STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

LARRY KEHOE
SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

July 17, 1981

Case 5899

Mr. R. E. Richards
Attorney at Law
Box 761
Hobbs, New Mexico 88240

Dear Mr. Richards:

As requested by Mr. Steve Reed's letter of April 16, 1981, and as authorized by Commission Order No. R-5516, Parabo is authorized to add an additional evaporation pit (Pit 6) at their facility east of Eunice, New Mexico.

The pit is to be constructed and monitor wells drilled as outlined in the above mentioned letter.

Please contact the Hobbs District Office prior to any dike construction.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Ed L. Reed and Associates, Inc.

Consulting Hydrologists

MIDLAND - CORPUS CHRISTI

TEXAS

ED L. REED, P.E.
PRESIDENT

A. JOSEPH REED
EXECUTIVE VICE PRESIDENT

CHESTER F. SKRABACZ
VICE PRESIDENT FIELD OPERATIONS

1109 N. BIG SPRING
MIDLAND, TEXAS 79701
915 682-0556

V. STEVE REED
VICE PRESIDENT GEOLOGY

OIL INDUSTRIES BLDG.
SUITE 315
723 UPPER N. BROADWAY
CORPUS CHRISTI, TEXAS 78403
512-883-1353

July 14, 1981

Mr. Joe Ramey, Director
State of New Mexico
Energy and Minerals Department
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87501

Dear Joe:

Enclosed are copies of the three cross sections which should have accompanied my April 16, letter concerning Parabo expansion. The locations of the cross sections are shown on the map that was included with the letter.

