

INTEROFFICE COMMUNICATION

Westlake, Louisiana
June 25, 1969

TO: D. G. Duncan
SUBJECT: Oxy Reactor Thermocouple

Attached are sketches showing the location of each thermocouple in the three oxychlorination reactors, R-301, R-302 and R-303. These locations are to be used the next time each reactor is recharged and all other future recharges unless specifically modified, in writing.

I agree with your suggestion that each thermowell be long enough to cover the entire range. This will allow us to run a complete manual profile on each thermowell tube if cross checking is ever required again.

R. H. Gerlach
R. H. Gerlach

RHG-PBB

cc: LNV
DKP
RLH
JDM
RDG
PMW ✓
RWC

Attachment

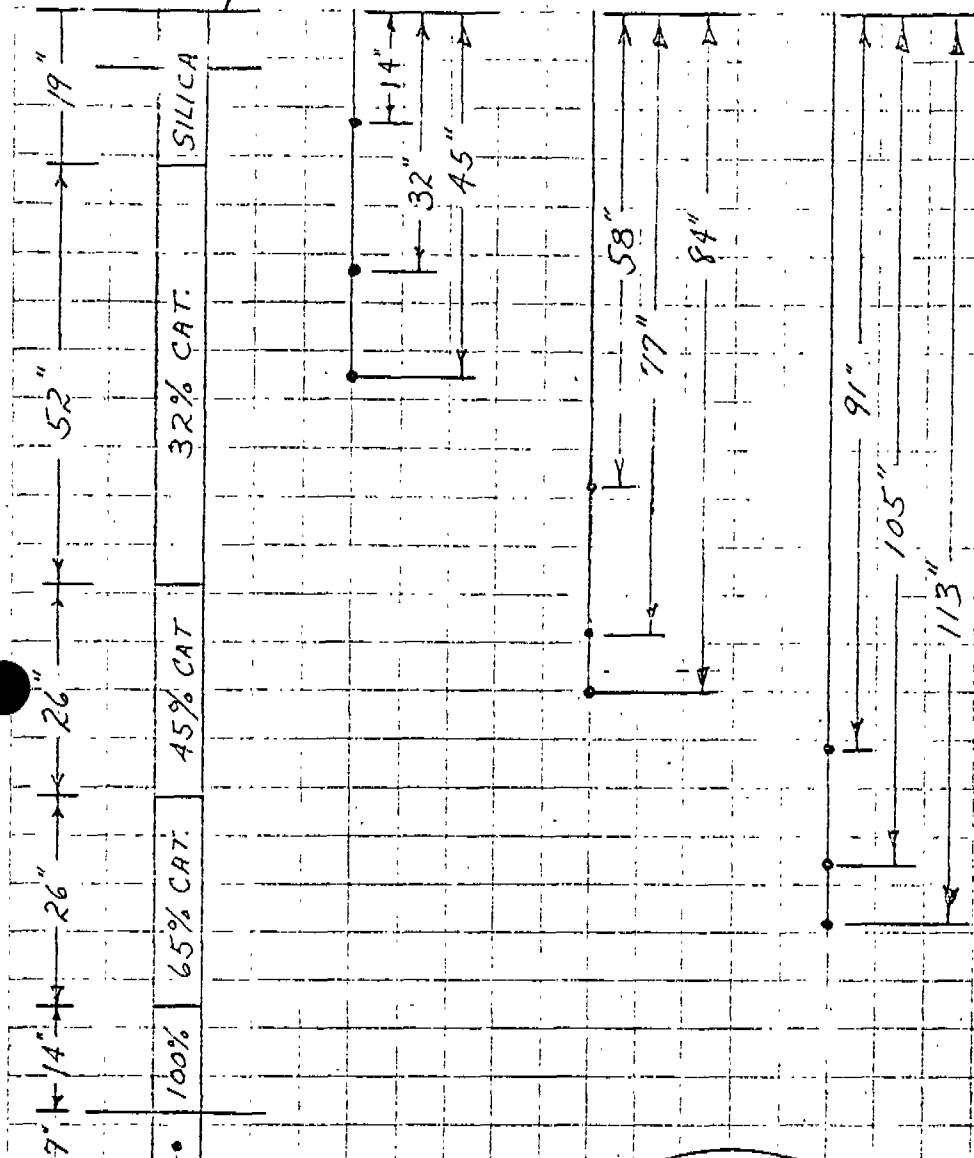
(CCR 000008227

TOP OF TOP
TUBE SHEET

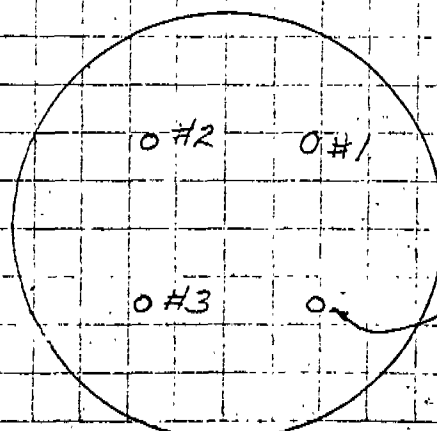
WELL #1

WELL #2

WELL #3



RINGS ~
BOTTOM OF
BOTTOM TUBE-
SHEET



N

20 POINT
WELL

PLAN

CONTINENTAL OIL COMPANY
