Case No.

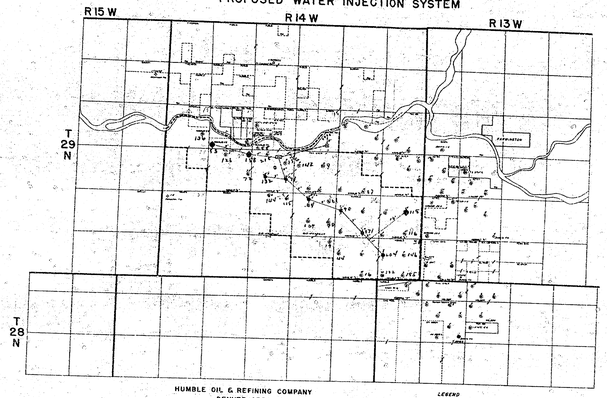
2447

Large Exhibits

V.S.M.C.F. MICROGRAPHICS

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N. W. CHA CHA GALLUP UNIT
PROPOSED WATER INJECTION SYSTEM



HUMBLE OIL & REFINING COMPANY
DENVER AREA

CHA CHA GALLUP FIELD
San Juan County, New Mexico

LEGEND

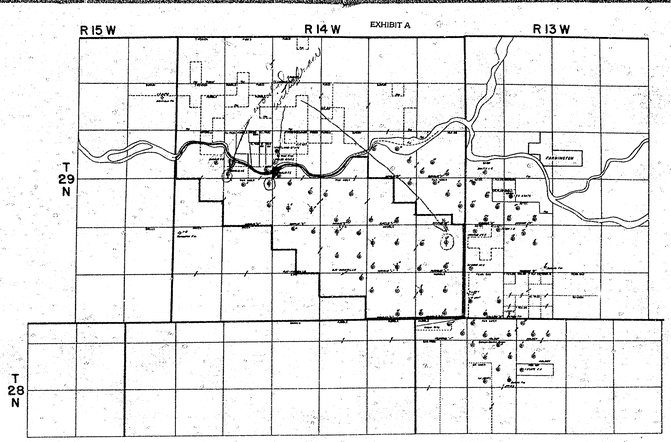
- Existing Wells to be converted to Water Injection
- Unit Outline
- Gallup Formation Producer
- Proposed Water Injection Plant
- Proposed Booster Station
- Proposed Water Source Wells
- Proposed Water Injection Line Location and Size
- Possible Alternate Water Source Well — Jm Formation
- Proposed Water Source Line Location and Size
- Conversion to be delayed until satisfactory Lease Line agreements are effected

Case 2417

W.N.M.C.F. MICROGRAPHICS

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EXHIBIT A



HUMBLE OIL & REFINING COMPANY
DENVER AREA

CHA CHA GALLUP FIELD

San Juan County, New Mexico

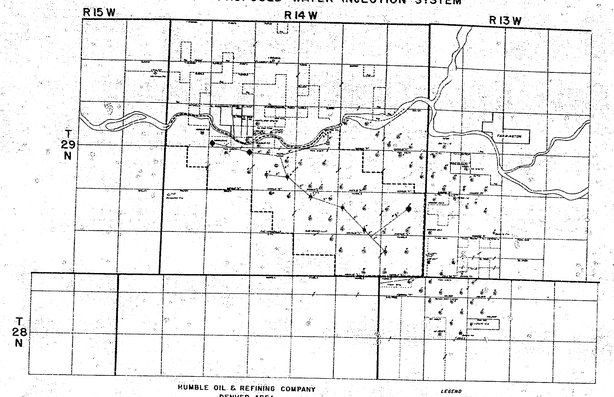
LEGEND

- Existing Wells to be converted to Water Injection
- Unit Outline
- Gallup Formation Producer

U.S.N.M.C.F. MICROGRAPHICS

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N. W. CHA CHA GALLUP UNIT
PROPOSED WATER INJECTION SYSTEM



HUMBLE OIL & REFINING COMPANY
DENVER AREA

CHA CHA GALLUP FIELD
San Juan County, New Mexico

LEGEND

- Existing Wells to be converted to Water Injection
- Unit Outline
- Proposed Water Injection Producer
- Proposed Water Injection Plant
- Proposed Booster Station
- Proposed Water Source Main
- Proposed Water-Injection Line Location and Size
- Possible alternate Water Source Well — Mesa Verde Formation
- Proposed Water Source Line Location and Size
- Connections to be delayed until satisfactory Lease Line agreements are effected

#1

U.S.N.C.F. MICROGRAPHICS
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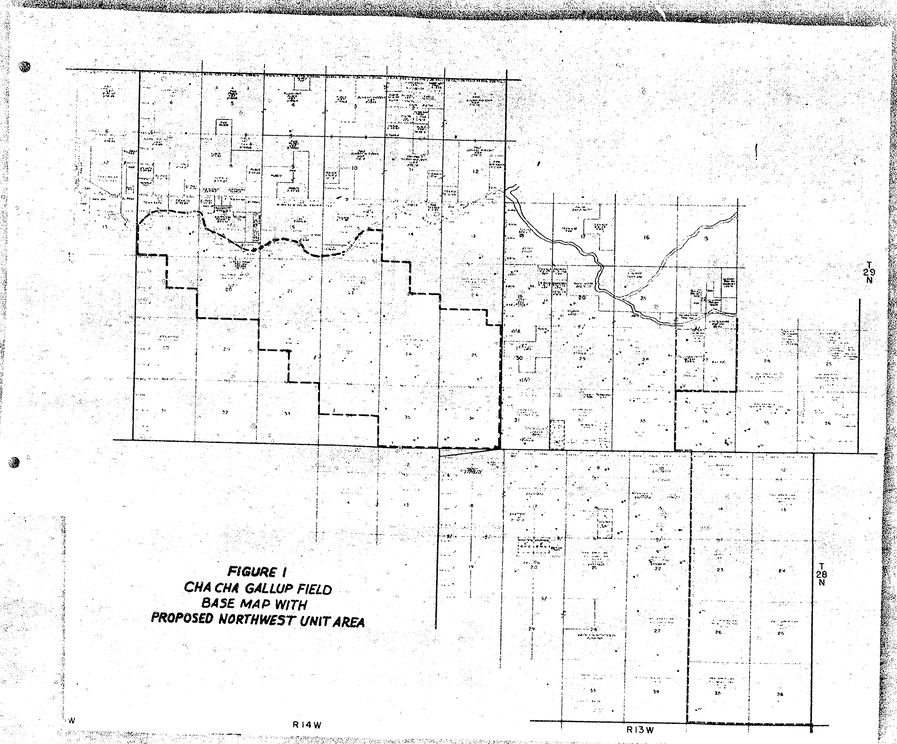


