

SEISMIC AMPLITUDE ANOMALIES AND AVO ANALYSES AT MESTENA GRANDE FIELD, JIM HOGG COUNTY, TEXAS

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ABSTRACT (NO TEXT SUBMITTED)

Mestena Grande field is located in northeast Jim Hogg County, Texas. It produces gas and condensate from the Middle Lobe of the Middle Eocene Queen City Formation. The field is located on the crest of a faulted, anticlinal ridge as shown in Figure 1. The Queen City is approximately 100 ft thick and the Middle Lobe, the main reservoir, is only 30 ft thick, which is well below tuning thickness. Porosities in the producing sands are generally 15 to 25% and permeabilities are usually 15 to 35 md, the maximum being about 80 md. The most recent seismic data exhibit amplitude anomalies which correspond fairly well with the production. The strongest amplitudes are in the vicinity of the better wells and show an increase with offset, as in Figure 2. Most of the dry holes are on weak amplitudes which do not increase with offset, as in Figure 3. Modeling the AVO response of a productive well, however, has predicted an amplitude decrease with offset. This disagreement is attributed to the lack of accurate shear wave velocities and the very thinly laminated sands.

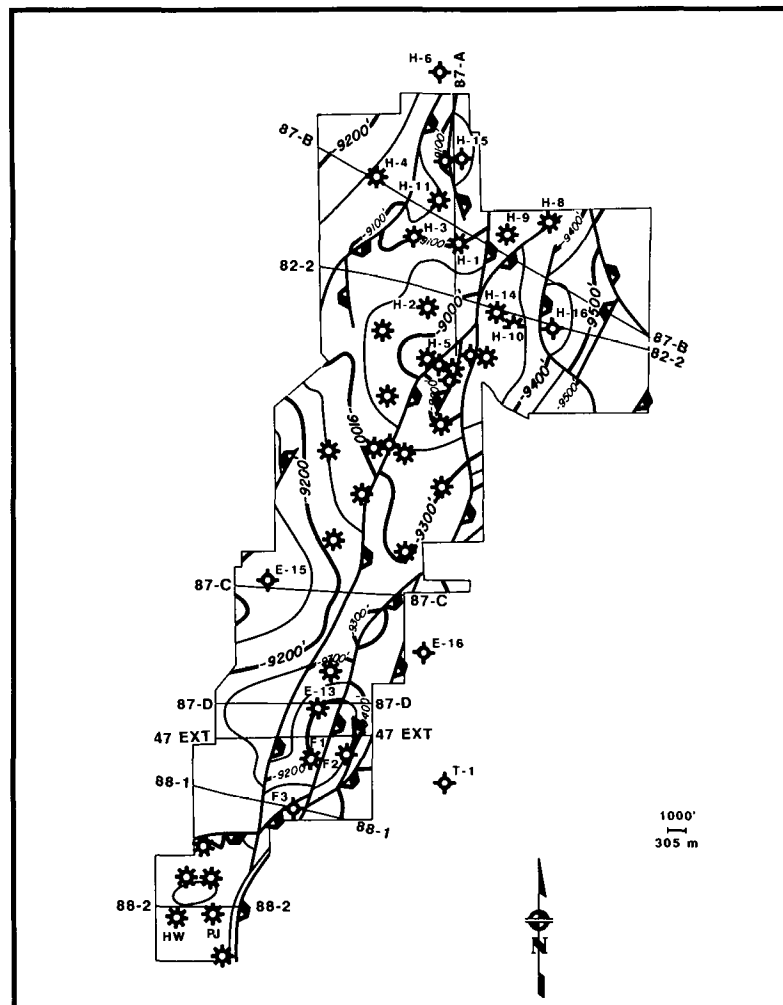


Figure 1. Depth map on top of Middle Lobe of Queen City. C.I. = 50 ft.