CALCULATION SHEET

JOB NO. CCR 000008228

MADE BY R/L

CHECKED BY

DATE

TITLE R-301 THERMO -

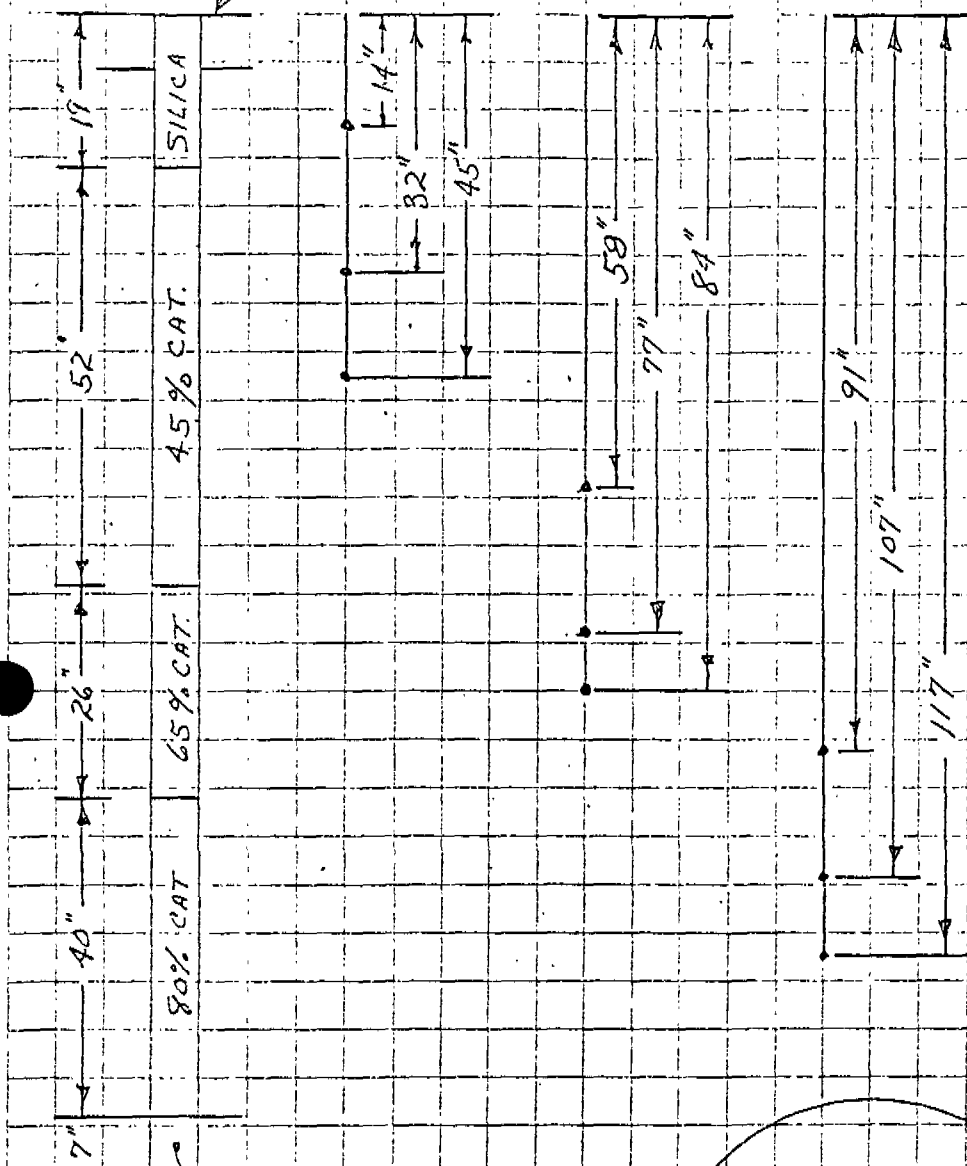
FIELD

TOP OF TOP
TUBESHEET

WELL #1

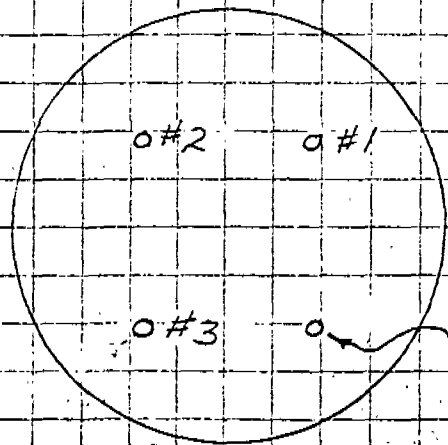
WELL #2

WELL #3



RINGS

BOTTOM OF
BOTTOM TUBE-
SHEET



PLAN

20 POINT
WELL

13-2-11-98

MADE BY RXL

CHECKED BY _____

DATE _____

CONTINENTAL OIL COMPANY
CALCULATION SHEET

JOB No.

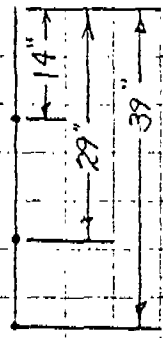
CCR 000008229

TITLE R-302 THERMOWELLS FIELD _____

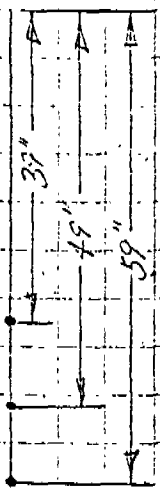
TOP OF TOP
TUBESHEET



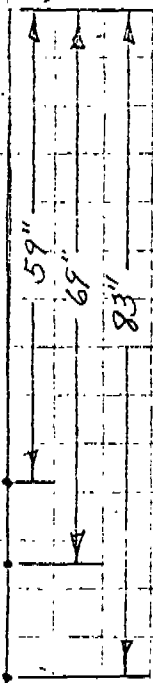
WELL #1



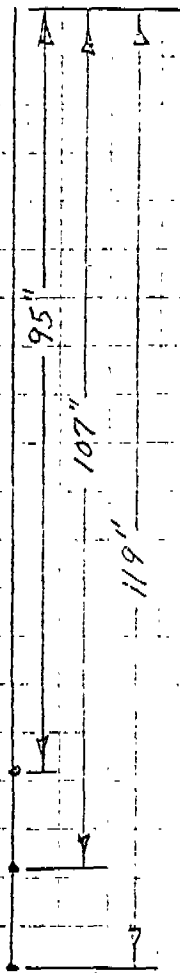
WELL #2



WELL #3

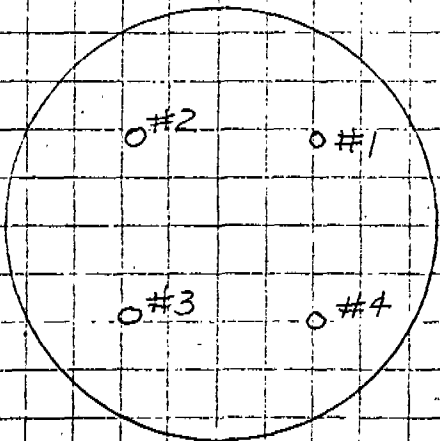


WELL #4



BOTTOM OF
BOTTOM
TUBESHEET

RINGS



N

THERMO COUPLES IN
WELLS 1, 2 & 3 SHOULD
BE ON THE BOARD

PLAN

13-2-1-10

MADE BY RX/K

CHECKED BY

DATE

CONTINENTAL OIL COMPANY
CALCULATION SHEET

JOB NO.

TITLE R-303 THERMOWELLS

FIELD

CCR 000008230

JDM

from

R. H. GERLACH

July 9, 1970

To

Doug Duncan

Please relocate the thermocouples in well #1 of R-303 to positions corresponding to the thermocouples shown in well #4 (refer to my letter to you of June 25, 1969).

This change is temporary and the #1 well locations shown in my letter of June 25, 1969 should be used for the next catalyst loading unless written instructions are received to the contrary.

R H Gerlach

Copies to: DKP - RDG - RLH - JDM

CCR 000008231

INTEROFFICE COMMUNICATION

Westlake, Louisiana
July 24, 1969

TO: Mr. D. G. Duncan
SUBJECT: R-301 Thermocouples

Please relocate the top thermocouple in well number three on the first oxy reactor, R-301, from 91" below the top of the top tubesheet to a position 135" from the top of the top tubesheet. This new location is approximately 2" above the top of the bottom tubesheet.

