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ATTACHMENT A

Maljamar AGI #2

Injection Zone Evaluation from Geophysical logs and mud log

APR 18 2016

ATTACHMENT A

EVALUATION OF GEOPHYSICAL LOGS HYDROCARBON AND INJECTION POTENTIALS: AKA ENERGY FRONTIER MALJAMAR AGI #2

**Sec. 21- Twp. 17S-32E
Lea County, New Mexico**

Prepared for
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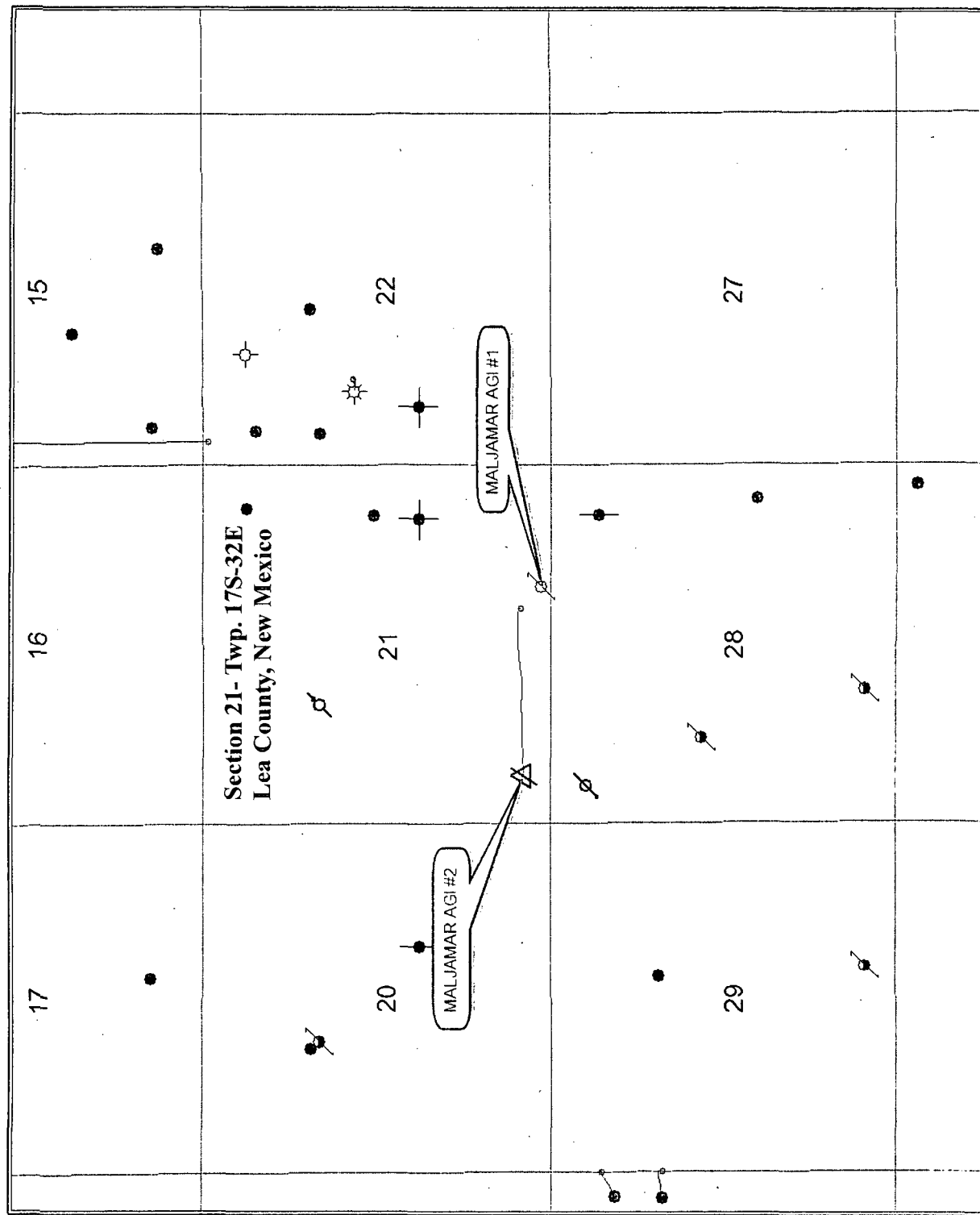
March 23, 2016

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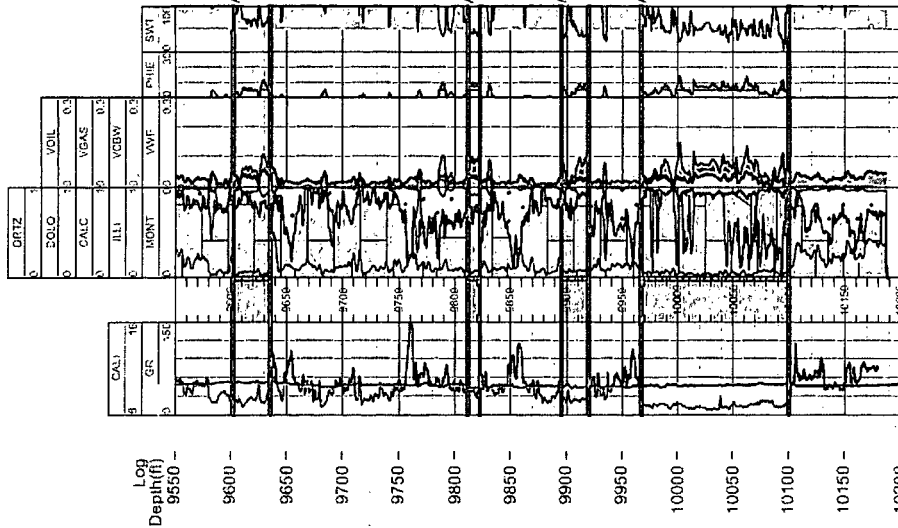
LOCATION OF THE MALJAMAR AGI #2 (DEVIATED WELL)



