

Expert Report on Air Quality, Contaminants of Concern, and Human Health Risk Assessment for the Stibnite Gold Project FEIS and draft Record of Decision

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Submitted via
<https://cara.fs2c.usda.gov/Public//CommentInput?Project=50516>

Pursuant to 36 CFR Part 218, I am filing this Objection to the FEIS and Draft ROD for the Stibnite Gold Project (“Mine” or “Project”) issued by Payette National Forest Supervisor Matthew Davis on September 6, 2024. See <https://www.fs.usda.gov/project/?project=50516>.

Below is a summary of comments I submitted on the SDEIS (labeled comment # 17436), the response by the Forest Service in the FEIS that I deemed inadequate, and (in blue) a narrative description of the specific issues of concern, a statement demonstrating the connection between prior specific comments and suggested remedies.

The ultimate remedy for these violations is for the Forest Service to withdraw the FEIS and DROD and not issue any decision or take any action based on the inadequate FEIS.

I filed comments on the Draft DEIS in October, 2020 and the SDEIS on January 10, 2023. Please incorporate my previous comments into this objection.

The technical components of this objection are also being provided to Save the South Fork Salmon, et. al. as an expert report in support of their objection.

Qualifications: Ian von Lindern holds a B.S. in Chemical Engineering from Carnegie-Mellon University and M.S. and Ph.D. degrees in Environmental Science and Engineering from Yale University. He is a licensed Professional Engineer in Chemical Engineering in Idaho (License # 3044) and has practiced in the disciplines of Environmental Engineering and Risk Assessment in Idaho for the last 50 years.

Dr. von Lindern was Co-founder, President and Principal Scientist for TerraGraphics Environmental Engineering with offices in Moscow, Kellogg, and Boise, Idaho for 30 years, retiring in 2016. TerraGraphics was IDEQ's prime consultant for the Bunker Hill Superfund Site (BHSF) and he was Project Manager and lead risk assessor for both the BHSF and the Coeur d'Alene Basin Superfund Sites from 1984 to 2014. Dr. von Lindern has 50 years of US and international environmental engineering and science experience and has directed over 40 major health and environmental investigations involving primary and secondary smelters and battery processors, landfills, and tailings at several major mining and smelting sites in the United States, as well as in Asia, Africa, Australia, and Latin America.

He and his wife, Dr. Margrit von Braun, co-founded the non-profit humanitarian organization TerraGraphics International Foundation (TIFO) in 2014 and have continued to work in mining-related health and safety issues in low-income countries. The TIFO mission is to assist mining and mineral processing communities to operate as safely as practicable while maintaining essential economic activities. TIFO supports scientifically sound and transparent analyses of the environmental and human health issues faced by mining communities; and the development of local solutions implemented within community socio-economic and cultural capabilities. Under his direction in the last ten years, TIFO has conducted has completed site characterization, risk assessment, and risk mitigation projects in Russia, China, Peru, Dominican Republic, Senegal, Nigeria, Kyrgyzstan, Uzbekistan, and the Duck Valley Shoshone Paiute Reservation in Idaho and Nevada.

TIFO collaborates with the international humanitarian organization Médecins Sans Frontières (Doctors Without Borders) assisting the Kyrgyz Republic Ministry of Health in developing health protective strategies to reopen both mercury and antimony smelters in Batken, Kyrgyzstan. These facilities were among the largest mercury and antimony producers in the former Soviet Union and are essential to the regional economy. TIFO is currently engaged with MSF, the US Department of State, the Massachusetts

College of Pharmacy and Health Sciences, and the Kyrgyz Ministry of Health in conducting risk assessment and risk mitigation activities in active and abandoned Kyrgyz antimony and mercury mining communities. Biological monitoring of the local populations indicates both children and reproductive aged women have arsenic and antimony blood and urine levels exceeding international norms. The principal source of metalloid contamination is mining-related fugitive dust contaminating the community water, soil, air, and food sources.

Dr. von Lindern is the lead risk assessor for these projects and has produced several major reports in the last five years. The project is currently engaged in implementing medical, environmental, public health advocacy and educational interventions to reduce exposures and health risks. As such, he has considerable insight and experience with the issues associated with the proposed antimony-gold operation at Stibnite. Over the past five years, he has monitored the development of the US Forest Service Draft Environmental Impact Statement (DEIS) for the Stibnite Gold Project (SGP) and has reviewed and submitted comments regarding the several revisions of the Draft Permit to Construct (PTC) and associated support documents. As a result, he is familiar with the many related issues, and particularly those related to contaminants of potential human health and environmental toxicity concerns.

Dr. von Lindern has served on numerous advisory committees, the USEPA Science Advisory Board (SAB) and Clean Air Science Advisory Committee (CASAC) assignments from 1975 to 2018 on topics relating to exposure and risk assessment in childhood heavy metal poisoning. A current CV is attached.

Numerous Specific Objections to the Draft Record of Decision are embedded in the following Comments. A summary discussion follows:

SUMMARY OBJECTION: The ROD should be withdrawn on the basis that the Forest Service (FS) has failed to objectively consider and substantively respond to Public Comments and extensive analyses provided to the FS during the DEIS and SEIS Comments (re-submitted below). The FS ignored salient public input, collaborated with Perpetua to substitute a new alternative, the 2021 Modified Mine Plan (MMP), during private alleged “additional scoping” activities and specifically precluded a more environmentally protective, technically and economically feasible alternative from being evaluated.

The lack of coherence and consistency between the DEIS and the SEIS and the various Expert Reports implemented as the “major change” in evaluation protocol between the DEIS and SEIS undermines the scientific validity of the overall FEIS process and is reason to dismiss the ROD. The FEIS failed to consider the 2021 MMP alternative substituted into the SEIS that shifts the bulk of production to ore bodies, presenting substantially different treatment, stabilization and cancer risk challenges. Regarding arsenic, the 2021 MMP is effectively a new alternative, more than doubling the production of arsenic from the most metallurgical challenging and environmentally significant West End Pit (WEP). This lack of coherence undermines the credibility and applicability of those DEIS analyses inherently being carried forward to the FEIS, without considering the implications of the modifications introduced by the 2021 MMP in the SEIS.

Of greatest concern, the Forest Service has failed to properly evaluate potential impacts of the new 2021 MMP alternative regarding i) arsenic cancer risk and ii) stabilization of amorphous arsenic in the CN/Detox slurry discharged to the TSF.

i) Arsenic Cancer Risk: The Forest Service has failed to conduct an independent analysis of potential carcinogenic arsenic emissions from the SGP, particularly from the WEP, and FEIS continues to rely on demonstrably erroneous and outdated estimations developed by IDEQ and Perpetua prior to the DEIS. The FEIS estimates cumulative cancer risk for the SGP as 6.45×10^{-7} and concludes this meets the acceptable 1×10^{-6} USEPA criteria. In sworn statements before the Idaho Board of Environmental Quality, IDEQ and Perpetua admit it is not possible to meet the 1×10^{-6} criteria. By their own calculations Perpetua asserts before the Board that the cancer risk is 4.1×10^{-6} , or 6.3 times greater than the FEIS estimate. The Objectors assert the risk is actually 1.2×10^{-5} , 19 times greater than the FEIS estimate over the alleged 16 year Project Life of Mine (LOM); or 5.3×10^{-5} (82 times greater than the FEIS estimate) on a 70-year operational basis, as IDEQ is required to calculate under (IDAPA 58.01.01.586) for a long-term stationary air pollutant source. As noted in Comment 18 the Board of DEQ has determined the application of the Project-specific adjustment factors that the FS has relied on are erroneous, indicating: *“DEQ Did Not Act Reasonably and in Accordance with Law When it Applied the 16/70 Calculation to the Ambient Arsenic Air Concentration Analysis”*.

The FS was notified of this May 9, 2024 determination by letter June 18, 2024, to Kevin Knesek, Acting Forest Supervisor, Payette National Forest. Nevertheless, the FS released the Draft ROD on September 6, 2024, knowingly retaining the erroneous cancer risk calculations.

The ROD should be withdrawn as the Forest Service has significantly underestimated particulate arsenic concentrations and total arsenic emissions, and consequently airborne carcinogenic risk levels.

ii) Regarding labile arsenic in the 400,000 to >1,000,000 tons of arsenic discharged to the TSF, the Forest Service has failed to demonstrate that amorphous arsenic can be stabilized in the TSF, nor does the Forest Service require redundant leak control or capture, or potential corrective actions should ambient water monitoring detect leaks. The SEIS addresses this issue only, and totally, in two sentences i) on page 2-51 Oxidation and Neutralization and ii) repeated in Table 2.4-13 Proponent Proposed Design Features:” *When increasing arsenic levels are observed, the oxidized slurry would be treated with hot arsenic cure (HAC) prior to neutralization. Metallurgical tests showed that this process promotes formation of the stable crystalline form of the arsenic precipitate enhancing environmental stability of arsenic*”.

Detailed scrutiny of the HAC testing by Perpetua Consultants in material cited by the SEIS shows:

ii a) The treatment system will not be installed in time to be used on the ores HAC has been tested on.

ii b) HAC has never been tested on the WEP ores for which it is intended and those most likely to be resistant to stabilization.

ii c) The stabilization tests were never conducted on the CN/Detox discharge “*oxidized slurry*” itself, as the design and the response to this comment suggests it will be applied, but instead on a diluted simulated discharges combined with other tailings.

ii d) The solubility extraction analytical test applied to assess stabilization simulates rainwater, rather than the aggressive conditions the allegedly stabilized arsenic will encounter in the pore water of the TSF.

The ROD should be withdrawn on the basis that FS has failed to show that amorphous arsenic can be appropriately treated and redundantly contained in the TSF.

Finally, the need to treat the CN/Detox slurry and dispose of the >400,tons of ore-bound arsenic on-site could be eliminated by Off-site Gold Processing. The ROD should be withdrawn as the Forest Service failed to identify and investigate Off-site Gold Processing as an economically and technically viable, and likely more environmental and human health protective Alternative. The dismissal of the Alternative was conducted in private negotiations with Perpetua in the alleged “re-scoping” activities following the Comment Review Period of the DEIS, without public notice or comment or government-to-government consultation.

Comment #	Comment	Response
<p data-bbox="218 857 394 1003">von Lindern, Ian (Founder, Terragraphics International Foundation)</p> <p data-bbox="218 1040 289 1065">17436</p> <p data-bbox="285 1138 310 1162">2</p>	<p data-bbox="422 833 1010 1404">Previous DEIS Comments: DEIS comments submitted by TIFO in 2020 focused on analyses regarding Contaminants of Concern (COC)s, specifically toxic metals. The comments emphasized the lack of transparency, material balances, and coherence in the document; and highlighted the resulting difficulties in determining the extent and disposition of toxic contaminants throughout the proposed alternatives. Because of these shortcomings it was not possible to develop comprehensive material balances and verify coherence. Rudimentary material balances were developed by TIFO, through reverse</p>	<p data-bbox="1066 833 1879 1404">Section 1.9 of the EIS states that the comments received on the 2020 DEIS were reviewed and considered as additional scoping input for the SDEIS preparation. These comments were analyzed in a content analysis process to develop public concern statements. Perpetua also reviewed the comments received on the 2020 DEIS and sought to respond to many of these comments by revising and resubmitting their Plan of Operations. This process produced the Modified Plan of Operations (ModPro2) submitted in October 2021, which then became the 2021 MMP which constituted a revised Proposed Action for Forest Service review. Sections 1 and 2 of the ModPro2 document explain how the changes in the modified plan of operations are partly in response to comments received on the 2020 DEIS. Appendix A of the ModPro2 document shows the comparison of the action</p>

	<p>engineering of Midas Gold support documents. Tables supporting the detailed calculations and data sources were attached to TIFO's DEIS comments. The comments and Tables illustrated the lack of transparency that precluded objective analyses of potential health and environmental risks associated with the SGP.</p> <p>Unfortunately, the Forest Service did not respond to public comments on the DEIS before substituting a new Preferred Alternative developed by Perpetua. Perpetua and the Forest Service characterize the new Alternative as refining the DEIS in response to public comments, without providing specific responses. As a result, the SDEIS Alternative comparison is limited to two site ingress/egress transportation routes and the status of previous comments is unknown. The Forest Service ignored public comments and de facto allowed Perpetua to determine which public comments are relevant and implied that responses are inherent in the SDEIS revisions. The Forest Service did little to address the lack of transparency and coherence in the SDEIS, and the documents remain fatally flawed. The introduction of a new Alternative in the SDEIS necessitated repeating the reverse engineering analyses to estimate material balance calculations with a different</p>	<p>alternatives reviewed in the 2020 DEIS and the ModPro2 plan. Because the 2021 MMP contained substantial changes to the Proposed Action that are relevant to environmental concerns the Forest Service decided to prepare a SDEIS. Also, based on comments received on the 2020 DEIS and the effects of the 2021 MMP, the Forest Service revised the action alternatives considered in the SDEIS. A major change in the format of the SDEIS and the 2020 DEIS was that technical supporting information was moved from the EIS to supporting Specialist Reports. The authors of these reports reviewed the public concern statements derived from the 2020 DEIS comments which advised the authors of the specialist reports regarding content of those reports to be responsive to what was learned from the 2020 DEIS comments. Per 40 CFR § 1503.4(a) the Final EIS will respond to individual comments or groups of comments. The Final EIS will contain responses to the comments received on the SDEIS and concern statements summarizing comments on the DEIS.</p> <p>The commenter submitted quantitative re-evaluation of the chemical characterization data in the 2020 DEIS to prepare elemental material balances for the different ore and waste materials of the operations. However, the elemental material balances are not solely indicative of potential environmental effects or how these effects compare to existing regulatory limits and guidance. These elemental material balances are not typically used in NEPA analyses of proposed mining operations. This is because quantification and relocation of elemental masses may not be directly associated with physical environmental effects. For example, relocating a certain mass of elemental antimony from an open pit to a</p>
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	<p>combination of Midas Gold and Perpetua support documents. SDEIS material balances are summarized in Tables attached below. TIFO's 2020 comments and DEIS material balance support Tables are provided as supplemental material.</p>	<p>development rock storage facility is not as informative as the mineral form and concentration of the mineral that contains the element, and how mobile the element would be in the environment based on the whole rock chemistry and the proposed management plan for the development rock. The impact analyses included in the SDEIS do utilize typically acceptable data and methods to predict chemical impacts on environmental media and then compare these projected impacts to existing regulatory requirements and guidance.</p> <p>Objection Narrative:</p> <p>The first paragraph of the Response to Comment #2 above states: <i>“Section 1.9 of the EIS states that the comments received on the 2020 DEIS were reviewed and considered as additional scoping input for the SDEIS preparation. Perpetua also reviewed the comments received on the 2020 DEIS and sought to respond to many of these comments by revising and resubmitting their Plan of Operations. This process produced the Modified Plan of Operations (ModPro2) submitted in October 2021, which then became the 2021 MMP which constituted a revised Proposed Action for Forest Service review. Sections 1 and 2 of the ModPro2 document explain how the changes in the modified plan of operations are partly in response to comments received on the 2020 DEIS.”</i></p> <p>An alternate interpretation of these events is that, at the time following the receipt of comments on the 2020 DEIS, Perpetua was also informed that the Idaho Department of Environmental Quality (IDEQ) had denied Perpetua's</p>
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		<p>“additional scoping” issue being presented or discussed in a public forum or in government-to-government consultation. (See comments 24-30, below)</p> <p>The Commenter has provided detailed analysis of substantial deficiencies in the HAC feasibility research effort, and the advantages of exporting more than 60% of the potentially liable arsenic to Nevada to be disposed of in existing disposal facilities. (See Comment 31).</p> <p>The Commenter contended in Comments below, that the MoDPRO2 modifications should have been considered as a <u>new</u> alternative rather than as a modification. Both Perpetua and the FS were aware the MoDPRO Plan was not viable following the DEIS review period and the IDEQ decision to require compliance with cancer risk criteria. The FS, as indicated above, considered this information as “<i>additional scoping input</i>” and substituted ModPRP2 as the new alternative. The FS should have i) revealed the difficulties in achieving chemical stability for the post-POX discharges, and ii) disclosed that an economically and technically viable (and likely more environmentally protective) alternative was available to address the post-POX labile arsenic discharge insufficiencies (i.e., production of salable concentrates, See Comment 31), and iii) sought public input in the rescoping efforts, as required by NEPA.</p> <p>OBJECTION – Based on the above discussion and extensive analyses provided the FS during the DEIS and SEIS Comments (re-submitted below), the ROD should be withdrawn. The FS ignored salient public input, collaborated with Perpetua to substitute a new</p>
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		<p>alternative during private “additional scoping” activities and specifically precluded a more environmentally protective, technically and economically feasible alternative from being evaluated.</p>
<p>4</p>	<p>The Forest Service has also imposed extraordinary burdens on Public Reviewers by i) allowing Perpetua to submit the new Alternative in the SDEIS without considering and replying to Public Comments on the DEIS, and ii) failing to conduct objective independent analyses for key health and air quality analyses, by deferring to analyses conducted by SGP for the Idaho Department of Environmental Quality (IDEQ) Permit to Construct (PTC). This has required reviewers to revisit analyses based on the DEIS Alternatives, repeat those analyses for the new SDEIS Preferred Alternative, compare the differences, and comment on both documents and the comparison. Similarly, reviewing the air quality analyses required obtaining and critiquing much of the support material from IDEQ. TIFO requested an extension detailing these challenges on December 15, 2022, and received no response from the Forest Service (letter attached).</p>	<p>The Forest Service released the SDEIS on October 28, 2022, and required that all comments be submitted by January 10, 2023. This was a 75-day public comment period which was 30 days longer than the required 45-day comment period. Per 40 CFR 1502.9(c) the Forest Service determined that a supplement to the DEIS was required because the new alternative contained substantial changes that were relevant to environmental concerns. Per 40 CFR § 1503.4(a) the Final EIS responds to individual comments or groups of comments. The Final EIS contains responses to the comments received on the SDEIS and concern statements summarizing comments on the DEIS. A criticism of the 2020 DEIS was that it included too much technical information making it too long and difficult to review. In response to this criticism the Forest Service provided most of the technical supporting information for the SDEIS in separate specialist reports that were made available at the same time as the SDEIS. The air quality impact analysis in the SDEIS was supported by air emissions inventory and impact modeling information that was independent from that prepared by Perpetua for the IDEQ PTC and is contained in the Air Resources Specialist Report. The Forest Service conducted its own air impact analyses and did not defer to the IDEQ impact analyses. For the convenience of the reviewers, the emissions information that was used</p>