This is a temporary change and unless written instructions to the contrary are received, the thermocouple layout described in my letter of June 25, 1969 should be followed on the next reactor loading.

R. H. Gerlach
R. H. Gerlach

RHG-MC
cc: LNV
DKP
RLH
JDM
RDG
PMW
RWC
KCC

CCR 000008232

INTEROFFICE COMMUNICATION

Westlake, Louisiana
June 25, 1969

TO: D. G. Duncan
SUBJECT: Oxy Reactor Thermocouple

Attached are sketches showing the location of each thermocouple in the three oxychlorination reactors, R-301, R-302 and R-303. These locations are to be used the next time each reactor is recharged and all other future recharges unless specifically modified, in writing.

I agree with your suggestion that each thermowell be long enough to cover the entire range. This will allow us to run a complete manual profile on each thermowell tube if cross checking is ever required again.

R. H. Gerlach
R. H. Gerlach

RHG-PBB

cc: LNV
DKP
RLH
JDM ✓
RDG
PMW
RWC

Attachment

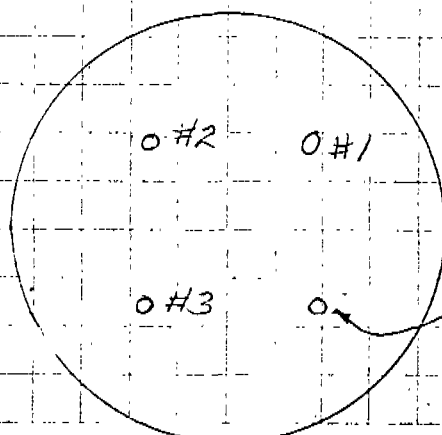
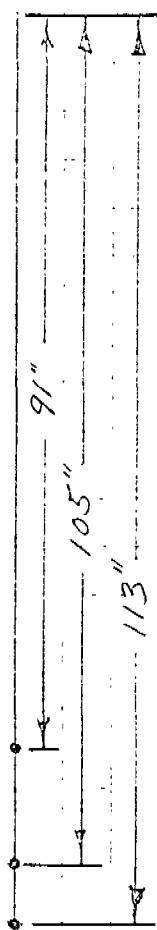
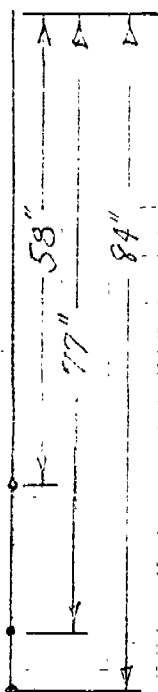
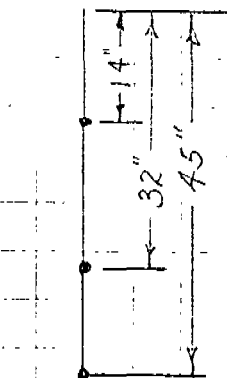
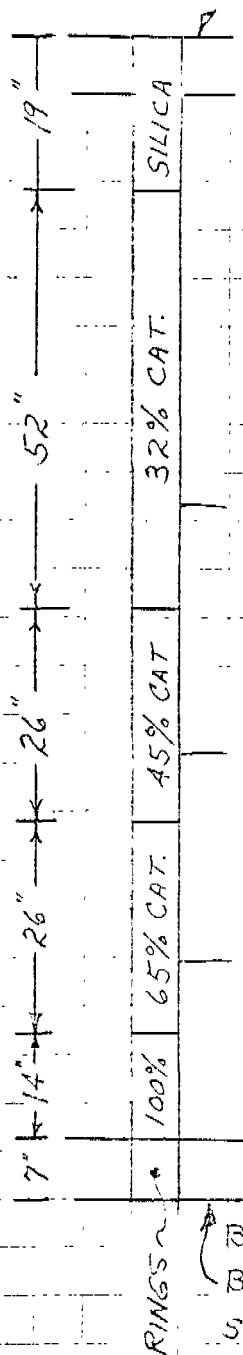
CCR 000008233

TOP OF TOP
TUBESHEET

WELL #1

WELL #2

WELL #3



N

20 POINT
WELL

RX/4

PLAN

CONTIN. VT. OIL COMPANY
CALC. ON FEET

JOB NO.