SUMMARY OF FACTORS TO CONSIDER IN RESERVOIR AND CAP ROCK EVALUATION

- The successful evaluation of reservoir and cap rock characteristics requires the simultaneous consideration of various data types and sources in order to arrive at a reasonable conceptual model of predicted injection performance. The data types used for the Maljamar AGI #2 included the complete geophysical log suite for the well, which included the density/neutron and sonic porosity logs, resistivity logs, and mud log, in addition to drilling condition reports and on-site observations. The geophysical logs were used by an independent contractor (Halliburton) to run petrophysical analysis of the proposed injection zones, to demonstrate expected fluid content, porosity, and permeability of those zones.
- The Wolfcamp Formation is dominated by shelf-margin detrital carbonates, which are variously composed of lithoclasts and bioclasts in either a carbonate or shaly-silty matrix. The approved and currently-used injection zone for the Maljamar AGI#1 is the same connected injection zone in the Maljamar AGI #2 and includes the more porous portions of these facies. The facies here are expected to be identical to those encountered previously in the nearby Maljamar AGI #1 well because the Maljamar #2 well was drilled along depositional strike with the Maljamar AGI #1. We previously verified the depositional facies of the Wolfcamp in the Maljamar AGI #1 with sidewall core data collected in that well. These facies appear more permeable in the Maljamar AGI#2 and are transitional to those observed in the Cimarex produced water injection well located over ½ mile to the southwest.
- Log-indicated porosity may be influenced by the directional nature of some porosity, like isolated or poorly-connected vugs or fractures, and may not always read true on a single logging pass.
- In the following slides, Geolex reviewed the results of logging and petrophysical analysis of the Maljamar AGI #2, and present log sections to document analytical conclusions.

RUNNING MALJAMAR AGI #2 11.065



AGI #2 Totals - Halliburton Petrophysics
4 Zone Gross TVD Thickness = 196'
4 Zone Gross MD Thickness = 245'

Net Porosity > 4% TVD Thickness = 135'
Net Porosity > 4% MD Thickness = 168'
GR < 50 api units & Porosity > 4%

Average Porosity = 6.7%
Ave Water Saturation = 49.3 %
Rw = 0.05, M=2.5, N=2

AGI2_ZONE1_TOP

Item Name	Unit	Value	Description
GROSS	ft	21.55	03142015 Net
NET	ft	0.500	03142015 Net Gross
PHI		6.15	03142015 Avg Porosity
SW		66.20	03142015 Avg Water Saturation

Item Name	Unit	Value	Description
GROSS	ft	13.420	03142015 Gross
NET	ft	2.000	03142015 Net
PHI		6.15	03142015 Avg Porosity
SW		66.20	03142015 Avg Water Saturation

AGI2_ZONE2_TOP

Item Name	Unit	Value	Description
GROSS	ft	8.016	03142015 Net
NET	ft	1.030	03142015 Net Gross
PHI		7.823	03142015 Avg Porosity
SW		42.780	03142015 Avg Water Saturation

Item Name	Unit	Value	Description
GROSS	ft	10.500	03142015 Gross
NET	ft	1.000	03142015 Net
PHI		7.823	03142015 Avg Porosity
SW		42.780	03142015 Avg Water Saturation

AGI2_ZONE3_TOP

Item Name	Unit	Value	Description
GROSS	ft	21.230	03142015 Net
NET	ft	11.911	03142015 Net Gross
PHI		6.615	03142015 Avg Porosity
SW		38.590	03142015 Avg Water Saturation

Item Name	Unit	Value	Description
GROSS	ft	20.875	03142015 Gross
NET	ft	16.036	03142015 Net
PHI		6.615	03142015 Avg Porosity
SW		38.590	03142015 Avg Water Saturation

AGI2_ZONE4_TOP

Item Name	Unit	Value	Description
GROSS	ft	132.787	03142015 Gross
NET	ft	90.245	03142015 Net
PHI		5.980	03142015 Net Gross
SW		49.851	03142015 Avg Porosity

Item Name	Unit	Value	Description
GROSS	ft	152.250	03142015 Gross
NET	ft	116.255	03142015 Net
PHI		5.979	03142015 Net Gross
SW		49.851	03142015 Avg Porosity

