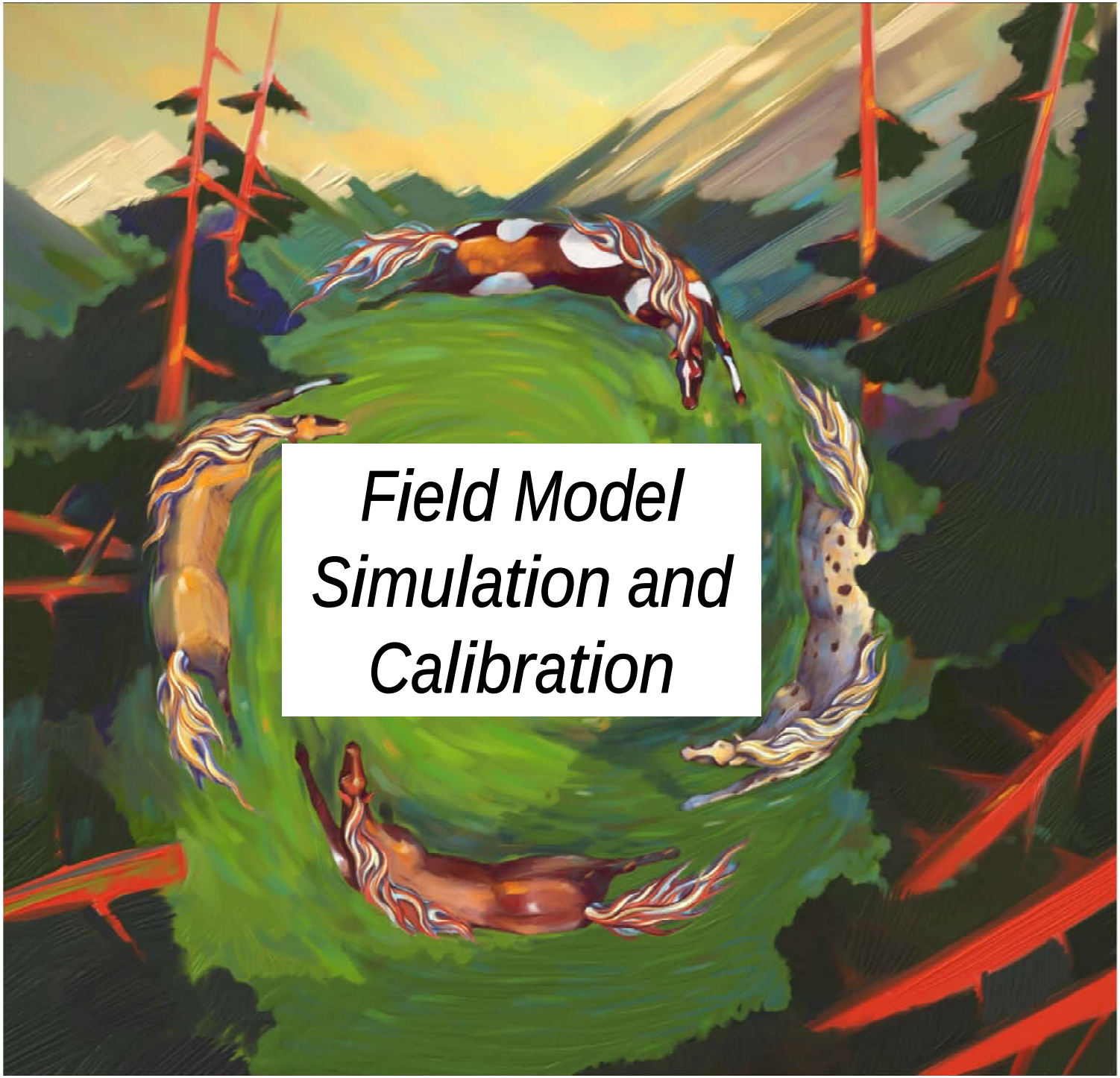

Field Model Simulation and Calibration

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Field Models

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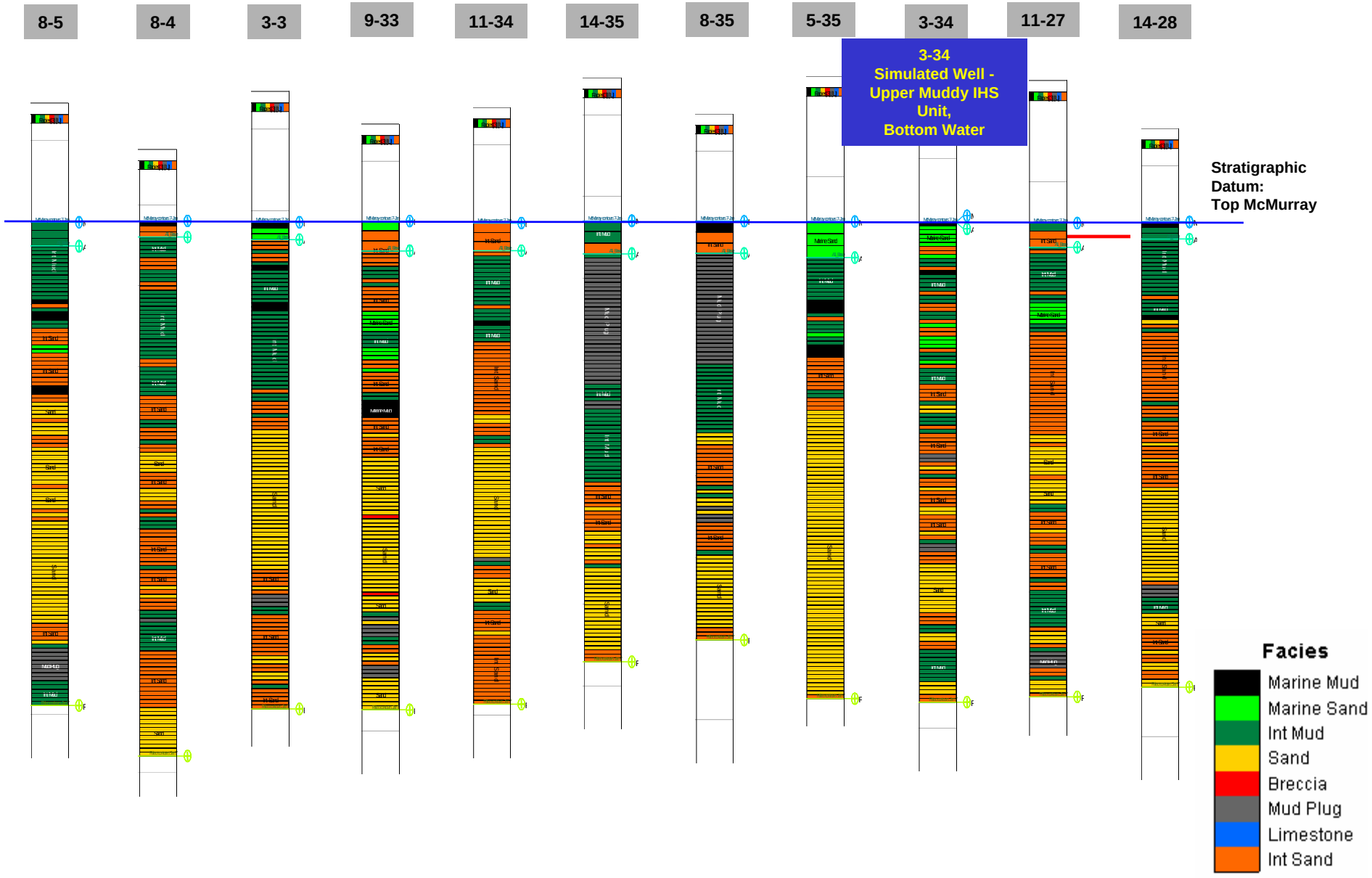
Recognizing the prevailing opinion of pressure data Paramount elected to not rigorously match individual pressure measurements.

Preferred approach was to consider the entire dataset and concentrate time and computer resources to represent trends and general behavior.

Further:

Detailed pressure matching of a <u>single</u> geostatistical realization is not consistent with the statistical approach

Corner McMurray C Pool



Field Models

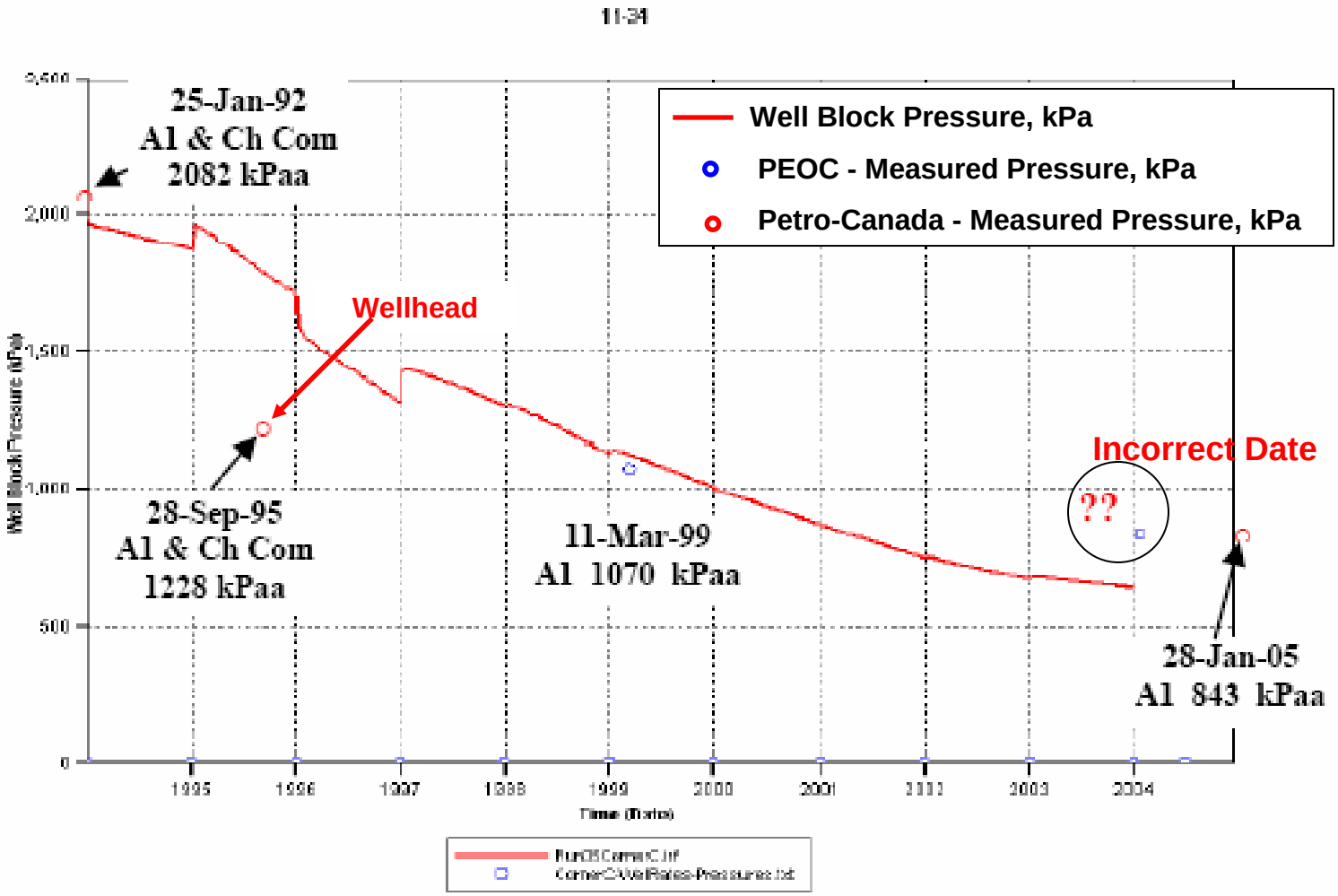
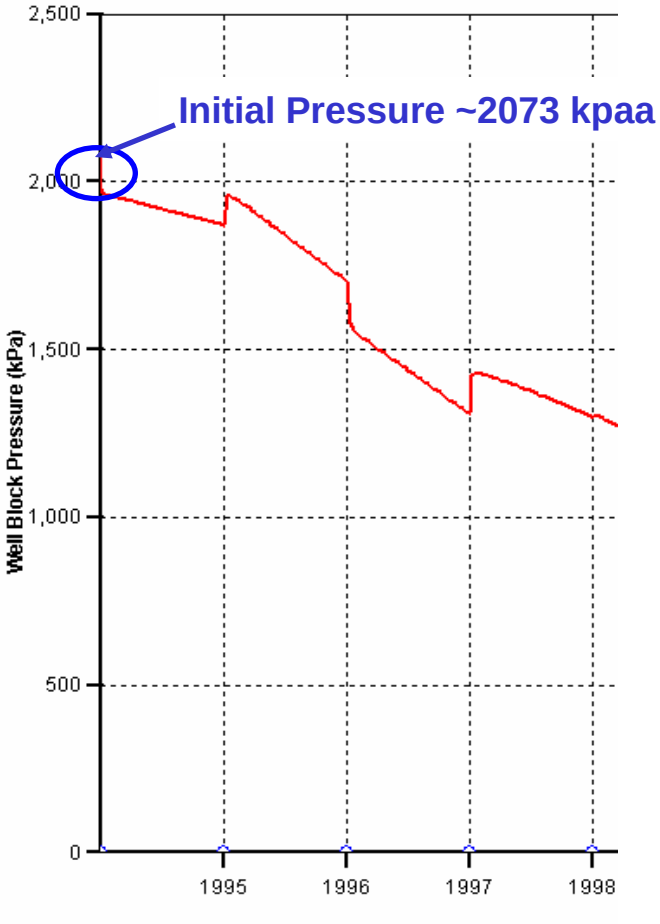


