

November 23, 1976

GG5 3162

To: Mr. Jimmy Mangrum, President
Evans County Oil Corp.

From: James H. Darrell, II *James H. Darrell, II*

Re: Geologic Report Mangrum No. 1

To date this well has been drilled to 1440 feet. Examination of the samples indicates that most of the main artesian fresh water aquifer of southeastern Georgia has been penetrated in addition the sediments which overlie it. No traces of petroleum have been encountered. This is to be expected, because if petroleum was found in this geologic unit, there would be shows of petroleum in some of the water wells drilled into this aquifer system. Based on normal geologic correlation procedures, the sequence of strata encountered so far in Mangrum No. 1 is expected. That is, based on the information available in GGS-95 (Toombs County) and GGS-363 (Liberty County) the closest deep wells, the rock types and thickness of the various rock layers found so far in Mangrum No. 1 agree with their projected occurrence in Evans County. Based on these projections, any possible reservoir rock (sediments that would have the characteristics necessary for the accumulation of petroleum) would be encountered at depths greater than 1800 feet. A summary of the general rock types and the depths at which they occur is found in the appendix of this report.

To my knowledge, no major geologic structures (fault, anticline, or salt dome) necessary for a trap to hold the petroleum are indicated by the drilling to date. Again this is in part based on the correlation of rock strata from the two deep wells mentioned above. Neither a fault nor an anticline is evident based on the surface topography of the area or attitude of the surficial sediments seen in roadcuts in the area. It should be mentioned, the only sure way to positively locate a fault in the area would be to encounter the fault plane in the well or to see displacement of the rock strata in nearby wells. Neither of these criteria have been observed in the area due to lack of data. However, rumors from water well drillers suggest a fault near the town of Hagin. But this has not been thoroughly investigated and the regional extent of such a fault is not known due to lack of data. The lack of subsurface data also does not substantiate an anticline being found in the area. Therefore, the probability of a fault or an anticline occurring in the area is very remote, and would not be located unless a geophysical survey was run in the area or a lot of wells were drilled to obtain information on the subsurface geology of Evans County. According to the published accounts of salt occurrence, salt is not found in the Coastal Plain sediments of Southeast Georgia. Likewise, salt was not encountered in any of the deep wells drilled through the Coastal Plain sediments into the crystalline basement in the Georgia Coastal Plain. Since a parent salt bed does not exist in this area, no salt domes that would serve as traps for petroleum are indicated in Evans County. However, it should be pointed out that rather small and difficult to locate stratigraphic traps may exist in the area. But the limited data available on the subsurface geology of Evans County would not allow such a trap to be predicted. The most economical and quickest way of obtaining the subsurface geological information would be geophysical exploration.

Based on the above information, there are three alternatives available to the Evans County Oil Corporation. These are: (1) to have a geophysical survey performed on the subsurface geology of Evans County; (2) abandon the Mangrum No. 1 well; and (3) to continue drilling the Mangrum No. 1 well.

At this stage, I feel that a geophysical survey would be meaningless as a well has already been started. On the other hand, a geophysical survey would indicate whether further drilling would be in order. However, the cost of such a survey would probably be as expensive as to continue drilling Mangrum No. 1.

Since any potential reservoir rock is below the present depth of drilling in Mangrum No. 1, the abandonment of this well would have to depend on the financial status of the Evans County Oil Corporation. If there is any change of finding petroleum it will have to be deeper and abandonment means not finding it.

If continued drilling of Mangrum No. 1 is followed, I recommend that a professional oil drilling firm be hired. This probably would be an expensive proposition. However, the expense of such an endeavor would probably be well worthwhile. Such a company would have experience in deep well drilling and would be able to handle any emergency (e.g., loss of circulation, encountering a high pressure pocket). Thus they would have the knowledge and resources readily available to overcome any difficulty during the drilling procedure. Another reason for this recommendation would be their having the proper equipment and knowledge to continue the well without further casing. This would be much cheaper considering the cost of casing. Also such a company would have available other equipment such as a blowout preventer and a mudlogger. The safety aspect should also be considered in addition to having the proper equipment in order to obtain the most geologic information from the well as possible. Even if petroleum is not found in Mangrum No. 1, the information gained on the subsurface geology in Evans County would be a significant contribution if drilling is resumed.

LITHOLOGIC SUMMARY MANGRUM NO. 1

| <u>Depth (in feet)</u> | <u>Lithology</u> |
|------------------------|--|
| 1-130 | Samples unavailable for analysis |
| 130-390 | Fine to coarse-grained, subangular to subrounded, poorly sorted, clayey quartz sand with varying amounts of fine to coarse-grain, subrounded to rounded phosphate nodules. Fossiliferous-mostly pelecypod shell fragments with scattered bryozoan fragments. Interbedded sandy clay and dolomitic limestone, particularly from 280 to 390 feet. Carbonized wood at 280 feet. |
| 390-450 | Interbedded sandy clay and quartz sand; similar to above except phosphate is not as abundant. Carbonized wood at 410 feet. |
| 450-452 | Dolomite; fine-grained, crystalline, medium gray colored, with fine subrounded quartz sand. |
| 452-810 | Limestone; cream to white colored, fossiliferous-mostly bryozoan remains with scattered pelecypod shell fragments; interbedded with white to buff colored hard fine-grained limestone layers, some very hard (e.g., 2 1/2 hours to drill 10 feet at 590 to 600 feet). hard layers less fossiliferous; oyster shell fragments very common from 790-810 feet. |
| 810-850 | Limestone; fine-grain, cream colored, fossiliferous; interbedded with fine to medium-grained, poorly sorted, subrounded quartz sand. |
| 850-873 | Limestone; cream to white colored, very fossiliferous-mostly bryozoan remains. |
| 873-930 | Limestone; very soft cream colored fine-grained, fewer fossils than above. |
| 930-1130 | Limestone; cream to white colored, fossiliferous-mostly bryozoan remains with occasional pelecypod shell fragments and echinoid spines. |
| 1130-1290 | Clay; probably marl-very soft, tan to cream colored, unfossiliferous (very poor sample returns as most was suspended in drilling mud). |
| 1290-1370 | Limestone; white, fossiliferous-mostly bryozoan remains; interbedded with harder layers which usually had fewer fossils. |
| 1370-1410 | Limestone; light gray colored, fine-grained, very few fossils. |
| 1410-1440 | Limestone; cream to white colored, fine-grained, fossiliferous-mostly bryozoan remains. |