FIGURE 1
CHA CHA GALLUP FIELD
BASE MAP WITH
PROPOSED NORTHWEST UNIT AREA

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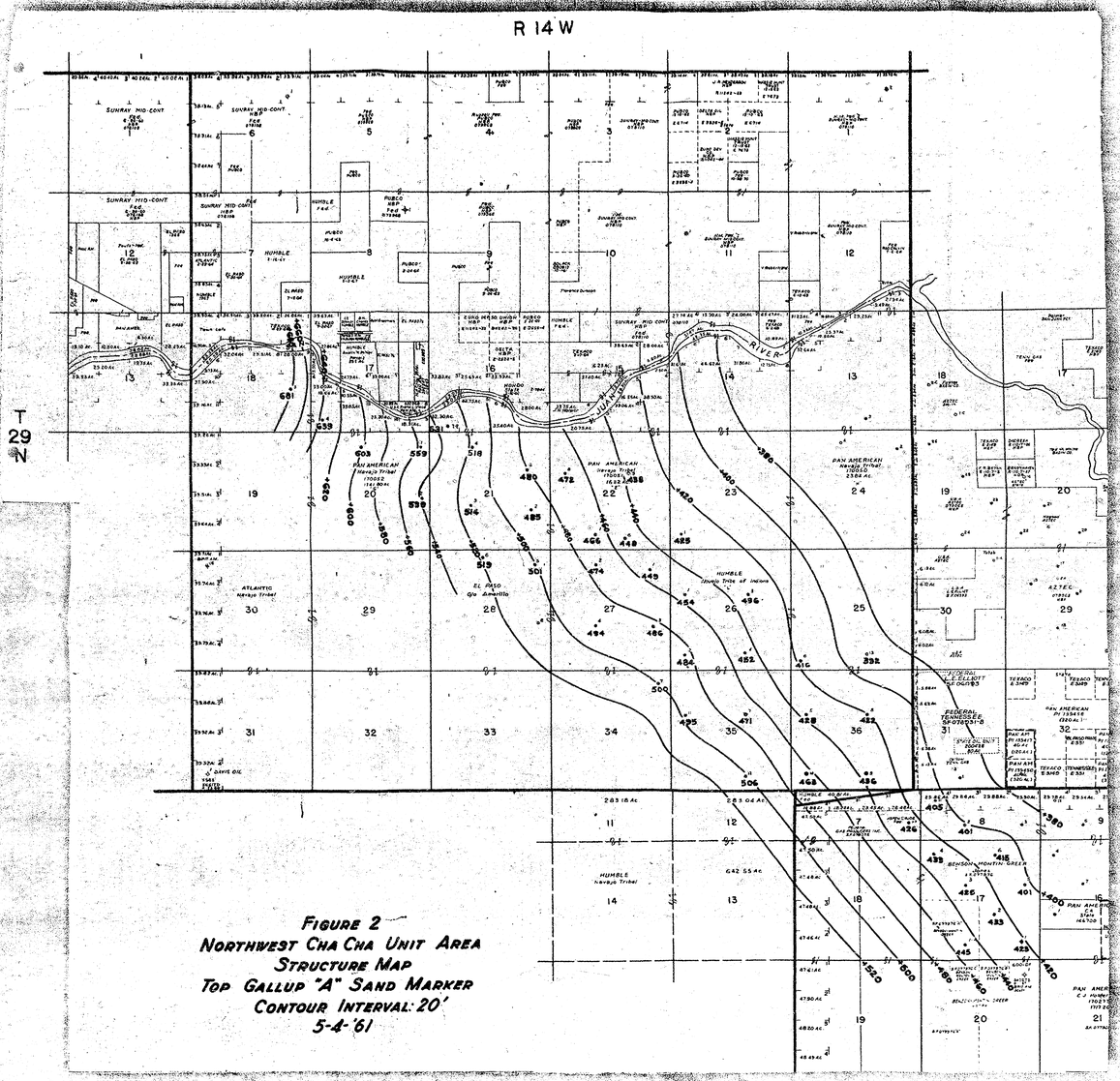
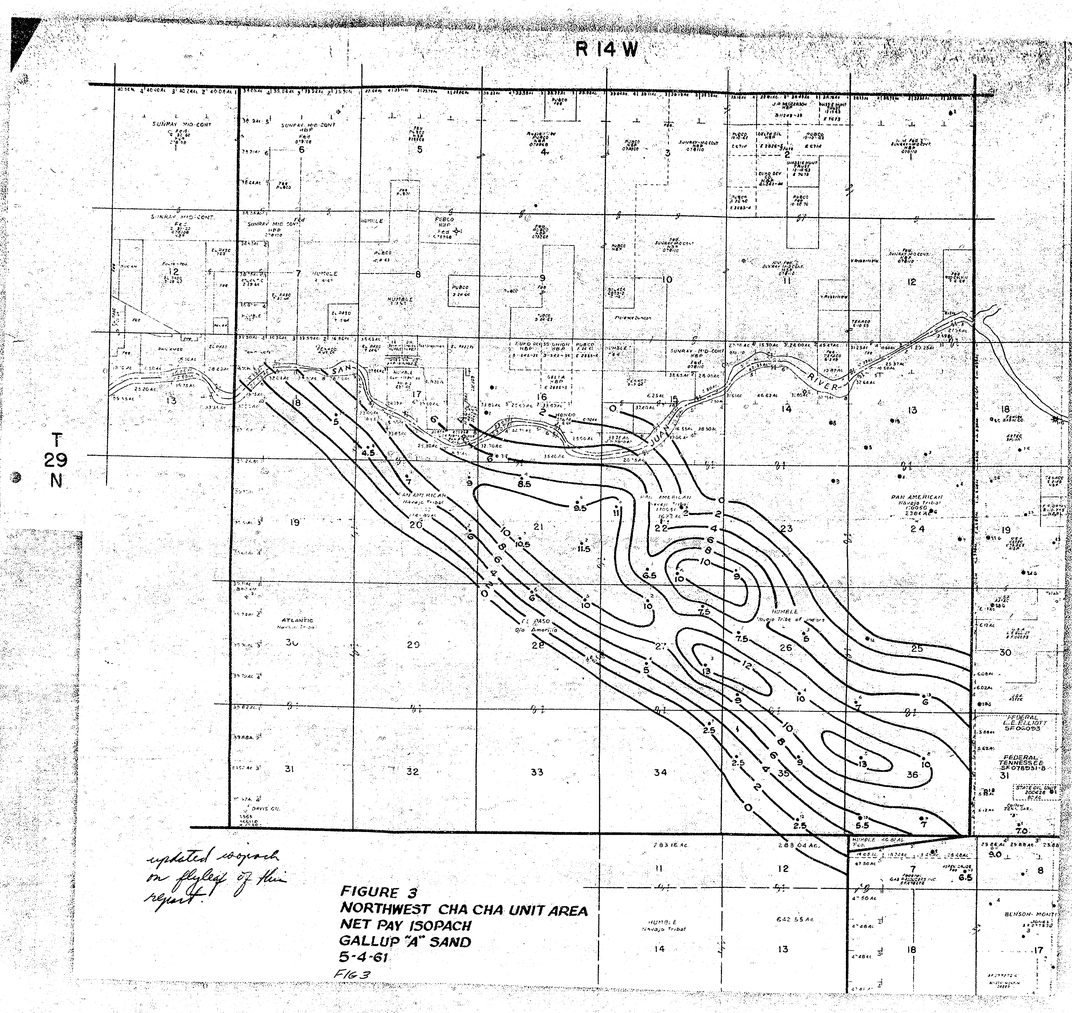


