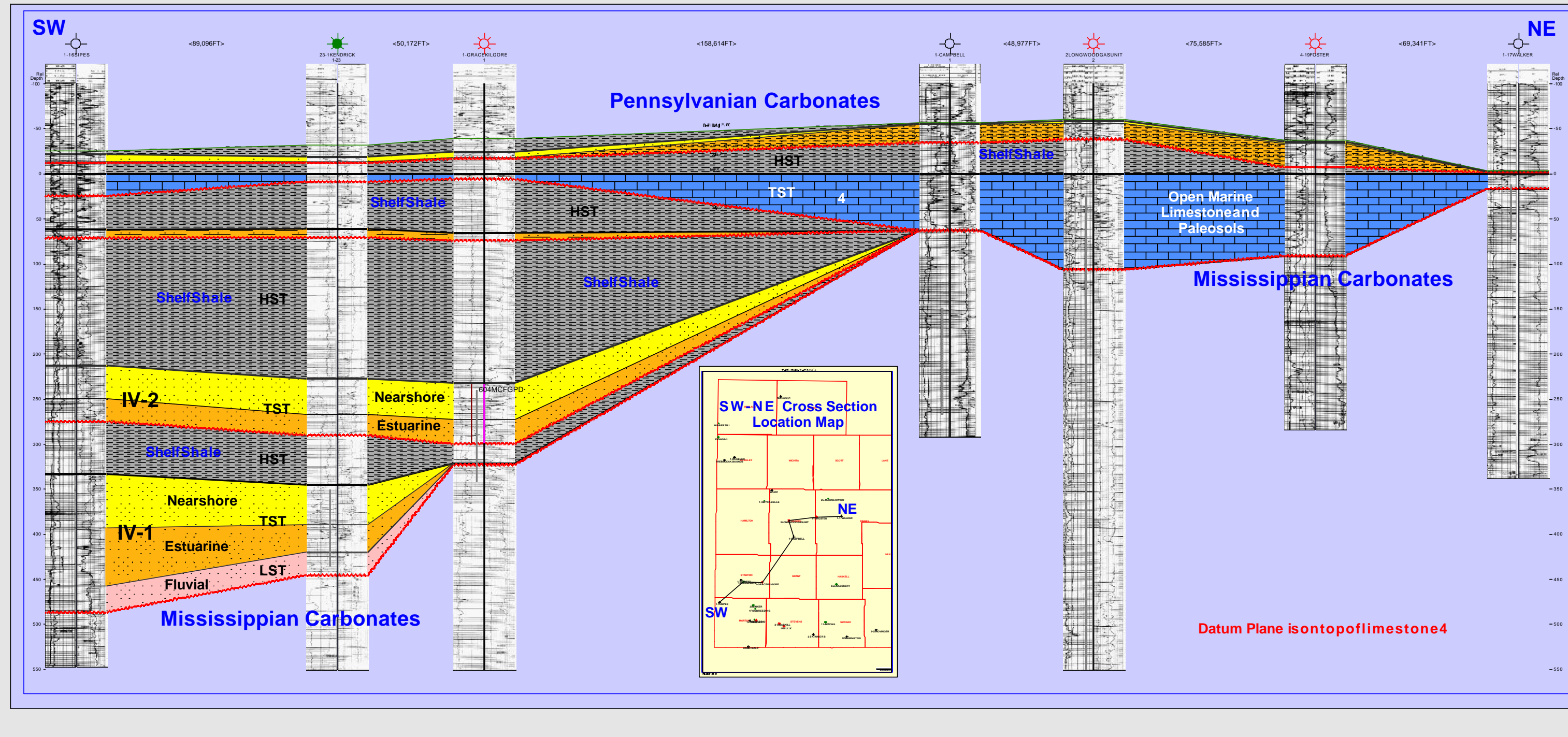
