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The Case for Concerns with the Possibility of Acid Mine Drainage (AMD) and Water Quality Problems with the Stibnite Gold Mine Proposal

Ever since the public was made aware of this proposal for a large-scale mining operation at Stibnite several years ago, my chief concern with the proposal has been the potential for pollution of the Salmon River with AMD and mobilized metals and arsenic. Why am I so concerned? Because the geographic location of this proposal is in the headwaters of a tributary to the Salmon River, a Blue-Ribbon waterway, one of Idaho's crown jewels, and a national treasure. The Salmon River is recognized as one of the most important rearing streams for salmon and other sea going fish in the entire Columbia River Basin.

These concerns are based almost entirely on the track record of the mining industry with the mining of sulfide ores elsewhere in North America as documented on the Internet. I am greatly concerned with the lack of attention given to AMD and somewhat alarmed at the short shrift manner with which Midas has treated AMD and water quality matters. The issue of AMD is completely ignored in the PRO proper and only receives mention in the M3 Engineering & Technology Corp., Prefeasibility Study Technical Report that is included in the list of References on page 16-1 of the PRO. (The inclusion of this document in the list of References for the PRO means that this document is technically part of the PRO and subject to public review for NEPA purposes in the same manner as any other part of the PRO). This report is available on the Internet by typing: "Report Cover Page Midas Gold" in the search box at Google, and at "<http://www.sedar.com>, December 16, 2014."

Midas is proposing to mine, over a period in excess of ten years, large bodies of sulfide ores. They will use open pit methods below the ground water table in a mountainous area subject to heavy winter snowfalls and intense summer thunder storms in a drainage that is critical habitat for at least 2 endangered species. It is my feeling that this is sufficient information to raise the red flag for the likelihood of a serious AMD and mobilized metals problem.

The entire subject of AMD has been a big issue with the mining industry for years. Go to Google and type "Acid Mine Drainage" in the search box. There are 20 pages of information on this subject, each page having a list of 10 links.

Midas Gold has released for public viewing the following two documents describing in detail their plans for mining at Stibnite:

* Prefeasibility Study Technical Report, (PFS) Issue Date, Dec 15, 2014

* Plan of Restoration and Operation, (PRO) Released September 22, 2016

(Midas has made replacements and updates with changes to both of these documents. It is my understanding that the Forest Service has determined that these are not part of the NEPA process; therefore, I will not comment on them in this write-up.)

We who have serious concerns with the potential of this proposal for possible downstream environmental impacts now have these two documents to review in detail.

At first glance, there is a great deal of similarity between these documents. Both are quite voluminous, in excess of 500 pages (the pages are not numbered consecutively). Both are well written and formatted with many maps and pictures in color. Although they appear to have come from different print shops, the first impression is that they are professionally prepared documents of a technical nature costing a great deal of money.

In spite of this similarity, there are differences which are important to the permitting process for the Stibnite Gold project. As my major concern with the project has been the potential for AMD and water quality issues, I will limit my detailed review of these two documents to these subjects. Therefore, the purpose of this write-up is to examine each document for its approach to Midas's plans for addressing water quality issues, primarily AMD.

Prefeasibility Study Technical Report (M3 PFS)

This document is available on-line. (In the search box at Google, type: "Report Cover Page Midas Gold Corp" and allow several minutes for it to download as it is a long document.) The M3 Engineering & Technology Corporation of Tucson, Arizona is the leader for preparation of this document. This firm put together a team of seven Professional Engineers, not all of whom are with M3, to do the actual writing and M3 compiled the document. Their logo is on the cover as well as on the bottom of each page. The names of the seven engineers are on the cover and each one has a full page "Certificate of Qualified Person" toward the end of the document to establish his credibility. The apparent leader of the team, in that his name is at the top of the list, and he is responsible for more sections in the PFS than the other engineers, is Conrad E. Huss P.E., Ph.D., of the M3 Corp. Although I have a few concerns with this document which I will go into later, in my opinion, overall, this is a technical document that the M3 team can rightly be proud of. It's almost encyclopedic in its coverage of the many issues that are involved in a large-scale mining operation.

