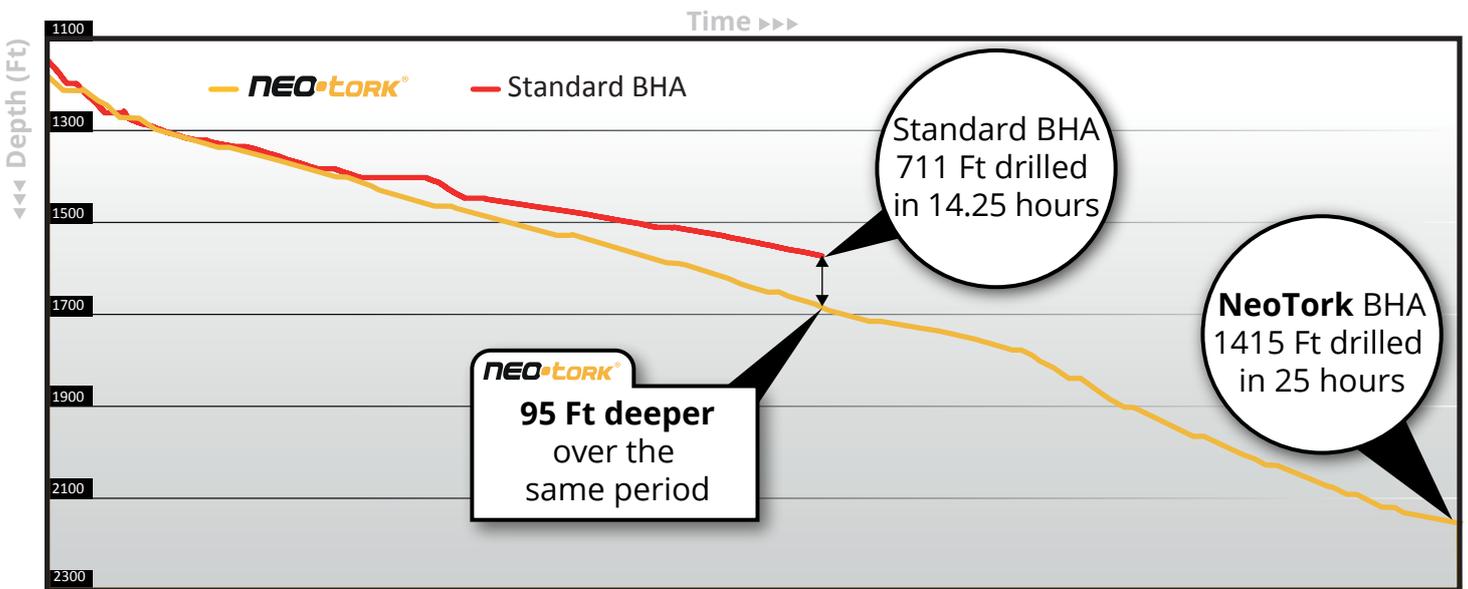


ROP IMPROVED UP TO 70% AND DOUBLE FOOTAGE



The **NeoTork** BHA drilled much faster over the same time period, in spite of a plugged nozzle. It also drilled twice the footage of the standard BHA.

In December, we tested **NeoTork** downhole in a purposely-designed facility. We drilled two comparative 8 ½ inch wells, 12 ft apart, using the same BHA. All the parameters, depth and formation types were identical, the only difference - one well was drilled using **NeoTork**. The drilling

results show an improvement in ROP of 15% over the same interval with the end of the run being 70% faster on average when using **NeoTork**.

The impact on bit life was also obvious - the photos below compare the two bits at run

completion. Not surprising then, that the well drilled without **NeoTork** ended its run at 20ft/hr before pull out compared to 40ft/hr at the same depth when using **NeoTork**. In total, the **NeoTork** bit drilled twice the footage and was pulled out looking like new.



NEO-TORK
BHA

The **NeoTork** drill bit shows no sign of wear, despite having drilled twice the footage, except for three cutters adjacent to a plugged nozzle damaged by heat checking.



Standard
BHA

The standard BHA drill bit shows clear signs of impact damage with broken cutters all over the cutting structure.

Testing Protocol

The Catoosa testing site offers a double drilling rig, equipped with top drive and the full suite of surface sensors. The rig can skid over a 12 wells drilling pad. Our tests used two wells that were just 12 ft apart; both were cased up to a similar depth with no shoe in place.

To assess **NeoTork** we decided to drill two parallel 8 1/2 inch holes, each with a new bit (Varel 5 blades V516SPDG2 set with 5 x 13/32" nozzles). Both wells were identical; the same BHA, the same mud, the same drilling parameters (WOB 16 Klbs, RPM 90, Flow 350 GPM). The test formation was a mix

of sand and shale with some harder streaks of carbonate.

