



**LEE  
ENERGY  
SYSTEMS**

## Using the Deep Perforating Tool for SCVF and SAP remedial work.

DayIn Beazer  
CTO and VP of Engineering

## **GATOR<sup>®</sup>** **PERFORATOR<sup>™</sup>**

**Over 1500 runs  
completed  
worldwide**



### **Applications**

- Environmental Plugs.
- Perforate and test.
- Perforate and circulate / Cement.
- Perforate for washing and retrieving casing.
- Perforations for washing and Cementing.
- Perforating production liner.
- Surface Casing Vent Flows / Sustained Annular Casing Pressure.

## Surface Casing Vent Flow can occur...

3

Between  
Formation and  
Cement



2

Between  
Casing and  
Cement



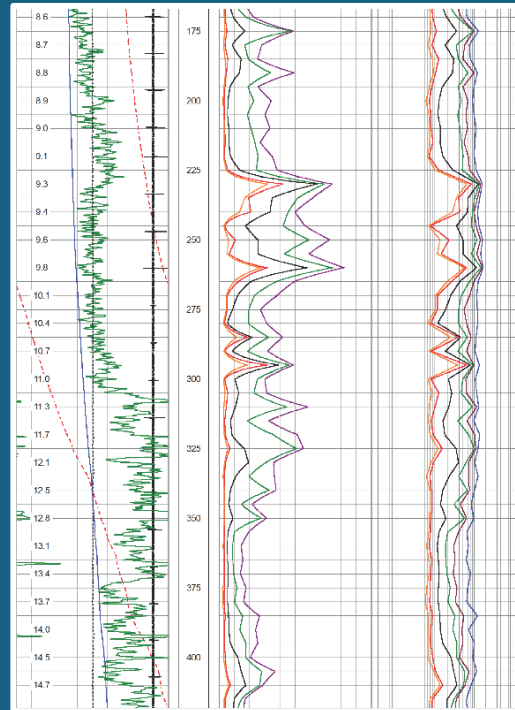
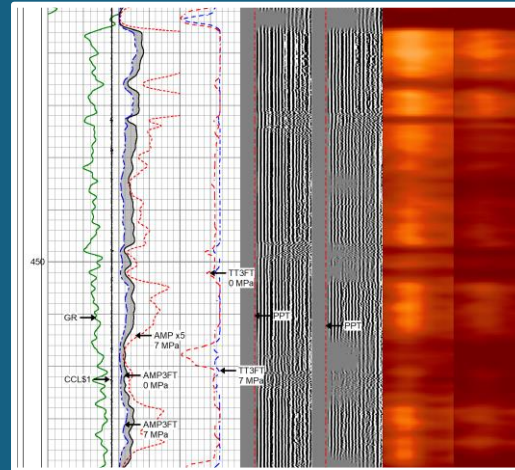
1

Through  
cracks and  
permeation in  
old Cement





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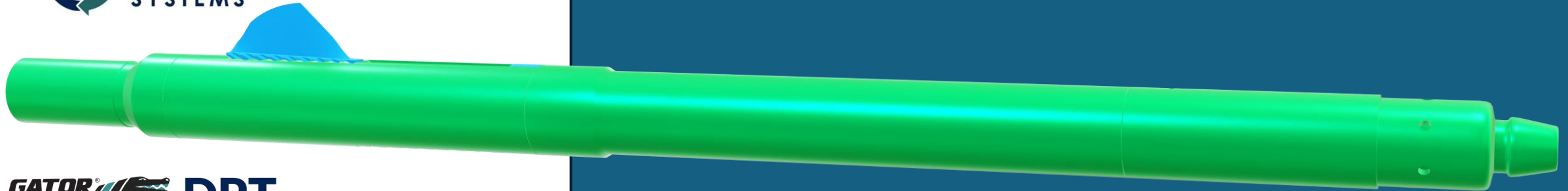


## CHALLENGE

Surface casing vent flow and sustained annular casing pressure continue to be an issue in Canada and many other regions in the world. It results in wells being shut in at times and potentially fields and high final abandonment costs.

