

“ We’ve seen a significant increase in the productivity, efficiency and ultimately, profitability of our mines since employing Minnovare’s Production Optimiser™.

It’s a prime example of a technology that quickly adds value in multiple areas - producing a better business outcome. ”

**Ryan Stimpson,**  
Minnovare, Head of Product and Product Strategy

## WHAT’S THE BEST MINING TECHNOLOGY INVESTMENT YOU’LL MAKE THIS YEAR?

It’s one of the most overlooked areas of mining process optimisation - blast-hole accuracy. Inaccurate drilling leads to sub-optimal blasts, which in turn has a significant downstream impact on the productivity AND profitability of your operation. Minnovare’s Production Optimiser technology is an advanced hardware/software system that can be applied to ALL rig makes and models - enabling sites to quickly improve their drilling and reap the rewards. Here’s how:

### 1. INCREASE YOUR AVERAGE RECOVERY

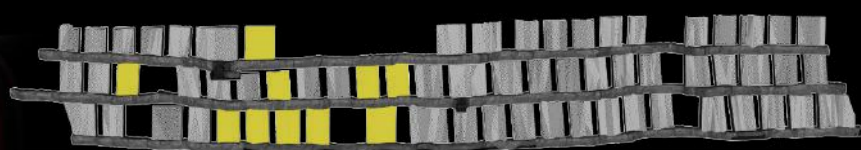
Drilling accuracy directly impacts mineral recovery in a number of key ways. Firstly, by reducing bridging / hang-ups. All sites are trying to maximise the amount of high-grade ore extracted from each stope. Sub-optimal blasts, as a result of hole-deviation, leads to the increased likelihood of valuable ore being left unrecovered.

Secondly, inaccurate drilling leads to increased re-drills and re-work. By reducing re-work and overall setup, the Production Optimiser **reduces stope cycle time**, i.e. more tonnes, faster.

Third, highly accurate drilling enables tighter drilling patterns - bringing **previously uneconomic narrow-vein stopes back online**.

**“IN 1 YEAR WE  
REDUCED OUR  
BRIDGED TNS  
RATIO BY 54%\*”**

**“AT ONE SITE  
WE ACHIEVED  
AN ADDITIONAL  
42,000 STOPE TNS,  
~8,300oz / A\$18M”**



Cross section from NSR’s Millennium Mine showing 10 additional stopes made economical thanks to improved drilling accuracy (by employing a narrower ‘Zipper’ drilling pattern).

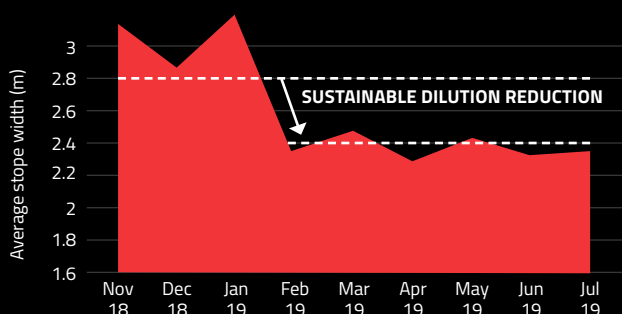
\*NSR were able to reduce their bridge / stope tonne ratio by over 50%.

# HOW MUCH IS BLAST-HOLE DEVIATION ALREADY COSTING YOUR MINING OPERATION?

## 2. REDUCE YOUR AVERAGE DILUTION

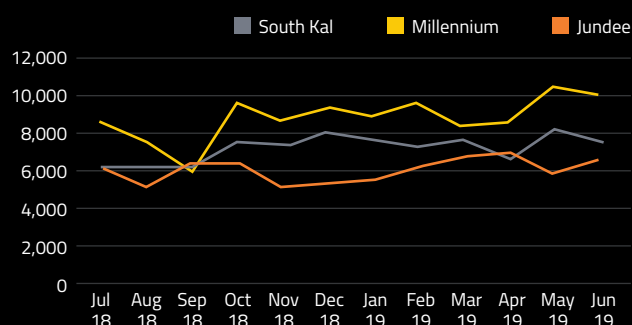
Blast over-break as a result of hole deviation delivers additional waste into the haulage and processing stages - **increasing all in sustaining cost** and directly (negatively) impacting return per stope. Improved drilling accuracy minimises over-break and unplanned dilution as a by-product.

Reliably improved drilling accuracy also **enables more ambitious drilling patterns** (such as moving from a 'Dice-5' to a 'Zipper' on the most narrow-vein stopes) - reducing planned dilution even further.



## 3. INCREASE YOUR DRILLING PRODUCTIVITY

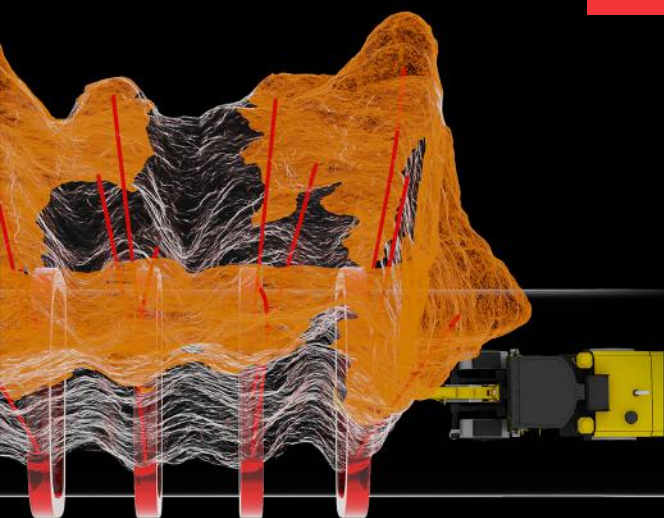
By simplifying the process each driller has to follow in order to accurately drill each hole, **the Production Optimiser makes an immediate impact on drilling speed**. For most rigs, the amount of time spent actually drilling therefore increases - contributing to an increase in average meters drilled. As demonstrated in the below graph, NSR increased their average drilled meters by over 30% after implementing the Production Optimiser at Millennium.



**33% INCREASE IN AVG  
DRILLED METERS**

**'ZIPPER' PATTERN  
REDUCED AVG STOPE  
WIDTH BY 0.5M**

**COST OF DILUTION  
REMOVED FROM  
HAULAGE &  
PROCESSING**



**LET US BUILD A BUSINESS  
CASE BASED ON YOUR  
OPERATION & DATA**

