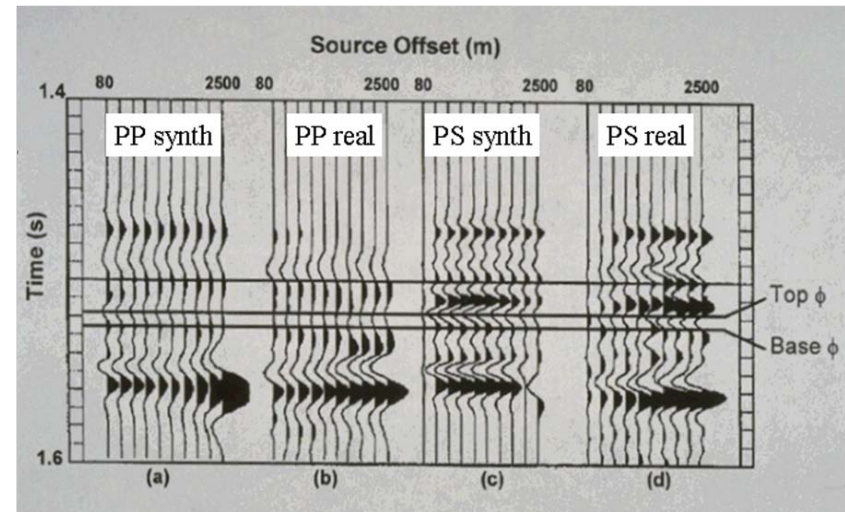# Reflections on PS: An interactive discussion of problems and promise in converted-wave exploration

Don Lawton, Gary Margrave and Robert Stewart

"We recorded a multicomponent seismic survey but we have parked the horizontal component data for now"

… anonymous geophysicist

The perceived conundrum of multicomponent data

- Field QC

- Takes too long to process

- Difficult to process

- Low S/N

- Statics are a nightmare

- Low dominant frequency

- Velocity analysis slow

- Unclear how to interpret

Enhancing the promise of PS data

|	
Field QC	**Plants, orientation analysis**
Takes too long to process	**Mature processing flows**
Difficult to process	**More experienced processors**
Low S/N	**Acquisition strategies**
Statics are a nightmare	**Better near-surface models**
Low dominant frequency	**Improved decon & acquisition**
Velocity analysis slow	**New approaches to imaging**
Unclear how to interpret	**Better understanding of registration & go to depth**

