

EUROPEAN REGION TECHNICAL CENTRE

REPORT No CS-83-43

PARTIAL ROCK ANALYSIS

ZECHSTEIN DOLOMITE

CLIENT- PHILLIPS
 DATE - 28 July 1983
 D.S. CONTACT- R COOPER

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INFORMATION REQUESTED

Solubility in 15X and mud acid and scanning electron microscope examination with EDAX analysis.

SAMPLES TESTED

Three small samples of rock debris were received in the lab, labelled:-

A	-	COD 7/11-7	15,926 ft Calc siltstone
B	-	COD 7/11-7	15,958 ft Dolomite
C	-	COD 7/11-7	15,967 ft Calc claystone

All chemicals used came from laboratory stock.

SUMMARY OF RESULTS

Sample A was found to be 12.0% soluble in 15X and 50.0% soluble in RMA.

Sample B was found to be 37.0% soluble in 15X and 80.0% soluble in RMA.

Sample C was found to be 11.0% soluble in 15X and 56.0% soluble in RMA.

Due to the poor quality and small size of the samples, it was not possible to perform detailed mineralogical analysis, but the labels already designated to the samples are fairly accurate, ie, A was a calcareous siltstone with a high clay content; B was either a dolomite or limestone (since the Mg content was fairly low); and C was a calcareous claystone consisting of mixed clays.

ACID SOLUBILITY1 Hydrochloric Acid Solubility Testsi) Procedure

One gram of pulverised formation was placed in 100 mls of 15% hydrochloric acid for one hour at 150°F. The solution was then filtered, then weighed. The amount of hydrochloric acid soluble material was calculated and reported as a percentage by weight.

ii) Results

<u>SAMPLE</u>	<u>PERCENT SOLUBILITY IN 15% HYDROCHLORIC ACID</u>
A	12.0
B	37.0
C	11.0

2 Mud Acid (12% Hydrochloric, 3% Hydroflouric Acid) Testsi) Procedure

One gram of pulverised formation was placed in 15% hydrochloric acid for one hour at 150°F to remove any carbonates from the sample. This was done since calcium or magnesium fluoride precipitation could occur when hydrofluoric acid reacts with carbonate material.

The hydrochloric acid was then poured off and 100 mls of mud acid was added. After one hour at 150°F the solution was filtered and the residue dried and weighed.

ACID SOLUBILITY (Continued)

The amount of mud acid soluble material was calculated and reported as a percent by weight.

ii) Results

<u>SAMPLE NUMBER</u>	<u>PERCENT SOLUBILITY IN 12-3 MUD ACID</u>
A	50.0
B	80.0
C	56.0

S.E.M. STUDY

All samples were found to consist of quartz and calcite grains with a high percentage of mixed clays, differing only in the relative proportions of the constituents.

A had the highest proportion of quartz with fairly low carbonates and a high mixed clay content.

B had a high percentage of carbonates, mainly Ca, with some Mg; low quartz content and fairly high clay content.