		<p>by the IDEQ for the PTC was disclosed in the specialist report and compared to the emissions inventory information used for the SDEIS.</p> <p>Objection Narrative:</p> <p>As noted above, the FS has not provided meaningful response to technical comments regarding the development of the Emissions Inventories and Air Quality modeling analyses. Several specific critiques of key variables and lack of conservativeness in the selection of variable values have been offered in comments to both the DEIS and SEIS and are resubmitted herein.</p> <p>The Commenter, as noted, has been critical of the FS' deference to Perpetua and to IDEQ with respect to key analyses and has endeavored, through detailed technical analysis presented in numerous comments, to point out the FS' failure to independently evaluate the pertinent comments below.</p> <p>The Air Quality Specialist Report provides the Emissions Factors used in the alleged independent analysis in Appendix A of the document. Appendix A refers to the "... <i>report Air Quality Analysis, prepared by Air Sciences Incorporated for Midas Gold Idaho, Inc. (Air Sciences 2018) and in the modeling report provided to support the Permit to Construct application to IDEQ (Air Sciences 2020) a variety of published air emission factors were used to quantify pollutant emissions from the Project sources. This discussion will review the selection of emission factors, as tabulated in Tables 4 through 9 in Air Quality Analysis, which are excerpted from that report and provided in Appendix A.</i>"</p>
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		<p>rationale for selection of the haul road EF Equations other than those “...vetted by the agencies during initial development of this Project inventory” on page 5 of Appendix C. The vetting by other agencies does not support the FS claim of independent analysis, but rather suggests deference to the DEQ and Perpetua collaboration in 2018, prior to the recognition of IDAPA 58.01.01.586 requiring cancer risk calculations. The reference to “...correlation 1a” does not seem to relate to any other section of the document, but perhaps refers to Equation 1a of AP-42 Section 13.2.</p> <p>The Air Quality Specialist Report is not independent of IDEQ and Perpetua’s selection of EFs, of ambient air arsenic concentrations, or of Cancer risk, as alleged by the FS. See Objections to Comment responses 2, 9, and 14-20.</p> <p>OBJECTION: The FS failed to conduct an independent analysis of the selection of Emission Factors, modeling assumptions, and application of USEPA guidelines for conservative analyses in applying AP-42 guidelines. These errors were compounded by the use of inappropriate dose-averaging analyses in calculating carcinogenic risk. This resulted in the FS underpredicting cancer risk by 1 to 2 orders of magnitude less than that reflected in sworn admissions by both Perpetua and the State Regulatory Authority. The fact that both Perpetua and IDEQ have asserted that attaining the human health cancer risk criteria claimed by the SEIS cannot be met by the SGP, is sufficient reason to dismiss the ROD.</p>
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5	<p>Both the DEIS and SDEIS lack transparency and coherence. The USEPA defines transparency to "... ensure that the regulatory science underlying its actions is publicly available in a manner sufficient for independent validation." https://www.regulations.gov/document?D=EPA-HQ-OA-2018-0259-9322.</p> <p>Coherence is the quality of being logical and consistent, or presented in a manner in which all the parts fit together to form a united whole. Neither document meets these criteria. Key data and analyses are contained in obscure, and often unavailable, references. With regard to COCs, neither overall productions figures, nor any material balances are provided. Determining the contaminant quantities, potential chemical forms and toxicity through the proposed immense mining operations and complex metallurgical processes requires tedious reverse engineering. Various support documents were used to develop rudimentary COC material balances for both the DEIS and SDEIS. These accountings are used below to demonstrate specific health and environmental concerns with DEIS and SDEIS, and the insufficiency of the Forest</p>	<p>The SDEIS is a well-organized, comprehensive review of the characteristics and potential environmental effects of the action alternatives considered. All sources of information used in the SDEIS are clearly cited and the specialist reports supporting the SDEIS with important data were made available on the Forest Service project website at the same time as the SDEIS itself. The important chemistry information for the ore and waste rock to be mined and their potential to release COCs is fully discussed in Sections 3.3, 3.5, 3.8, 3.9 of the SDEIS. The projected impacts of these COCs on environmental media are fully disclosed and discussed in the corresponding sections of Chapters 4 and 5 of the SDEIS. Where appropriate, these COC impacts are compared with applicable regulatory standards and requirements for the receiving media including ambient air, surface water, and ground water.</p> <p>Objection Narrative: See also Objection to Comment 2.</p> <p>The Commenter has submitted substantial technical comments on both the DEIS and SDEIS. The FS has yet to provide substantive response or rebuttal to the more significant comments. There are concerns with the FS' failure to respond to comments that provided specific quantitative details questioning the FS evaluations and conclusions with respect to potential harm to human health and the environment. The FS responses are generic, provide no specific, technical nor quantitative rebuttal. The FS offers four basic rationales for providing</p>

	<p>Service analyses. It is not possible, in the time allotted with the available reference material, for an independent reviewer to assess the consistency and accuracy of the assertions made regarding COCs throughout DEIS or SDEIS.</p>	<p>non-specific response: i) The FS does not recognize the type of analysis offered, although mass balance analysis is a standard engineering and scientific principle; ii) the FS considers conflicting information that the SGP is providing in other regulatory and investment forums irrelevant to the NEPA process, iii) the FS will only consider information as it applies to the “2021 MMP”, and iv) circular referencing.</p> <p>OBJECTION: Consequently, the Commenter Objects to the ROD on the overall basis that the FS has failed to provide objective and meaningful response to numerous detailed technical comments submitted to both the DEIS and SDEIS as follows, and in the additional objections related to the individual comments below.</p> <p>As a result, all previous comments and support material are herein resubmitted to support the multiple Objections.</p> <p>The following discusses the nature of the four Objectionable FS Generic Responses to Substantive Comments.</p> <p><i>i) FS refusal to substantively comment based on the type of analysis presented in the Comment.</i></p> <p>The Commenter has critiqued the DEIS and SEIS for lack of Coherence and Transparency. The DEIS, SEIS and Specialist Reports are exceptionally difficult to comprehensively review with respect to Contaminants of Concern (COCs), particularly for arsenic. The refractory gold ores targeted by the SGP are arseno-pyrites. Arsenic concentrations and chemical form are both critical to metallurgical and environmental processes,</p>
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		<p>mining economics, and short-term and long-term environmental and human health concerns. The massive amounts of arsenic in the proposed SGP processes and surrounding ecosystems will be present in various chemical forms and will naturally and intentionally undergo numerous chemical and physical transformations as the ores and wastes move through the mineral extraction and environmental disposition systems.</p> <p>The DEIS, SDEIS and FEIS do analyze potential impacts within most of the environmental and mining activity compartments. Numerous comments and responses have been offered, usually organized by discipline and compartment. However, in an overall systems evaluation, there are critical inconsistencies with respect to the accounting of the mass and chemical form of COCs as these toxins transfer from one-compartment to others in this complex mineral extraction proposal. This failure to maintain consistency in systematic analyses is described as lack of coherence.</p> <p>The Commentor has conducted and offered detailed mass balance analyses for both the DEIS and SEIS demonstrating both the lack of coherence and dangerous omissions that threaten human health and the environment. There are numerous examples of lack of coherence among the many analyses involving arsenic. As described below in several Comments, there are critical insufficiencies with regard to arsenic cancer risk analyses from airborne dusts and labile arsenic discharges from the cyanidation processes.</p>
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		<p>Both these critical concerns have been pointed out in detail in previous comments and substantial support material, summary tables and calculations were provided. The FS has yet to provide any technical rebuttal or meaningful response to the critiques offered in those analyses. Conversely the FS response to the detailed technical analyses presented is a generic dismissal of mass balance analyses with no substantive response to the technical critique, as follows:</p> <p><i>“The commenter submitted quantitative re-evaluation of the chemical characterization data in the 2020 DEIS to prepare elemental material balances for the different ore and waste materials of the operations. However, the elemental material balances are not solely indicative of potential environmental effects or how these effects compare to existing regulatory limits and guidance. These elemental material balances are not typically used in NEPA analyses of proposed mining operations. The impact analyses included in the SDEIS do utilize typically acceptable data and methods to predict chemical impacts to environmental media and then compares these projected impacts to existing regulatory requirements and guidance.”</i></p> <p>The Commenter has never contended that the material balances are “solely indicative” of environmental consequence but has offered these standard engineering analyses to better quantify the comments and issues. The FS rationale that the “relocation <u>may not</u> be directly associated with physical environmental effects” does not justify the dismissiveness of the FS response to the methodology. The elemental balances are offered <u>precisely</u> to show that there are significant physical and</p>
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		<p>chemical effects that are harmful to human health and the environment, and that in several instances the FS has not consistently evaluated nor addressed those concerns.</p> <p>Additionally, note the following sentence in the FS Response to Comment #2: <i>“A major change in the format of the SDEIS and the 2020 DEIS was that technical supporting information was moved from the EIS to supporting Specialist Reports”.</i></p> <p>This <i>“major change”</i> exacerbated the lack of coherence in the FS’ SDEIS analysis. Each expert report was then free to select an independent basis of analyses, or the input assumptions for arsenic. Because there was no overall attention to mass balance principles, one compartment’s expert assumption inputs do not necessarily reflect the magnitude, chemical or physical characteristics of the output arsenic from the previous compartment’s expert analyses. Combined with the confusion of substituting a new alternative mid-stream between the DEIS and SDEIS, coherence was lost. The analyses cannot be relied on due to violation of the most fundamental preservation of mass principles.</p> <p>Nowhere is this better illustrated than in the cancer risk analyses for which the Forest Service output cancer risk is one to two orders of magnitude less than that determined by Perpetua, IDEQ and the DEQ Board for the same Mine Plan.</p> <p><i>ii) the FS considers conflicting information the SGP is providing in other regulatory and investment forums irrelevant to NEPA process,</i></p>
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		<p>exceeding alleged 29% capacity limitation (See Objection 2023 letter). In this case, these mass balance inconsistencies have resulted in order of magnitude errors in cancer risk calculations. An order of magnitude error in cancer risk evaluation is a substantial, non-trivial, and dangerous oversight that deserves serious response and correction. Two FS generic non-responses are provided for these critiques as follows:</p> <p><i>“The Forest Service decision on the Project extends only to the alternative selected as described by its plan. Modifications to that plan would require permit modification through additional NEPA analysis,” or “The Forest Service intends to require Perpetua to comply with the descriptions of its proposed operations as described in the 2021 MMP. If significant changes are proposed in the future to the 2021 MMP, the Forest Service would consider what additional environmental analyses would be required as part of the review and subsequent decision process of these proposed changes”</i></p> <p>There are no indications as to how the FS will intervene in mine operations should the SGP operate at the production rates indicated to the IDEQ, or how the FS would reimpose the NEPA process after adoption of the ROD and initiation of the mine.</p> <p><i>iv) Circular Referencing</i></p> <p>In response to several comments the FS simply redirects the Commenter to the same Sections of the SDEIS addressed in the comment with no assertion or discussion as to the validity of the Comment. Comments below directly quote the first and last Paragraph of Section 13.9.4 of the Feasibility Report (M3 2021) in pointing out</p>
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		<p>technical insufficiencies in the Report. The FS response to the comment states:</p> <p><i>“Additional detail on the studies that have been conducted on arsenic stability in mill wastes and the design responses to these studies is found in Section 13.9 of the Feasibility Report (M3 2021).”</i></p> <p>Comments herein provide specific technical critiques regarding the insufficiencies of the analyses. Referring the Commenter back to the paragraphs which the Commenter cites as insufficient does not constitute an objective response.</p> <p>Example Non-substantive Responses with Substantial Human Health and Environmental Consequences. Several examples of the lack of responsiveness to salient technical analyses by the Commenter are detailed below as individual Objections. Two examples are critical as they represent significant errors that could have large and irreversible damage to human health and water quality. Those examples are a) airborne arsenic cancer risk calculations and b) labile arsenic in the post-POX discharges to the TSF. The examples also demonstrate the value of i) the mass balance analyses, and ii) the SGP inconsistent assertions to the IDEQ and Investor Feasibility Studies disclosures that the FS failed to respond to on the basis the information is not relevant to NEPA.</p> <p>As noted above, the SGP’s targeting of arsenical ores results in massive amounts of arsenic encountered in overburden, waste rock, and ores. The Commenter’s mass balance analysis estimates 616,000 - 1,856,000 tons (average - 95th%tile) of arsenic is mined in the</p>
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		<p>SDEIS configuration, with approximately 64% found in ores and 36% in overburden and waste rock. Greater than 99% of this arsenic will be permanently wasted and re-distributed on-site.</p> <p>a) Airborne arsenic cancer risk calculations: Regarding the smallest release identified in the mass balance analyses, (i.e., <1% of total arsenic that is emitted off-site as mining fugitive dust), the FS estimates cumulative cancer risk for the SGP as 6.45×10^{-7} and concludes this meets the acceptable 1×10^{-6} USEPA criteria. In sworn statements before the Idaho Board of Environmental Quality, IDEQ and Perpetua by their own calculations assert the cancer risk is 4.1×10^{-6}, or 6.3 times greater than the FS assertion. The Appellants and this Objector assert the risk is actually 1.2×10^{-5}, 19 times greater over the alleged 16 year Project Life of Mine (LOM); or 5.3×10^{-5} (82 times greater) on a 70-year operational basis, as IDEQ is required to calculate under (IDAPA 58.01.01.586) for a long-term stationary air pollutant source. Clearly the FS is severely and dangerously underestimating the cancer risk associated with the SGP facility Perpetua intends to construct. Additional detail can be found in specific Objections to Comments 24-30.</p> <p>b) Labile arsenic in the post-POX discharges to the TSF. Regarding the greatest concentration of arsenic identified in the mass balance analyses, the largest ultimate sink of arsenic will be the 396,000 - 1,188,000 tons of cyanidation waste arsenic projected to be disposed in the TSF. This issue was discussed extensively in Comments #26 to #30 noted in the Objections. The extensively detailed comments draw on a series of Midas</p>
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		<p>Gold Feasibility Study disclosures to investors, which indicate substantial difficulties in stabilizing POX stream arsenic prior to disposal to the TSF. There is likely no more dangerous threat to the aquatic environment of the Salmon River drainage than the release of labile post-POX arsenic from the TSF. It is essential that the FS be absolutely confident that the arsenic disposed of in the TSF be stabilized in low-solubility chemical forms, and that redundant reliable leak protection, detection and corrective actions be provided for in the design, construction, operation and perpetual maintenance of the TSF.</p> <p>The evaluation of both of these critical issues is significantly informed by mass balance analyses that the FS considers “<i>not solely indicative of potential environmental effects or how these effects compare to existing regulatory limits and guidance</i>”. These examples address the largest and smallest sinks of arsenic identified by the mass balance analyses.</p> <p>OBJECTION: The ROD should be withdrawn on the basis that the Forest Service has failed to objectively consider and substantively respond to Public Comments.</p>
6	<p>TIFO comments include rudimentary material balances for the DEIS and SDEIS Alternatives. Table SD1a contains the Pit-specific and historic waste material COC distributions for Development Rock DR, Ores, and Historic Materials from the SRK (2017) SGP Baseline Geochemical Characterization Report. Tables SD1b and</p>	<p>The commenter submitted quantitative re-evaluation of the chemical characterization data in the 2020 DEIS to prepare elemental material balances for the different ore and waste materials of the operations. However, the elemental material balances are not solely indicative of potential environmental effects or how these effects compare to existing regulatory limits and guidance. These elemental material balances are not typically used in</p>

	<p>SD1c, combine the COC distributions with mining production estimates from M3 (2014), (2019) and (2021) Stibnite Gold Project Feasibility Technical Study Reports supporting the MoDPRO and MoDPRO2 Alternatives. These Tables contain probability distributions of COC production for mined materials for the DEIS and SDEIS, respectively. Table SD2 summarizes overall DEIS and SDEIS Pit-mined COC production. Table SD3 summarizes COC production and DR COC disposal for the SDEIS Alternative.</p> <p>The lack of material balances has been noted in several reviews including the DEIS and several IDEQ PTC submittals regarding the SGP. It is unusual that credible material balances are excluded in such complex environmental systems analyses. IDEQ has responded that material balances are “helpful but not required,” and has been unwilling to request SGP to supply the accounting. The Nevada Department of Environmental Protection (NDEP), that regulates the only comparable gold refinery operations in the United States, does require material balances. Despite the Forest Service Air Quality Expert Report 2022 citing the NDEP requirements as exemplary, the Forest Service has not completed material balances for either the DEIS or SDEIS. As demonstrated below, COC sources,</p>	<p>NEPA analyses of proposed mining operations. The impact analyses included in the SDEIS do utilize typically acceptable data and methods to predict chemical impacts on environmental media and then compare these projected impacts to existing regulatory requirements and guidance.</p> <p>Objection Narrative: See Objection to Comment 5 regarding the FS dismissal of material balance analyses and consequent refusal to provide meaningful response. Note the Forest Service Air Quality Expert Report 2022 cites the Nevada Department of Environmental Protection (NDEP), that regulates the only comparable gold refinery operations in the United States; NDEP requirements as exemplary. The NDEP does <u>require</u> material balances for permitting such facilities. The FS dismissal of material balance analyses for COCs for either DEIS or SDEIS, does not justify the dismissal of the comments, or the refusal to consider the value of the additional detail.</p> <p>As noted in Objection to Comment 5, the “major change” adopted during the substitution of the new alternative between the DEIS and SDEIS allowed each expert report to select an independent basis of analyses. Specifically, the input assumptions for arsenic being markedly different from the DEIS exacerbated the lack of coherence in the FS’ SDEIS. Because there was no overall attention to mass balance principles, one compartment’s expert input assumption do not necessarily reflect the magnitude, chemical or physical characteristics of the output arsenic of from the preceding expert compartment’s analyses. These inconsistencies then multiply through the various transitions from mining operations to metallurgical processes to contaminant releases, deposition in</p>
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	<p>concentrations and distribution differ significantly for the DEIS and SDEIS.</p> <p>The Forest Service should require material balances for toxic contaminants in future Supplemental analyses.</p>	<p>environmental media, and eventual environmental hazard and cancer risk.</p> <p>The consequence of this lack of coherence with Expert Reports is no better illustrated than in the Air Quality Expert Report cancer risk calculations discussed in Comments 2, 9, and 14-20. The Air Quality selected input production assumption is wholly inconsistent with the remainder of the SDEIS. The Air Quality Specialist Report does not maintain a consistent basis within the report itself, using different Emissions Inventories for different pollutants in the same particulates, obviously violating the principle of conservation of mass. See Objection 2023 letter. The result was order of magnitude underpredictions of the cancer risk that justifies withdrawing the ROD from consideration.</p> <p>The supposed application of the HAC treatment of labile arsenic in the CN/Detox discharge is another example of disjointed analysis that would be avoided by mass balance analyses. The tests on sample ores are conducted on ores that allegedly will not require treatment as the HAC facility will not be in place before these ores are depleted. Conversely, the treatment viability tests were never conducted on the ores most likely to require additional HAC treatment. Mass balance analyses assure continuity in time as well as preservation of mass and would have identified this critical error missed, and not yet acknowledged, by the FS. See Comments 24-30, below.</p> <p>OBJECTION: The lack of coherence and consistency between the DEIS and the SDEIS and the various Expert Reports implemented as the “major change” in evaluation protocol undermines the scientific</p>
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		validity of the overall DEIS process and is reason to dismiss the ROD.
7	<p>The Preferred Alternative is New and Improperly Substituted in the SDEIS: The Forest Service has failed to evaluate appropriate Alternatives in both the DEIS and SDEIS. As noted, the Forest Service has abused the NEPA process, by extending extraordinary and inappropriate deference to Midas and Perpetua, and allowing new Alternatives to be substituted during the EIS period without Public Review. The SDEIS summarizes: “This SDEIS was prepared in response to a modified Plan of Restoration and Operations (Plan) for the SGP. The Forest Service received the original SGP Plan in 2016, (Midas Gold Idaho, Inc. [Midas Gold] 2016a) for review and approval in accordance with regulations at 36 Code of Federal Regulations (CFR) 228 Subpart A. A revised Plan, also known as MoDPRO(1), was submitted to the Forest Service in 2019 (Brown and Caldwell 2019a). A further modified Plan, also known as ModPRO2(2), was initially submitted in December 2020 with a revised submittal in October of 2021 (Perpetua 2021a).”</p>	<p>Section 1.9 of the SDEIS states that the comments received on the 2020 DEIS were reviewed and considered as additional scoping input for the SDEIS preparation. These comments were analyzed in a content analysis process to develop public concern statements. Perpetua also reviewed the comments received on the 2020 DEIS and sought to respond to many of these comments by revising and resubmitting their Plan of Operations. This process produced the Modified Plan of Operations (ModPro2) submitted in October 2021, which then became the 2021 MMP which constituted a revised Proposed Action for Forest Service review. Sections 1 and 2 of the ModPro2 document explain how the changes in the modified plan of operations are partly in response to comments received on the 2020 DEIS. Appendix A of the ModPro2 document shows the comparison of the action alternatives reviewed in the 2020 DEIS and the ModPro2 plan. Because the 2021 MMP contained changes to the Proposed Action that are relevant to environmental concerns, the Forest Service decided to prepare a SDEIS. Also, based on comments received on the 2020 DEIS and the effects of the 2021 MMP, the Forest Service revised the action alternatives considered in the SDEIS. A major change in the format of the SDEIS and the 2020 DEIS was that technical supporting information was moved from the EIS to supporting specialist reports. The authors of these reports reviewed the public concern statements derived from the 2020 DEIS comments which advised the specialist report authors regarding content of those reports to be</p>