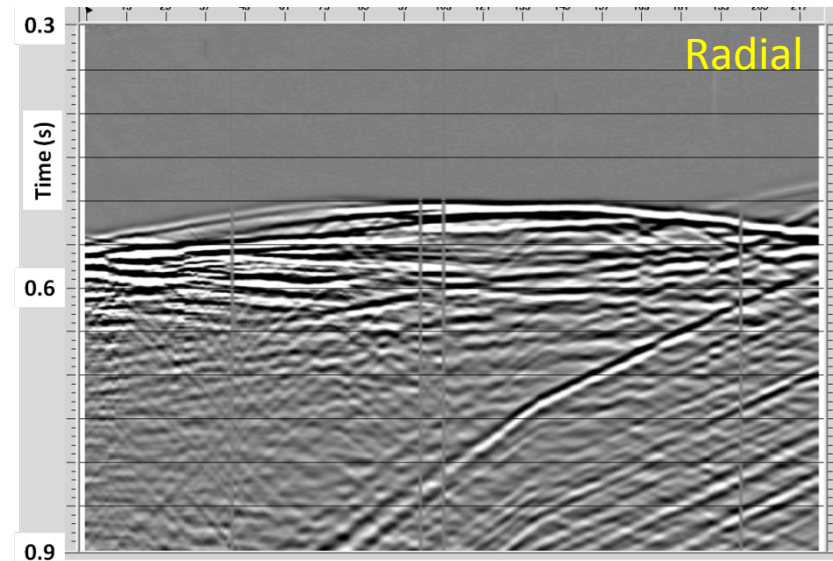# The beauty of elastic waves

Dynamite
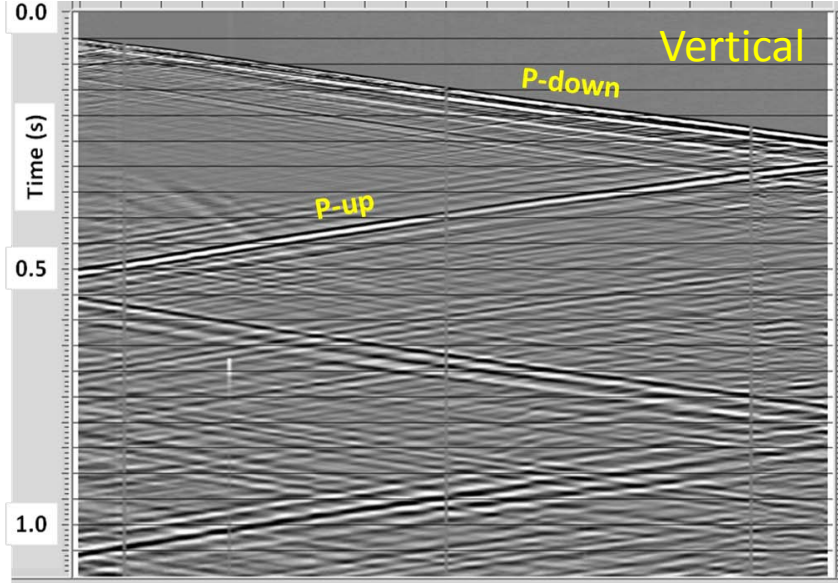
EnviroVibe
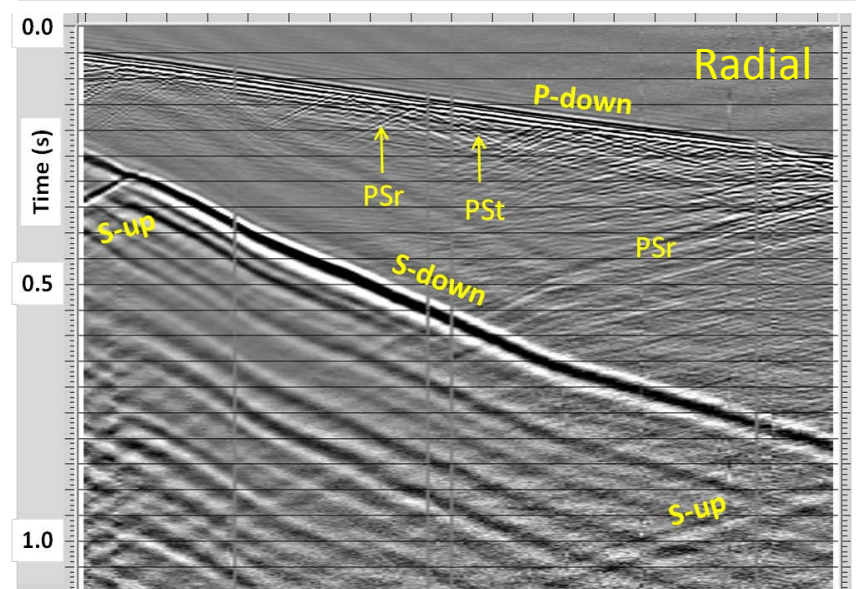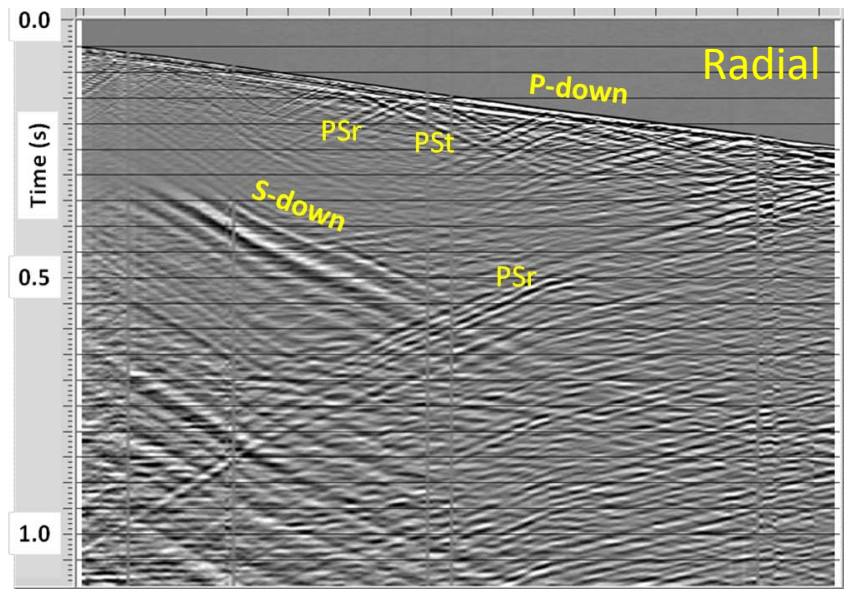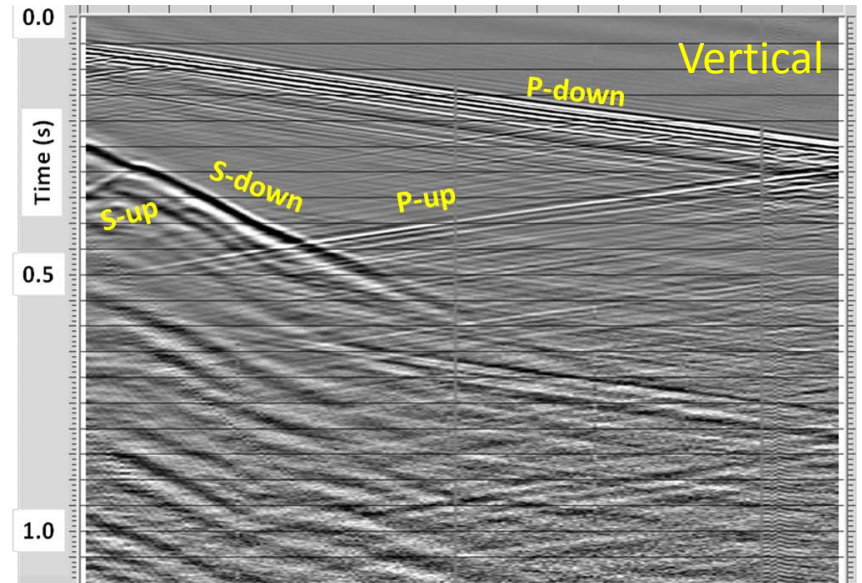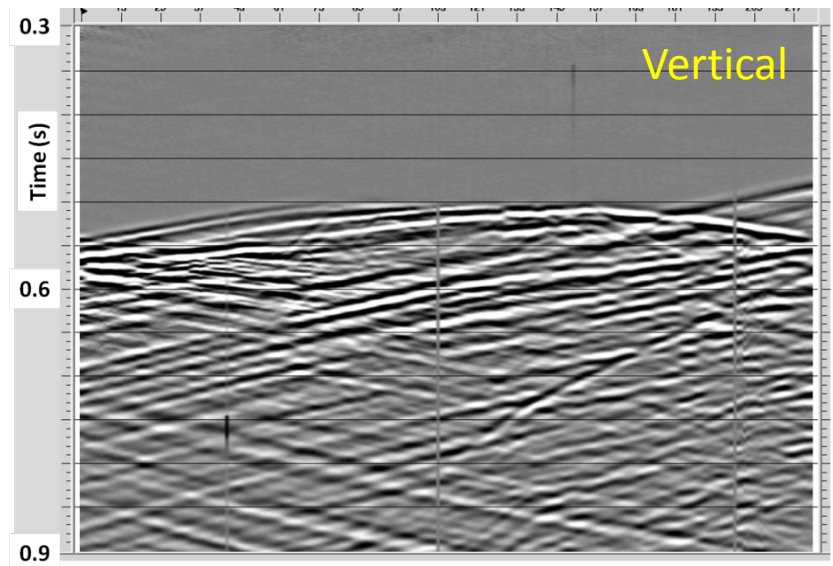

