternative to siting facilities in [RHCAs] exists, locate and construct the facilities in ways that avoid impacts to [RHCAs] and streams and adverse effects on inland native fish.

MM-3: Prohibit solid and sanitary waste facilities in Riparian Habitat Conservation Areas. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in Riparian Habitat Conservation Areas exists, and releases can be prevented and stability can be ensured, then:

a. analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.

b. locate and design the waste facilities using the best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in Riparian Habitat Conservation Areas.

c. monitor waste and waste facilities to confirm predictions of chemical and physical stability, and make adjustments to operations as needed to avoid adverse effects to inland native fish and to attain Riparian Management Objectives.

d. reclaim and monitor waste facilities to assure chemical and physical stability and revegetation to avoid adverse effects to inland native fish, and to attain the Riparian Management Objectives.

e. require reclamation bonds adequate to ensure long-term chemical and physical stability and successful revegetation of mine waste facilities.

The National Forest Management Act (NFMA) requires that all agency projects and activities "shall be consistent with the land management plans." (16 USC 1604(I)). The Record of Decision (ROD) for INFISH amended the Kootenai National Forest Plan. The Standards and Guidelines (S&Gs) incorporated into the Kootenai Plan must be met at the project-decision level, such as the Plan of Operation/EIS in this case.

As the Ninth Circuit noted just last month in a major Forest Service case: Pursuant to the NFMA, the Forest Service must demonstrate that a site-specific project would be consistent with the land resource management plan of the entire forest. 16 U.S.C. B 1604(I); 36 CFR B 219.10(e) ("[T]he Forest Supervisor shall ensure that all outstanding and future permits, contracts, cooperative agreements, and other instruments are consistent with the [land management] plan."). Neighbors of Cuddy Mountain v. U.S. Forest Service, 1998 WL 89069, 3 (9th Cir., March 4, 1998).

Thus, the Standards and Guidelines for INFISH must be met by the Forest Service in reviewing the Rock Creek project. As admitted by the agency, that has not been done. As such, the agencies must develop alternatives that do. The agency cannot excuse violation of the S&Gs by simply stating that "[s]pecific mitigations could satisfy the overall goals and objectives of INFISH even if this specific standard was not met." Bull Trout Section at 11. The Standards and Guidelines must be complied with, period.

At a minimum, the Forest Service must detail a new alternative that fully complies with each and every S&G for INFISH, especially with regard to bull trout and westslope cutthroat trout. In the end, only an alternative that fully complies can be considered as a viable alternative. (S6318)

Response: Inland Native Fish Strategy (INFS) acknowledges that human use within riparian areas cannot be totally eliminated. Hence the language, "if no alternative exists" and words like “avoid” occur in many INFS standards, as in many situations there are no better alternatives to the proposed action. INFS is clear that no action should retard the attainment of riparian management objectives, but it clearly does not prohibit activities within the riparian areas. Alternative V as described in the final EIS has been revised to be fully consistent with INFS.

Chapter 4 for the preferred alternative indicates adverse effects to native fish have been greatly reduced at all scales of analysis.

Virtually all project facilities would be located outside the Riparian Habitat Conservation Area (RHCA), and some existing features (roads) have been relocated. Those features that would remain in the RHCA (primarily portions of the road and utility corridor) include extensive abatement and mitigation measures to minimize their impact on riparian values and processes.

The mine waste rock has been subjected to testing and would not be toxic. Additional mitigations would be in place to test waste rock and ensure that no acid generating material was used for mill pad or starter dam construction

The tailings paste facility under Alternative V would be more stable than a conventional impoundment and the lesser amount of water contained in the paste would minimize the release of pollutants.

Monitoring of project facilities, water quality and aquatic organisms would be required of the proponent, with detailed monitoring plans to be submitted before final approvals are issued.

All project facilities would be reclaimed and monitored.

Project bonding would be specified at the time of permit issuance (see GEN-1501 for more comments and responses about bonding.

The supplemental EIS should have been more clear that though there was activity planned within the RHCA, it was consistent with INFS as is the proposed relocation and mitigation. Alternative V, as described in the final EIS is fully consistent with INFS. Even so, the potential exists for adverse effects to bull trout and other native aquatic species within Rock Creek as a result of construction and operations. Consultation with the USFWS identified increased sedimentation from construction as a concern to be mitigated. Appropriate mitigations to reduce negative impacts from construction and operations that could result in increased sedimentation have been identified in the subsequent biological opinion developed through consultation with the USFWS and included as part of Alternative V. The situation with westslope cutthroat trout is somewhat more complex. This native species is hybridized in this watershed through past management and has been effectively lost. Though we conclude that there may be adverse effects to westslope, the project would not contribute toward listing the species.

2. "Increased sediment loading within the riparian zone could adversely affect inland native fish." Portions of FDR No. 150 (an existing road) are within the INFISH RHCA for Rock Creek (Asarco SDEIS, 1998; VOl1 App B p 11). The paste storage facility would also be in violation of INFISH standards. Logging which has already begun is in violation of INFISH guidelines. There is clearly multiple violations regarding the INFISH 300 foot buffer Category 1-4 provisions. The deliberate exclusion of INFISH standards, by relying on continued anthropogenic disturbances, and by not recognizing and describing the past and future natural terrestrial successional patterns or disturbances, within the RHCA's will cause the Clark Fork / Pend Oreille bull trout metapopulation to be greatly disrupted. (S3469)

You could also demonstrate that the mining project will meet regional fish habitat protection standards. (S3701) (S4797)(S4801)

The SDEIS overtly admits that significant impacts will occur to westslope cutthroat and bull trout. Such impacts are unlawful and prevent the ASARCO mine from preceding. There are currently no action alternatives that do not

impact these native fish species. All action alternatives, including Alternative 5, violate INFISH, jeopardize bull trout, and significantly impact both resident WCT and bull trout populations in Rock Creek. Due to the significant impacts to water quality and fisheries, this project can not proceed as proposed. (S22)

Page 4-69 This model predicted that annual sediment yield..... This is unacceptable from the standpoint of aquatic life standards and Bull Trout habitat alteration. 36CFR 219.19(a)(7). (S614)

Last paragraph p. 73, top of 74: The last sentence in this paragraph implies that INFISH goals and objectives could be met "even if this specific standard was not met." (This same contention is repeated on p. 11 Appendix B (BA for Bull Trout). This statement makes no sense and appears to be a deliberate attempt to mislead the reader. If, as the model predicts, sediment will increase by 30%, and is already high, it is logical to conclude the INFISH goals cannot be met. This conclusion, not the nonsense statement, belongs in the SDEIS. (S3462)

Response: As stated in the final EIS, Alternative V is consistent with Inland Native Fish Strategy (INFS) requirements. Implementation of INFS does not preclude activities within a Riparian Habitat Conservation Area (RHCA). As required by INFS, the project would retard the attainment of RMOs and would allow for improving riparian conditions. The logging that has occurred in the Rock Creek riparian area was done on private land and complies with the State of Montana streamside management zone regulations. The riparian vegetation along Rock Creek will continue to mature despite minor project disturbances. Implementation of the preferred alternative would mitigate many of the existing effects of riparian development, protect dependent resources, and accelerate recovery of important riparian values.

This final EIS, which includes a revised Alternative V and an effects analysis that is consistent with INFS standards, would result in no net increase in sediment in Rock Creek at all points in time, would mean a long-term cumulative reduction in instream sediment, would require sediment abatement and mitigation solely in Rock Creek on public and private lands, and would cumulatively mean a limited impact on populations of bull trout.

The supplemental EIS INFS findings that state an INFS standard would not be met were misleading. The project would have impacts to the riparian and stream system; however it would be consistent with INFS by reducing impacts to those values. The objective of INFS is to protect riparian values, which for fish habitat are measured by RMOs. The alternative as proposed and described in the final EIS is consistent with INFS as it would reduce the impacts of implementing the project, particularly as those effects relate to the production of additional sediment. The potential sediment production that may occur during construction has been a focal point of proposed mitigation developed through the NEPA and ESA consultation processes.

3. The Supplemental DEIS (Chapter 4) identifies a range of impacts to native bull trout and westslope cutthroat trout populations in Rock Creek that the SDEIS states ``could lead to the potential loss of Rock Creek as a spawning and rearing tributary'' of the Clark Fork River. In 1996, a collaborative effort of biologists, hydrologists, and other scientists, referred to as the Montana Bull Trout Scientific Group, prepared a report for Governor Racicot's Montana Bull Trout Restoration Team that addressed the status of bull trout in the Lower Clark Fork River drainage which includes the Rock Creek watershed. The primary threats to the persistence of bull trout, as identified in the report, are hydroelectric dams, timber management practices, and mining. Of importance, the report specifically mentions mining in the Rock Creek watershed as one of the primary threats.

The Rock Creek drainage is important because it currently (and historically) supports one of the strongest remaining populations of bull trout in the Lower Clark Fork drainage. Accordingly, the Group designated the Rock

Creek drainage as a ``core area.'' Core areas are considered key habitats for ensuring the continued existence of bull trout and thus should receive the highest priority for protection and restoration activities.

The findings presented in the biological assessment (Appendix B of the SDEIS) for bull trout conclude that the project, with the proposed mitigation, will not likely jeopardize the continued existence of the bull trout metapopulation. However, the Department believes important habitat information on Rock Creek and the Lower Clark Fork drainage describing the status of the environmental baseline and the effects of the proposed action on bull trout is missing from the biological assessment.

For example, the Bull Trout Section (page 15) reports that temperatures in excess of 59 F limit bull trout distribution. However, water temperature data has not been collected in Rock Creek (to establish the baseline conditions), and the analysis fails to analyze whether or not water temperature will change as a result of the ASARCO mine project. The SDEIS also reports that instream wood or high channel complexity is an important habitat variable to quantify (Bull Trout Section, page 15), yet the analysis inadequately quantifies the existing condition in Rock Creek, nor does it identify whether or not the project will change the existing conditions or recruitment rate of large woody debris. Other shortcomings are evident in the analysis pertaining to (1) the anticipated effects of the projected 30 percent increase in annual sediment yield (Bull Trout Section, page 10) on substrate embeddedness and surface fines, (2) anticipated changes (quantified) in channel and streambank stability, and (3) characterization of the existing and projected changes in the number and depth of pools and the average wetted width/maximum depth ratio of scour pools in a given reach. (S971)

Warming of instream water temperature is one of the most common factors in the decline of healthy bull trout populations. In spite of this, no temperature data were gathered to determine whether there are existing temperature barriers to spawning, rearing and migration. The BA claims that the project will have no effect on water temperatures. However, the construction and reconstruction of many miles of road along with clearing of corridors for pipelines and powerlines which will require numerous stream crossings is likely to affect stream temperatures.

