# MULTICOMPONENT PROCESSING AND INTERPRETATION OF SEISMIC DATA FROM THE JACKFISH HEAVY OIL PROJECT

KAREN PENGELLY, LARRY LINES, AND DON LAWTON

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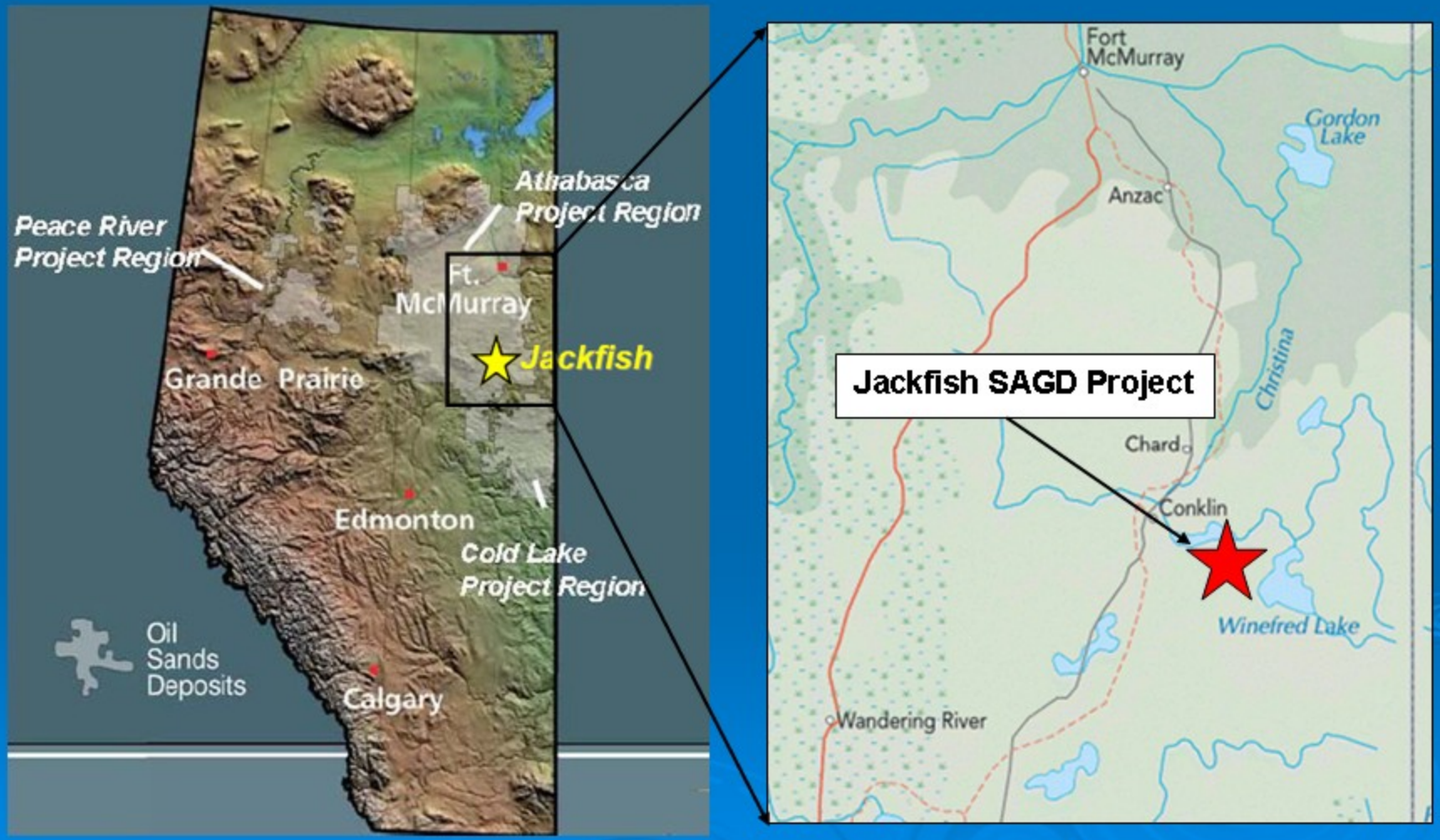
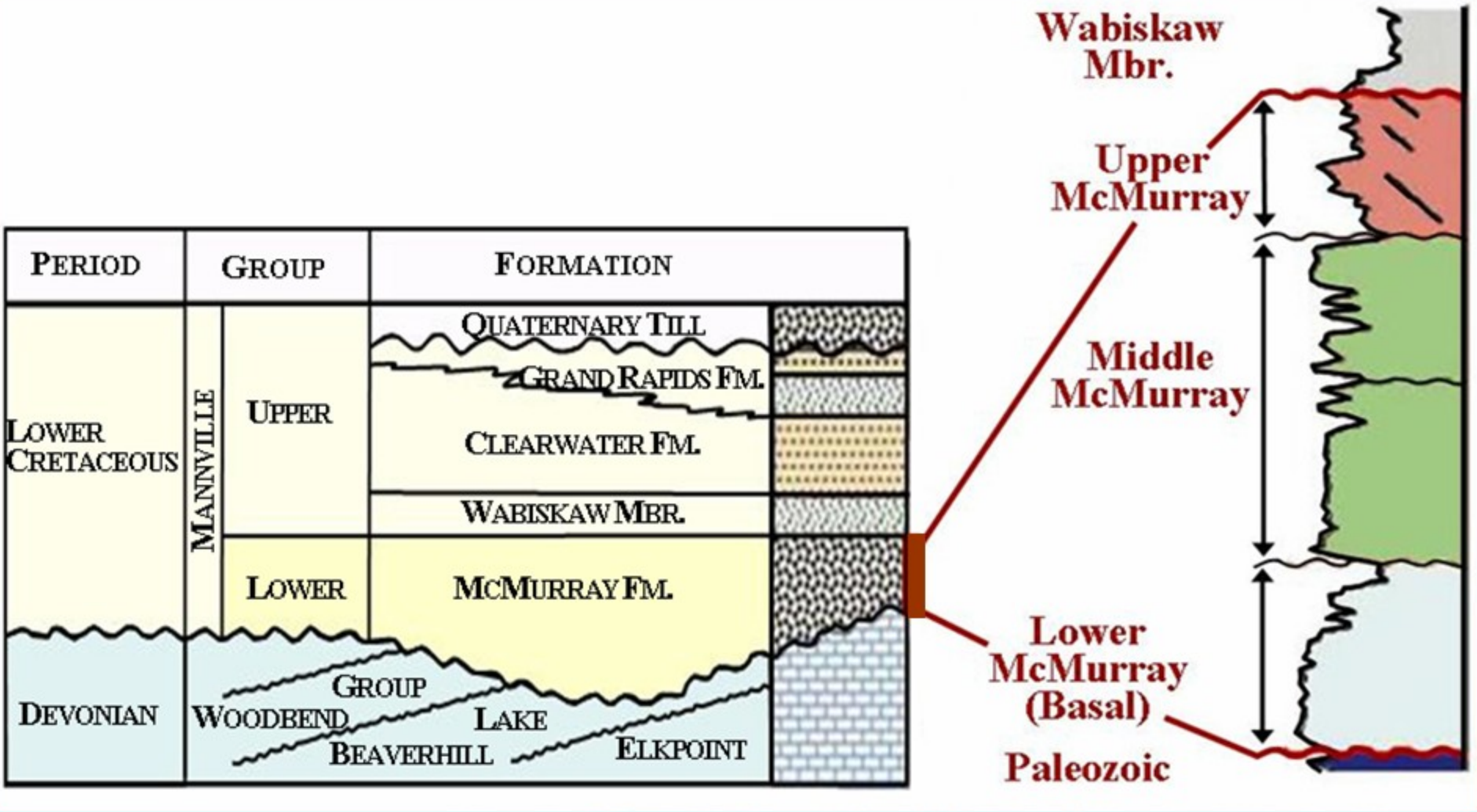
# JACKFISH FIELD LOCATION




(modified from Multimap online mapping software and Devon Canada, 2005)

# REGIONAL GEOLOGY

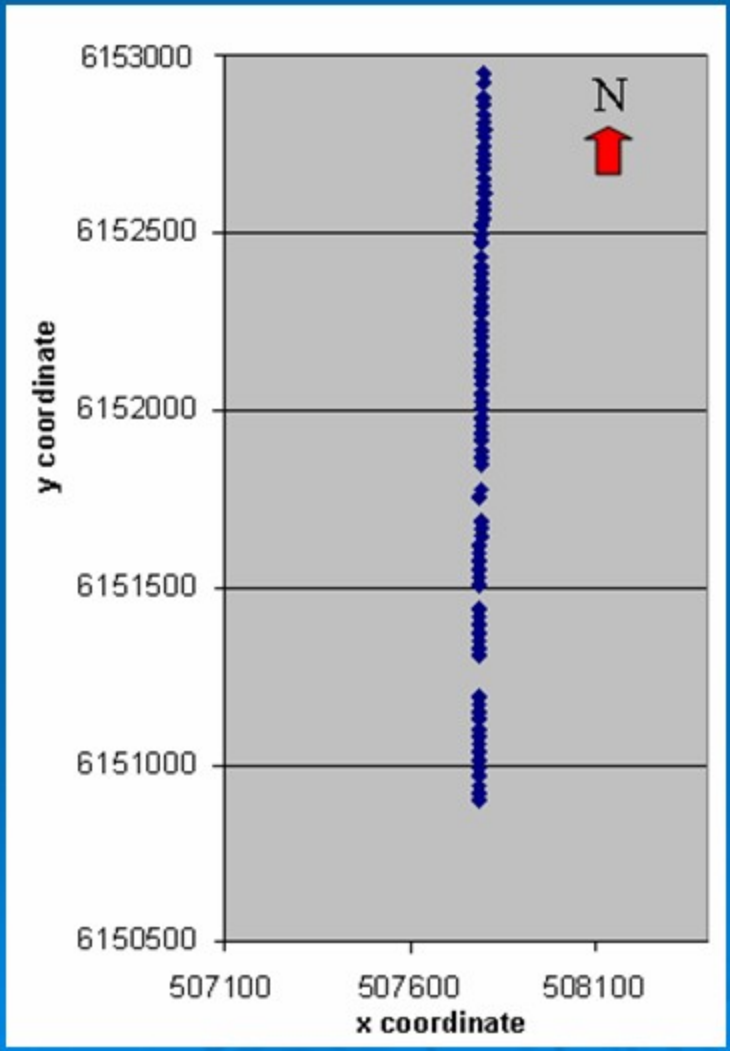



(modified from Zhang, et al., 2002 )