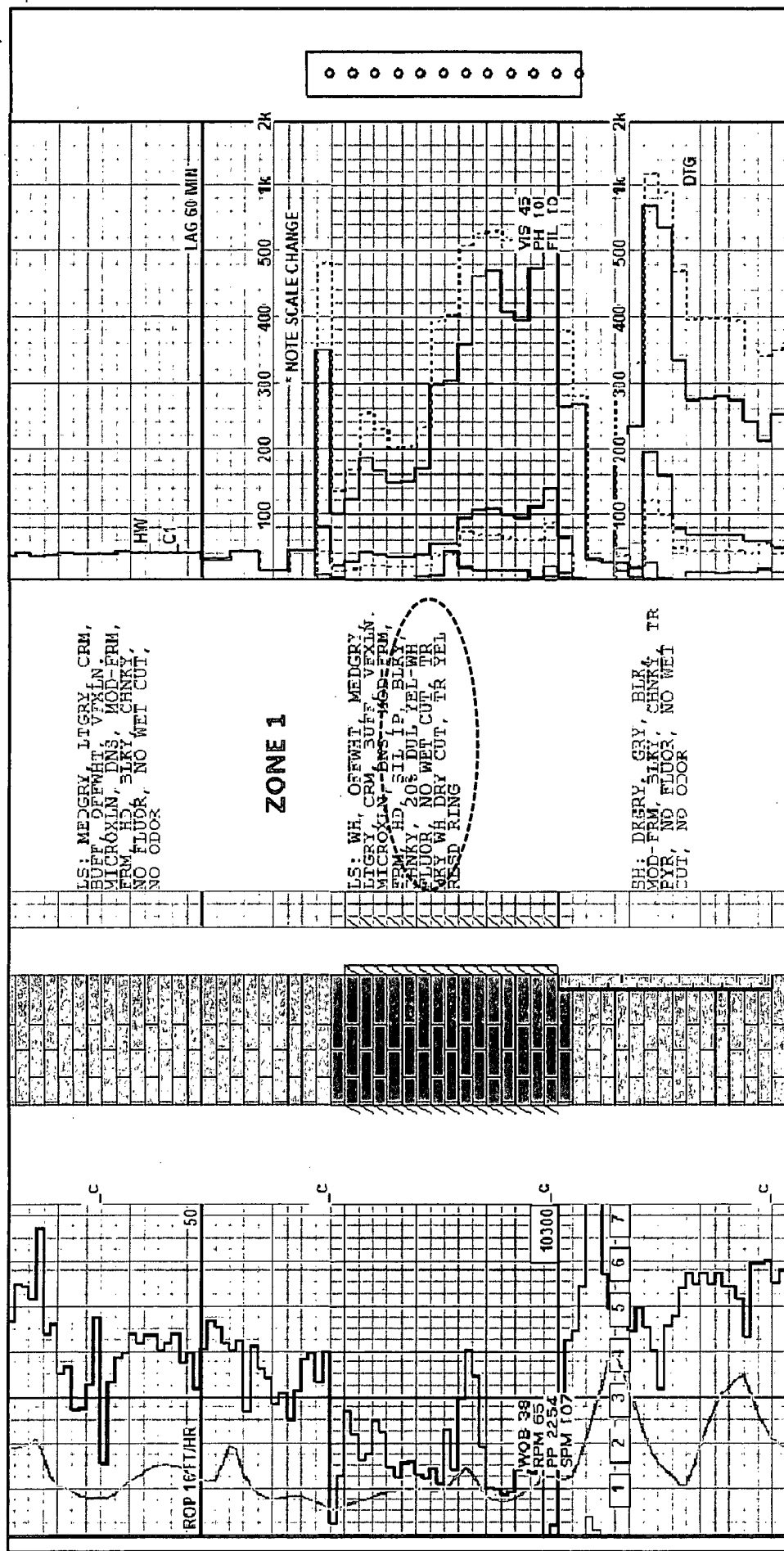
Comments:

Water Saturations values are preliminary due to the nature of the carbonate pore systems, natural fracturing and formation water resistivity.

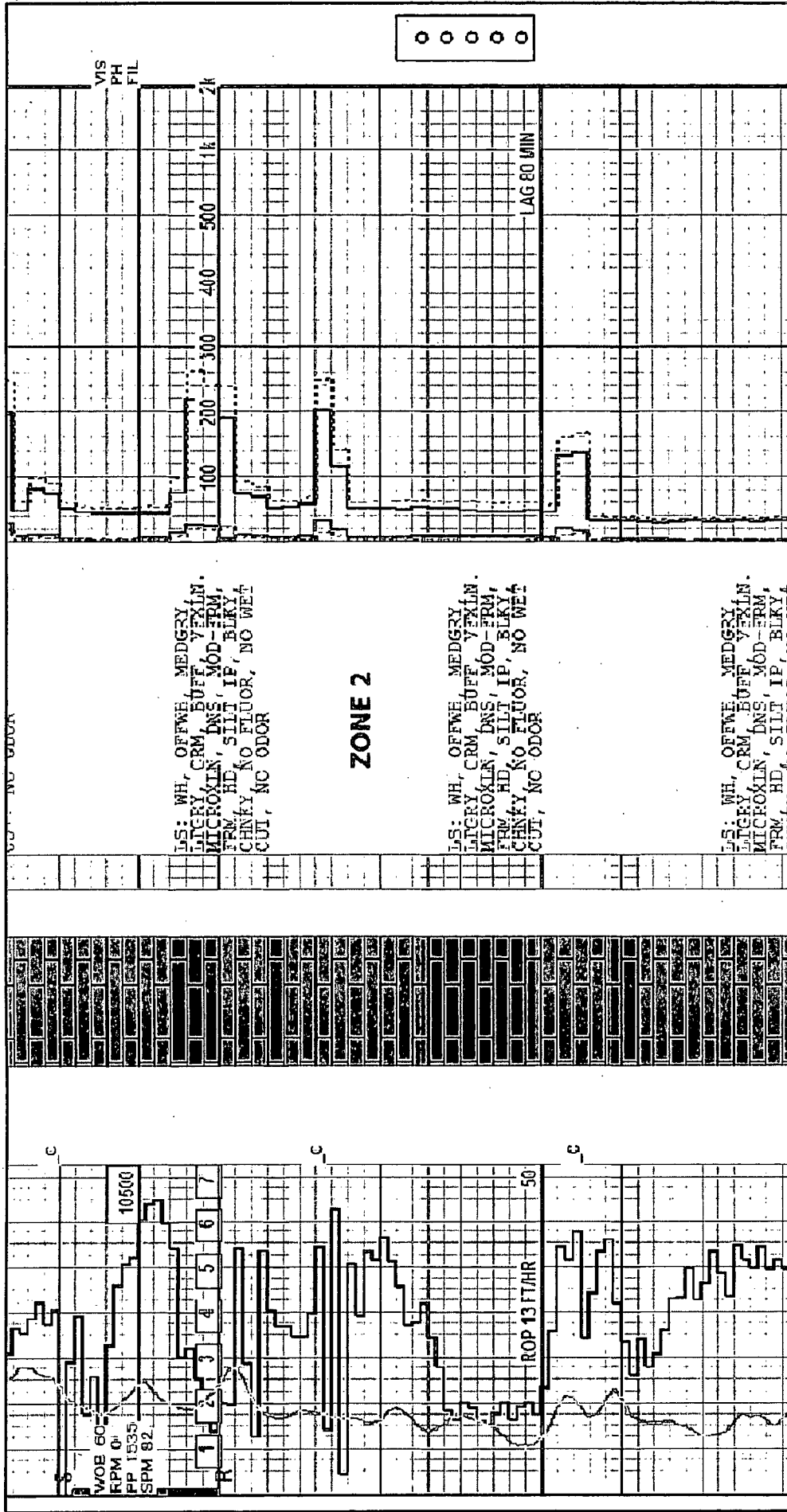
Carbonate vug pores are assumed to be dominate affecting Archie equation M variable assumptions. Formation image log will help characterize pore systems and natural fractures.