Two Smart Boxes* were placed in the BHA (courtesy of Varel) to collect the maximum amount of drilling data. On both runs, the bottom box was placed right above the bit. The second box was placed just above **NeoTork** on the first run and on the second run, on top of the standard BHA.

*Smart Boxes are instrumented subs that record downhole data at high sampling rates.



Testing Results

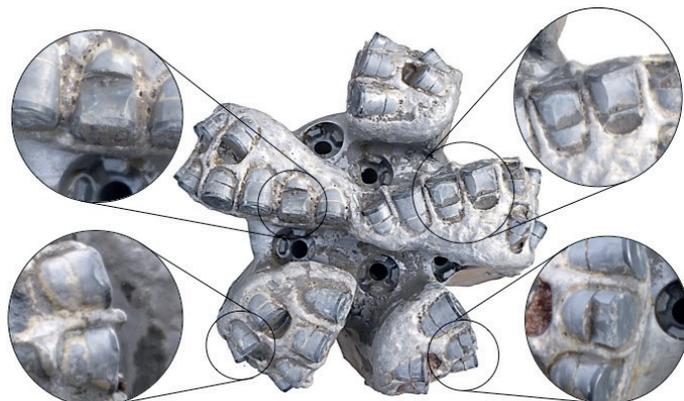
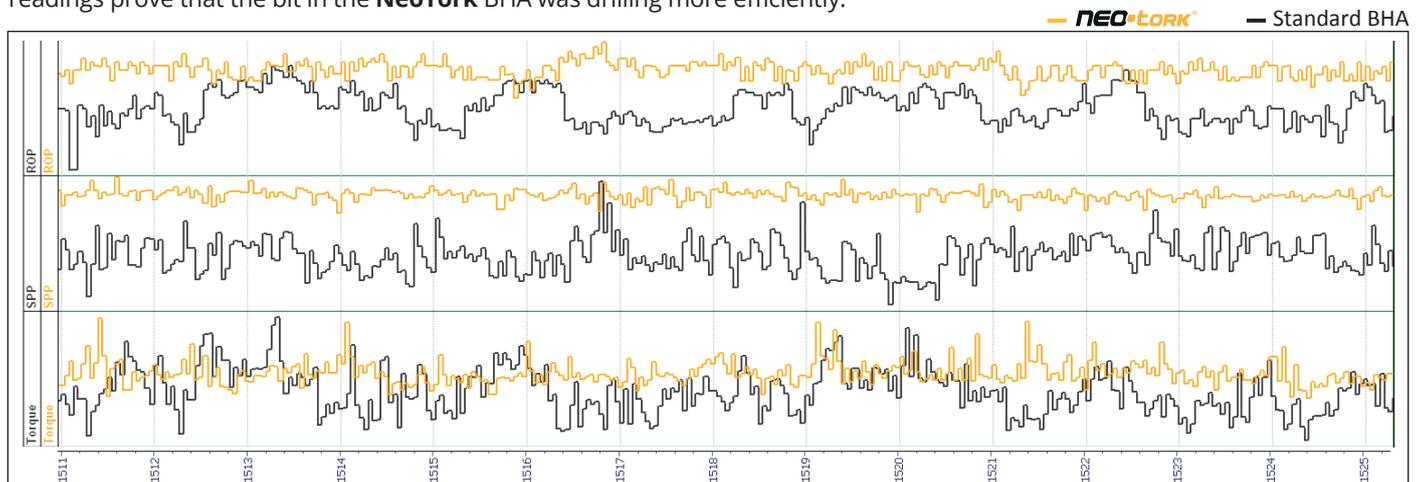


Results for **NeoTork** were impressive – even more so considering that a nozzle on the bit using **NeoTork** got plugged early on in the drilling test. The plugged nozzle slowed down ROP (particularly in the soft zones) and caused damage to the adjacent PDCs (which showed signs of heat checking), however the BHA using **NeoTork** still greatly outperformed the standard BHA.

Three cutters beside the plugged nozzles show clear signs of heat checking. All the other cutters are green.

Smooth Drilling

The benefits of using **NeoTork** can clearly be seen in the smooth characteristics of the surface data. The attached log shows the variance between the two runs, as registered by the surface sensors. Consistent ROP, steady torque and uniform pressure readings prove that the bit in the **NeoTork** BHA was drilling more efficiently.



The picture above shows the damage sustained by the bit on the standard BHA, which only drilled half of the footage of its NeoTork counterpart.

Bit Performance

The most crucial aspect of **NeoTork** is its impact on bit performance: how long it takes to drill and how far the bit can be pushed before the BHA needs to be pulled out.

Here too, the results using **NeoTork** were remarkable:

- 15% faster ROP overall and nearly twice faster in the end section
- Double footage drilled compared to the standard BHA
- Almost no bit damage except for the central cutters showing signs of heat checking - despite extreme parameters at the end of the test (35kLbs WOB to push NeoTork to its limits)

Please contact us at info@neo-oiltools.com if you'd like to test **NeoTork** in your wells!