Figure 2
Northwest Cha Cha Unit Area
Structure Map
Top Gallup "A" Sand Marker
Contour Interval: 20'
5-4-61

U.N.M.C.F. MICROGRAPHICS
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R 14 W

T 29 N



updated approach on display of this report.

FIGURE 3
NORTHWEST CHA CHA UNIT AREA
NET PAY ISOPACH
GALLUP "A" SAND
5-4-61

Fig 3

V.A.M.C.F. MICROGRAPHICS
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R 14 W

T 29 N

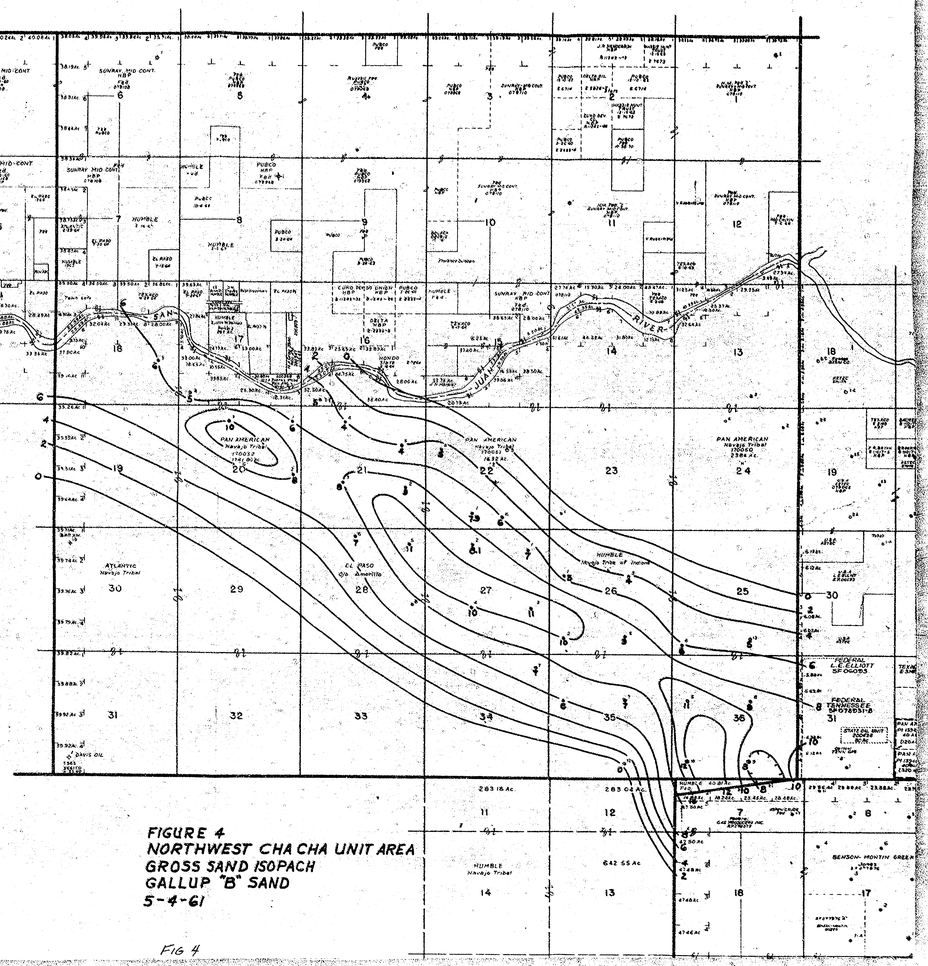
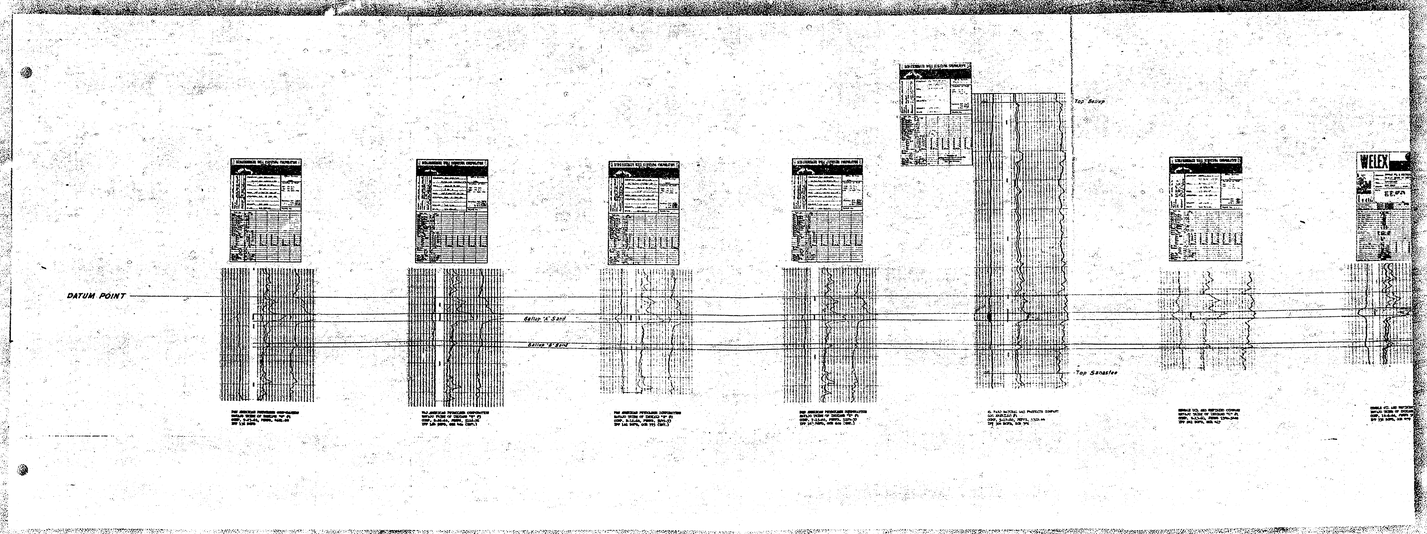