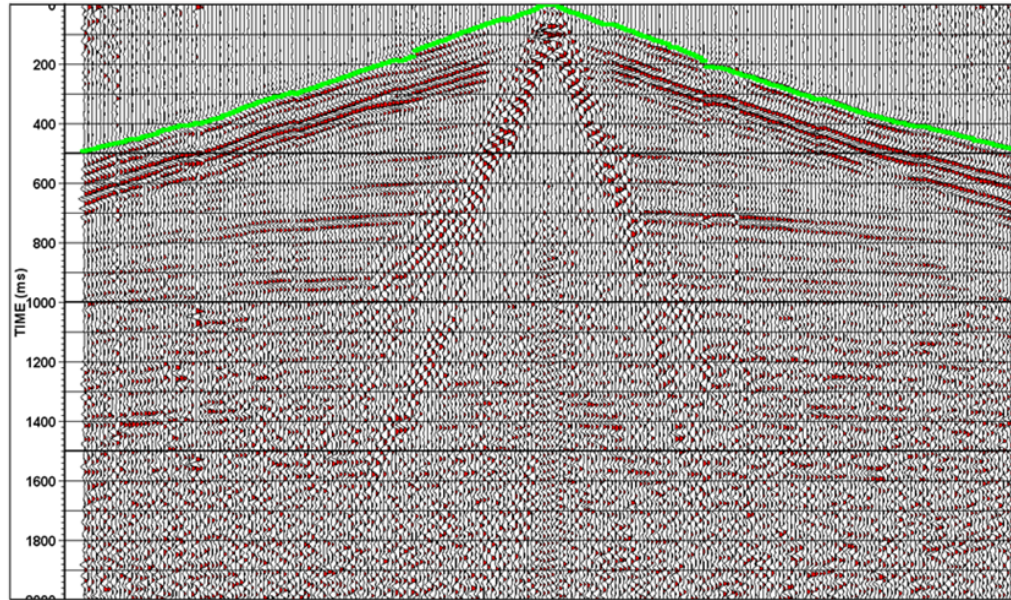Data courtesy of Husky

More beauty

Offset = 800 m
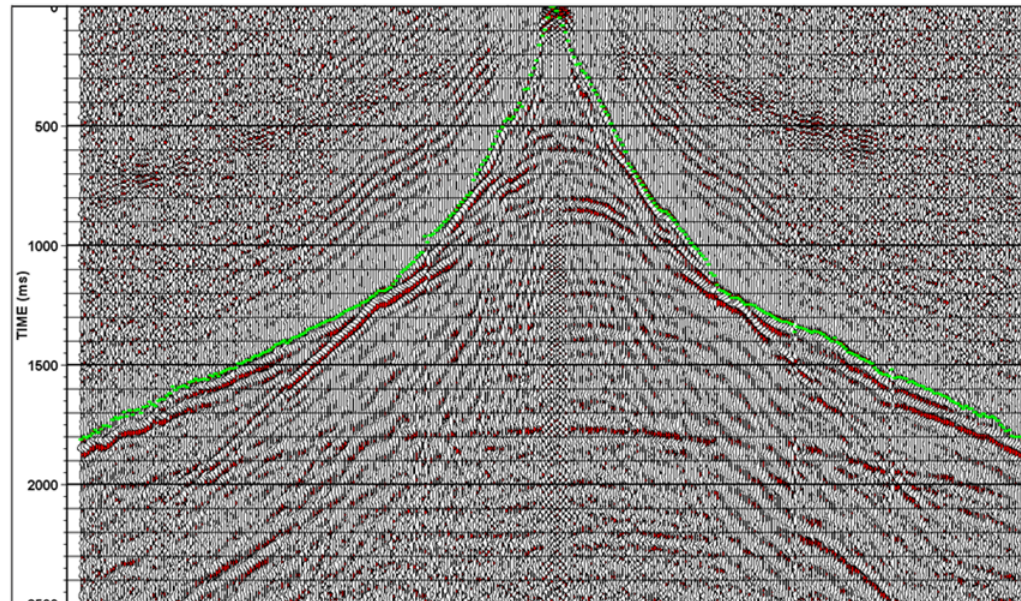
Offset = 1040 m

Vertical

Vertical

Radial

Radial
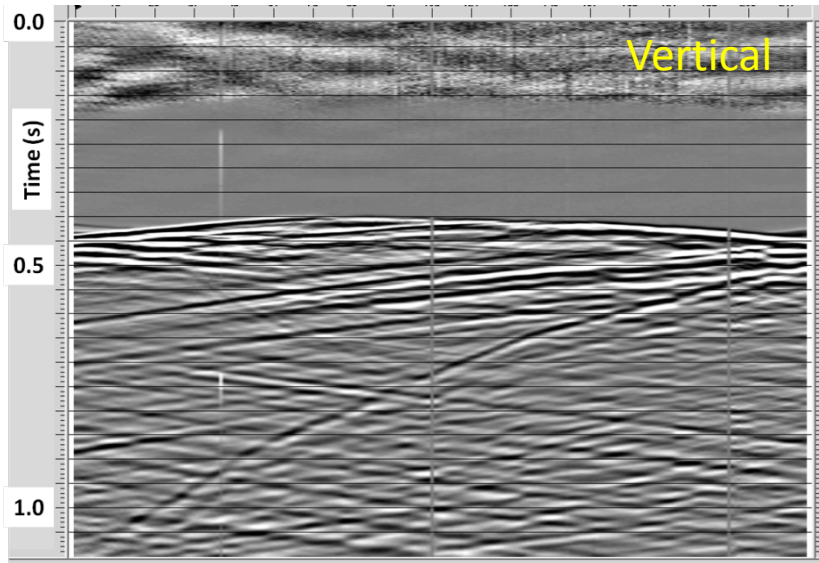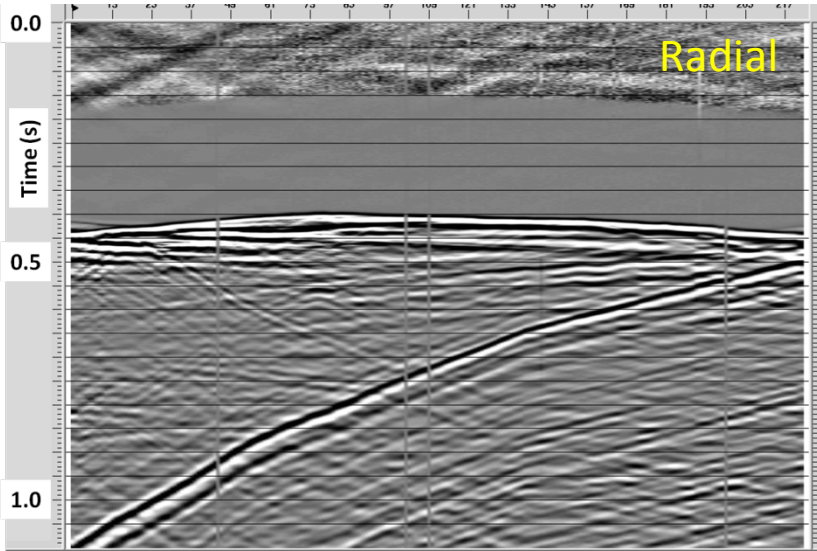
Data courtesy of Husky