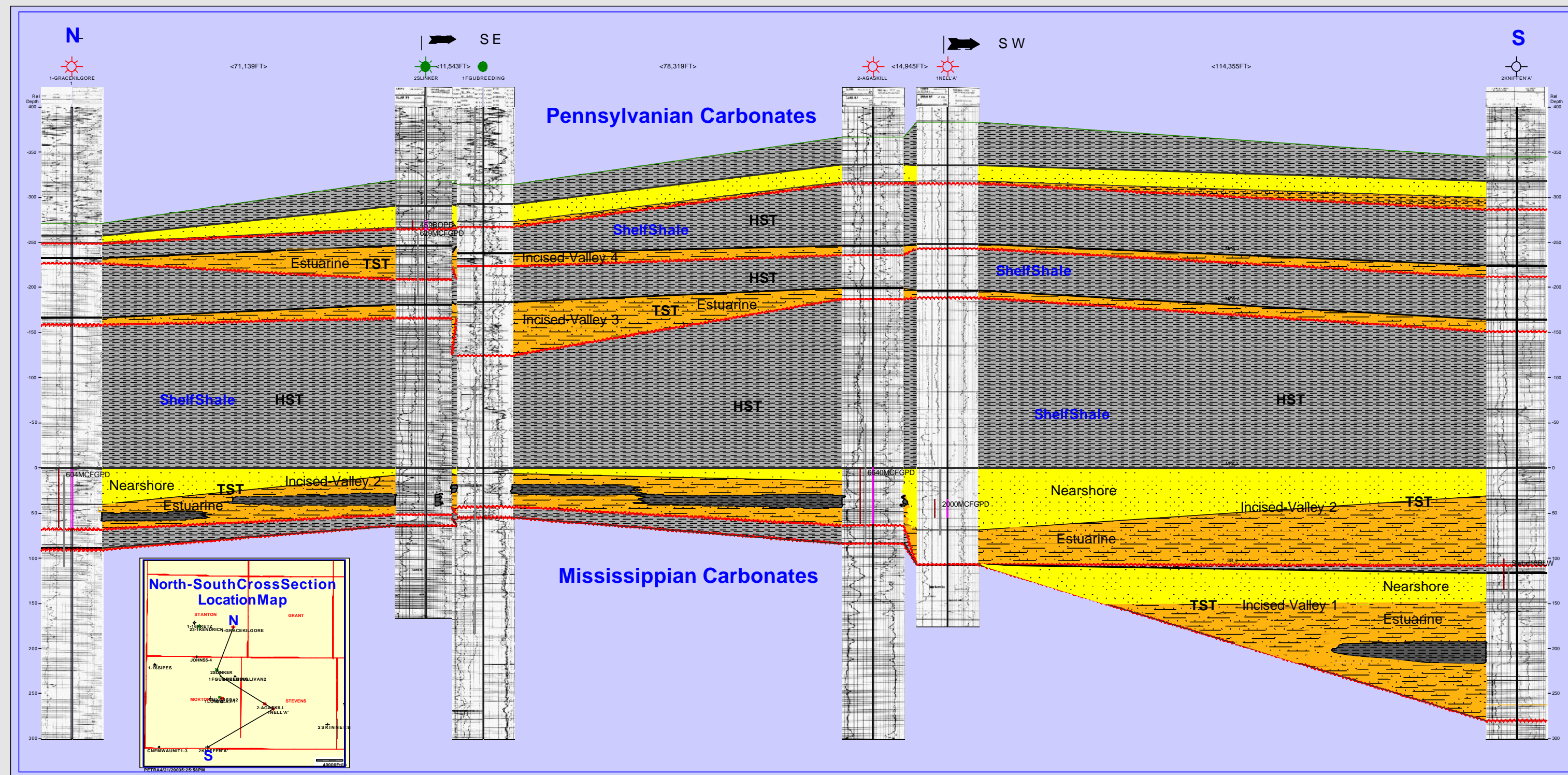