# ACQUISITION PARAMETERS

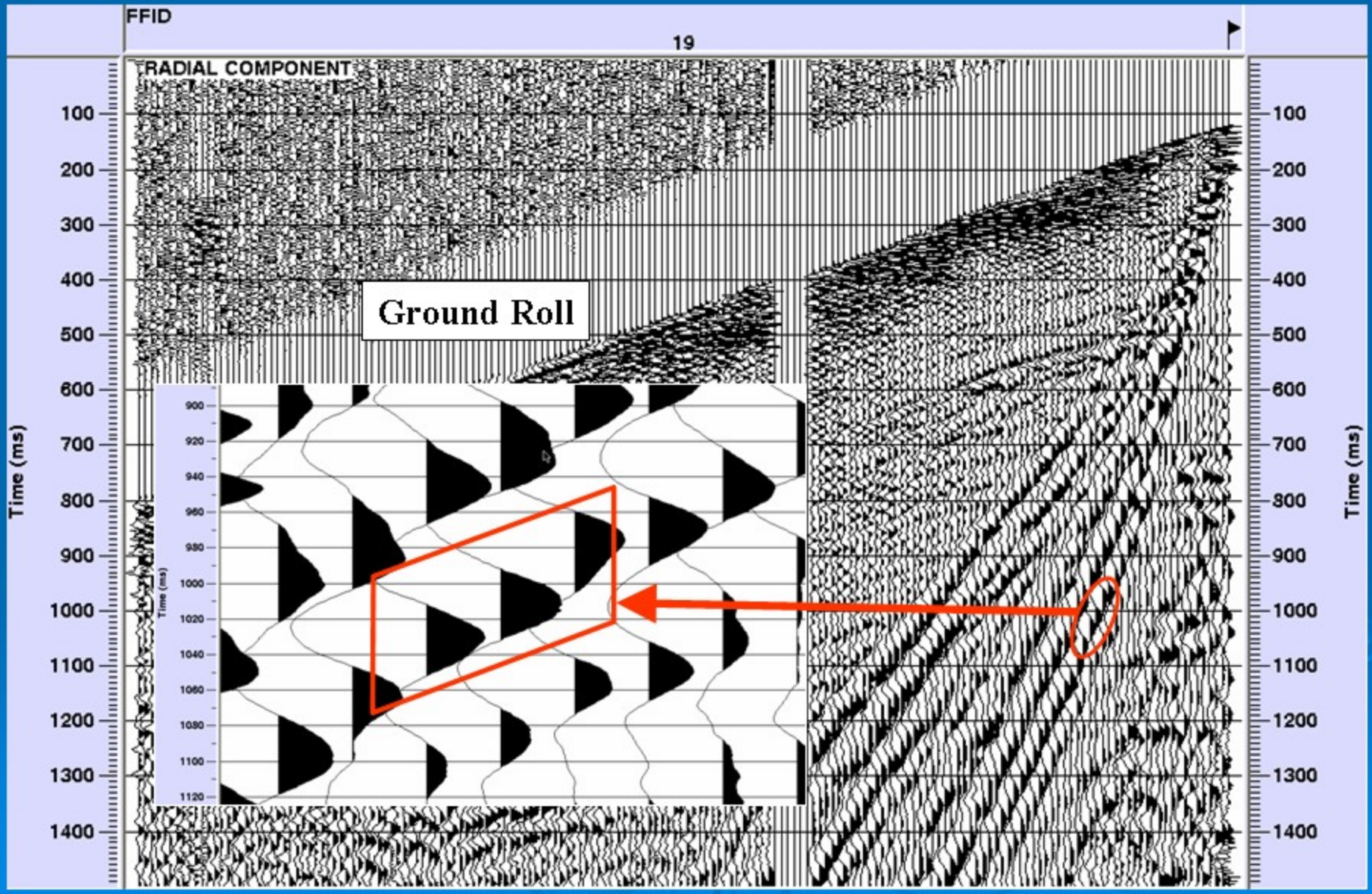
- Vectorseis and conventional data
- Source and receiver spacing = 7.5 m
- Dynamite-10m shot depth
- 3 charge sizes of 60, 125, and 250 grams