The near-surface

Vertical vibe

Vertical

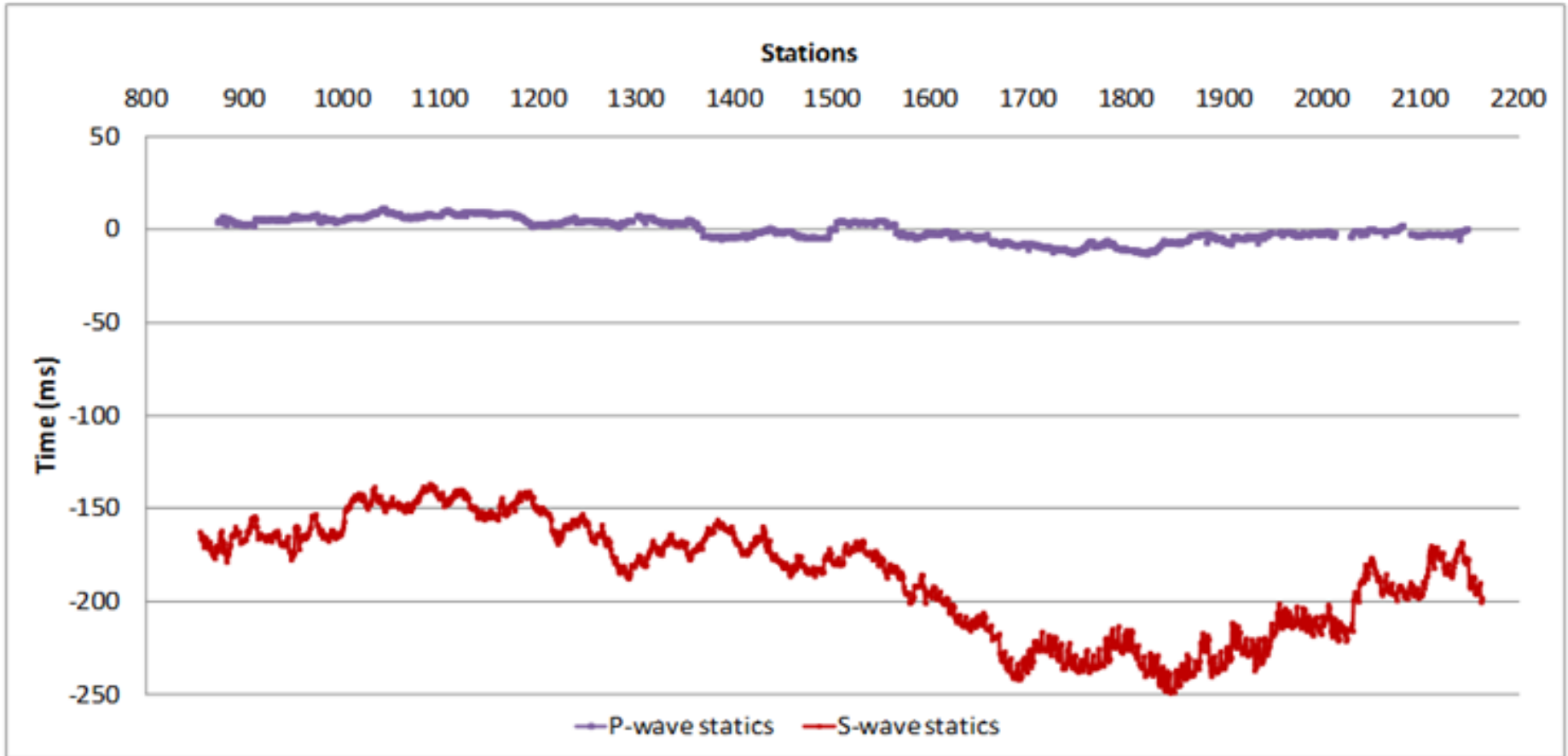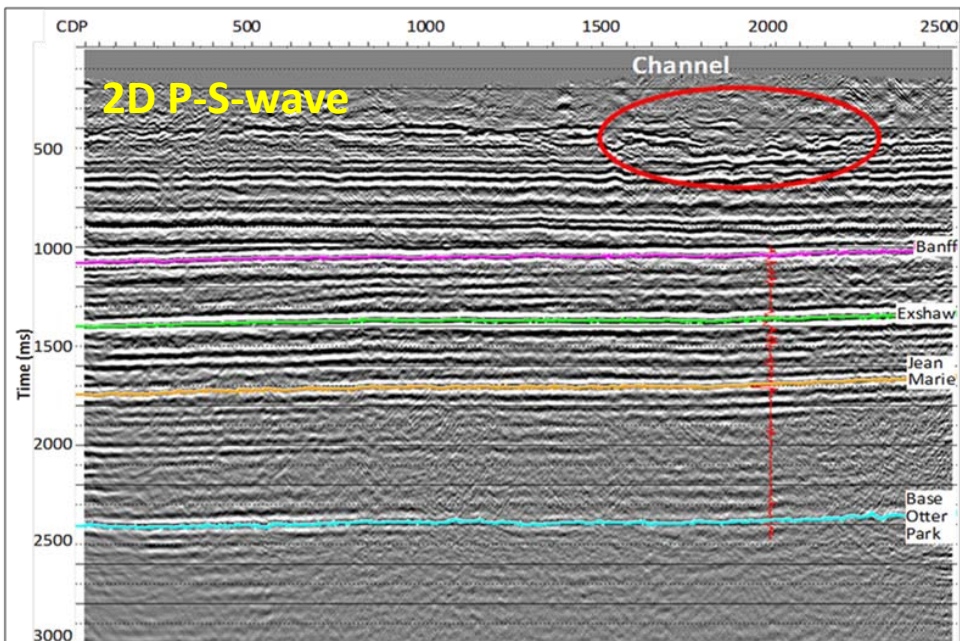SH vibe