Five wells with casing specs 8 5/8's 24lb/ft 219mm 35.3kg with surface casing vent flows were required to be fixed prior to final abandonment (sustained casing pressure). The international operator needed a way to gain circulation to the vent assembly with all wells showing good to excellent bond to casing per the logged intervals. Prior attempts were made with perforating guns at several intervals in some of the wells.

The wells were relogged with a pressure pass correlated to the 0 MPA pass along with a noise temperature log. Carbon isotope analysis was also conducted.



**GATOR PERFORATOR™ DPT**  
DEEP PENETRATION TOOL

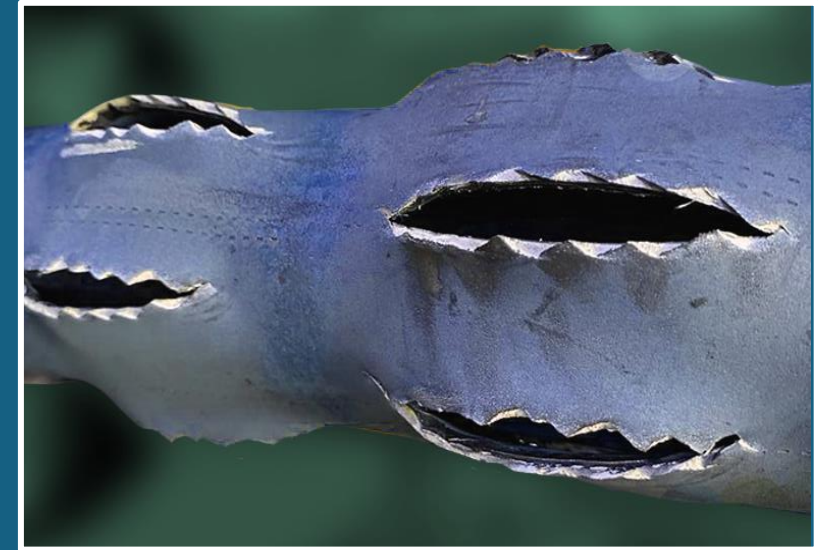
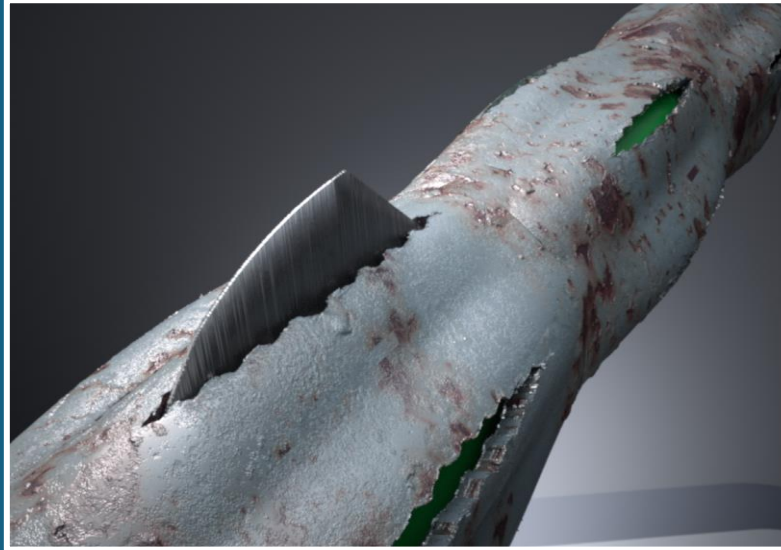
## SOLUTION

- The Lee Energy Systems “Deep Penetrating Tool” (DPT) deployed
- perforating 24 to 48 intervals
- 60-degree phasing
- 6 cuts per depth, rotating thirty degrees offsets to the cuts above
- Total interval perforated was 1.0 or 2.0 meters with 91 and 182 inches of flow area



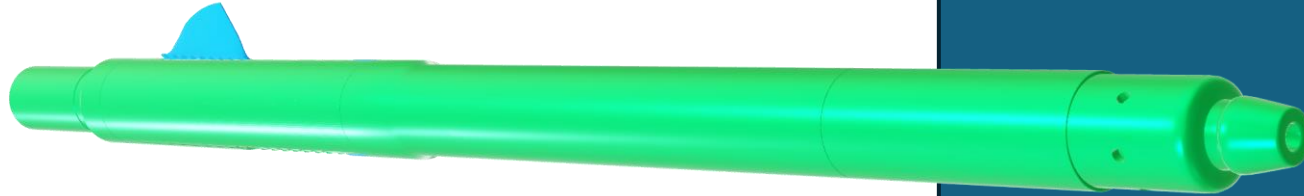


- The Lee Energy Systems 600 Deep Penetrating Tool (DPT) was deployed on pipe, perforating 24 to 48 intervals.
- Flow area is maximized while keeping integrity in the casing to go below cuts after a drill out if needed. Feed rates can be tested after groups of cuts.
- DPT Gators can be used in 3 ½ up to 20-inch casing.