FIGURE 4
NORTHWEST CHA CHA UNIT AREA
GROSS SAND ISOPACH
GALLUP "B" SAND
5-4-61

FIG 4

U.N.M.C.P. MICROGRAPHICS
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U.S.B.M.C.F. MICROGRAPHICS
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N.M.M.C.F. MICROGRAPHICS
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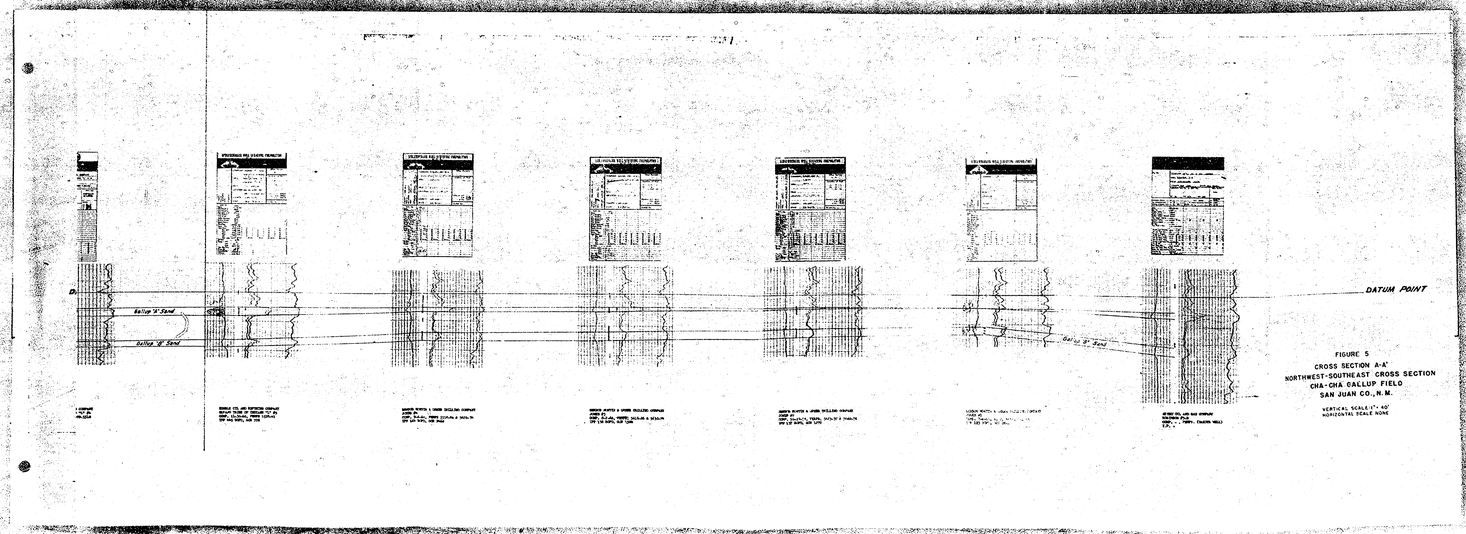


FIGURE 5
CROSS SECTION A-A'
NORTHWEST-SOUTHEAST CROSS SECTION
CHA-CHA GALLUP FIELD
SAN JUAN CO., N.M.

