

TerrAdapt Adaptive drill bit

Mitigate stick-slip and impact damage to reduce drilling costs

But there's a cost...

It's costing you **ROP**.

It's costing you **footage**.

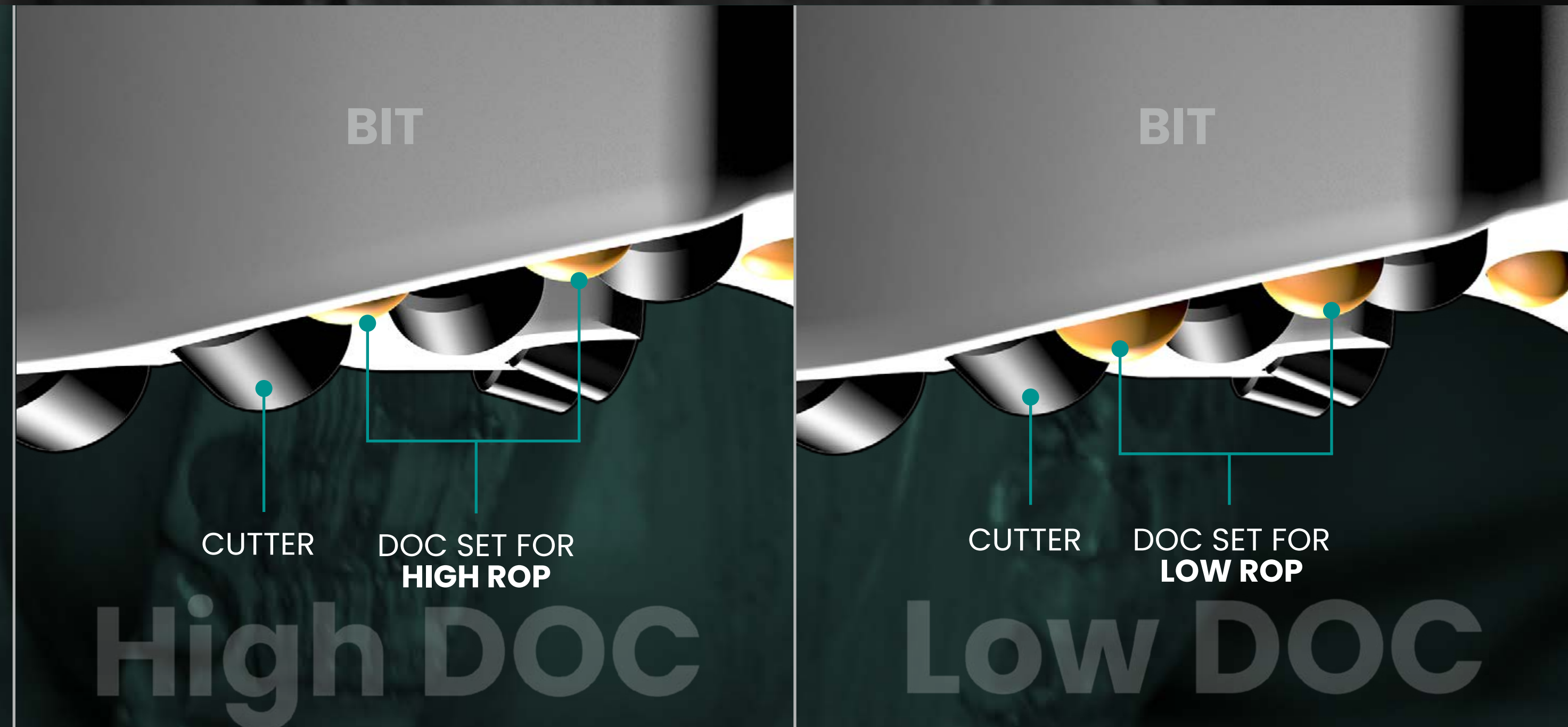
And it's costing you **time**.

And it's because your bit is 'dumb.'

And a dumb bit can't adapt.

No two wells are the same, so it's impossible to know exactly what your bit may encounter. But you're stuck with a single, **fixed depth-of-cut (DOC) control setting** on your bit once you send it downhole. **It isn't smart enough** to sense or adapt to changing conditions.

And this causes a lot of problems when in transitions between hard and soft rock formations.