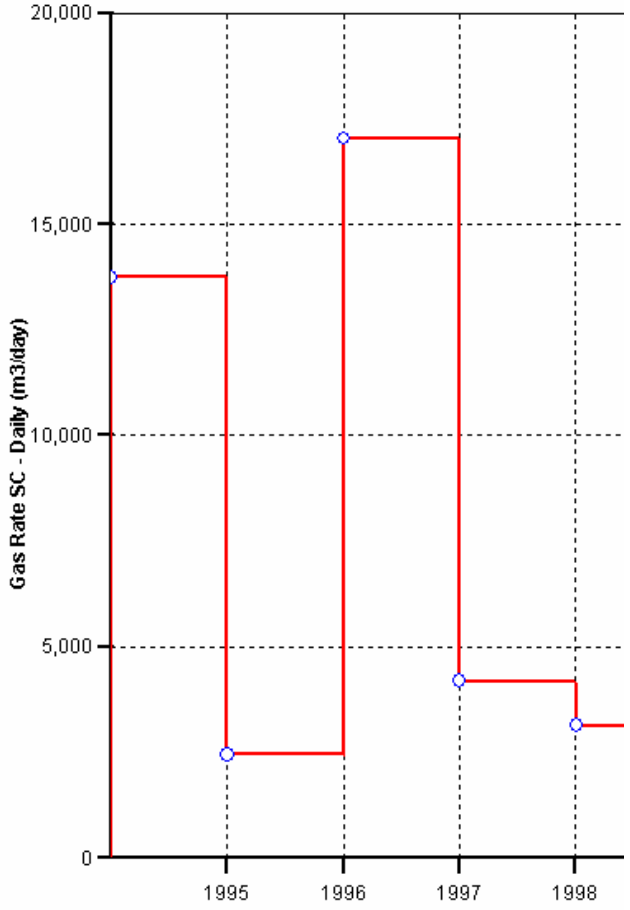
Figure 31: History Match Plot, Well 11-34

