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THE STUDY OF MINERALOGICAL AND MICROFACIES ANALYSIS SHIRANISH FORMATION WELL (KH-6) ANSAB AREA IN SOUTHERN IRAQ

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ABSTRACT

The study of Shiranish Formation rocks in southern part of Iraq at Ansab area well (KH-6) were carried out. The formation is tongued with tayarat formation, which bounded from top and bottom, the upper tongue at thickness 49m. and tongued at depth (476-525m.) the lower tongue at thickness 4m. tongued at (541-537m.).

The rocks of this formation were divided into three sedimentary microfacies:

1- Dolomitized formininferal Wackestone facies.
2- Dolomitized formininferal Mudstone facies.
3- Dolostone facies.

34 slides were investigated depending on mineralogical, compositional and biological processes and compared diagenesis which reflect open marine shelf at lower part of formation (F.Z.2) (S.M.F.8), but at the top represent deep shelf margin environment.

The most important diagenesis is neomorphism and spary calcite cement deposits within fossils (intragranular) with late dolomitie stage special in dolostone facies (third facies).

INTRODUCTION

The Shiranish carbonate Formation is considered as one of the rock stratigraphic unit with wide regional extension in the north of Iraq and Syria, represented as one of upper Cretaceous Formation and it was studied in many surface and subsurface sections in different areas of Iraq, but first described by (Henson, 1940) in Islam Shiranish village near Zakho city in the north of Iraq, latitude north 37°-11¯- 32″and east 42° -5¯-30″.

Rocks of the Shiranish Formation was divided in type section into two units by (Bellen, R. C., 1959);, (Buday, R.T., 1980) and (Kassab, I. J. M. 1973)in 1986, Al-Qayim divided the type section of the Formation into three units depending on rocks compostion, petrographic analysis and chemical properties also the Formation divided into three by secondary units in Singar mountain area(Maala, K. A. 1977), (AI-Shibani, S. K. 1973), (Youkana, A. K. 1976) and (Kassab, *et al.*1986) depending on foraminifera.

Some researches were pointed into extension to the mid and south of Iraq, (A1-Naqib, 1967) in (Darmoian, S. 1974 b.) considered Qurna Formation in the southern area equivalent to Shiranish Formation as in (Bellen, R. C., 1959) . . . .etc. and (Buday, R. T., 1980) considered as a large tongue for Shiranish Formation, (Darmoian, S. 1975 b.)confirmed that he considered the marine facies of Qurna Formation in the area which described by (Owen, R. M. S., 1985) in Zubair well-3 equivalent for Shiranish and it was fixed by (Al-Mashhadani, A. 1984) the existence of marine facies in the direction of Sudia Arabia boundary in suggested distribution sedimentary facies maps, also Tamar-Agha (Al-Janabi, Safa, A. A. F. 1986) mentioned the existence of this Formation in the southern desert wells, it has been studied one of this well.

We draw a sketch of distributing microfacies for sedimentary basin of the Formation according to Wilson model 1975 (Wilson, J. L., 1975) as in Fig. 3 and the facies were:-

1- Dolornitized Forarniniferal Wackestone Facies:
These facies located at the lower part of the Formation (lower tongue) in depth (537-541m.) and in the upper part (upper tongue) the depth (522-525m.) which recognized by the abundant of planktonic Foraminiferal (*Globigerinelloides escheri*, *Heterohelix reussi*, *Rugoglobigerina rugosa*) plate (1-1) inaddidition to echinoderms and shell fragments.

Chambers of some fossils were filled by spary calcite cement (intragranular) plate (1-2), rhombohedral shape of dolomite mineral were noticed in matrix of this facies and pyrite appeared in some planktonic foraminifera chamber plate (1-3) and the last represented local suitable environment for mineral pyrite deposition because of abundant organic matter that made reduction alkaline condition and this represented the best location for the crystallization of pyrite mineral (Siesser, W. G., 1967). This facies equivalent to the standard microfacies (S.M.F.8) in Facies Zone (F.Z.2), represented on marine shelf with open water circulation below wave base and normal salinity (30-40%) according to the existence of echinoderms (Wilson, J. L., 1975).