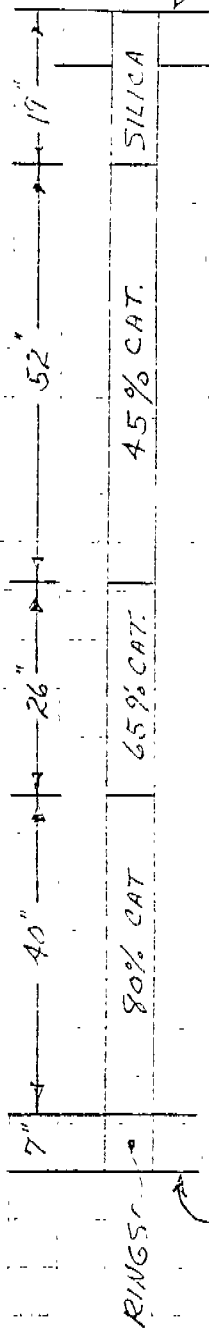
CCR 000008234

TITLE R-301 THERMO -
WELLS

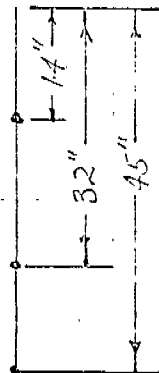
FIG. NO.

STATE

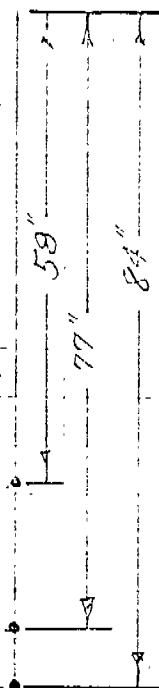
TOP OF TOP
TUBESHAFT



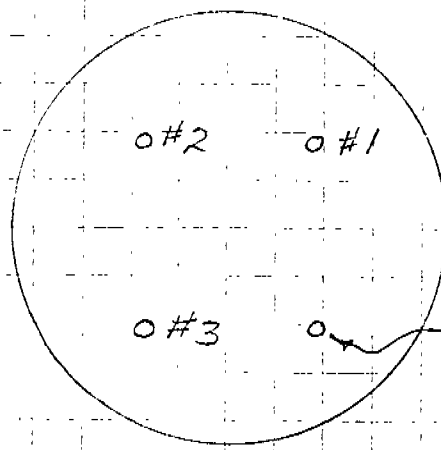
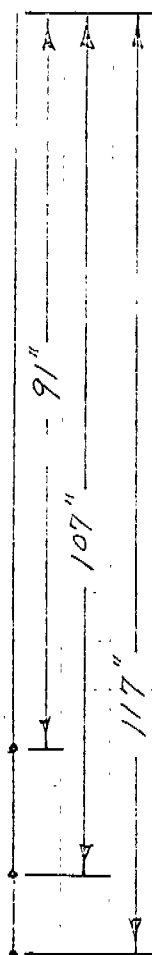
WELL #1



WELL #2



WELL #3



PLAN

ANALYST

(R-302)

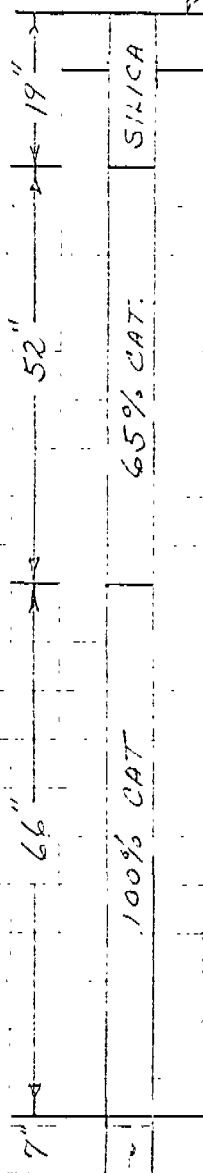
CONTINENTAL OIL COMPANY
CALCULATION

JOB NO.

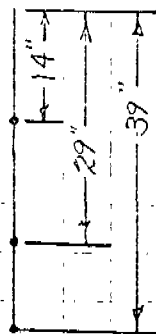
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FILE R-302 THERMOWELLS