This PFS (let's call it the M3 PFS) has a Section 20 titled: "Environmental Studies Permitting and Social Community Impacts". Subsections 20.4 and 20.5 address "Geochemical Characterization and Mitigation". There is a page on "Acid Base Accounting Results", and the words acid generation and potential acid generating rocks (PAG) are used in several places. The author of this section, Peter Kowalewski, discusses the matter of testing for an AMD condition of the ore to be mined and draws this conclusion: "Despite their overall sulfide content, most of the samples contain neutralization potential in excess of their acid generation potential." This, of course, is just what one would think Midas would like to hear, but as he uses the word "acid" and hints that there could be a potential for acid generation, Midas has elected to disregard this statement in the PRO.

On the matter of waste rock and the potential for AMD, he describes the testing methodology and draws this conclusion: "The results of the static geochemical test work demonstrate that the bulk of the Project waste rock material is likely to be net neutralizing and presents a low risk for acid generation. However, this prediction needs to be confirmed by the ongoing kinetic testing program since the majority of the Hangar Flats and Yellow Pine samples demonstrate an uncertain potential for acid generation based on the BLM criteria for Acid Base Accounting Data."

The points that I am making here are that, according to a team of highly qualified engineers, the project does, indeed, have a potential for AMD, and, at the very least, this needs to be recognized in subsequent documents that are part of the permitting process. Now, let's take a look at the second document.

Plan of Restoration and Operation (PRO)

The public was first made aware of this document by means of a "News Release" dated September 22, 2016. The Forest Service formally accepted this document to start the NEPA process. It was made available to the public in hard copy at the offices of the Payette National Forest and the Idaho Department of Lands in McCall, as well as on the Internet. I have only recently seen a hard copy, but prior to this, I have spent hours studying the on-line version.

This document was produced by the "Midas Gold Team" who signed the Introduction in long hand. In contrast to the M3 PFS, there is no information on the individuals who comprise this team or their credentials for working on a project of this magnitude. Also, in contrast, there is no "Date and Signatures Page" so the public is at a loss as to the date, and who actually prepared this document other than it was prepared in house by Midas Gold.

The list of References on page 27-1 has been shortened from slightly more than 6 pages in the M3 PFS to a single page. The one reference in the M3 PFS to a document with acid mine drainage in the title has been eliminated: (Miller S. . . .Proceedings of the 4th International Conference on Acid Rock Drainage- Vancouver, May 6, 1992.)

Somewhat to my surprise, the M3 PFS is included in this list. A surprise as this was produced by "The Midas Gold Team", who has been working hard to eliminate all previous mention of this word 'acid' from their documents and here is a Reference giving considerable attention to this matter. The M3 PFS is the only document supplied by Midas that has any mention of the possibility of an AMD problem, and, as noted above, the M3 PFS does, indeed, address this issue.

The list of over nine pages of Abbreviations and Acronyms in the M3 PFS has also been reduced to a single page. The acronyms for anything containing the word "acid" (ABA , AP, ARD, AMD, and PAG) have been eliminated.

This really disturbs me. The PRO comes across to me as giving the same treatment and attention to a potential AMD problem as, say, to alligators. That is, there are no alligators at Stibnite, therefore, we don't have to talk about alligators. The same thing goes for AMD. We don't have an AMD problem at Stibnite, therefore, we are not going to talk about AMD.

* This constitutes an "absolute certainty" treatment of a no problem with AMD., a stance my geologist friends have cautioned me to avoid when dealing with large mineral deposits. There is just too much variation in mineral deposits to make "absolute certainty" predictions. The geology at Stibnite is such that it is imperative that AMD and water quality matters be addressed in the permitting process for the mine.

With the exception of the inclusion of the M3 PFS in the list of References as noted above, (I view this as a mistake on Midas's part and something that they are now regretting.) this approach is negating all the work Mr. Kowalewski did in the M3 PFS on the matter of the potential for AMD as discussed above, and might well account for the apparent lack of agreement between the two documents.

A friend, who is as equally concerned with the environmental impacts of a large scale mine at Stibnite as I am, has directed me to this site on the Internet that is somewhat germane to the Midas proposal:

* The EPA's "Technical Document (Acid Mine Drainage Prediction)" To view the document in its entirety, type the title in the search box at Google.

This document has been produced by the EPA to deal with the possibility of AMD in the U.S. There are a number of broad statements in the Introduction that I will quote here verbatim that are relative to the Stibnite proposal:

"The formation of mine acid drainage and the contaminants associated with it has been described by some as the largest environmental problem facing the mining industry."