Very truly yours,

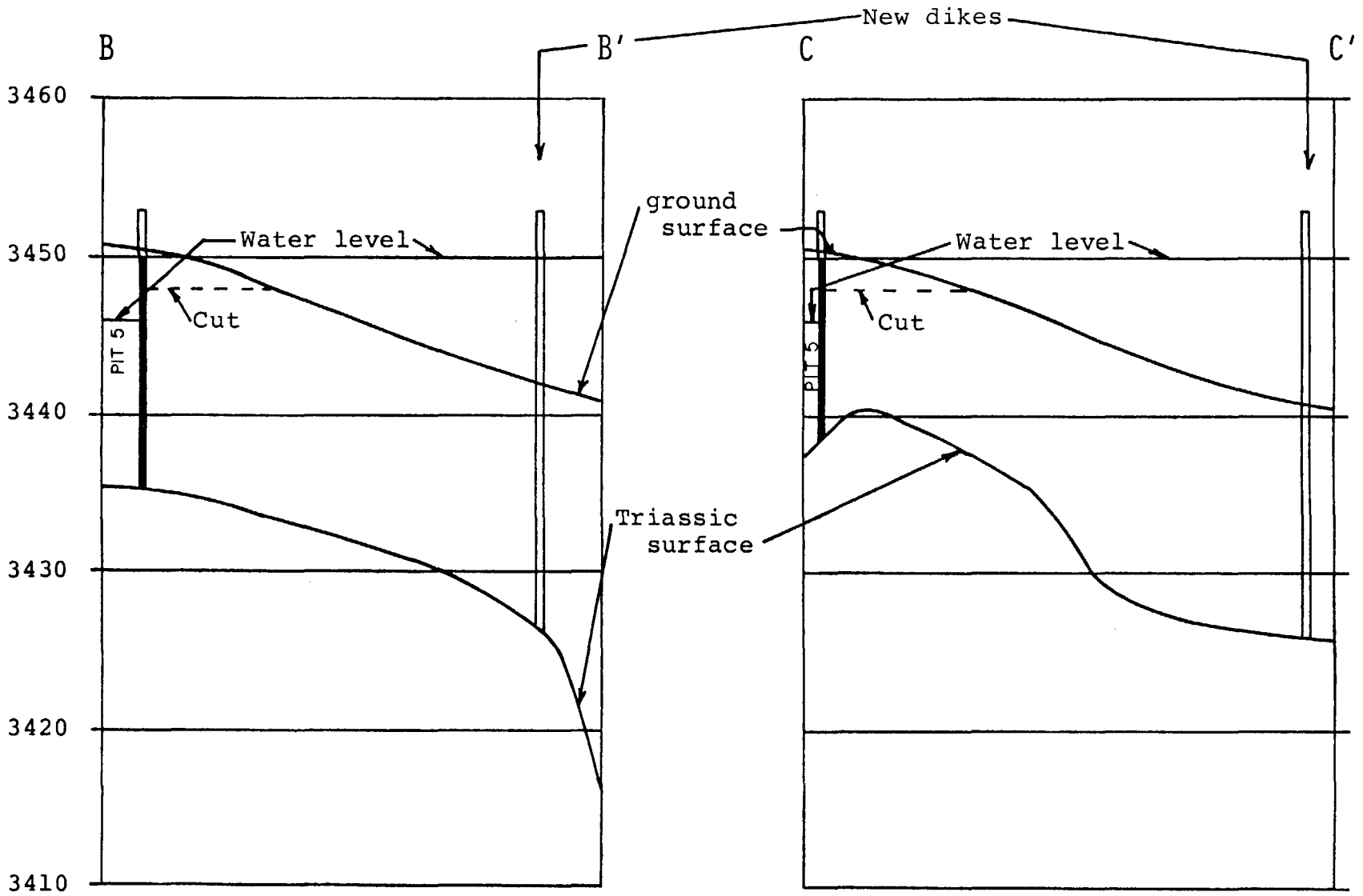
V. Steve Reed

V. Steve Reed

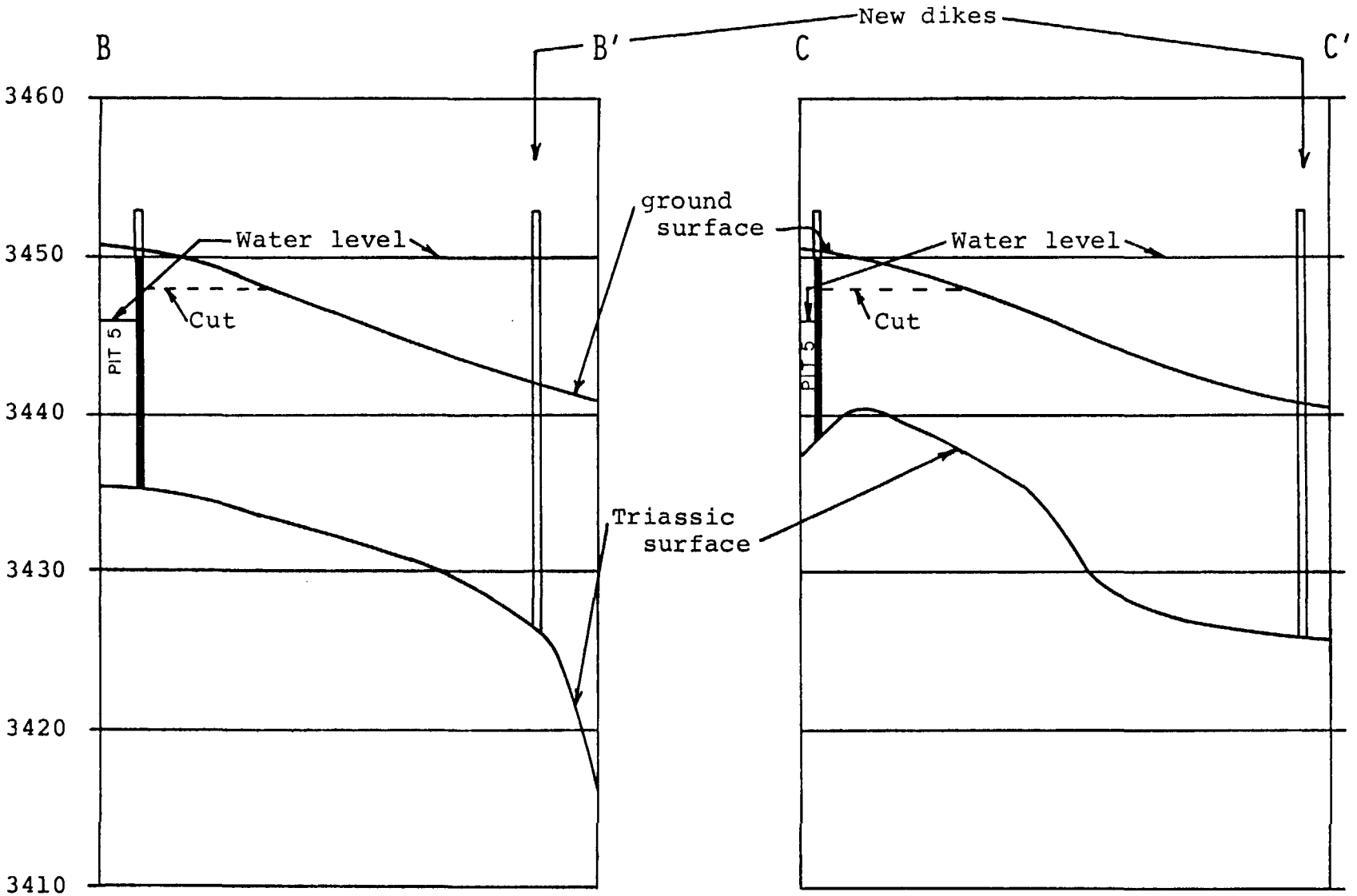
dp

Enclosures

Copy: Mr. R. E. Richards
P.O. Box 761