Formation water resistivity is assumed to be 80-100k TDS based on offset water injection well data.

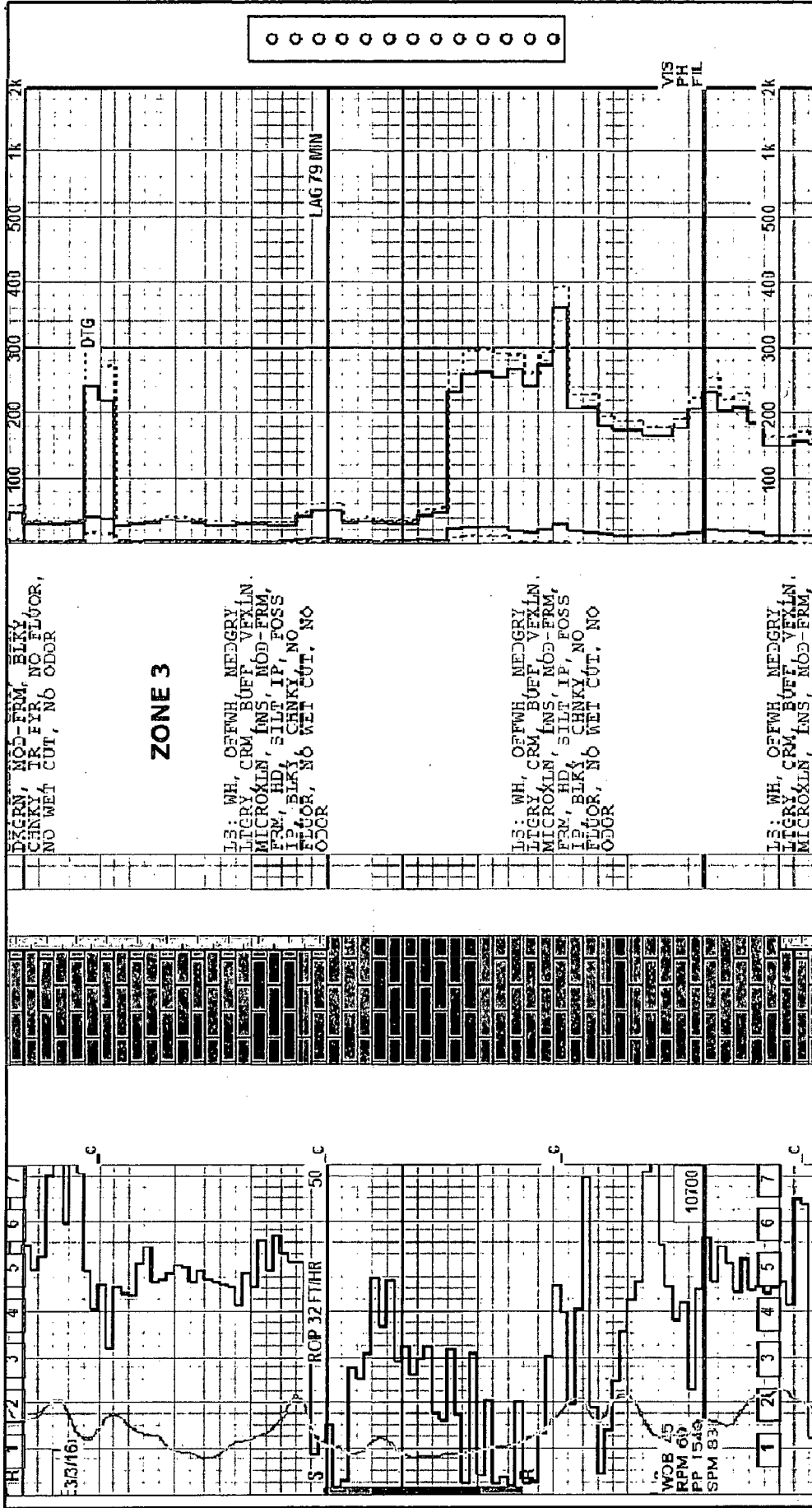
Halliburton's petrophysical calculations over the four gross zones (shown here in true vertical depth view) that are going to be perforated for the purpose of injection all show high water saturations, indicating no presence of movable hydrocarbons. The next four slides will show the mudlog section of each of the four gross perforation zones, in order from top to bottom.