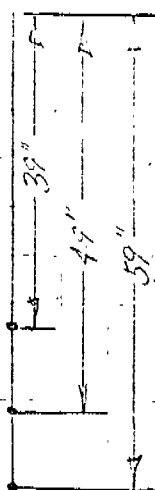
WELL #1



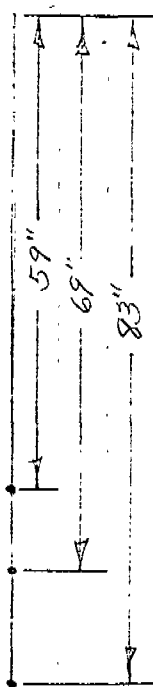
WELL #2



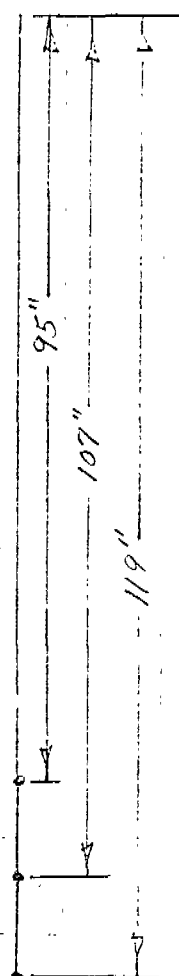
WELL #3



WELL #4

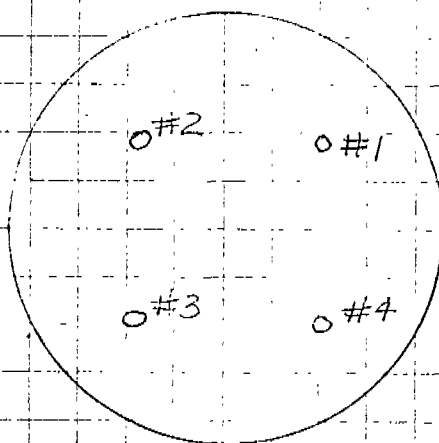


WELL #5



RINGS - BOTTOM OF
BOTTOM
TUBESHEET

THERMOCOUPLES IN
WELLS 1, 2 & 3 SHOULD
BE ON THE BOARD



PLAN

N

MADE BY

R/K

CONTINENTAL OIL COMPANY
CALCULATION

JOB NO.

DATE

TITLE R-303 THERMOWELLS

FIELD

CCR 000008236

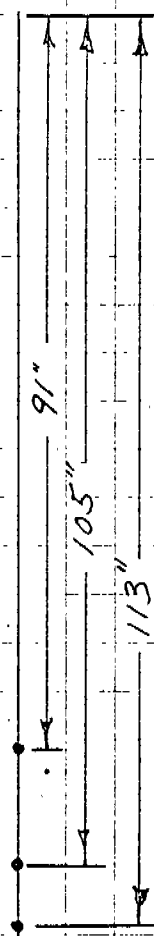
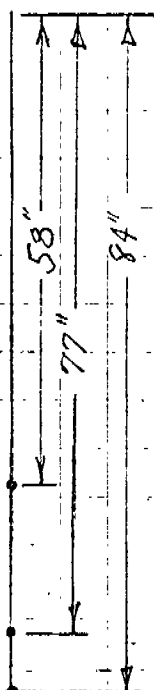
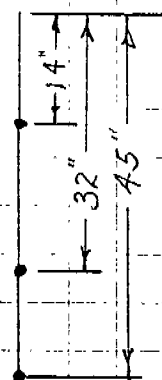
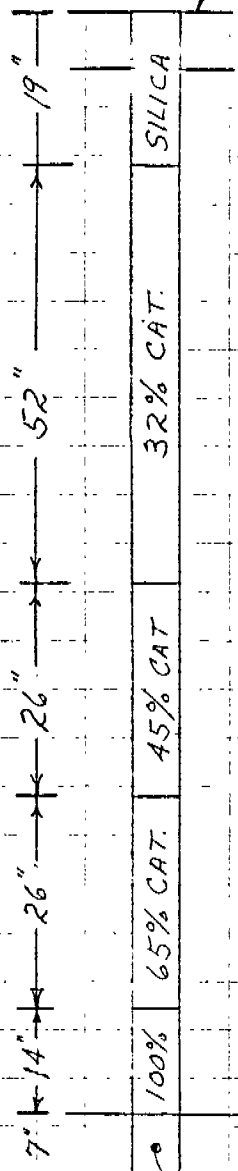
STATE

TOP OF TOP
TUBESHEET

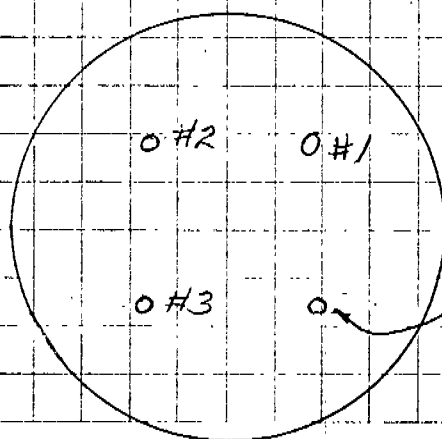
WELL #1

WELL #2

WELL #3



BOTTOM OF
BOTTOM TUBE-
SHEET



N

20 POINT
WELL

13-2-1-93

MADE BY RXL

CHECKED BY

DATE

PAGE OF

PLAN
CONTINENTAL OIL COMPANY
CALCULATION SHEET

TITLE R-301 THERMO -
WELLS

JOB No.

