



ALTERNATIVE 2: LIME KILN

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When the DEIS was released by the U.S. Forest Service in August of 2020, our company was called Midas Gold. Since then, we have changed our name to better reflect our values and our project. Today, we are proud to be Perpetua Resources.

REFINED PLAN

- Limestone and lime are important for controlling pH (acidity/alkalinity) in the ore processing circuit and significant volumes are required over the entire mine life. In the original Plan of Restoration and Operations (PRO), Midas Gold proposed to use lime from an off-site supplier for pH control, sourcing it from Montana or Oregon. However, following further consideration, In Alternative 2 of the Draft Environmental Impact Statement (DEIS) Midas Gold proposed switching to using a combination of limestone already generated on-site as development rock and lime produced on-site to manage pH. Considerations included:
 - Reduced greenhouse gas emissions from eliminating the need for approximately 9 transport trucks per day hauling lime from Oregon or Montana;
 - Fewer trucks on access roads (SH-55, Warm Lake and Burntlog) to site, during operations, would reduce dust emissions;
 - Fewer trucks would also reduce the risk of traffic incidents (vehicle-vehicle, vehicle-wildlife or going off-road) and/or spills;
 - Similar or lower emissions to generate lime (depending on the fuel source used at other locations which, if coal or oil, would be higher than Midas Gold's proposed use of propane);
 - Reduced overall consumption of lime as some is replaced by limestone;
 - Reuse of limestone that would be otherwise classified as development rock and disposed of on-site; and,
 - Reduced operating costs.
- As outlined in Alternative 2 of the draft Environmental Impact Statement, the Stibnite Gold Project proposes to build a lime kiln and produce lime on site. (See: U.S. Forest Service Draft Environmental Impact Statement (DEIS); Ch. 2; Section 2.4.5.3)
 - Lime is the single largest consumable product (by weight) needed for the ore processing



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circuit and generating it on site will reduce truck traffic with resultant benefits to emissions, safety and wildlife.

- The lime kiln would be powered by propane and located between the ore processing plant and the run-of-mine stockpile area.
- The lime kiln would be used to process (i.e. calcine) calcium carbonate rock (limestone/marble) mined from the West End pit to generate lime (CaO), also known as quicklime.

USES ON SITE

- Both lime and ground limestone (as a slurry) are proposed to be used to increase the pH of process solutions at Stibnite (reduce acidity).
- As described in the Stibnite Gold Project PRO, (See: Midas Gold Idaho, Plan of Restoration and Operations (PRO); Section 10) lime (calcium oxide) is a reagent used in several steps of ore processing to control pH, including:
 - Grinding: lime may be added to the feed conveyor to control circuit alkalinity.
 - Antimony flotation: milk of lime (water and pulverized lime) is added to aid in the separation of gold-bearing minerals (pyrite and arsenopyrite) from the antimony-bearing mineral stibnite.
 - Pressurized oxidation (POX) process: oxidized gold and silver concentrate slurry from the autoclave would be neutralized using lime and limestone. Limestone will also be used to manage the pH inside the autoclave.
 - Lime is used in the management of cyanidation solutions to control pH and prevent the generation of hydrogen cyanide gas.
- Lime would be needed continuously, throughout the life of the operation. Consequently, Midas Gold expects to begin mining limestone from West End during the pre-production years so that crushed limestone and lime are available concurrent with the start-up of the ore processing facility and for the operating life of the mine.

SAFETY

- The lime kiln will be subject to all applicable Mine Safety and Health Administration safety requirements and undergo continued monitoring for regulatory compliance.



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- Propane will be used to fuel the lime kiln and will be managed accordingly. (See: DEIS; Ch. 2; Section 2.4.5.3)
- Potential environmental concerns associated with a lime kiln can include the generation of (1) fugitive dust generated by the drilling, blasting, loading/unloading, transporting and crushing/grinding of limestone rock, and (2) the emissions generated by the combustion of propane to fuel the lime kiln and calcination of limestone.
 - These issues are addressed in Midas Gold Air Permit to Construct, which is administered by the Idaho Department of Environmental Quality (IDEQ).
 - Midas Gold has committed to incorporate appropriate mitigation for fugitive dust best management practices that include:
 - Applying water to running surfaces in the mine and on haul roads.
 - Utilizing wet drilling methods where practicable.
 - Loading/unloading points and conveyance of materials can incorporate water spray bars to reduce fugitive dust.
 - For the crushing and grinding of rock, air is passed through bag filters to reduce fugitive dust.
 - Emissions from a lime kiln include CO, NO_x, particulate matter (PM_{2.5} and PM₁₀), SO₂ and VOCs. Midas Gold has committed to incorporate appropriate mitigation for emissions management practices that include:
 - Use of energy efficient parallel flow regenerative shaft kiln vs. rotary kiln.
 - Use of cleaner fuel (propane vs. coal/oil).
 - Use of fabric filter to control particulate emissions.
 - pH control is essential during processing to ensure cyanide gas is not generated.