Well 11-34 Expanded View

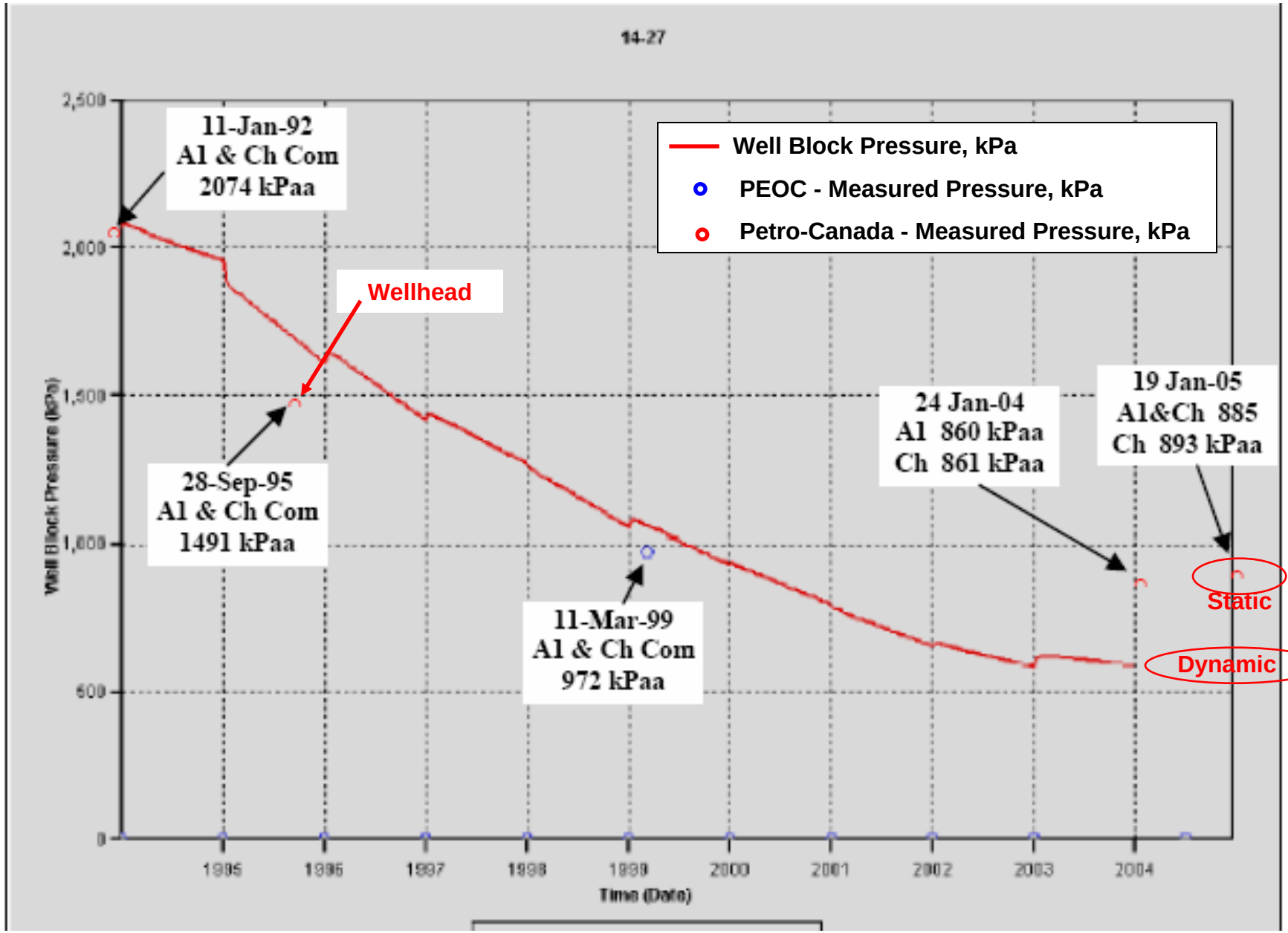
Well Block Pressure



Gas Rate SC



Field Models



Field Models

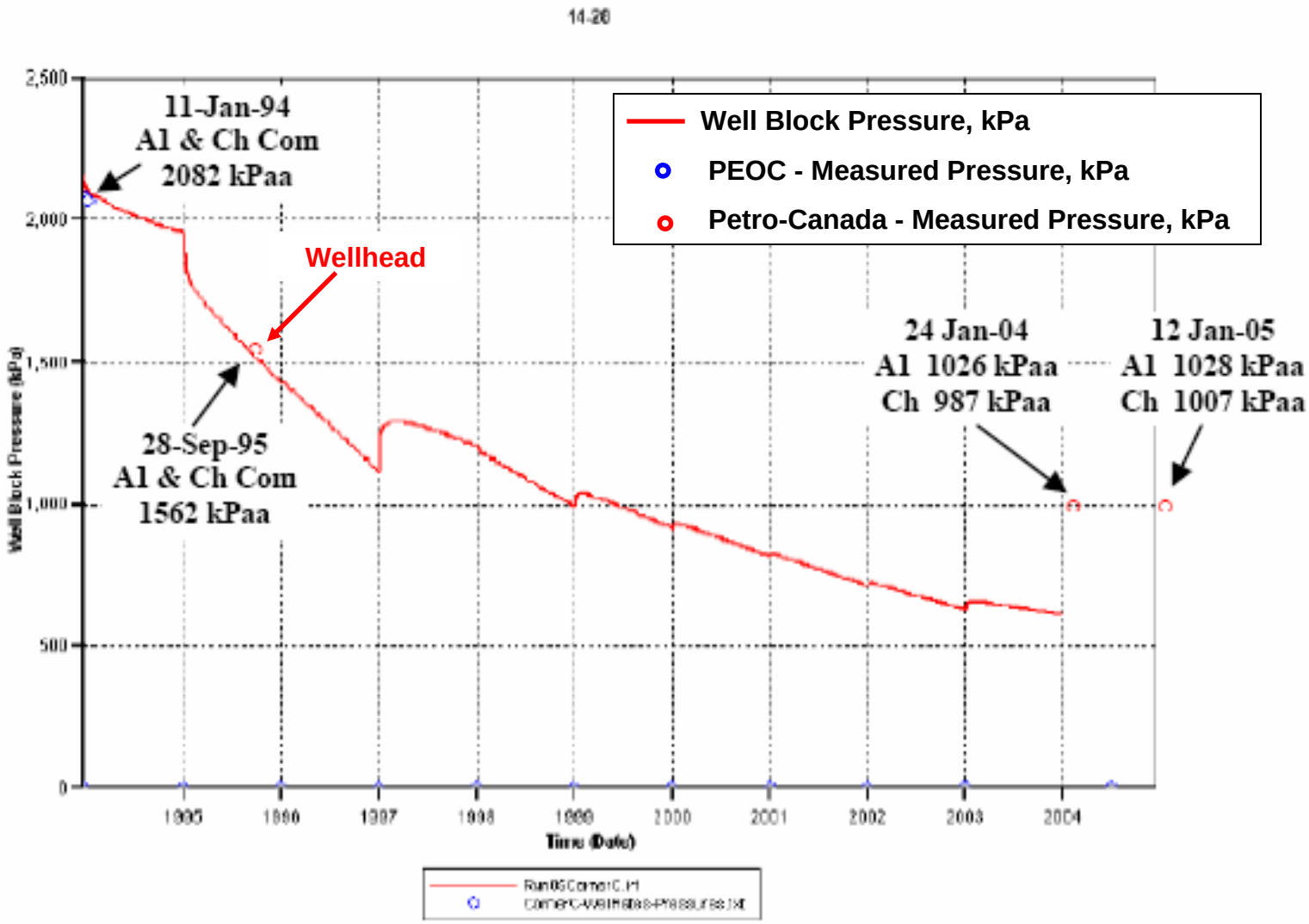


Figure 34: History Match Plot, Well 14-28

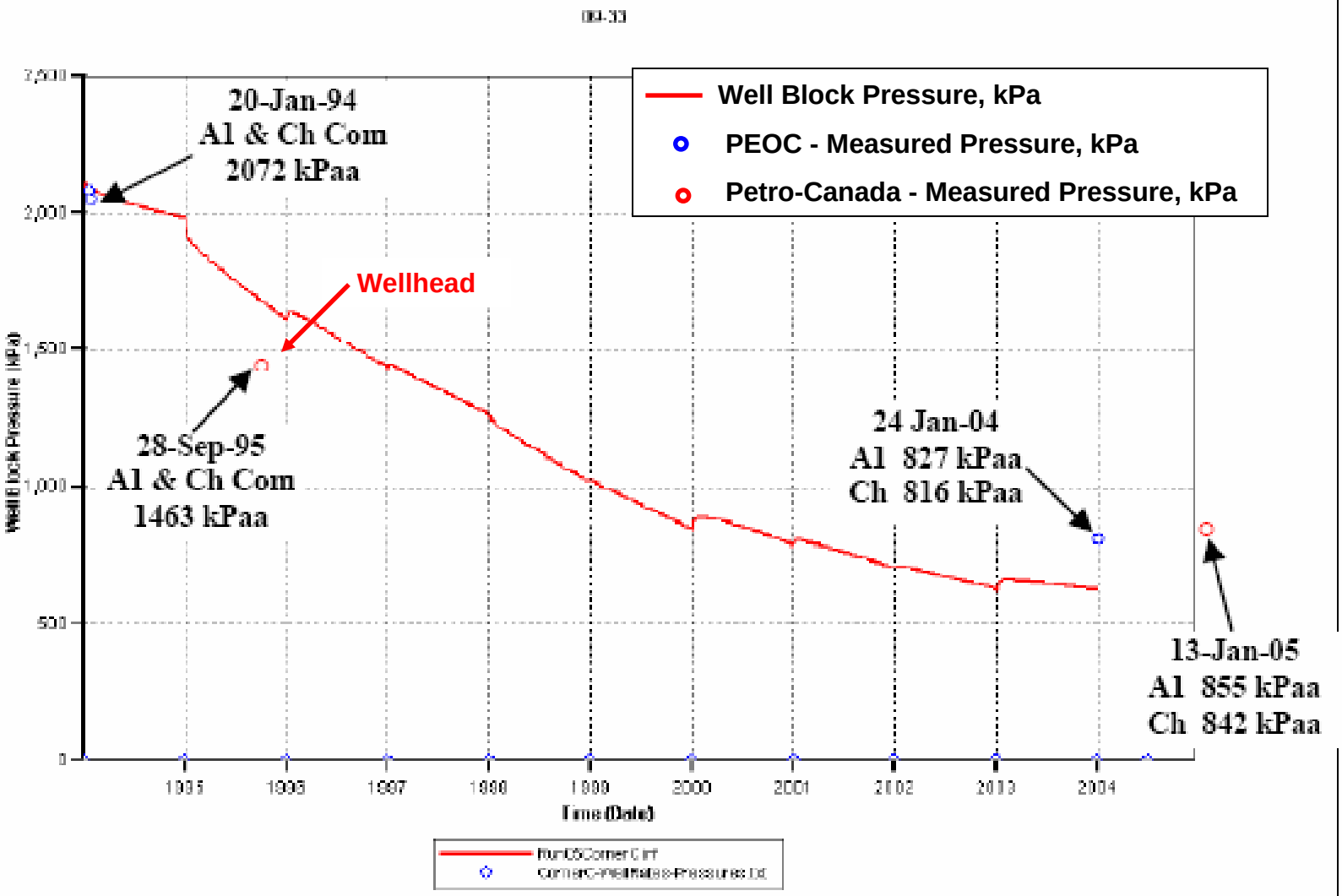


Figure 30: History Match, Well 09-33

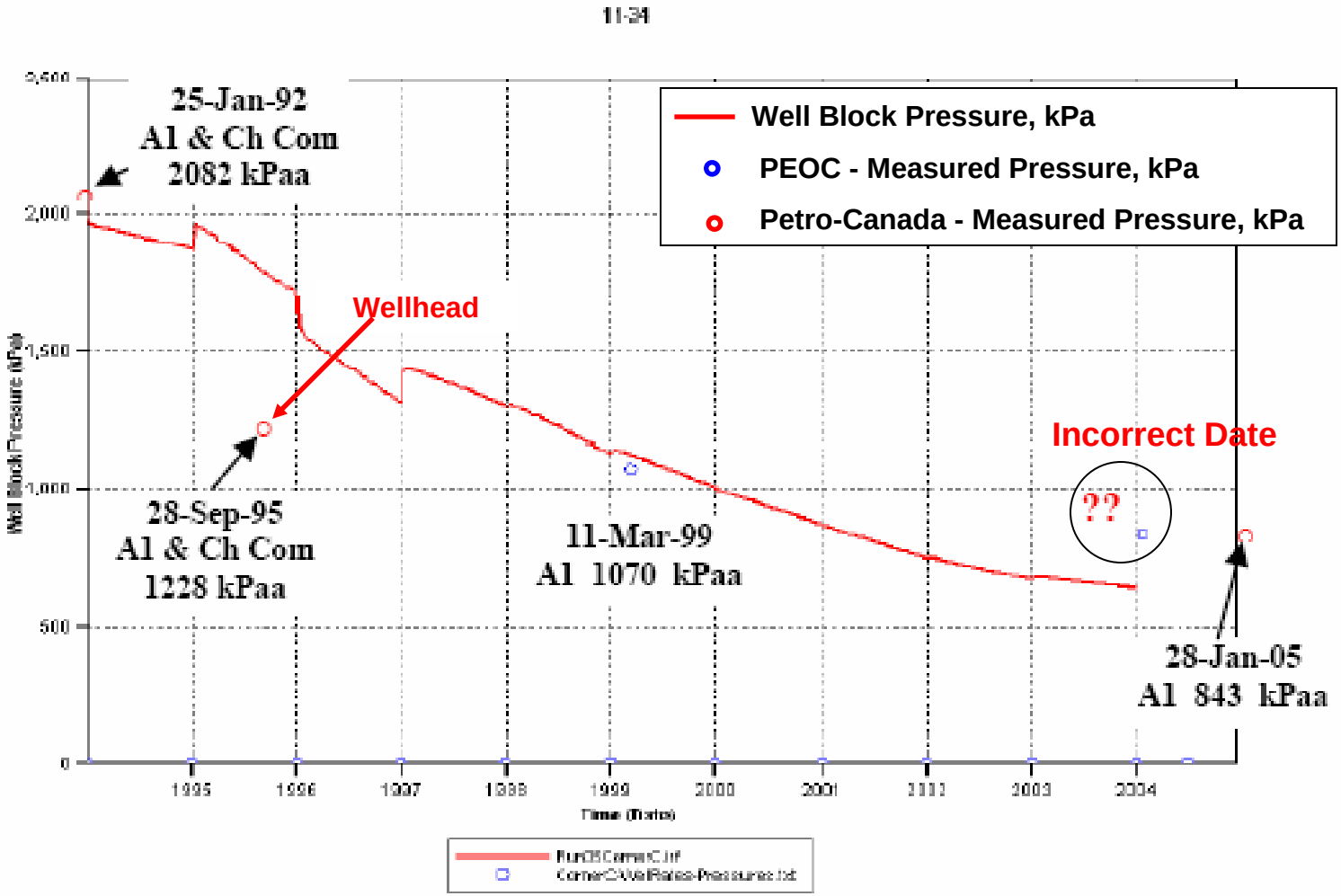
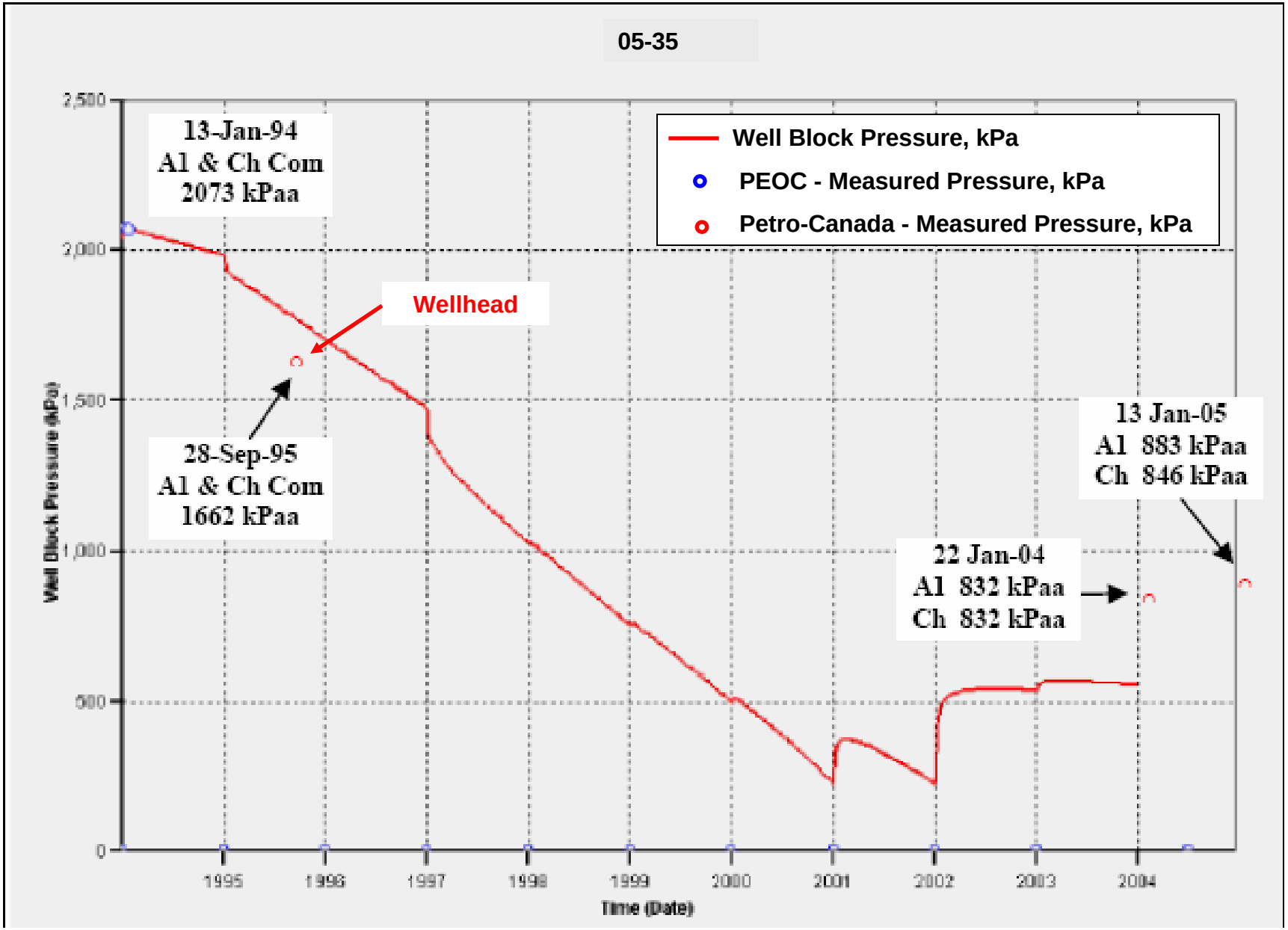