2- Dolomitized Foraminifera Mudstone facies:
These facies were represented in depths (494-522m.), (482-490m.) and in depth (476-478m.), the matrix of this facies composed of partially or completely micrite alteration to micro spar plate (1-4) in which the complete faces of dolomite crystal (Anhedral) were scattered plate (2-1) because the burial mud deposit under water by the action of pressure that made confined connate water out of pores contributed in magnesium enrichment which necessary for the late dolomite process (Wilson, J. L., 1975). Formed mineral dolomite process in this facies supposed to be late dolomitic process because the size of dolomite mineral particle larger than 0.02 ml, also no combination with gypsum and did not contain fossils that indicate lagonal environment (Fuchtbauer and Goldscmidt, H., 1956) and the percentage of fossils in this facies less than 10% represented by planktonic foraminiferal genus Aegyptice Globotruncana and G-diwi also echinoderms and shell fragment plate (2-2), many fossils in this facies were affected by neomorphism process such as recrystallization and some of their chamber were filled by calcite cement and pointed the existence of Numlite genus plate (2-3) less than 1% in micrite-matrix, this indicated that it comes by transportation from high energy environment into low energy environment and this fades equivalent to Standard Microfacies (S.M.F.3) in the zone (F.Z.3) in which deposited in deep shelf margin environment.

3- Dolostone Facies.
This facies found in depth (490-494m.) and (478-482 m.), dolomite mineral with sugar texture and equal crystal sizes represented high percentage more than 75% in matrix plate (2-4) that formed by the action of diagenesis substitution process in carbonate deposits, in which Dolomite mineral crystal formed completely faces (Enhedral) medium sizes between (0.55-0.93mm) particles sizes were increased upward that indicate the diagenesis process becomes more intense (Fuchtbauer and Goldscmidt, 1956) the facies has high porosity as a result of late diagenesis process and reflected condition of Supratidal environment because the lack of fossils in this facies. The percentage of crystal Dolomite minerals in this facies identified and determined through X-Ray diffraction scheme (XRD), Dolomite weight % is calculated by using Royse method (Royse, *et al*, 1971) fig.4, the percentage of Dolomite mineral more than 75% that indicate the rocks of this facies was Dolomite from mineralogical andlithological point of view.

CONCLUSIONS

1- Shiranish Formation rocks were intertongue with Tayarate Formation in well (KH-6) into three sedimentary mineralogical microfacies:-
   (a) Dolomitized Foraminiferal Wackestone Facies.
   (b) Dolomitized Foraminiferal Mudstone Facies.
   (c) Dolostone Facies.
2- These facies reflected open marine shelf at the lower part of Formation (F.Z.2) (S.M.F.8) but at the upper part represented deep shelf margin environment.
3- These facies assure the existence of diagenesis processes such as Neomorphism (recrystallization) and late Dolomite process in different degrees, which alter to Dolomite rocks or Dolostone facies.
4- Diagram of microfacies distribution of sedimentary basin were drawn according to Wilson model -1975.
5- These described facies closer to Qurna Formation in the studying that has been done southern oil well co., then we can consider that Shiranish Formation in this area (southern Iraq) has a type of facies different from the Formation in northern Iraq, under the effect of dominated tectonic condition and water depth in this area.
6- The thickness of this Formation considered less in comparison with thickness of Shiranish Formation in the other part f Iraq, the studying pointed to the average thickness formation in the range (100-400 m.) which the thickness reached about 53 m. in Ansab area.