		<p>responsive to what was learned from the 2020 DEIS comments. Per 40 CFR § 1503.4(a) the Final EIS responds to individual comments or groups of comments. The Final EIS contains responses to both the comments received on the DEIS and SDEIS.</p> <p>The commenter submitted quantitative re-evaluation of the chemical characterization data in the 2020 DEIS to prepare elemental material balances for the different ore and waste materials of the operations. However, the elemental material balances are not solely indicative of potential environmental effects or how these effects compare to existing regulatory limits and guidance. These elemental material balances are not typically used in NEPA analyses of proposed mining operations. The impact analyses included in the SDEIS do utilize typically acceptable data and methods to predict chemical impacts on environmental media and then compare these projected impacts to existing regulatory requirements and guidance.</p> <p>OBJECTION: See objections to Comment Responses 2, 5 and 6, above.</p>
8	<p>The evolution of these documents was also at issue in the IDEQ Permit to Construct (PTC). SGP has pursued and, although under Administrative Appeal, obtained a PTC for a facility capable of processing 180,000 tons/day of ore from the IDEQ. The initial PTC proposed by IDEQ did not address 99% of arsenic emissions from the proposed facility. Yielding to public scrutiny,</p>	<p>Most of this comment addresses the IDEQ permitting actions not the SDEIS. The SDEIS responds to a different Proposed Action (40 CFR. § 1502.9(c)(1)) than was considered for the DEIS, and also public input received on the DEIS, thus the action alternatives for the SDEIS can be different than those considered in the DEIS (40 CFR. § 1503.4 allows “[m]odifying alternatives including the proposed action” and “[d]eveloping and evaluating alternatives not previously given serious consideration by</p>

	<p>IDEQ relented and required these emissions to be addressed in the PTC. The subsequent PTC application was also found to be insufficient. IDEQ accepted Perpetua’s contention that there was no reasonably available control technology (RACT) addressing arsenic emissions from the proposed facility that could meet airborne carcinogenic risk criteria. IDEQ granted Perpetua TRACT relief from the carcinogenic criteria, allowing a ten-fold increase in cancer risk, and imposed production limits of 75% of capacity on operations. PTC Appellants argue these limitations are ineffective, as arsenic emissions and ambient concentrations are grossly under-predicted, the limits are not enforceable, and no monitoring is required to ensure compliance. (IDEQ 2022a,b).</p> <p>The Forest Service should recognize the initial configurations rejected by IDEQ are the Alternatives presented in the DEIS, and the alleged refinements are new Alternatives developed to comply with IDEQ requirements. The Forest Service SEIS Preferred Alternative (as noted in the SGP 2021 Modified Mine Plan (MMP) Alternatives Report (Forest Service 2022a)), is actually the 2021 MMP that includes the limits imposed by IDEQ. As a result, the Forest Service has selected a Preferred Alternative that differs</p>	<p>the agency”). The air impact analysis in the SDEIS is contained in Section 4.3 and is based on the description of the operations contained in the 2021 MMP submitted to the Forest Service for its permitting process. The Forest Service conducted its own, objective air quality impact analysis separate from IDEQ. However, it is recognized that the IDEQ is the regulatory authority in Idaho for air quality matters and any approval of the SGP permit application to the For4est Service would require compliance with IDEQ permit conditions.,19</p> <p>OBJECTION: See Objection to Comments 2, 13,14, 15, 17, 18, 20 and 22 stated herein.</p>
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	significantly from the original scoping and the DEIS Alternatives.	
9	<p>The Preferred Alternative evaluated by the Forest Service relies on SGP assertions that Perpetua, or subsequent operators, will adhere to the 2021 MMP. Perpetua has a PTC to construct a facility capable of operating at 180,000 tons/day capacity and an amendable permit condition limiting production to 135,000 ton/day (75% of capacity). The Forest Service relies on Perpetua’s assertion in the 2021 MMP that the SGP will operate at 29% of capacity. There are no provisions in the PTC permit conditions to limit SGP to the Forest Service assumed production level. IDEQ permit conditions allow production up to the 75% of capacity TRACT limit, and is amendable without federal oversight.</p> <p>The Forest Service only has Perpetua’s unbound assurance that the SGP will operate according to the 2021 MMP. Table SD4 compares the Forest Service 2021 MMP, Maximum Design Capacity, and TRACT permitted emissions for Mining Fugitive Dust emissions. Table SD4 demonstrates the SGP is permitted by IDEQ to increase production, emissions and environmental releases by 2.5 times, and has the design capacity to increase emissions by 3 times. The Preferred Alternative is only constrained by</p>	<p>The Forest Service decision on the Project extends only to the alternative selected as described by its plan. Modifications to that plan would require permit modification through additional NEPA analysis.</p> <p>OBJECTION: See Objection to Comments 2, 13, 14, 15, 17, 18, 20 and 22 herein, as well as the Objection letter submitted October 18, 2024, pp. 227-242.</p>

	<p>amendable IDEQ Minor Source Permit conditions. Forest Service should consider the probability of SGP expansion, and evaluate potential impacts at the permitted and design capacity of the facility.</p> <p>Alarminglly, Perpetua's 2021 Technical Feasibility Study disclosure to Investors indicates that substantial additional resources are available for exploitation, including expansion of the current Pits, and several other on-property and nearby reserves. Other mining companies are actively exploring similar ore bodies nearby that could utilize the SGP mineral processing excess capacity. The SDEIS does not address these nearby reserves, or the lack of constraints on the SGP to exploit the excess capacity,</p>	
10	<p>The Forest Service has never responded to public comments alleging the insufficiencies of the Alternatives in the DEIS. Those DEIS Alternatives were demonstrated to be fatally flawed by rejection from IDEQ. The Forest Service avoided making that determination by electing to provide no response, ignore the Public Comments, and narrowed the SDEIS analyses by substituting and selecting a new Preferred Alternative as suggested by Midas/Perpetua.</p>	<p>Section 1.9 of the SDEIS states that the comments received on the 2020 DEIS were reviewed and considered as additional scoping input for the SDEIS preparation. These comments were analyzed in a content analysis process to develop public concern statements. Perpetua also reviewed the comments received on the 2020 DEIS and sought to respond to many of these comments by revising and resubmitting their Plan of Operations. This process produced the Modified Plan of Operations (ModPro2) submitted in October 2021, which then became the 2021 MMP which constituted a revised Proposed Action for Forest Service review. Sections 1 and 2 of the ModPro2 document explain how the changes in the modified plan of operations are partly in response</p>

		<p>to comments received on the 2020 DEIS. Appendix A of the ModPro2 document shows the comparison of the action alternatives reviewed in the 2020 DEIS and the ModPro2 plan. Because the 2021 MMP contained substantial changes to the Proposed Action that are relevant to environmental concerns, the Forest Service decided to prepare a supplemental draft EIS. Also, based on comments received on the 2020 DEIS and the effects of the 2021 MMP, the Forest Service revised the action alternatives considered in the SDEIS. A major change in the format of the SDEIS and the 2020 DEIS was that technical supporting information was moved from the EIS to supporting specialist reports. The authors of these reports reviewed the public concern statements derived from the 2020 DEIS comments which advised the authors of the specialist reports regarding content of those reports to be responsive to what was learned from the 2020 DEIS comments. Per 40 CFR § 1503.4(a) the Final EIS responds to individual comments or groups of comments. The Final EIS contains responses to the comments received on the SDEIS and concern statements summarizing comments on the DEIS.</p> <p>OBJECTION: See Objection to Comment 2, above.</p>
11	<p>Perpetua and the Forest Service allege MoDPRO2 is a refinement of the earlier MoDPRO and PRO Alternatives, and addresses the insufficiencies identified in the DEIS. However, there are substantial and definitive differences with respect to the</p>	<p>With regards to production rates, the commenter appears to be referring to permitting by the IDEQ and not the Forest Service. The Forest Service intends to require Perpetua to comply with the descriptions of its proposed operations as described in the 2021 MMP. If significant changes are proposed in the future to the 2021 MMP, the Forest Service would consider what additional environmental analyses would be required as part of the</p>

	<p>sources, toxicity, treatment, and disposition of COCs. In the Preferred Alternative, the SGP is not constrained to the production rates assumed by the Forest Service, but is permitted to increase production, emissions and environmental releases by 2.5 times, and could increase emissions by more than 3 times by amending a Minor Source Permit not subject to federal review. The Forest Service has neglected to consider whether there are adjacent resources available to SGP to substantially increase production.</p> <p>Conversely, the Forest Service has refused to consider Alternatives suggested by Public Reviewers.</p> <p>Among the more protective Alternatives are process options considered by Midas in the same time period the serial MoDPRO Alternatives were developed to address arsenic instability and exposure problems. These potential Alternatives, as noted below, are both technically and economically viable, and could substantially reduce the environmental burden of COCs.</p>	<p>review and subsequent decision process of these proposed changes. The commenter alleges that the Forest Service did not consider other action alternates including: processing changes to reduce arsenic availability, offsite processing of gold concentrates, and consideration of CERCLA under the No Action Alternative. Inclusion of steps to reduce the environmental availability of arsenic in mill tailings are discussed in the Oxidation and Neutralization subsection of Section 2.4.5.7 of the SDEIS. More technical information related to the process designs are available in the 2021 MMP and the Feasibility Study Technical Report (M3 2021). The consideration of off- site processing of the gold concentrate is discussed in Section 2.6.2.1 of the SDEIS. Consideration of CERCLA applicability for the No Action Alternative is discussed in Sections 1.3 and 2.3 of the SDEIS.</p> <p>OBJECTION: See Objection to Comments 2, 24, 25, 26, 27, 28, 29 and 30 herein.</p>
12	<p>The Forest Service should reopen the Public Record and allow the same deference accorded the SGP to the Public. Appropriate alternatives should be identified in consultation with Public representatives, and addressed in a second, more objective, Supplemental</p>	<p>The Forest Service intends to require Perpetua to comply with the descriptions of its proposed operations as described in the 2021 MMP. If significant changes are proposed in the future to the 2021 MMP, the Forest Service would consider what additional environmental analyses would be required as part of the review and subsequent decision process of these proposed changes.</p>

	<p>DEIS. The Preferred Alternative should be re- evaluated on the basis of the design capacity of the facility, rather than on alleged production limitations.</p>	<p>The comment does not present significant new information relevant to the environmental concerns that have a bearing on the Proposed Action or its impacts.</p> <p>OBJECTION: See Objection to Comments 2, 4, and 5, above.</p>
<p>13</p>	<p>Concurrent review of the serial Alternatives and support documents submitted to the Forest Service demonstrates that the Preferred Alternative is more than a refinement. As noted, it should be considered a new Alternative substituted for earlier DEIS Alternatives that were clearly insufficient.</p> <p>In comparing MoDPRO and MoDPRO2, mined material is decreased by 44 MT in the SDEIS Alternative. This is achieved by decreasing Development Rock (DR) by 61 MT and increasing Ore production by 17MT. This significantly changes the production, sources, concentrations, and toxicity of COCs from mining operations, and the disposition of COCs downstream in metallurgical processes and environmental media (Tables SD1b and SD1c).</p> <p>Most of the gold at SGP is refractory, i.e., chemically bound as small particles in arseno-pyrites. Massive amounts of these ores and Development Rock (DR) are</p>	<p>The SDEIS analyzed the 2021 MMP as proposed by Perpetua to assess its environmental effects and to determine mitigation requirements. Geological, air quality, and water quality effects are described in Sections 4.2.2.2, 4.3.2.2, and 4.9.2.2, respectively.</p> <p>Objection Narrative: This Comment best demonstrates the response-to-comment (or FS dismissiveness) ratio (i.e., 3-pages of detailed analyses dismissed in a 5-line circular reference to the sections of the document being critiqued). See Objection to Comment 5 regarding FS dismissal and avoidance of substantive response to comments.</p> <p>Nevertheless, this Comment summarizes and illustrates the most basic weaknesses of the FS SDEIS analyses and is relevant to the other Objections submitted herein.</p> <p>This Comment compares the DEIS and SDEIS differences in production, sources, concentrations, and toxicity of COCs from mining operations, and the disposition of COCs downstream in metallurgical processes and environmental media. Those differences are quantified and presented in Tables SD1b and SD1c submitted to the FS with the Comment. The comparison is accomplished using standard engineering mass</p>