"The U. S. Forest Service sees the absence of acid prediction technology, especially in the context of new mining ventures, as the major problem facing the future of metal mining in the western U.S. (U.S. Forest Service 1993)"

Then, to further strengthen my case that AMD and water quality matters should not be taken lightly, there are a number of documented case histories of AMD and metals and arsenic mobilization disasters. I will list a few of them here that can be viewed by, again, typing them individually into the search box at Google:

- * Failed Promises-Water Quality Predictions Gone Wrong-Large Mines and Water Pollution

- * Acid Mine Drainage Disasters

- * Summitville Mine Disaster Colorado

- * Zortman/Landusky Gold Mine Disaster Montana

- * Earthworks Sulfide Mining 101

Now let's take a close look at several things in the M3 PFS that cause me concerns.

There is this statement under Permitting on page 1-21:

"Midas Gold's objective is to make the Project a fully integrated, sustainable, and socially and environmentally responsible operation through open communications and accessibility."

From the standpoint of a person interested in the environmental aspects of the Project, I am very glad that Midas is making this commitment for transparency in all their planning and that they promise not to withhold pertinent information from the interested public. However, from a cursory look at the M3 PFS, I have concerns that this is not always the case.

The M3 PFS has this statement under the heading of "Permitting Risks and Risk Management Strategy" on page 20-14:

"The water treatment facilities contemplated in this PFS have been proven at other mining operations located in very sensitive environments."

My concern is that there is no specific information as to the case histories of these other mining operations that have allegedly operated successfully in environmentally sensitive areas using mining techniques similar to those planned for at the Stibnite Gold Project. If this has been done elsewhere, why isn't this documented in detail in the M3 PFS? If Midas is so confident that they are on top of the AMD and the potential for pollution problems from the mobilization of metals and arsenic issues, and have plans to mitigate any problem, how about a detailed description of the methodology and techniques that they plan to use? This would do much to further Midas's claim for conducting a Project that is open to the public as put forth in their statement of overall objectivity.

I also have a concern with this statement in the M3 PFS that is under Conclusions on page 25-3:

"The Qualified Persons (QPs) of this Report are not aware of any unusual, significant risks or uncertainties that could be expected to affect the reliability or confidence in the Project based on the data and information available to date."

Again, it appears that the authors are attempting to downplay the issue of a possible AMD and mobilization of metals problem by completely ignoring the issue. But take a look at these statements under "Risks and Opportunities" on page 1-33[hellip] "high impact Project specific Risks and opportunities are summarized below[hellip]" There are five Risks listed for which additional information is required in order to mitigate. Four of these have no concerns to me, but the fifth certainly does. I'm quoting this Risk verbatim and am underlining the words long term water treatment as that is my top concern:

"Water management and chemistry, which could affect diversion and closure designs and /or the need for long term water treatment."

The need for long term water treatment upon closure is significant and somewhat of a predicament to the mining industry in that it is a need not welcomed by the regulatory people who would like to have a "maintenance free" closure. I have two concerns with mention of long term water treatment in the M3 PFS. First, the very fact that it is identified as a possible Risk is contrary to the preceding statement that the QPs were not aware of any significant risks, etc. In the first statement the QPs state that there are no significant risks under the heading of

Conclusions. Then they reverse this determination and list long term water management under the heading of Risks and Opportunities as one of the high impact specific risks that require additional information in order to mitigate-an inconsistency that leads the reader to wonder if there are other similar inconsistencies in the M3 PFS?

My second and major concern with the listing of long term water treatment as a risk is that this is a rather common condition brought about by the creation of an AMD problem during the mining and processing of sulfide ores. There is little information in the M3 PFS to substantiate this hypothesis since the authors are going all out to downplay use of the word "sulfide" and the possibility for the creation of an AMD condition, but just what are the water quality factors that brought about the listing of long term water treatment as a risk if it's not AMD? This brings out the need for more attention to transparency in public relations on the part of Midas.

A little more on the subject of long term water treatment: The Summitville mine in Colorado is listed above as one of case histories of a mining disaster involving AMD. Here, in my own words, is a brief summary of what I have learned about Summitville from reading several links about it on the Internet, and why I am so concerned with the possibility of the need for a long-term water treatment program at Stibnite.