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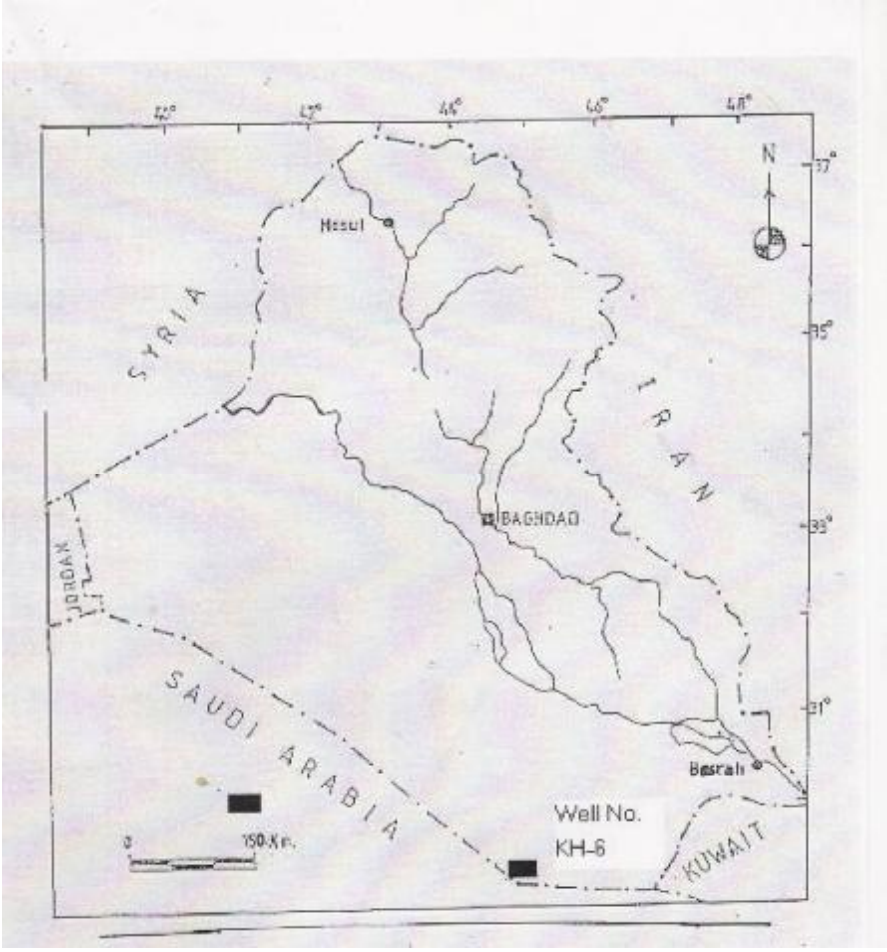