	<p>mined to access this gold. The SDEIS Preferred Alternative mines nearly 400 million tons of material. Approximately 290 – 866 pounds of arsenic, 0.2 - 0.63 pounds of mercury, and 71 - 304 pounds of antimony will be disturbed for each ounce of gold produced (average - 95th%tile) (Table SD2).</p> <p>Overall, arsenic, mercury, and antimony mined are reduced by 15%, 25% and 40%, respectively, from totals estimated in the DEIS. The decreases are due to reduced DR from Hangar Flats Pit (HFP) offset by decreases in the DR/Ore strip ratio, and increasing Ore production in the West End Pit (WEP). About 17MT, or 18%, more Ore will be produced in the SDEIS Alternative than in the DEIS.</p> <p>COCs in ores decrease by 5% overall, with 20% and 224% increases in Yellow Pine Pit (YPP) and WEP Ore arsenic, respectively, and a 75% decrease in HFP Ore arsenic (Table SD1c).</p> <p>Estimated gold recovery increased by 5% from 4040 - 4238 koz. Antimony product increased from 16% from 98.9M to 115M pounds, despite the 40% decrease in antimony ore production. This was accomplished by a 32% increase in recovered YPP antimony offsetting a 31% decrease in antimony recovered from HFP. Antimony ores will be mined in years 1-6,</p>	<p>balance analyses to confirm preservation of mass in systems evaluations. The more significant differences identified are related to 2021 MMP shifting production from the Yellow Pine and Hanger Flats Pits to the West End Pit (WEP). Among the more significant findings are:</p> <p>About 17MT, or 18% more ore will be produced in the SDEIS Alternative than in the DEIS, markedly increasing arsenic levels in waste streams.</p> <p>Antimony ores will only be mined in years 1-6, with 64% of antimony product recovered in years 1-4. There is no appreciable antimony ore in the WEP, and no antimony ores will be produced after Year 7. By year 6, the SGP will be a refractory gold mine operating from the WEP.</p> <p>These SDEIS Preferred Alternative modifications affected large changes at the WEP in comparison to the DEIS configuration:</p> <ul style="list-style-type: none"> - COC production in WEP Ores increases by more than 3.2 times, and WEP Development Rock COCs increases by 14%. The WEP is expected to yield 175,320 –597,200 tons of arsenic (average - 95th %tile), nearly doubling (1.97X) the estimate for the DEIS. - There is a 224% increases in WEP Ore arsenic production. - Arsenic concentrations for mined material, and environmental releases from the WEP increase by 1.5 times, from 569 - 2079 ppm to 887 - 3021ppm (average - 95th%tile). <p>The significance of the shift of production to the WEP disguised in the DEIS to SDEIS 2021 MMP modification cannot be overstated. The WEP is the largest fugitive</p>
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	<p>and 64% of product will be recovered in years 1-4. There is no appreciable antimony ore in the WEP, and no antimony ores will be produced after Year 7. Table SD2 shows gold production and Table SD5 shows antimony production for the DEIS and SDEIS.</p> <p>The purported remediation of historic wastes and tailings represents about 3% of total disturbed arsenic and 5% of disturbed mercury and antimony on site. All of the remediated arsenic, and >75% of remediated mercury and antimony will be redistributed on site. Undetermined percentages of mercury will leave the site as high-level waste, be disposed in DR or discharged to the TSF. About 22% of remediated antimony and 47% of ore antimony will be recovered as antimony concentrate for off-site sale. The remainder will be disposed on-site.</p> <p>Approximately 36% of disturbed antimony will be recovered and 64% wasted. About 16% of disturbed antimony will be disposed of in DR repositories in about equal amounts above and below ground. About 47% of disturbed antimony will be discharged to the TSF, largely as flotation tailings.</p> <p>Table SD3 shows SDEIS COC production and disposal.</p>	<p>dust arsenic source most affecting the compliance point for arsenic exposures, and overwhelmingly presents largest cancer risk at the SGP. Comments 4,9 and 14-20 detail the FS underprediction of this risk.</p> <p>The WEP is noted in the 2018 through 2021 series of M3 Feasibility Studies as the most difficult ore for gold recovery and for the associated stabilization of the CN/Detox effluent arsenical compounds. Comments 24-30 detail the insufficiencies of the proposed HAC treatment system for labile arsenic stabilization in this critical waste stream.</p> <p>The WEP waste materials are the largest source of input to any of the environmental and metallurgical evaluations allegedly evaluated under the SDEIS. However, the SDEIS adopted, by default without modification, the majority of the COC impact evaluations from the DEIS. The DEIS evaluations were conducted assuming the MODPRO configuration of relative ore and waste contributions from the Yellow Pine, Hanger Flats, West End Pits and historical waste ratios. These evaluations are not representative of the 2021 MMP. The relative contribution from the more unstable WEP ores has more than doubled under the new alternative introduced by the FS between the DEIS and SDEIS. Yet the FS endeavored to update only a fraction of the evaluations conducted for the DEIS and relied upon in the FEIS.</p> <p>In terms of Objection to Comments 5-6 and 13-14, these analyses fail to meet the basic coherence criteria of preservation of mass. These evaluations are not conducted on the same mass balance basis as the modified alternative.</p>
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	<p>Regarding arsenic, an estimated 616,000 - 1,856,000 tons (average - 95th%tile) of arsenic is mined in the SDEIS configuration. Approximately 36% of site-wide arsenic (102,560 - 827,600 tons) is in Development Rock (DR) and historic overburden, and 64% (309,580 - 1,028,400 tons) in ore. Practically all of this arsenic will be disposed of on-site or released to the immediate environment. Three principal concerns are arsenic in air from mining dust, DR disposed in locations subject to groundwater and meteoric waters, and in ores disposed in the Tailings Storage Facility (TSF) after gold extraction. Over time, all three sources will release arsenic to the local environment (Table SD3).</p> <p>The SDEIS Preferred Alternative effected large changes at the WEP, the fugitive dust source most affecting the compliance point for arsenic exposures. COC production in WEP Ores increases by more than 3.2 times, and WEP DR COCs increase 14%. The WEP is expected to yield 175,320 – 597,200 tons of arsenic (average - 95th %tile), nearly doubling (1.97X) the estimate for the DEIS. The change in strip ratio increases weighted arsenic concentrations for mined material in the WEP by 1.5 times, from 569 - 2079 ppm to 887 - 3021ppm (average -95th%tile). Weighted concentrations remain similar to the DEIS, at 2240 – 6350 ppm in the YPP and 3436 –</p>	<p>In fact, it can be assumed that any impact analysis, conducted based on WEP-predicted inputs in the DEIS, underpredicts WEP impacts under the 2021 MMP by at least a factor of 2 in the SDEIS configuration.</p> <p>As demonstrated in Objections to Comments 5-6, 14-20 and 24-30 this underprediction applies to both the critical cancer risk calculations for airborne arsenic emissions, and the labile arsenic discharges from the post CN/Detox processes.</p> <p>OBJECTION: The SDEIS failed to consider the effects of shifting the bulk of production to ore bodies presenting substantially different treatment, stabilization and cancer risk challenges. With regard to COCs, the 2021 MMP is a new alternative more than doubling the production of the most environmentally challenging ore bodies. The lack of coherence and applicability of the DEIS analyses being carried forward to the SDEIS, while ignoring the significant increase in releases from the most problematic ore bodies with respect to increased cancer risk and labile arsenic in the TSD, justifies withdrawing the ROD.</p>
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	10,170 ppm in the HFP (Tables SD1a, SD1b and SD6).	
14	<p>Arsenic Emission Rates are Underestimated: Use of inappropriate Emission Factors (EF)s in the 2021 MMP combine to significantly underestimate arsenic emission rates in the SDEIS. The most critical EF selections are associated with Mining Fugitive Dust and include underestimated i) arsenic concentrations in Pit roadbeds, ii) silt content in on-site gravel roadbeds, and ii) percent control levels for application of dust suppressants. Each is discussed below.</p>	<p>The emission factors used are described in Section 4.3.1.2 and were based on regulatory and industry technical documents as detailed further in the Air Quality Specialist Report.</p> <p>Objection Narrative. As noted in objection to Comment 4 responses the Air Quality Specialist Report adopts outdated emissions inventories provided by Perpetua Consultants in 2018 and 2020 Reports. There is no rationale for selection of the haul road EF Equations other than those “...vetted by the agencies during initial development of this Project inventory” on page 5 of Appendix C. The vetting by other agencies does not support the FS claim of independent analysis, but rather suggests deference to the DEQ and Perpetua collaboration in 2018, prior to the recognition of IDAPA 58.01.01.586 requiring cancer risk calculations. As noted above in several Comments and Objection letter 2023, the Air Quality Specialist Report uses different Emissions Inventories modeling ambient arsenic and the particulates that carry arsenic into the air. As noted in several Comments, the Air Quality Specialist Report underpredicts arsenic cancer risk by an order of magnitude. The Air Quality Specialist Report contends that the SGP will comply with the State of Idaho and USEPA 1x 10-6 cancer risk criteria. Both Perpetua and IDEQ have indicated in sworn statements that such compliance is not possible, and have in fact applied for relief to modify the risk criteria to 1x10-5 cancer risk. The DEQ Board has determined that the analyses the FS relies on are erroneous and that the proposed SGP will</p>

		<p>not comply with Idaho cancer risk criteria. The Board of DEQ specific conclusions are noted in Objection to Comments 18-22.</p> <p>Notwithstanding the numerous fatal flaws, the Air Quality Specialist Report adopted Emissions Factors improperly developed by Perpetua and IDEQ prior to the DEIS and inappropriate to apply in the SDEIS supporting report. The only justification for this adoption is the single statement noted above that the Emissions Factors were <i>“...vetted by the agencies during initial development of this Project inventory”</i></p> <p>The Air Quality Specialist Report alleged independent analysis of the selection of Emission Factors for the FS cites the use of USEPA AP-42 protocols. Appendix C page 2 of the Air Quality Specialist Report states: <i>“In general, emission factors are representative of a broad average of emissions data available for a specific source category. So, a single emission factor encompasses data from many actual operations that cover a relatively large range of actual emission rates per unit of activity. One should consider the AP-42 emission factors as representing an average of the range of measured or calculated emission rates. Approximately half of the sources in this population would have emission factors higher than the published average, and the remainder would have lower factors (EPA 2003). In EPA Document AP-42, the level of uncertainty in a given factor is indicated by an “emission factor rating” with values ranging from “A” for best accuracy, and “E” for greater uncertainty. To illustrate the level of confidence in judging emission estimates, it can be noted that nearly all</i></p>
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		<p><i>the emission factor values in Section 11.19.2 in Document AP-42, which is relied upon for many Project sources, have emission factor ratings of “D” or “E” (EPA 2003). To compensate for this uncertainty, the accepted practice is to over-estimate the activity rates for a given operation to avoid under-reporting the final estimates. It is also noteworthy that the guidance from the State of Nevada, which is the home of numerous surface gold mines, supports the use of factors from this AP-42 section for surface mining operations (NDEP 2017).”</i></p> <p>Although there are no specific analyses, references or citations as to how the FS Special Report selected or evaluated the EFs for the largest arsenic source, (i.e., haul roads), it is apparent that the FS used the EFs provided by Perpetua and DEQ. In this case, procedures outlined in Section 13.2 of EPA AP-42 for unpaved roads were inappropriately applied by DEQ and Perpetua as noted in previous Comments to both the DEIS and SDEIS.</p> <p>The DEQ and Perpetua, and hence the FS, do not follow USEPA Guidance in the application AP-42, Section 13.2, and violate the recommendation <u>to use conservative data in the interest of health protectiveness, and particularly with respect to carcinogenic air pollutants.</u></p> <p>All three parties use minimal, not conservative, EFs indicating >>50% likelihood that emissions are underestimated. There are three key (data-based) variables used in estimating controlled unpaved road arsenic emissions: <u>silt content</u>, <u>arsenic content of the silt</u>, and <u>control efficiency</u>. The following Table summarizes plausible values for the three key variables at this site as noted in previous comments. These values are rated as minimal, typical, and conservative EFs.</p>
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Comparison of Characteristic Values for Key Variables Used in Calculating Particulate and Arsenic Emissions from Gravel Haul Roads				
Characteristic Values	Silt Content All Gravel Roads	Silt Content Haul Roads	As Content ppm	Control %- Emitted
AP-42 Minimal	4.3%	5.8%	909	10%
AP-42 Typical	8.8%	9.9%	1231	15%
AP-42 Conservative	10.1%	11.6%	1812	20%
Midas PRI	4%	4%	667	6.7%

In each case, the FS has accepted DEQ's determination and used less than minimal values. Moreover, these equations are non-linear, and the variables are multiplicative, exacerbating the degree of underestimation. The FS has in each case accepted the minimal plausible value, despite the requirement that conservative values be used, and the Special Reports guidance regarding the uncertainties on page 2 of Appendix C.

The result of this divergence from the Guidance makes it likely (i.e., >>50% probability) that emissions are underestimated by several times. It is important to note that, even accepting these underestimates and correcting for erroneous dilution techniques as demonstrated in Comments 18-20 below, cancer risk exceeds acceptable risk levels. Even modest increases in these EFs to reasonable levels exacerbates cancer risk to more dangerous levels.

The non-conservative values selected for use in estimating haul road emissions are multiplicative in the

		<p>equations and procedures outlined in Section 13.2 of EPA AP-42 unpaved road techniques. The following three comments demonstrate that the use of these non-conservative Emission Factors result in significant underprediction of emissions, modeled air quality levels, and cancer risk. Most important to note is that the estimated cancer risk, using Perpetua's and DEQs calculation, does not meet the 1x10-6 criteria as alleged by the FS. The SDEIS and Air Quality Specialist Report is the only entity asserting compliance with the 1x10-6 cancer risk criteria.</p> <p>OBJECTION: The Forest Service has failed to conduct an independent analysis of potential carcinogenic emissions from the SGP and has relied on demonstrably erroneous estimations of toxic and hazardous contaminants conducted by other Agencies and Consultants. This deference to outside parties for key evaluations is reason to withdraw the DROD.</p>
15	<p>Arsenic Dust Concentrations: Fugitive Mining Dusts in the three Pits will reflect the changing arsenic production and concentrations noted in Table SD6. The new 2021 MMP Preferred Alternative analyzed in the SDEIS does not include these changes. The DEIS characterized all Haul Roads using the median concentration of site-wide rock samples of 667 ppm As. The 2021 MMP uses 667 ppm to calculate mining fugitive dust arsenic</p>	<p>A median arsenic concentration was utilized to assess aggregate dust emissions from Project traffic which travels variable routes depending on the daily mining activity. There would be areas of higher arsenic concentrations and lower arsenic concentrations compared to the median value, but that value is characteristic of the overall distribution.</p> <p>Objection Narrative: See Objection to Comment 14. The FS avoids objective and substantive response by defining the median statistic and pointing out that the</p>

	<p>emissions for Pit Haul Roads and substitutes 90 ppm for “CR: clean rock - used to cap haul roads outside of the pits and DRSFs.” The 2021 MMP modification should have included substituting the Pit-specific arsenic concentrations noted in Table SD6 for in-Pit Haul Roads. This oversight underestimates in-Pit arsenic emissions by 1.3 times for the WEP, 3.4 times for YPP, and 5.2 times for HFP. Table SD7 shows the calculation adjusting for the weighted in-Pit Arsenic concentrations from Table SD6.</p>	<p>median is a measure of the central tendency in a distribution of values. Extensive comments have been submitted regarding these issues to both the DEIS and SDEIS, No substantive response has been provided by the FS. Previous comments to the DEIS have asserted that the mean is a more appropriate measure of central tendency in exposure calculations; the mean value is significantly greater than the median in this particular distribution of values, and use of the mean would significantly increase arsenic emissions estimates. More important than the statistic selected to represent the central tendency is the selection of the data distribution itself. The distribution used is a huge collection of site-wide samples collected for a variety of reasons and contains numerous observations unrelated to the haul roads. This has been pointed out to the FS in Comments to the FS on both the SDEIS and DEIS. No substantive response has been provided by the FS.</p> <p>Moreover, the substitution of the 2021 MMP for the DEIS Alternative markedly changed the arsenic concentration of the arsenic and total arsenic emissions from Haul Roads. The FS lowered the arsenic concentrations and total emissions in acknowledging specific controls and management protocols to allegedly effect reductions in haul road concentrations (i.e., placement of low arsenic gravels on haul roads outside the Pits). However, as noted in Comment 15, the FS did not adjust for increased arsenic particulate concentrations and total emissions from the WEP, which most effects excess cancer risk. The 2021 MMP increases both arsenic concentration and total emissions significantly. This comment points out to the FS that: “<i>This oversight underestimates in-Pit arsenic emissions by 1.3 times for the WEP, 3.4 times for YPP,</i></p>
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		<p><i>and 5.2 times for HFP". By extension this would increase cancer risk beyond that calculated by either Perpetua, DEQ or the FS.</i></p> <p>OBJECTION – No substantive response has been provided.</p>																																								
16	<p>Haul Road Silt Content: Pit Haul Road (HR) Fugitive Dusts are the largest source of total particulate (PM) and arsenic emissions, accounting for 83% of PM as calculated in the 2021 MMP Preferred Alternative. HR PM emissions are grossly under-estimated due to unrealistic assumptions regarding the silt content of the roadbeds and the level of control assumed for dust suppressants.</p> <p>The Forest Service cites USEPA AP-42 guidance as the basis for HR Dust emission estimates. Table 13.2.2-1 from the cited guidance summarizes 272 gravel road samples from 53 sites at 18 different industries. Ten (10) sites and 58 samples were obtained specifically from Haul Roads. Haul Roads silt content ranged from 5.8% to 24%, averaging 11.6%. The minimum mean silt content from any one site was 4.3% for all gravel roads and 5.8% from Haul Roads. Table SD8 summarizes the USEPA AP-42 results for all roads. (USEPA 2022.)</p> <p>The SDEIS uses a 4% silt content, lower than any value observed by the USEPA.</p>	<p>The silt content of gravel roadways was predicted based on the analysis of site materials as described in the cited baseline report. Therefore, the value was used as characteristic for the site.</p> <p>OBJECTION: See Objection to Comment 14.</p> <p>The cited baseline report is irrelevant to the silt content of constructed in pit mining and haul road designed for the heavy transport vehicles anticipated at the SGP. The Air Quality Specialist allegedly considered USEPA AP-42 Chapter 13.2 in accepting DEQ and Perpetua’s selection of the 4% silt content value.</p> <p>The silt content values recommended from AP-42 are summarized in the following Table:</p> <table border="1" data-bbox="1115 967 1839 1395"> <thead> <tr> <th colspan="4">Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE AP-42 MATERIAL ON INDUSTRIAL UNPAVED ROADS</th> </tr> <tr> <th></th> <th colspan="2">All Gravel Road</th> <th>Haul Roads</th> </tr> </thead> <tbody> <tr> <td>Industry Types</td> <td>18</td> <td></td> <td>4</td> </tr> <tr> <td>No. Sites</td> <td>53</td> <td></td> <td>10</td> </tr> <tr> <td>No. Samples</td> <td>272</td> <td></td> <td>58</td> </tr> <tr> <td>Minimum</td> <td>4.3%</td> <td></td> <td>5.8%</td> </tr> <tr> <td>Maximum</td> <td>24.0%</td> <td></td> <td>24.0%</td> </tr> <tr> <td>Average</td> <td>10.1%</td> <td></td> <td>11.6%</td> </tr> <tr> <td>Median</td> <td>8.4%</td> <td></td> <td>8.4%</td> </tr> <tr> <td>Geomean</td> <td>8.8%</td> <td></td> <td>9.9%</td> </tr> </tbody> </table>	Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE AP-42 MATERIAL ON INDUSTRIAL UNPAVED ROADS					All Gravel Road		Haul Roads	Industry Types	18		4	No. Sites	53		10	No. Samples	272		58	Minimum	4.3%		5.8%	Maximum	24.0%		24.0%	Average	10.1%		11.6%	Median	8.4%		8.4%	Geomean	8.8%		9.9%
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	<p>The 4% value is referenced to "Soil Resources Baseline Study, Stibnite Gold Project." Reid, Samuel B., Assistant Geology Supervisor, Midas Gold, Inc., April. (Midas Gold 2015). The Appendix to this document notes <75 micron fractions for 28 on-site sieved soil samples, but it is unclear how the 4% value was selected. Although the guidance indicates the importance of locally collected data, the 4% silt content cited by Midas are most relevant to "dirt roads" operating on native soils. The in-Pit Haul Roads at SGP will be constructed from Development Rock crushed gravels from within the Pits and with "CR: clean rock - used to cap haul roads outside of the pits and DRSFs." The silt content of industrial constructed gravel haul roads is generally designed and maintained at higher levels for stability reasons, as indicated in Table 13.2.2.1 of the AP-42 document (i.e., mean values ranging from 5.8% to 24%). Substitution of 8% and 24%, as a more appropriate range, for roadbed silt content into the Emission Calculations in the Appendices relied on for the SDEIS, increases uncontrolled PM emissions by 1.6 to 3.5 times, respectively. Table SD9 shows these calculations applied to the On-site Hauling fugitive dust Maximum production scenario in Table SD4 (i.e., 2901.3 tons/yr.).</p>	<p>The silt content observations represent 272 gravel road samples from 53 sites at 18 different industries. Ten (10) sites and 58 samples were obtained specifically from Haul Roads. The minimal mean silt content from any one site was 4.3% and for all gravel roads and 5.8% from Haul Roads. Perpetua, DEQ and the FS all use 4.0%, a value less than any observed in the USEPAs nationwide survey and is based on an irrelevant analysis of dirt-based forest roads.</p>
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<p>17</p>	<p>Particulate Control: The SDEIS also relies on 93.3% particulate control achieved by a combination of chemical dust suppressants and watering. The AP-42 Guidance (AP-42) also discusses the effectiveness of both technologies. As Perpetua’s control strategy relies largely on chemical dust suppressants, it is important to note the following excerpt from AP-42 that concludes: “Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM-10 control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month” (p 13.2.2-12). This suggests the proposed 93.3% control assumptions are suspect and will more likely range from 80% to 90%. Controlled emissions would be 1.5 - 3.0 times greater at 90% and 80% control, respectively. Table SD9 also shows that using 8% and 24% silt content increases the required PM control from 93.3% to 96.4% and 98.7%, respectively. These values are not achievable even for paved roads.</p> <p>Table SD10 shows combined correction factors for the several emission factors underestimated by IDEQ and accepted by the Forest Service. In combination, correcting for the arsenic concentration and silt content in roadbeds and percent control for dust suppression underestimates</p>	<p>The fugitive control management compliance requirements would be rigorous due to the high dust control proposed by Perpetua. The 93.3 percent control has been accepted by IDEQ and adopted for assessment of emissions by the USFS based on the use of chemical suppressants and water application.</p> <p>OBJECTION: See Objection to Comment 14.</p> <p>The response is self-evident. The FS is relying on DEQ interpretations and has not conducted an independent assessment of the reliability of the assertions regarding achievable and maintainable control levels. Review of the USEPA AP-42 noted in the Comment suggests the practical maintainable control level will be 80-90%. This level of control would increase emissions and cancer risk 1.5 to 3 times more than currently estimated.</p> <p>This comment goes on to note that <i>“In combination, correcting for the arsenic concentration and silt content in roadbeds and percent control for dust suppression underestimates indicate that arsenic emissions are likely 7.5 - 33 times greater from the YPP, 14 - 60 times greater for HFP, and 3 - 14 times greater for the WEP, than those estimated in the SDEIS”</i>.</p> <p>As noted above in Comment 15, this is most significant regarding the immense change in WEP output with the substitution of the 2021 MMP in the SDEIS. The selection of the Emission Factors and modeling assumptions employed by the Air Quality Specialist Report were outdated, do not reflect the 2021 MMP conditions, use different input assumptions for modeling particulates and the arsenic carried on those particulates, and underestimate cancer risk by an order of magnitude.</p>
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	<p>indicate that arsenic emissions are likely 7.5 - 33 times greater from the YPP, 14 - 60 times greater for HFP, and 3 - 14 times greater for the WEP, than those estimated in the SDEIS. These changes alone would result in exceedance of cancer risk criteria. Unfortunately, specific calculations of the ambient estimates cannot be developed, as the link to the electronic support documents cited by the Forest Service cannot be accessed.</p>	<p>OBJECTION: The DROD should be withdrawn as the Forest Service has significantly underestimated particulate arsenic concentrations and total arsenic emissions, and consequently airborne carcinogenic risk levels.</p>
<p>18</p>	<p>Airborne Arsenic Carcinogenic Risks Are Underestimated: Carcinogenic risk is determined by appropriately estimating emissions from SGP proposed activities, conducting air quality modeling to estimate ambient air arsenic concentrations and exposures, and comparing the exposures to carcinogenic risk criteria. The analyses the Forest Service relies on understates arsenic impacts in each of these steps. Objective correction of these dilutions results in cancer risks exceeding acceptable levels. These serial dilutions significantly underestimate carcinogenic risk for average conditions. Estimating risk at the average exposure implies half the receptor population has a greater cancer risk. Carcinogenic risk should be evaluated at both mean and reasonable maximum exposures (95th%tile) to ensure protectiveness for the more vulnerable</p>	<p>Section 4.3.4.2 describes arsenic air emissions associated with the Project and compares them to acceptable ambient carcinogenic concentrations in SDEIS Table 4.3-13 which shows them to be below the acceptable concentrations Idaho standards (IDAPA 58.01.01.586).</p> <p>Objection Narrative: The analysis in Section 4.3.4.2 is outdated and incorrect. The FS compares a computed long-term ambient air arsenic concentration of .00015 ug/m3 to the .00023 ug/m3 AACC implying the cancer risk is 6.45x10-7 for the SGP. The FS has been informed over the past year (Objection letter 2023) that the cancer risk estimates have been contested in IDEQ Administrative Appeals and several updates and additional analyses have been undertaken and reported to the public record in the Administrative hearings. That Record is referenced as a whole and submitted as additional evidence to support this objection.</p> <p>In summary, in this FEIS, the FS estimates cumulative cancer risk for the SGP as 6.45x10-7; DEQ and Perpetua</p>