Figure 31: History Match Plot, Well 11-34

Field Models



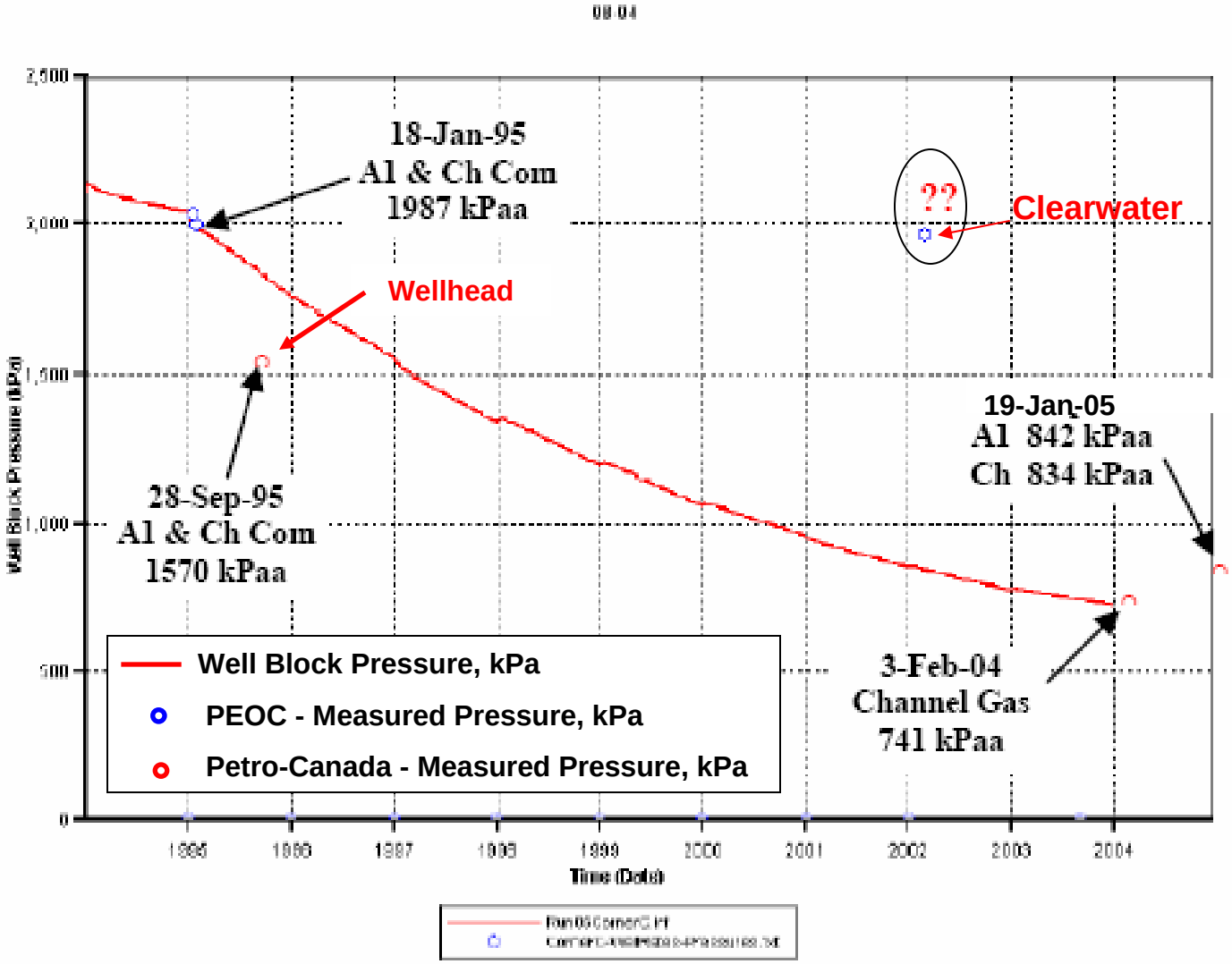


Figure 28: History Match Plot, Well 08-04

Field Models

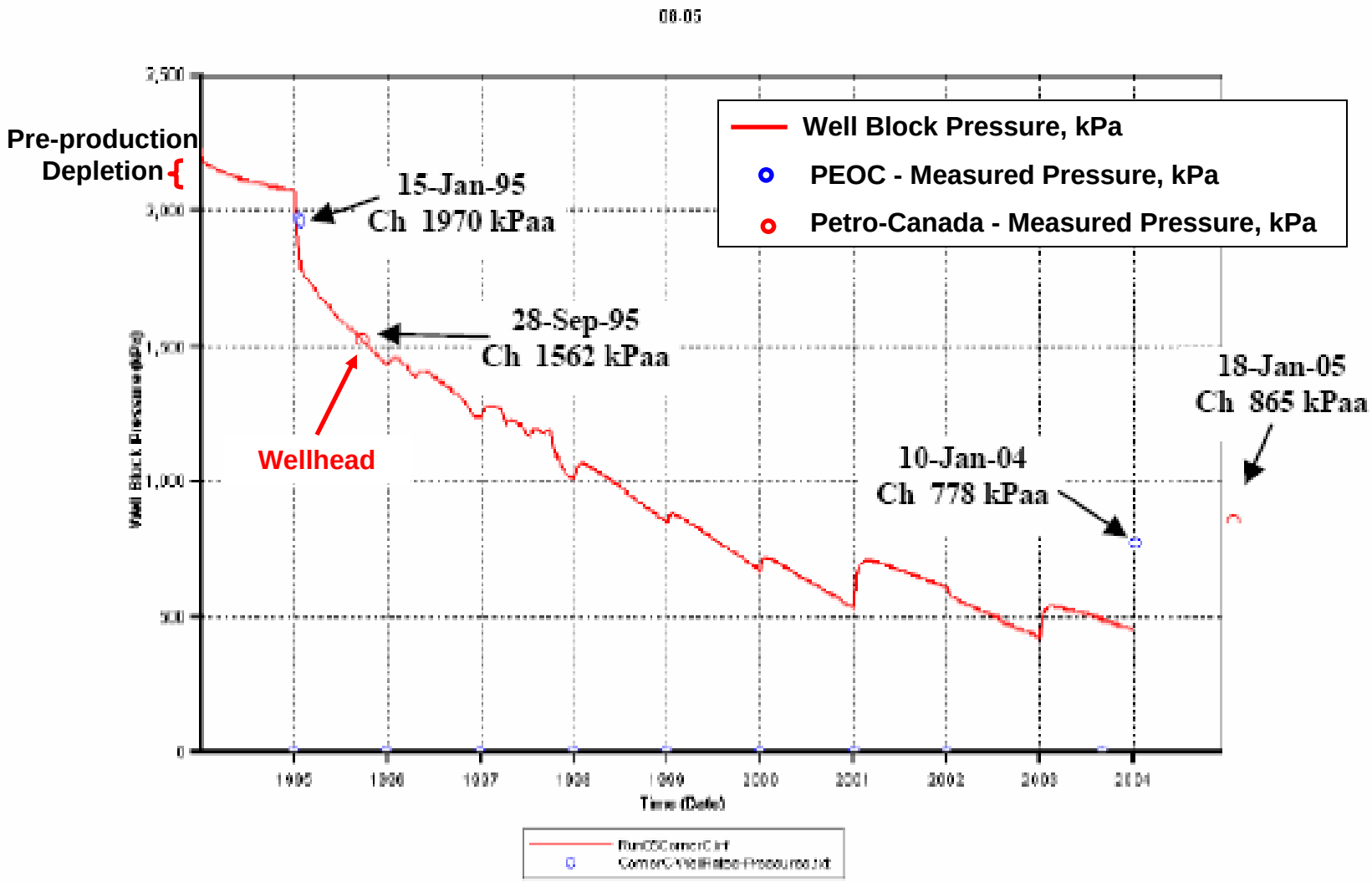
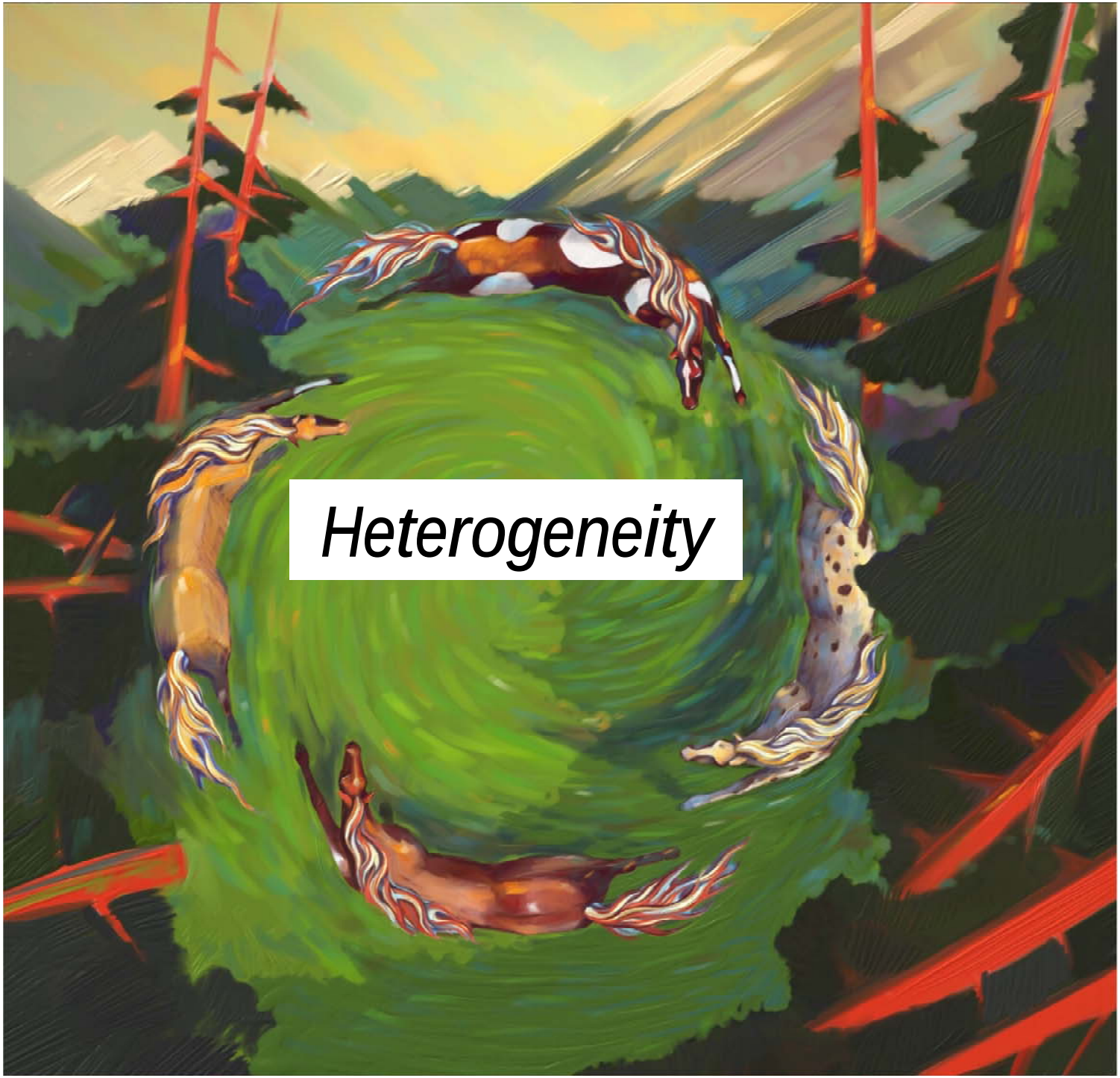