Another important component of fish habitat that has not been assessed is the frequency and residual volume of pools throughout Rock Creek and its tributaries. (S805)(S1687)(S1851)(S6806)

Response: The supplemental EIS did not include an item-by-item in-depth disclosure of effects for all Inland Native Fish Strategy (INFS) riparian management objectives (RMO) (see comments about temperature, woody debris, channel complexity/stability, channel/bank stability, pools and channel dimensions). The reason the supplemental EIS (and final EIS) does not discuss these elements extensively is that the proposed action would have clearly discountable effects on these habitat factors and there was nothing of significance to report. Thus, the supplemental and final EISs include a finding on whether an alternative is consistent with INFS requirements for all RMOs and standards. A consistency finding means the proposed action would promote maintenance or restoration of watershed conditions, and that there would be no significant effects on RMOs like temperature, woody debris, instream stability and pools.

It is only when access and utility work would occur in Rock Creek itself (i.e. direct effects) that the proposed action would affect woody debris, channel shape and channel condition RMOs. Our analysis includes consideration of data from Washington Water Power (now Avista) that was collected in Rock Creek in the early 1990s. Because the various mine facilities would be largely surrounded by a containment system, there would be no water yield and peakflow changes that indirectly affect the Rock Creek stream channel.

Since we have consolidated all utilities within the road corridor, and the majority of access and utility work would be an upgrade of an existing road corridor, we found that the approximate 100 discrete locations where work would actually occur in a streambed or riparian area would not be significant in the context of the entire Rock Creek riparian habitat conservation area. Roughly ninety percent of the instream activities would occur in draws or swales that have surface flow (if any) for a few weeks a year, and do not support onsite beneficial uses. Further, 85% of the road/utility corridor already exists but would be doubled (more or less) in width, while the new access construction would be almost entirely well outside the riparian zone.

In short, the amount of riparian habitat conservation area physically disturbed by the proposed action is approximately 1 percent, in the majority of instances it is only lightly affected since it is a pre-existing disturbance area, and almost always occurs where there are no onsite aquatic beneficial uses. Because the riparian area outside these disturbance zones would be undergoing a concurrent recovery process (tree growth, wood input, channel armoring, etc.), and an extensive effects abatement and protection program would reduce the indirect and cumulative effect of disturbed areas on Rock Creek, we find the proposed action would have discountable effects on riparian values and processes.

4. The plans they have shown so far are inadequate to protect fish.. (S4485)

Response: The trout population in Rock Creek would be protected, and perhaps even benefit slightly over the long term, under the preferred alternative (Alternative V). Please see Chapter 4 for more details.

5. Page 3-15 (Rock Creek): The statement that a self-supporting salmonid fishery is present despite the potential impacts from elevated metal concentrations in Rock Creek does not mean there is no existing impact of water quality on salmonids and other aquatic life. It only means that some level of a population is able to maintain itself with this stress. (S146)

Page 3-46 - Metals concentrations in fish, concern: lead should be tested, to see what it is and to establish a baseline. (S5093)

Response: The statements on page 3-15 of the supplemental EIS point out that baseline water quality is excellent despite several exceedances of water quality standards, and the fish population shows no overt signs of being adversely affected. Other data from Avista indicate Rock Creek supports very high numbers of trout relative to other watersheds in the lower Clark Fork. Under controlled conditions many aquatic animals actually become more vigorous in the presence of minor increases in metals loading. This is thought to occur because many metals are essential to life and can be in short supply in high quality waters, and because natural environmental "irritants" often stimulate an organism's health defense mechanisms. Rock Creek water quality is having no apparent impact on the fish; conversely, other more compelling evidence indicates historic stream channel and riparian alterations have reduced the trout population well below its optimum state.

Lead was one constituent evaluated in the water quality baseline data program, but not in the fish tissue testing because the water quality indicated lead in fish would be in trace amounts far below any health concerns. Chapter 3 indicates only trace amounts of lead in the water column. Chapter 4 indicates that even under severe climate conditions, lead levels in the water (Alternative V) would be well within State regulations. A baseline data set for lead is unnecessary since a trigger value and State standard have been established.

6. Page 4-180, paragraph 1 - This statement is not supported by the analysis earlier in the SDEIS. There is no discussion of water quality degradation in Rock Creek. With appropriate mitigation there should not be sediment increases that would adversely impact fish populations. (S5)

Page 3-32 (Rock Creek, 2nd paragraph): We want to reiterate a comment made on the DEIS that the large eroding bank located 0.2 miles up Engle Creek should be stabilized to reduce sediment delivery to Engle and Rock Creeks as part of the recommended sediment source reduction mitigation. (S146)

Response: As Chapter 2 and 4 indicate, we have revised the sediment prevention and mitigation requirements in Alternative V. New information acquired after publication of the supplemental EIS, together with a far more refined analysis of sediment impacts, indicates we can substantially reduce long-term sediment impacts resulting from construction and operation of the mine. Two natural sediment sources have been evaluated, and two other sediment source areas are known, in the Rock Creek watershed. An analysis of effects of all activities, together with some validation monitoring information, allowed us to specify a numerically-specific sediment mitigation program for this project to occur within the Rock Creek drainage; mitigations in Bull River could still be included, but would not contribute to the revised sediment mitigation requirement. Stabilization and revegetation of known streambank sediment sources within the Rock Creek drainage concurrent with construction of the mine will ensure no net increase in fine sediments in the stream network under Alternative V. Over the longer term, maintenance of these mitigation measures will slowly reduce the sediment load in Rock Creek as old instream deposits are flushed out and not replenished.

7. Page 4-72, paragraph 1 - There is no evidence to demonstrate increased recreation or fishing use of Rock Creek drainage. The Socioeconomic section cited actually predicts a smaller population with the mine. (S5)

Response: We stand by our effects predictions for recreational fishing. Chapter 4 indicates a population increase with the mining project although at a slower rate than under the No Action alternative, with fluctuations in the size of that change related to the project activities underway at any given time. Similarly, the U.S. Fish and Wildlife Service has projected an annual increase in recreational fishing as the U.S. population grows, but the growth in fishing is expected to be smaller than the increase in the number of people. Thus, we conclude that recreational fishing activities will increase in the surrounding area, that fishing effort will at first increase in Rock Creek primarily due to off-duty recreation by construction workers, and that recreational fishing effort will shift away from Rock Creek and towards the reservoirs as the mine moves into the production phase.

8. Page 4-74, paragraph 3 last line - This conclusion (minor impacts to sediment) doesn't seem to follow through the whole document. The use of the phrase "potentially significant" is not consistent with the definition used elsewhere in the document (page 4-2). (S5)

Response: The comments on page 4-74 of the supplemental EIS, and the use of the term "potentially," reflect the uncertainties associated with an analysis of effects over a 30-year time span in a highly variable environment. The effects disclosed are minor relative to the existing baseline condition, but would be significant some years and not-significant other years as the amount of fugitive sediment varies, the amount of precipitation varies, the number of trout varies, and other factors overwhelm the adverse pressures put on the environment by project-related sediment.

9. Page 4-180, paragraph 5 - The indirect impact/population effect discussed previously is repeated here. The further conclusion that a small percentage population increase would "reduce the biodiversity of the Lower Clark Fork and Bull River valleys" is not substantiated. (S5)

Response: The loss of biodiversity prediction from page 4-180 of the supplemental EIS was predicated on unavoidable impacts to fish, amphibians, rare plants and riparian-dependent animals. This impact would result from habitat losses from increased human settlement and use of the surrounding area. The key concept of importance here is the term "unavoidable." A project of such magnitude cannot be implemented without indirectly caused concurrent landuse changes in the immediate and surrounding area. On the basis of what has been observed elsewhere, as humans increase their use of the environment, there is likely to be extirpation of one or more species from the lower Clark Fork valley as people use the valley bottoms and private land more intensively. This is unavoidable because the Agencies have little or no influence on private sector behavior and what people choose to do with private land.

10. Page 4-183, paragraph 5 - The conjecture (worst case analysis?) that "Spills of heavy metal could have long term impacts on the aquatic environment" is not provided in context. What would the source of such spills be, what would the likelihood of spills reaching the stream be? This very general "what if" scenario is not particularly useful or informative. (S5)

Response: The impact predictions from page 4-183 of the supplemental EIS evolve from the aquatic effects analysis earlier in Chapter 4. Here, on this page, we disclose that short-term uses could have long-term impacts on productivity. Since the aquatic environment is notoriously quick to recover from even major insults to its integrity, there are only a few special circumstances in which a major long-term impact would result from a proposed mine. Here we disclose that a failure of the tailings facility, or a substantial accidental spill of concentrated metals, would persist and adversely affect the environment for a period likely to exceed the life of the project. There are too many variables to specify where, when, what, and how large a spill or tailings facility failure would be. Those variables combined with natural variations of season and weather make predicting the magnitude of a spill or failure nearly impossible. The likelihood of these situations is very remote as indicated, but planning regulations demand the disclosure of a potential impact to give the public and decisionmakers a context in which to judge the tradeoffs between short-term resource use and long-term environmental health. The company has developed a spill response plan that describes the measures to take to prevent and cleanup spills.

11. Page 4-73 of the SDEIS provides a discussion on the relative risks to aquatic resources in the event of spills from a slurry pipeline failure. While we agree that Alternative V poses less risk than previous alternatives, the document none-the-less notes that impacts to aquatic organisms from a spill could be significant. As we indicated earlier, we believe statements about expected short term impacts from spills need to be qualified. A toxic spill which pulsed through the system might only have short term impacts on aquatic invertebrates, but could eliminate multiple year classes of fish. In the case of depressed stocks of fish, such an incident could lead to local extinction. (S4711)

Response: An accidental spill in Rock Creek could not be pervasive enough to totally eliminate one or many year classes of fish. Portions of the watershed (and the fish living there) would not be at risk of accidental spills because they are outside the zone of mining activity or upstream from potential spill locations. Further, there is a wide range of accident conditions that are at least possible, but only the most severe (in magnitude and materials involved) would be sufficient to cause a major fish kill. Also, accidents that occur at certain times of the year might affect stream reaches that are dewatered, thus offering the opportunity for cleanup and mitigation before flows return and fish downstream are put at risk. In conclusion, a number of truly catastrophic events (i.e. floods, volcanic eruptions) have been studied over the years by scientists that argue against your assertion.