Adjusting the DOC control on your bit—or how aggressively it engages the rock—helps to optimize its performance in a particular formation. While this is beneficial in homogeneous rock, interbedded formations present an entirely different challenge.

While it might drill smoothly in some areas...

it can cause stick-slip in other areas.

When a bit with fixed DOC enters into a transition zone, its bite can become too aggressive, causing torsional vibrations that send the bit into stick-slip mode. Even minor changes in the rock can cause impact loading, severely limiting your bit's cutting structure life.

And to make matters worse, there's not much you can do about it.

Making adjustments to RPM and WOB from surface is a best guess approach. Staying in a conservative operating window is a last resort that sacrifices drilling efficiency and performance.

Don't get stuck with stick-slip—and increased costs.



In addition to its immediate effects on your ROP and footage, stick-slip has a tremendous impact on your overall drilling economics. Accelerated tool wear and extensive damage to expensive bit/BHA hardware and electronics cost operators millions of dollars each year.

Choose a bit that works **smarter**.

The TerrAdapt™ adaptive drill bit autonomously adjusts its depth-of-cut to changing lithology, **mitigating stick-slip** with no interaction from surface. It also **absorbs shocks and helps prevent damage to the bit and BHA**.

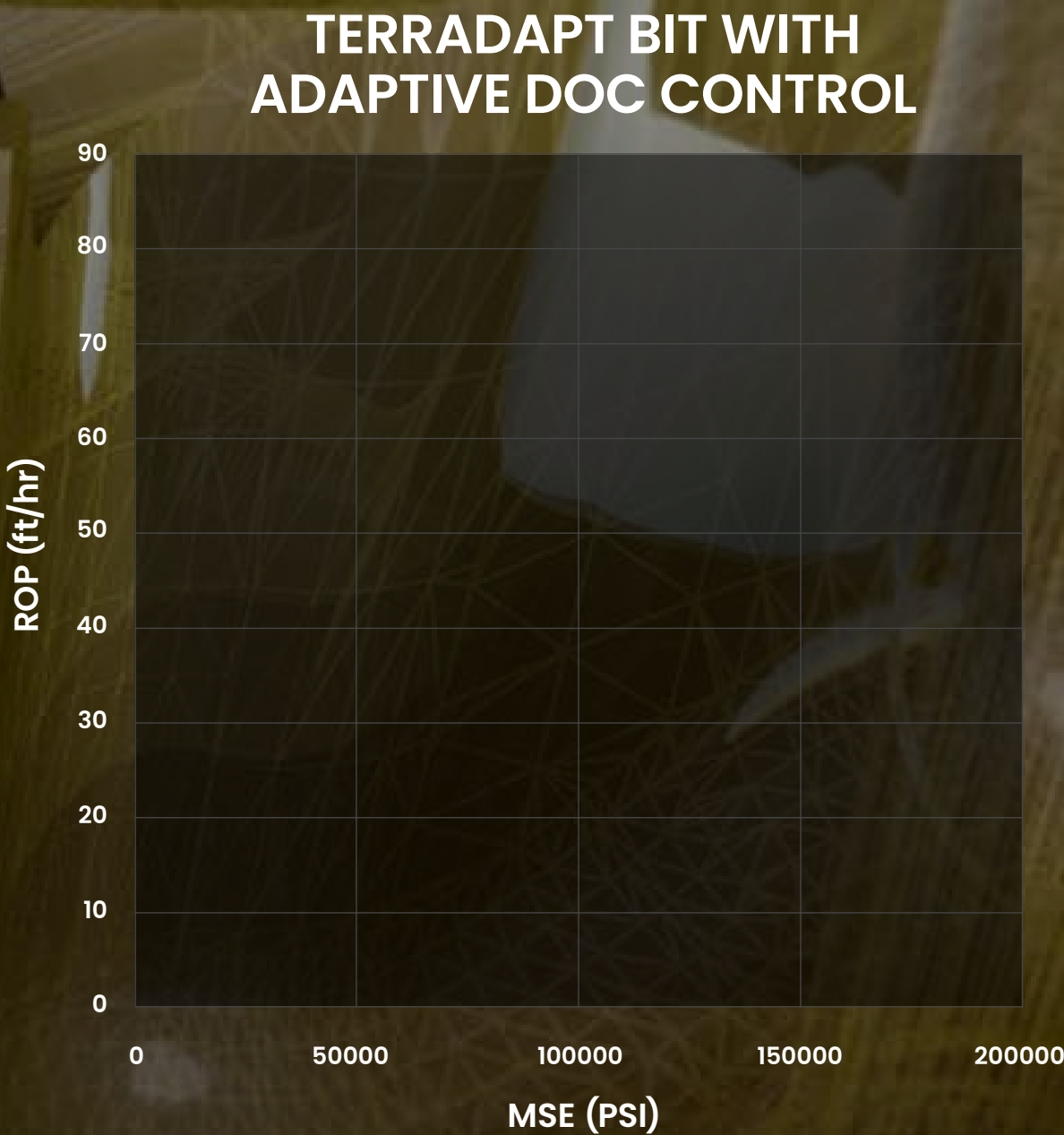
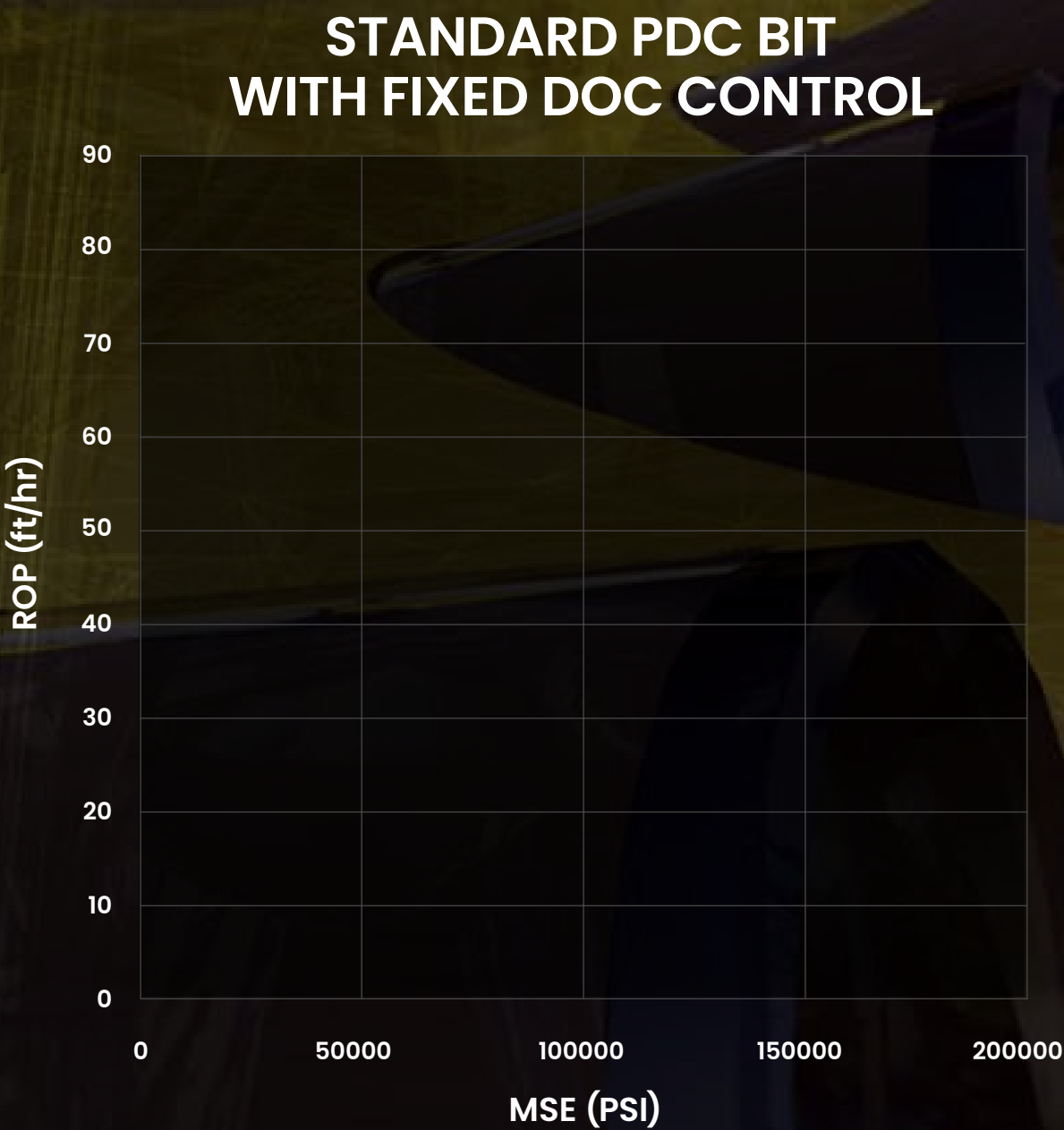
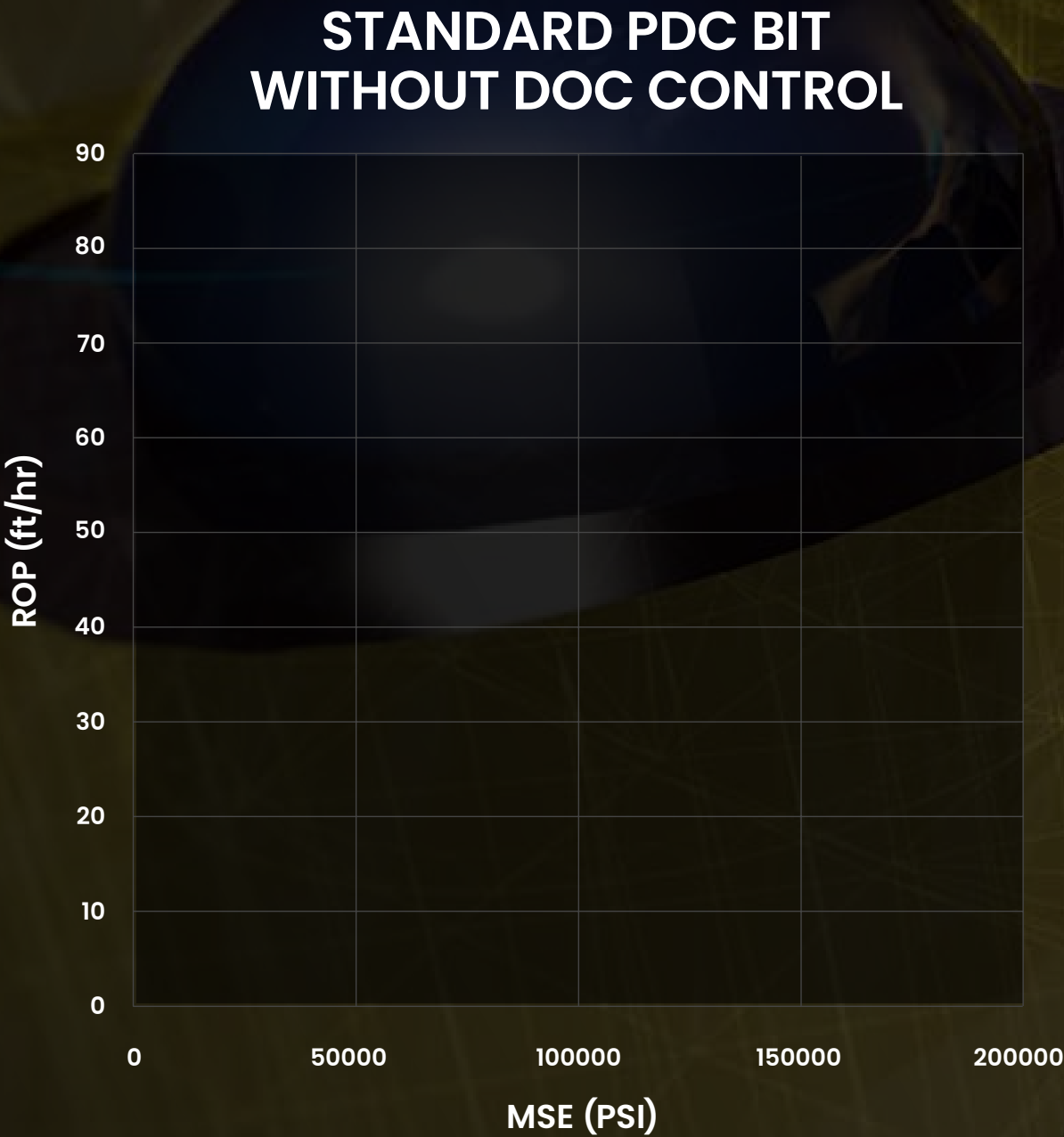
The result: extended tool life, significantly reduced NPT and ILT, optimized performance—and a step change in your drilling efficiency.