Fig.1: Location map of stuied well

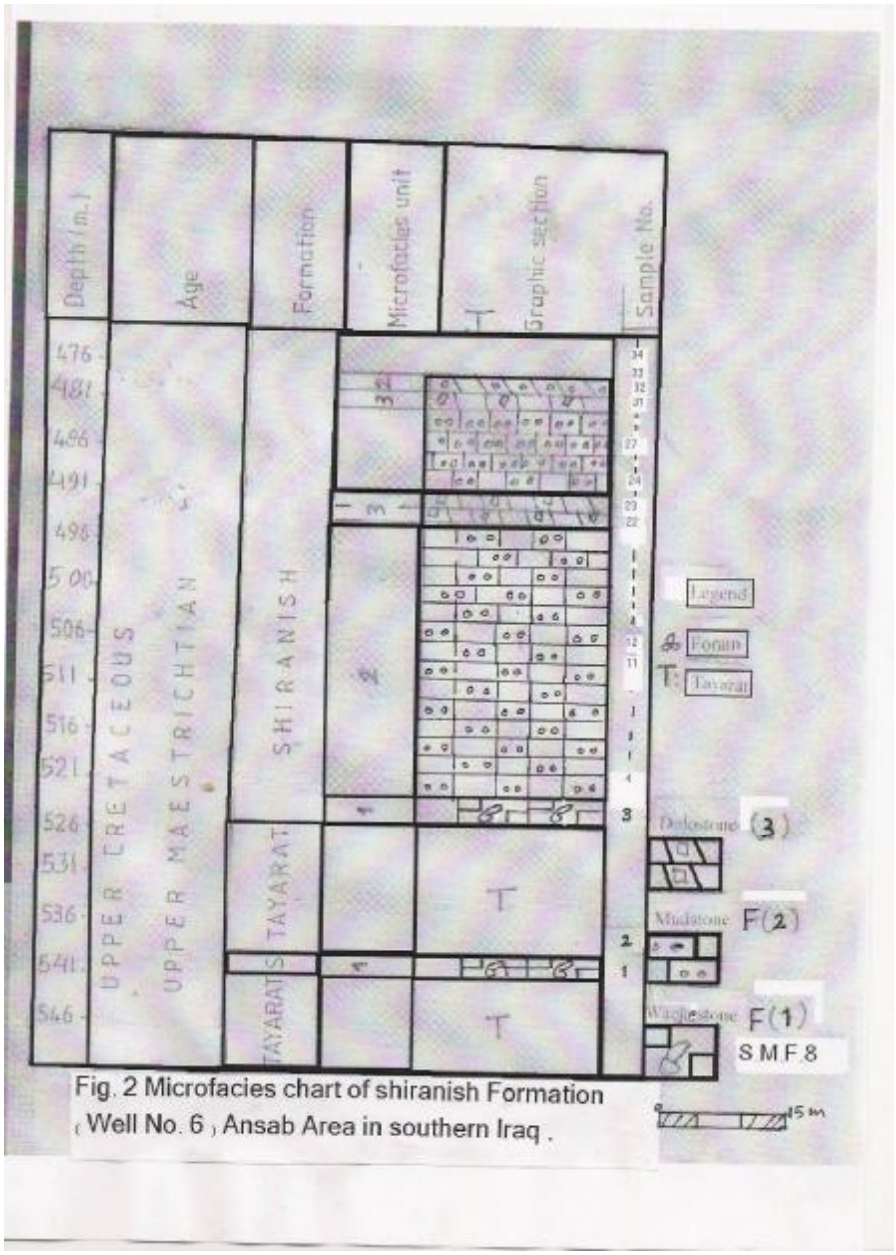
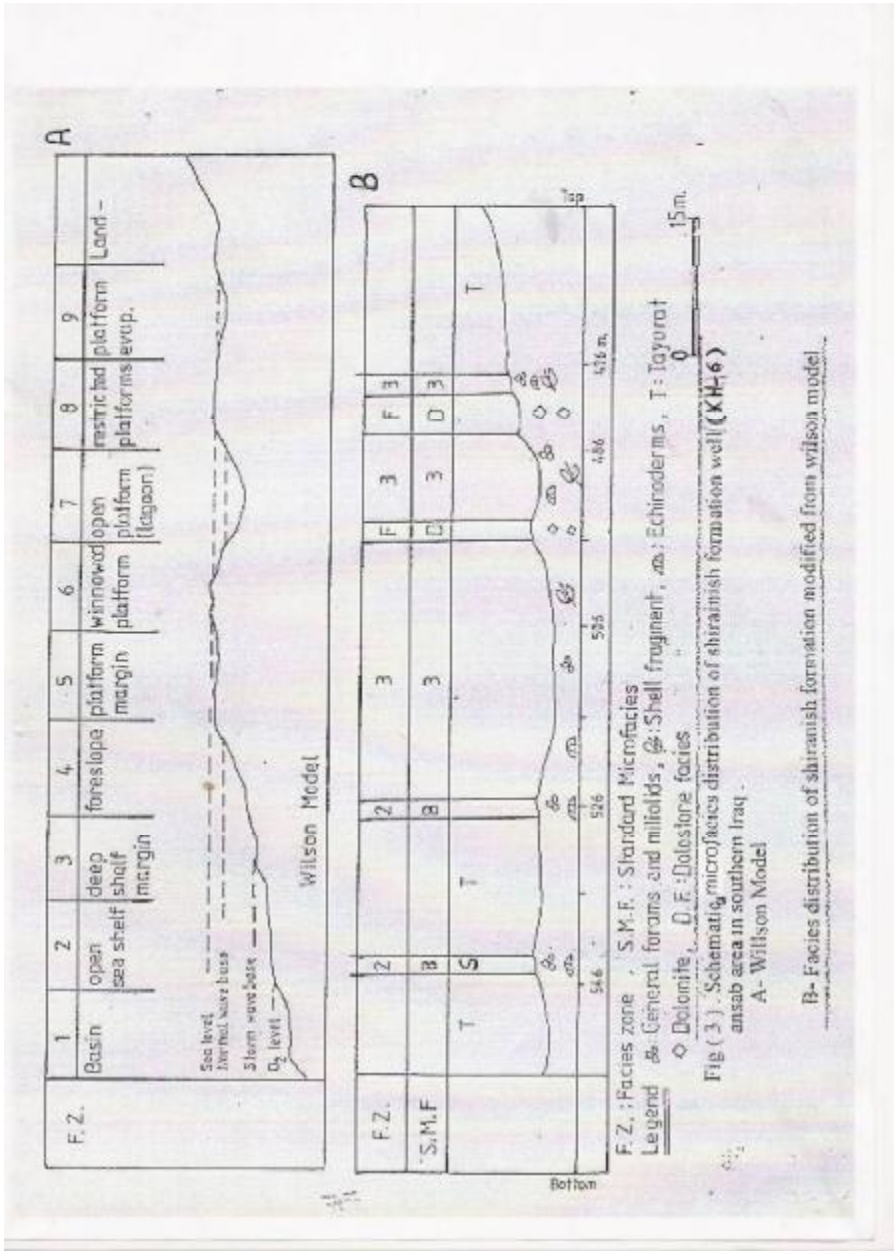


Fig. 2 Microfacies chart of shiranish Formation
(Well No. 6) Ansab Area in southern Iraq .