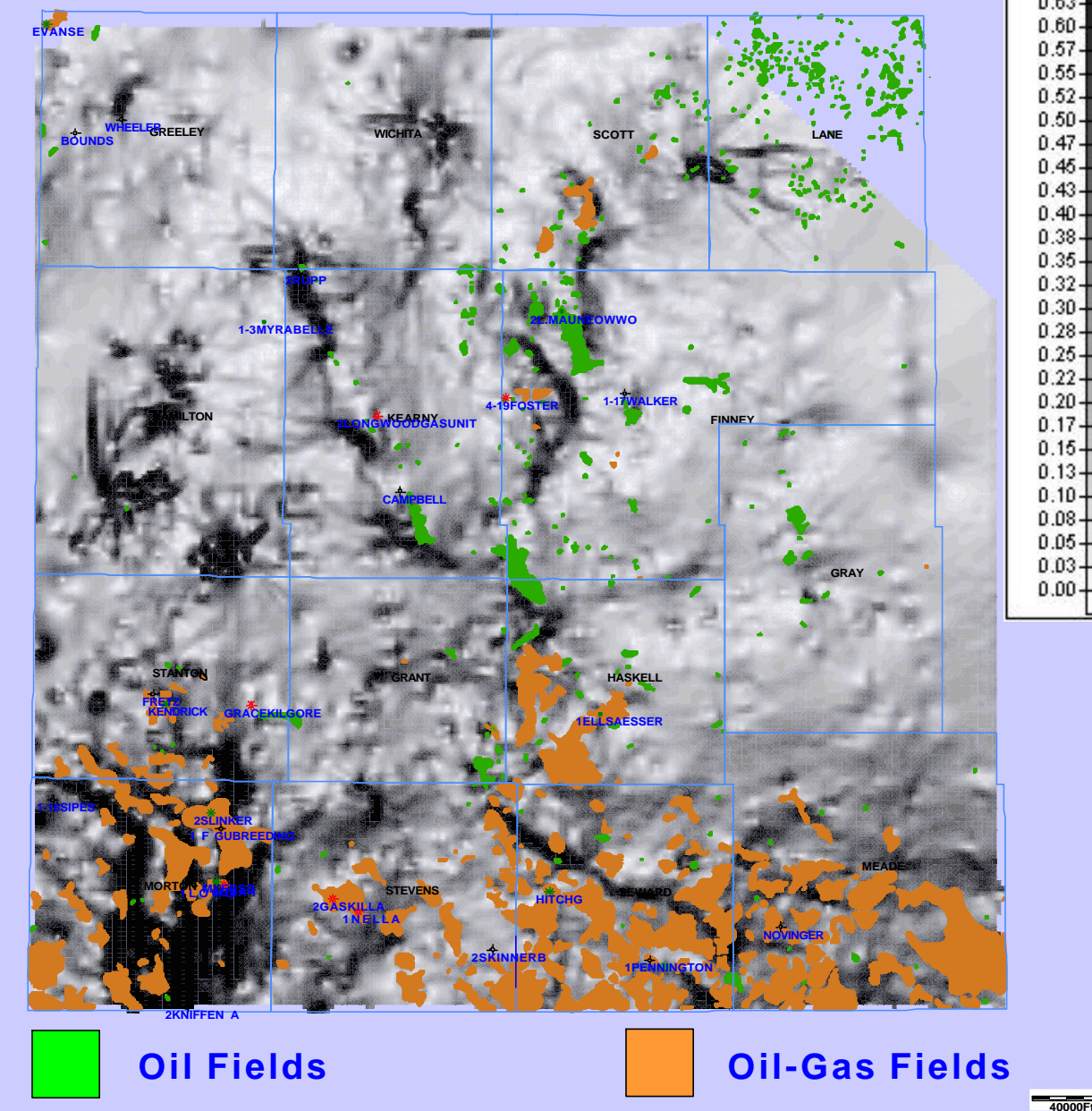


