

To Whom it May Concern:

Hello NEPA comment reviewer! I will attempt to add a little levity to your no doubt grinding day of categorizing and summarizing a steaming load of comment letters. You see I have been there myself at that job, although I was loosely chained to the desk instead of working from home.

First, the obligatory credibility establishment. I am a retired Forest Service geologist, having spent 25 years of my career in McCall, ID working on the Payette National Forest (PNF). Over the rest of what's been a pretty decent career I've been a hydrologist, an exploration geophysicist, and worn a lot of other earth science related hats over the years. I have spent a lot of both work time and play time hiking over much of the PNF and have come to gain somewhat of an understanding of the various natural processes that comprise this unique landscape of west-central Idaho. I am probably more familiar than most with the Stibnite mine site having spent many days working out there, including involvement with the previous reclamation/remediation ("restoration" as some refer to it) efforts out there. Actually walking the land seems to me to be the best means of truly internalizing a recognition of how remarkably integrated the various ecological processes are at a landscape scale. As a geoscience oriented sort of guy, I have a unique conceptual model of how things work out there. I can imagine the past states, present states, and future states of processes at a landscape scale pretty vividly. Which is what this whole analysis is supposed to be about – predictions (informed by the best available science). And finally, as I first mentioned, my NEPA duties as assigned were fairly comprehensive.

Ok, so there's a pretty good brag rap. Time for a little random meta-observation about what's going on with this whole "to mine or not to mine" issue that seems to have captured the attention of many folks. There must be a genetic component that imparts rose-colored glasses to people. Nothing against such glasses if used in moderation, but the PR branch of Midas Gold is a little hooked on their own product. Their promises got way out in front of their technical people and consultants who understood the scientific limitations on the project. Apparently management was okay with that. Consequently the DEIS is a real turd in the analysis punchbowl as a result of trying to rush realistic time frames. Likely there was a bit of investor pressure behind that.

The DEIS, despite its glaring inadequacies, at least puts the lie to that seductive fantasy of a mining project that benefits the environment. When this whole analysis started years back I was willing to entertain the possibility that perhaps such a concept was feasible. It's certainly a laudable goal. I still think there's a remote possibility that such a project could some day come to fruition. This, however, is not the project. If the NEPA process were applied as intended, there's a chance that through the application of rigorous scientific analysis, the current SGP proposal could be modified to the point where there actually were net gains both environmentally and economically. However, that would require Midas Gold, Barrick Gold, Paulson & Co., and all the investors to accept a somewhat lower profit margin. Ok, maybe that's a bit of financial blasphemy.

Just to continue that thought experiment of using the NEPA process as intended, I'll start by critiquing the process as it was followed for this project. It didn't start well. Back when I was still working for the PNF, a document that billed itself as a Plan of Restoration and Operations landed on my desk. Certainly creative marketing, I thought to myself (normally such things are known as Plans of Operations). So at least Midas was paying lip-service to the concept (agreed upon by mining companies and regulators alike) of designing projects for closure. Reclamation (as it's usually referred to) has historically been a major weak point in the mining process. After all, who wants to clean up their own mess? At any rate, I was willing to entertain the idea of mining-enabled restoration if Midas could prove it (via the NEPA process). This first draft of a plan (basically what became alternative 1)

was complex yet quite vague on many points. So vague that it didn't really qualify as being sufficiently developed to warrant its acceptance by the PNF. This acceptance of a plan is a required prerequisite to initiating NEPA. Failure to heed that guidance became the first misstep in the regulatory process. The plan was accepted when there should have been far more information included before it moved on to the NEPA phase of permitting. Oh, well.

So, one of the first tasks of NEPA is to define a range of alternatives that will meet the purpose and need of the project, and this is where I'll start my critique. It seems odd that for a project submitted to the FS as a "Plan of Restoration and Operations" (as opposed to a standard Plan of Operations) that the development of alternatives did not include one which emphasized restoration. The selection of alternatives seems to have been driven primarily by operational considerations rather than restoration objectives. This apparent bias in alternative selection should be remedied by the Forest Service issuing (at a minimum) a Supplemental DEIS which includes a fully developed analysis of a Restoration Emphasis Alternative (REA). Just like the Midas team, I too can come up with catchy acronyms. Their plan may sound PROfessional but mine is more REAListic.

Rather than approaching the analysis solely from the perspective of what environmental sacrifices would have to be made to allow a profitable mining project, the perspective of what mining objectives and profits could be foregone to achieve a long-term improvement of environmental conditions at the site needs to be considered. Only by looking at the project from both perspectives can a true understanding of the range of possible outcomes be realized. Although economic feasibility is one consideration, the FS is under no obligation to give special consideration to the proponents desires (e.g. profit margin) as noted in AECOM (2020b):

It should be noted that the emphasis for alternatives development is what is a reasonable alternative rather than whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

Why wasn't such a REA considered? Based on the alternatives already analyzed in the DEIS, it's not hard to come up with several options that fit the screening criteria for reasonable alternatives. One such example that was brought up in the initial scoping comments by myself (Stibnite Gold Project EIS Scoping And Issues Summary Report, Section 2.6.18, AECOM, 2018) is to mine the deposit with underground methods. The FS was completely unresponsive to this suggestion. It was not even one of the components listed in section 2.8. It was neither considered nor explicitly ruled out.