Except in the case of accidents involving highly toxic materials, there are always fish that survive the catastrophe, and recovery of the fish population is typically much more rapid than the experts anticipated. However, depressed fish stocks and species like bull trout may not be resilient enough to survive a catastrophic event without suffering highly significant side effects (e.g. inbreeding) that could eventually lead to extirpation.

12. The BA discusses the risk of an "accident" or spill from ruptured pipe(s) and/or impoundment failure, but this is downplayed as well. In spite of contingency plans for reducing the impacts of a spill, if it were to happen, a major "accident" has the potential to wipe out all fish and fish habitat downstream in Rock Creek, not to mention having dire impacts on the Clark Fork River and its fisheries. (S805)(S1687)(S1851)(S6806)

Response: Mitigation of spill or tailings facility failure would depend upon the cause of the incident, when and where it occurred, the time of year, the weather and what and how much entered either Rock Creek and or the Clark Fork River. There are too many variables to get specific about mitigation for these low probability incidents. How effective mitigation would be, would depend upon the same variables as well as what other damage the cause of the incident had elsewhere in the region.

13. Bull Trout Section, page 17. In the event of a mine-related accident that adversely affects aquatic life, restoration needs to include restoring fish populations to their pre-accident condition. (S1816)

Response: Restoration requirements in the case of low probability accidents are deliberately general to account for the large range of potential impacts that would need to be fully mitigated to pre-accident conditions;

14. DEIS p. 2-118/SDEIS p. 2-105. Issue 3, 1st bullet: "surface water quality and aquatic life in lower Rock Creek and Clark Fork River if failure occurred (all action alternatives)" should read "surface water quality and aquatic life in lower Rock Creek, Clark Fork River, Cabinet Gorge Reservoir, and Lake Pend Oreille if failure occurred (all action alternatives)." (S3462)

Response: The reader is correct regarding the statements on page 2-105 of the supplemental EIS for a tailings impoundment failure. However, the impacts to Lake Pend Oreille would be substantially less than those upriver since a reservoir would act as a highly effective sink, and if the failure was small enough, the impacts would actually be insignificant. We have revised the text in the final EIS accordingly.

15. Page 4-76, last paragraph - The "concurrent activities" alluded to in this discussion should be identified. The vague reference to Cabinet Gorge mitigation issues (i.e. fish passage?) is not clear. If the FERC re-licensing is a cumulative impact it should be more thoroughly discussed, if not why is it referenced. (S5)

The SDEIS still does not fully consider potential cumulative impacts to Idaho fishery resources, particularly in light of the reasonably foreseeable action to restore connectivity between the Montana portion of the lower Clark Fork basin and the portion within Idaho, including Lake Pend Oreille. (S4711)

Response: The "concurrent activities" are identified in Chapter 2 "Reasonably Foreseeable Activities" section of the final EIS. The indirect reference to fish passage is meant to highlight that restoration of the migratory population component is the best hope for long-term conservation of bull trout in the lower Clark Fork River and Rock Creek. The FERC has issued a new license for the Avista projects and part of the license requires addressing the feasibility of reestablishing upstream connectivity. Should the monitoring required by the new Avista license show that reestablishing connectivity is possible as well as beneficial to the native salmonid populations in the lower Clark Fork, then upstream fish passage will be provided. The cumulative impact of reestablishing

connectivity would be to allow fish originating in Montana to return to their natal streams and spawning. Providing large migratory individuals access to their natal streams could potentially provide for increased recruitment to Lake Pond Oreille.

16. Page 3-50 last paragraph brings up cumulative impacts ... Lake Pend Oreille was an important fishery resource until Corps dammed the Clark Fork and the Pend Oreille River. Should one consider cumulative impacts over a longer (50 + years) period of time, rather than just current permit applications? The loss of 90% available spawning habitat is already gone - why would the FS or MDEQ, or IDEQ even consider permitting an activity which could potentially disrupt what habitat is left in the lake? The lead agencies should have a broader view. (S4832)(S4833)

Response: The material on page 3-50 of the supplemental EIS describes historical impacts. We looked back almost 50 years to the single significant historical change that triggered the major decline in local native fish - total elimination of the migratory fish run up the Clark Fork. We also identify other habitat impacts spanning the full period of Euro-American settlement of the region. As Chapter 4 indicates, the preferred alternative (V) would not significantly affect Rock Creek or any other downstream habitats or local or distant aquatic organisms. The purpose of an EIS is not to endorse or reject any particular use of the environment - rather, it identifies the consequences of such use and leaves it to the reviewer to conclude what is acceptable.

17. SDEIS p.4-74 3rd par. last sentence. Therefore, impacts from sediment to Rock Creek would be minor but potentially significant under Alternative V. This conclusion directly contradicts earlier statements in the same section. (S5)(S3462)

We previously raised concerns about the potential for sediment inputs to Rock Creek. We remain concerned about this issue based on information provided in the SDEIS and the Biological Assessment (BA) for bull trout. On page 2-105, the document states that effects are predicted to impact sensitive aquatic species (bull and westslope cutthroat trout) due to increased sediment and increased interbreeding with non-native species (alternatives II and III). Further, the biological assessment (Appx. B, p. 16) states The proposed project and other concurrent activities may jeopardize the continued existence of adfluvial bull trout in Rock Creek by increasing sediment loads during mine construction or in the event of a severe mine-related accident. A key statement in the SDEIS appears on p.4-74, where it states impacts from sediment to Rock Creek would be minor but potentially significant under Alternative V. We interpret this to mean the delivery of relatively small amounts of sediment to Rock Creek will have a significant negative impact on bull trout populations and habitat. (S4711)

Response: We see no contradiction on page 4-74 of the supplemental EIS with the statement that says effects are minor but significant. Given the existing situation in Rock Creek we consider any discretionary increase in fine sediment to be significant if it (in part) affects habitats considered essential for bull trout spawning. Effects can be minor when they are small and (usually) much less than natural changes that occur every year. These minor effects can be significant, however, if even a small change can have long-term consequences that are significant. In the case of aquatics and fisheries, many project effects on habitat would be very small, far less in magnitude than natural year-to-year variations in habitat, would be unlikely to measurably affect aquatic animals, and would only last a few years. However, some of the minor effects could lead to a long-term decline in bull trout abundance, which is a significant impact. Please examine the final EIS carefully; we have modified Alternative V actions slightly to reduce effects (i.e. mitigate) below the level considered significant.

18. The Mitigation for Impacts from the Mining Activities is Inadequate. The BA relies upon BMPs, INFISH and non- specific mitigation for sediment to reduce the impacts of the project on water quality and fisheries. The

adequacy of forestry BMPs to protect aquatic resources from the impacts of logging are highly questionable. Expecting these BMPs to protect water quality from the impacts of a massive mining project borders on ludicrous. INFISH also has failed in many instances to protect native fish habitat, given the many variances that are built into it. (S805)(S1687)(S1851)(S6806)

We commend ASARCO's commitment to follow BMPs for logging, road construction, pipelines, and power lines, as well meeting INFISH guidelines. However, it should be noted that forestry BMPs were designed for water quality standards, and their effectiveness towards conservation of bull trout and WCT has not been determined. As noted in the DEIS, audits of compliance have been conducted at a number of locations. There has been no long-term effectiveness monitoring of these BMP sites to determine long-term impacts on bull trout and other native fish species. [We] encourage ASARCO and the agencies to continually monitor effectiveness of BMPs towards conservation of native fish, and implement stricter standards where appropriate. (S1816)

Response: Federal actions that adversely affect fish in some manner result in a change in water quality. This is because modern land management has all but eliminated direct impacts to habitat and actual killing of fish. Today we overwhelmingly mitigate indirect and cumulative effects that result from the upland activity-offsite transport-water quality-habitat-plant-insect-fish sequence of cause and effect. Alternative V would require periodic effectiveness monitoring for best management practices (BMP) and protection of beneficial uses.

All BMPs are not in some way designed to mitigate forestry activities. Although a few BMPs are indeed specifically intended to mitigate activities unique to forestry, the majority of BMPs are designed to mitigate activities that directly or indirectly affect soil and water resources. Whether in the long run BMPs will succeed in conserving sensitive species is an issue that may never be resolved because landuse activities are not the only threat to species. Certainly BMPs cannot shield rare animals from many significant threats (non-native fish competition, hybridization, poaching, climate change, etc.). The present regulatory approach to this conundrum is to prohibit many practices, mitigate other practices (BMPs), monitor the outcome, utilize new research findings as appropriate, and adjust activities as needed and repeat this process - more commonly called adaptive management.

19. Bull Trout Section p 8 -- The R1 Watsed model results are presented without adequate discussion of the model limitations and the significance of the results with respect to Bull Trout spawning impacts. Points that need to be clarified include:

R1Watsed evaluates changes in suspended load, not bed load. The model results cannot be directly applied to the evaluation of potential impacts to spawning habitat.

R1Watsed may over-predict the increase over existing conditions since it does not evaluate the existing effects of stream bank terrace erosion. This is identified as one of the principal sources of sediment on the main stem of Rock Creek (paragraph 4). This issue should be clarified as part of the discussion of the simulation of existing conditions.

The model may overestimate sediment loads from project activities due to a limited ability to evaluate the effect of BMPs such as sediment retention ponds.

There needs to be additional discussion of the magnitude of the predicted increases in suspended load. The predicted increase over background of 30% is equivalent to 3 mg/L of TSS during peak flow periods. This increase is very small and would typically be classified as a very minor impact.

When the R1Watsed results are cited for Alternative V it needs to be clarified that the predicted increase is prior to sediment source mitigation. This mitigation is a component of the preferred alternative. The predicted increase will be reduced or offset by proposed sediment source reduction, which cannot be evaluated by R1Watsed since the mitigation will include areas of channel instability not characterized by the model.

These limitations need to be adequately discussed where the R1Watsed results are cited. This is particularly true when citing the model results with respect to potential impacts to Bull Trout.

There also needs to be some qualitative discussion of the type of sediment being generated, the proximity to spawning reaches and the likely duration of any impacts.

Load is not analogous to deposited load. Increases in suspended sediment are not directly related to the quantity of fines (1/4 inch or smaller) present in spawning gravel.

The contribution of additional bedload to Rock Creek should be nominal due to the use of BMPs and the presence of a 300 foot wide vegetated buffer strip separating most areas of construction (roads, pipelines, mill facilities, etc.) from Rock Creek. Any sediment that does enter the stream from construction activities will likely be in suspended form and will tend to be flushed through the stream during high flows.