VERTICAL SCALE 1"= 40'
HORIZONTAL SCALE NONE

W.N.M.C.P. MICROGRAPHICS

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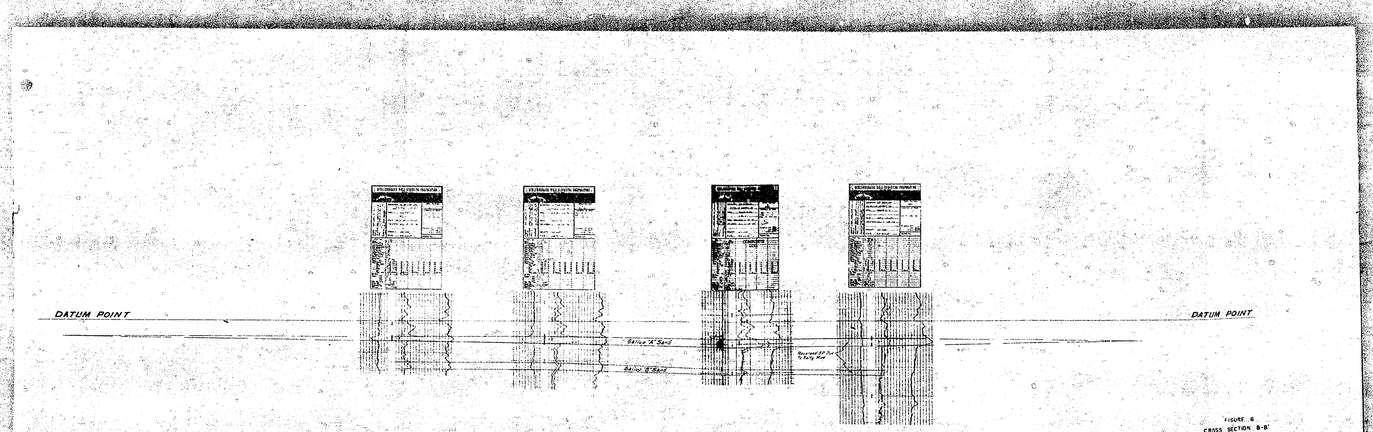


FIGURE 6
CROSS SECTION B-B'
NORTHEAST-SOUTHWEST CROSS SECTION
CHA-CHA GALLUP FIELD
SAN JUAN CO., N.M.

VERTICAL SCALE 1" = 40'
HORIZONTAL SCALE 1" = 200'

12-9-60

V.R.N.C.F. MICROGRAPHICS
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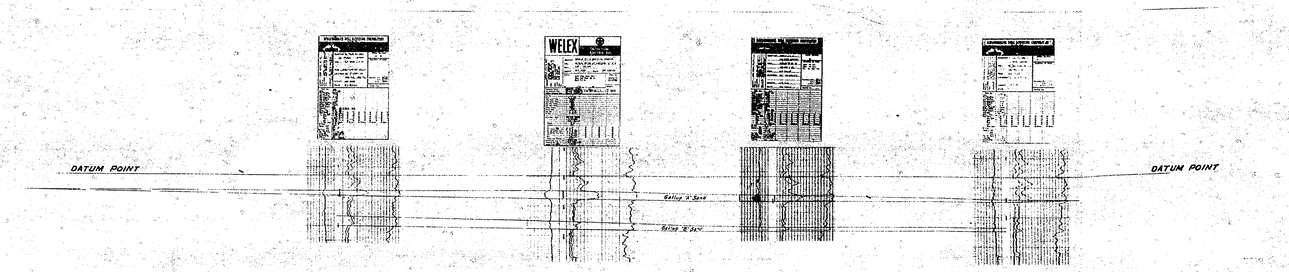


FIGURE 7
CROSS SECTION C-C'
NORTHEAST-SOUTHWEST CROSS SECTION
CHA-CHA GALLUP FIELD
SAN JUAN CO., N.M.

VERTICAL SCALE: 1"= 40'
HORIZONTAL SCALE: 1"=500'