Stratigraphic Cross sections



Morrow Slope (Dip Angle) Map



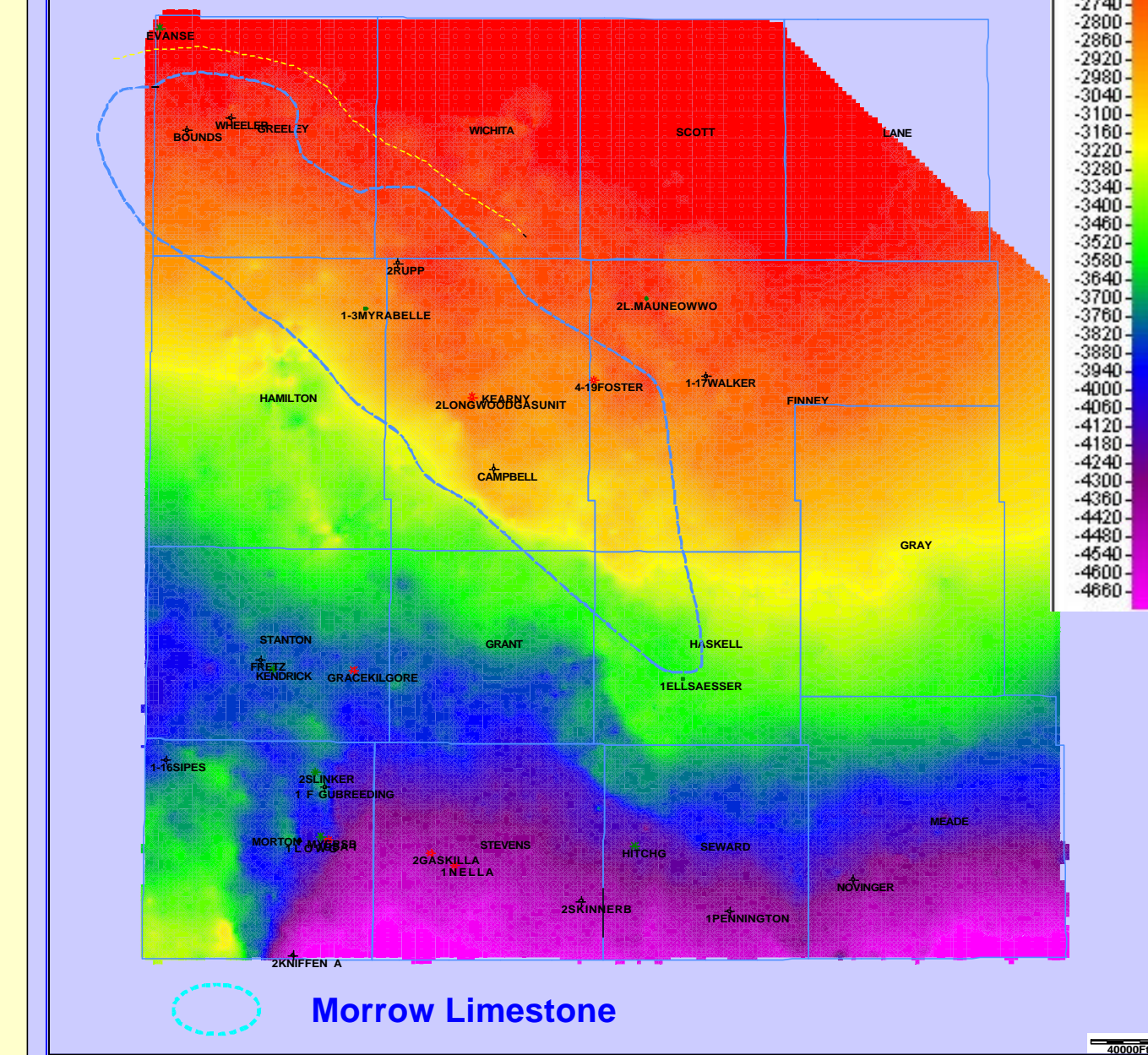
Map elaborated with computed processed data from 14,574 wells with top of Morrow horizon.

Possible faulted areas in dark colors, indicating rapid change of slope.

Oil and oil-gas production appear to be related to faulted areas.

Eastward migration of Morrow incised-valleys (1, 2, and 3) through time, may be related to tectonic movement in SW Kansas and eastern Colorado (Keyes Dome).