Transverse

Data courtesy
of Nexen

Near-surface structure and Vp/Vs

Zuleta and Lawton, 2012

Well data courtesy of Nexen

P & S-wave statics

Zuleta and Lawton, 2012

2D P-wave
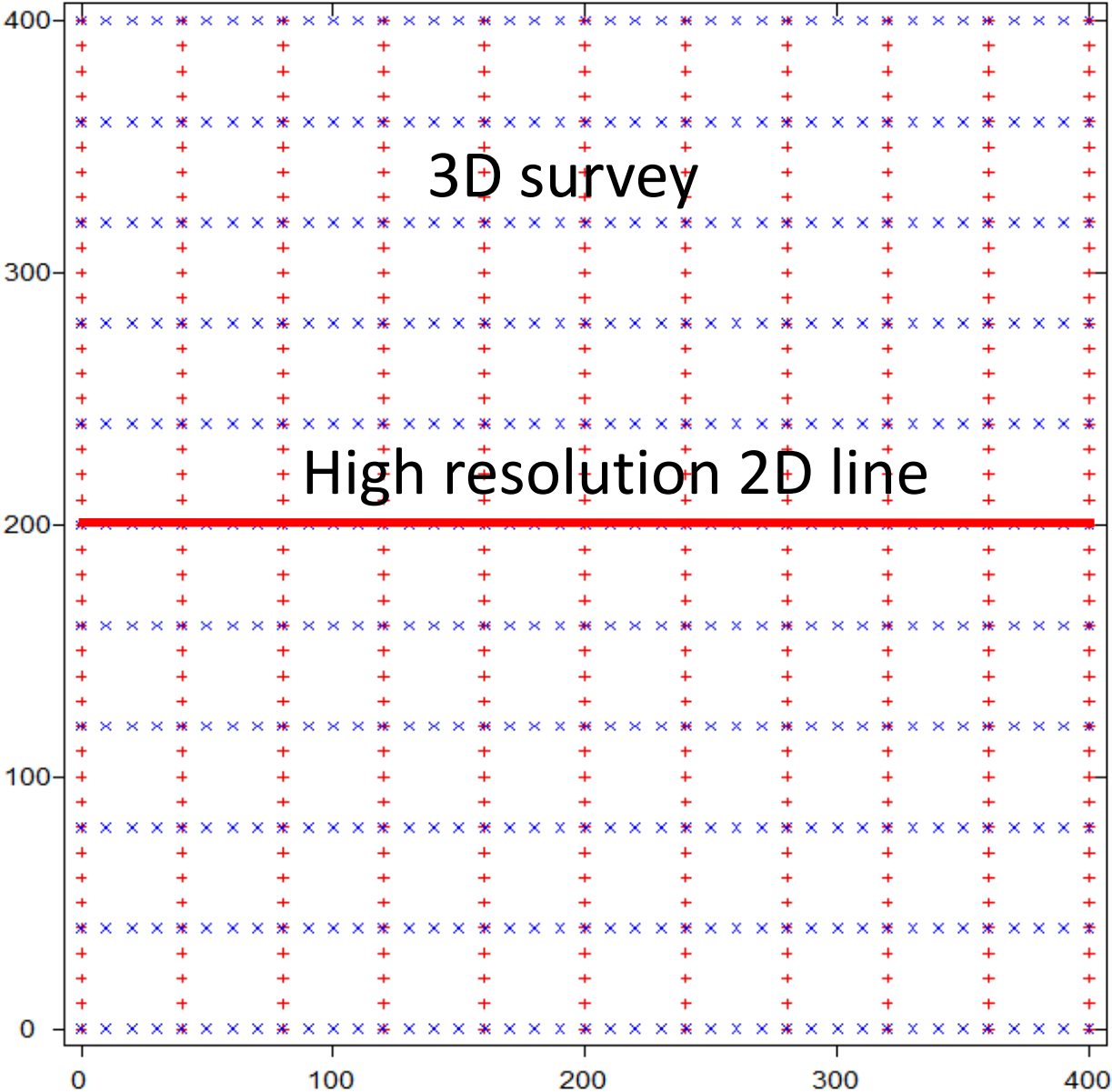