12-9-60

U.N.M.C.F. MICROGRAPHICS

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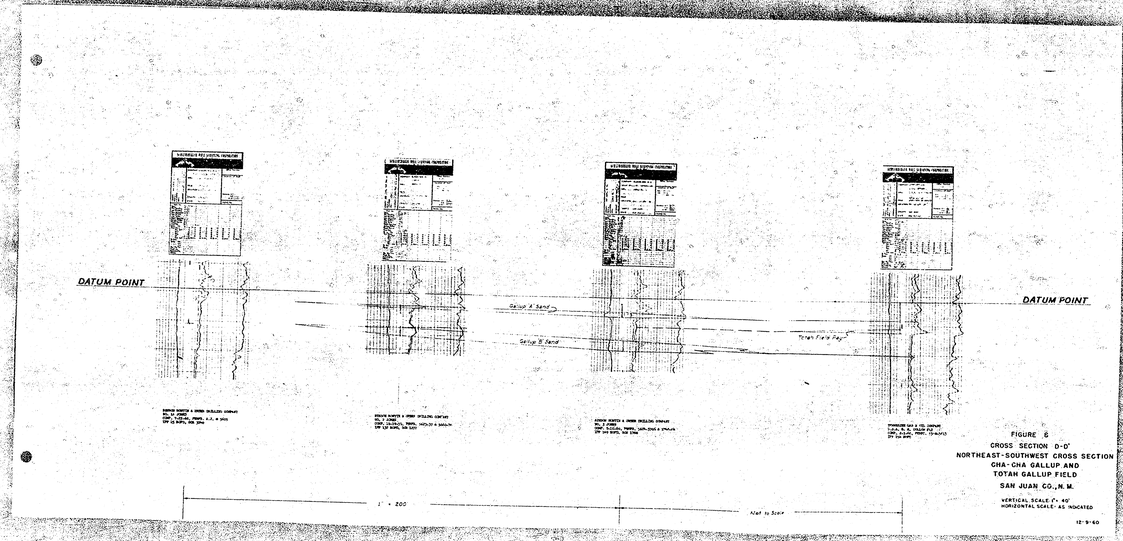


FIGURE 6
CROSS SECTION D-D'
NORTHEAST-SOUTHWEST CROSS SECTION
CHA-CHA GALLUP AND
TOTAH GALLUP FIELD
SAN JUAN CO., N.M.

VERTICAL SCALE 1"= 40'
HORIZONTAL SCALE AS INDICATED

12-9-60

N.M.M.C.P. MICROGRAPHICS
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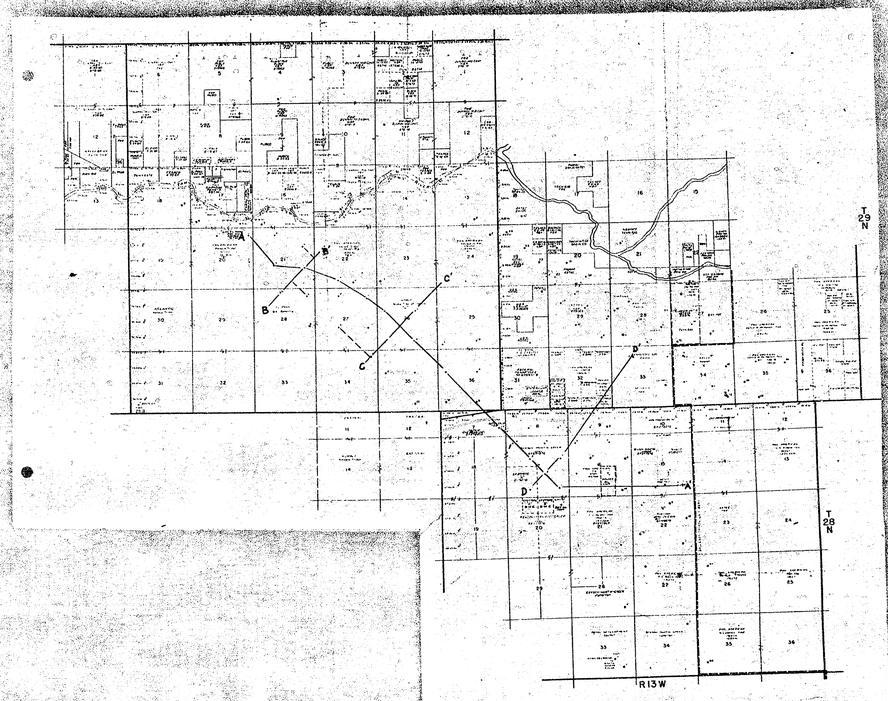
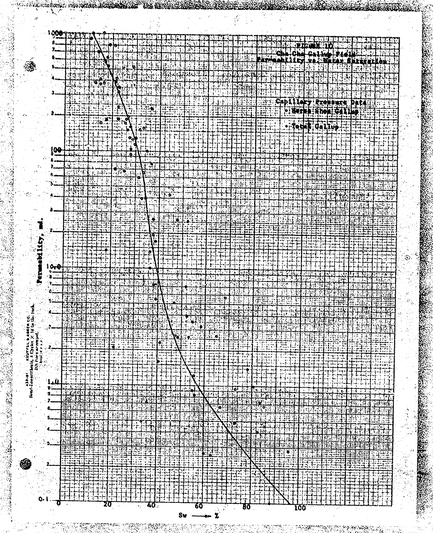
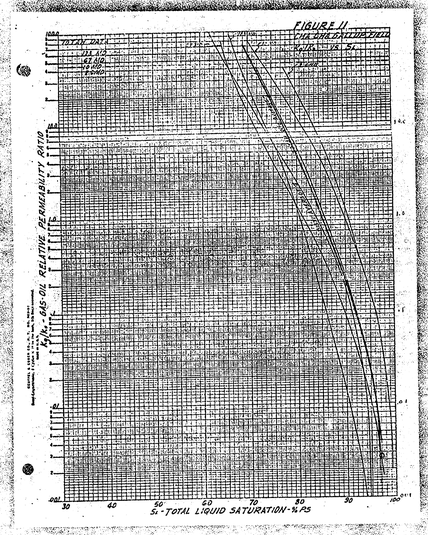


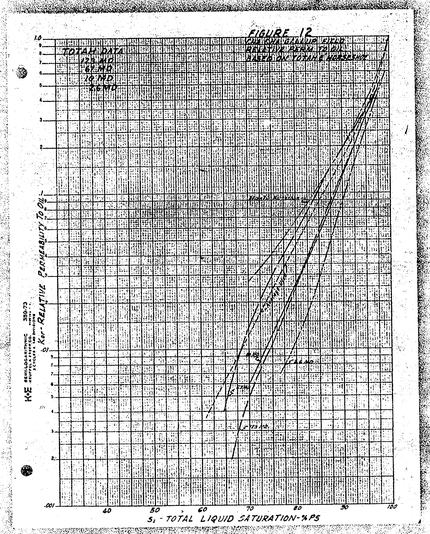
FIGURE 9
CHA CHA GALLUP FIELD
CROSS SECTION KEY MAP
12-5-60