Most evidence of spawning activity is on the east and west forks of Rock Creek upstream of any major facilities. A sediment release from construction activities would likely be short lived and would occur on a portion of the stream that has very little evidence of active spawning. The short-term nature and possible location of a release significantly decreases the potential for significant long-term impacts to fisheries.

As discussed above instream source mitigation would likely prove more effective at decreasing sediment load than implementing general offsite storm water control BMPs.

Impacts can be quantified from both suspended sediment (TSS) and deposited sediments. Does this refer to project impacts or generic impacts from increases in these constituents? Increases in TSS are not explicitly quantified. Deposited sediment is not quantified at all. (S5)

Response: An EIS is not the appropriate forum for an in-depth discussion of effects modeling (e.g. R1-WATSED); however, there is uncertainty in the results of the analysis. For instance, WATSED cannot predict changes in streambed sediment conditions, for that we must default to professional judgement. For this project we took the results of the WATSED analysis and put it in the context of some model validation monitoring so we could evaluate the accuracy and realism of the model output. Then we considered what we understand about Rock Creek that is not incorporated in the model, and use our professional judgement and real-world observations to turn the model output into a physical and biological disclosure of effects.

Although the supplemental EIS notes a model prediction that suspended sediment could increase 38 percent early in the project, we did not claim an equivalent increase in streambed sediments. Logically, if a model does not consider a known disturbance process, it would tend to under-predict the real effects. Based on validation monitoring and field observations, our best judgement is that the WATSED model under-predicts real-world consequences significantly. However, this generalization only holds when you look at many watersheds and projects. We would expect a specific watershed or project to depart significantly from the general rule about model accuracy and realism. Although WATSED was built to compare alternatives, here in the final EIS we take the numeric prediction and

turn it into a specific mitigation requirement in Alternative V. See Appendix N for more discussion on WATSED and the results for this project.

The WATSED model output of a 4 milligrams per liter (mg/L) increase in suspended sediment (38 percent greater than existing, which is 121 percent of pristine conditions) may not seem that significant, but given the degraded condition of important habitats, the status of bull trout in the watershed, and what we know about the sensitivity of some aquatic animals to even small persistent changes in sediment, this 38 percent change could have significant consequences. Not all suspended sediment is exported from the watershed. Our validation monitoring in several watersheds indicates that surficial and streambed sediments rise and fall over the years in concert with disturbance activities and modeled predictions of effects.

The WATSED model addresses the non-organic suspended sediments that are transported from a disturbance area down to the stream network over the course of the peak flow season. This generally involves sand, silt and clay particles. The model does not consider bedload process effects, nor does it consider the streambed and streambank sediments that are mobilized during the peakflow season. The model considers all disturbances and nearly all mitigations (BMPs), with location of the disturbance influencing the probability that sediments will reach the stream. Our effects analysis thus considers activities that are in proximity to, and distant from, important habitats in the west fork and mainstem of Rock Creek. There are no stream reaches in the west fork and mainstem Rock Creek that would preferentially accumulate sediments and thus reduce the effects downstream. It is true that the direct sediment effects paragraphs pertaining to WATSED in the supplemental EIS do not consider the sediment reduction plan mitigation requirement because the location of the mitigation sites are unknown.

Some bull trout spawning probably occurs upstream of major facilities; we do expect effects on important spawning habitats in the west fork as a result of exploratory adit developments, and in the mainstem as a result of mill site and road reconstruction. The primary human-caused sediment sources are disturbed soils in the vicinity of stream crossings, plus other activities that do not have containment dikes around them. Sediment impacts from construction would be short-term (1-5 years before levels start to fall) depending on the effectiveness of revegetation efforts.

The sediment effects analysis is not numerically specific about the precise change in streambed sediments because the information and technology to do so does not exist. Despite these limitations, we did revise Alternative V to mitigate for a numerically specific effect (change in suspended sediment), but conditioned these numbers based on model validation monitoring and a safety factor to compensate for uncertainty (see other response regarding the sediment reduction plan).

20. Concerning sediments in Rock Creek: p. 4-56 of SDEIS says "...30 percent increase in annual sediment yield during the life of the mine [30 yrs, correct?] Same par: "At the end of the life of the mine, the peak flow value would drop one percent below the existing value [current baseline?], and the annual sediment increase is predicted to drop by 20 percent." [But on Page 4-74, the following appears:] "At the end of the life of the mine, annual sediment yield is predicted to by 20 percent lower than existing conditions." What on Earth does this mean? How is the reader expected to evaluate the potential effects of sediment to bull trout spawning from these statements? (S3462)

Response: Although these numbers have changed a little in the final EIS, here is a condensed version of the sediment and flow effects for Alternative V using supplemental EIS data:

- The 30% increase refers to the impact of the project without the agency required sediment mitigations.

- The total amount of water leaving Rock Creek in 1998 was approximately three percent higher than if the watershed were in pristine condition with no human development. The preferred alternative would not change this condition, but after thirty years of tree growth in previously logged areas, the total amount of water leaving Rock Creek would decline to two percent above pre-development conditions (i.e. a one percent drop).

- The total amount of fine sediments leaving Rock Creek in 1998 was approximately 121 percent higher than if the watershed were in pristine condition with no human development. The preferred alternative would increase the total sediment production to 159 percent above pristine conditions (a 38 percent increase) for the first five years of the mine, but by the end of the mining period of thirty years the sediment production would decline to 109 percent above natural (a 50 percent drop and 12 percent lower than in 1998).

What these numbers mean with regards to fish is stated in Chapter 4 and the bull trout Biological Assessment in Appendix B. Our conclusion was that the project would degrade spawning habitat and result in "take" as defined by the Endangered Species Act. The information provided in the supplemental EIS was somewhat ambiguous as final sediment mitigation sites would be identified through population and watershed monitoring that is currently ongoing as a result of the Avista relicensing and as identified by the USFWS through formal consultation for this project.

21. We've had some concerns about an earlier comment we provided, so we'd like to make a clarification here. On page 2-78; Vol. 1, Aquatic and Fisheries Monitoring and Mitigation Plan, first paragraph, second to last sentence starting with The plan…, change to: The plan would also include measures to improve in-stream sediment transport by increasing streambed stability and scouring. These measures should include addition of large woody debris or similar acting structures, where appropriate. (S1816)

Response: It may be appropriate to require the types of habitat improvement suggested in your comment. In-kind mitigation would be preferred; however, improving sediment transport, channel function, and habitat complexity would benefit bull trout. These types of improvements would be identified through the ongoing efforts of the Rock Creek Watershed Council in which the applicant is an active member.

22. The cumulative effects of Forest Service and private lands logging will further increase sediment loading and potential impacts to native fish. ASARCO logging on their land along the Bull River and in the Rock Creek drainage could reduce channel stability, further increase sediment, elevate water temperatures, and change the magnitude and timing of peak runoff events. (S22)

Response: The format of the document is such that direct and indirect effects connected to the project are addressed first. At the end of each resource section, the cumulative effects are addressed with an overall effects conclusion that incorporates project effects, other activities' effects, and mitigations. This can give the appearance of conflicting effects statements as the sum of the cumulative effects is often different from the result of the direct/indirect effects. This difference in determinations is a result of the difference in scale.

23. If the project is permitted, existing sediment inputs into the drainage should be reduced before additional impacts occur. Unfortunately, any mitigation activity would be difficult to measure for effectiveness because of the limited baseline data that appears to be available for comparison. Long-term baseline information would be required for effectiveness monitoring due to the inherent variability in both the hydrography and biology of the drainage. (S5789)

Response: Monitoring does not absolutely rely upon a before vs after-project monitoring design. There are other options of a limits-of-change monitoring design (trigger values) and the impacted vs unimpacted (experimental and control reach) sample design. Both these alternative monitoring designs would be required of this project, with the intensity of the monitoring being driven by the existing baseline. Please see the monitoring requirements in Appendix K for more details. To further ensure no net increase in sedimentation, Alternative V requires elimination of several natural sediment sources concurrent with project start-up. Our sediment analysis and independent model validation indicates the project would result in a minor short-term increase, and a long term decrease, in sediment loading even without the elimination of existing sediment sources. See additional information in responses to comments in T&E-501.

24. Bull Trout Section p17, paragraph 4 Rather than rely on high risk best management practices for sediment mitigation the agencies should consider requiring sediment source reduction equivalent to the predicted increased load from the project. (S5)

Response: Mitigation is now based on an estimate of the amount of fugitive sediment, rather than the acres disturbed, includes a safety factor of 200% to account for uncertainties, and would result in a long-term reduction of instream fine sediment. All sediment mitigations would occur within the Rock Creek drainage under Alternative V. See other comments and responses in this section that pertain to how the sediment mitigation plan for Alternative V was developed.

25. Page 2-122, paragraph 5, line 3 -- The statement that increased sedimentation would significantly reduce fry emergence is speculative and should be reworded to reflect the data available for Rock Creek. It should be emphasized that the primary spawning areas are probably the East and West Forks and that these stream segments (upstream from the mill site) are not adequately described and factored into impact interpretations. (S5)

Response: Sediment effects analysis is on the edge of what deterministic science can conclusively say about cause (mining) and effect (streambed fine sediment levels). However, extensive inventory and monitoring on the Kootenai National Forest supports these findings because: surficial and streambed sediments routinely rise in concert with increasing levels of watershed disturbance; and streambed sediments are strongly correlated with the modeled (R1-WATSED) sediment effects analysis output. Research conducted on the Kootenai National Forest indicates the primary source for streambed sediment impacts is the channel erosion triggered by peakflow impacts, with a lesser impact attributable to disturbed-soil erosion, and that Best Management Practices reduce but do not eliminate sediment effects. Thus, our analysis tools and conclusions are indicative of actual on-the-ground changes, but the exact magnitude of the impact is unknown. Other equally compelling laboratory and field research has shown that increasing levels of fine sediment do in fact reduce the survival of incubating fish. Thus, we have slightly revised the Alternative V sediment mitigation requirements, and incorporated a safety factor in the magnitude of the mitigation to accommodate the uncertainties involved in this analysis.