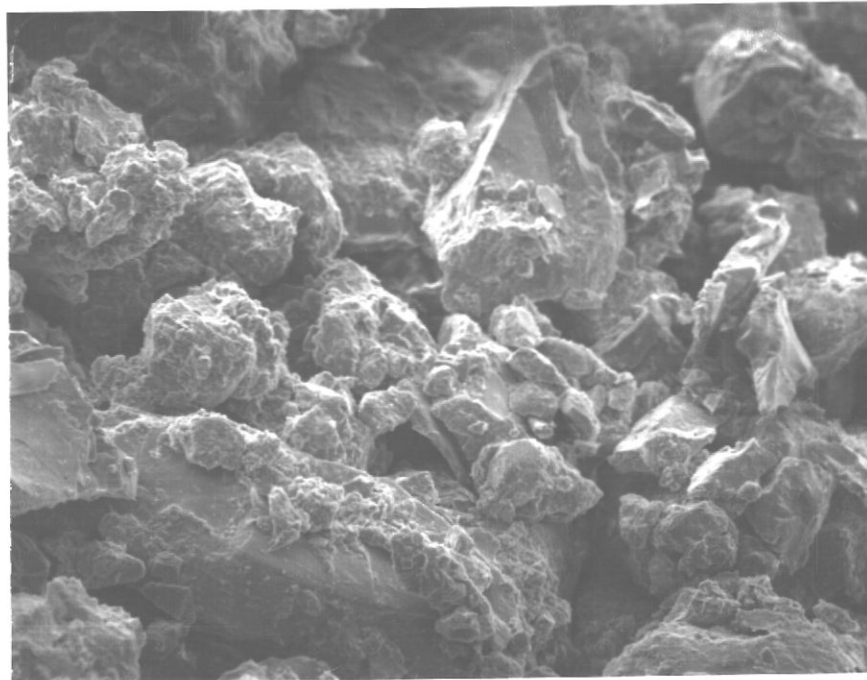
C consisted almost entirely of clays with minor amounts of quartz and carbonates.

EDAX analysis showed all samples to contain the following elements;-

Si, Al, Na, Mg, K, Ca, Fe, Ba and Cl.

At the time of analysis no information was available on the drilling mud composition and consequently it was not possible to determine if any of these elements arose from mud damage.

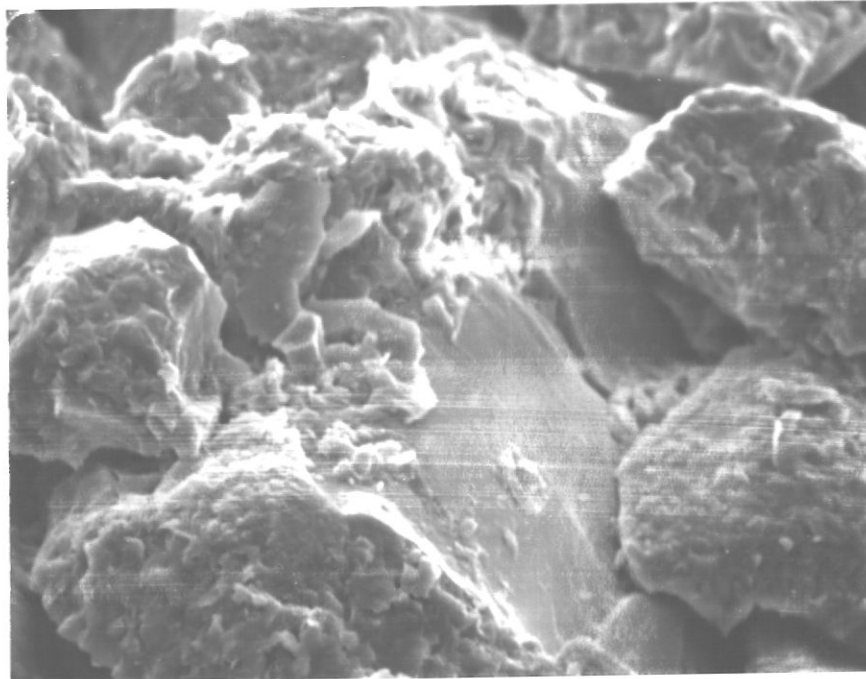
S.E.M. OBSERVATIONS



Sample A Magnification x 160

Quartz grains interspersed with Ca and Mg carbonate grains, coated with mixed clays.