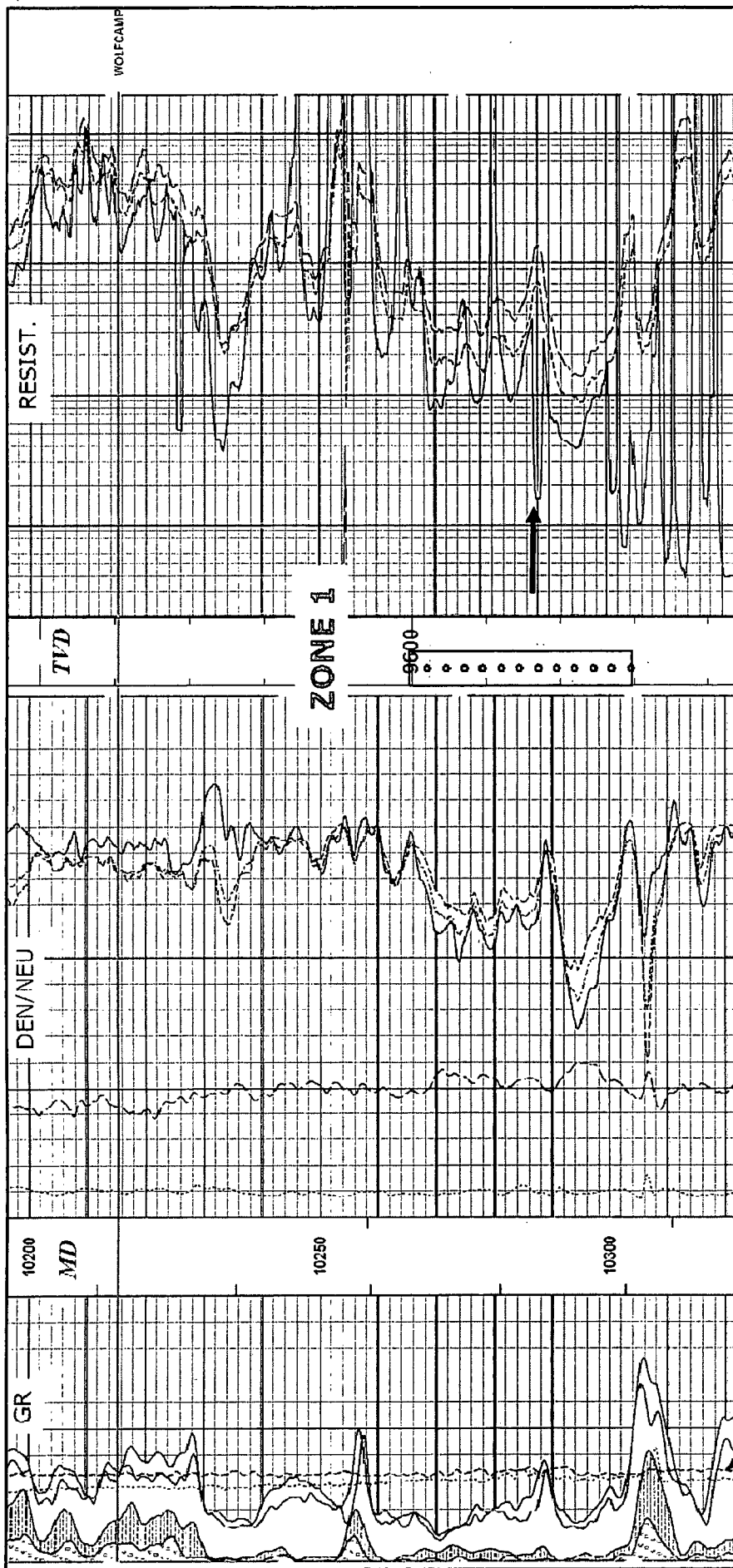
Porous carbonate in this and subsequent slides is indicated by the yellow shading. The logs sections shown are measured depth logs; perforations (far right) are adjusted to measured depths. Gas readings over background are due to dissolved, residual and shale gas in the formation. There are no bright sample shows of oil in this zone, only dull yellow (wet) fluorescence.