26. Bull Trout Section p9, last paragraph Discharge of nitrogen from waste rock would be minimized under Alternative V through installation of a Mill Pad underdrain that would capture the majority of the seepage through the waste rock and redirect it into the process circuit. (S5)

Response: The mill site containment system and 300-foot "buffer" are designed to avoid most offsite effects. However, our experience with nearly all best management practices is that they are rarely 100 percent effective. More importantly, there are equivalent waste rock/nitrogen concerns at the evaluation adit that does not include containment features and thus potentially affect fish in the west fork should runoff from the evaluation adit reach the west fork. This has a low potential of occurring given the distance and the fact that most drainage would infiltrate the ground in close proximity to the waste rock dump.

27. The bull trout will be adversely impacted by nitrates. (S3488)

Response: We do expect some minor leaching of nitrogen from access upgrades and waste rock that is used as fill material, and a small release of nitrogen to the Clark Fork River via the waste water discharge. Unless something unknown happens (major pipeline rupture and failure of safety measures, a catastrophic flood, etc.), this unmeasureable loading of nitrogen compounds could minimally affect the productivity of the receiving waters through increased growth of some algae and minor changes in community composition. In turn, the aquatic insect community living at the affected sites would shift its composition slightly. However, these changes would be localized and brief in nature, would be unmeasurable compared to annual natural variations in the community, and would not be great enough to affect fish and amphibians in any way other than feeding behavior.

28. The cursory discussions of sedimentation, for example on SEIS p. 4-56, fails to relate increased pollution to impacts on beneficial uses. The SEIS states: …Alternative V actions show…a 30 percent increase in annual sediment yield during the life of the mine. After this statement, the subject is conveniently changed to post-closure predictions.

Loading from and the biological impacts of the full range of pollutants of concern are essential to a defensible analysis of the project s impacts and associated risks. Impacts need to be assessed on beneficial uses if compliance with Idaho water quality standards is to be determined . (S6332)

Another potential effect of further degradation of the mainstem of Rock Creek by mining activities-- Laboratory studies indicate that trout tend to avoid waters with sublethal levels of heavy metals. How will this affect potentially spawning adfluvial bull trout at mouth of Rock Creek when mining activities increase metal loading? How mitigate this? (S3462)

Response: Taken on its own, the effects discussion at 4-56 (supplemental EIS) could easily be cursory. However, after reading this section on water quality effects please turn to the Aquatics/Fisheries section of Chapter 4 for a discussion of how this affects beneficial uses.

Important "pollutants" were not ignored. Please see the Hydrology section of Chapter 4 for the many "pollutants" we evaluated, and then turn to the Aquatics/Fisheries section to see which of these are expected to have a significant or measurable effect on beneficial uses in Montana and Idaho.

Not all fish species are able to detect and avoid metals pollution, but those that appear to usually do so only at relatively high levels of pollution. We are not concerned about this potential effect, however, because very little metals pollution will reach Rock Creek itself as most metals are contained in the tailings sediments that would not reach Rock Creek except from either a pipeline rupture or tailings facility failure. The water system used in the mining process that will contain

some metals eventually goes through a treatment process before being discharged to the Clark Fork River. The metals that remain in the waste tailings will essentially remain with the tailings, since it is deposited as a concrete-like material that does not "bleed" significant amounts of metals into the ground water and surrounding surface waters.

29. Sources of impacts may include channel disruptions resulting from vegetation removal. We request that pipeline or utility right-of-ways that cross the stream and road encroachment in the floodplain be reduced to the greatest extent possible. Where pipeline or utility crossings occur, a right-of-way plan needs to be developed to secure bank stability and channel form. Any portion of the pipeline that occurs in the floodplain needs to be buried below maximum scour depth of the stream. (S1816)

Response: The road and utility corridors have been consolidated to the smallest footprint possible, but pipelines would be suspended above the maximum probable flood stage when crossing a stream;

30. To protect native bull trout and cutthroat require that double-walled corrosion resistant pipelines with leak detection systems should be used for the highly toxic wastewater; the existing toxic sediment in Rock Creek should be reduced to offset the increased loads that will result from mine construction; and the applicant should demonstrate that the project will meet regional fish habitat protection standards. (S6745)

Response: Double-walled pipes are unnecessary for water transport since there is little internal abrasion of the pipe and minimal chance of a rupture, it would be used for all pipelines except for stormwater transport, nevertheless leak detection measures would be used.

31. Page 4-70, 4-74 (Water Temperature): The discussion should also mention the potential for reduced surface water flows to contribute to increased water temperatures. It is our understanding that bull trout require among the coldest temperatures for various life stages than nearly all other lotic species native to the continental U.S.. We note that the bull trout biological assessment (Appendix B, bull trout section page 14) reports that temperatures in excess of 59°F limit bull trout distribution, and that water temperature data have not been collected for Rock Creek. We are concerned that analysis of water temperature impacts is lacking, and that baseline data upon which to evaluate temperature effects is inadequate.

Response: We expect no significant change in surface flows and the biological community dependent on them. Even if we are wrong in this regard, the "worst-case" flow reduction of 10 percent is not enough to push stream temperatures outside the range preferred by bull trout. Data from Washington Water Power (now Avista) indicates Rock Creek is at the lower end of the temperature range preferred by bull trout. Therefore, even in the event of a flow-temperature impact, stream temperatures should remain in the preferred range. Ultimately, we anticipate no impact of this nature because cold ground water is the only source of baseflow surface discharge in Rock Creek - this water fluctuates little in temperature and is exceptionally cool and unlikely to rise above the preferred range for bull trout. Over the life of the project we also expect a small increase in shading on Rock Creek as the riparian area vegetation moves closer to a climax condition - this will produce a marginal decrease in stream temperatures.

32. We are concerned with impacts to water temperature due to project activities. The SDEIS states that impacts from increased water temperature under Alternative V would be negligible. (4-74). We would like to see information about current temperatures and activities that will affect stream temperature. The cumulative effects section indicates that due to logging activities in and near the Rock Creek drainage, stream temperatures may increase. The SDEIS needs to address stream temperature in greater detail. (S22)

Response: Temperature impacts are minimized by consolidating the road and utilities (power and pipelines) into one corridor, eliminating several stream crossings by the utility lines, and by reducing the length of corridor within the riparian zone. At several stream crossings there will be a marginal

loss of shade trees (well below 1% of stream length), but this impact will be offset by a natural increase in shade resulting from 30 years of growth in undisturbed stream reaches.

33. Page 4-64: The italicized summary discussion of effects on aquatics/fisheries should also describe potential changes in surface water flows (particularly lowered flows and extended duration of low/no flow periods during the low flow periods of the year) that could occur as a result of mining exploration or production. Springs and ground water feeding Rock Creek could be reduced during blasting and excavation of the adits and mine cavity. Mine water flows going through the water treatment system discharging to the Clark Fork River will no longer feed Rock Creek headwater tributaries. Altered flows could have significant effects on aquatic life in the Rock Creek basin, and thus, are of potential concern.

Of particular concern would be lowered flows that further reduce the length of time that intermittent sections presently flow, or lower stream levels that prevent the ability of bull trout to ascend and successfully spawn and rear young within the drainage. This would include locations near the mouth of the stream and near the juncture of the East and West Forks that presently are intermittent.

We note that the Bull Trout Section of the Biological Assessment indicates that likely limiting factors for bull trout are the three intermittent stream segments RC-1, RC-4, and WF-1 (Bull trout BA, page 2). Will the duration of low or no flow in these (or other) intermittent stream segments be increased by mining exploration and production? Will mining exploration and production exacerbate the low or no flow situations at the mouth of Rock Creek that prevent upstream passage of fall spawning bull trout from the Clark Fork River (Bull trout BA, page 4)?

Page 2, Bull Trout Section: The Rock Creek drainage supports one of the strongest remaining populations of bull trout in the Lower Clark Fork River drainage. We understand that the Montana Bull Trout Scientific Group designated Rock Creek as a key habitat that should receive the highest priority for protection and restoration to insure continued existence of bull trout. Due to the importance of Rock Creek to maintenance of bull trout in the Lower Clark Fork River drainage, [we] support the USFWS in its request that the lead agencies adopt the USFWS February 1998 recommended (draft) framework of analysis procedures for bull trout at the 5th or 6th field Hydrologic Unit Code watershed scale.

It is also noted that flows at the mouth of Rock Creek in recent years have been insufficient to allow upstream passage of the fall-spawning bull trout from the reservoir. Will flows at the mouth of Rock Creek be affected by mining exploration and production?

We are concerned that mining exploration and production may interrupt ground water flows feeding Rock Creek (particularly lowered flows and extended duration of low/no flow periods during the low flow periods of the year), and that these flow effects along with sediment effects (page 4-74 of SDEIS) and potential temperature effects will potentially have significant adverse effects upon the bull trout. (S146)

Ground water upwelling is known to positively influence the abundance and distribution of bull trout. Up to 1,700 gpm (page 4-41) to 2,046 gpm (page 4-34) of ground water will be treated and then piped to the Clark Fork River for discharge during the mining phase of the project. Watershed Consultants (1997) identified several sections of Rock Creek that gain flow after being intermittent due to ground water inflow. Most notably, they reported that the portion of West Fork Rock Creek becomes perennial below the falls because of ground water recharge. This ground water source may be threatened by bypassed ground water, and therefore result in more dry sections in the Rock Creek drainage. Continued ground water will be lost to the surface once mining ceases if the adits are not sealed. If the adits are sealed, then mine water discharge would be diffuse, potentially occurring as springs and seeps, discharge to valley fill ground water systems, and/or baseflow in streams. Impacts on bull trout and WCT due to alterations in ground water quantity and quality are not addressed, but are a major concern. Alteration of seeps,

springs, and upwellings may have a large influence on future distribution and abundance of bull trout, and should be addressed, monitored, and mitigated. (S1816)

In discussions of ground water (p.4-50), the SDEIS indicates ground water quantity returning to Rock Creek may be affected. Given that lower Rock Creek already has reaches which may go subsurface during drought conditions, loss of recharge to the stream could further reduce stream flow and increase water temperatures thereby affecting migration and rearing of bull trout. Watson and Hillman (1997) noted that ground water may be a key component of bull trout habitat selection due to its positive influence on water temperature. (S4711)

Page 4-28-29 Hydrology summary. All water naturally reporting to the mine that is discharged to the tailings impoundment and the Clark Fork river is water that would naturally trickle into the Rock Creek drainage and provide habitat for bull trout and other organisms using this system. Removing this water in the proposed method is the equivalent of removing habitat for bull trout. This could occasion that current reaches of Rock Creek with water might become dewatered. It was stated earlier in the text (Huston) that before the heavy logging in the drainage, Rock Creek maintained a perennial flow throughout its length. If treatment of effluent discharge from the mine were required after closure this would in effect create a long term insufferable impact to habitat and bull trout in Rock Creek. This entire issue has not been discussed in the EIS document 36CFR 219.27 (a)(6). (S614)

Response: The project would intercept a minor amount of underground water and ultimately reroute it to the Clark Fork River rather than the Rock Creek surface or ground water system. Although, in theory, grouting of the mining adit walls could reduce this interception even further, it is doubtful that it could be eliminated altogether. More importantly, the underground mining activities require a certain amount of water for drilling, dust suppression and other purposes. This water must come either from underground interception, or from a streamflow withdrawal or a well. The underground seepage collection is preferable to surface withdrawals since stream dewatering and shallow ground water pumping is certain to affect biota dependent on surface waters unless the water is drawn from the Clark Fork River. The estimated ground water interception (approximately 2,000 gallons per minute at year 30) represents less than 10 percent of the Rock Creek discharge at baseflow condition if we assume that all of this ground water is destined to be Rock Creek surface flow.