	<p>receptor population. Neither the Forest Service, nor IDEQ, has performed responsible risk assessment calculations. This is one basis for the current Administrative Appeal of the PTC. The serial dilutions are described in the following paragraphs.</p> <p>The SDEIS cites a Perpetua consultant's report (Air Sciences 2021b) that alleges compliance with the 10-6 cancer risk criteria by comparing a calculated maximum equivalent 70-year exposure of 0.00015 ug/m3 arsenic to the 0.00023 ug/m3 standard. These calculations include a number of questionable dilution steps. Nevertheless, as calculated by the Forest Service, this evaluation implies that the 12 years of the 2021 MMP consumes 65% (0.00015/0.00023) of a receptor's acceptable 70-year lifetime exposure. Appropriate emission rate estimates are critical to estimating carcinogenic risk associated with the Preferred Alternative. Even by the Forest Service analysis, any correction of the EFs resulting in a > 50% (or 1.5 times) increase in arsenic emissions, would result in exceedance of the carcinogenic risk criteria.</p>	<p>assert the cancer risk is 4.1×10^{-6}, or 6.3 times greater than the FS.</p> <p>The Appellants and this Objector assert the risk is 1.2×10^{-5}, 19 times greater over the alleged 16-year LOM; or 5.3×10^{-5} on a 70-year operational basis, as IDEQ is required to calculate under (IDAPA 58.01.01.586) for a long-term stationary air pollutant source.</p> <p>The formulae applied by the FS Air Quality Expert Report to determine the .00015 ug/m3 uses a 70-year carcinogenic lifetime in the denominator to average the SGP exposure over the receptor's lifetime and the FS alludes to DEQ's approval of this methodology as justification for applying this dangerous assumption. These calculation origins are found in Air Sciences, Inc. (Air Sciences). 2021b. Stibnite Gold Project. Supplemental HAP Air Quality Analysis Addendum ModPro2. Prepared for Perpetua Resources, Air Sciences, Inc. Project No 335-21-402, October 5, 2021, Forest Service and Environmental Protection Agency for their consideration.</p> <p>The Air Sciences calculations were adopted by the Air Quality Specialists report and reported in full to Section 4.3.4.2 the FS, as cited.</p> <p>As of the date of this submittal and prior to the issuance of the DROD, the Idaho Board Environmental Quality has ruled and issued a Final Order regarding the calculations the DEQ and FS have relied on in calculating cancer risk. The Board's Final Order (2024-05-09-106-Final Order, attached) concludes:</p>
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		<ul style="list-style-type: none">a. DEQ Did Not Act Reasonably and in Accordance with Law When it Analyzed the Ambient Arsenic Air Concentrations for the SGP.b. DEQ did not Act Reasonably in Using a Five-Year Rolling Average for T-RACT that was not Properly Supported by Permit Conditions.c. There was Insufficient Evidence to Support the T-RACT Analysis Limiting the Non-West End Pit Production Limit.d. DEQ Did Not Act Reasonably and in Accordance with Law When it Applied the 16/70 Calculation to the Ambient Arsenic Air Concentration Analysis. <p>Because both the DEQ and FS relied on the same methods supplied by Perpetua, the Board conclusions are applicable to the analyses cited in Section 4.3.4.2. Item d. refers directly to the methodology used by the FS in the risk calculations on Pages 4-48 and 4-49. This methodology was discredited by the Idaho Board of Environmental Quality in its Final Order remanding the PTC to the Administrative Officer for additional evaluation (2024-05-09-106-Final Order, attached).</p> <p>Subsequent to the Final Order, additional analyses of cancer risk have been offered in sworn testimony and support materials. DEQ, Perpetua and the Appellants Experts have offered opinions as to cancer risk levels associated with SGP MODPRO2 configuration examined by the FS Air Quality Expert Report and adopted in the FEIS. Those Expert Opinions are attached as additional evidence in this Objection but are also attached directly to emphasize the substantial underestimation of cancer risk.</p>
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		<p>Both Perpetua and DEQ expert Risk Assessors cite .00095 ug/m3 as the base exposure to estimate lifetime cancer risk over a receptor's lifetime. This equates to a 4.1×10^{-6} lifetime risk. DEQ and Perpetua's alleged cancer risk level is 6.3 times greater than the FS estimate.</p> <p>Appellant's Experts agree with the Board of Environmental Quality's conclusions that the DEQ and Perpetua estimates are erroneous and that the serial dilution methods employed, alluded to in the original comment, should be removed. Those erroneous dilution factors are identified in the Board's Final Order, respectively, as above Items a) Five-year Rolling Average, b) Non-West End Pit, and c) 16/70 Calculation. DEQs sequential application of the three SGP3 Project-specific Adjustment Factors underpredicts cancer risk by 13 times, as these carcinogenic risk levels are employed in properly implementing the standards (IDAPA 58.01.01.586). These analyses confirm Vice-chairman McMillan's observation in the Special Hearing: "The PTC proposes to allow 16 years higher daily carcinogen doses and disguises such doses using a non-rules-based mathematics."</p> <p>The dangers inherent in applying dose-averaging applied by the IDEQ and the FS were the subject of Expert Opinions submitted to the Administrative Hearing during the ROD Objection review period. Those reports support Board findings in the Final Order and are included in the Administrative Record submitted to the FS with these objections.</p> <p>These same analyses and conclusions also apply to the FS' erroneous application of this scientifically unsound dose-averaging methodology. The expert opinion</p>
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		<p>submitted by this Commenter (von Lindern Declaration Final submitted herewith, as well as electronically submitted to the FS on October 18, 2024, by Save the South Fork Salmon) concluded:</p> <ul style="list-style-type: none"> <i>i.</i> DEQ’s (and the FS) Application of the 16/70 SGP Project-specific Adjustment Factor underestimates Cancer Risk and is Inappropriate Science and Public Health Policy <i>ii.</i> Ambient Air Arsenic Concentrations and Cancer Risk are underestimated for SGP by use of Five-year Rolling Average in the Air Quality modeling input factors. <i>iii.</i> Ambient Air Arsenic Concentrations and Cancer Risk are underestimated for the SGP by Improper Application of the Non-WEP Emissions Scenario <i>iv.</i> The Combined Application the SGP 16/70, Five-year Rolling Average, and Non-WEP Project-Specific Adjustment Factors increase Cancer Risk and Negate the Health Protectiveness of the TAPS rules <i>v.</i> DEQ’s (and the FS) SGP Project-specific Adjustment Factors represent a significant change in the regulation of Carcinogenic Risk in Idaho that increases both Cancer Risk and Regulatory Burden. <p>See Dr. von Lindern’s Declaration and the documents submitted herewith for detailed analyses supporting these conclusions.</p>
19	Table SD10 summarizes the appropriate correction factors for Haul Road emissions	Section 4.3 describes the site data and assumptions utilized to forecast arsenic air emissions and their

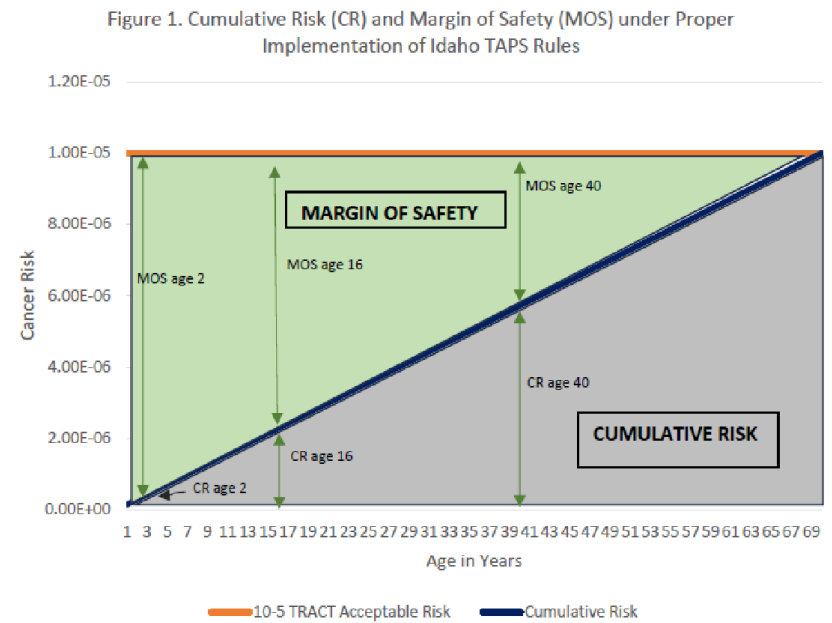
	<p>and includes combination factors for As concentration, silt content, and % Particulate Control adjustments.</p> <p>Applying any combination of adjustments >1.5 in Table SD10 would result in excess cancer risk. For example, simply correcting for the minimum increases in arsenic emission rates for the WEP (3 – 14 times) results in airborne arsenic exposures arsenic levels exceeding the applicable carcinogenic risk criteria. That is, $3 \times 0.00015 \text{ ug/m}^3 = 0.00045 \text{ ug/m}^3$, corresponding to 2×10^{-6} cancer risk. Applying the 14 fold increase indicates a 9.3×10^{-6} cancer risk. Similarly, should either the silt content (1.6 -.3.5) or control level corrections (1.5 – 3.0) apply, excessive cancer risk will result. Correcting for silt content, percent control and pit-specific concentrations for all Pits, likely increases to concentrations >10^{-5} risk levels.</p>	<p>comparison to acceptable ambient carcinogenic concentrations. The parameter values proposed by the comment were not adopted in the approved air quality modeling.</p> <p>OBJECTION: See Objections to Comment Response 17-18.</p>
20	<p>Inappropriate Serial Dilution of Exposure Indices: The preceding discussion applies only to underestimated emissions. In addition to diluting emissions, the 0.00015 ug/m^3 arsenic chronic exposure cited by the Forest Service was derived using three additional inappropriate dilutions of the air quality modelling results. In total, four levels of inappropriate dilution are: i) the underestimated arsenic emissions, noted</p>	<p>Section 4.3 describes the site data and assumptions utilized to forecast arsenic air emissions and their comparison to acceptable ambient carcinogenic concentrations. The alternative assumptions proposed by the comment were not adopted in the approved air quality modeling.</p> <p>OBJECTION: See Objection to Comment 18.</p> <p>As noted in Comment 18, the Board of Environmental Quality has determined the application of the Project-</p>

	<p>above, due to unrealistic particulate arsenic concentrations, roadbed silt content, and control levels; ii) maximum emissions input to the air quality models are five-year averages (not maximums) diluted by different pit production ratios; iii) the predicted model results are diluted by averaging the results of two scenarios, one WEP and one non-WEP related. This averaging incorrectly reduces the WEP maximum annual average by 41%. The Forest Service relies on IDEQ's assertion that this technique is justified on the basis that maximum prediction for the WEP scenarios will not apply during the life of the mine. There are several problems with this reasoning.</p> <p>The five-year average already accommodates this effect. Several of the scenarios are no longer applicable, as the DR repository destinations no longer exist. The adjustments for Pit-specific dust concentrations are much greater for the non-WEP scenarios; and iv) adjusting for the ratio of the 16-year life of the mine to the 70-year lifetime of the receptor dilutes the ambient calculation by an additional 78%. The SGP is not entitled to consume the remaining 54 years of the receptor's 70 year lifetime acceptable exposure during the alleged 16-year life of the mine. (IDEQ 2022b).</p>	<p>specific adjustment factors the FS has relied on are erroneous. The Board issued a Final Order (2024-05-09-106-Final Order, attached) indicating: <i>"DEQ Did Not Act Reasonably and in Accordance with Law When it Applied the 16/70 Calculation to the Ambient Arsenic Air Concentration Analysis"</i>.</p> <p>The FS was aware of this determination on June 8, 2024, at the time the DROD was released on September 6, 2024. Since that time, substantial testimony has been presented to support the Board's determination that Perpetua's, DEQ's, and, by extension, the FS' use of dose-averaging for cancer risk estimates, is based on unsound science and increases cancer risk. The Board's conclusions are listed in the Comment 18 Objection. Additional testimony supporting the Board's position is hereby included in Objection to the DROD.</p> <p><i>DEQ's (and the FS) Application of the 16/70 SGP Project-specific Adjustment Factor underestimates Cancer Risk and is Inappropriate Science and Public Health Policy</i></p> <p>The following paragraphs excerpt key testimony provided in support of the Board's conclusion. The complete document with all record citations and the complete record of Administrative Procedure is provided for the FS' convenience.</p> <p>DEQ. in adopting dose-averaging, has failed to properly implement Section 586 and T-RACT for the SGP PTC by introducing a 16/70 SGP Project-specific Adjustment Factor to allocate the full 70-year lifetime allowable cancer risk to the alleged 16-year Life of Mine (LOM). The calculation averages the risk resultant from SGP emissions over the life of the receptor. This adjustment allows the SGP to emit as much as 70 years of allowable</p>
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	<p>These serial dilutions are another basis for the IDEQ PTC Administrative Appeal currently under consideration. Correction of these serial dilutions likely increase exposures and cancer risks by an order of magnitude exceeding 10-5 cancer risk criteria.</p>	<p>carcinogenic emissions in 16 years. This 16/70 “adjustment factor,” also known as risk amortization or cancer dose-averaging, undermines both the health protectiveness and the regulatory certainty of the TAPS rules. In the context of the existing TAPS rules, as applied over the last 30 years, using the 16/70 adjustment factor is an incorrect interpretation and represents unsound science and public health policy. Specifically, DEQ misinterprets the purpose and function of the maximum one-year annual average ambient air carcinogen concentration in implementing the TAPS rule. The FS analyses in the Air Quality Specialist Report also represents unsound science and public health policy by adopting the same dose averaging techniques proposed by Perpetua.</p> <p>The TAPS Section 586 and T-RACT rules are highly prescriptive. Strict adherence to the rules is requisite to simultaneously afford regulatory certainty and simplicity for the regulated community and provide health protectiveness to the public. The key aspects of the simple, yet protective, rules are i) the incremental nature of the rule relieves industry and DEQ of the burden of assessing multiple sources and exposures, and greatly simplifies the permitting process; and ii) a significant margin of safety (MOS) is provided to ensure surrounding communities are not subjected to industry-generated ambient air TAP concentrations exceeding health-based risk criteria.</p> <p>The purpose and function of the MOS is to protect the community from those other sources and exposures, risk cofactors, and uncertainties that would otherwise be evaluated in comprehensive risk assessment and health</p>
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		<p>impact analyses. The DEQ and the regulated community have successfully employed these TAPS Rules in a productive and protective manner since the 1990s.</p> <p>This prescriptive strategy specifically depends on protecting the public air space against the potential one-year annual maximum TAP emissions scenario throughout the life of the project. The one-year maximum emissions scenario is used to estimate the maximum one-year annual average ambient air carcinogen concentration. Ensuring that the maximum one-year annual ambient air carcinogen concentration does not exceed the acceptable ambient concentration for carcinogens (AACC) at the critical receptor location, ensures that no receptor will be exposed to greater than the AACC by the incremental TAPS source for any year. The AACC is provided in Section 586 and is the ambient air concentration determined by dividing 1×10^{-5} lifetime risk by the Unit Risk Factor (URF). The URF is the lifetime cancer risk per 1.0 ug/mg^3. Section 586 defines the AACC is an annual average.</p> <p>Ensuring that the criteria are achieved every year of the project guarantees the Margin of Safety (MOS) will protect the individual receptors from other potential sources of the carcinogen that are not addressed in the incremental PTC analysis. Applying these criteria and MOS collectively to all individual sources assures that these health protections extend Statewide. Figure 1 illustrates the MOS and the cumulative lifetime risk at the critical receptor expected under the prescribed TAPS Section 586 maximum annual ambient concentration. The vertical axis is the carcinogenic risk.</p>
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The horizontal axis represents the critical receptor's age commencing at the introduction of the incremental TAPS source. The maximum allowable lifetime risk is shown as the horizontal line at the top of the Figure (1×10^{-5} T-RACT risk in this example).