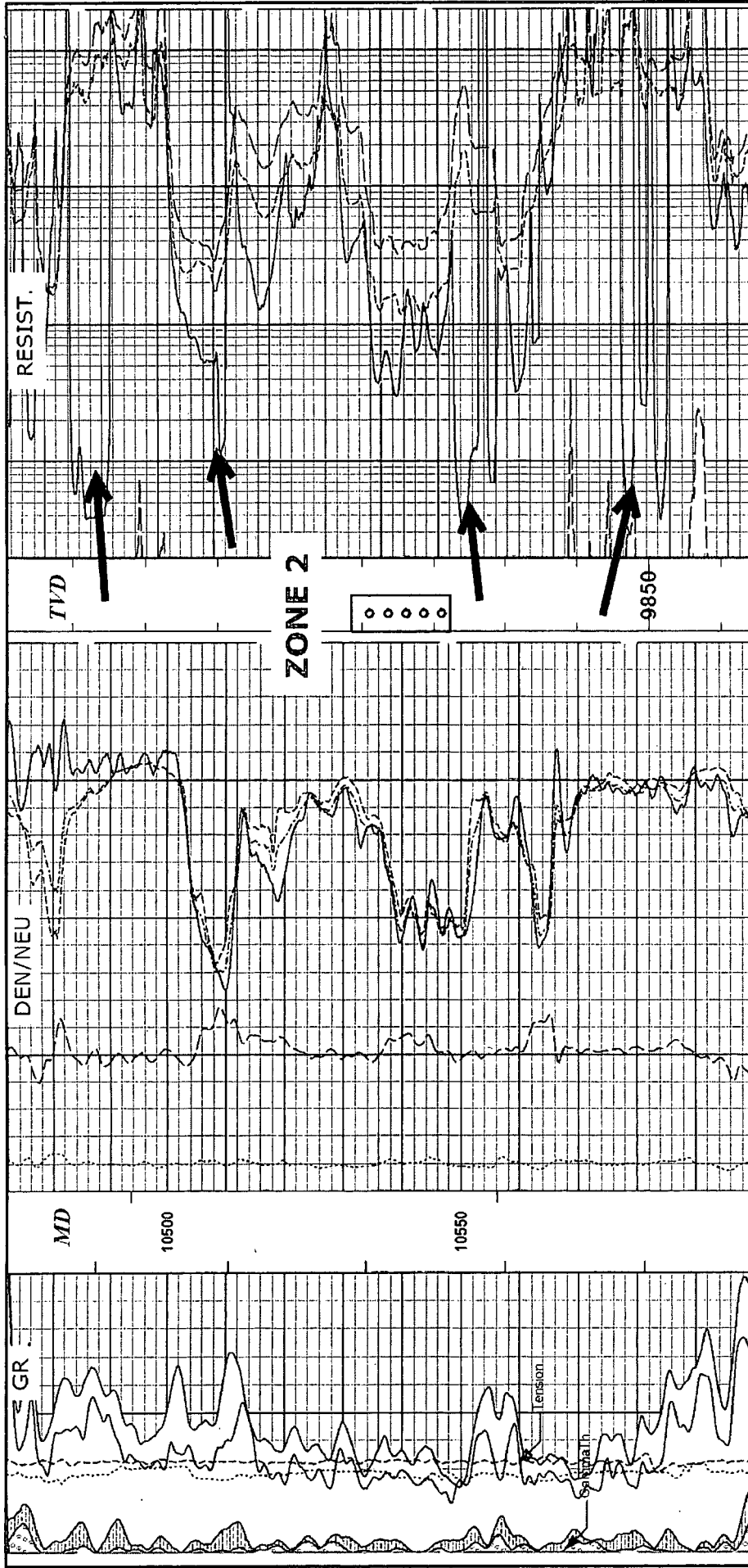
Zone 2 is devoid of any sample shows of any kind, and only minor residual gas shows.



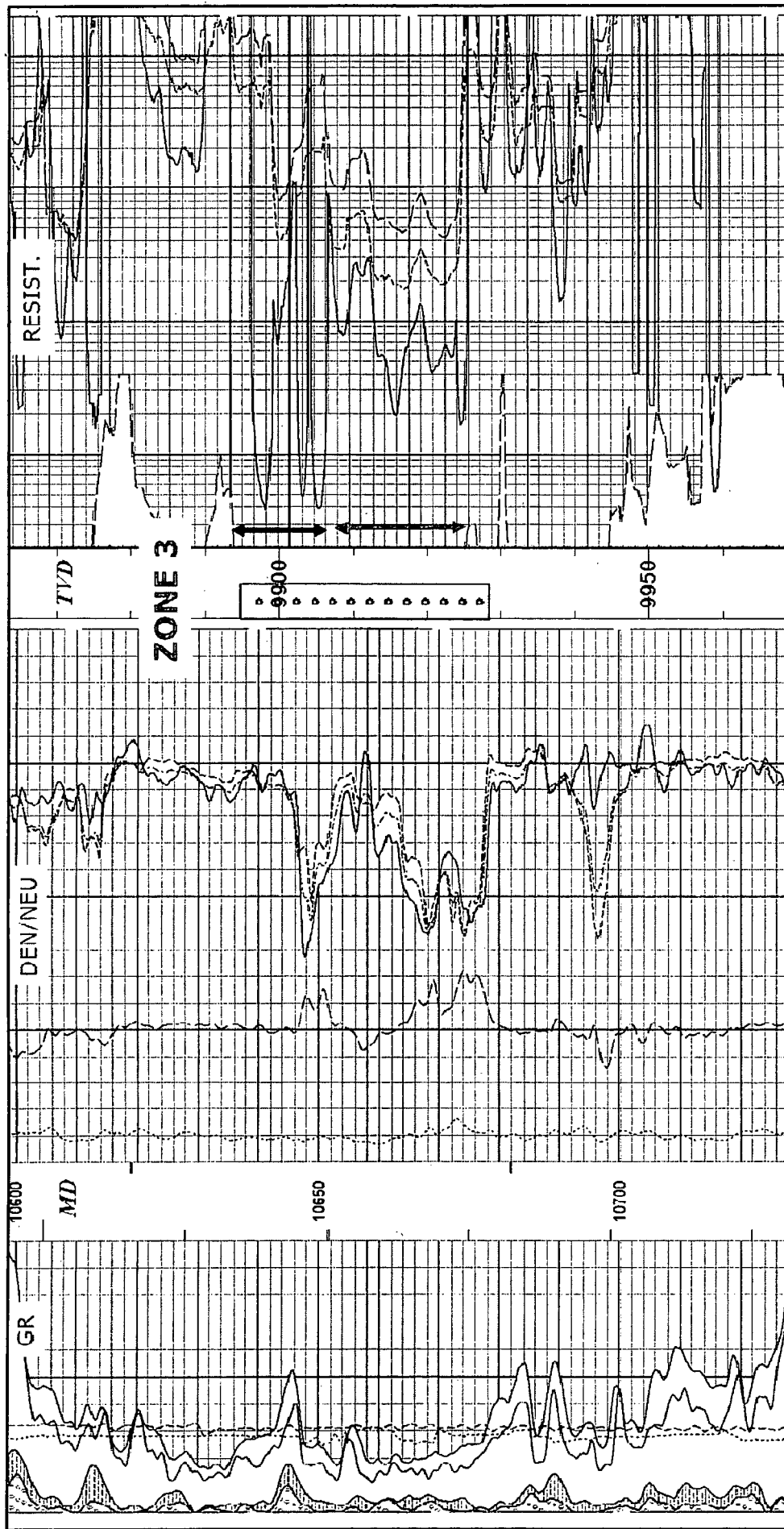
Zone 3 is devoid of any sample shows or cuts, and has shows of shale gas and residual gas.