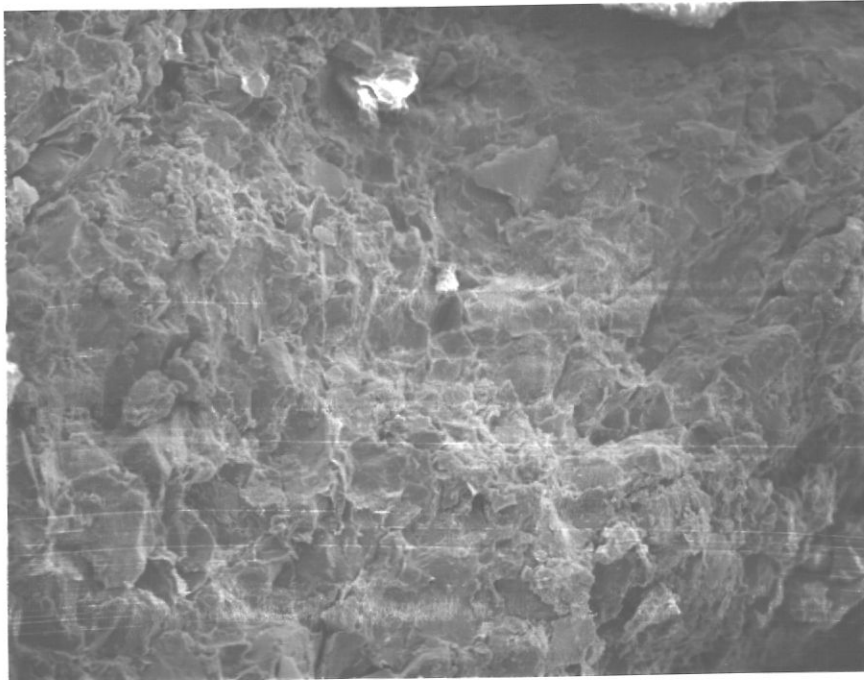
S.E.M. OBSERVATIONS (Continued)



Sample A Magnification x 1250

Clay coatings on the primary grains.

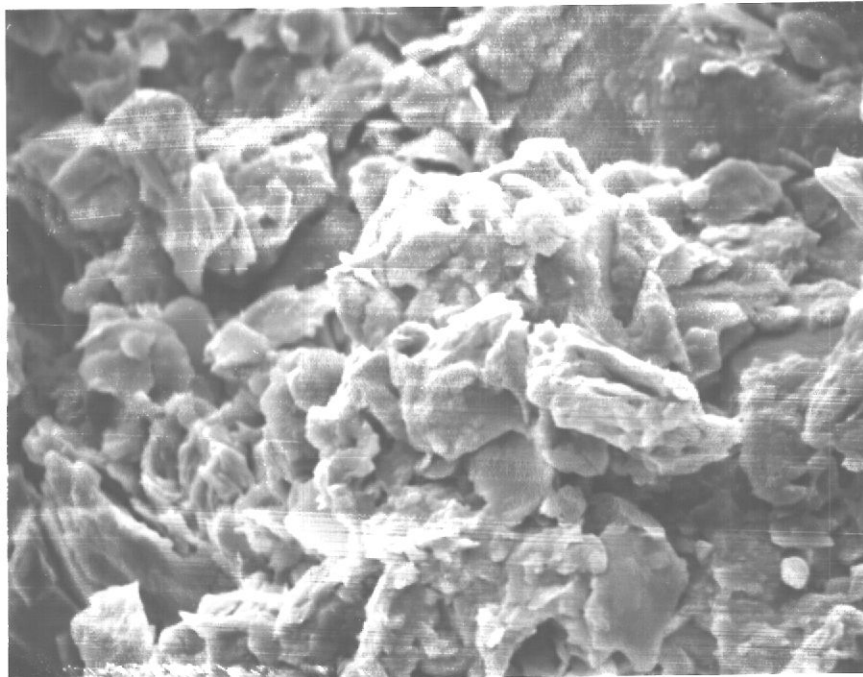
S.E.M. OBSERVATIONS (Continued)



Sample B Magnification x 160

Primary carbonate grains with a high interstitial clay content.