Mississippian Paleostucture Map



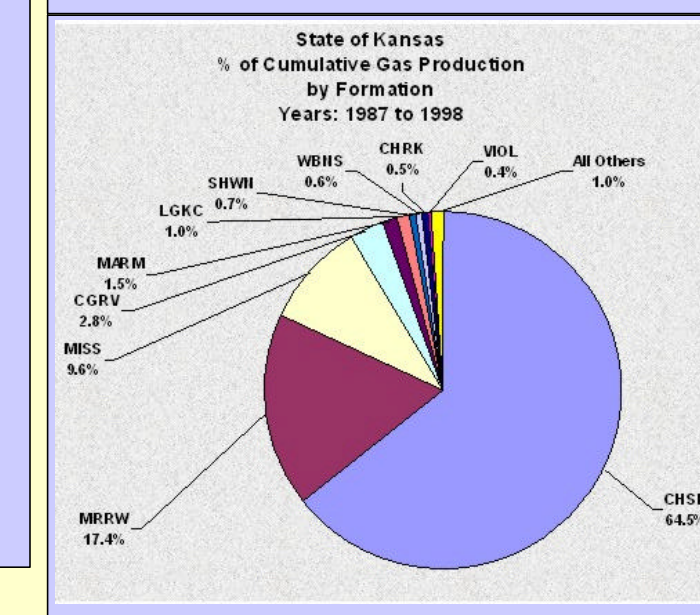
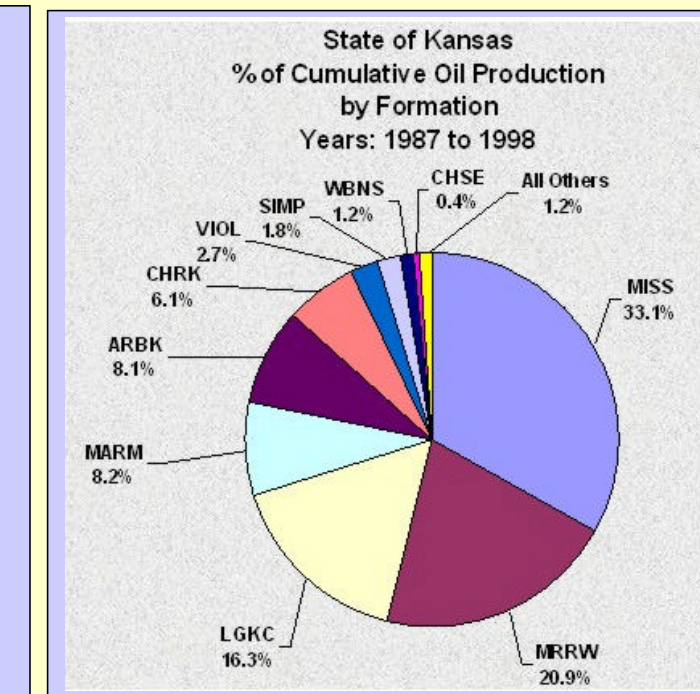
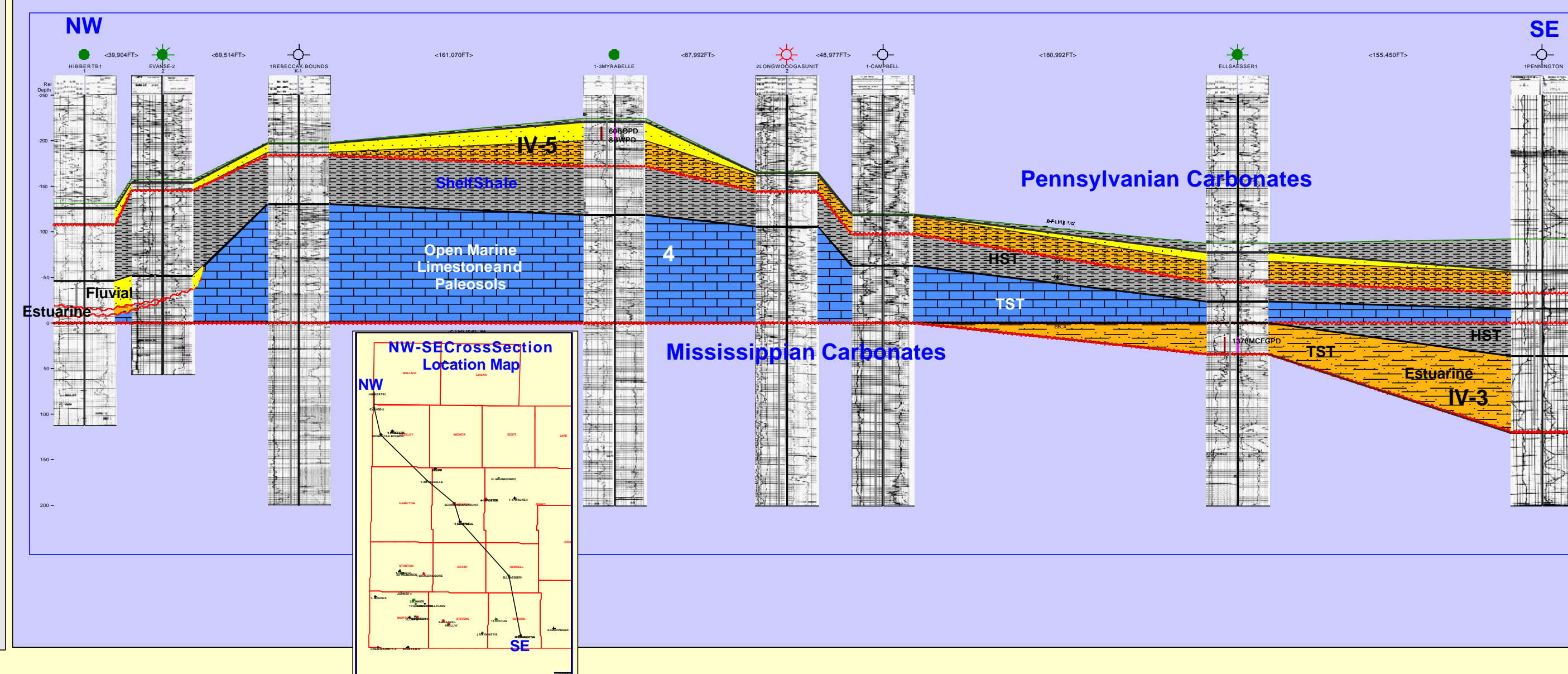
Mississippian Paleostucture Map based on computed processed data from 9,091 wells with top of Mississippian horizon.