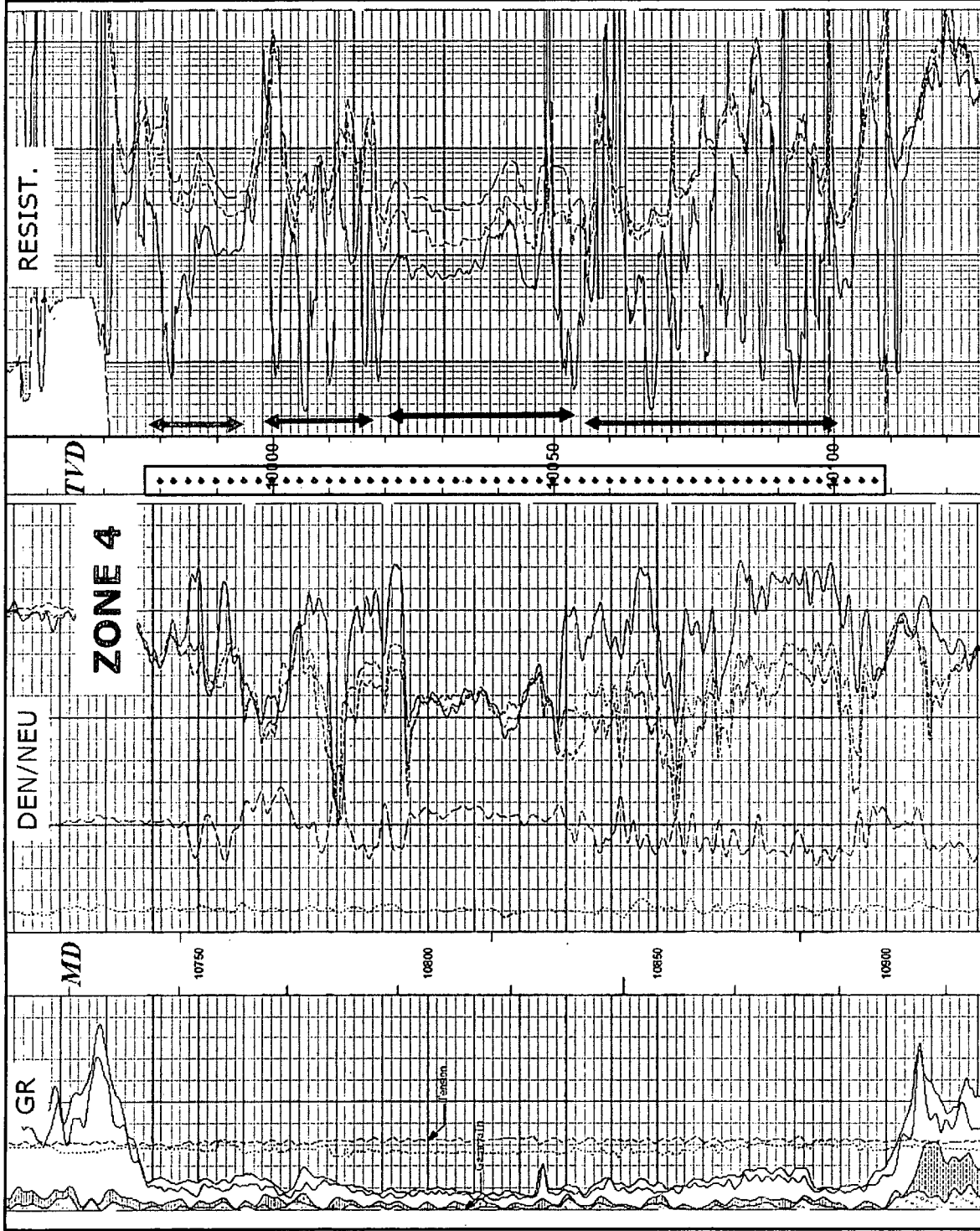
The triple combo log composite through Zone 1 indicates primarily matrix-dominated (connected vugs, intercrystalline) porosity in dolomitic limestone, with only one fracture indicated on the shallow resistivity log (red arrow). The proposed perforations encompass this entire porosity section. Permeability across this zone, as indicated by separation on the resistivity logs, is good to moderate.