Figure 29: History Match Plot, Well 08-05



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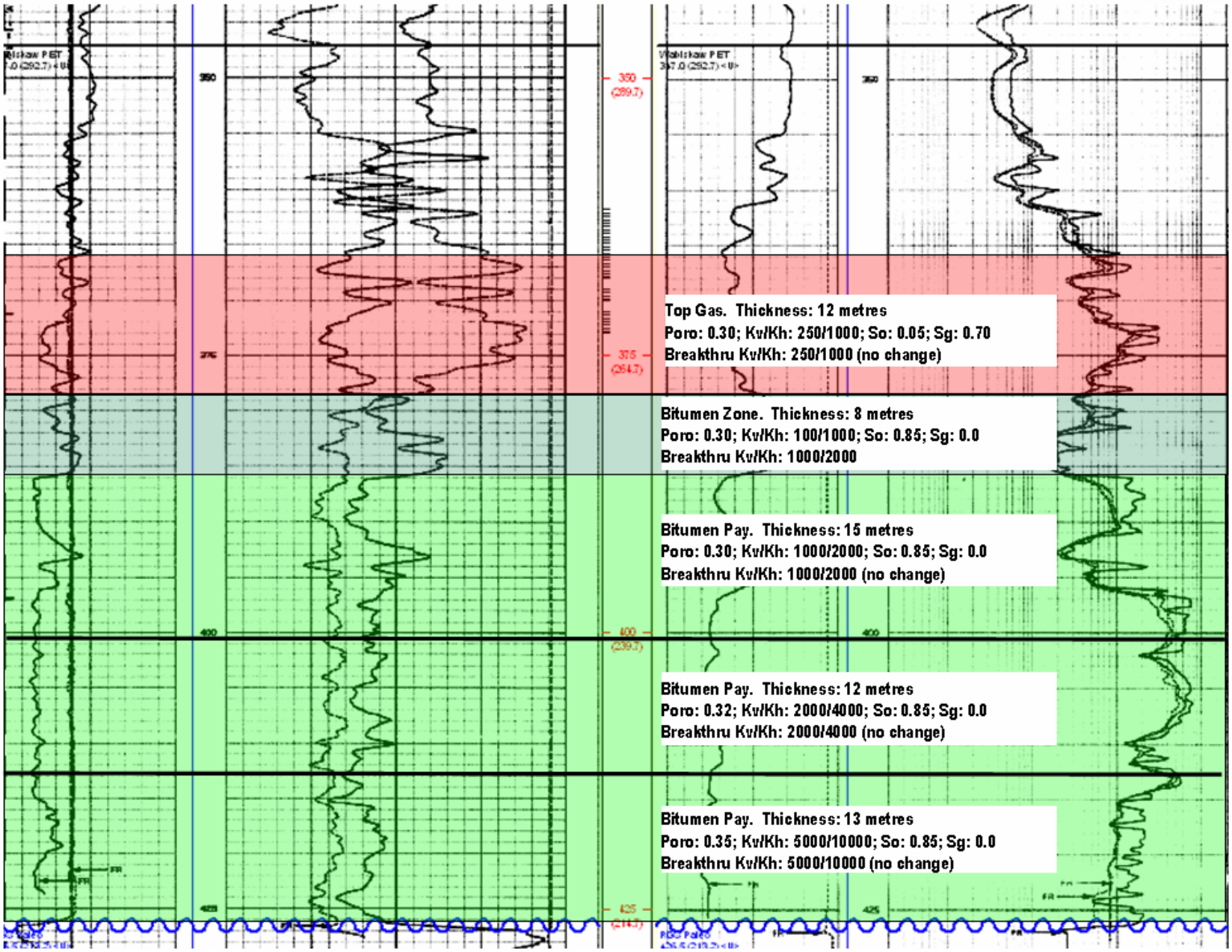
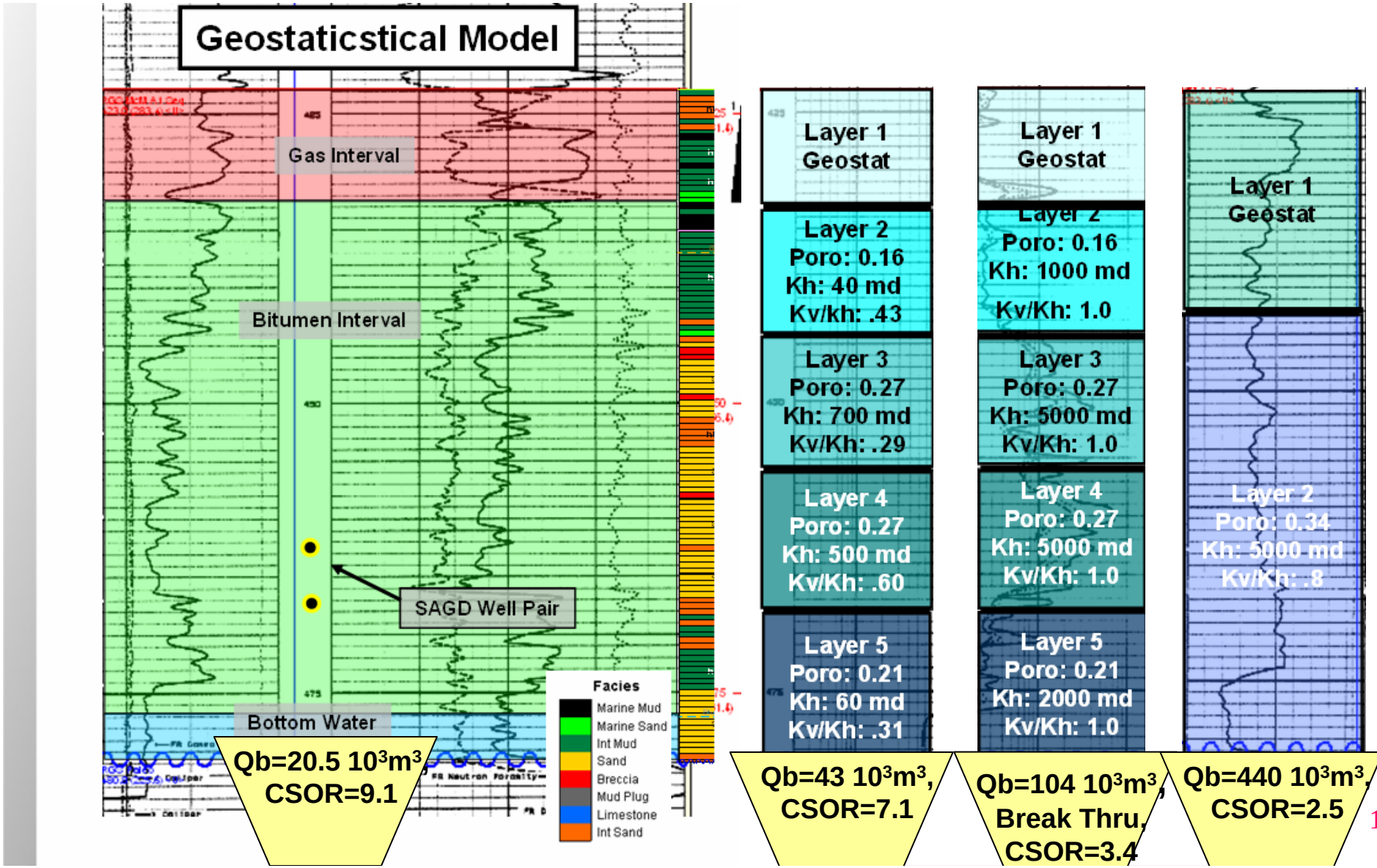
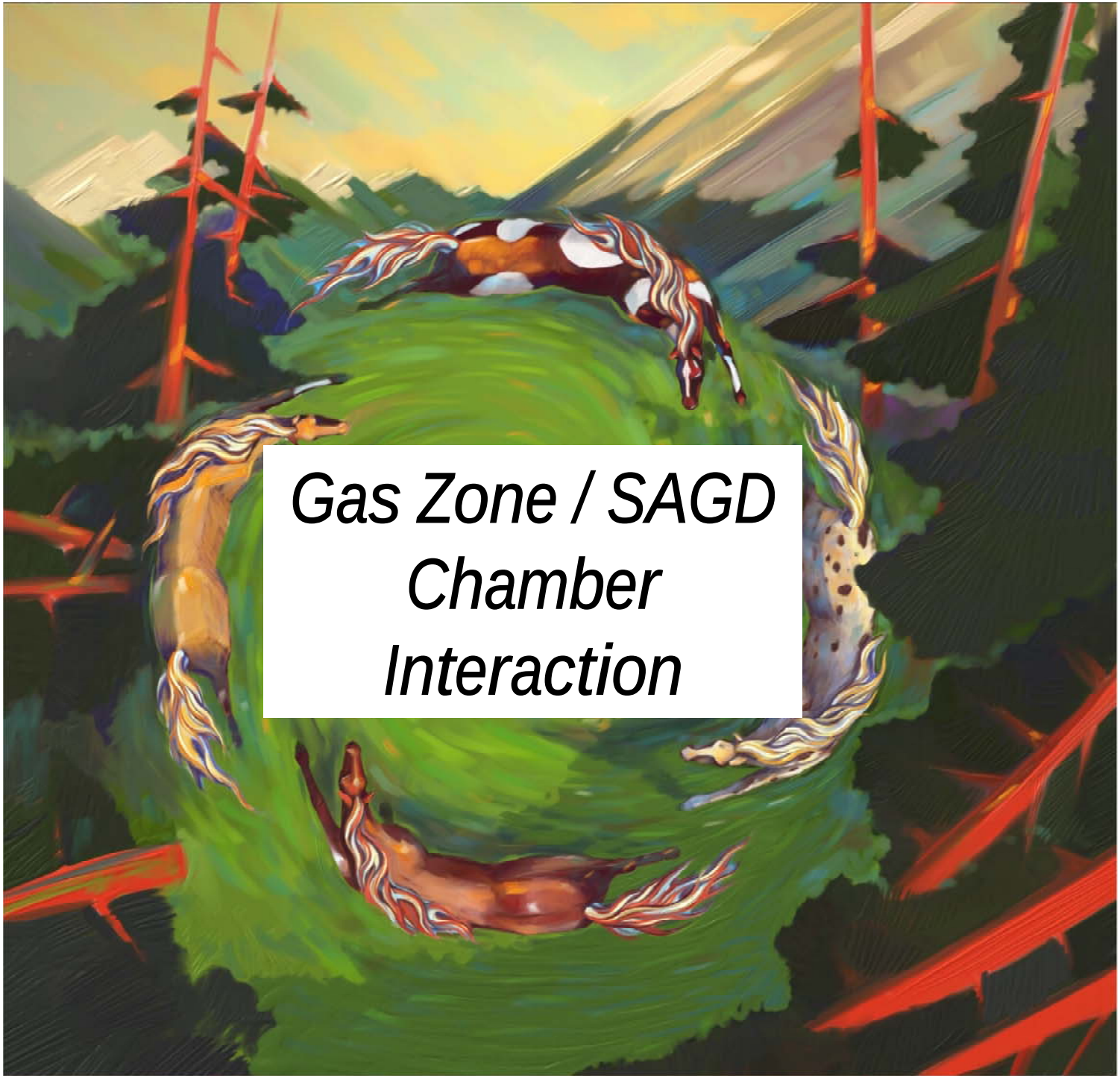
Chard 00/11-22-81-7W4: Simulation Grid & Properties