TerrAdapt™
Adaptive drill bit

A smart bit can mitigate stick-slip.

Adaptive DOC control cartridges installed inside the fixed blades autonomously extend and prevent sudden changes in DOC when vibrations are detected, keeping the bit from taking too large a bite and getting stuck. When the vibrations subside the cartridges slowly retract to enable the maximum ROP for that section of rock.

CLICK OR TAP THE LEGEND ON THE RIGHT TO COMPARE DRILLING PERFORMANCE

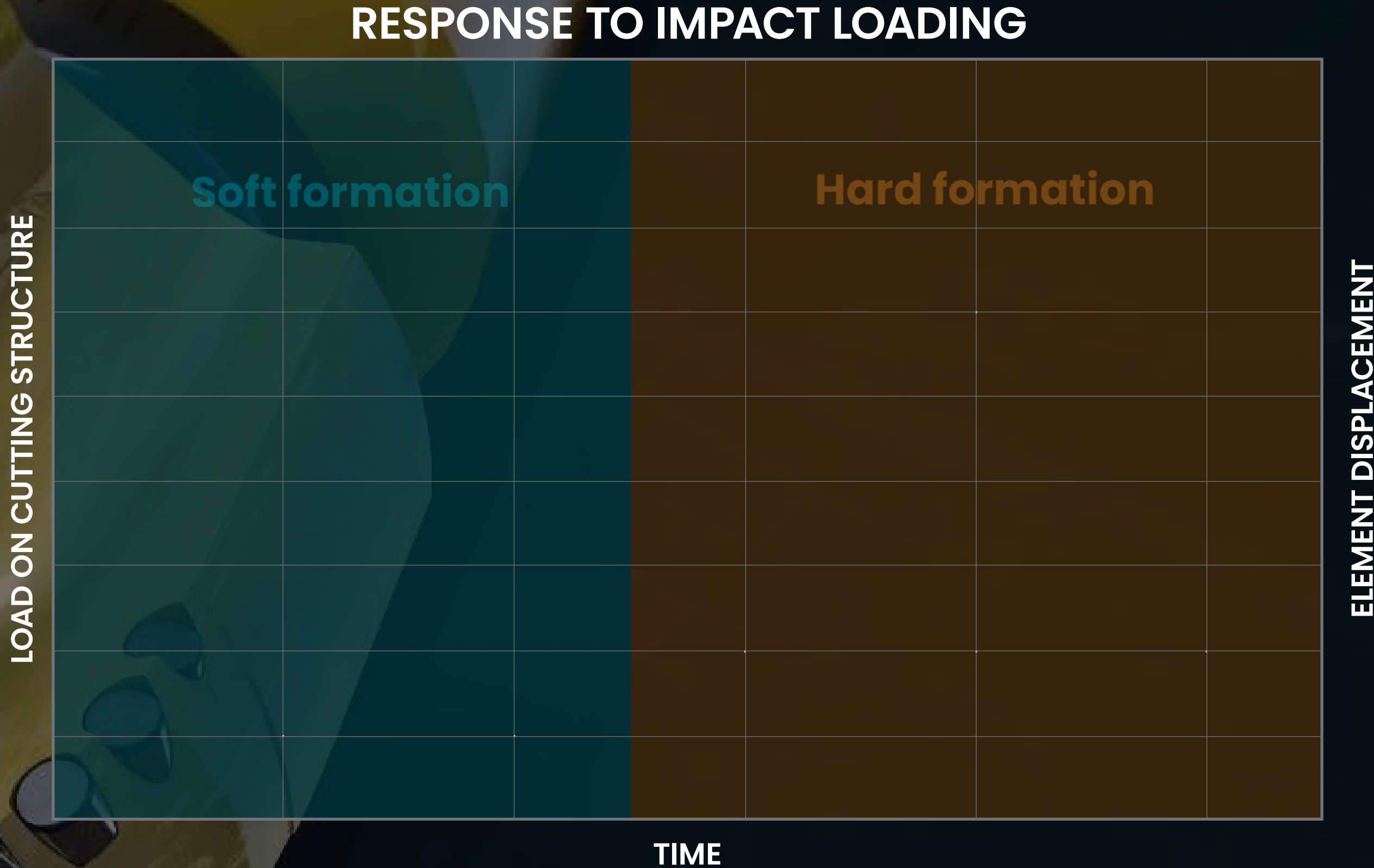


Bits without DOC control experience unpredictable stick-slip events across the entire operating window. Using a bit with fixed DOC control creates smoother drilling, but only within a narrow window. The TerraAdapt bit's adaptive DOC control elements significantly expand the smooth drilling window, enabling faster, more consistent ROP with lower mechanical specific energy.