Perforations across zone 2 will be across primary porosity in dolomitic limestone, with no fracture porosity directly across fractures. Resistivity separation indicates excellent permeability. Fractures are prevalent elsewhere in this general interval (red arrows), but in tighter or shalier facies where some of the fractures are probably healed. The perforations will be limited to the cleaner (i.e., less shaly) facies, as recommended by the Halliburton petrophysical evaluation.



Zone 3 perforations are proposed across fractured limestones with lower permeability (red arrow), and fracture-enhanced primary porosity in dolomitic limestones and dolomites with excellent permeability (blue arrows), which should provide good transmissivity across the zone.

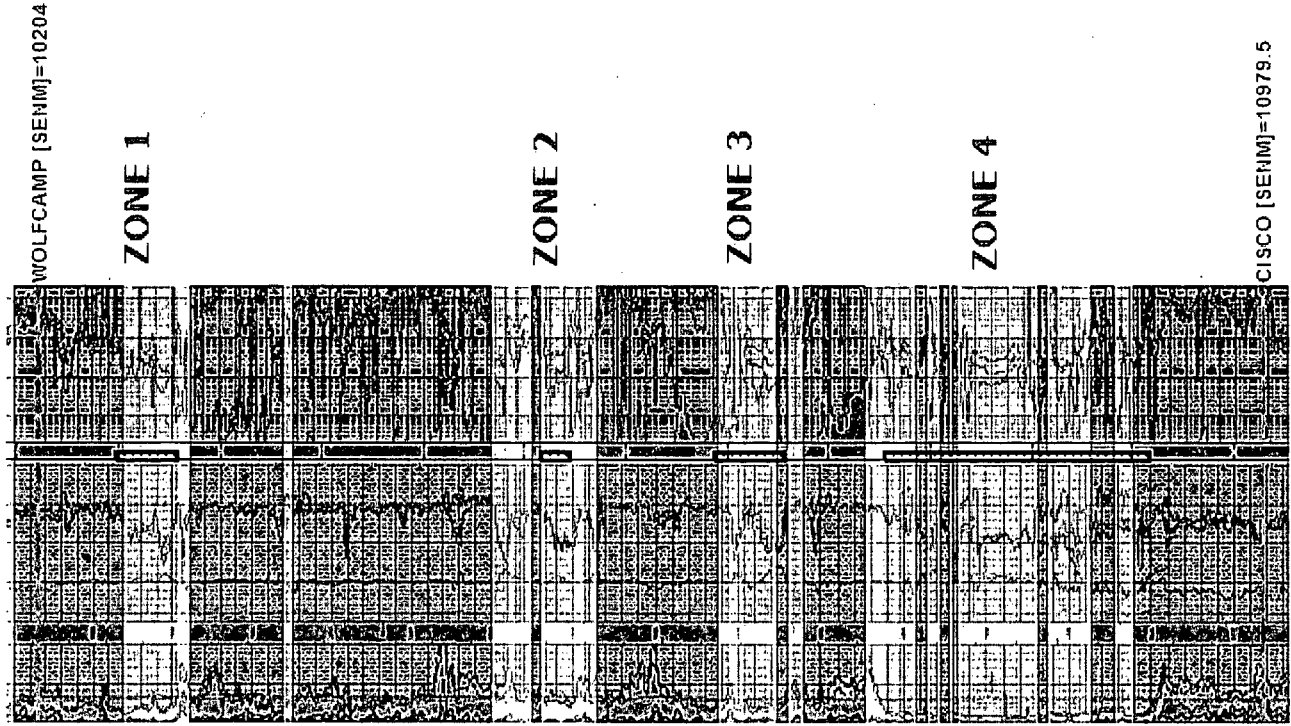


Zone 4 will be perforated across a variety of facies types with variable permeability, ranging from primarily matrix-porosity-dominated limestones (red arrow), fractured-enhanced dolomites (blue arrow), and fractured dolomites (brown arrows).

SUMMARY OF RECOMMENDED PERFS AND CAP ROCK

COMPOSITE LOG SECTION OVER THE ENTIRE WOLFCAMP INTERVAL

Porous facies are highlighted in yellow; tight carbonates and silty-shaly facies (Cap rock) are highlighted in brown. Formation tops are in measured depths. Cap rock is pervasive both between the perforated zones, and above and below the gross interval.



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CONCLUSIONS AND RECOMMENDATIONS

- The approved injection zone currently in use in the Maljamar AGI#1 is the same zone evaluated herein and approved for injection in the Maljamar AGI#2. This zone has been demonstrated to be devoid of any recoverable hydrocarbons. Upon perforation of the Maljamar AGI#2, the operator will swab the well to obtain a sample for confirmation considering safe practices since this zone is the active AGI#1 reservoir. The data presented herein confirm that in the Maljamar AGI#2 within the zone approved for injection. This same zone is used by Cimarex for produced water injection over ½ mile to the southwest and these two wells are situated to mitigate any pressure effects within the zone.
- Well log evaluation and petrophysical analysis indicate that the dominant facies types over the proposed injection intervals are detrital carbonates and associated silty carbonates and shales, where the carbonates have locally high matrix porosity and permeability, and significant to minor fracture porosity and permeability.
- Good, log-indicated (resistivity profiles) permeability is generally pervasive in the porous carbonates, so that every proposed perforation zone should provide some measure of injection potential.
- The best overall zone is Zone 4, lowest in the section, and should be perforated and tested first, followed in sequence by zones 3, 2, and 1. No perforations are proposed by Geolex above the top of the Wolfcamp.
- All zones are capped and straddled by tight carbonate and clastic rocks, which provide good inter-zone barriers and a competent caprock to contain the overall injection interval.