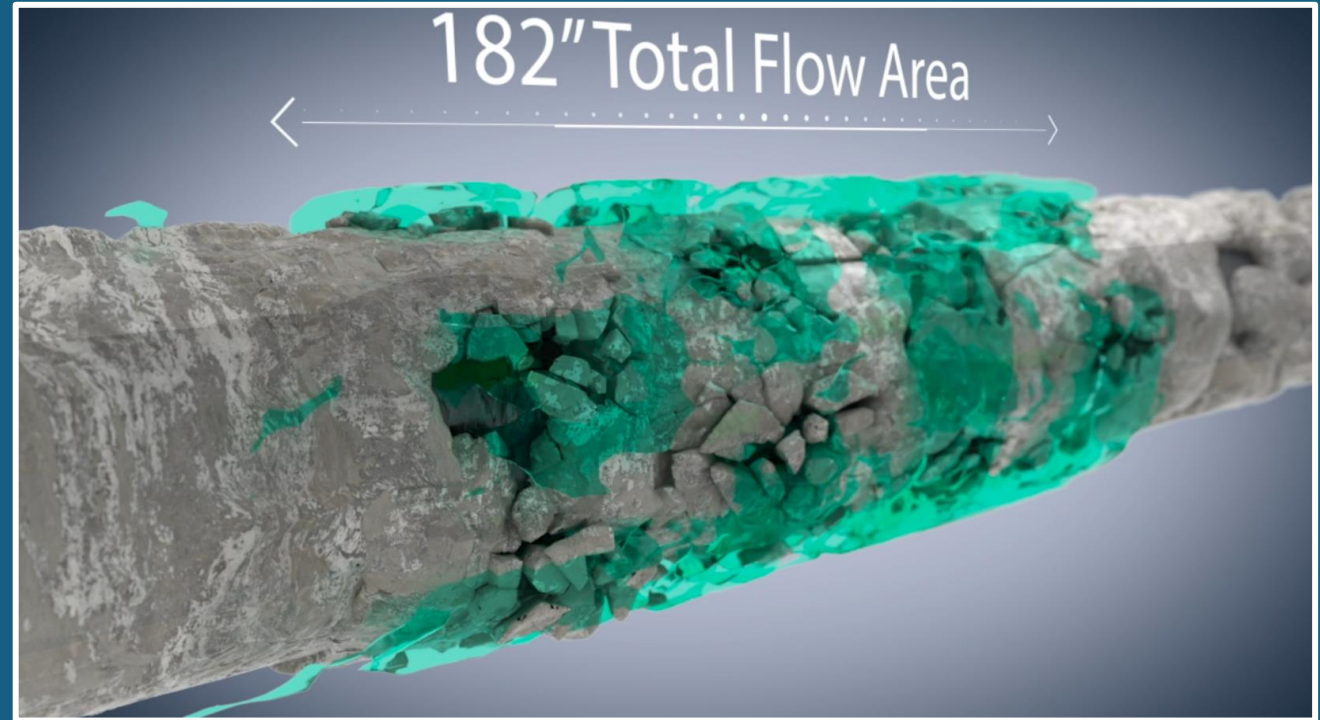


**GATOR PERFORATOR™ DPT**  
DEEP PENETRATION TOOL



# Acid Washed and then Cemented –

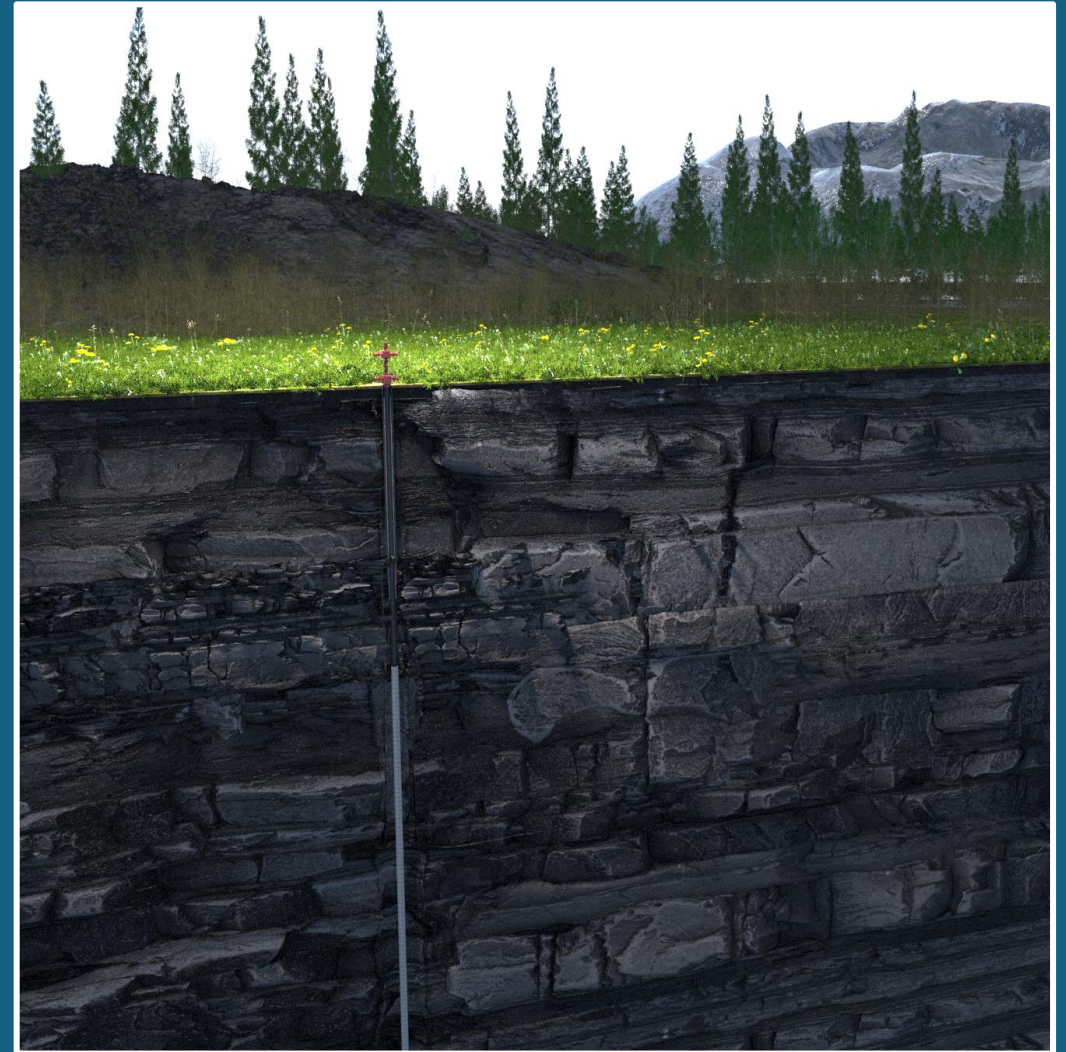
\*other treatment fluids can  
be used



**All five wells were successfully shut off with no vent flow. Single attempt was made on three wells and two interventions/cuts on the other two wells**

Surface casing vent flow and sustained annular casing pressure continue to be an issue in Canada and many other regions in the world. It results in wells being shut in at times and potentially fields and high final abandonment costs.

Locating and identifying the source through advanced logging techniques (samples supplied in the images to the left without sound files) and carbon isotope analysis, along with superior means to access the backside of the casing and cemented section while leaving the casing structurally in place gives operators the best chance of placement of material to stop the flow. **If you can not gain access to the source on the backside of the casing you can not stop the flow of fluids.** The findings and learnings of the access to the backside along with good washing and acidizing techniques, give operators the ability to place the product (cement in this case) to stop the flow to the surface.







**QUESTIONS?**