11-19-81-9W4: Heterogeneity Sensitivity

Decreasing Heterogeneity





Gas Zone / SAGD Chamber Interaction

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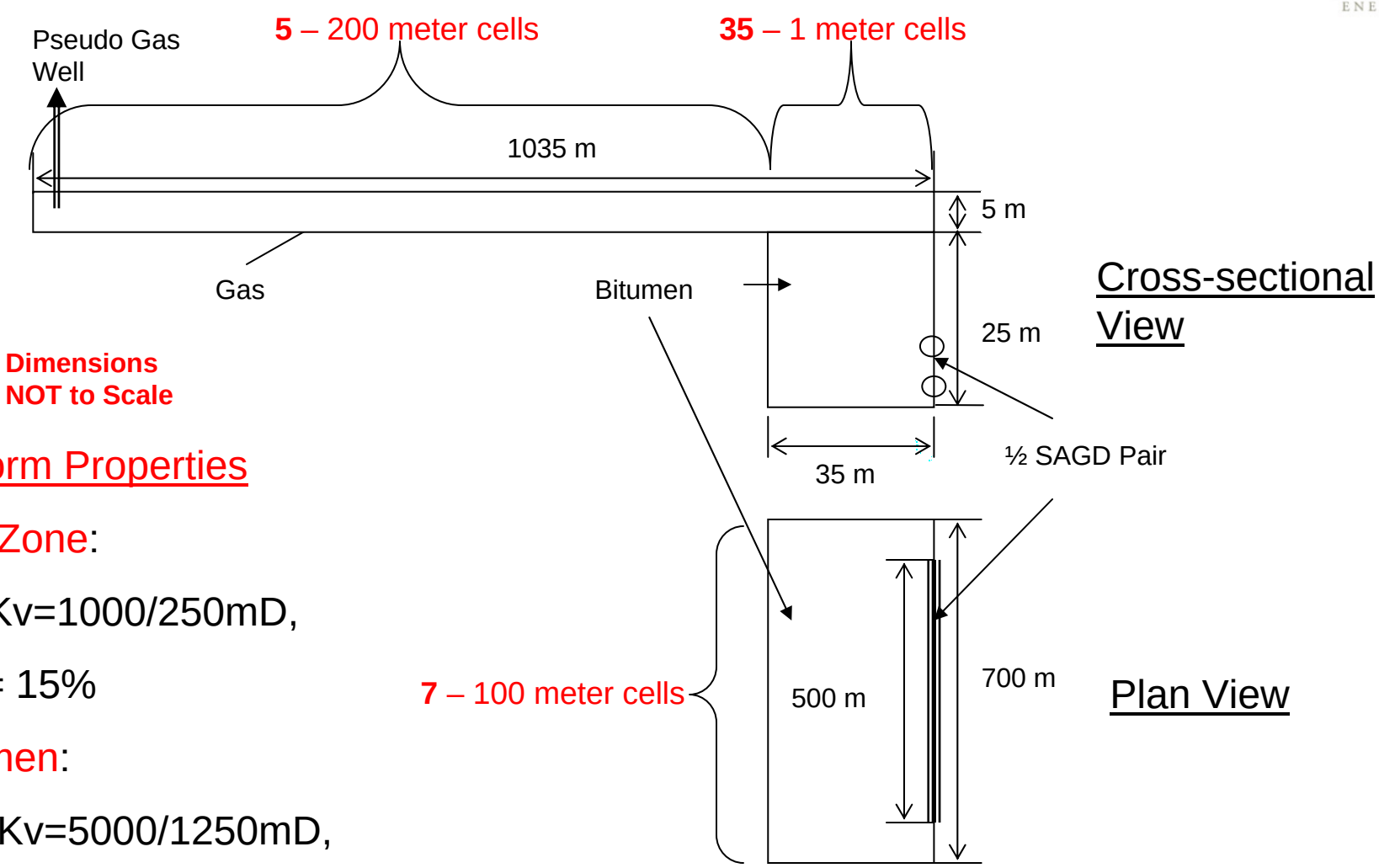
3D SAGD Models



Dimensions NOT to Scale

Cross-sectional View

Plan View

Uniform Properties

Gas Zone:

- Kh/Kv=1000/250mD,
- Sw= 15%

Bitumen:

- Kh/Kv=5000/1250mD,
- Sw= 18%

Pressure, kPa

3D SAGD Models

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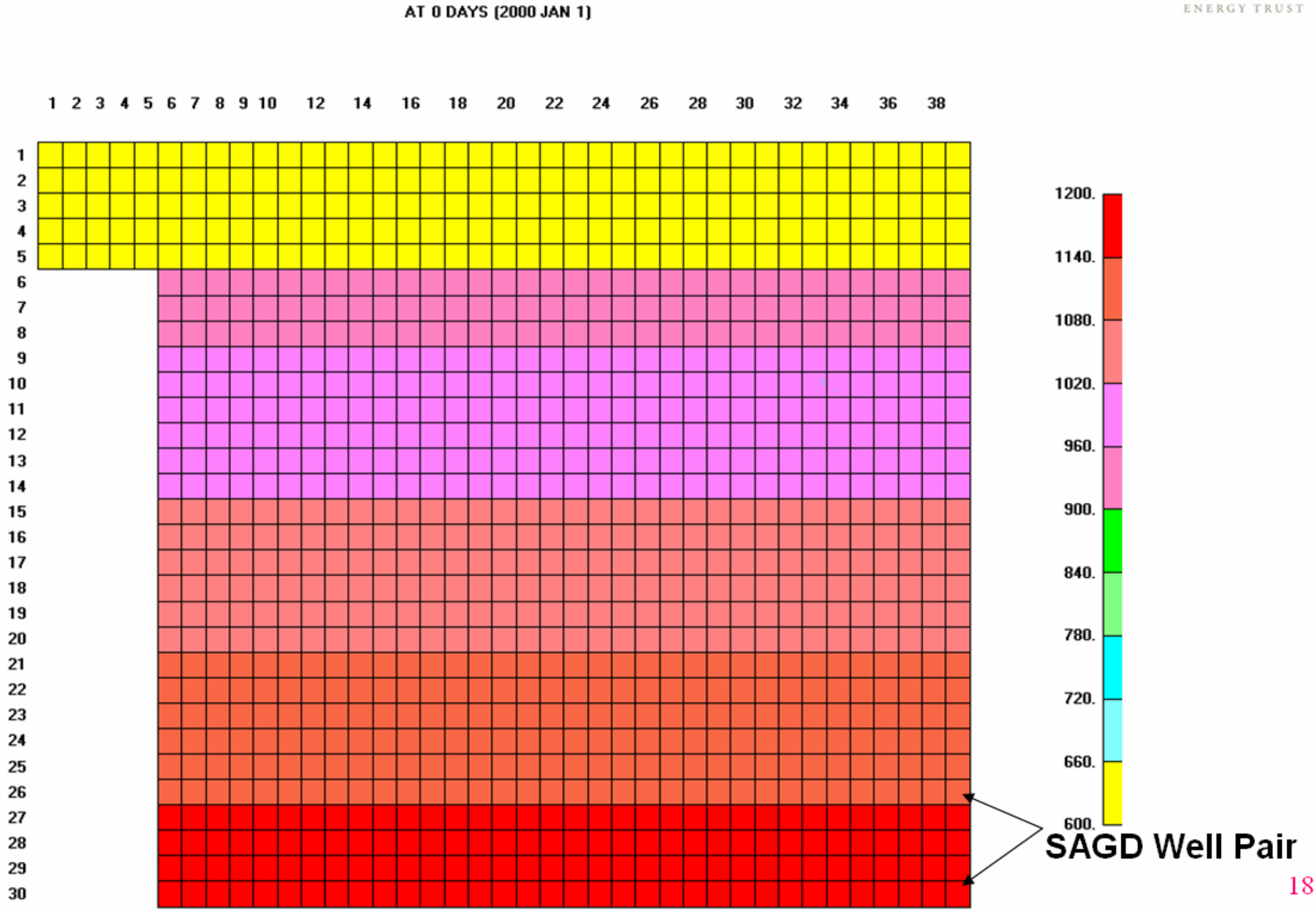