Intercepted ground water deep within the mountains would be delivered to both a deep aquifer and a surface stream and springs. Thus not all of the 2000 gallons per minute of underground interception represents a potential loss of surface flows. Further, because ground water moves through soils and rock at relatively slow rates, we would expect the relative impact of this interception to be muted since interceptions at a given point in time would actually be expressed on the surface months if not years later after periods of higher ground water input from areas outside the underground workings have been added to the ground water supply. As the underground adit system is developed and grouted, this imposition of a less-permeable void in the ground water system should modify the routing of water. This revised flow path for ground water could actually increase discharge at adjacent springs or nearby stream upwelling sites, or it could modify the balance between water going to the deep aquifer and that going to the surface water network. The effect of interception on surface flows at the mouth of Rock Creek would depend upon the fraction of surface discharge that originally came from the zone occupied by the adits, and also change over time as the balance between water seeping through the tailings area, and ground water recharge from the surface of the reclaimed tailings "mountain," shifts back to a more or less normal process. There are no known locations in Rock Creek where deep ground water issues from a major spring, so we conclude that Rock Creek is largely fed by shallow ground water that follows topographic depressions (valley bottoms). Finally, the mill site, tailings facility and road corridors would produce a minor increase in

flows because these sites would be deforested and relatively impermeable, but only the road corridor flow increase would likely affect Rock Creek.

In summary, predicting the surface outcome of this subsurface water interception and modified ground water flow path is complicated by many variables that are only generally known. We predict a marginal impact on surface streamflow and ground water upwelling that is insignificant in relation to the total surface and ground water supply for the watershed. The magnitude of this effect would be less than what 2,000 gallons per minute of interception would suggest. We anticipate this effect would occur in the later half of the project, and most likely would affect springs in the vicinity of the adits but likely not measurably. Closure plans include tentatively adit plugging so that the mine would fill with water. There could be some seepage through the adit that would seep into the mill pad. However, it is possible that the mine adits would not be plugged if necessary to prevent creation of new springs and seeps at ore outcrop zones downgradient of the mine. In recognition of the uncertainties involved in this issue, Alternative V includes an enhanced monitoring requirement to look for unanticipated water quantity effects.

The flow characteristics of the intermittent stream segments are highly variable. Thus, the monitoring plans described Appendix K of the final EIS will not rely on surface flow monitoring alone to detected mine-related impacts. In addition, flow monitoring will be conducted for all springs and seeps in the vicinity of the mine, with particular emphasis on those sources of water that provide recharge to Rock Creek. If measurable flow reduction do occur, mitigations will be incorporated into the remedial action plan to be developed as part of the water resources monitoring plan.

34. Environmental assessments need to include seasonal high and low flow conditions, cumulative effects analysis, and evaluation of possible synergistic effects. The failure of the EIS and SEIS to perform these fundamental analyses represents major flaws in the analysis to-date. (S6337)

Response: Our effects analysis specifically addressed effects at high and low flow conditions, as well as cumulative effects. Please review the final EIS closely in the Aquatic/Fisheries and Hydrology sections, as well as Appendix B for the bull trout Biological Assessment.

35. The West Fisher and 4th of July drainages are identified as water quality impaired streams and bull trout habitat. And both of these areas are identified as critical grizzly bear habitat. (S6312)

Response: The proposed action will not affect watersheds and bull trout on the east flank of the Cabinet Mountain range.

36. Page 4-64 last paragraph "A Forest Service timber sale ...". The FS shall condition this action as it does any other action - require BMP's, no sediment loading, no changes to stream flow patterns, mitigation, etc. A timber sale is no different than a mining proposal or any other regulated activity on lands owned by the public. To state that the mining industry would have more or less impacts, or more or less mitigation than forestry "practices" is unfair and unwarranted. The same should apply to all activities on public lands. This paragraph suggests that environmental impacts as a result of a no-mine action would be potentially negatively significant. (S4832)(S4833)

Page 4-73 Standard MM-2. pg. 4-74 Alt. 5 contains a requirement for implementing a sediment source identification.. Page 4-76 Cumulative impacts; USFS timber sales and any logging on private lands.... All of these activities point towards impacts to the fisheries resource that will be unmitigatable. Continued Asarco logging of their own project lands has not been monitored and this makes questionable the use of data gathered before these activities occurred. (S614)

Response: Impacts from timber sales and other permitted actions do indeed have to be mitigated. However, the fact remains that a mine of this magnitude and duration represents a risk of effects an order of magnitude or more greater than almost all other projects typically occurring on federal land. The purpose of a cumulative effects analysis is to evaluate whether a proposed action's direct and indirect effects will have more significance in association with other actions underway or foreseeable in the same time period and place. We evaluated the project in the context of other ongoing and foreseeable activities and found (as you note) that cumulative sediment would be a problem larger than just the impact from the proposed mine. We have thus revised Alternative V to begin reversing this situation as the mine construction would begin. The private land timber harvest has ceased in Rock Creek. Existing conditions have changed as a result of this logging, but this would be the case even in the absence of the logging since the environment is continually changing.

37. Given the common occurrence of rain-on-snow events in the Cabinet Mountains, storm water management is critical. While portions of the SDEIS refer to storm water design for a 100-year event, page 28 of the Fact Sheet/Statement of Basis notes a design for the 10 year event at the tailings pile. Apparently this design is predicated on an acceptable level of dilution, but we are concerned about the level of runoff and potential for negative impacts to stream channel stability from peak flow events. (S4711)

Response: The largely impermeable surfaces at the mill site and tailings facilities are surrounded by a containment system. Almost all water falling on these facilities will be incorporated into the water management system that is connected to the milling process and water treatment system. This water would ultimately be delivered to the Clark Fork River after treatment, but very small fractions of intercepted surface water would be lost via evaporation or exported in the refined ore concentrate, and other small fractions would be returned to Rock Creek via seepage through project facilities. In short, Chapter 4 indicates no measurable effect on peak flows from the project. The State is only authorized to require designs for 10-year, 24-hour events for technology based requirements. The applicant voluntarily sized all ponds and diversions for a 100-year, 24-hour event, to retain peak storm water flows and rain-or-snow events.

38. ASARCO's history of creating twenty-one Superfund sites makes the possibility of catastrophic failure of the tailing impoundment or paste facility a very real concern. Such failures would have disastrous consequences for aquatic life in downstream water bodies under all action alternatives. The reduced risk of failure under Alternative V is certainly no guarantee and the possible impacts resulting from failure forbid this project from being developed. (S22)

Response: The assertion that Superfund (mining) sites elsewhere necessarily means the Rock Creek Project tailings deposit will inevitably fail is not valid. The Agencies are not authorized to use Superfund history of a company as means for project denial. The proposed tailings disposal method is not directly comparable to historic activities or other sites because it involves different geologic materials, different disposal methods, a safer disposal location, and substantially different reclamation requirements. The reduced volume of water in the tailings and lack of water stored on top of the tailings greatly reduces the risk of failure and the ability of the tailing to flow should a portion of the facility fail. More information regarding tailings facility stability can be found in Chapter 4, Geotechnical Engineering and Appendix G.

39. Bull Trout Section p12, paragraph 3 The theory that Rock Creek is intermittent due to human impacts is not substantiated. The historic naming of the channel Rock Creek, argues that the highly permeable channel and depth to ground water (which are a function of the nature of the underlying alluvium) was going dry even at the time of early settlement.

Bull Trout Section p13, paragraph 4 The contention that the intermittent nature of Rock Creek might be a result of logging or fires is unsupported. The stream is intermittent because of the very high permeability of the streambed alluvium. This high permeability has been here for a long time and, if anything, would presumably be decreased by sediment produced from logging or fires. (S5)

Response: There are other possible explanations for stream dewatering than riparian logging. Climate change, geologic events, and the 1910 wildfire and subsequent floods are all considered possible explanations. One theory suggests that glacial Lake Missoula (10,000+ years ago) caused the dewatering problem by filling Rock Creek Valley full of large stones and very little fine sediment that would hold water tables higher.

40. Page 2-3 2nd bullet "Effects will be …". It was earlier stated that this isn't known - how can it be 'estimated'? (S4832)(S4833)

Response: This statement identifies that means by which the agencies plan to estimate impacts to fish species. The sentences prior to this statement is a description of the respective issue of concern that needs to be addressed in the EIS and necessary alternative developed and mitigations required to minimize, avoid, or eliminate the impact relative to that issue. This paragraph does not say that there would be would not be an impact, but that this is a concern and here is how we plan to measure the impact.

41. SDEIS p. 2-105. Issue 2, 4th bullet: "sensitive aquatic species (bull and westslope cutthroat trout) due to increased sediment and increased interbreeding with non-native species (alternatives II and II)" should read "(all action alternatives)." Alt V?

SDEIS p. 2-105. Issue 2, 4th bullet: Replace the phrase "increased sediment" with "reduced habitat quality."

SDEIS p. 2-107. Table 2-18, Water Resources under Alternative II, 2nd paragraph. It should read: "Suspended sediment and nitrogen loads would be temporarily increased in Rock Creek and the West Fork during mine construction and nitrogen could impact aquatic invertebrates and algae in the short term."

SDEIS p. 2-107. Table 2-18, Water Resources under Alternative II, 3rd paragraph. It should read: "Sedimentation associated with proposed timber harvest would be reduced because timber road construction on NFS lands in the Rock Creek drainage may be limited due to project increased open road densities. Sedimentation associated with the proposed project would increase over baseline conditions." The second sentence is missing in the SDEIS.