A
F.Z.
1
Basin
2
open sea shelf
3
deep shelf margin
4
foreslope
5
platform margin
6
winnowed platform
7
open platform (lagoon)
8
restricted platforms
9
platform evap.
Land –
Sea level
Normal wave base
Storm wave base
O2 level
Wilson Model
B
F.Z.
S.M.F
Bottom
F.Z. : Facies zone , S.M.F. : Standard Microfacies
Legend : General forams and miliolids, : Shell fragment, : Echinoderms, T : Tayurat
Dolomite, D.F. : Dolostone facies
15m.
Fig (3) : Schematic microfacies distribution of shiranish formation well (XH-6)
ansab area in southern Iraq .
A- Wilson Model
B- Facies distribution of shiranish formation modified from wilson model

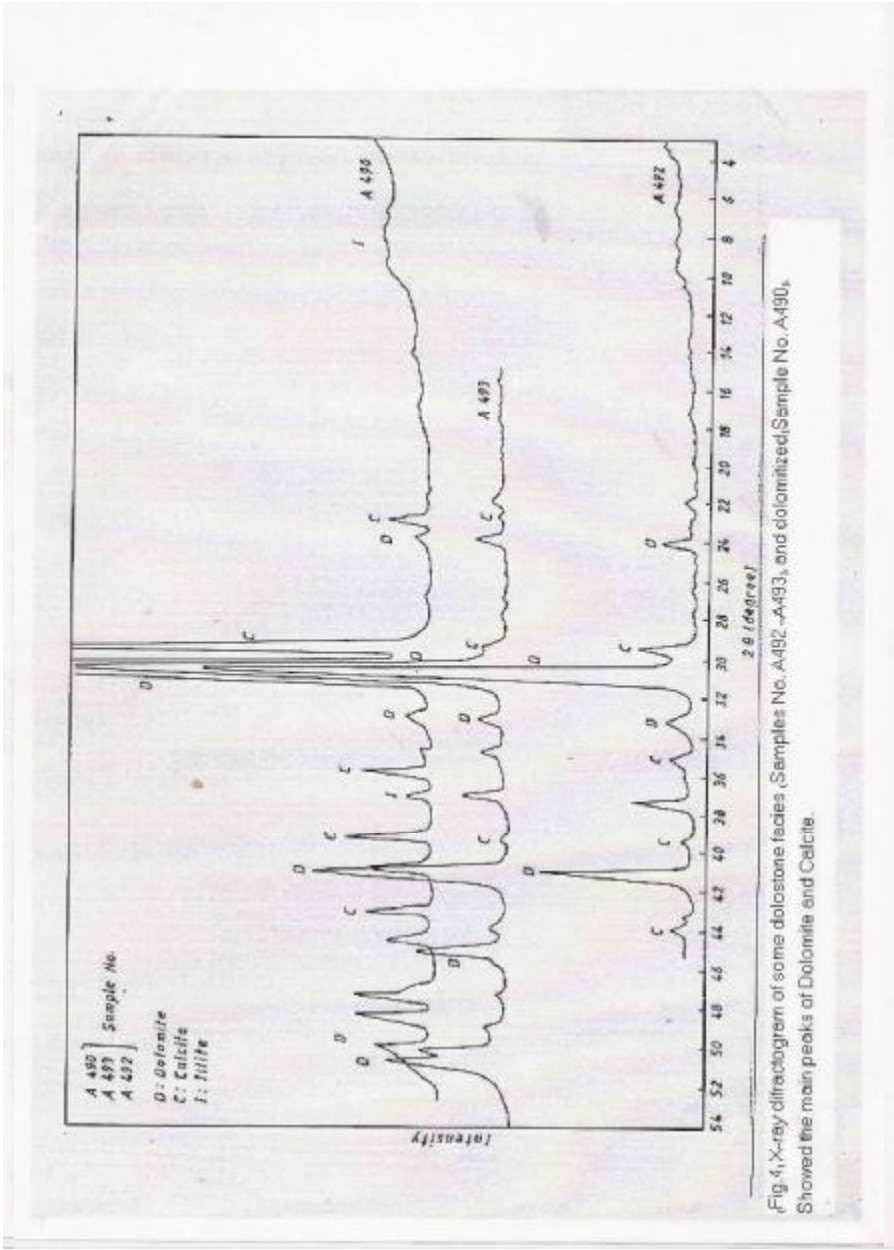


Fig.4, X-ray diffractogram of some dolostone facies (Samples No. A492 -A493, and dolomitized Sample No. A490). Showed the main peaks of Dolomite and Calcite.

