Updating Air Practices for Better Open Pit Blasthole Drilling

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Abstract.

The need for continual process improvement and innovation to reduce operating costs in the mining industry extends to the first significant encounter all production miners have with the rock: drilling blastholes. Material and design advances alone have greatly increased the productivity of today's tricone blasthole bit over bits used just a few years ago. Significant additional operating savings are being realized by utilizing improved air practices on blasthole drills, and by selecting drilling equipment designed to provide optimum air volume and pressure at the blasthole bit.

This paper will explain the techniques and concepts involved. Past air practices have tended to focus only on Bailing Velocity: how fast the air moves up the hole. Rock density, particle size, particle settling velocity, hole geometry, etc., received little to no consideration. Now, actual bit pressure, operating characteristics of the air compressor, pressure losses in the air piping system, and blasthole annulus geometry are additional areas requiring consideration. Other topics to be discussed will include the effect of altitude on air practices, interpreting the industry standard "sharp edged orifice" air tests, and finally, drilling system productivity.

Examples of productivity increases and the resulting operating savings at U. S. gold and copper mines are presented. These will be followed by suggested design parameters for drilling some of the more common blasthole diameters.