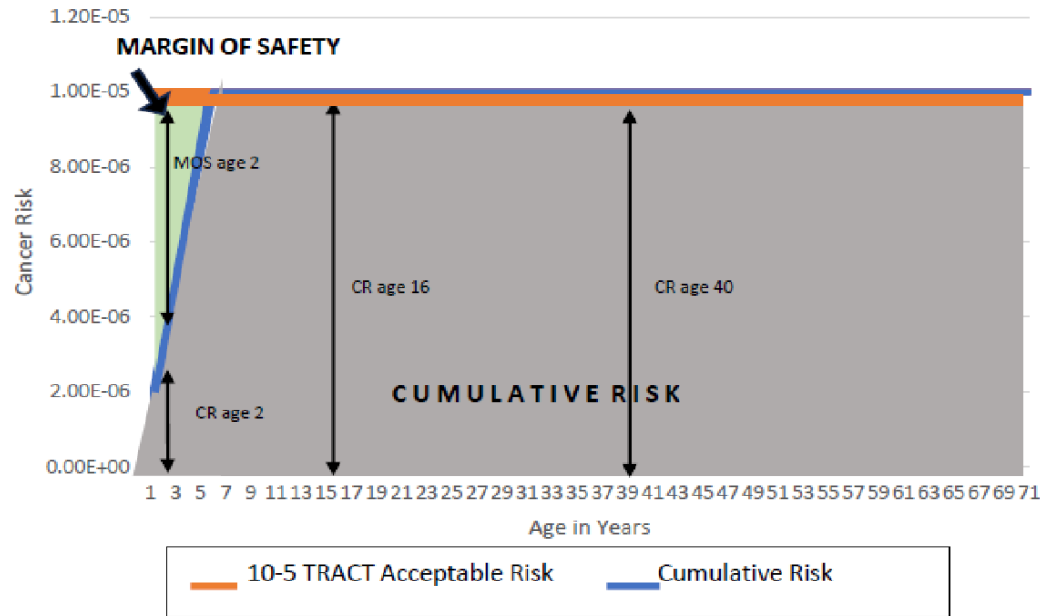
If the TAPS rules are properly implemented, the cumulative incremental risk is shown by the diagonal line proceeding from birth to age 70 years (i.e., risk is allowed to accumulate at an annual rate of $(1 \times 10^{-5})/70$ per year, or $(AACC \cdot URF)/70$ under T-RACT. The gray area below the diagonal line represents the portion of allowable lifetime risk accumulating from the incremental source. Risk increases proportional to the receptor age and the individual will have received the full allowable lifetime T-

		<p>RACT exposure, and have a 10⁻⁵ carcinogenic risk burden, at age 70-years.</p> <p>The green area above the diagonal line represents the margin of safety (MOS) for the receptor to accommodate other contaminant exposures, risk co-factors, or uncertainties that might increase cancer risk from sources other than the incremental emissions regulated under TAPS Section 586 and T-RACT. Specifically, the large MOS accommodates those risk considerations that would otherwise be addressed in onerous risk and health assessment protocols. In this manner the Idaho TAPS compliance strategy purposefully, but safely, avoids requiring risk analyses.</p> <p>The strategy also extends maximum protection to those population sub-groups who are most sensitive to carcinogenesis. Important life-stages of the receptor are indicated by the vertical lines at ages 0-2 years for infants and toddlers, ages 3-16 for children and adolescents, ages 17- 40 for reproductive-aged women and the fetus, and ages 41-70 years for older adults. This Idaho TAPS rule strategy affords minimal cumulative risk and maximal MOS protection during early life stages and pregnancy, acceptable risk levels during most of adulthood, with lesser protection at advanced ages when incremental cancer risk has limited effect on lifetime cumulative risk.</p> <p>In the case of arsenic under T-RACT criteria, the allowable annual rate of risk accumulation is a direct function of the .0023 ug/m³ T-RACT AACC times the URL/70. As a result, contrary to Respondents' assertions, the AACC functions as an annual standard as historically</p>
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		<p>applied in Idaho TAPS rules. DEQ and the Respondents' Declarations contend the Section 586 comparison of average annual ambient air arsenic concentration should utilize the average 70-year concentration, as opposed to basing health protectiveness on the worst-case maximum one-year annual average ambient air carcinogen concentration that is the foundation of the MOS. Using the 70-year basis proposed by DEQ and Perpetua would allow the SGP to emit a lifetime of allowable emissions in 16 years, undermining the health protectiveness of the rule, and increasing cancer risk.</p> <p>DEQ's modified policy implies that the SGP Project-specific "adjustment factor" can be applied to any carcinogenic source with a duration greater than five years. This shortsighted conclusion is incorrect, unprecedented, and not supported by USEPA guidelines. The new policy is poor science and undermines the health protective strategy of regulating TAPS that has successfully been applied for the last thirty years.</p> <p>Consider the extreme case of DEQ permitting a six-year (>5 yr.) life facility to emit sufficient carcinogens to expose individuals to the full 70-year lifetime acceptable risk in six years. The alleged allowable maximum annual ambient concentration would be $70/6 = 11.7$ times the AACC, (or 117 times the AACC if T-RACT applied, (i.e., 1.17×10^{-4} cancer risk if applied for 70 years). DEQs misinterpretation would allow emissions and consequent exposures more than two orders of magnitude greater risk than the AACC (1.2×10^{-4} equivalent risk) for six years. At year 7 (or 10% of the receptor's assumed lifetime), the six-year-old child will have accumulated, and carry the</p>
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		<p>lifetime burden, of a one-in-one-hundred-thousand cancer risk (10⁻⁵). This risk burden will accompany the individual for the following six decades (> 90% of the receptor's expected lifetime).</p> <p>The effect of this dangerous scenario is illustrated in Figure 2. The margin of safety (MOS) afforded this childhood receptor occurs briefly in the first six years of life. For the remainder of the receptor's lifetime, any additional exposure to arsenic or other carcinogen, from any source at any time, would immediately cause the cumulative lifetime exposure to exceed the unacceptable >10⁻⁵ risk. The receptor would be challenged to avoid any additional arsenic exposures for the remainder of life.</p> <p>The ad hoc introduction of risk averaging by DEQ through the SGP 16/70 adjustment factor allows a six-year project to concentrate 70 years of emissions and lifetime cancer risk into both the 6-year life of the project and receptor child's first six years of life. This scenario undermines the health protectiveness originally incorporated in Section 586, particularly with respect to neo-natal, pediatric, and adolescent cancers.</p>
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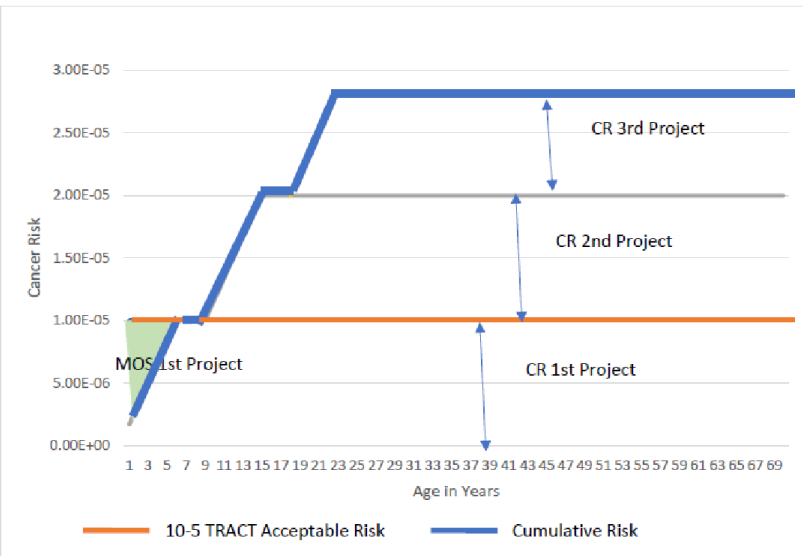
Figure 2. Cumulative Risk (CR) and Margin of Safety (MOS) using the Project-specific (6/70) Adjustment Factor for a 6-year project



Carcinogenic potency and cancer risk accumulation differ for various stages of life. The cancer dose varies based on contaminant intake and absorption rates and physiological factors such as body weight and organ development. Considering early life exposures, warrants additional examples of the inappropriateness of introducing the SGP Project-specific 16/70 adjustment factor. Pregnant women, the fetus, and pre-school children accumulate dose and risk at the highest rates and are especially vulnerable to disease due to age and developmental factors. Body weight, absorption, and hormonal considerations can also make older children and adolescents more susceptible to childhood cancers.

		<p>DEQ's assertion that the SGP Project-specific Adjustment Factor is health protective implies that it is permissible to subject these sensitive sub-populations to equivalent >10-4 risk levels from conceptus to school age because it will average out over the remainder of the child's life.</p> <p>The SGP Project-specific 16/70 adjustment factor is a classic example of dose-averaging. The practice of averaging cancer risk over a receptor's lifetime was progressively developed as an issue in the risk analyses applied to contaminated hazardous waste sites during the 1990's and early 2000's. The USEPA comprehensively considered the application of dose-averaging or risk amortization in the Science Advisory Board (SAB) review <i>Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens</i>. (USEPA 2005a).</p> <p>The excessive risk associated with early life-stage carcinogenic dose accumulation has long been recognized by most health authorities and specific protections were incorporated in USEPA RAGS policy in 2005. The USEPA recommends a quantitative adjustment of the toxicity value to account for early life susceptibility. This guidance recommends a 10-fold adjustment for exposures during the first 2 years of life; and a 3-fold adjustment for exposures from ages 2 to <16 years of age for carcinogens exhibiting mutagenic mode of action (MOA). (EPA 2009).</p> <p>As another example, consider the case of two additional 6-year projects being implemented near the source represented in Figure 2 at years 9 and 18 in this child's life. Figure 4 shows that the child - already exposed to the</p>
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Figure 4. Cumulative Risk using the Project-specific (6/70) Adjustment Factors for 3 Successive 6-year Projects

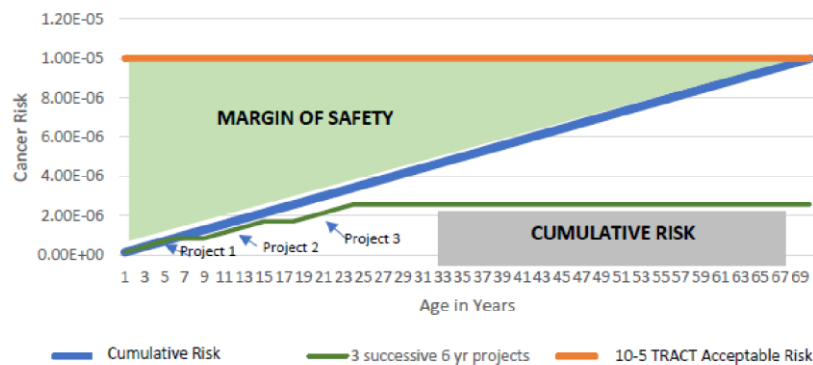


full lifetime allowable cancer 1×10^{-5} risk by age 6 - will have double (2×10^{-5}) the acceptable risk level by adolescence, and will carry the three times the allowable lifetime cumulative risk burden (3×10^{-5}) through the reproductive stage of life.

Under Section 586 DEQ must consider these new projects incrementally. DEQ would be prohibited from talking into account cumulative lifetime exposures associated with the earlier projects in a new source PTC application and would be required to approve the projects.

At the SGP, for example, should Perpetua apply to open another pit at the mine, DEQ would be required to ignore the cumulative lifetime risk and cancer burden imposed by the proposed SGP 16-year LOM scenario.

Figure 5a. Cumulative Risk (CR) and Margin of Safety (MOS) under Proper Implementation of Idaho TAPS Rules for 3 Successive 6-year Projects



Figures 5a and 5b demonstrate the same three sequential project scenarios under the proper implementation of the current TAPS rules using the maximum one-year annual average ambient air carcinogen concentration that incorporates the MOS to accommodate additional sources. Figure 5a shows the cumulative risk from all three projects. In this case a child growing up in the community would be protected from excess cancer risk through all life stages even though DEQ would not consider the earlier exposure in applying Section 586. The lifetime risk accrued by the individual is 2.6×10^{-6} as opposed to 3.0×10^{-5} in the earlier example.

Allowing use of the SGP Project Specific adjustment factor, as the FS advocates, would increase lifetime cancer risk by 12 times in this example.

		<p>The DEQ Board further concluded that DEQ did not Act Reasonably in Using a Five-Year Rolling Average and the Non-West End Pit Adjustment Factors</p> <p>Two other ad hoc SGP Project-specific adjustment factors are applied to the exposure estimates prior to implementing the 16/70 lifetime adjustment factor. First, DEQ erroneously applies the Five-year Rolling Average adjustment factor to the emissions rates used as input to the refined modeling. This disguised risk-averaging technique results in the model's predicting a five-year average ambient air carcinogen concentration rather than the maximum one-year annual average ambient air carcinogen concentration required under Section 586 and T-RACT, further undermining the health protectiveness of the TAPS rules.</p> <p>DEQ's application of the Five-year Rolling Average adjustment factor reduces the maximum one-year annual ambient air arsenic concentration and the associated cancer risk by 45%.</p> <p>A second SGP Project-specific adjustment, the NON-WEP adjustment factor, was applied to model predicted ambient air concentrations. This is a second disguised dose-averaging step combining eight different Five-year Rolling Average scenarios, reduced the alleged WEP2 maximum annual average by an additional 41%.</p> <p>In summary, DEQ's diluted the maximum one-year annual average ambient air carcinogen concentration by 45% in applying Five-year Rolling Average. DEQ further diluted five-year average concentration by 41% by applying the non-WEP adjustment factor, which is diluted an additional</p>
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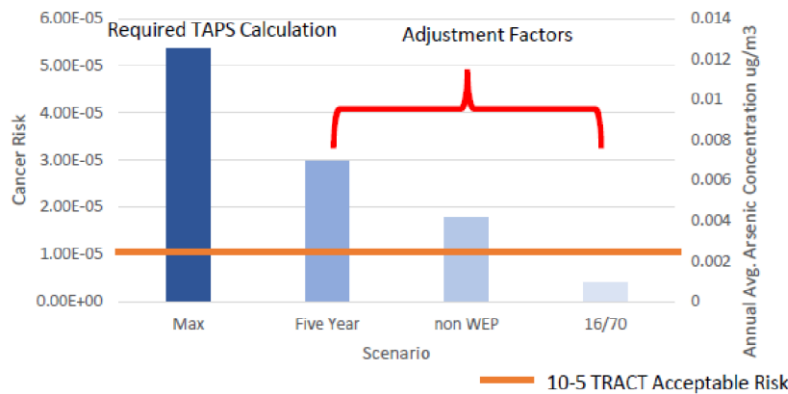
78% applying the 16/70 SGP Project-specific Adjustment Factor. In total, DEQ diluted the required maximum one-year annual average ambient air carcinogen concentration by 93%, or a factor of 13 times before calculating the corresponding cancer risk.

The risk levels associated with these exposures were similarly underpredicted as follows: risk for estimated maximum one-year annual average ambient air carcinogen concentration is 5.3×10^{-5} , diluted to 3×10^{-5} by applying the Five-year Rolling Average Adjustment Factor, to 1.8×10^{-5} by applying the Non-WEP adjustment factor, to the alleged compliance 4×10^{-6} by applying the SGP 16/70 Project-specific adjustment factor.

These results are shown in Figure 6. DEQs sequential application of the three SGP Project-specific Adjustment Factors underpredicts cancer risk by 13 times.

OBJECTION: The above analyses and discussion show the use of dose-averaging underestimates cancer risk by 13 times for the proposed 2021 MMP. The Board of DEQ has determined this methodology is inappropriate and increases cancer risk. The FS was aware of these conclusions when the ROD was issued, but nevertheless continues to endorse FS cancer risk estimates which are more than order of magnitude less than those indicated in the DEQ Board testimony. This assertion that the SGP will meet cancer risk criteria, that even Perpetua’s own analyses refute, is sufficient cause to withdraw the DROD.

Figure 6. Effect of DEQs Application of the Project-specific Adjustment Factors Compared to Required TAPS Calculation



21	<p>However, as noted above, exposure estimates cannot be developed, as the link to the electronic support documents cited by the Forest Service cannot be accessed.</p>	<p>Supportive documents (e.g., resource specialist reports, air modeling reports, fisheries baseline and modeling reports, water baseline and modeling reports, etc.) for the SDEIS were made available on the Forest Service project website at the same time as the SDEIS. Where reviewers requested additional information to review, the Forest Service did respond by making the information available.</p>
22	<p>On-site Carcinogenic Air and Dust Exposures: All of the air quality analyses are limited to off-site ambient air. On-site air concentrations are likely an order of magnitude higher. In the interest of worker, site resident and visitor health, the Forest Service should estimate on-site airborne arsenic levels and assess the risk of on-site exposures. The high arsenic content of the dusts is also a health concern due to direct contact exposure, incidental ingestion, inhalation, and skin absorption. Arsenic levels in on-site dusts will range from 580 – 10,000 mg/kg. Total arsenic concentration for growth media range up to 3,000 ppm As, justified on the basis of observing vegetation survival on Hecla reclamation sites. These metals concentrations substantially exceed (by 2 – 3 orders of magnitude) health risk screening and CERCLA cleanup levels for occupational, recreational and residential scenarios. On-site workers and visitors will be exposed to</p>	<p>On-site carcinogenic air and dust exposures would be regulated under MSHA requirements for mine operation. Therefore, attainment of standards for worker health would be reasonably foreseeable for the Project. Dust monitoring is incorporated into the Final EIS in Section 4.3.5. For further details see response to comment 16878.5.</p> <p>Objection Narrative: The response is insufficient as it only refers to workers. Among the greatest concerns expressed in Comment 22 are exposures to site residents and visitors, particularly children and women of child-bearing age, as representing the fetus. Perpetua has indicated that workers and families will live on-site. Visitors will be escorted through the mine property. MSHA requirements are not protective of resident children nor visitors. Despite numerous requests from Public Commenters, the FS has indicated it has no obligation to request nor disclose predicted on-site carcinogenic air, dust or soil concentrations of COCs.</p> <p>The Commenter has extensive experience with exposures to and absorption of these toxic metalloids by</p>