# RECEIVER LOCATIONS

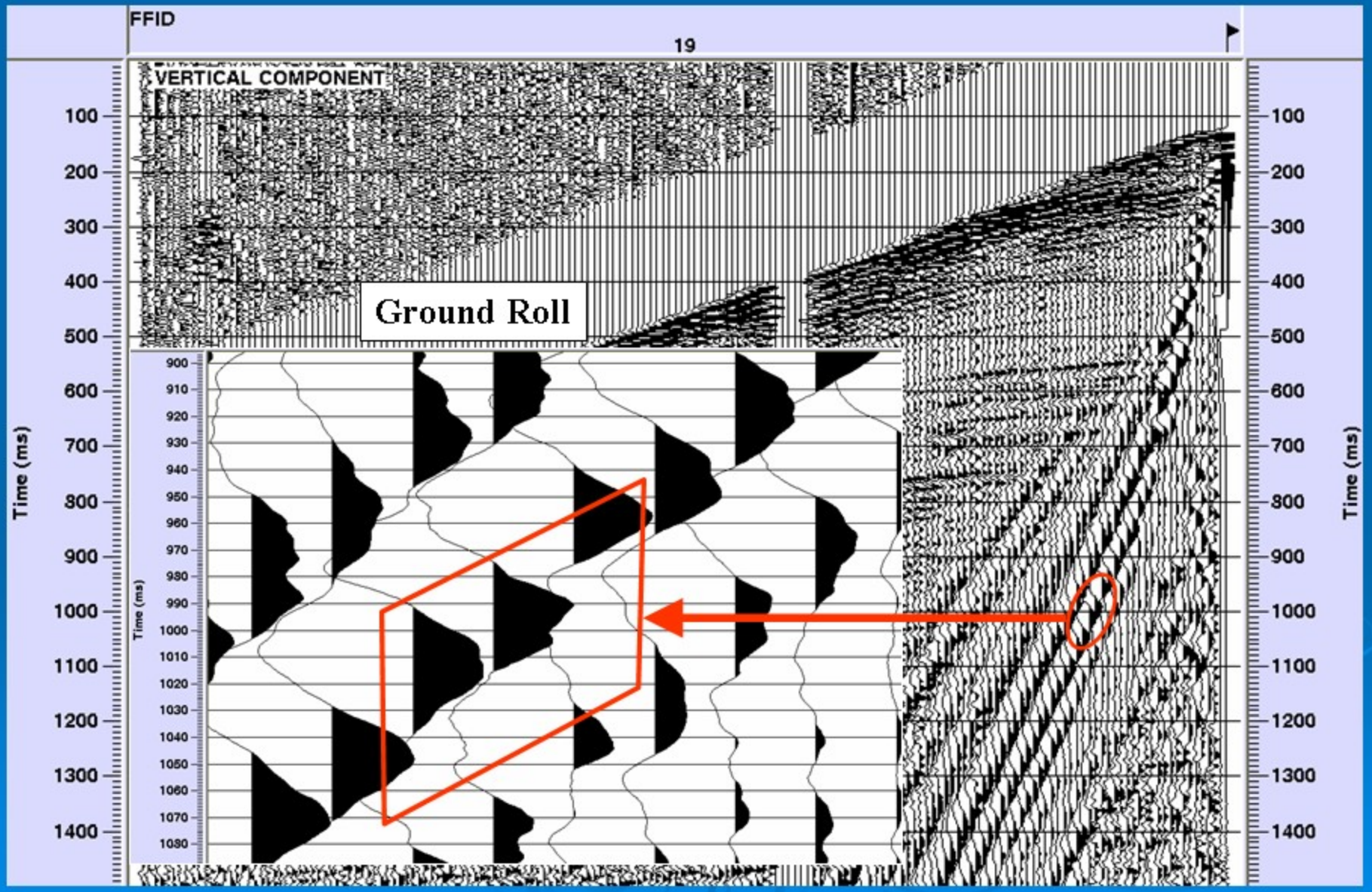


# POLARIZATION ANALYSIS

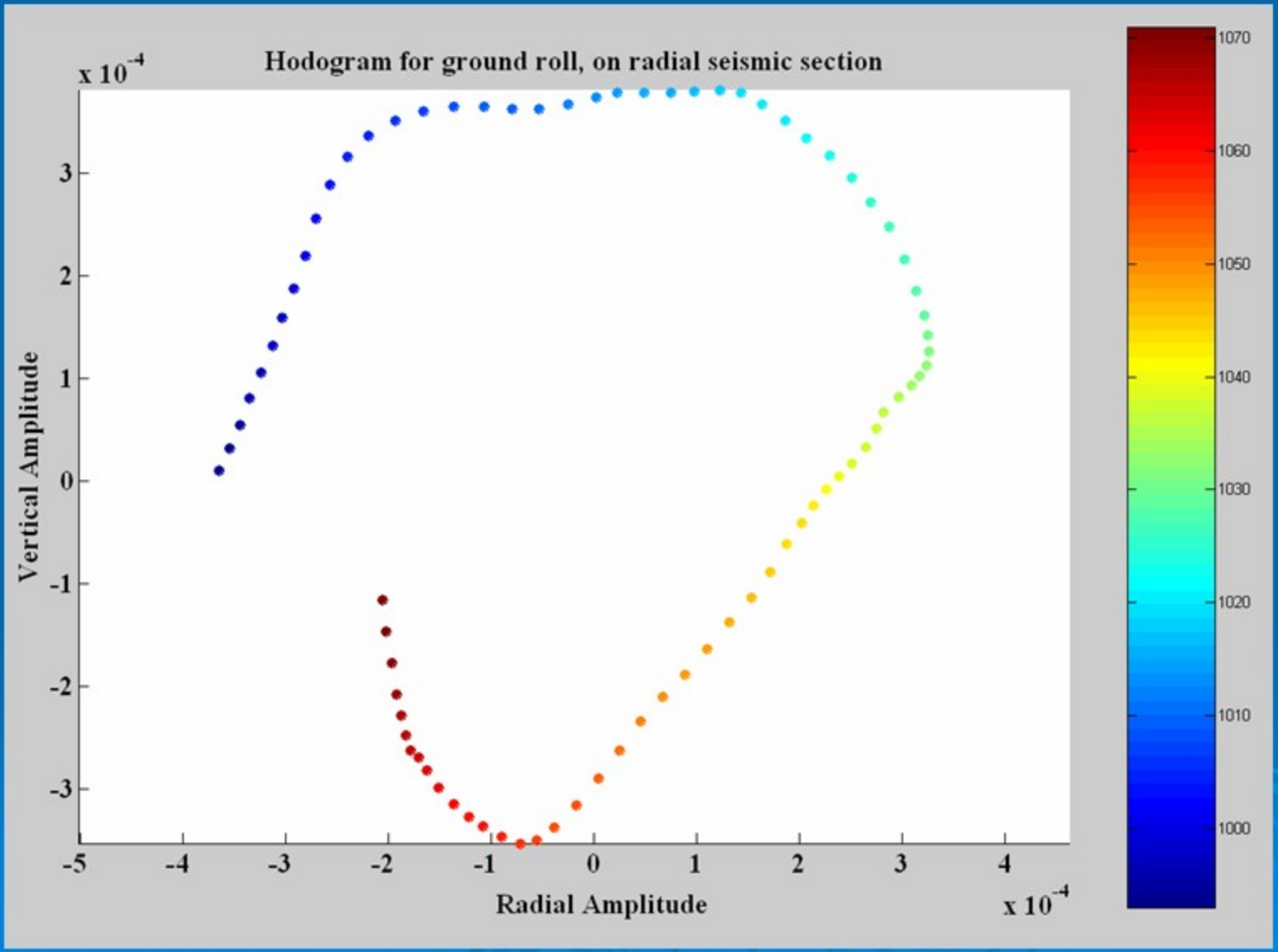
# RADIAL COMPONENT



# VERTICAL COMPONENT

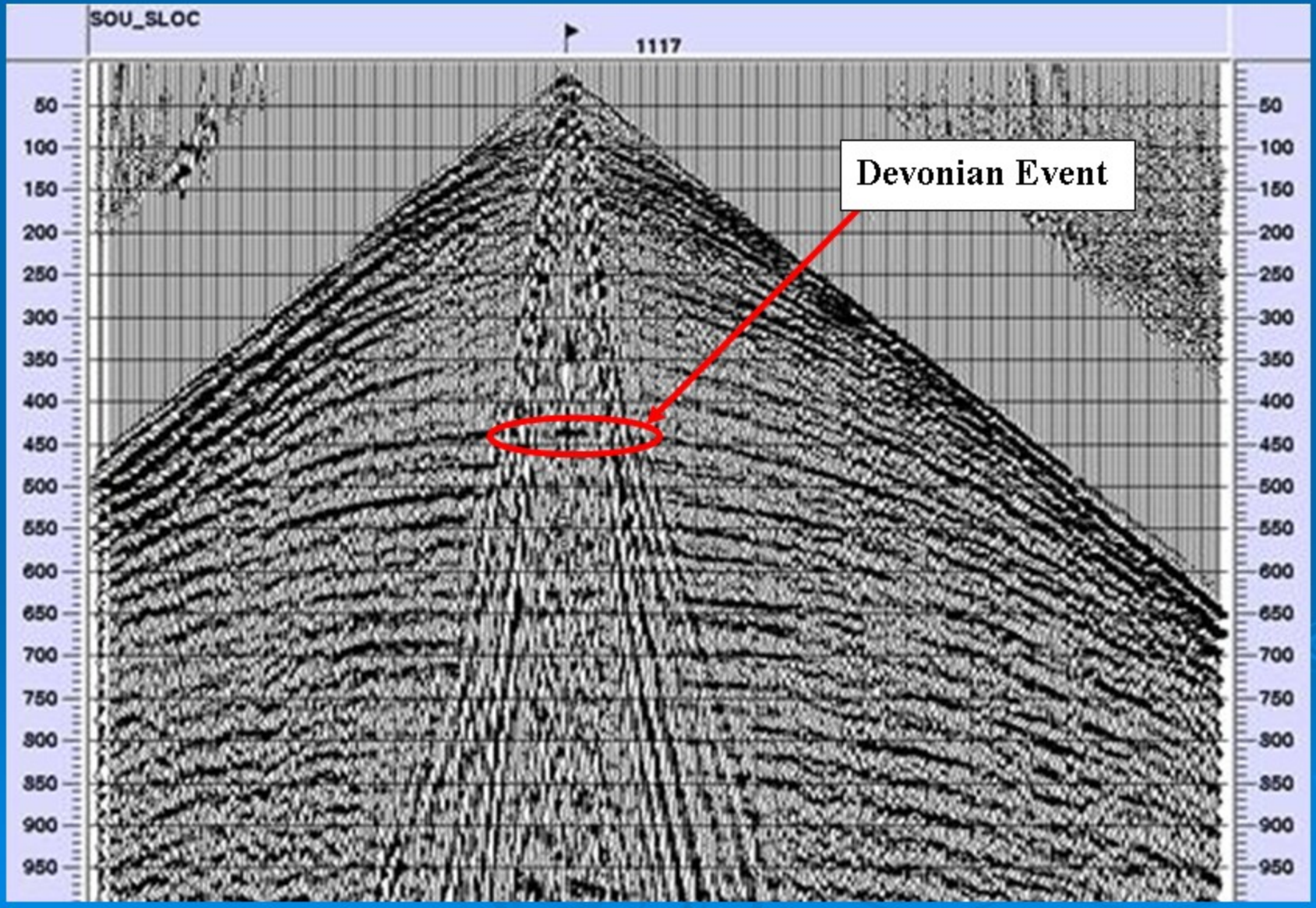


# HODOGRAM OF GROUND ROLL

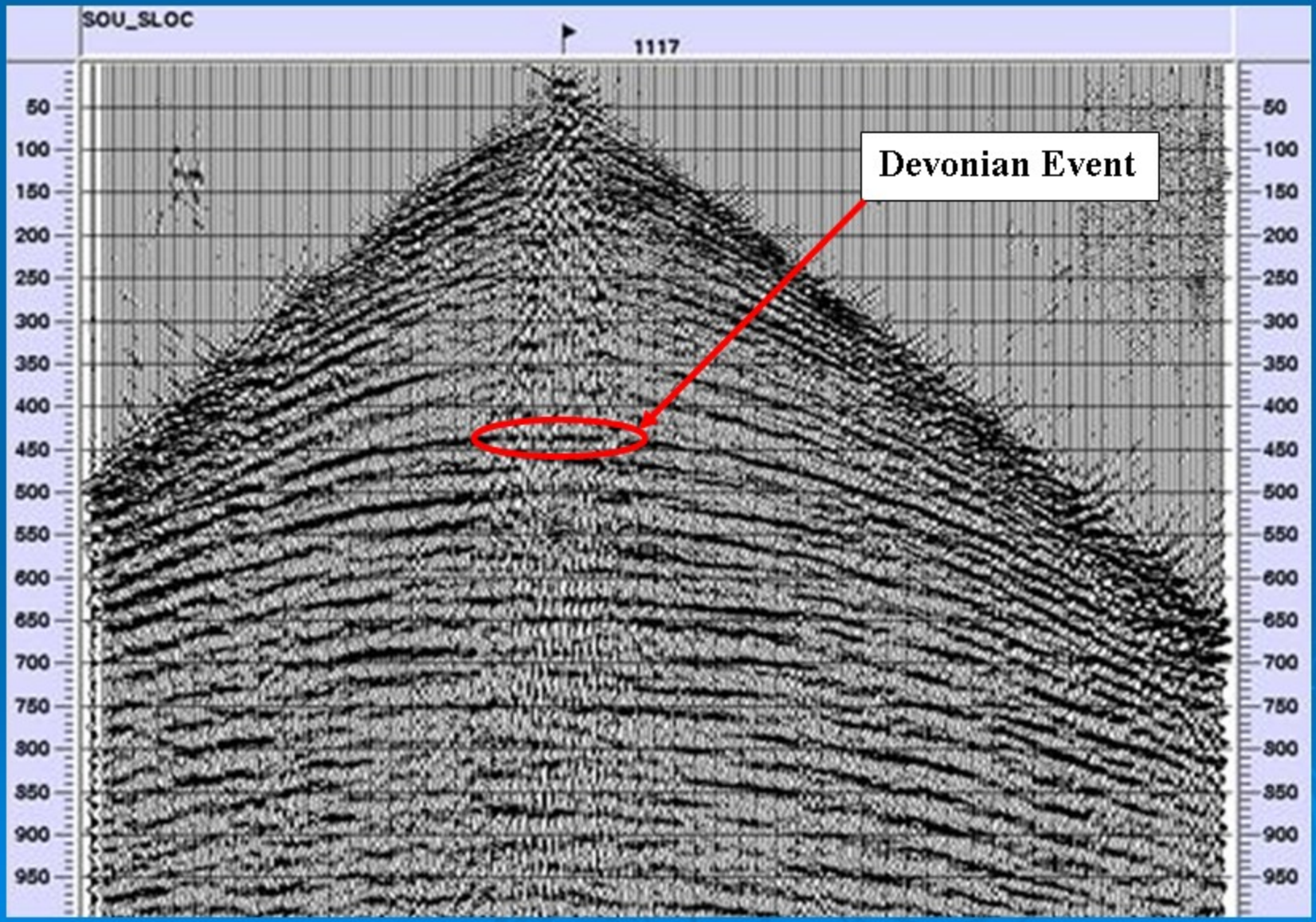


# VERTICAL COMPONENT SEISMIC PROCESSING

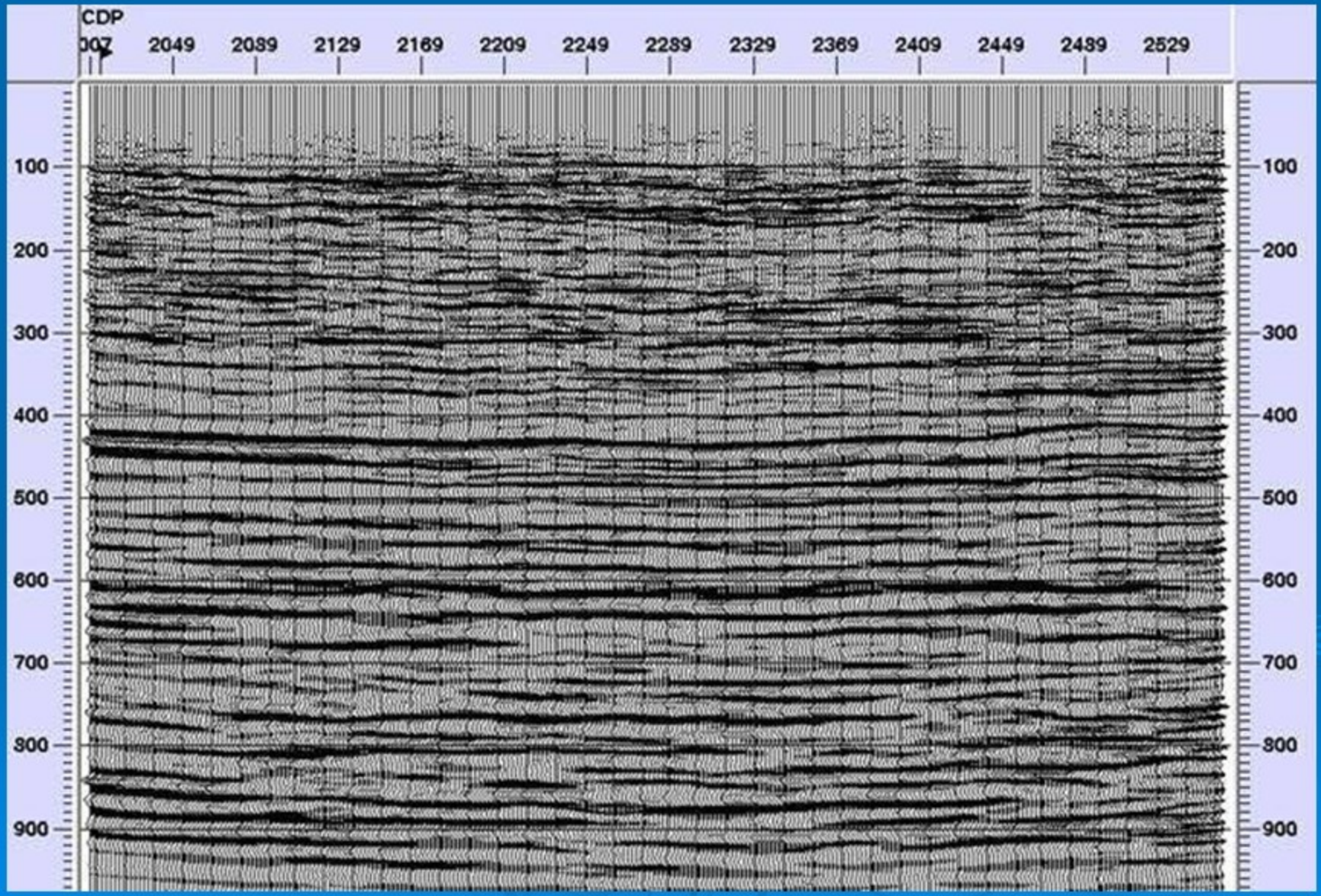