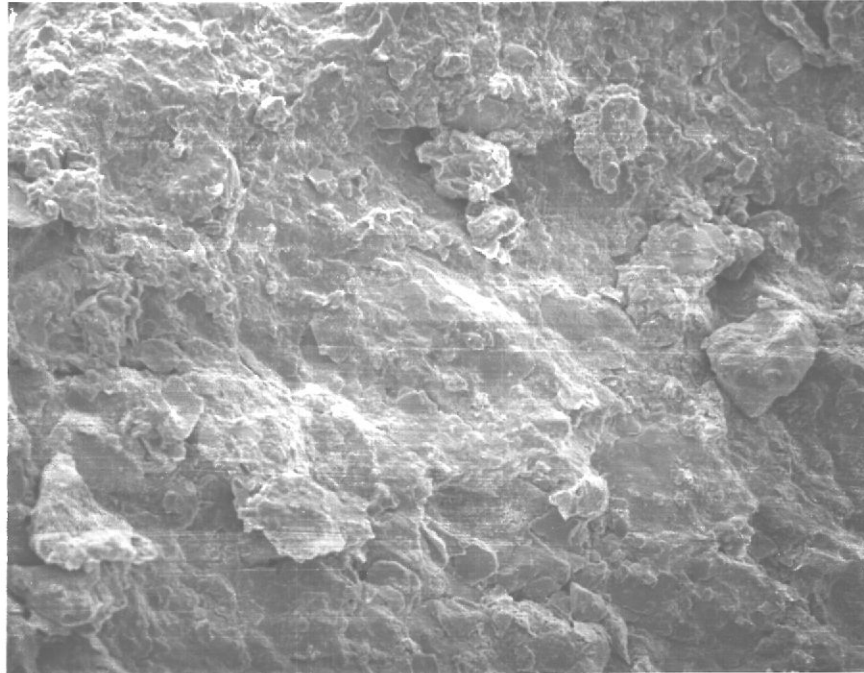
S.E.M. OBSERVATIONS (Continued)



Sample B Magnification x 1250

Clay coatings on the primary grains.

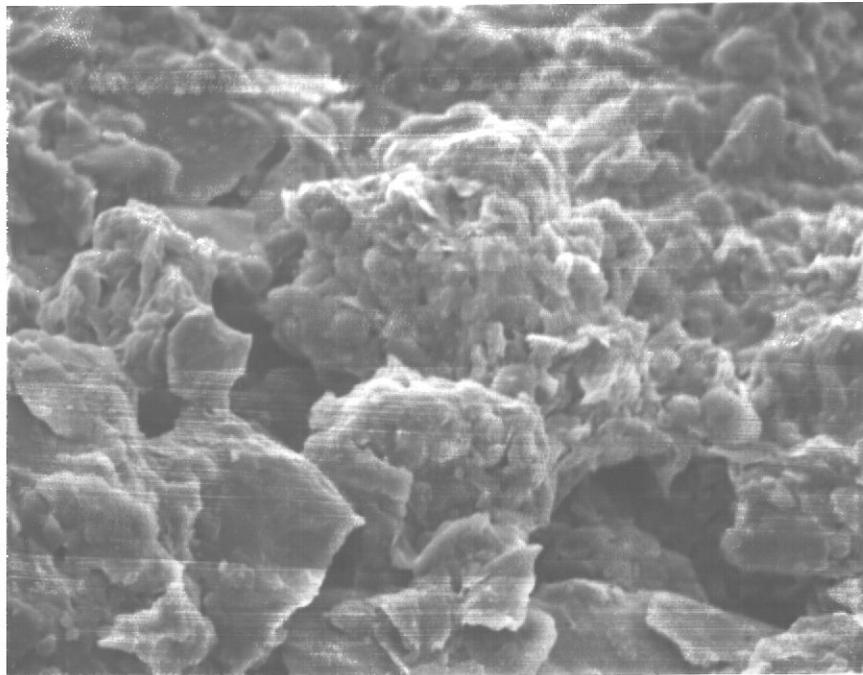
S.E.M. STUDY



Sample C Magnification x 160

Little granular texture is evident with the sample consisting almost entirely of clays.

S.E.M. OBSERVATIONS (Continued)



Sample C Magnification x 1250

Occasional silt-sized quartz grains in the clay matrix.