FIELD

STATE

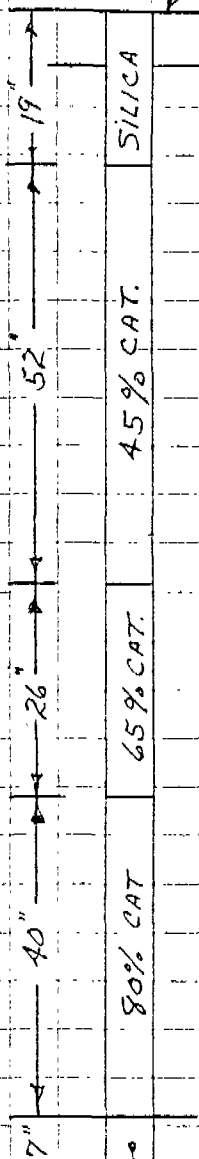
CCR 000008237

TOP OF TOP
TUBESHEET

WELL #1

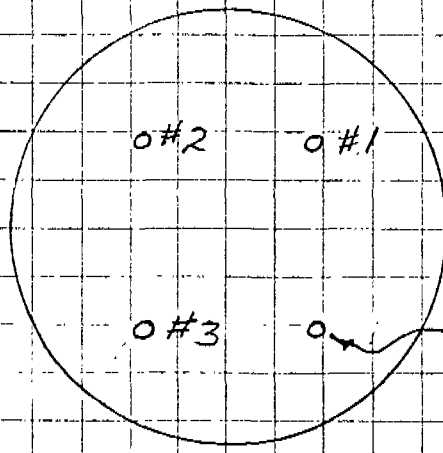
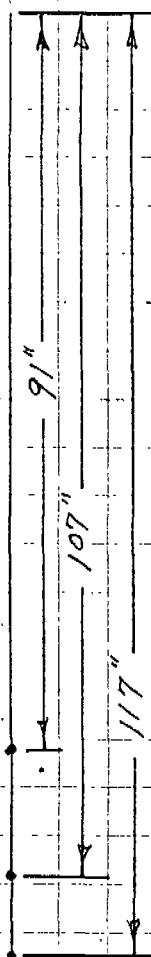
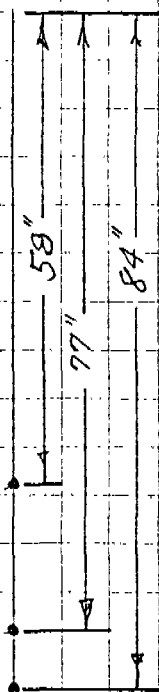
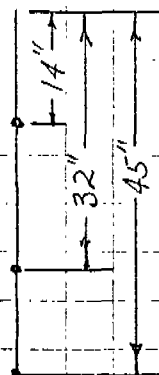
WELL #2