Underground mining is already proposed on site as is evidenced by the plan to drive a mile long decline at the Scout site for exploration [DEIS 2.3.6.2]. Incidentally, there is absolutely zero analysis of the environmental consequences of this action disclosed in the DEIS. An estimated 100,000 tons of waste rock having unknown geochemical reactivity would be disposed of at an undetermined location. The Prefeasibility Study (PFS) (M3, 2019) notes that the Scout target is a potential high grade ore body that would be amenable to underground mining (PFS section 1.10). Thus, it appears that underground mining is certainly considered to be a viable method. Also of note in the PFS (section 9.7.2) is the description of a high grade "deep target" at Hanger Flats. Exactly the type of deposit that would be most effectively mined by underground methods.

While underground mining may not be as cheap as open-pit mining, the cost difference and the environmental advantages vary between the three main deposits. As noted in the original comment and in the PFS as noted above, underground mining makes most sense at the Hangar Flats deposit and

results in a host of environmental mitigation measures. This option would eliminate the permanent pit lake that would result from alternatives 1-4. The DEIS makes it abundantly clear that the pit lake creates a number of water quality problems. Not only would the pit lake be gone, much of the waste rock volume would not be generated. By including paste backfill disposal of tailings in such an alternative, TSF storage volume requirements would decrease as well. Note the statement by AECOM (2020c) that paste backfill is “best suited to underground or pit backfill, neither of which are envisioned for the Project”. Wait a minute, pit backfill is planned. Under the hypothetical framework of a REA, which I have begun to outline here, underground mining would also occur. I'm not going to belabor my point here by developing a REA in full detail, other than to say that with a fresh look at the various components and their interrelations (as mentioned in DEIS section 2.2.2), a significant gain in environmental protection is likely possible with a modest increase (if any) in costs, not to mention a gain in returns by accessing the deep target that would be forgone under an open pit scenario. Even the suitability of individual components outlined in section 2.8 should be reevaluated after the data gaps that exist in those evaluations are filled. This problem is acknowledged in AECOM (2020c):

“An assessment of the feasibility of any of the tailing technologies/deposition methods is limited by available information and certain data gaps such as the physical and geochemical properties of the tailing”.

So the economic feasibility of various methods of handling tailings is as speculative and uncertain as many of the other supporting references one finds behind this analysis.

Even the development of a REA would not provide a proper comparison of the full range of environmental effects expected by each alternative. In order to do so, the No Action alternative needs to be modified to include the reasonable assumption that if the project did not happen, CERCLA mandated remediation of the site would be the foreseeable result. This realistic scenario would result in environmental conditions that would constitute a reference baseline that would be far more useful for comparing the environmental impacts of differing alternatives than the use of existing degraded conditions that are currently assumed under the No Action alternative.

For all the reasons stated above the Forest Service needs to include a Restoration Emphasis Alternative in this analysis and to reconsider the reasonably foreseeable effects of a No Action alternative. This can only be accomplished by issuing a Supplemental DEIS at a minimum.

So what about water quality? I'll touch on that briefly since I've spent a lot of time thinking about how the groundwater system out there works (Rygh, 2015). It is abundantly clear that bedrock aquifers are associated with the numerous faults and fracture zones present at the site. Although these features may not be volumetrically significant, they may have high hydraulic conductivity and can act as preferential flow paths (or conversely as barriers) for groundwater (and any dissolved contaminants) that will eventually discharge to become surface water somewhere. The DEIS analysis arbitrarily discounts the influence of these features when running the hydrologic models and states that the bedrock is essentially impermeable. Faults and fracture zones were not even included in any conceptual model; a gross oversight. Many faults are mapped and the core drilling program encountered plenty of fracturing in the bedrock. Part of the core analysis process includes recording the Rock Quality Designation (RQD) which is a measure of the degree of fracturing in the core. RQD is mentioned in the PFS (M3, 2019), None of that data is publicly available, but Midas could certainly review their records to get a rough idea of open fracture distribution. There are numerous other factors associated with the core drilling (e.g. drilling fluid losses/gains, rapid increases in drilling rates, etc.) that can at least give a qualitative sense of the degree of fracturing in a given section of rock. Having monitored

the drilling program during my tenure as a Minerals Administrator with the PNF, I can attest to several instances of significant drilling fluid loss. Just because fracture dominated aquifers can be difficult to model is no reason to simply disregard them and claim that the bedrock is impermeable. Of particular interest would be the use of some of the above methods (or actual well tests) to assess the validity of the assumption in the conceptual hydrologic model that there is a 500' thick zone of fractured rock having high hydraulic conductivity underlying every stream channel in the area. This feature does not appear to be based on any actual data. The DEIS needs to disclose the rationale for inclusion of this feature.

As far as the geochemical modeling goes, don't get me going. The errors are manifold and covered well by other comments. Suffice to say, the accuracy of predictions based on the modeling is highly questionable. Particularly egregious is the use of chemical compounds in the PHREEQC model that have no naturally occurring mineral analogs. Bogus!

OK, I've had enough fun with this. Hope you enjoyed this little document more than the thousands of form plus letters you've reviewed, dear reader. Executive summary: Nice try with the DEIS, but go back and do it over again. You know that's what a judge is going to say if you don't fix this mess.

Best Regards,

John Rygh
Geologist, retired

Attachment 1: Rygh, J. T., 2015, *Analysis of the Potential Effects to Groundwater Resources from the Proposed Golden Meadows Exploration Project*, unpublished report in Payette NF project files for Golden Meadows Exploration Project.