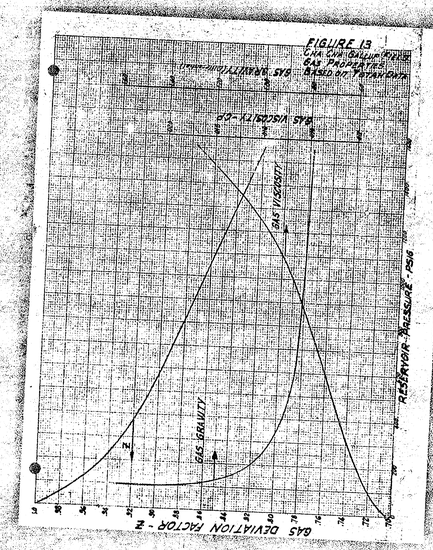
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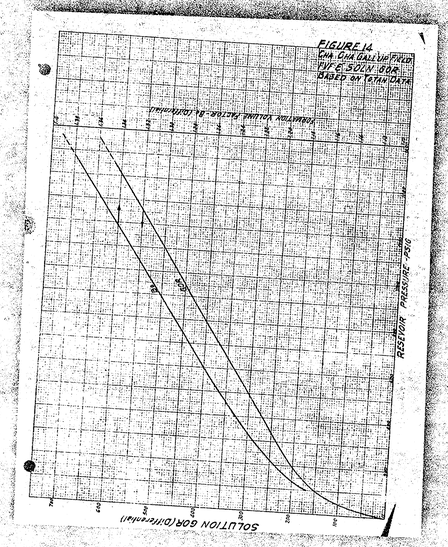


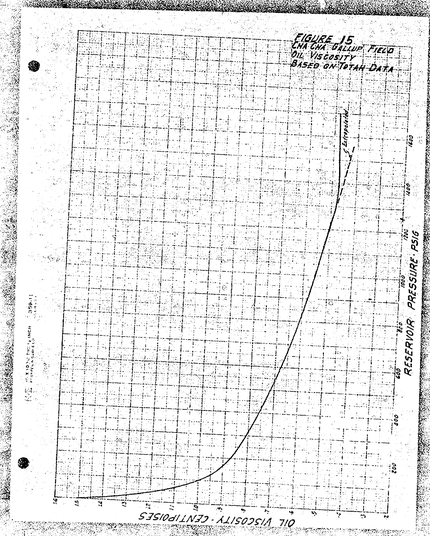
W.R.N.C.F. MICROGRAPHICS
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M.E.N.C.F. MICROGRAPHICS
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W.N.M.C.P. MICROGRAPHICS
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FIGURE 76

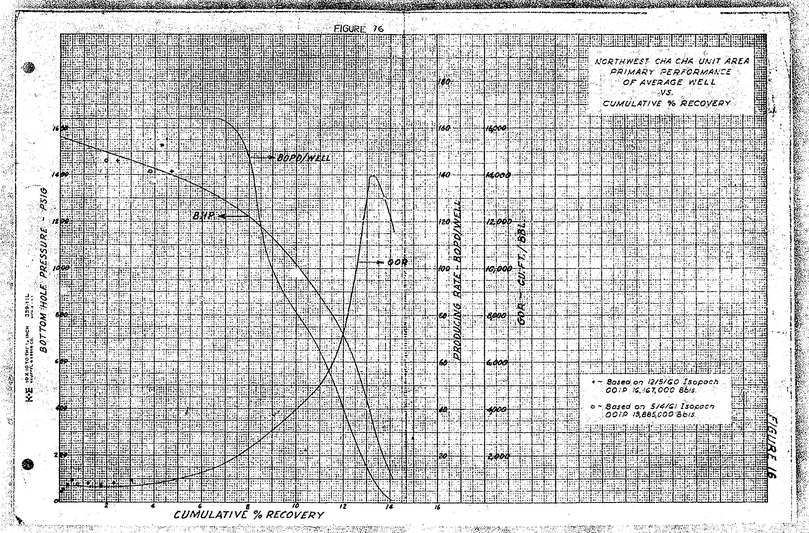
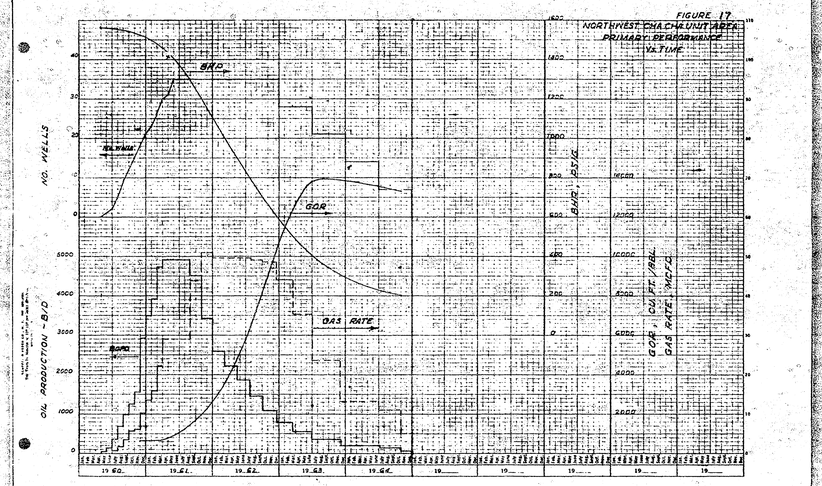