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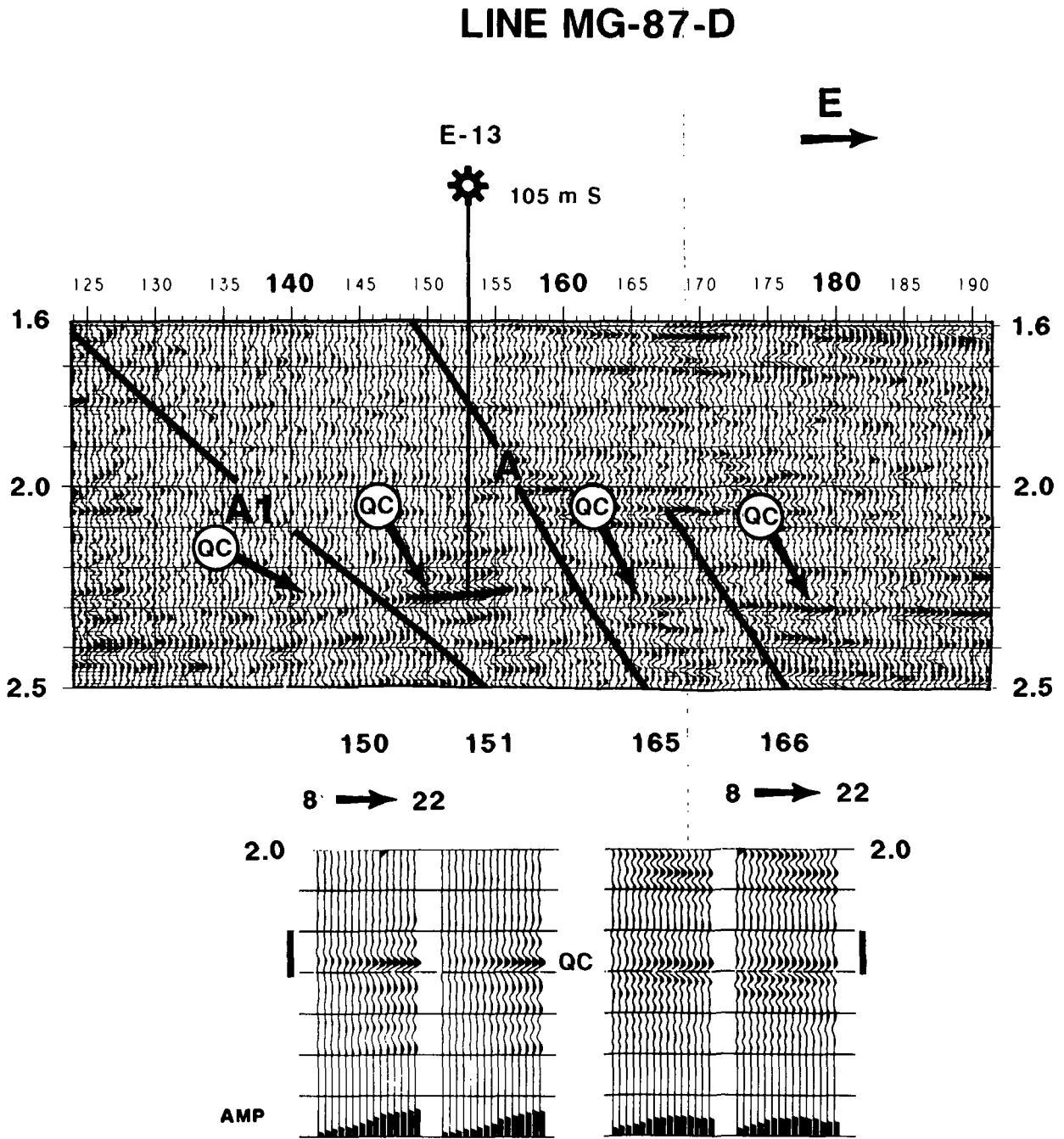


Figure 2. Line MG-87-D and angle gathers for incident angles of 8-22° at Queen City horizon.