3D P-wave
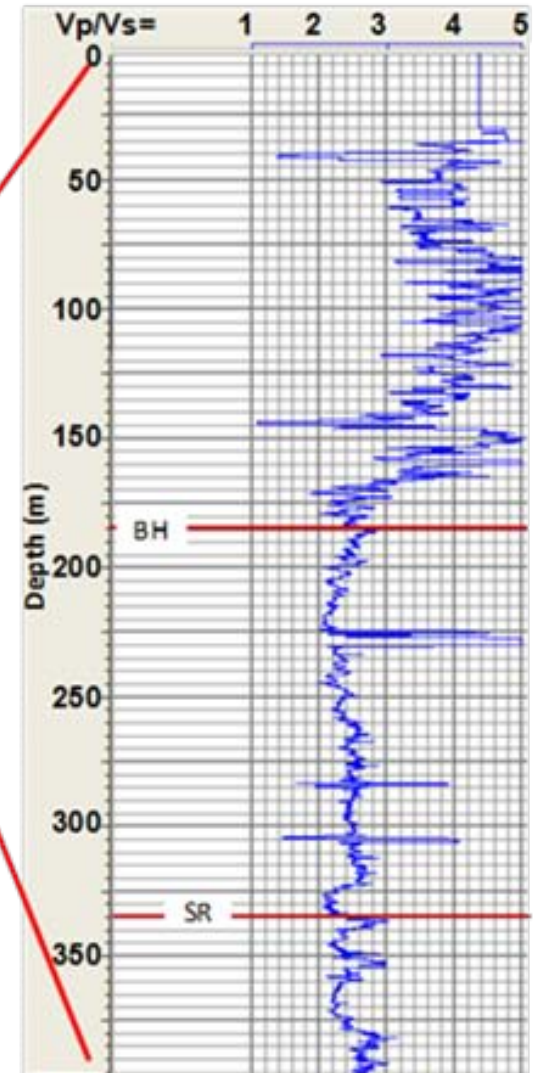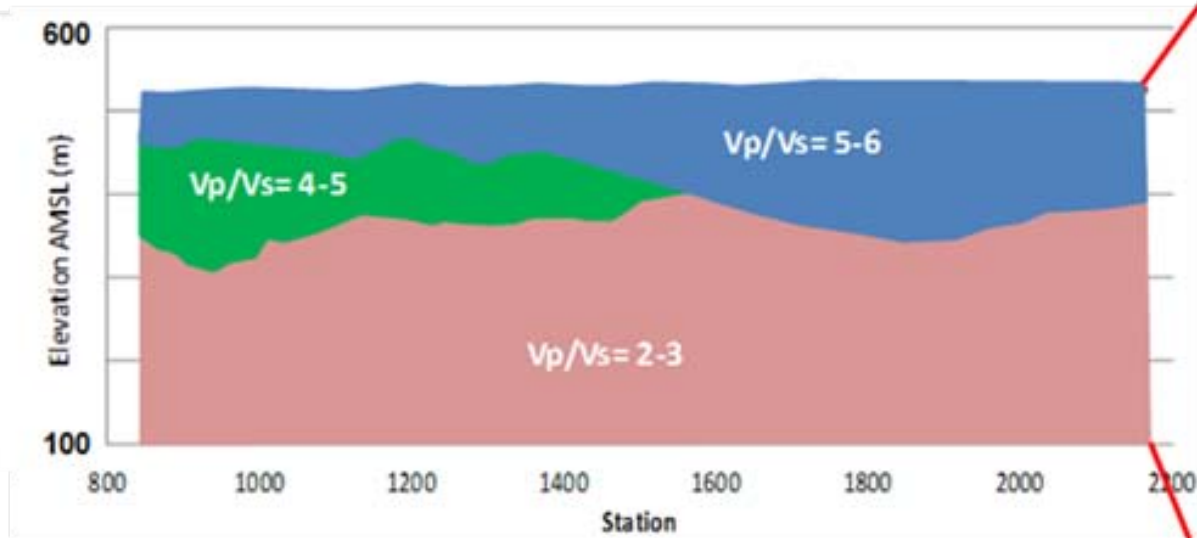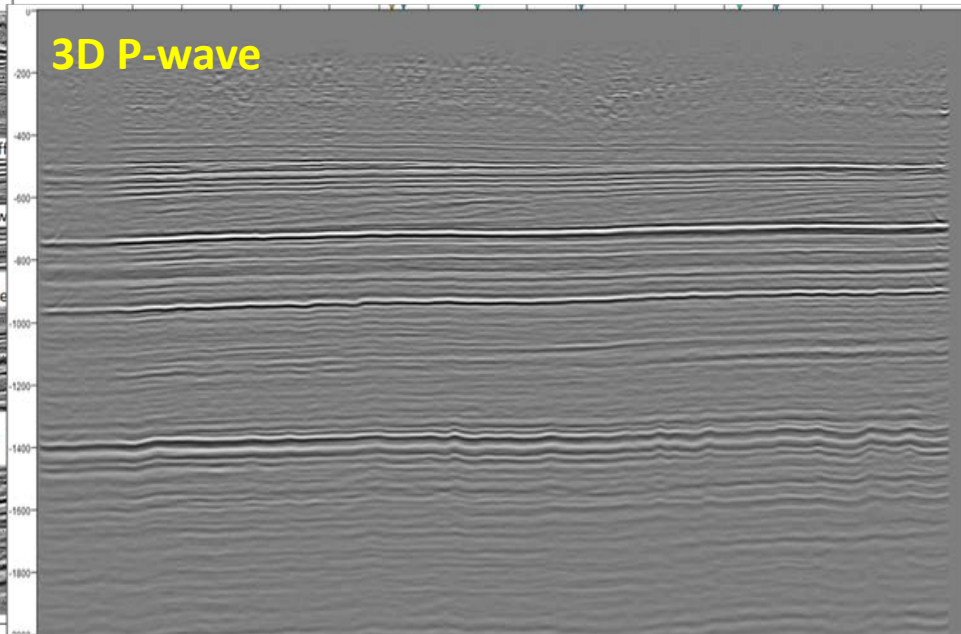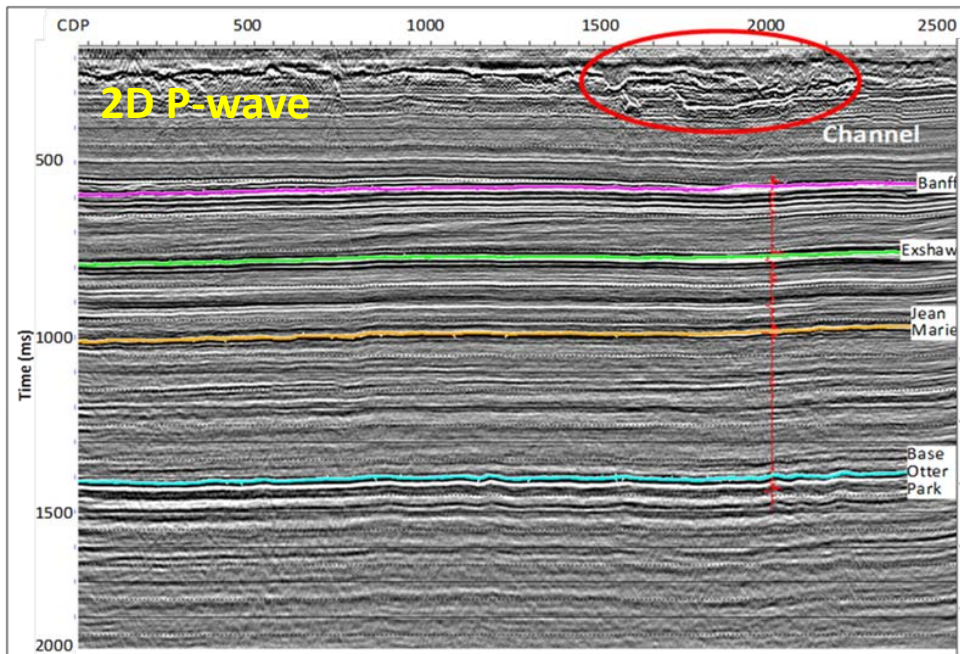
2D P-S-wave