Hobbs, New Mexico 88240



Ed L. Reed & Assoc. Inc
Consulting Hydrologists
Midland, Corpus Christi, Texas



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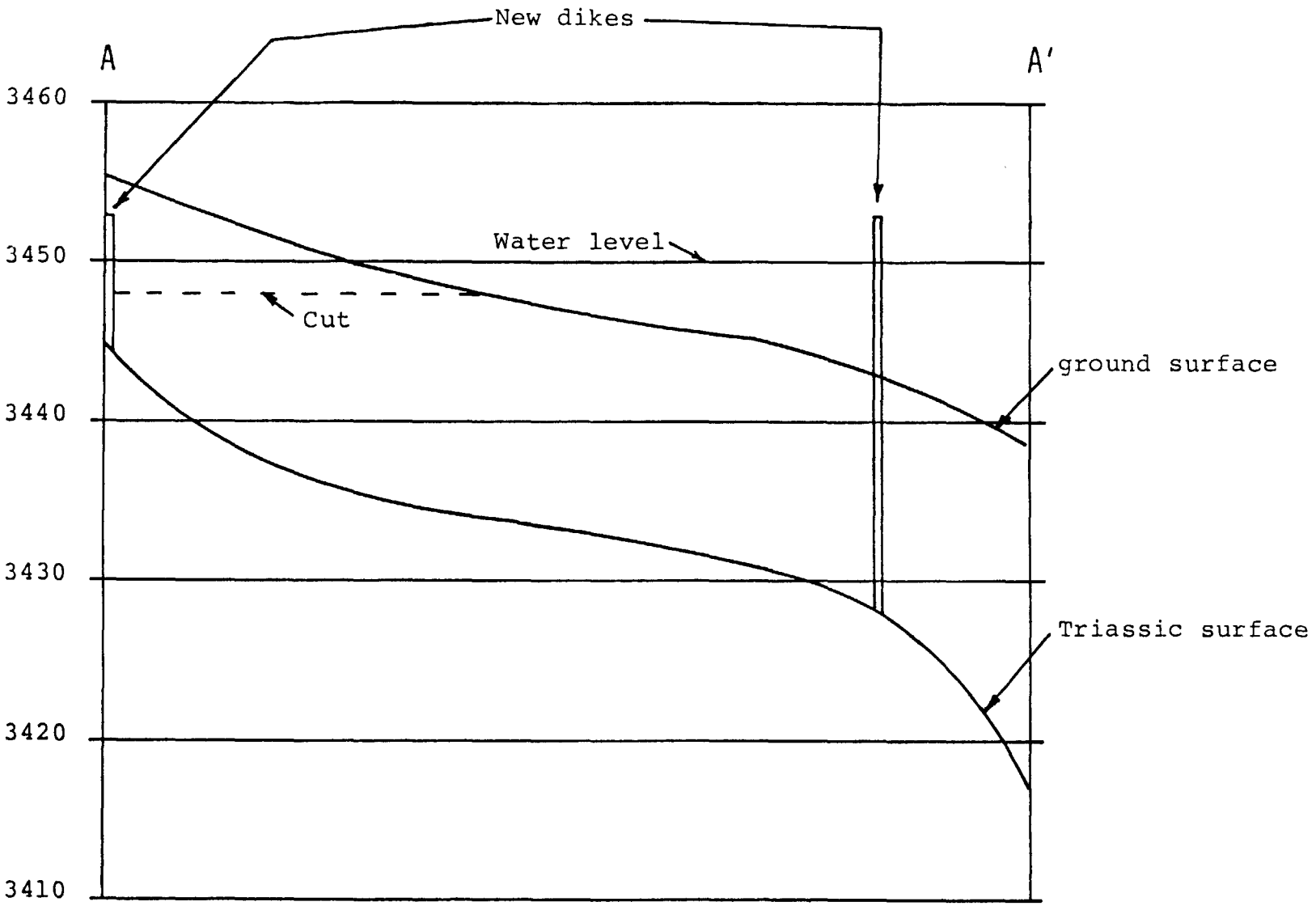