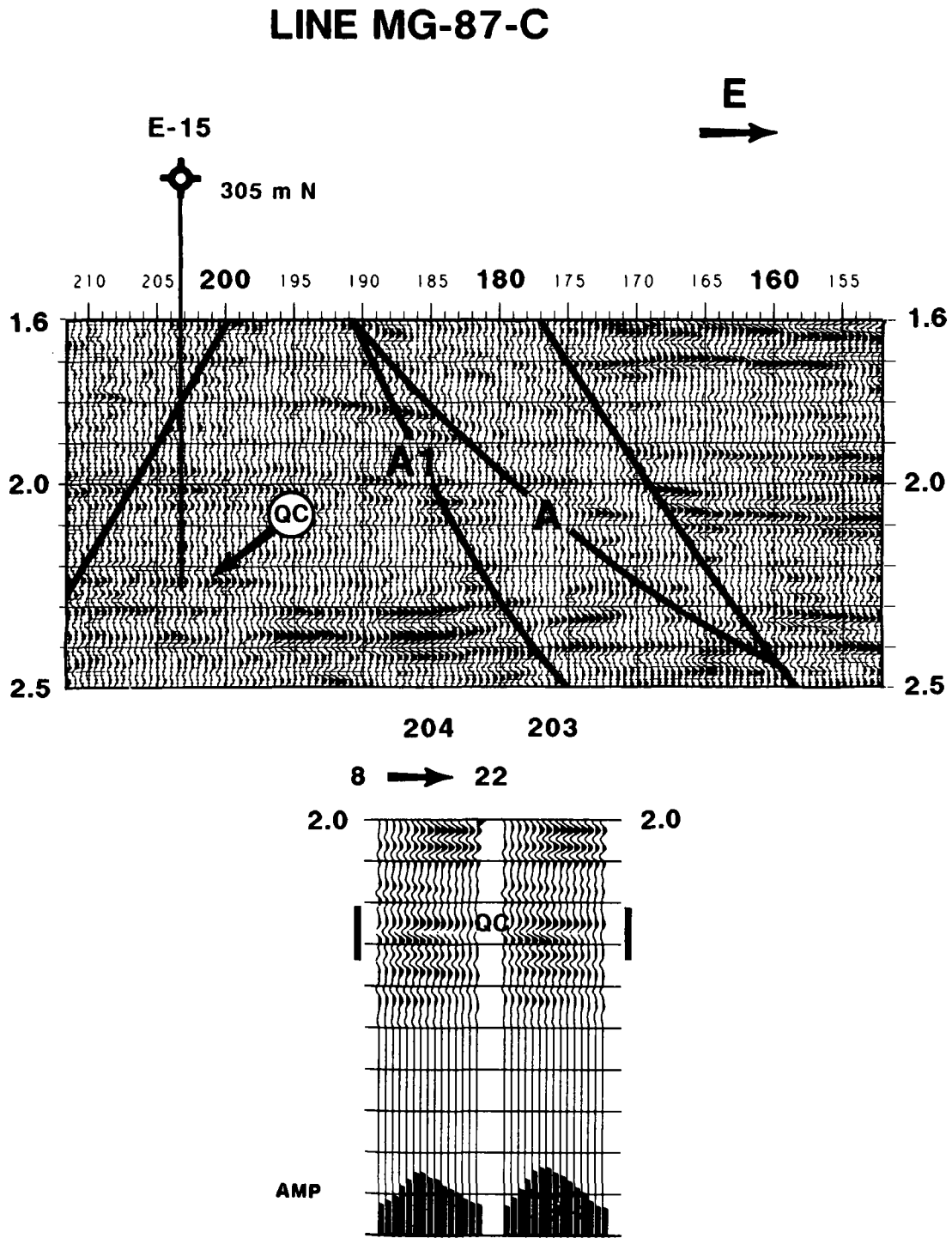


Figure 3. Line MG-87-C and angle gathers for incident angles of 8-22° at Queen City horizon.