# VERTICAL COMPONENT RAW DATA



# NOISE ATTENUATION

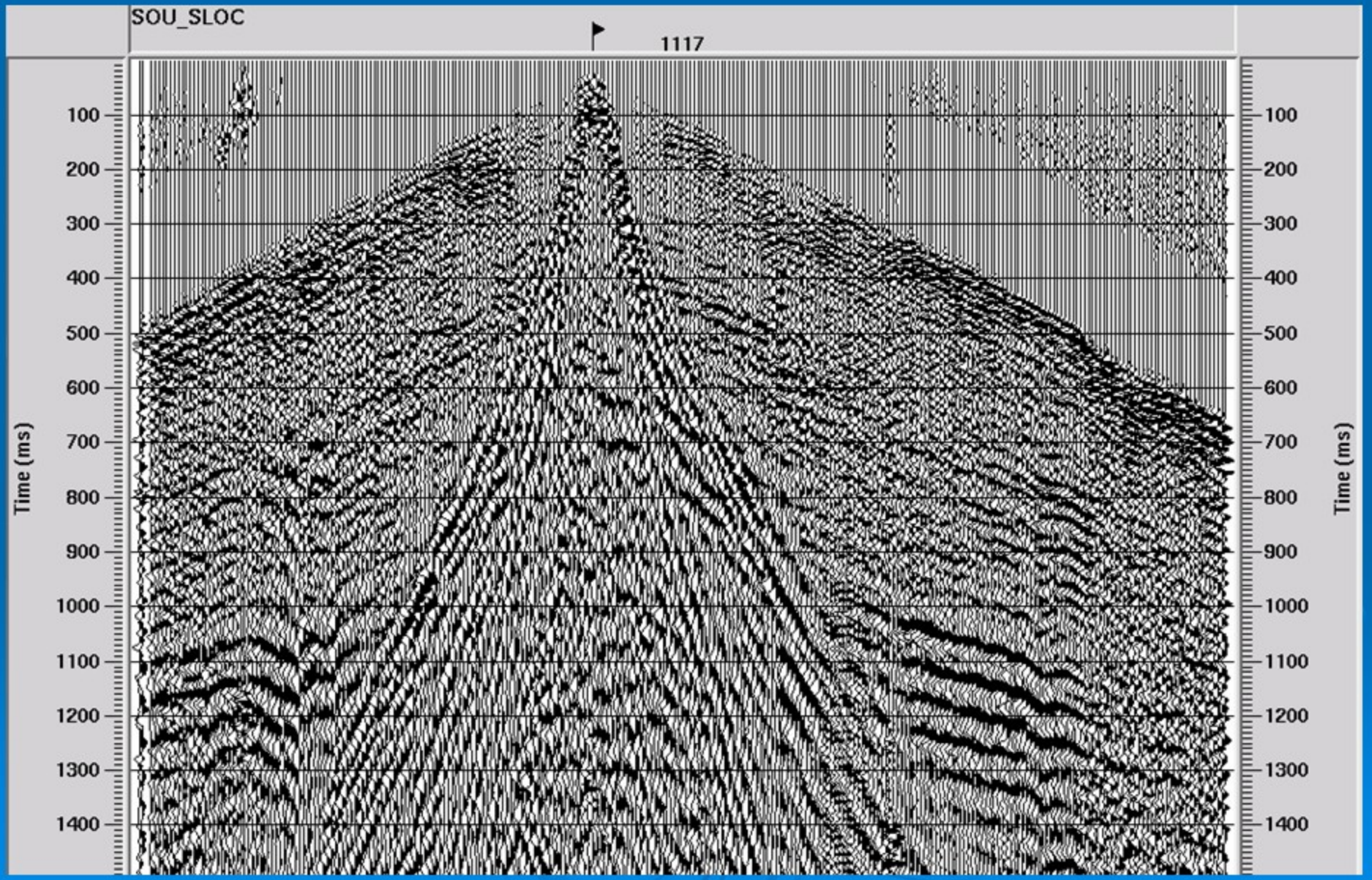


# FINAL MIGRATED SECTION-VERTICAL

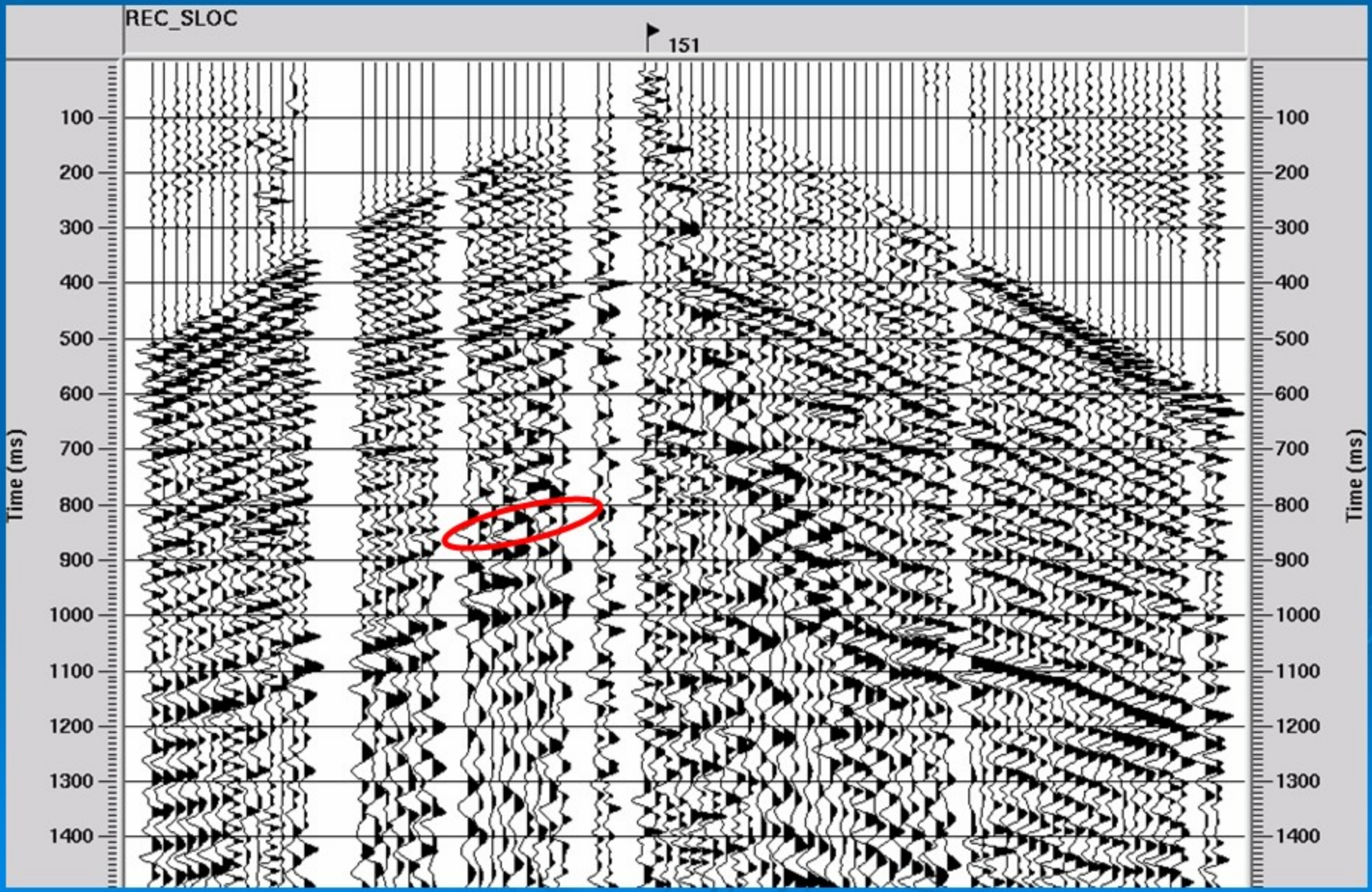


# RADIAL COMPONENT SEISMIC PROCESSING

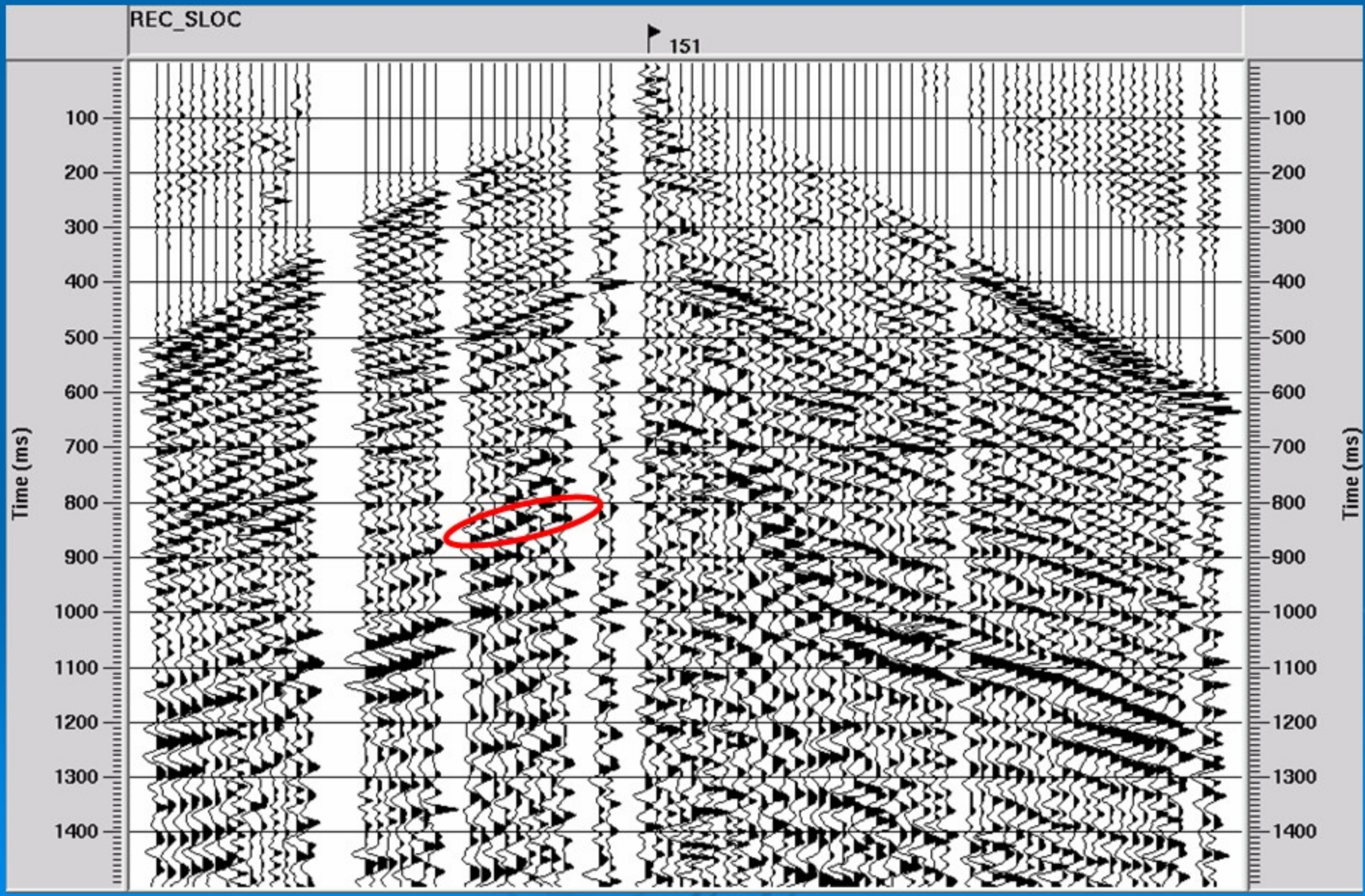
# RADIAL COMPONENT RAW DATA



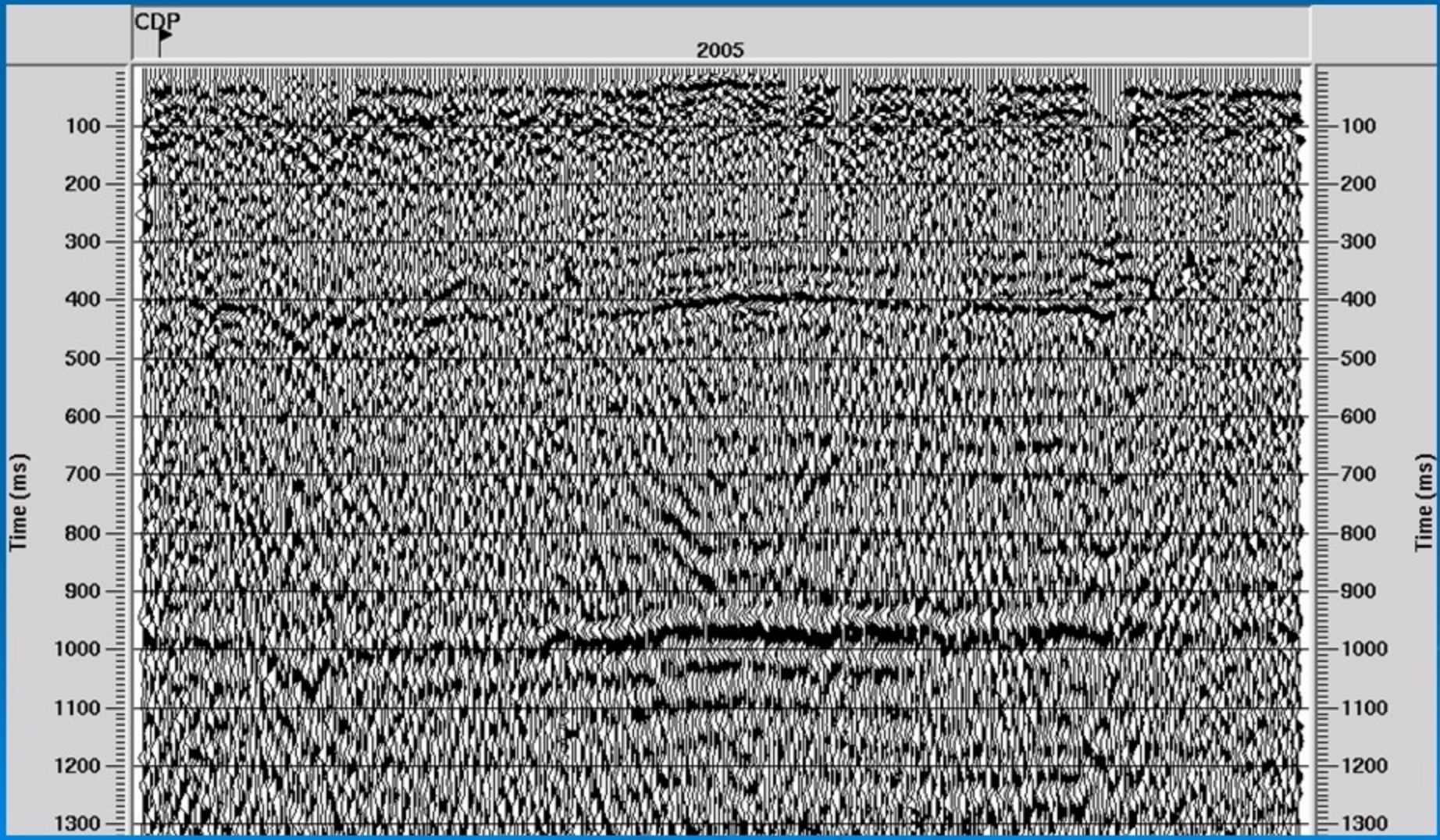
# RECEIVER GATHER



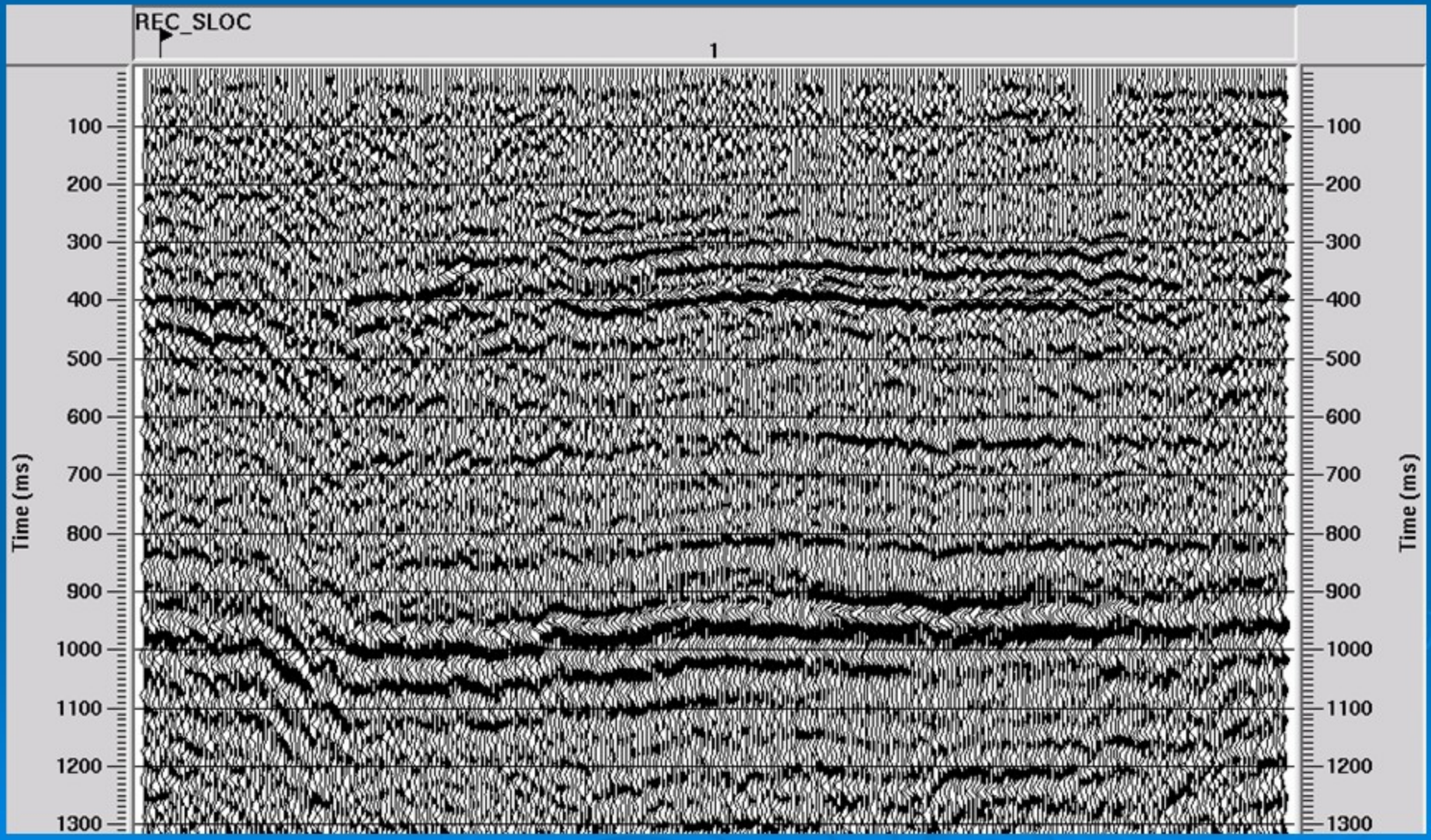