SDEIS p. 2-107. Table 2-18, Water Resources under Alternative II, 4th paragraph. It should read: "Impacts from materials from spills and pipeline ruptures potentially could affect water quality and aquatic life in Rock Creek and the Clark Fork River, including Cabinet Gorge Reservoir." The Cabinet Gorge Reservoir is not mentioned in the SDEIS.

SDEIS p. 2-111. Table 2-18, Sensitive aquatic species under Alternative IV, 1st paragraph. It should read: "Sediment impacts to bull and westslope cutthroat trout would be minimized in the West Fork of Rock Creek. The 300 ft. buffer around the confluence mill site would reduce sedimentation impacts downstream, although impacts to aquatic species may still be significant."

SDEIS p. 2-118. 4th full paragraph, 1st sentence. It currently reads: "Construction of the mill pad, roads, and waste rock dumps would temporarily increase the concentrations of sediment and nitrogen loads of Rock Creek for alternatives II and III." Replace the phrase "concentrations of sediment" with the phrase "concentrations of suspended sediment." Replace the phrase "alternatives II and III" with the phrase "all action alternatives."

SDEIS p. 4-65. Paragraph that begins "Aquatic habitat degradation..." The errata-sheet changes were made, except "Alternative V" was substituted for "Alternatives III and IV" throughout. It now reads: "Sediment mitigations in Rock Creek under Alternative V could reduce project-related impacts to resident Rock Creek bull trout and westslope cutthroat trout and to Cabinet Gorge Reservoir bull trout. Sediment mitigations in the Bull River drainage under Alternative V could reduce existing sediment-related impacts to Cabinet Gorge Reservoir bull trout."

DEIS p. 4-81. 3rd full paragraph, 1st sentence. In the SDEIS, readers are referred to the DEIS for this information. Therefore, the error should have been noted. Replace the sentence with the following sentence: "Construction phase BMP audits, followed by corrective measure, would help reduce new sediment impacts."

DEIS p. 4-81. 3rd full paragraph, last sentence. The error still needs to be noted. See above. Replace the phrase: "on Cabinet Gorge bull trout" with "on resident and migratory bull and westslope cutthroat trout."

DEIS p. 4-82, last paragraph. The error still needs to be noted. See above. Add the following sentences to the end of the paragraph: "Impacts to bull and westslope cutthroat trout in Rock Creek would be further reduced under this alternative by establishing a 300-foot buffer zone around the confluence mill site. However, despite mitigation measures, impacts to these species are likely to remain significant under Alternative IV." (S3462)

Response: We have slightly revised the text in the final EIS in response to these comments, and to make the final EIS internally consistent between Chapters 2 and 4. Thank you for your editorial help.

42. Page 3-46, paragraph on Metals Concentrations in Tissues. No mention is made of which tissues were analyzed. This should be clarified. It is our understanding from other sources that gill tissue was analyzed for copper and zinc, and muscle tissue for the mercury. Is this the same for the tissues taken from other drainages? (S1816)

Page 3-49, paragraph on Metals Concentrations in Tissues. Again, no mention is made of which tissues were sampled. This needs to be specified. (S1816)

Response: A table was added to this section which specifies the tissues that were analyzed. Gill tissue was analyzed for copper and zinc and muscle tissue was analyzed for mercury.

43. Page 3-51, paragraph on Metals Concentrations in Fish Tissue. Again, no mention is made of which fish tissues were sampled. We understand from other sources that whole-body composites were analyzed, so the interpretations of risk to humans from consumption is somewhat obscured, since only muscle will likely be consumed. We suggest the statement on health problems be qualified in this regard. Even so, we do agree that the risk to humans from metals in these fish does appear to be low. It should be noted, however, that the statements in footnote 10 on the bottom of this page are only partially correct. The State of Montana (the Department of Public Health and Human Services along with MFWP) has established consumption guidelines for mercury. These guidelines are based on the U.S. EPA oral reference dose of 0.1 µg/kg body weight/day. In the case of the northern squawfish, if the muscle concentration of mercury was the same as in the whole-body sample (0.46 mg/kg), then our consumption guidelines would suggest 1 meal/week for adults and 1 meal/month for women and children. (S1816)

Response: A table was added to this section which specified the tissues that were analyzed. Additional clarification was added to the text and the footnote describing the fish consumption advisory published by the State of Montana and its relationship to measured concentrations in Lake Pend Oreille.

44. Page 2-73, 2-107, 2-118 -- Previous comments on sediment mitigation indicated our concern about limiting potential sediment mitigation to application of best management practices on a given amount of area (114 acres). Since the R1 model does not determine quantitative sediment loads, but calculates relative differences between various practices the agencies should consider modifying the suggested mitigation requirement to be equivalent to 114 acres of management activities (based on those considered by the model) or the reduction of sediment load as a percentage (as indicated by the model), whichever is more applicable. (S3058)

Page 2-73, paragraph 4 – Sediment mitigation appears to be very narrowly conceived as being the application of best management practices for sediment control over some fixed acreage of disturbance (114 acres). However, a broader definition of acceptable mitigation has the potential to be much more effective at offsetting sediment impacts. As an example of the potential effectiveness of specific source reduction mitigation, the stream bank erosion site on the main stem of Rock Creek near Engle Creek is approximately a quarter acre in size, but has a 34 foot high eroding face that potentially contributes large volumes of sediment directly to the stream channel during spring runoff periods. (S5)

Response: Watershed modeling using the R1-WATSED model was completed to better define the anticipated amount of sediment mitigation required to maintain or improve the fisheries habitat and water quality in Rock Creek with the implementation of Alternative V. The Agencies have decided on a sediment mitigation plan that will meet or exceed the amount of predicted sediment increase in Rock Creek from mine development. The plan will require an amount of sediment reduction (in tons) and not be based on the application of best management practices on a given area of land. Please reference the "Rationale for Alternative V Sediment Mitigation Calculation" discussion contained in Appendix N.

45. Page 2-122, paragraph 5 – The "high levels of fine sediment, close to critical levels" are primarily in main stem Rock Creek not the East or West Forks. Evidence indicates that most of the bull trout are located in these upstream reaches and would not be affected by the mine. The conclusion that increased sedimentation would significantly reduce fry emergence and potentially lead to elimination of populations is not supported by the data. (S5)

Response: The discussion on sediment and its potential adverse effects on bull trout has been modified for the EIS. Although there are some relatively high levels of fine sediment in potential spawning gravels in both the main stem and the West Fork of Rock Creek, additional sediment mitigation built into Alternative V suggests that habitat functioning with respect to sediment would be maintained upon implementation of the project.

FISH-602 Sensitive Fish Species

1. In accordance with the Endangered Species Act (ESA), the US Fish and Wildlife Service (USFWS) should recognize the project as jeopardizing the continued existence of bull and cutthroat trout. The project jeopardizes the genetically important bull trout population in Rock Creek, critical to bull trout recovery in the Cabinet Gorge watershed. The project requires additional modification to be reasonable and prudent in accordance with the ESA. (S188)

Response: The USFWS, through consultation with the applicant and action agencies, developed reasonable and prudent measures to reduce the likelihood of adverse effects to bull trout. These same measures would reduce impacts to westslope cutthroat trout as well. The term 'jeopardy' is defined by the Endangered Species Act and has specific legal meaning. This project does not jeopardize the distinct population segment listed under the ESA. The mitigations and Reasonable and Prudent Measures would be adequate, as determined by the USFWS, to protect the continued existence of bull trout in Rock Creek. These specific measures would also protect the continued existence of the currently hybridized westslope population.

2. The SDEIS fails to include an updated biological assessment of westslope cutthroat trout, a sensitive species on the Kootenai National Forest. There is a lot of new information about westslope cutthroat trout in the Lower Clark Fork River Basin as a result of a petition for ESA listing filed by several conservation groups. American Wildlands conducted an extensive compilation of the most recent scientific data, which underwent substantial peer review, concerning the status of the WCT. According to this scientific data, there are few viable populations remaining, and adequate protective and restorative programs do not currently exist. They are extinct throughout most of their historic range, and existing populations are in imminent danger from land-use activities and hybridization. Reasons for the critical condition of these species include habitat destruction from logging, road building, grazing, mining, urban development, agriculture and dams, introduction of artificial hatchery strains, competition and hybridization from introduced non-native species and overfishing. The SDEIS should have included a biological assessment detailing the impact of Alternative V on westslope cutthroat trout and how those impacts will affect the long-term viability of this WCT population. (S22)

We and others on whose behalf these comments are being submitted also have concerns about the impacts of the Rock Creek mine on the long term viability of the lower Clark Fork population of westslope cutthroat trout. Because the westslope cutthroat is considered a sensitive species the completion of a biological assessment is required in order to adequately analyze the impacts of the proposed mining activities. The evaluation in the original DEIS does not adequately address the impacts on westslope cutthroat, which should be addressed in full blown BA in the FEIS. (S805)(S6806)(S1687)(S1851)

Why wasn't a Biologic Assessment done for westslope cutthroat trout? (S2117)(S6312)(S188)

Response: As noted elsewhere in our response to comments, a Biological Assessment is only prepared for species protected by the Endangered Species Act. A biological evaluation is required for sensitive species, but was not prepared for this project because the westslope cutthroat has been irreversibly lost in Rock Creek due to ongoing hybridization. A biological evaluation is prepared when a distinct population of a sensitive species utilizes a project area. In the case of Rock Creek, a population of hybrid cutthroat inhabit the area, but genetically pure westslope cutthroat individuals are present within the hybrid population. These genetically distinct individuals cannot be protected or conserved because the population is the smallest biological unit that can be conserved in the wild. In this case the cutthroat population has been compromised due to historic non-native fish stocking and the resulting hybridization.

3. Cutthroat trout - Almost no mention of the cuts in Rock Creek and the impacts this proposed mine would have on a genetically pure strain of this sensitive species. (S3536)

How could the Asarco corporation justify the risk of loss of exceptional strains of trout? (S4354)

Also, how will native fish populations in Rock Creek be preserved or enhanced during the life of this mine so that the population remains as distinct as it currently is? (S6721)

Response: The discussion of impacts to westslope cutthroat trout is deliberately general for one reason - the cutthroat population in Rock Creek has been irretrievably lost as a result of rainbow trout stocking and genetic hybridization. Sampling in the drainage has indicated the presence of hybrid cutthroat in Rock Lake and Rock Creek Meadows, and pure westslope cutthroat trout downriver. The hybrid cutthroat will disburse throughout the watershed over time as they drift downriver. Fisheries managers cannot conserve pure westslope cutthroat individuals in the wild if they are mixed in with a hybridized population. Elimination of the hybrid cutthroat may be an option to conserve this distinct population, but this would require genetic sampling of nearly every fish and killing all fish that were not genetically pure. At this time fisheries managers do not have a suite of tools that could accomplish this restoration with any degree of certainty. Thus, the effects analysis for bull trout (and their greater sensitivity to habitat change) is a surrogate for an analysis of effects to hybrid cutthroat.