	<p>concentrations, potentially, orders of magnitude greater than these criteria.</p> <p>Neither Perpetua, nor the Forest Service or IDEQ have publicly disclosed estimated on-site airborne concentrations.</p> <p>In the interest of Public Health protection, the Forest Service should not defer to the IDEQ PTC assertions under Administrative Appeal. The Forest Service should independently perform the emission calculations, air quality modeling, and risk assessment associated with COC releases from this facility. Resulting COC airborne and dust concentrations, both on-site and off-site estimates should be publicly disclosed. Human health risk assessments should be undertaken at mean and Reasonable Maximum Exposures (RME). Soil cleanup criteria should meet CERCLA guidelines.</p>	<p>children and reproductive-aged women at a refractory-gold, antimony mining operation exploiting stibnite/arseno-pyritic ores in Central Asia. Women and children do reside in and near the mine at this location. The largest active air pollution sources are mining fugitive dusts, particularly haul roads operating with metals concentrations comparable to those projected for SGP.</p> <p>An extensive media contaminant exposure characterization, human health risk assessment identified excessive exposure throughout the community. A follow-up human biomonitoring study focused on women of child-bearing age and children living in high-risk areas. Blood and urine samples were collected from 254 participants and analyzed for metals identified in the environmental assessment. Results showed elevated levels of antimony and arsenic, with > 90% of participants (mostly children) exhibiting; chronic, abnormal exposure to one or more heavy metals, and 20% of participants have chronic exposure to arsenic and/or antimony exceeding action values. (Report and summaries attached.)</p> <p>The arsenic absorption levels were not unexpected as arsenic from these ores are significantly bioavailable, as are the arsenical chemical species anticipated at the SGP. The excessive absorption of antimony by women and children was not anticipated as antimony from stibnite ore mines has generally been expected to be of low bioavailability.</p> <p>There is suggestive evidence that the bioavailability of arsenic and antimony at the SGP is high, perhaps among the highest ever observed. (Dovick, M.A., Arkle, R.S., Kulp, T.R., Pilliod, D.S., 2020, Extreme arsenic and</p>
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		<p>antimony uptake and tolerance in toad tadpoles during development in highly contaminated wetlands: Environmental Science and Technology, https://doi.org/10.1021/acs.est.0c00558.) Dovick et al. findings demonstrate uptake and accumulation of extremely high amounts of toxic metalloids and contend that the levels accumulated by these amphibians were <i>among the highest concentrations of arsenic and antimony ever reported for a living vertebrate</i>.</p> <p>These results should be of concern to the FS. There will be extremely high exposures at on-site or locations, and at critical receptor locations off-site. Concern with the potential adverse human health exposures extends well beyond those expressed with cancer in previous Comments.</p> <p>Non-carcinogenic Risk. The carcinogenic risk concerns associated with the FS use of dose-averaging through employing the SGP Project-specific Adjustment Factors have been demonstrated in Comments 18 and 20. There are also non-carcinogenic risk concerns associated with dose-averaging as employed by the FS. Environment Canada 2013 conducted an extensive review of issues surrounding dose-averaging, and risk amortization in applying cumulative risk assessment to short-term exposure scenarios and concluded that dose averaging generally underestimates risk for fetuses, infants, toddlers, school children and adolescents; can be appropriate for healthy adults; and overstates risk late in life. Environment Canada also notes specific examples of non-carcinogenic arsenic health effects that can become the risk driver after applying age-specific exposure,</p>
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		<p>absorption, and dose accumulation adjustments at contaminated sites where children may ingest, in addition to inhaling, arsenic laden dusts. (Environment Canada 2013, page 18, pdf provided)</p> <p>Allocating a lifetime of allowable arsenic intake to children in 6 or 16 years, raises numerous non-carcinogenic concerns. The largest source of arsenic at the SGP are Haul Road fugitive dusts. Application of the SGP Project-specific adjustment factor allows the SGP to increase annual emission rates from Haul Roads by four to ten times more than that allowed under proper implementation of the TAPS rules.</p> <p>This concentration of emissions in early childhood, not only increases ambient air arsenic concentrations, but more than quadruples the rate of arsenic-laden dust deposition. It is well-known, in Idaho, nationally and internationally, that incidental ingestion of mining-related fugitive dusts is the major childhood exposure route for heavy metals in mining communities. Numerous DEQ risk assessments for abandoned mine sites in Idaho, including several at the Bunker Hill and Coeur d'Alene Basin Superfund Site, have historically involved fugitive dusts from mining sites. (von Lindern et al., 2016, pdf attached).</p> <p>OBJECTION: The ROD should be withdrawn because the Forest Service has failed to disclose and/or objectively evaluate potential contaminants of concerns exposures and carcinogenic and non-carcinogenic risk for on-site visitors.</p>
23	Under the SDEIS, the TSF Embankment and Buttress will contain from 115,317 – 425,957 tons of arsenic, 117-378 tons of	The composition and leachability of the TSF embankment and buttress and pit backfill material are incorporated into the water chemistry analysis as depicted in the

	<p>mercury, and 13,145 -17,566 tons of antimony. Compared to the DEIS Alternative, arsenic disposed in the TSF Dike /Buttress is increased by 210%, and decreased by 10% in the YPP and 66 % in the WEP. The HFP is backfilled with 14,618 - 53,995 tons of arsenic as opposed to water in the DEIS. Typical arsenic concentrations in DR backfill will range from 812 ppm to 3000 ppm, (average - 95th %tile), as compared to 656 ppm to 2422 ppm in the DEIS. Table SD11 summarized DR COC for the DEIS and Table SD3 summarized DR and Waste COC for the SEIS.</p> <p>DR disposal SDEIS and DEIS are markedly different, and direct comparisons are difficult. Three of the DR surface repositories indicated in the DEIS have been eliminated and one subsurface pit has been added. Four (4) of the 10 DR haul road scenarios evaluated for both the DEIS and SDEIS air quality analyses are no longer applicable, and none estimate haulage to the TSF Dike/Buttress, the most utilized route under the new SDEIS Preferred Alternative. As a result, the relevancy of the air quality analyses supporting HR emissions calculations is suspect. However, these effects cannot be evaluated as the electronic links to the modeling files can no longer be accessed.</p>	<p>conceptual diagrams shown in SDEIS Figures 4.9-2 and 4.9-15, respectively.</p> <p>The incorporation of arsenic concentrations in dust into the air quality assessment is described in SDEIS Section 4.3.2.2.</p> <p>OBJECTION: See Objections to Comments 4,14,17, 18, 25 – 29 herein.</p>
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	<p>All SDEIS Alternative DR repositories will be under a geo-synthetic cover and largely protected from meteoric waters for the life of the cover. In total, approximately 54% of SDEIS DR arsenic will be disposed in surface repositories and 46% in Pits, as opposed to 68% surface and 32% sub-surface disposal in the DEIS. Pit-disposed COCs will be exposed to groundwater wet/dry and redox cycles, and will release COCs to groundwater. Although additional protections will be afforded from meteoric waters, YPP and HFP subsurface disposal of COCs likely increases groundwater contact, leaching and discharge.</p> <p>The Forest Service should independently re-evaluate the air quality modeling and the relevance of the Haul Road characterizations, emission estimates, and carcinogenic risk assessments. Similarly, the release to groundwater and consequent downstream effects from YPP and new HFP should be re- evaluated.</p>	
24	<p>The largest component of total on-site arsenic (64%) is in ore. Under the new SDEIS Alternative, a projected 112M tons of pit ore will be produced containing 396,246 to 1,028,406 tons of arsenic (average - 95th%-tile). About 55%, 12%, and 31% of arsenic in Pit ore will be produced from the YPP, HFP and WEP, respectively. This a marked change from</p>	<p>The arsenic contained within tailings would be managed within containment facilities that would inhibit environmental exposure during operations and long term with impermeable liners and clean cover materials. Limitations on arsenic exposure would control effects of arsenic solubility, bioavailability, and toxicity on environmental receptors. Additional detail on the studies that have been conducted on arsenic stability in mill</p>

	<p>the DEIS Alternative reflecting 44%, 46% and 9%, respectively. These are significant differences, as the concentrations and chemical form vary among ores and can have important effects on the distribution, chemical form, toxicity, and disposition of arsenic in downstream metallurgical processes, disposal and releases, and behavior in environmental media. About 3% of ore arsenic is in historic wastes.</p> <p>Ores will be crushed and ground and subjected to flotation concentration. About 85% of arsenic in ore will go to concentrates and 15% to tailings. An estimated 9% of YPP arsenic, 30% of HFP arsenic, and 17% of WEP arsenic, or a total of 61,547 to 157,878 tons of arsenic will discharge with flotation tailings to the TSF. The chemical form of this arsenic is unclear, but likely varies by Pit source. An estimated 85% of arsenic in ore (348,766 – 894,462 tons) will be captured in gold flotation concentrates (54% of Site-wide As). The arsenic in these concentrates is pressure oxidized in a high temperature autoclave (POX) to liberate gold and will eventually go through cyanide (CN) leaching and detoxification (Detox) and be discharged to TSF. About 60% of total Site-wide As will be subjected to the POX/CN/Detox processes and undergo substantial chemical transformation.</p>	<p>wastes and the design responses to these studies is found in Section 13.9 of the Feasibility Report (M3 2021).</p> <p>OBJECTION: See Objections to Comments 4,14,17, 18, 25 – 29.</p>
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	<p>Neither the DEIS nor SDEIS addresses the arsenic content, geochemistry or chemical constituency in relation to these proposed metallurgic processes or waste characteristics. This omission is of considerable concern, as arsenic chemistry and toxicity are complex and species (valence) dependent. Solubility, bioavailability and toxicity are highly variable among mineral processing applications depending on other metal concentrations, pH, and oxidation-reduction status, among other factors. Only two, two-sentence statements in the entire SDEIS document address these issues: i) on page 2-51 Oxidation and Neutralization and ii) in Table 2.4-13 Proponent Proposed Design Features. Both allude to: “Perpetua would monitor levels of soluble arsenic in the tailings. If soluble arsenic levels are higher than anticipated, Perpetua would treat the oxidized concentrate with HAC prior to neutralization.”</p>	
25	<p>Careful concurrent review of the evolution of the New MoDPRO2 Alternative using the 2014/2019/2021 M3 Feasibility Study documents and the subsequent MoDPRO and MoDPRO2 Alternative modifications, indicates that the Forest Service should be more diligent and forthcoming in the SDEIS, and in informing the public regarding difficulties with toxic soluble</p>	<p>The arsenic contained within tailings would be managed within containment facilities that would inhibit environmental exposure during operations and long term with impermeable liners and clean cover materials. Limitations on arsenic exposure would control effects of arsenic solubility, bioavailability, and toxicity on environmental receptors. Additional detail on the studies that have been conducted on arsenic stability in mill</p>

	<p>arsenic in the TSF discharge.</p> <p>The brief mention of HAC (Hot Arsenic Cure) in the SDEIS apparently parrots a two paragraph statement in Section 2.2.5 Tailings Arsenic Management, in Perpetua, October 2021, STIBNITE GOLD PROJECT: REFINED PROPOSED ACTION – MoDPRO2. In short, Perpetua acknowledges that 2018 testing showed a substantial amount of amorphous (unstable) arsenic compounds formed in the POX would result in elevated soluble arsenic in POX waste and the tailings leachate. These levels may not meet water quality standards during post closure, necessitating long-term water treatment, even with the MoDPRO improvements.</p> <p>Perpetua then asserts that, based on mid-2020 tests, the new Alternative MoDPRO2 will address the soluble arsenic detoxification problems as follows: “During the initial years of operation, Perpetua Resources would monitor levels of soluble arsenic in the tailings. If soluble arsenic levels were higher than anticipated, Perpetua Resources would treat the oxidized concentrate with hot arsenic cure (HAC) prior to neutralization.”</p> <p>Repetition of a single unsupported sentence in serial reports does not constitute reliability in the assertion that the HAC is a catch-all solution for the arsenic</p>	<p>wastes and the design responses to these studies is found in Section 13.9 of the Feasibility Report (M3 2021).</p> <p>OBJECTION: The FS response does not address the technical considerations provided in the comment, but simply re-directs attention to Section 13.9 of M3 2021. It is important to note that the following four comments specifically address and rebut shortcomings in those very sections of the M3 2021 findings. The comments also note conflicts with earlier versions of the M3 Feasibility Reports, particularly those that indicated concerns that long-term water quality goals could not be met without perpetual treatment. The comparison of the evolving drafts of the Feasibility Reports is important because, at the time of the DEIS, the FS failed to disclose that the SGP could not adequately treat amorphous arsenic in cyanidation discharges. The reasons for this omission are important. Did Perpetua disclose this shortcoming to the FS and, if so, why was this critical flaw not discussed in the DEIS?</p> <p>The stabilization test results from M3 2021 were first presented in the SEIS and as shown in the following comments do not provide sufficient evidence that Perpetua will be able to control amorphous arsenic to the degree necessary to avoid perpetual treatment.</p>
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	instability problems in the largest on-site discharge.	
26	<p>Although the documents show Midas was aware of, and actively investigated these problems in 2018, the Forest Service was either unaware of, or chose to ignore, these concerns in the DEIS and, subsequently, in the SDEIS. The only public disclosures regarding arsenic detoxification difficulties prior to the DEIS were the two brief references to arsenic behavior in wastes in the 2019 Feasibility Study noted and copied in full in the original DEIS comments.</p> <p>The 2021 Technical Feasibility Study disclosure to Investors provided the details of the tests that indicated conditions necessary to capture precious metals in the POX/CN/Detox circuit, resulted in arsenic instability downstream of the autoclaves; and largely labile, pentavalent As being discharged to the TSF.</p> <p>The following are the first and last paragraphs of Section 13.9.4 Arsenic Stability Investigation (2020) of the 2021 Technical Feasibility Study summarizing the problem, investigations and conclusions: The stability of arsenic was a concern flowing out of the 2018 metallurgical product environmental geochemical results. A test work program was initiated at SGS commencing April</p>	<p>The arsenic contained within tailings would be managed within containment facilities that would inhibit environmental exposure during operations and long term with impermeable liners and clean cover materials. Limitations on arsenic exposure would control effects of arsenic solubility, bioavailability, and toxicity on environmental receptors. Additional detail on the studies that have been conducted on arsenic stability in mill wastes and the design responses to these studies is found in Section 13.9 of the Feasibility Report (M3 2021).</p> <p>OBJECTION: The above response is another example of the FS failure, not only to adequately address the technical concerns with the SGP inability to treat amorphous arsenic discharges, but also to respond meaningfully to public critique. The response simply re-directs attention to Section 13.9 of the Feasibility Report. The comment contains direct quotes of the first and last paragraph of that very Section 13.9.4. The conclusion of Section 13.9.4 says “.... <i>The only sink for aqueous arsenic is in the pore water within the tailings facility.</i>” That finding should be of concern to the FS, should be addressed on a technical basis, and <u>most notably</u>, should be addressed in the SEIS. This topic is not addressed in the SDEIS. The Objector has pointed this out to the FS by referring to the Feasibility Study. Public reviewers should not be required to consult SGP investor disclosures to provide assessments of water treatment adequacy in NEPA assessment. The FS should not apply circular</p>

	<p>2020 to examine where arsenic destabilization occurred.</p> <p>Section 13.9.4.7 Arsenic Department Across Metallurgical Circuit concludes: Arsenic destabilization appears to be an inevitable outcome of raising the pH of the POX residues for the recovery of gold employing the cyanide carbon-in-leach step. The destabilization of arsenic does not seem to be reversible at pH values above neutral and only appears to be arrested when the pH is reduced to approximately 8.5 in Cyanide Detox. Arsenic is expected to leach from POX residues and report to the process liquors. The only sink for aqueous arsenic is in the pore water within the tailings facility and in the autoclave and neutralization circuits where arsenic containing process water is employed in the feed repulp, reagent make up and quench water (emphasis added).</p>	<p>responses referring the Commenter back to the same paragraphs being critiqued.</p> <p>These comments go on to point out that the SEIS addresses this issue only, and totally, in two sentences i) on page 2-51 Oxidation and Neutralization and ii) repeated in Table 2.4-13 Proponent Proposed Design Features:” <i>When increasing arsenic levels are observed, the oxidized slurry would be treated with hot arsenic cure (HAC) prior to neutralization. Metallurgical tests showed that this process promotes formation of the stable crystalline form of the arsenic precipitate enhancing environmental stability of arsenic”.</i></p>
27	<p>SDEIS. The 2021 Feasibility Study, MoDPRO2 and SDEIS documents confuse the HAC acronym, with the Feasibility Study distinguishing Hot Acid Cure (HAC) and Hot Arsenic Cure as (HC), in contrast to the MoDPRO2 and SDEIS documents using only Hot Arsenic Cure (HAC). Regardless of the confusion, it is most important to note that the supposed process indicated in the MoDPRO2 refinements, and the four SDEIS</p>	<p>The SDEIS applies the acronym for hot arsenic cure consistently with its use in the proposed mine plan description.</p> <p>As stated in the Project description, the hot arsenic cure treatment would be applied if soluble arsenic levels were higher than anticipated. Further, processing residuals containing arsenic would be placed in lined facilities that inhibit exposure of those materials to the environment.</p> <p>Objection Narrative: The above Response to this comment repeats almost the entire justification for HAC</p>