FIGURE 16

W.N.M.C.P. MICROGRAPHICS
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FIGURE 17

NORTHWEST CHACHEUNIT AREA
PRIMARY PERFORMANCE
Vs TIME



W.N.M.C.V. MICROGRAPHICS

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R14W

T
29
N

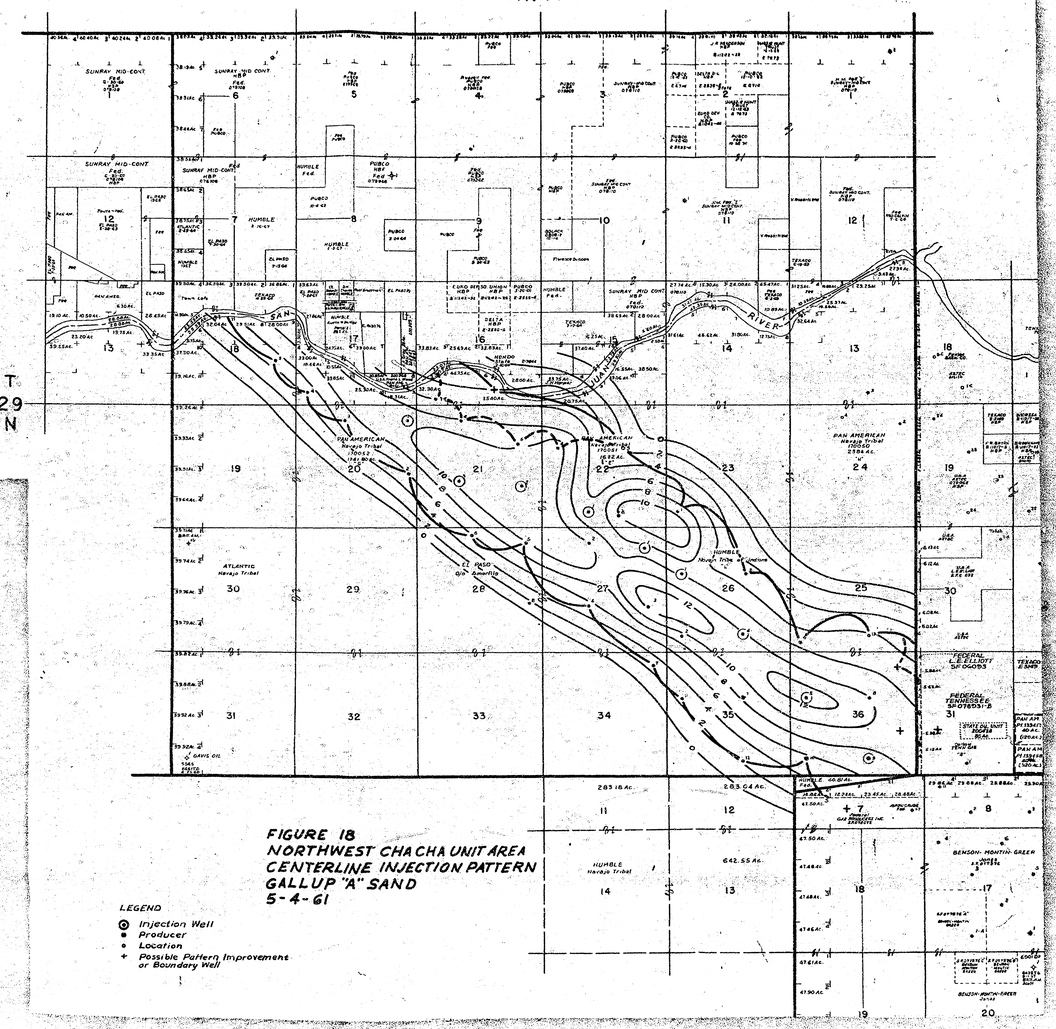
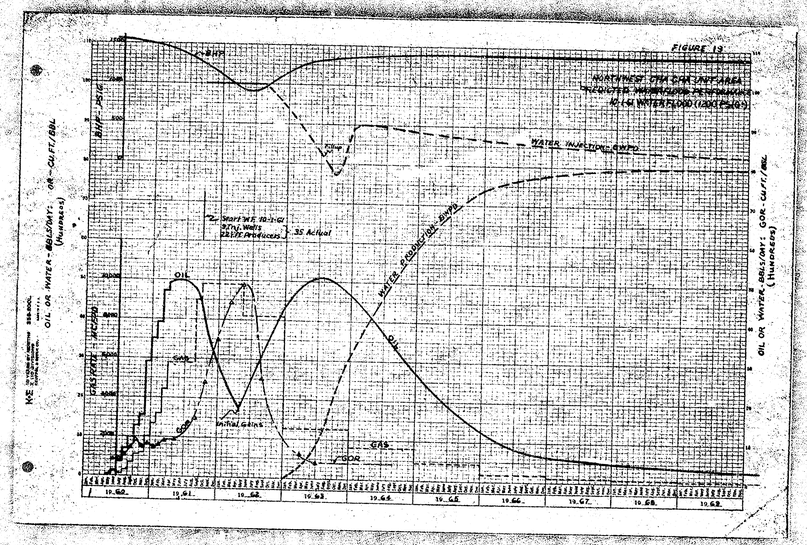


FIGURE 18
NORTHWEST CHA CHA UNIT AREA
CENTERLINE INJECTION PATTERN
GALLUP "A" SAND
5-4-61

LEGEND
- Injection Well
- Producer
- Location
- + Possible Pattern Improvement or Boundary Well

W.N.M.C.P. MICROGRAPHICS
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W.S.W.C.P. MICROGRAPHICS
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