4. Page S-14 "increased interbreeding." The ESA addresses species not ecotypes - species concept precludes interbreeding between "species." (S4832)(S4833)

Response: As noted on page S-14 of the supplemental EIS, several alternatives would lead to an increase in hybridization between Rock Creek native fish and non-native fish because other habitat effects put adverse pressure on the native fishes. Bull trout are now listed as a threatened species under the Endangered Species Act (ESA), and the westslope cutthroat may be warranted for protection. Inter-breeding between bull trout and brook trout has been conclusively demonstrated elsewhere. Further, hybrid cutthroat-rainbow trout are known from the Rock Creek drainage. Several alternatives would result in sufficient stress on the native fish that hybrid and non-native species in the drainage would expand in number and contribute to losses through inter-breeding. The ESA does allow for protection of animals at levels below the species if it can be shown that they are unique, of significance, and likely to be extirpated without protection.

FISH-603 Amphibians

1. The discussions of impacts to amphibians on pages 4-96, 4-97 and 4-109 seem to conclude that the impacts to this important wildlife group will be insignificant and not extensive, especially with sedimentation control and wetland mitigation. However, a statement is made on page 4-109 that the magnitude of the effect on this group of species is unknown. Please clarify. (S3312)

Response: The effects analysis for amphibians has been revised. Please see Chapter 4 of the final EIS in both the Aquatics/Fisheries and Biodiversity sections.

2. Since the completion of the EIS much has been learned about the plight of many amphibians, particularly the leopard frog. We feel that effects of this and related mineral projects on frogs and other amphibians should be re-evaluated. (S6739)

Response: As Chapter 4 indicates, the mine would not significantly affect the aquatic community under Alternative V. This, together with no net loss of wetland functions and minimal changes in riparian areas and streams, indicates amphibians would be protected.

SUPPLEMENTAL EIS
RESPONSES TO COMMENTS

FOREST PLAN

FPL-700 Forest Plan

1. National Forest Plan, isn't this a multiple use plan to be used to maximize long-term public interests and benefit, in an environmental sound manner that will have the least impact on wildlife, water quality, fish species, and human health? (S3655)

Response: Yes, and part of that multiple use is mineral development. The National Forest Management Act (NFMA) implementing regulations at 36 CFR 219.22 state, "mineral exploration and development in the planning area shall be considered in the management of renewable resources". In the definition of "multiple use" the NFMA implementing regulation state that "some lands will be used for less than all of the resources." There is not an intent for all lands to be available for all uses, this is in part the premise for having Management Prescriptions.

2. The document needs to address the effect the project would have on future Forest Service management outside of the permit area but influenced because of the permit. Would it eliminate the ability of the Forest Service to do any sediment producing activities (timber harvest, prescribed burning) in the area due to the already permitted disturbance? (S5484)

Response: The EIS does disclose further Forest Service management and the limits which may restrict these, see Chapter 4, Forest Plan, Alternative II and Hydrology, sediment as examples. Two of the main limiting factors would be open-road-densities and habitat effectiveness for the grizzly bear and sediment generation. This analysis and the subsequent Record of Decision however, do not make a decision regarding potential future management activities (e.g. timber sales). Any future management activities would be analyzed in accordance with NEPA.

3. Page 4-178, Part 2 and 4-185 Part 4 Forest Plan - After full reclamation of the mine site the forest plan should be revised back to the before-mine plan. The mine is only a temporary feature due to reclamation requirements. Page 4-185 Part 4 Forest Plan - As stated above please explain why the NFS land would not be returned to previous designation after full reclamation is approved by the agencies. (S5)

Response: Once activities were completed at the mine site and reclamation completed, areas would be reviewed to determine how they should be reallocated. Since forest plans are revised every 10-15 years this review would most likely take place during a future revision effort and allocated according to direction at that time.

4. Page 4-185 Forest Plan: Permitting this mine would irreversibly alter, and effectively preclude, public use of the entire Rock Creek Drainage in the manner it is used today. The proposed project would turn a drainage renowned for its multiple uses and essentially turn it into a single use industrially tainted mining zone. Logging and timber management would have to be effectively eliminated for the life of the project. The easiest wilderness access in northwest Montana would be denied to most seniors and less physically fit because of road closures. Hunting, firewood cutting, huckleberry picking opportunities will be reduced. (S471)

Response: Public use would only be precluded on the paste facility, mill site, and waste water treatment facility areas. Logging may be somewhat reduced in the drainage, but that is only a small percentage of the forest timber base. However, no decision is being made at this time and any future management activities would be analyzed pursuant to NEPA. Under Alternative V as described in the EIS, Chicago Peak Road will remain open (see Chapter 4, Recreation and Threatened and Endangered sections). The impacts of the project on huckleberry picking, firewood gathering and for the most part hunting will be impacted very little since only a small part (481 acres) of the whole drainage would be disturbed.

5. We wonder if your forest plan monitoring data for the area has been incorporated in your analysis of the various resources. Where such monitoring data has not been collected or interpreted, you are acting upon incomplete information. (S177)

Response: Data has been collected for all resources affected. This includes watershed, streams, fisheries baseline data, as well as data on sensitive species, etc. Forest Plan monitoring data was used by specialists as appropriate. The data sets a baseline for monitoring activities from this project (see Appendix K titled "Agency Conceptual Monitoring Plans" and the proposed MPDES permit in Appendix D). In addition, the project includes an intensive monitoring program. All the data has been interpreted and summarized in the EIS.

6. Page 2-51. "Surface Disturbance: A total of about 481 acres would be disturbed within the permit area under Alternative V (see Table 2-2). The Forest Plan would be amended so that management allocations on 147 acres would be consistent with the intended use." Does this make sense? (S3462)

Response: Yes. The rest of the area, 334 acres would still be available as they are now for wildlife use be it big game summer or winter range and grizzly bear habitat. Even some of the areas allocated to MA-23 Electric Transmission Corridor or MA-31 Mineral Development would be utilized by some wildlife.

7. We believe the KNF should adopt the needed standards and guidelines to protect sensitive fish species, and to promulgate them during the EIS process for the Rock Creek project. Page 2-4 of the SDEIS states that "all alternatives include amending the Kootenai National Forest Plan to change Management Area allocations." We believe the standards and guidelines for sensitive fish species should be included in this amendment process. (S6318)

Response: Amending the Forest Plan to establish standards and baselines for the sensitive species across the forest would be inappropriate for this EIS. This EIS looks at the Rock Creek area only. The Rock Creek watershed is different from others. To appropriately amend the plan forest-wide, we would need to evaluate all the steam types on the forest and determine if there should be the same or different requirements on streams based on their conditions. For example, some areas are more affected by rain-on-snow events than others; precipitation is not constant across the forest which affects streams differently and the soil types are different, including their erodibility and susceptibility to movement. Protecting water quality is a foundation from which all activities are either developed or managed which in turn helps protect fish resources.

8. We find reason enough for the Forest Service to reject the project's plan of operations. The project is obviously inconsistent with water, land, and/or TES species guidelines on the forest, since "(t)he Forest Plan would be amended so that management allocations on 147 acres would be consistent with the intended use" (SDEIS, p. 2-51). More specifically "(t)he amendments would convert MA 13 (old growth), MA 11 (big game winter range), and MA 14 (grizzly bear habitat) to MA 31 (mineral development) and MA 23 (electric transmission corridor) for the mine life and beyond" (SDEIS, p. 4-178). Why would the Forest Service change the allocations of 147 acres to accommodate a large mine adjacent to a wilderness area? Is it common practice to amend the forest plan in order to accommodate any project that comes along? How will the forest make up for the losses of the old growth and big game winter range acreage? Will it redesignate other forest land to mitigate the effects? Has there been any site-specific scientific analysis to determine what effect the loss of habitat will have on old-growth dependent species and big game? We found no discussion of mitigation for the loss of big game winter range. (S6332)

Response: All projects must be consistent with the Forest Plan. This can be accomplished by modifying the project, dropping the project or amending the Forest Plan. The 1872 Mining Law gives the applicant the right to mine this deposit and remove the copper and silver, therefore, the Forest Service cannot drop the project or deny the permit, until laws are not being adhered to. To ensure all laws and regulations are met and to minimize potential effects on forest resources through

the permitting process, the Forest Service may incorporate management requirements. The preferred alternative (Alternative V) incorporates mitigation measures to provide environmental protection and meet state and federal laws. In addition, the preferred alternative includes changing the management areas to reflect the allocation of those lands. Those lands will not be allocated for old growth, wildlife, etc, but will be allocated to recognize the permanent facilities that will reside there.

The National Forest Management Act 36 CFR 219.10(f) states "The Forest Supervisor may amend the forest plan. Based on an analysis of the objectives, guidelines, and other contents of the forest plan, the Forest Supervisor shall determine whether proposed amendments would result in a significant change in the plan." The EIS for the Rock Creek Project will provide the analysis for making any amendment to the Forest Plan relative to the Rock Creek drainage.

Based on the analysis, the compartment will remain above the 10% criteria for old growth. There will not be any specific mitigation for big game winter range. However, the acres of mitigation included for grizzly bears will also benefit big game. Chapter 4, Biodiversity, discusses the impacts of the project on old growth dependent species. There is no mitigation for loss of big game winter range as the amount lost is a small percentage of that available in the area and though the Management Area has been changed, much of it will still be available (e.g. electric transmission corridor and parts of the past facility, etc.).

9. Page 3-3 under "Forest Plan Direction", 2nd paragraph "The goal for minerals ... environmentally sound ... ". ASARCO has openly admitted significant habitat degradation, loss of species viability, significant and often 'unknown' water quantity and water quality impairments. One cannot believe these are "environmentally sound" methods. ASARCO admits to proposing degradation of environmental conditions in the basin. This cannot be part of the FS goals. (S4832)(S4833)

Response: The goal as stated is to "encourage responsible mineral development of mineral resources." The Forest Plan provides broad goals to be met. There are impacts from this proposal but with mitigation/modification, the Alternative is in compliance with legal requirements.