Summitville has been the scene of historic mining for a long time (somewhat like Stibnite). Sometime in the mid 1980's a Canadian company started mining for gold on a large scale using open pit and heap leaching methods. This created an AMD problem that killed fish for a distance of 17 miles downstream in the Alamosa River. Upon closure of mining in 1995, the company started on a program of cleanup of the mine site that included treatment of a large volume of acid producing water but soon gave up and filed for bankruptcy in Canada. They then left Colorado, leaving a big mess for the American taxpayers to cleanup. Shortly thereafter the EPA took over cleanup as a Superfund Site, spending something in the neighborhood of \$155,000,000 to date on long term water treatment that will probably continue for hundreds if not thousands of years. The U.S. Geological Survey made an investigation of the matter (probably due to the large amount of public money required to remedy the public safety hazards) and made this statement in the conclusion of their investigation:

"Extreme acid rock drainage is the dominant long term environmental concern at the Summitville mine and could have been predicted given the geological characteristics of the deposit."

I have a fear that much the same thing will be said about the Stibnite Gold Project sometime in the distant future.

I want to provide a little more information on the Salmon River that I value so highly. As stated previously, this Project is located in the headwaters of a tributary to this river. Runoff from all of our natural streams is precious but the Salmon River is particularly special in this regard. Although entirely Idaho's river in that from its source in the Sawtooth Mountains to its mouth on the Snake River in Hells Canyon, the river is entirely within the state, this waterway is truly a national treasure. It is often said that it is the longest stream in the U.S. that is entirely within one state. It is completely free-flowing in that there are no dams or other man made obstructions. Sections of the

river are paralleled by U.S. Highways, while other sections can be accessed by low standard roads and pack trails. There are sizable sections that have no roads or trails. Whitewater rafting and kayaking are popular on the main stem and several of the largest tributaries and considered to be world class. Power boating (jet boating) is permitted and popular on the main stem. The Salmon River was one of the initial waterways to be included in the National Wild and Scenic River System.

However, as the name indicates, probably the primary value of this stream is that it is an important fishery and rearing area for salmon and other sea-going fish. Historically the Salmon River has been recognized as the most important stream in the entire Columbia River system for its value as a salmon fishery.

It seems to me to be foolhardy to risk impacting this resource by permitting a mining operation that has a strong possibility of negatively impacting fisheries values by creating an AMD problem that is likely to be with us in perpetuity. This would be a dismal legacy to leave for the generations that follow us.

In summary of the above material, it is my contention that AMD and the mobilization of metals and arsenic is, indeed, a big concern to the mining industry. The attention Midas is giving to these matters in their PFS is grossly inadequate. The authors of the PFS undoubtedly know a great deal more about AMD than is covered in the M3 PFS, yet they have chosen to downplay the issue in the hope that they can somehow get the project permitted and on line without alarming the public as to the strong possibility of a serious AMD problem that might be expected to pollute the Salmon River in perpetuity. Both the M3 PFS and the PRO fail to give the reader a proper perspective of the likelihood and seriousness of an AMD problem. This needs to be corrected in the EIS.

As stated at the start of the above write-up, I have pretty much limited my review to the proposed treatment of AMD and water quality matters. And how is Midas proposing to deal with these matters? By completely ignoring them and treating them as non-issues that they don't have to talk about. This approach reminds me of the story of the ostrich who sees trouble headed his way so he buries his head in the sand so he can't see reality. Does the Midas Gold team that produced the PRO that is being used to formally start the NEPA process really think that they could gain approval for this Project by completely ignoring AMD? The PRO calls for three open pits approximately 400 feet deep and the mining of sulfide ores. This is a recipe for AMD, a condition quite common elsewhere with the mining industry in North America. It is true that the area has been extensively mined in the past without creating AMD conditions, and that there are large deposits of alkaline materials that can be used to neutralize the sulfides, but no mining company has ever mined sulfide ores at Stibnite to the large extent that Midas is planning to do.

One last thought and I will close this write-up.

This plan for a huge gold mine in the headwaters of the Salmon River by a Canadian company that has never mined before has a high probability of putting the Salmon in jeopardy of mining pollution that will last well into the future. The people of Idaho have an opportunity to comment on this matter during the 45 day scoping period for

the Environmental Impact Statement (EIS) that is required by the National Environmental Policy Act (NEPA).

See <http://fs.usda.gov/goto/StibniteGold>

Earl Dodds