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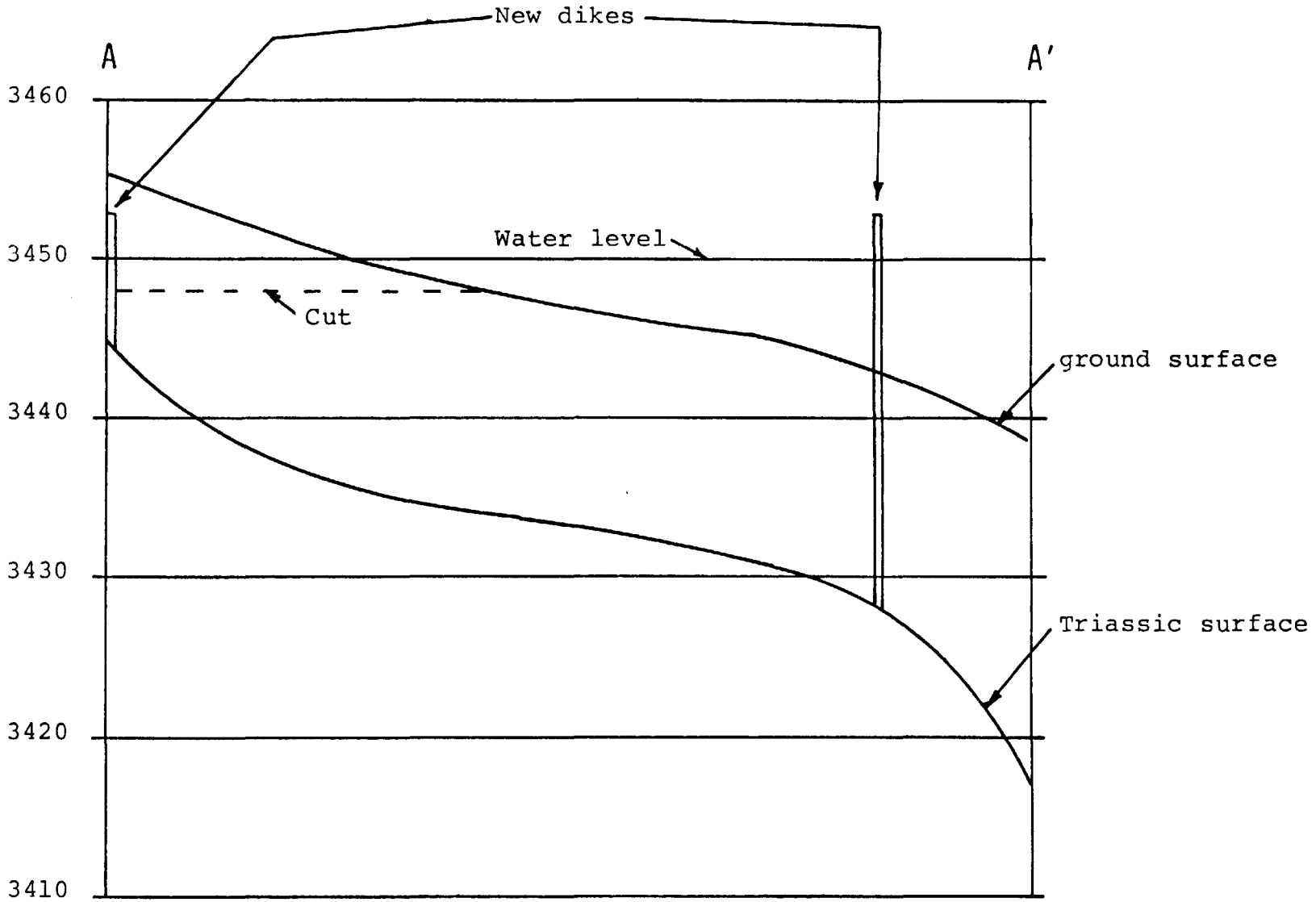