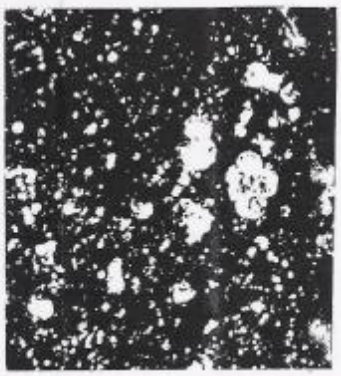
Plate 1

1-1- Echinoderms and shell fragments 40x
1-2- Chambers of fossils were filled by spary cement . 40 X
1-3- Pyrite in some planktonic foraminifera chamber . 40 x
1-4- Dolomitized foraminiferal mudstone 40 x

Plate 2

2-1- Rhombhedral dolomite in micrite matrix 40 x
2-2- Shell fragment in micrite matrix 40 x
2-3- Dolomitized foraminiferal mudstone facies with numulite 40 x
2-4- Dolomite mineral with sugar texture 40 x

plate (1)



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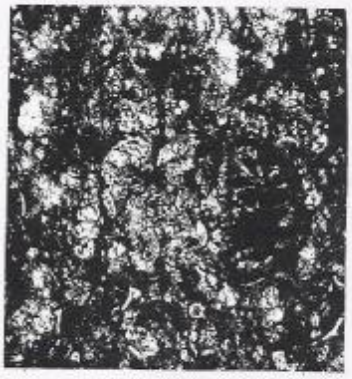
1

4



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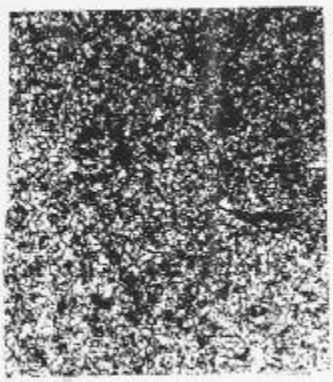
plate(2)(

2

1



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ر ئبش لريشدلا وضدلق يلدلا ينحلاوي نعمل ا يلحتلا ة ارد (KH-6) لقطنم
ب طلا ١ – قار ع لبونج

وصا م ظكفلمي لع* ن ج ن ا يدسو**
* مولع ا ةيلك– دادغب ةعماج
** يعي ب للخ و ا لفحتم– دادغب ةعماج

ةصلاخلا

ر وصةسا دتقجفيش يلرشد لا ن و تبر تبطنلا قا رع لبو (KH-6)، والتي يظهر فيها التكوين على هيئة متلاصقة (تلاصق) مع تكوين الطيارات الذي ميمه من الأعلى والأسفل لسان علوي بسمك ٥٣م يتداخل من عمق ٤٧٦–٥٢٥م ولسان سفلي بسمك ٤م يتداخل من العمق ٥٣٧–٥٤١م.

قسمت صخور هذا التكوين إلى ثلاث وحدات سحنية رسوبية دقيقة هي:

١. سحنة الحجر الواكي الحياتي المتدلمت.
٢. سحنة الحجر الطيني الحياتي المتدلمت.
٣. سحنة الحجر الدولوماتي.

وذلك من خلال فحص الشرائح الرقيقة البالغة ٣٤ شريحة اعتماداً على المكونات الصخرية والمعدنية، والمتحجرات والعمليات التحويرية اللاحقة وقد وجد أن هذه السحنات تعكس بيئة رف البحر المفتوح في الجزء الأسفل من التكوين (F.Z.2)(S.M.F.8) أما في الجزء الأعلى فتمثل بيئة حافة الرف العميق (Deep shelf margin) وان اهم العلميات التحويرية هي إعادة التبلور (Neomorphism) النيومورفزم وترسبات معدن الكالسايت السباري داخل حجرات المتحجرات وعملية الدلمتة المتأخرة خاصة في الدولسنون (السحنة الثالثة).