3D P-S-wave

Coming soon

Data courtesy of Nexen

2D line for shallow velocity structure and statics
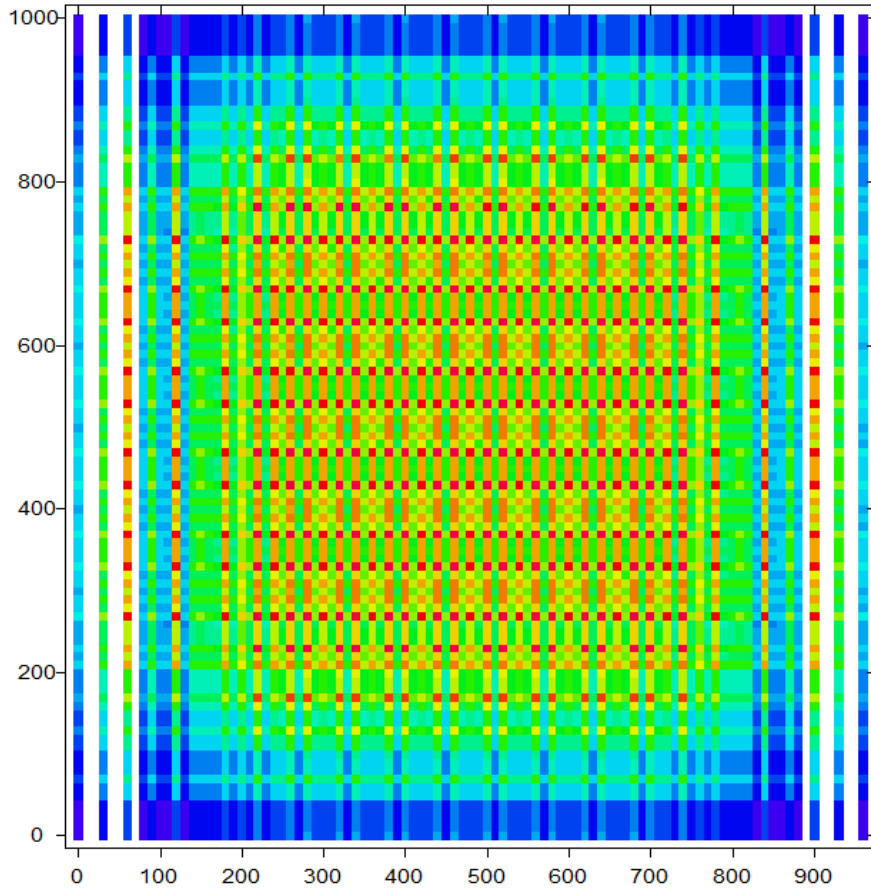