Datum plane is the Permian Stone Corral Formation.

Morrow limestone accumulation is located at a shelf-edge margin.

CONCLUSIONS

- Recognition of 5 sedimentary depositional sequences.
- 3 incised valleys (from older to younger IV-1, IV-2 and IV-3) are filled mostly with estuarine facies and with minor nearshore marine and fluvial facies.
- Thickness varies from 20 to 40 meters for older IV-1, IV-2 and IV-3. Individual incised valleys are 60 to 100 km long and 40 to 70 km wide. Infilling sediments thicken southward to southwestward.
- Sequence 4 is dominated by accumulation of limestone and paleosols with minor estuarine and nearshore marine facies. Thickness varies from one to 40 meters. Limestone 4 approximated dimensions are 140 km in length and 40 km wide.
- Depositional trends of incised valleys are oriented NW-SE.
- Migration of incised valleys (1-3) to the east through time, may reflect tectonic movement in SW Kansas and eastern Colorado.
- Morrow sediments thin eastward, onlapping Mississippian carbonates of the Central Kansas Uplift.



SYSTEM	LITHOLOGY	SERIES	GROUP	SIGNIFICANT FORMATIONS
QUATERNARY	PLEISTOCENE			OSBALLE
TERTIARY	PLIOCENE			MORRIS
CRETACEOUS	UPPER			WASKITA
				WASKITA
JURASSIC	UPPER			WASKITA
				WASKITA
PERMIAN	LEONARDIAN			WASKITA
				WASKITA
MISSOURIAN	DESMOINESIAN			WASKITA
				WASKITA
PENNSYLVANIAN	ATOKAN			WASKITA
				WASKITA
MISSISSIPPIAN	MERAMECIAN			WASKITA
				WASKITA
ORDOVICIAN	MIDDLE			WASKITA
				WASKITA
CAMBRIAN	UPPER			WASKITA
				WASKITA
PRECAMBRIAN	IGNEOUS AND METAMORPHIC BASEMENT ROCKS			

Stratigraphic Chart