Pressure, kPa

3D SAGD Models

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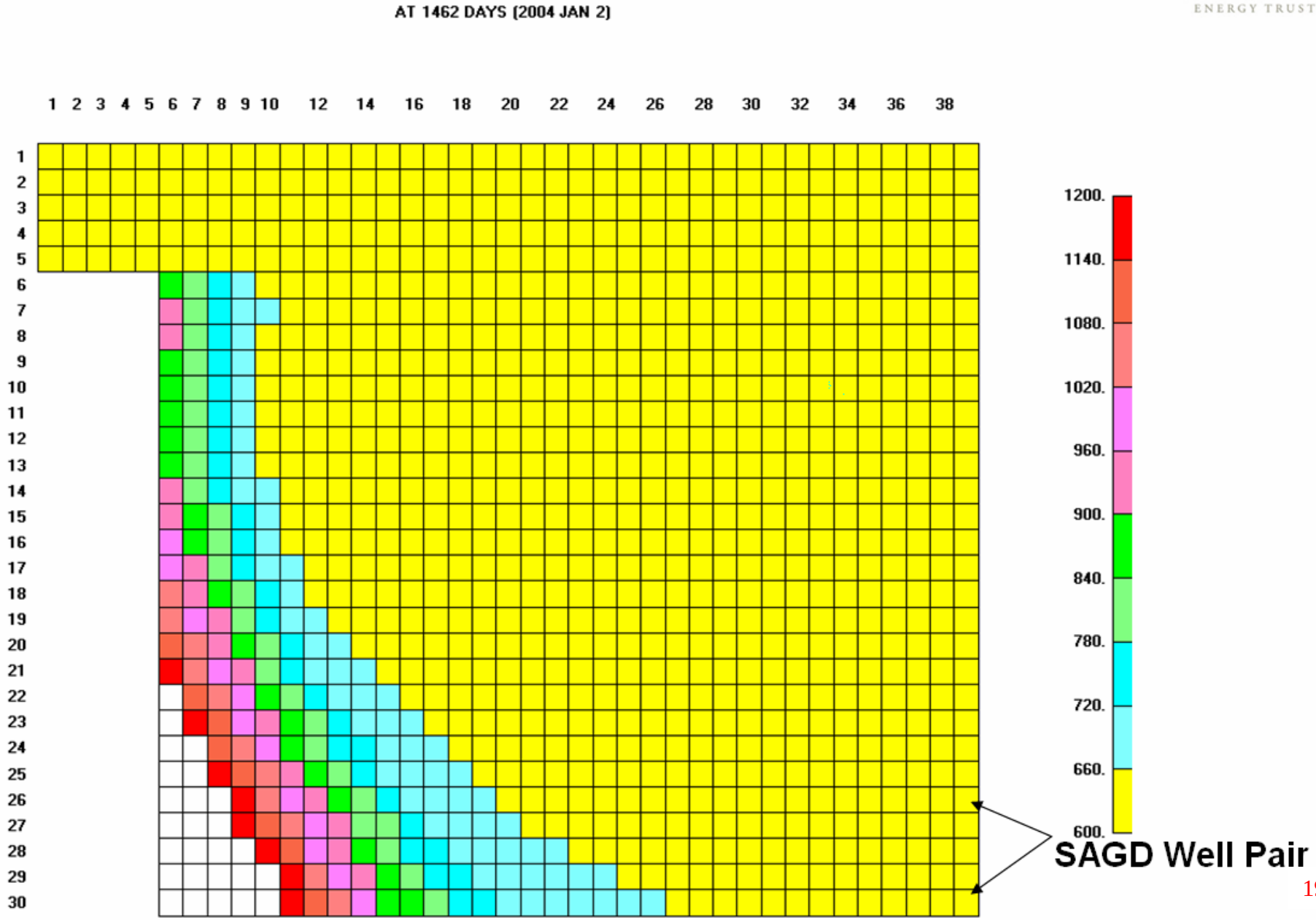

Temperature, ºC

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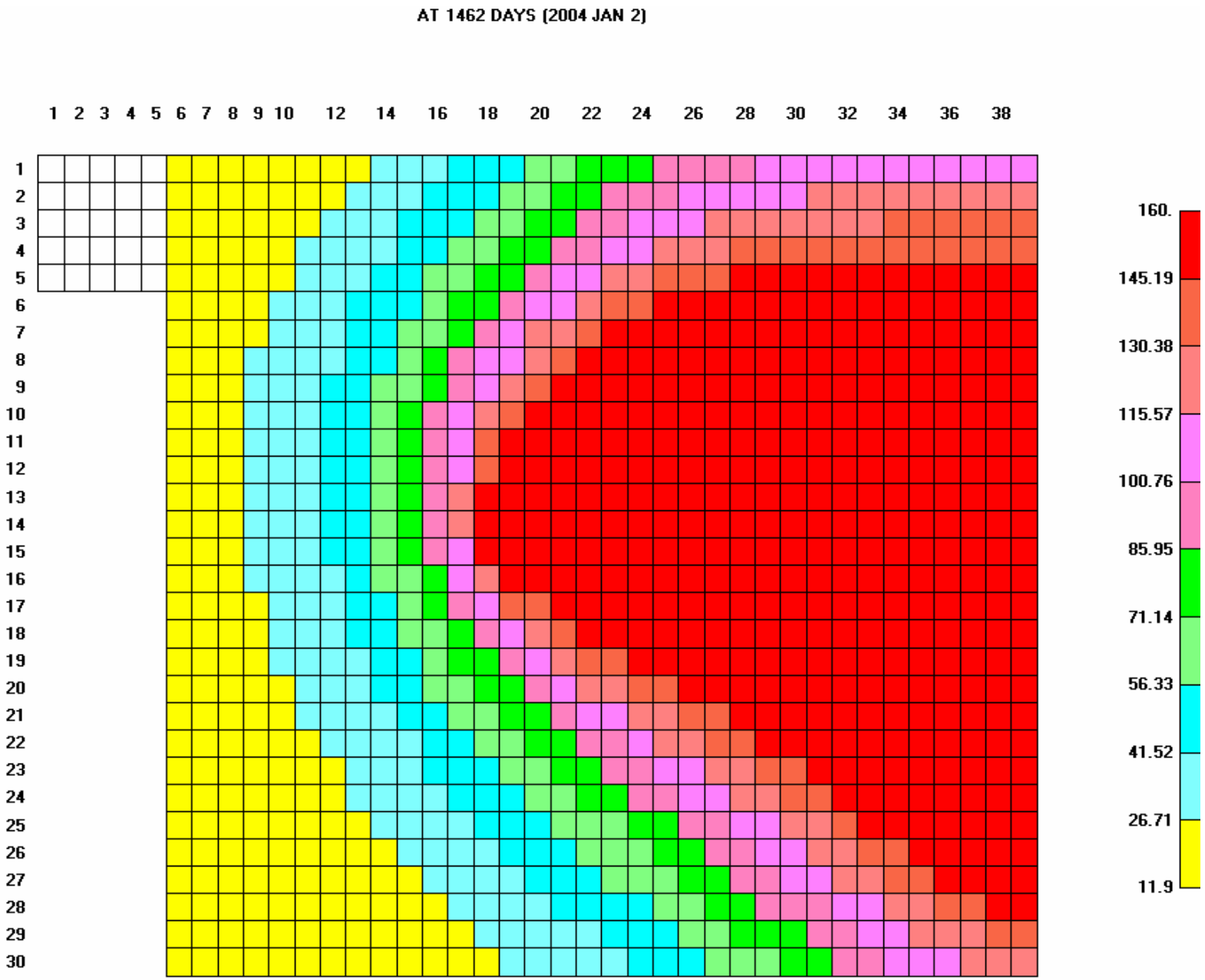

Temperature, °C

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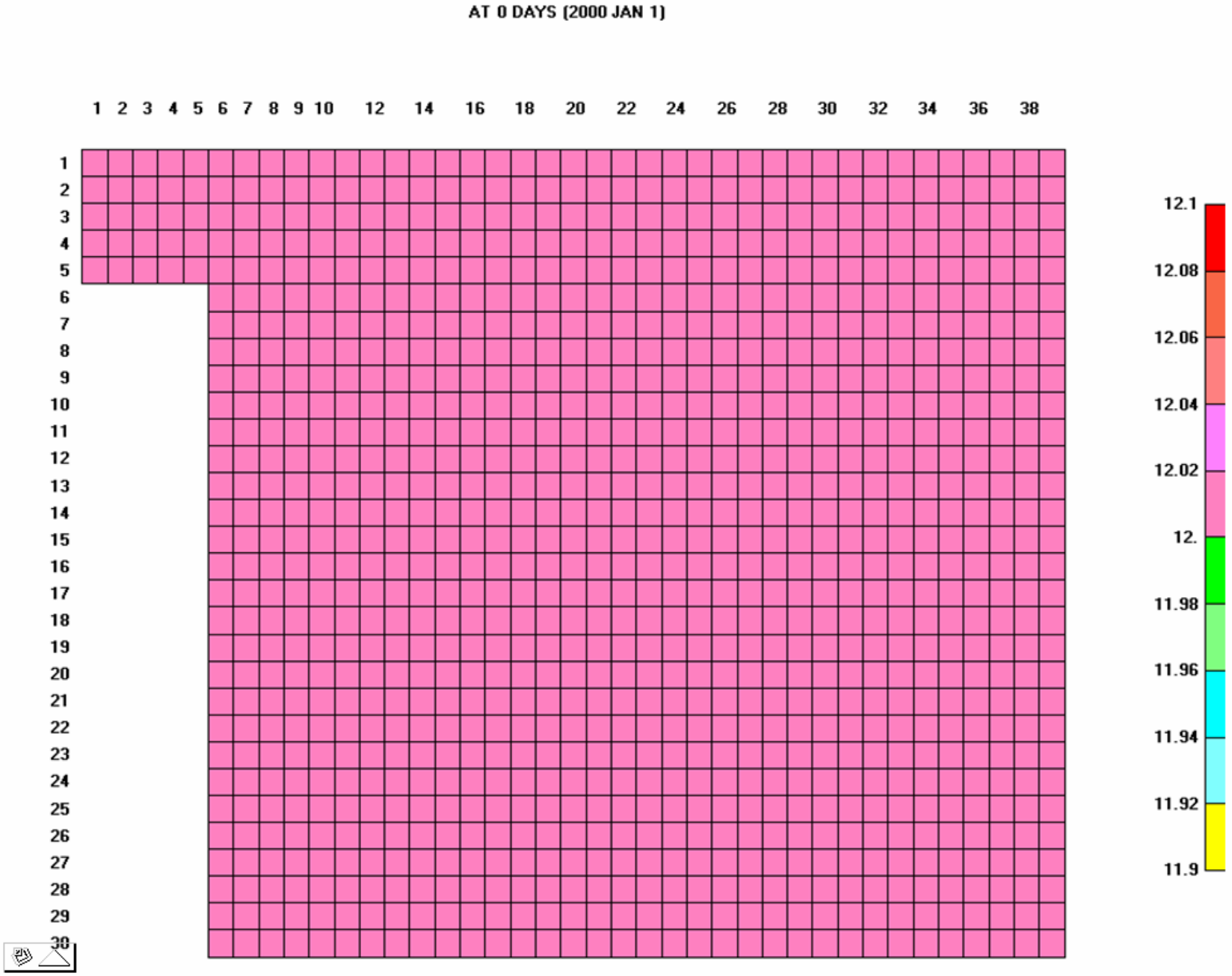