A smart bit can also prevent impact damage.

Hydro-mechanical ovoid elements absorb any sudden overload or shock that could damage the TerrAdapt bit's cutting structures, meaning you no longer have to micromanage your WOB or RPM. Instead, you can open up your drilling parameters and reach new levels of drilling efficiency.

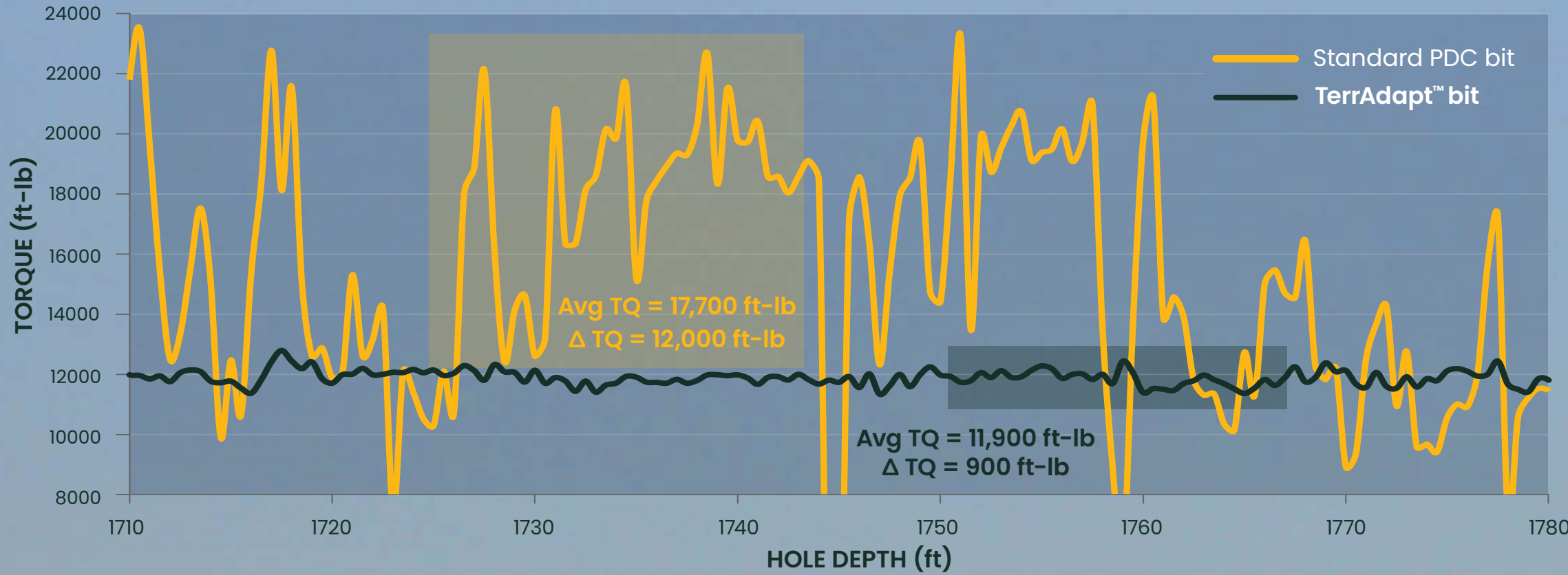
CLICK OR TAP THE LEGEND BELOW TO COMPARE DRILL BIT IMPACT DAMAGE