3D survey

High resolution 2D line

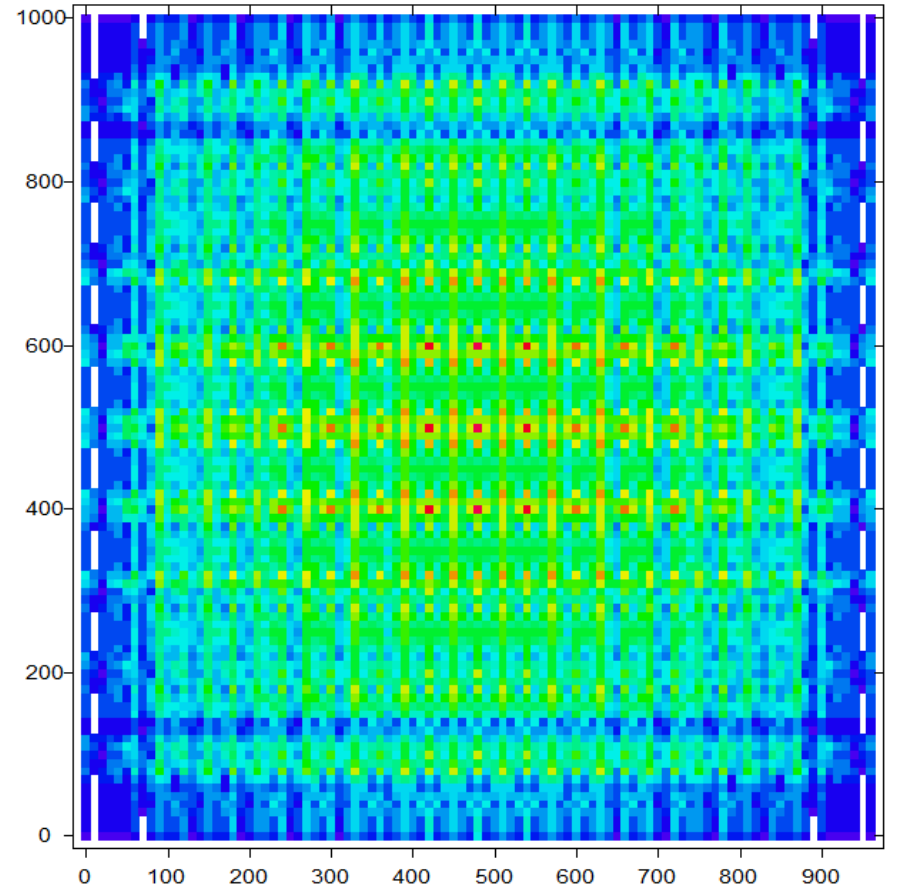# Sparse nodal survey, receivers 50 m deep
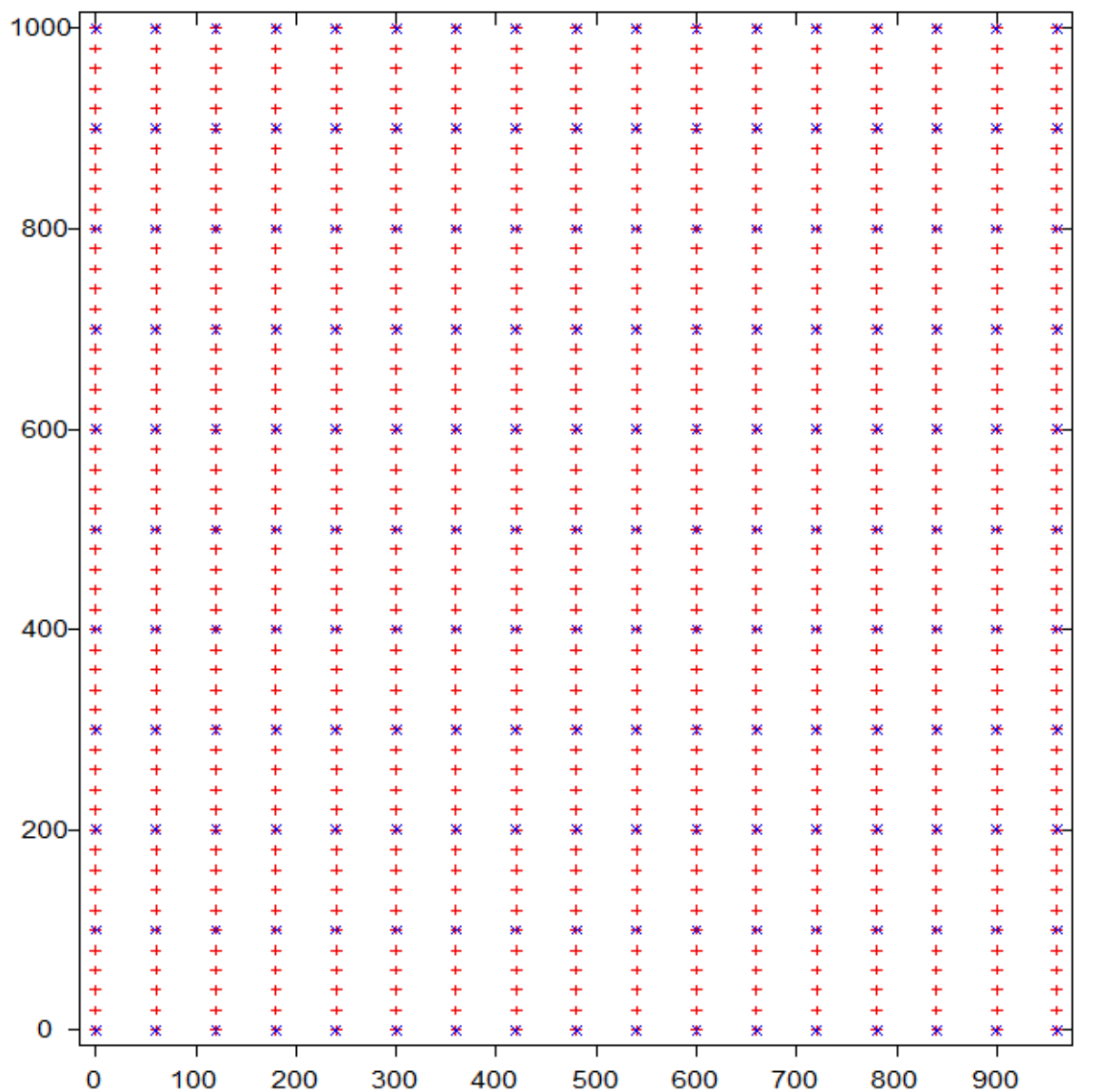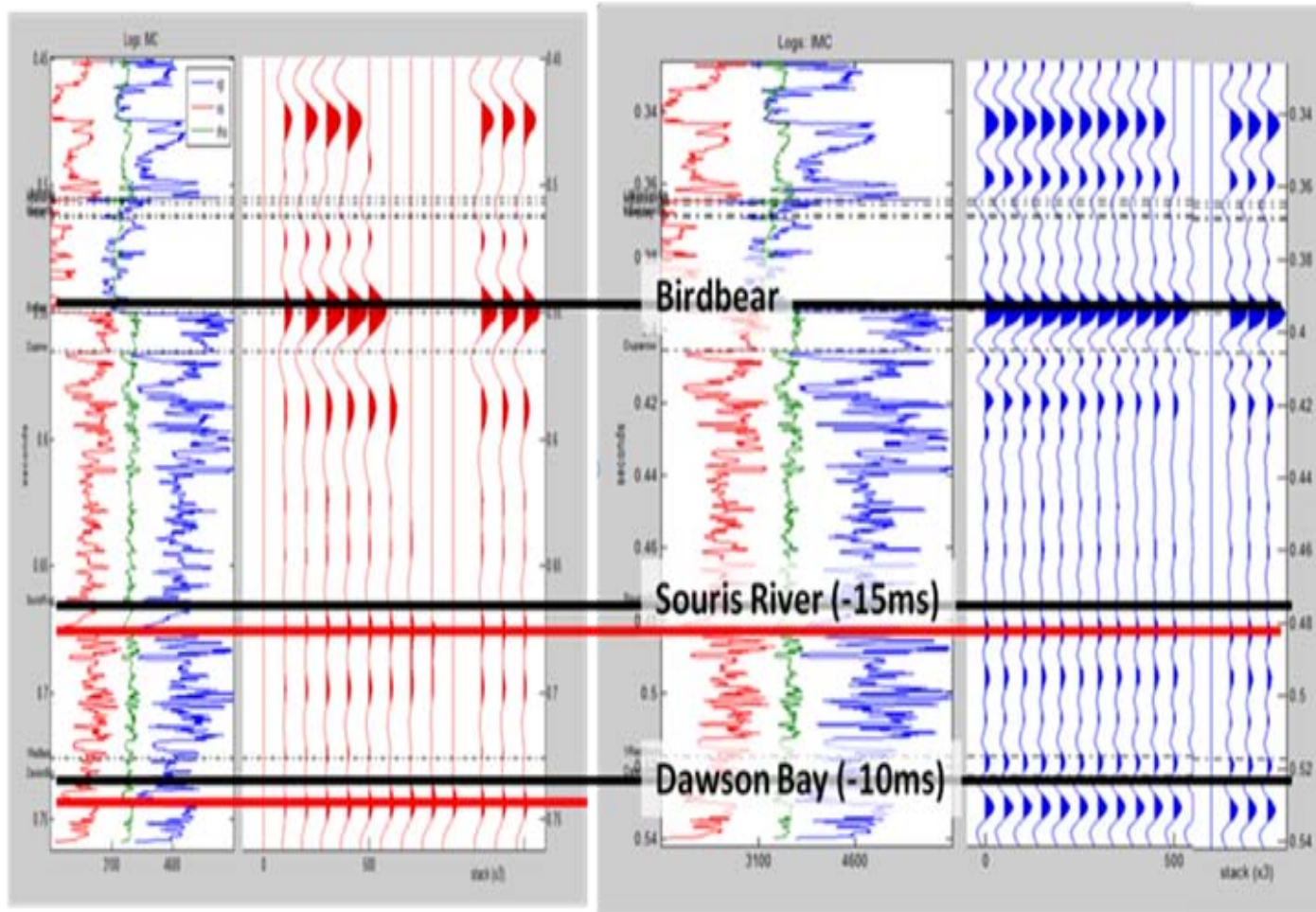
Acquisition strategy

P-P fold

P-S fold

Target depth = 400 m

PP & PS registration challenges

bandwidth, dominant frequency, phase, polarity
PS ≠ PP ➡ Need dipole sonic logs

Go to depth

Time for discussion !