# NOISE ATTENUATION



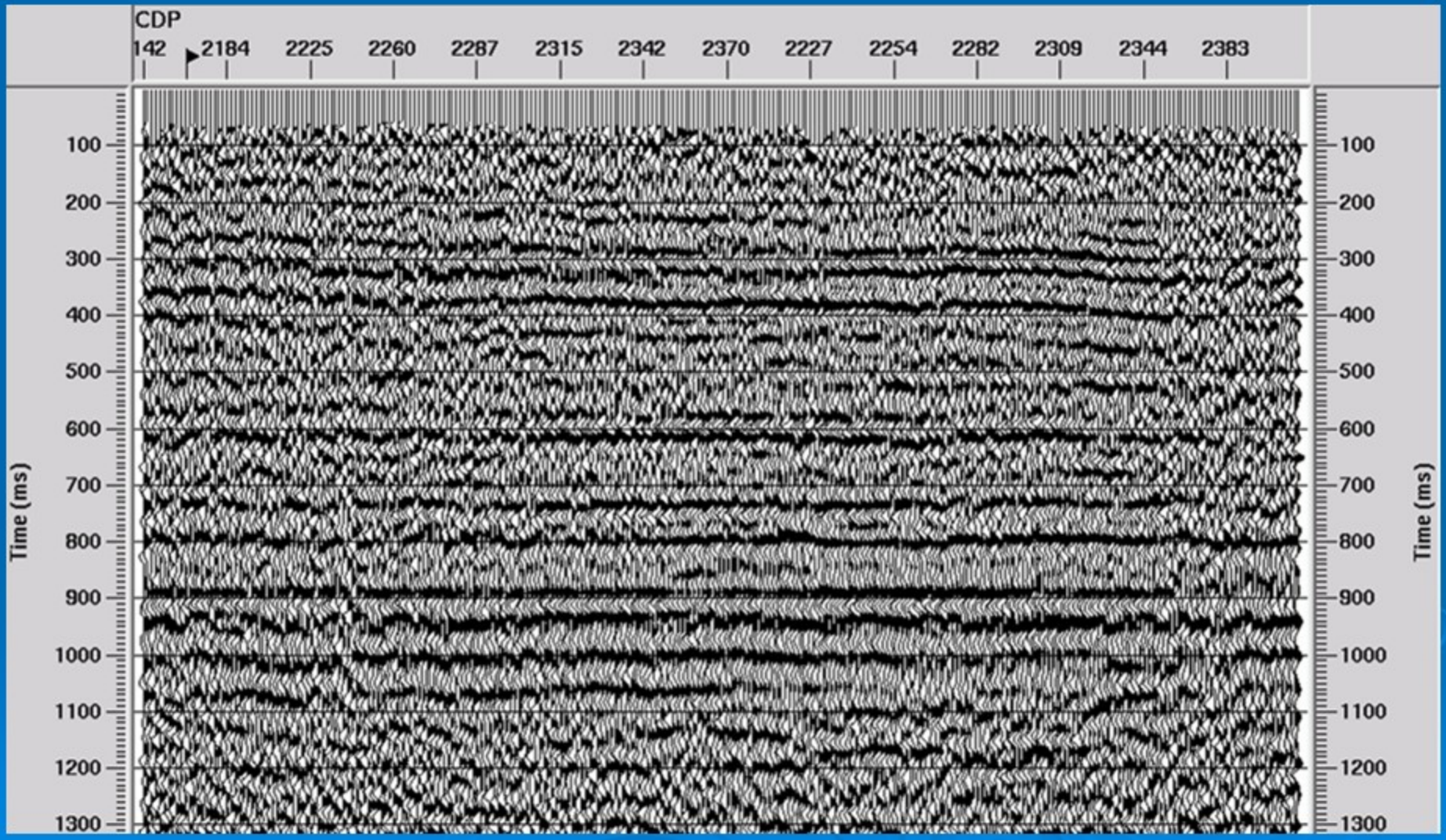
# BRUTE RECEIVER STACK



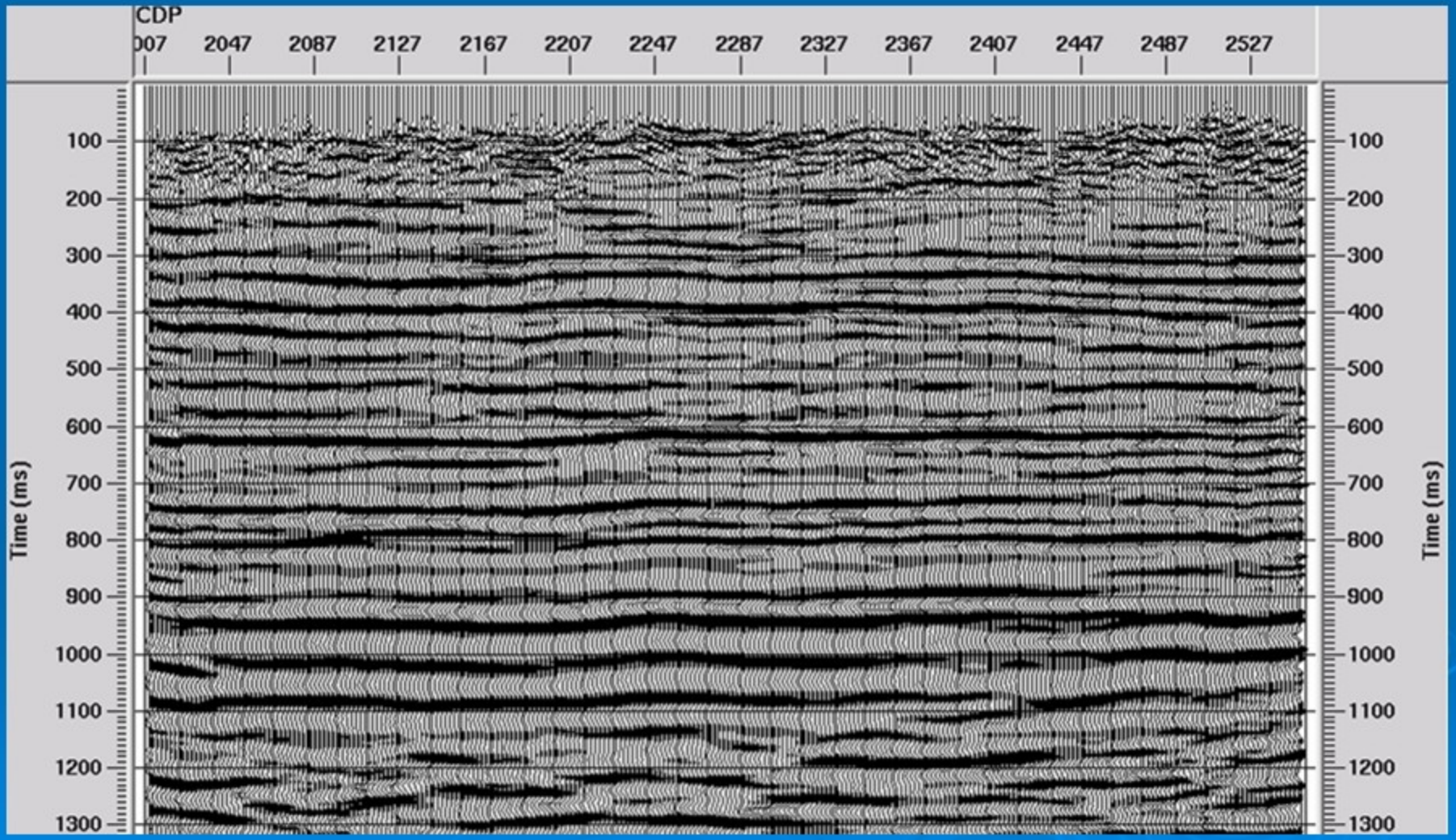
# RECEIVER STACK WITH NA/DECON



# RECEIVER STACK WITH HAND STATICS

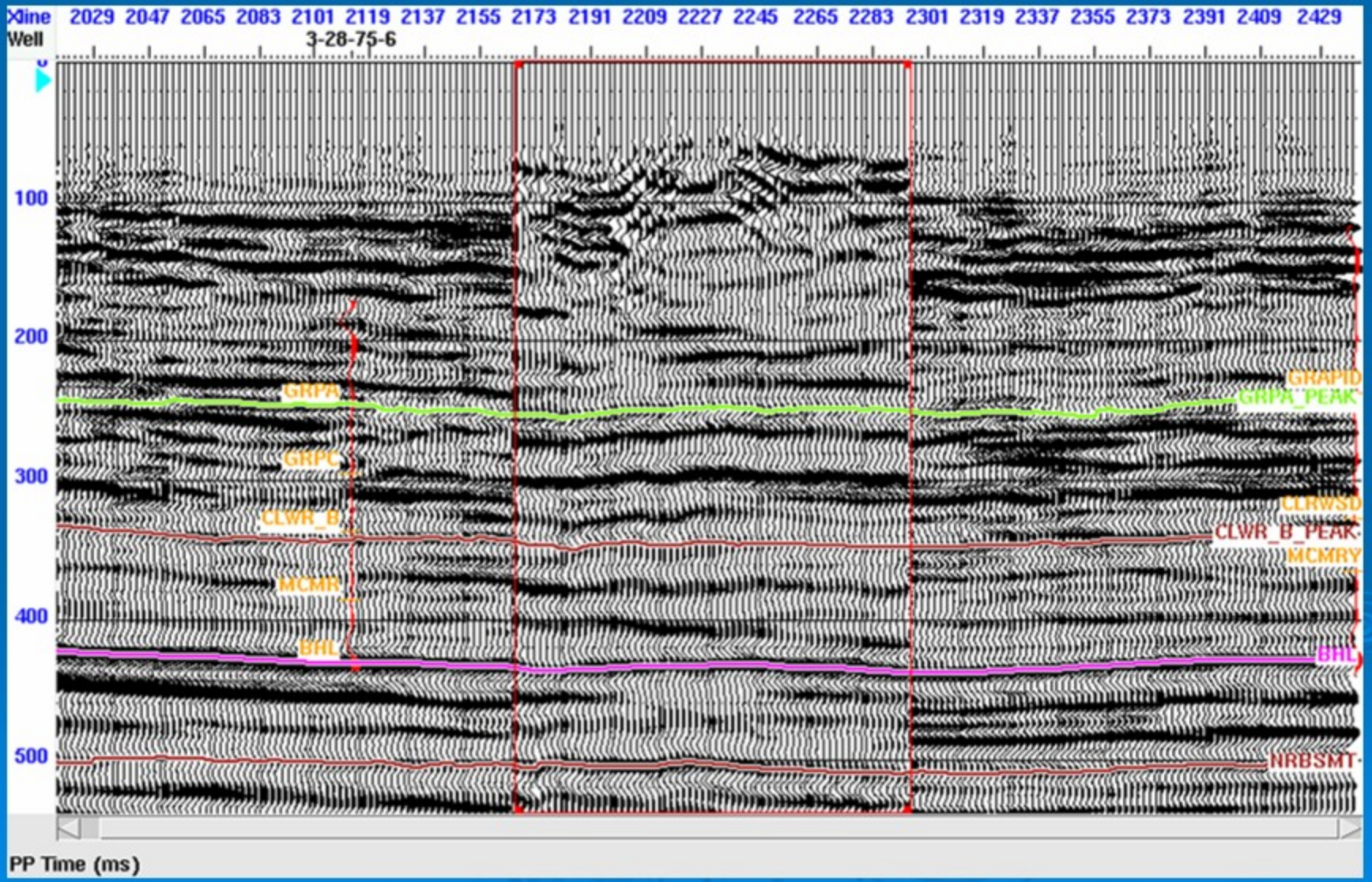


# FINAL DVS MIGRATED SECTION

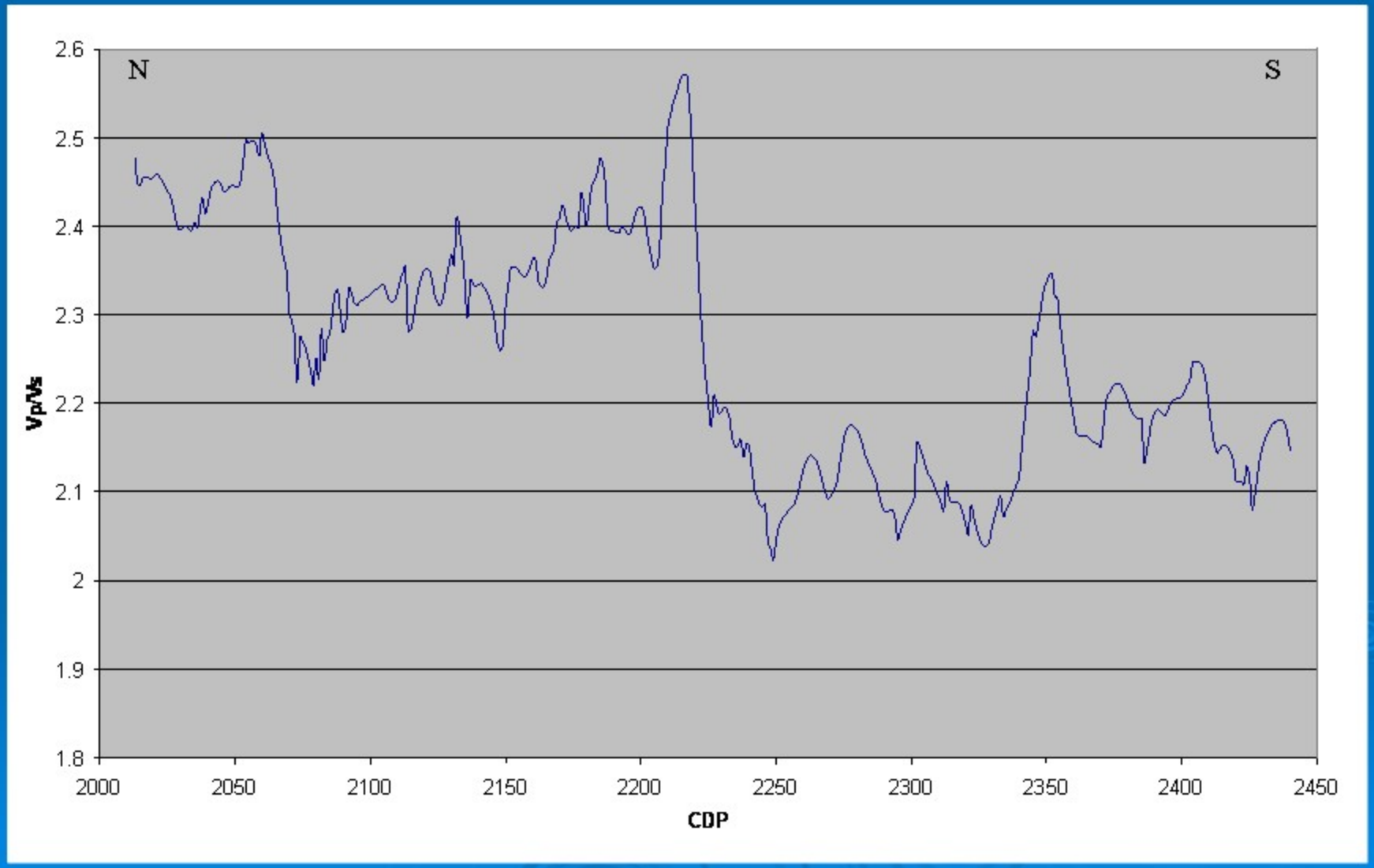


# SEISMIC INTERPRETATION

# VERTICAL-RADIAL SEISMIC TIE

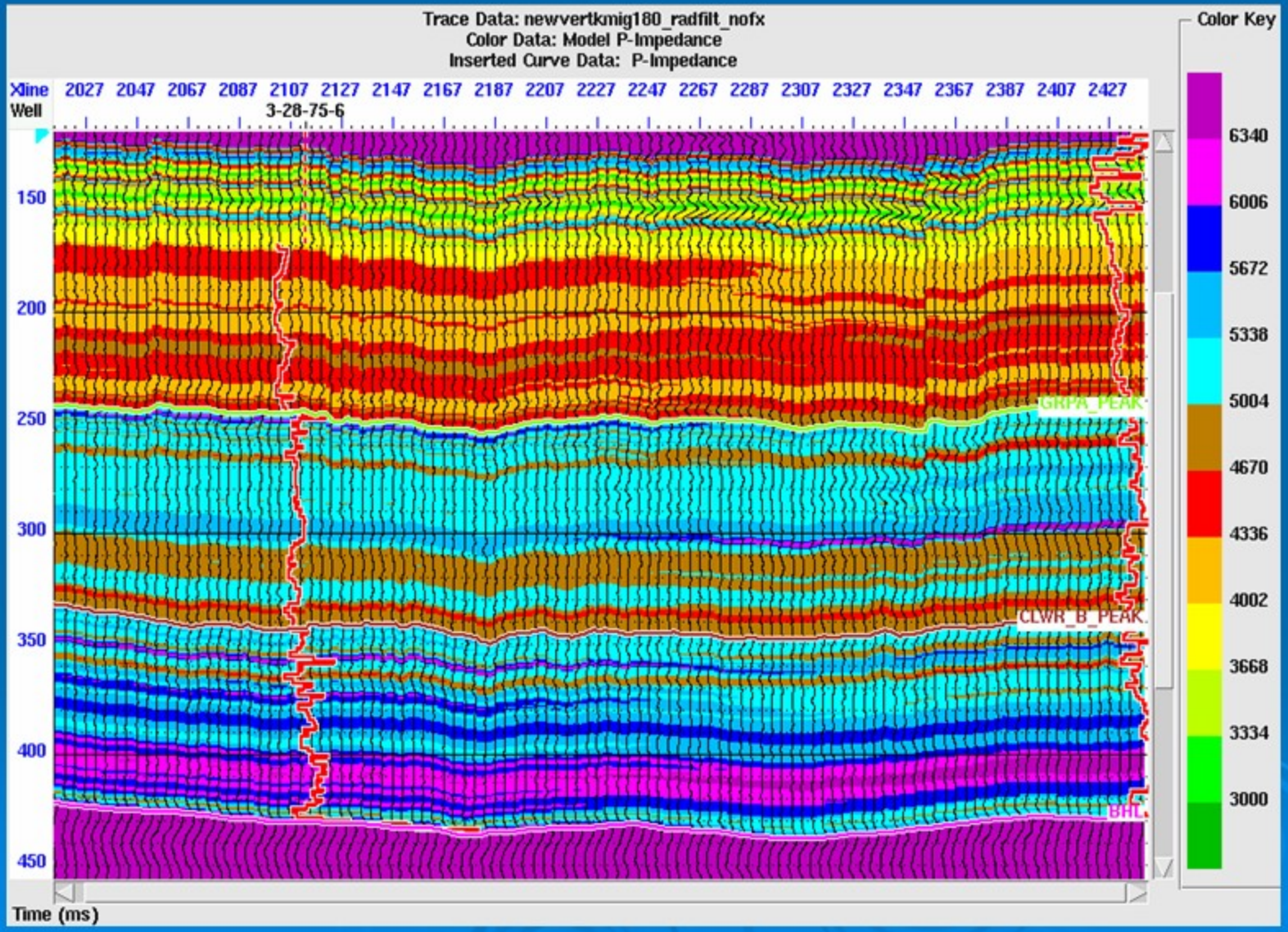