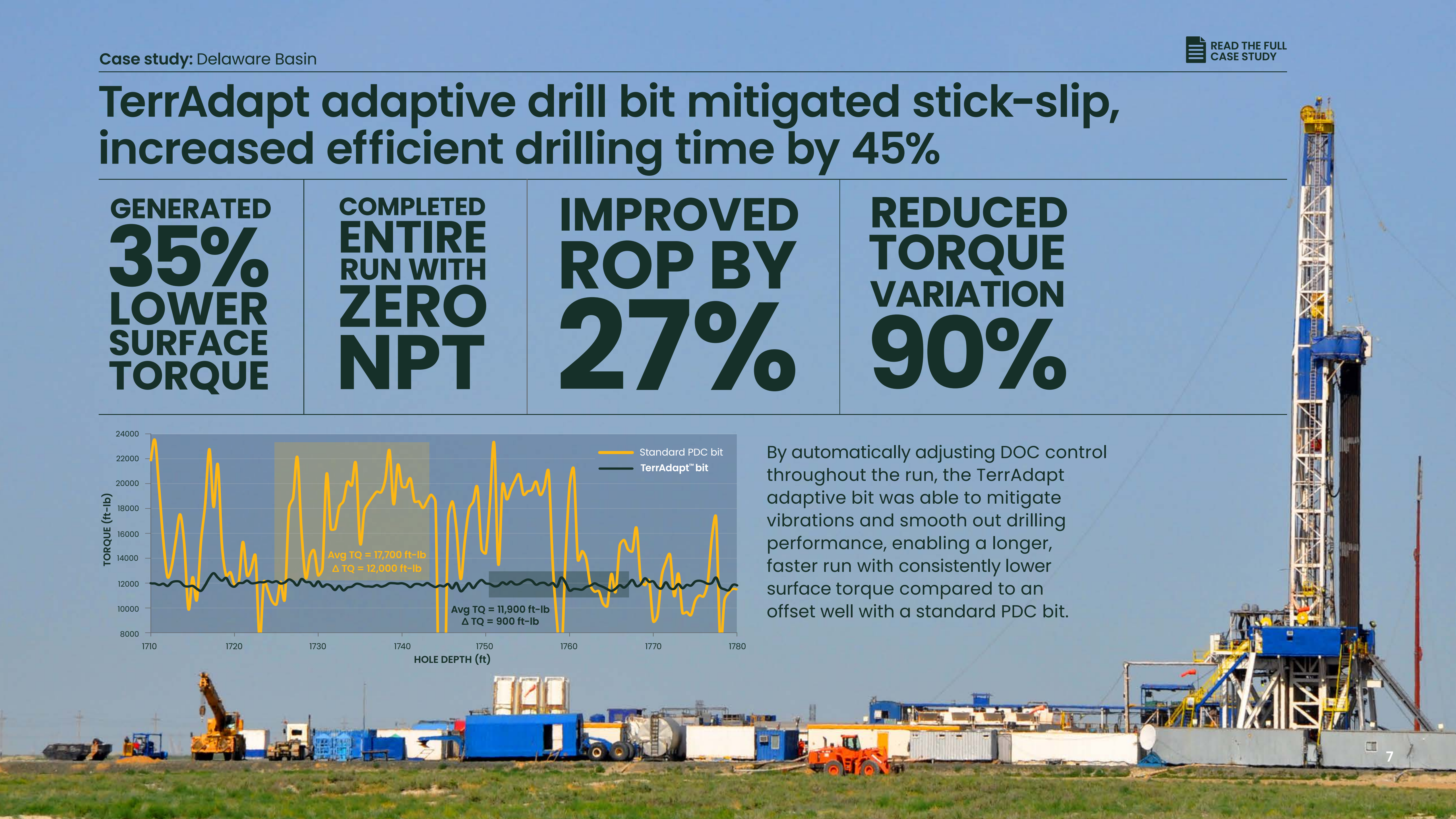
As soon as the TerrAdapt bit's adaptive elements sense a sudden change in loading due to a formation change, they rapidly extend and fully engage the rock to protect the cutting structures until steady WOB is re-established.

TerrAdapt adaptive drill bit mitigated stick-slip, increased efficient drilling time by 45%

GENERATED 35% LOWER SURFACE TORQUE	COMPLETED ENTIRE RUN WITH ZERO NPT	IMPROVED ROP BY 27%	REDUCED TORQUE VARIATION 90%
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By automatically adjusting DOC control throughout the run, the TerrAdapt adaptive bit was able to mitigate vibrations and smooth out drilling performance, enabling a longer, faster run with consistently lower surface torque compared to an offset well with a standard PDC bit.





**Don't expect a 'dumb' bit
to work harder.**

Choose a bit that works smarter.

Contact your Baker Hughes representative to find out how you can mitigate stick-slip and impact damage—and reduce your drilling costs—with the TerrAdapt adaptive drill bit.

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