	<p>sentences, are based on 3 tests of a single concentrate, representing “years 1-4 production consisting of 85% Yellow Pine and 15% Hangar Flats (Con 10).” The 2021 Feasibility Study also indicates the HAC system would be installed in Year 6 to be operational in Year 7, when arsenic levels in the mill feed are expected to increase. This corresponds with the completion of YPP and HFP ores and the introduction of WEP ores for which there were no reported HAC tests. This indicates the HAC will not be installed in time to treat the majority of concentrates that were tested, and was never tested on the concentrates it is intended to treat.</p> <p>It is also important to note that the amorphous arsenic concern is with the final discharge in a six step detoxification flowchart. This occurs after the supposed HAC stabilization of thermally treated arsenic in the POX in an earlier step. The supposed stabilized CN/Detox slurry was then blended with concentrator tailings thickener underflow, and the blend was examined for arsenic stability. The blend ratio was 75.2% rougher tailings, 12.0% cleaner tailings, and 12.8% cyanide detox residue. As a result, it is unclear if the alleged stabilization in the final discharge is due to dilution from rougher and cleaner tailings, or from the alleged effectiveness of</p>	<p>included in the SEIS. HAC is offered in SDEIS as a cure-all to one of the most serious and potentially threatening COC issues at the SGP. There is no supportive evidence regarding the purported effectiveness of HAC in the SEIS. The chemical and physical status of the hundreds of thousands of tons of arsenic is of paramount concern in the TSF. Perpetua’s own Feasibility Studies indicate that, without HAC, substantial portions of this arsenic will exist in amorphous labile forms indefinitely in TSF pore-water, under hundreds of feet of hydraulic head, protected by a single liner, underlain by a porous gravel “liner protection” layer. The gravel protection layer is not confined, as it would be in a double-layer system. This system does not provide control to prevent leakage and severely impedes even leak detection.</p> <p>The location of any leaks will be difficult, and likely impossible, to detect. It is probable that any leaks will eventually be observed only after long periods of time in downstream monitoring wells, and the local hydrologic systems. There will be no effective corrective action that can be applied. The FS and IDEQ’s failure to demand redundant protection for the TSF makes it absolutely necessary that the arsenic in the TSF be stabilized into non-aqueous insoluble matrices.</p> <p>The FS and Perpetua’s predecessors were derelict in not disclosing the inability to stabilize amorphous arsenic in the CN/Detox waste stream in the DEIS, even though Consultant Feasibility Reports contained pertinent warnings as has been noted and provided to the FS in several previous comments. The entire justification for the HAC cure-all included in the SDEIS is:</p>
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	<p>the HAC.</p> <p>Considering the complex arsenical geochemical differences in ores processed, and the shift in the 2021 MMP toward WEP Ores (that demonstrated significantly different arsenic recovery chemistry due to unique combinations of sulfide, oxidized and transitional ores), the Forest Service should have little confidence in Perpetua’s ability to manage arsenic stability through the Life of the Mine (LOM).</p>	<p><i>“When increasing arsenic levels are observed, the oxidized slurry would be treated with hot arsenic cure (HAC) prior to neutralization. Metallurgical tests showed that this process promotes formation of the stable crystalline form of the arsenic precipitate enhancing environmental stability of arsenic.”</i></p> <p>Comment 27 to the SDEIS points out that detailed scrutiny of the HAC testing by Perpetua Consultants shows:</p> <ul style="list-style-type: none"> i) The treatment system will not be installed in time to be used on the ores HAC has been tested on. ii) HAC has never been tested on the WEP ores for which it is intended and those most likely to be resistant to stabilization. iii) The stabilization tests were never conducted on the CN/Detox discharge “oxidized slurry” itself, as the design and the response to this comment suggests it will be applied, but instead on a diluted simulated discharge combined with other tailings. iv) The solubility extraction analytical test applied to assess stabilization simulates rainwater, rather than the aggressive conditions the allegedly stabilized arsenic will encounter in the pore water of the TSF. <p>The sum total applicability of the HAC testing conducted with regard to i) the ores is intended to be applied to and ii) the conditions within the pore water of TSF does little to prove the applicability of this unproven process to stabilize the largest source of arsenic anticipated for the SGP. Moreover, the FS</p>
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		<p>entire reliance offered in the SEIS on this most critical environmental protection treatment option is on the unsupported assertions in the two sentences noted above.</p> <p>OBJECTION: The Forest Service has failed to demonstrate that amorphous arsenic can be stabilized in the TSF, nor does the FS require redundant leak control or capture, or potential corrective actions should ambient water monitoring detect leaks. Considering that the TSF may contain hundreds of thousands of tons of potentially liable arsenic, the DROD should be withdrawn.</p>
28	<p>Finally, the stabilization results referenced in the Feasibility Study are based on Synthetic Precipitation Leachate Procedure (SPLP) test results. SPLP is commonly used to simulate the effect of acid rain on land-disposed waste (e.g., land application or unlined landfills) where leaching to groundwater is a concern. The SPLP test is not a regulatory test, and concentrations are generally compared to drinking water standards (i.e., 0.01 mg/l for As). The 2021 Technical FS leachate studies refer to “acceptably low SPLP concentrations of As (<2 mg/L).” The justification for this SPLP “cut off” level is unknown as it is 200 times the drinking water standard.</p> <p>Because these wastes are to be disposed in a lined and covered TSF landfill, the Toxic Characteristic Leachate Procedure</p>	<p>The arsenic contained within tailings would be managed within containment facilities that would inhibit environmental exposure during operations and long term with impermeable liners and clean cover materials. Limitations on arsenic exposure would control effects of arsenic solubility, bioavailability, and toxicity on environmental receptors. Additional detail on the studies that have been conducted on arsenic stability in mill wastes and the design responses to these studies are found in Section 13.9 of the Feasibility Report (M3 2021).</p> <p>The TCLP test is only applicable to regulated hazardous wastes for disposal purposes. Mill tailings are not regulated as hazardous wastes so TCLP testing is not applicable. SPLP and WMWT was therefore used to help characterize the waste materials.</p> <p>OBJECTION: See Objection to Comments 2, 5 and 27. The FS is confusing science with regulation. The Comment does not assert regulatory applicability. The</p>

	<p>(TCLP) is a more appropriate test, and that most often cited in reviews of arsenic stabilization (Nazari, et al (2017). TCLP is a regulatory test and the standards are generally 100 times the drinking water standard. The TCLP procedure generally shows considerably greater concentrations of arsenic than the SPLP. The use of SPLP in the earlier studies suggest that Midas was concerned with disposal of the arsenic subject to meteoric waters. MoDPRO2 changed the TSF configuration to a geo-synthetic cover. As a result, the Forest Service should not rely on SPLP test results in evaluating arsenic stability and should consider the Perpetua’s alleged capacity to stabilize amorphous arsenic in the POX/CN/Detox is unproven.</p>	<p>Comment suggests that, scientifically and as it relates to the concerns of these analyses, the TCLP test is more appropriate to assess the leachability of the CN/Detox discharge than the SPLP. The Nazari et al. 2017 journal article cited is a scientific review showing the applicability of the TCLP test in assessing potential leachate from heavy metals disposed of in landfills, as opposed to SPLP. Nazari et al. suggest that the TCLP is a better indicator than SPLP in all applications, regardless of any regulatory requirement. The pertinent qualifier in this comment is that Perpetua’s own analyses acknowledge that 2018 testing showed a substantial amount of amorphous (unstable) arsenic compounds formed in the CN/Detox would result in elevated soluble arsenic in POX waste and the tailings leachate. <i>“These levels may not meet water quality standards during post closure, necessitating long-term water treatment, even with the MoDPRO improvements”.</i></p> <p>OBJECTION: The FS reliance on the SPLP to assess leachability of supposed “stable crystalline form of the arsenic precipitate” in the harsh environment of the pore water in the TSF is unsound science. Application of the aggressive TCLP would better assess the leachability of post-POX effluents, considering the complex chemistry of arsenic compounds in highly oxidative conditions.</p>
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<p>29</p>	<p>TSF Leak Detection and Treatment: The concern with appropriate leachate testing was exacerbated with the Idaho mining industry’s successful lobbying effort to modify the IDEQ CN waste disposal rules. At the time Midas was conducting arsenic stabilization investigations, the Idaho CN rules required double- lining, and leachate collection and treatment for the TSF. These rules were amended by the Idaho State legislature and as noted in the SDEIS, the TSF will not require double lining. Leak detection will be commenced in groundwater monitoring as opposed to between the liners, and feasibility of timely seepage collection/treatment is unlikely. This rule change increases the urgency for reliable arsenic stabilization alternatives.</p>	<p>Comment noted. Statement of position. No response required.</p> <p>OBJECTION: Again, the FS is avoiding meaningful response to a public comment regarding a substantial threat to human health and the environment. This “position” is a statement of concern, a concern the FS should share and address. The TSF poses an inherent risk to an extremely valuable and vulnerable public water resource and a fragile and unique ecosystem, both of world-wide significance. That risk is magnified by the uncertainties noted in Comments 24 – 30. The relaxation of standards by the State of Idaho does not relieve the FS of objectively assessing the risk associated with non-redundant groundwater protection.</p> <p>The TSF will contain from 396,246 to 1,028,406 tons of arsenic, 30% of which comes from WEP ores. Perpetua’s own feasibility studies indicate an inability to stabilize the amorphous arsenic from WEP ores. The purported treatment alternative will not be available for the first half of SGP production life, has never been tested on the ores or CN/Detox waste stream of greatest concern. The stabilization testing conducted for the alleged HAC system was conducted on a waste stream diluted by buffering tailings and tested by a leachate test that is insufficiently aggressive to determine if any alleged stabilization is reversible. Meanwhile biological assays conducted in adjacent wetlands contaminated by historic stibnite tailings show high amorphous arsenic and antimony concentrations and the <i>highest concentrations of arsenic and antimony ever reported for a living vertebrate due to uptake and accumulation of extremely high amounts of these toxic metalloids.</i></p>
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30	<p>Summary of Arsenic Tailings Concerns: Numerous tests conducted prior to the DEIS indicated significant arsenic instability associated with POX/CN/Detox proposed discharges to the TSF. These instabilities were not disclosed to, or were ignored by, the Forest Service in the DEIS. Midas Gold performed an assessment of arsenic stability in 2020 and alleged that the HAC had been developed to address this problem in the new 2021 MoDPRO2 Alternative. Examination of the studies, however, show these were based on three tests of a single ore concentrate, were significantly diluted with pre-POX flotation tailings, and relied on an inappropriate leachate procedure. The DEIS and SDEIS failed to mention or consider these uncertainties and shortcomings.</p> <p>Simultaneously, IDEQ cyanide disposal rules were amended, relieving the SGP of double lining the TSF. Leakage from the TSF will likely be undetectable in any way that supports corrective actions.</p> <p>The Forest Service should not accept Perpetua's assertions that arsenic in the TSF discharges can be stabilized, and consider an Alternative that does not require on-site treatment and disposal of thermally treated arsenic.</p>	<p>The arsenic contained within tailings would be managed within containment facilities that would inhibit environmental exposure during operations and long term with impermeable liners and clean cover materials. Limitations on arsenic exposure would control effects of arsenic solubility, bioavailability, and toxicity on environmental receptors. Additional detail on the studies that have been conducted on arsenic stability in mill wastes and the design responses to these studies is found in Section 13.9 of the Feasibility Report (M3 2021).</p> <p>OBJECTION: See Objections to Comments 23-29 herein.</p>
31	<p>Off-Site Processing of Gold Concentrates: The issues associated with disposal of</p>	<p>Section 2.6.2.1 of the SDEIS does address potential offsite shipment of raw ore from the SGP for milling. It</p>

	<p>massive amounts of potentially unstable arsenic were repeatedly pointed out in the DEIS public comments. The Forest Service did not respond to these comments, but inserted vague references to a supposed HAC treatment system. Midas and the Forest Service did not disclose these problems and neglected to inform the public of an Alternative that could reduce toxic metals burdens to the environment by 50% - 80%. The 2021 Technical Feasibility Study also reveals that, at the same time Midas was conducting the HAC treatment tests, off site gold processing was being evaluated. This option would eliminate the POX/CL/Detox circuit and the arsenic stability challenges and would reduce the arsenic disposal burden at the site by more than 50%.</p> <p>The Forest Service evaluated and rejected Off-Site Gold Processing in Section 2.6.2.1 of the SDEIS that states: "Under this alternative, raw ore would be processed off-site and would reduce the amount of reagents transported and used at the SGP, and the number of employees traveling to the site. It would also eliminate the need to store mill tailings at the SGP site. Transporting approximately 22,000 tons per day by trucks to an offsite mill would require approximately 550 round trips daily during the 15 years of mine operations. This would greatly increase the air</p>	<p>states that the environmental effects of approximately 550 round trips by truck per day to an offsite mill would be added to the offsite impacts of building the offsite mill facility to process the ore. This would clearly be a higher level of environmental effect than building and operating the proposed onsite mill facilities.</p> <p>The commenter states that offsite shipment of concentrate produced at flotation mills has been widely practiced. This does not invalidate the conclusion in Section 2.6.2.1 because a concentrator mill would still need to be constructed at the SGP to produce the concentrates.</p> <p>The commenter then focuses on the potential for production of the gold/silver concentrate and shipping it offsite for further processing instead of processing the concentrate on site. The commenter states the reason for this would be elimination of the POX/CL/Detox circuits and the arsenic stability challenges. Section 13.13.2 of the Feasibility Study (M3 2021) discusses the potential for production of a gold concentrate that could be shipped off site for further processing. The report describes that production of said concentrate would require a more complex and expensive gold flotation circuit than is currently planned for the SGP. Offsite toll processing of a gold concentrate would also require production of a cleaner, higher-grade concentrate at the SGP than would be necessary for the planned onsite gold extraction circuit, which would result in some additional loss of precious metal in the process. The Feasibility Report stated that, compared to production of a gold concentrate for onsite processing, cleaning the concentrate to shippable grades would result in a supplemental 3.3</p>
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	<p>emissions and transportation impacts of the SGP and dramatically increase operational costs. The main problem with this alternative is that there currently is no commercial milling operation in the U.S. West that could economically process the SGP ore. So, a new mill, with all the same associated environmental impacts as the proposed SGP on-site mill would need to be constructed.” (Emphasis added)</p> <p>It is uncertain whether this statement is naïve, facetious, or intentionally misdirecting. Raw ores were first, and perhaps last, shipped from Central Idaho Territory to Utah from Bayhorse in 1864 by pack train. For the last century, ores have been concentrated before shipping, usually at flotation mills built near the mine. In fact, simultaneous with addressing the arsenic stabilization problem, the 2021 Technical Feasibility Study states: “The potential for cleaner flotation to produce a concentrate suitable for shipment off-site, as an alternative to on-site sulfide oxidation and gold leaching, was investigated during the FS.”</p> <p>The 2021 Technical Feasibility Study also disclosed that pilot tests indicated that the processes were potentially technically and economically feasible, developed process flowsheets, and made recommendations for additional testing, should the alternative</p>	<p>percent loss of gold. With an estimated 4,217 koz of total recovered gold and 852 koz of silver from the proposed operations (Table 22.2 in M3 2021), this supplemental loss would be about 139,161 ounces of gold. Using the Base Case metal prices of \$1,600/oz for gold, this supplemental loss of gold would cost the project about \$223 million. This would not be consistent with the Project Purpose and Need.</p> <p>The commenter's stated benefit of the offsite processing of the gold concentrate was to eliminate the cyanide leaching on site and reduce the disposal of arsenic contained in the mill tailings in the onsite TSF. This would not result in a significant change in the environmental effects of the TSF already analyzed in the SDEIS because the proposed TSF is designed to prevent release of tailings to the environment during operations and post-closure. The proposed tailings management system also includes a cyanide treatment circuit to detoxify the cyanide in the tailings before disposal in the TSF.</p> <p>Narrative addressing offsite processing of a gold concentrate has been added to Section 2.6.2.1 of the Final EIS.</p> <p>Objection Narrative: The added Narrative that the FS refers to above is as follows:</p> <p><i>Shipping a gold concentrate for offsite processing was also considered in the Feasibility Report (M3 2021) and was found to result in a supplemental loss of gold of about 3.3 percent compared to the production of a concentrate that could be further processed on site as proposed. The value of this large supplemental loss of gold would not be consistent with the purpose and need of the SGP. The environmental effects of operating the</i></p>
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	<p>be pursued. As opposed to the one concentrate tested for HAC, variability testing was conducted on 13 different samples from all Pits, representing some of the “best and worst acting samples from the feasibility study.” Gold grades in concentrates were 40-50 g/t. “Average estimated supplemental loss in gold recovery was 3.3%, compared with the flotation of an on-site POX-ready concentrate.” This indicates a 25-30 fold concentration of Life-of-Mine (LOM) gold grades, reducing trucking to 20 loads/day at concentrate metals values comparable to the antimony concentrate Perpetua intends to ship to Asia or the Middle East.</p> <p>The 2021 Technical Feasibility Report continues. “A preliminary market study for gold concentrate sales was completed by an independent leading industry participant. The participant’s name has been withheld for confidentiality. In the study, the assumption was that the gold flotation concentrate would be shipped offsite to a regional processing facility located in Nevada where several autoclave and roaster plants are located...On May 9, 2018, Barrick Gold, which owns and operates (through the Nevada Gold Mines joint venture with Newmont) several roasters and autoclaves in Nevada, was granted a right of first refusal regarding purchase of gold concentrates as part of a</p>	<p><i>flotation mill and TSF onsite would also essentially be the same as the Proposed Action. Therefore, because the alternative would increase mine traffic and air emissions, would not reduce environmental effects, and would be economically infeasible, this alternative was dismissed.</i></p> <p>The 3.3% loss of gold recovery is noted in the Comment, along with the observation this alternative would reduce the total TSF arsenic disposal burden by >85% or by >350,000 to > 1,000,000 tons, which would be disposed of in Class 1 facilities in Nevada.</p> <p>The 3.3% loss in projected \$6.7 Billion revenue would be offset economically by several hundred million dollars of construction, operations, and maintenance the entire POX circuit and a substantial reduction the complexity and magnitude of tailings disposal and management, and the possibility of perpetual water treatment. More importantly the \$223M removes 396,000 - 1,188,000 tons of cyanidation waste arsenic projected to disposed in the TSF. Comments 24-30 note the uncertainties and dangers associated with SGP inability to stabilize the CN/Detox waste stream, the inherent risks to human health and the environment associated with labile arsenic releases, and the considerable uncertainties regarding the reliability and long-term integrity of the treatment and disposal systems.</p> <p>OBJECTION:</p> <p>The ROD should be withdrawn as the Forest Service failed to identify and investigate Off-site Gold Processing as an economically and technically viable, and likely more environmental and human health protective Alternative. The dismissal of the Alternative was conducted in private</p>
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	<p>financing arrangement were such concentrates to be shipped off-site.”</p> <p>Midas Consultants noted this Alternative was, potentially, technically and economically feasible with a substantial reduction in capital costs. This alternative would minimize, or eliminate, the highly toxic POX/CN leaching processes at Stibnite. This would reduce the total TSF arsenic disposal burden by >85% or by >350,000 tons, that would be disposed of in Class 1 facilities in Nevada. This would result in a 55% decrease in on-site disposal of arsenic, and elimination of labile As downstream of the flotation circuits.</p> <p>These undisclosed findings certainly suggest that Off-site Sale of Gold Concentrates meet the Alternatives criteria noted by the SDEIS: i) does the alternative, including a combination of component options, meet the purpose and need of the SGP? ii) does the alternative or component option potentially reduce environmental effects to at least one resource? iii) is the alternative or component option technically feasible? iv) is the alternative or component option economically feasible?</p>	<p>negotiations with Perpetua in alleged “re-scoping” activities following the Comment Review Period of the DEIS, without public notice or comment or govern-to-government consultation.</p> <p>The Off-site gold processing alternative meets the criteria noted by the SDEIS: i) does the alternative, including a combination of component options, meet the purpose and need of the SGP? ii) does the alternative or component option potentially reduce environmental effects to at least one resource? iii) is the alternative or component option technically feasible? iv) is the alternative or component option economically feasible?</p>
32	<p>No Action alternative should consider CERCLA: This site is also subject to CERCLA, although it has not risen to priority status by the State of Idaho at this time. CERCLA-related actions are ongoing</p>	<p>Consideration of CERCLA applicability for the No Action Alternative is discussed in Sections 1.3 and 2.3 of the SDEIS. Consideration of off-site processing of gold concentrates is discussed in Section 2.6.2.1 of the SDEIS which was characterized as potentially having overall</p>

	<p>and are more likely to proceed, based on the outcome of the DEIS, and USFS, State of Idaho and Nez Perce Tribe considerations. Based on preliminary investigations undertaken, and other sites involving PRPs for this site in adjacent States, it is probable this site will achieve active status in the foreseeable future.</p> <p>Imposition of CERCLA, would be among the first steps require a conceptual site model that includes an accurate and transparent material and contaminant balance for the site. Evaluation of such a model would be incumbent on the State, Tribal and federal trustees to resolve remedial requirements and CERCLA liabilities in, either Consent Decrees or implementation of voluntary cleanups, as part of mine development, reclamation, and closure.</p> <p>The Forest Service should include Off-site Processing of Gold Concentrates and CERCLA Cleanup as Alternatives in a more objective Supplemental DEIS.</p>	<p>environmental impacts greater than the 2021 MMP and an increase in operating costs significantly impacting Project economics. There is no need to disregard Perpetua's purpose and need for the Project and to develop alternatives that may be purely conjectural and whose implementation would be remote and speculative.</p> <p>The SGP ROD should be denied and the FS should pursue CERCLA action on this site.</p>
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