# Vp/Vs FROM TIME-ISOCHRON ANALYSIS

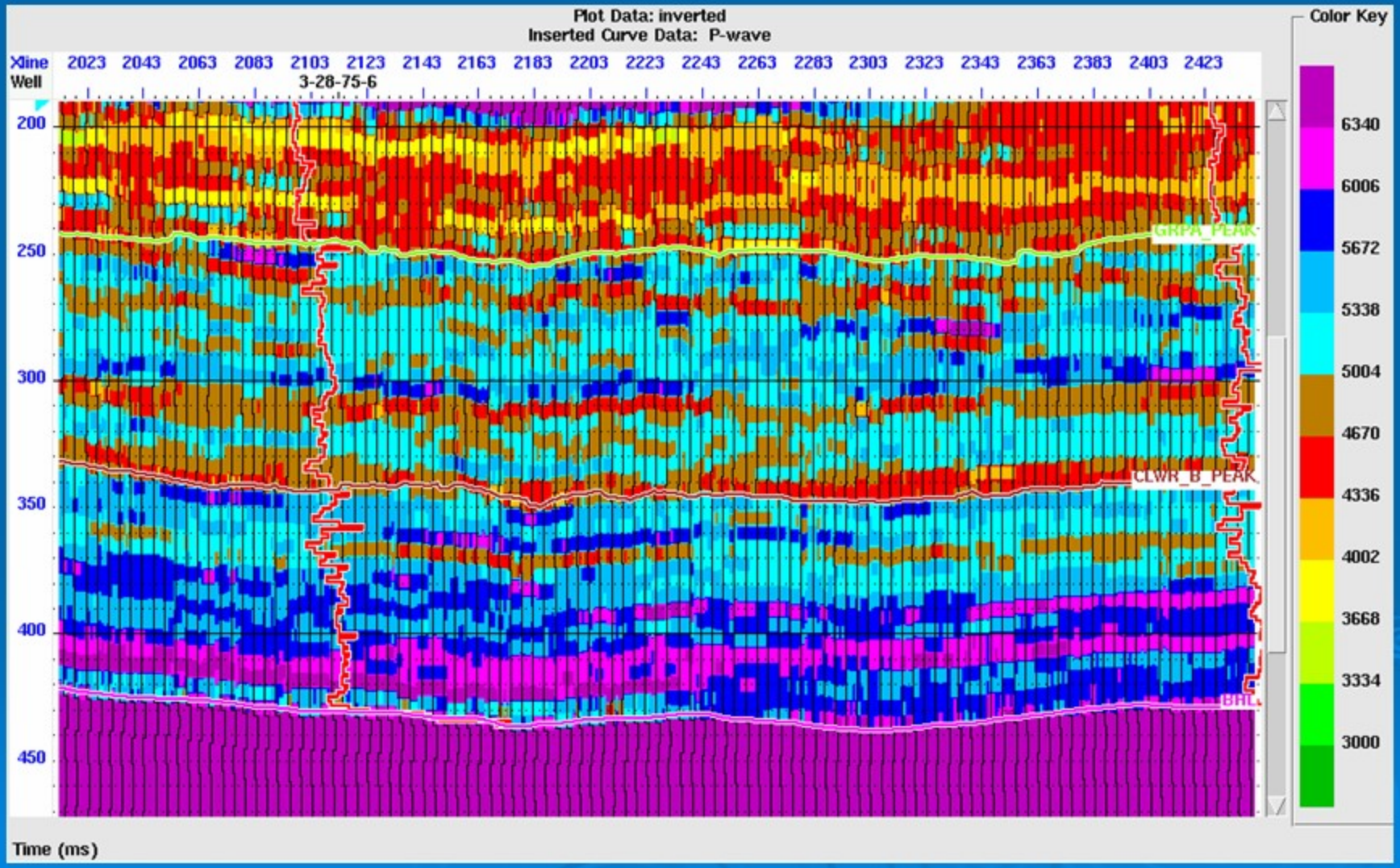


# INVERSION

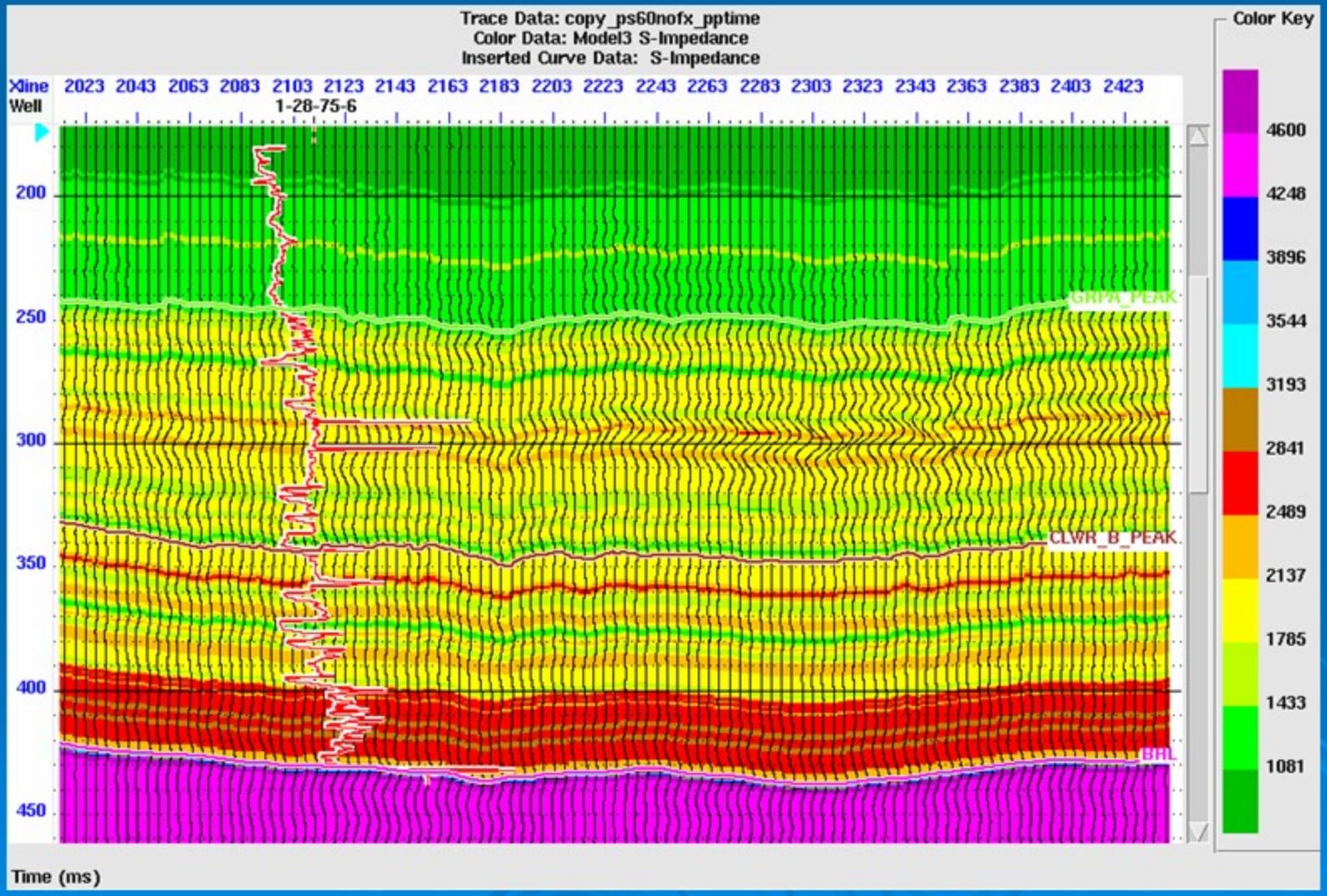
# P-IMPEDANCE MODEL



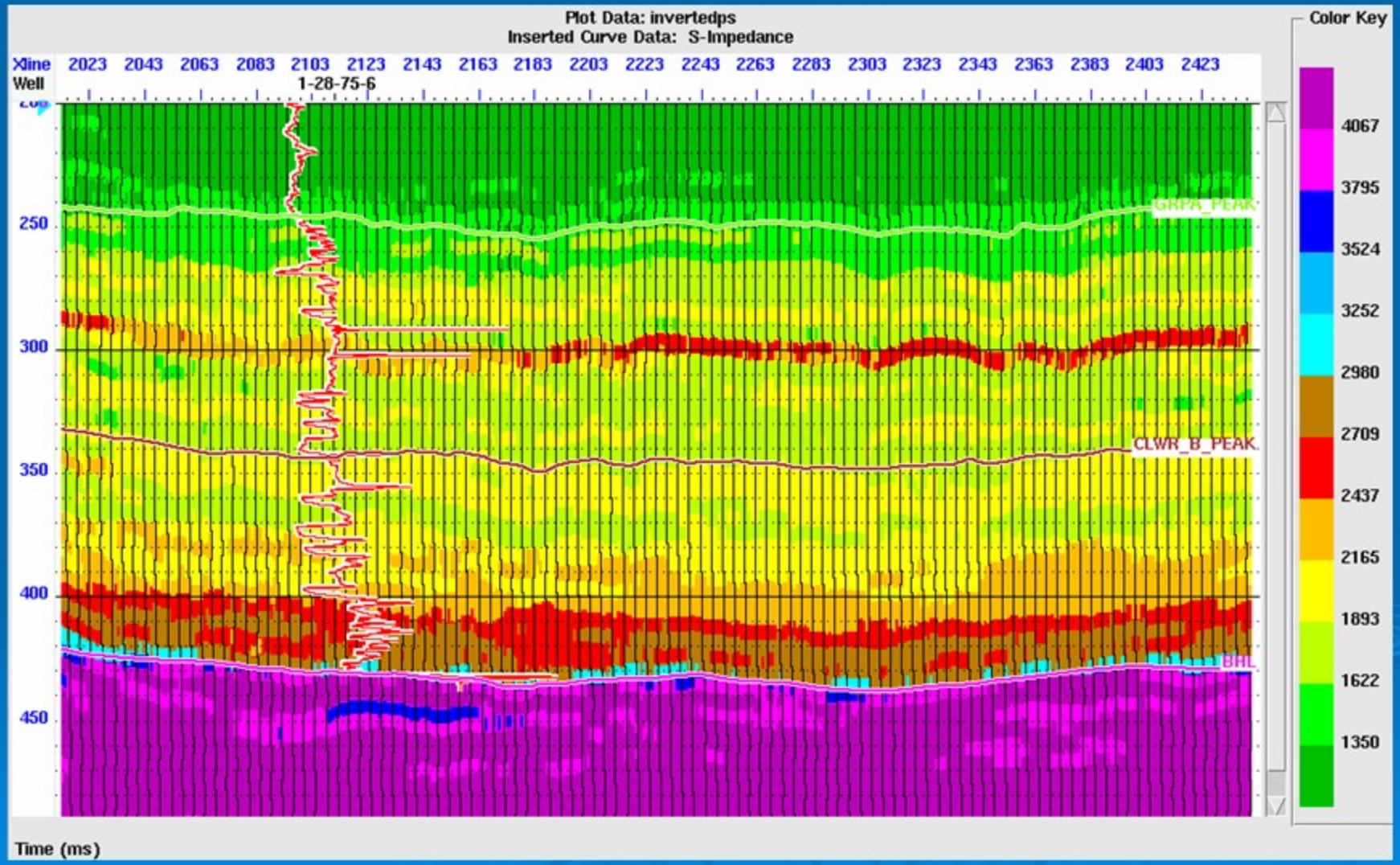
# P-IMPEDANCE MODEL-BASED INVERSION



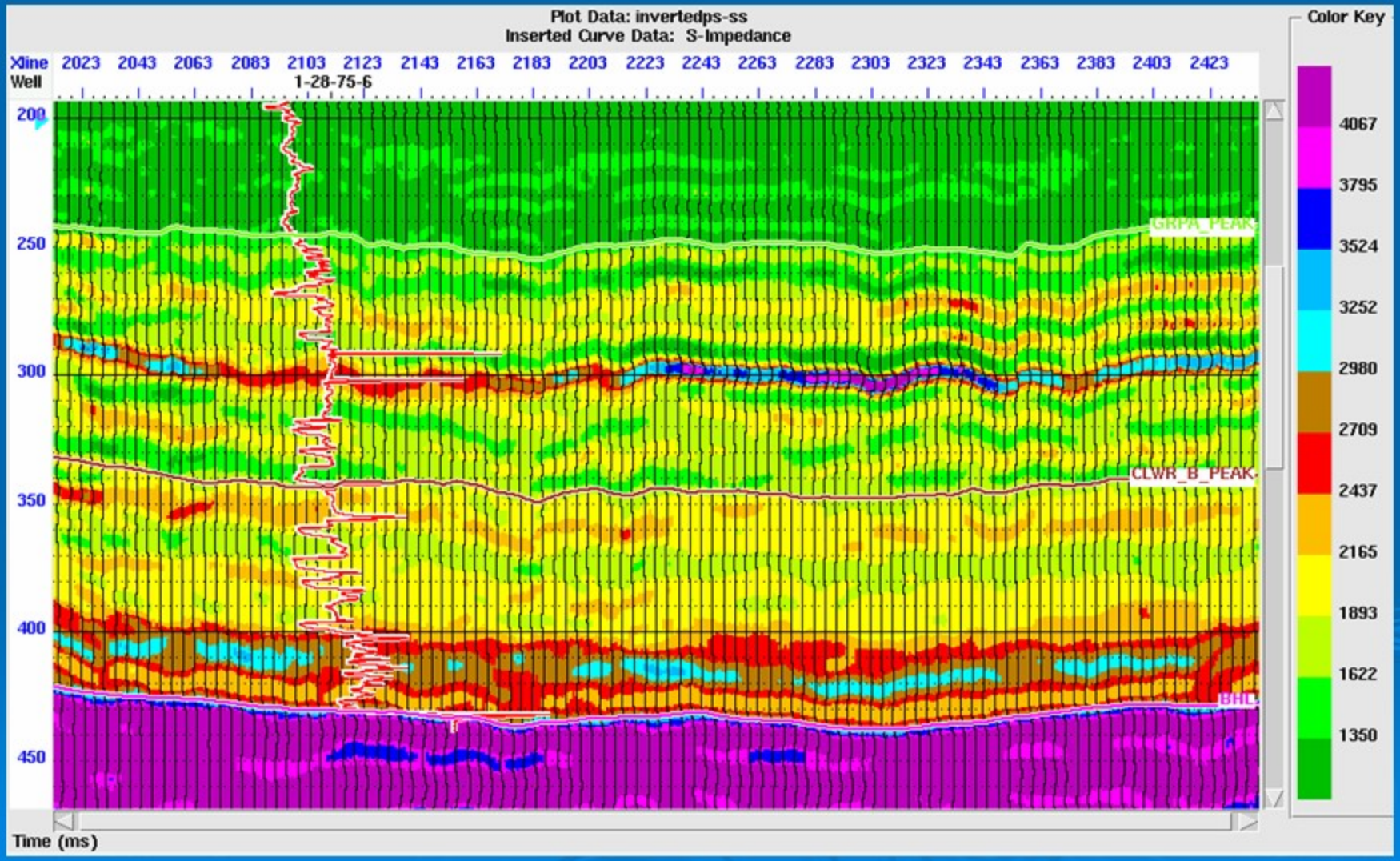
# S-IMPEDANCE MODEL



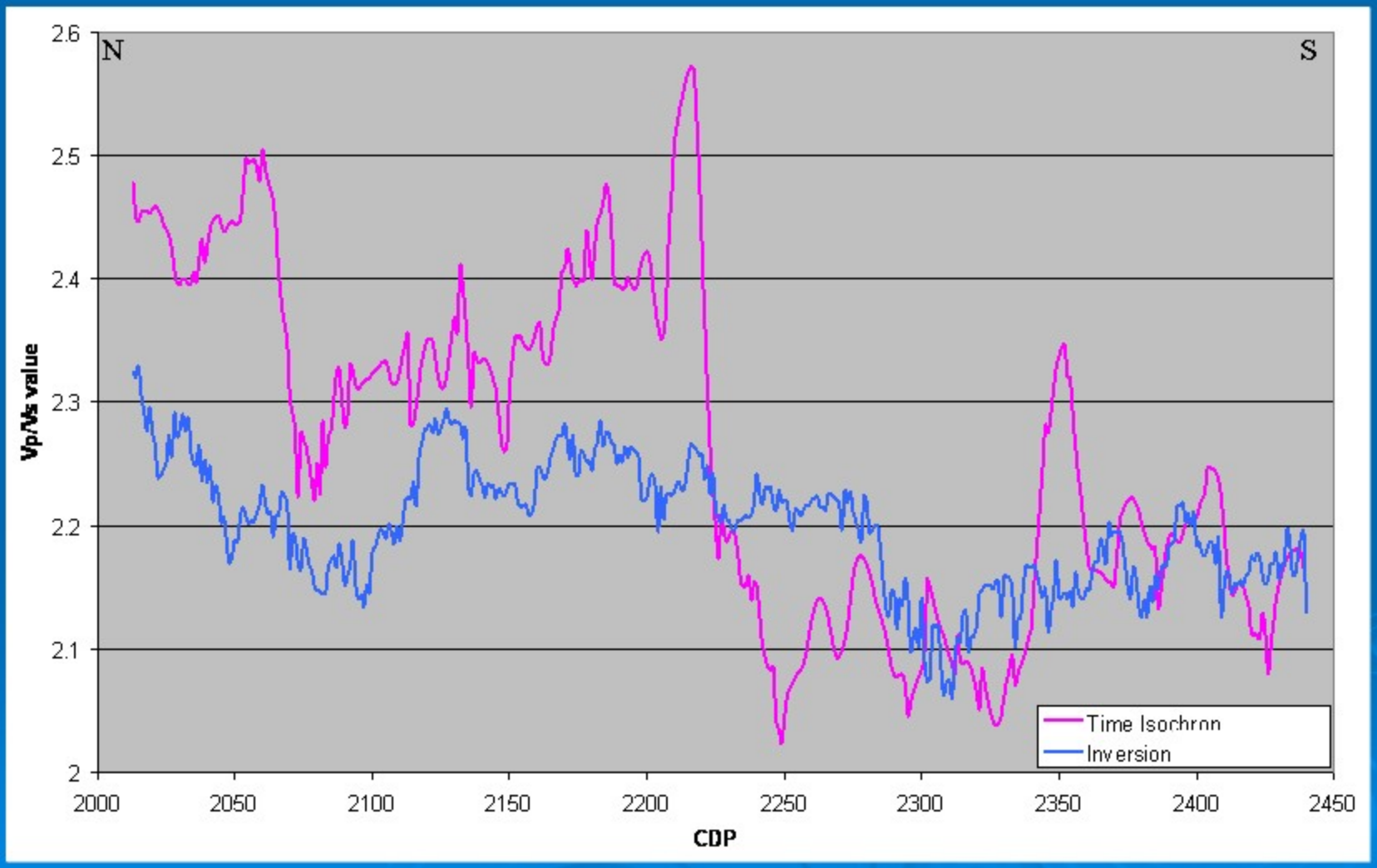
# S-IMPEDANCE MODEL-BASED INVERSION



# S-IMPEDANCE SPARSE SPIKE INVERSION



# Vp/Vs


N
S
2.6
2.5
2.4
2.3
2.2
2.1
2
Vp/Vs value
2000
2050
2100
2150
2200
2250
2300
2350
2400
2450
CDP
Time Isochron
Inversion

# CONCLUSIONS

- Surface seismic data does not contain frequencies high enough to resolve the thinly bedded reservoir layers.
- Radial component does image the top of the McMurray Formation better than the vertical component in some parts of the data.
- Both traveltime mapping and trace inversion VP/VS ratios provide lithology discrimination.
- Need to look at alternative methods of imaging the reservoir (ie. offset VSP)

# ACKNOWLEDGEMENTS


- AICISE
- Devon Canada
- CREWES
- Kevin Hall, Helen Isaac, Han-Xing Lu
- Dave Henley
- Promax2D and Hampson Russell Software
- Graham Carter (Veritas)