Temperature, ºC

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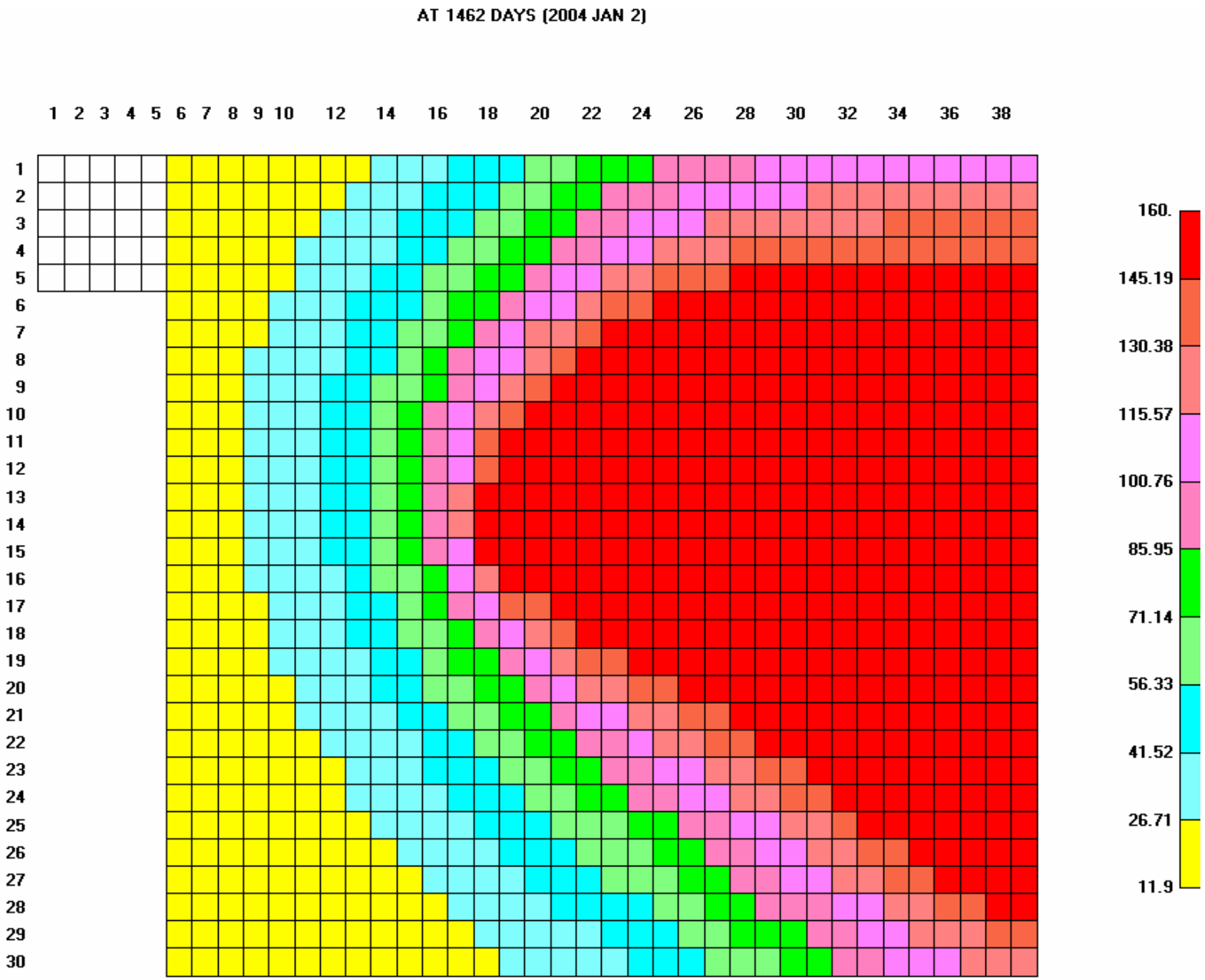

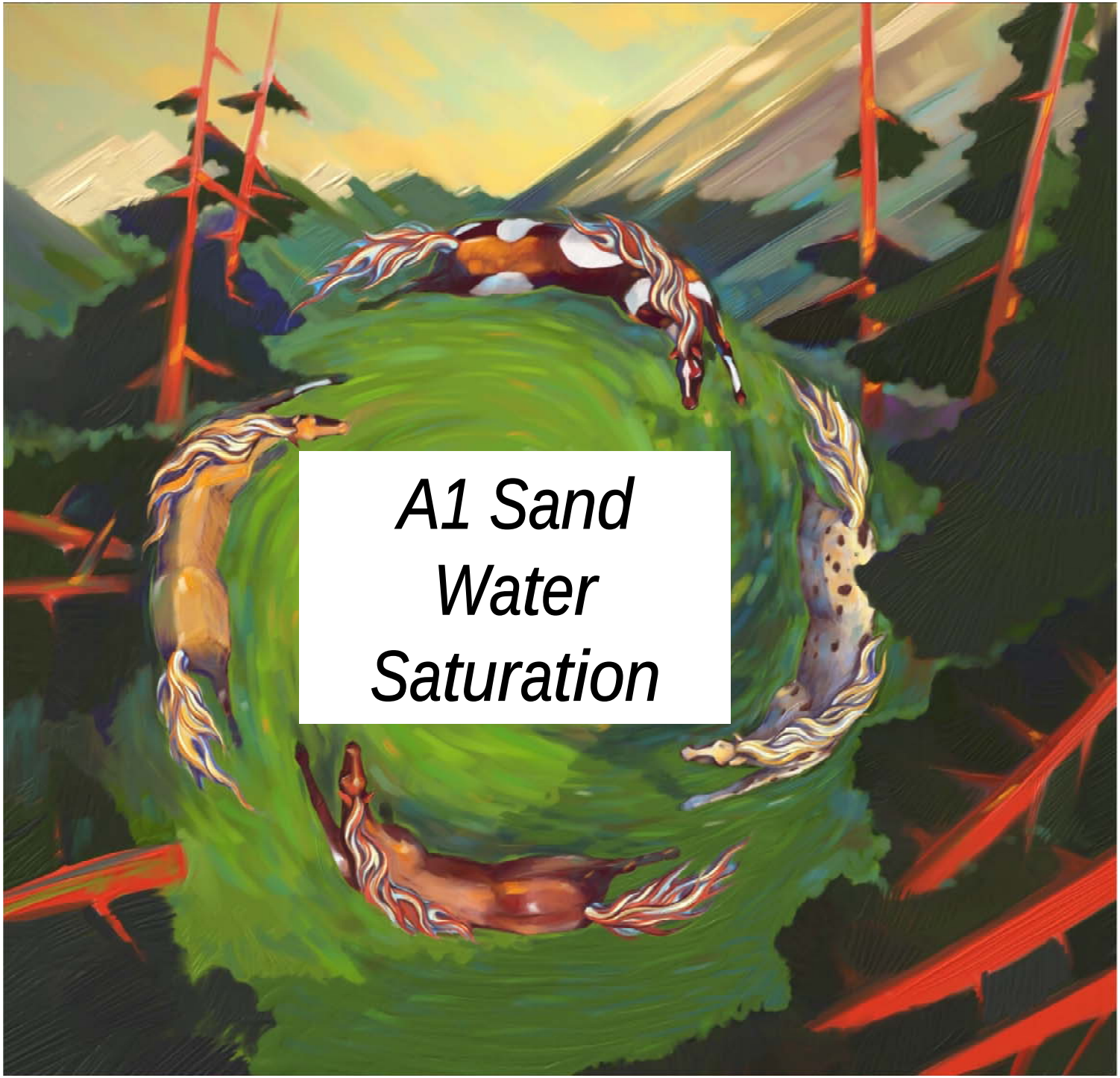

A1 Sand Water Saturation

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Sw Revisions

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A1 Water Saturation Modifications

Initial version of the Field models:

- ***Very low aggregate pool pressure, all models***
- ***Excessively low Well Block Pressure … Dynamic***
- ***Input or historical gas rate was not maintained.***
- ***Average A1 Sg from Log Analysis ~ 40-50%***

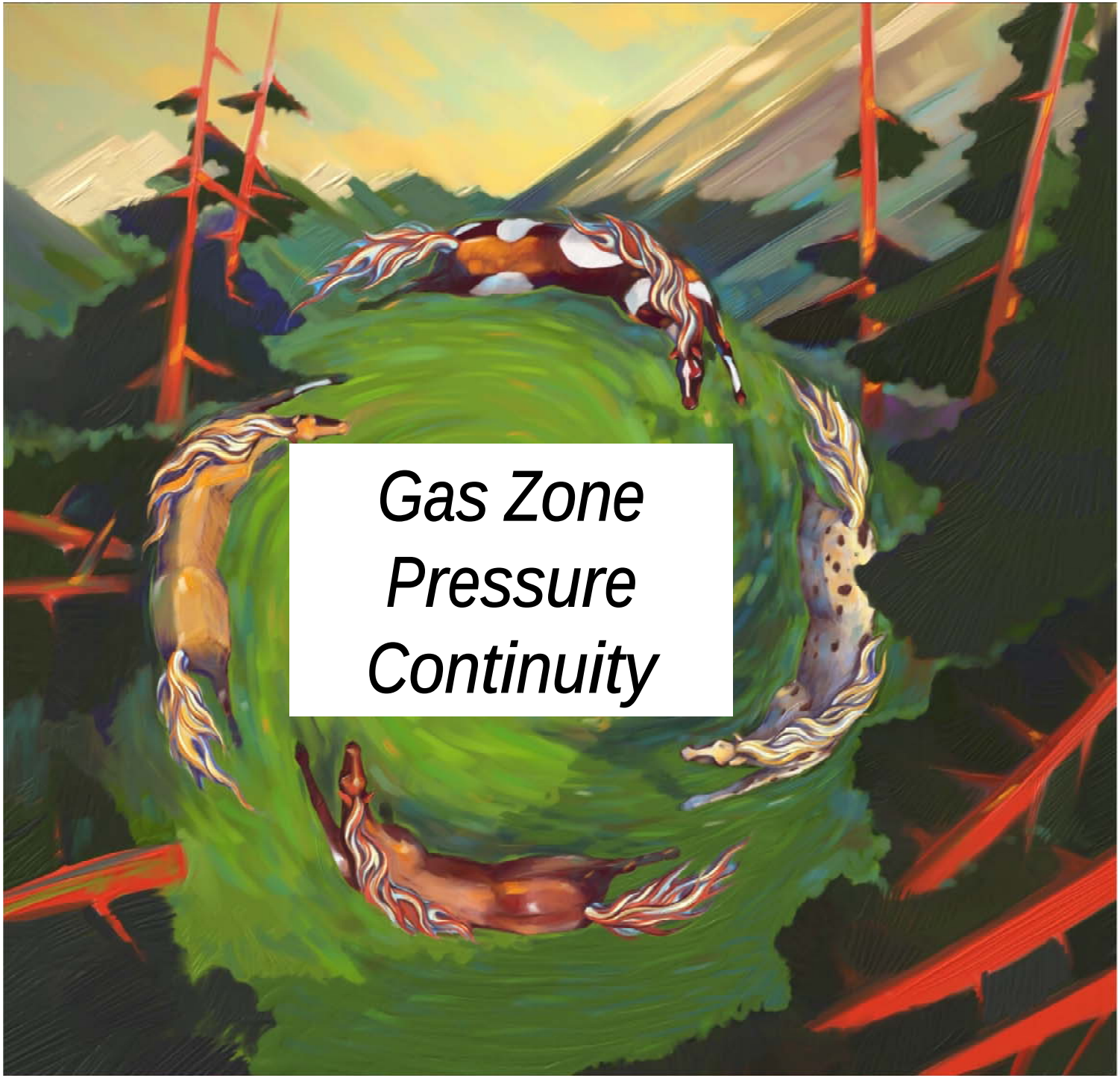
Additional mobile gas was required!

Potential Solutions to Increase Mobile Gas Volume within Gas Zones:

- ***Incremental Porosity***
- ***Incremental Net Thickness***
- ***Incremental Gas Saturation…Sw***
- ***Incremental Area***

Revised Sw:

- ***Limited saturation data from core***
- ***Invasion of drilling mud – Gas Zone***
- ***Shale content masked by Gas Effect***
- ***No specific Rw Data***



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11-19 2D SAGD

Hangingstone X , 11-19 , 600 kPa , original reservoir Pressure at initial and start SAGD

340 Grid Cells