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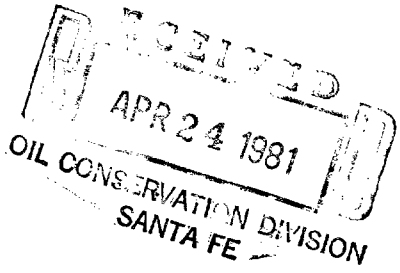
April 16, 1981



Mr. R. E. Richards
Attorney at Law
P.O. Box 761
Hobbs, New Mexico 88240

Re: Parabo expansion

Dear Bob:

I have recently test drilled an area south and east of Pit #5 to evaluate its potential for constructing salt water evaporation pits. I find that an evaporating pit consisting of about 18 surface acres can be constructed as shown on the enclosed maps. This pit would be completed by constructing a combination core trench/dike from the north end of Dike "G" to about 200 feet east of Dike "B". Both ends of the dike would be tied into Dike "G". This core trench/dike would be constructed by cutting a trench at least 15 feet wide through the overburden into the underlying Triassic clay. This trench would be filled with compacted clay to the ground surface, and a free-standing dike would be continued to an elevation of 3453 feet. Dike "G" which now has an elevation of 3450 feet would be raised to an elevation of 3453 feet. I have constructed three cross-sections in the proposed expansion area showing the configuration of the surface topography, the existing dike and new structure. The material lying on top of the redbed has no economic value, therefore, it is proposed that this material would be left in place where it lies below an elevation of 3448 feet. That material which lies above 3448 feet would be excavated. I propose to maintain the fluid level at a maximum elevation of 3450 feet, providing a 3-foot freeboard.

As can be seen from the cross-sections, the southern side of the core trench/dike is as high as 27 feet. With a 3-foot freeboard the maximum height impounding water is 24 feet. Over half of this structure would be completed below ground level with a maximum exposed dike of 12 feet, three feet of which are for freeboard. Thus, even though the core trench/dike is quite high on the south side, there should be no problems with its structural integrity.

Due to the height of the proposed structure, I have calculated the time which one could expect salt water to leak through the base of the core trench at its deepest point where the pressures are the highest. The velocity of movement through the structure is calculated using the formula as follows.

$$V = \frac{PI}{7.48\ Sy}$$

where

V = Velocity in feet per day

P = Permeability in gallons per day per square foot

I = The hydraulic gradient. The hydraulic gradient is the height of the water divided by the thickness of the dike.

Sy = Specific yield, or effective porosity. The effective porosity of a clay ranges from 1 to 10 percent. The velocity calculations use a conservative 2 percent effective porosity.

Using a permeability of 1×10^{-8} cm/sec (2.12×10^{-4} gpd/ft^2),

$$V = \frac{2.12 \times 10^{-4}\ \text{gpd/ft}^2 \times 24/15}{7.48 \times .02} = .0023\ \text{ft/day}$$

Therefore, a 15-foot thick dike would not begin to leak at its lowest point (24 feet below the water level) until there had been continual impoundment for 6500 days or almost 18 years. I consider the 18 years to be a minimum time period and thus consider the structure capable of adequate impoundment. Assuming the structure did begin to leak after 18 years, the total leakage along the 1100 foot long south side of the core trench would be 0.4 gallons per day along the basal one foot of structure.

Prior to placing this new pit in operation, 13 monitoring wells should be drilled as shown in the enclosed figures. These monitoring wells would be drilled to an elevation of 3410 feet and the casing perforated from total depth to an elevation of 3450 feet or within 5 feet of the surface of the ground. This expansion would also involve abandoning monitor holes 2, 3, and 4 and 54 through 61.

Maintenance of the pit and monitoring will be in accordance with the order.

Very truly yours,

V. Steve Reed

V. Steve Reed

VSR:vjr

cc: Parabo