WELL #3



BOTTOM OF
BOTTOM TUBE-
SHEET

SADDLES



20 POINT
WELL

PLAN

13 JUL 93

MADE BY RXL

CHECKED BY _____

DATE _____

PAGE _____ OF _____

CONTINENTAL OIL COMPANY
CALCULATION SHEET

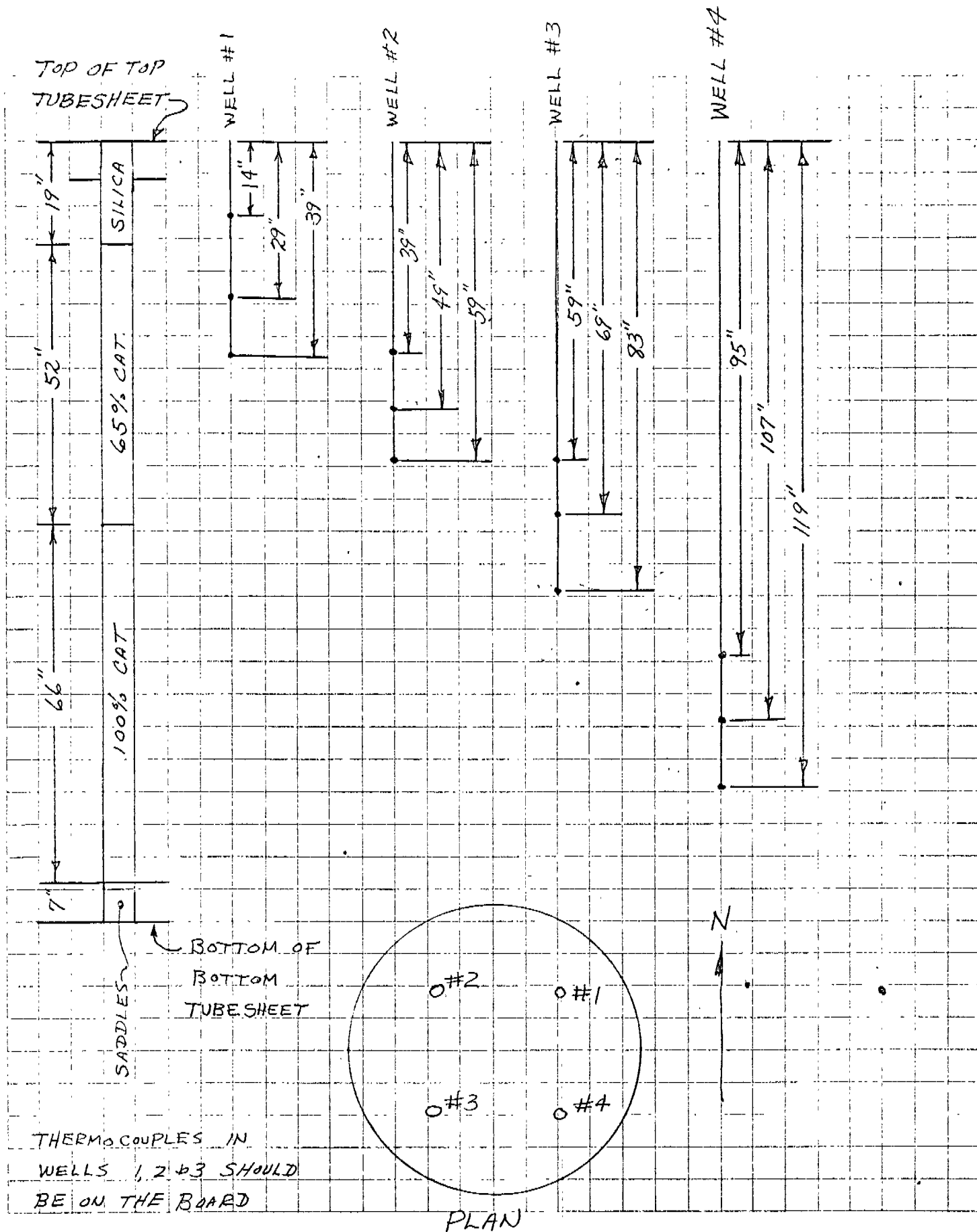
TITLE R-302 THERMOWELLS

JOB NO. _____

FIELD _____

STATE _____

CCR 000008238



13-201-PC

MADE BY R/L

CHECKED BY _____

DATE _____

PAGE _____ OF _____

CONTINENTAL OIL COMPANY
CALCULATION SHEET

TITLE R-303 THERMOWELLS

JOB NO. _____

FIELD _____

STATE _____

CCR 000008239

TOP OF TOP
TUBESHEET

WELL #1

6' 11" long

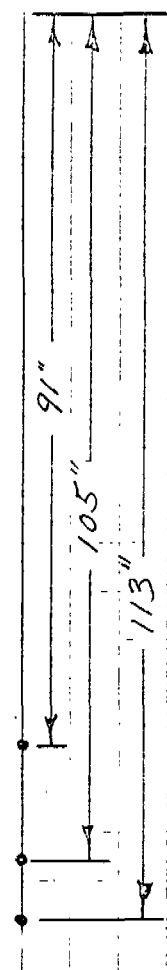
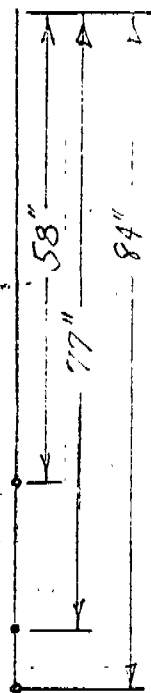
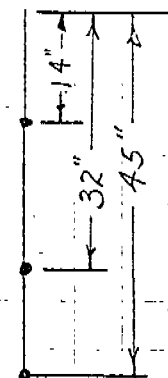
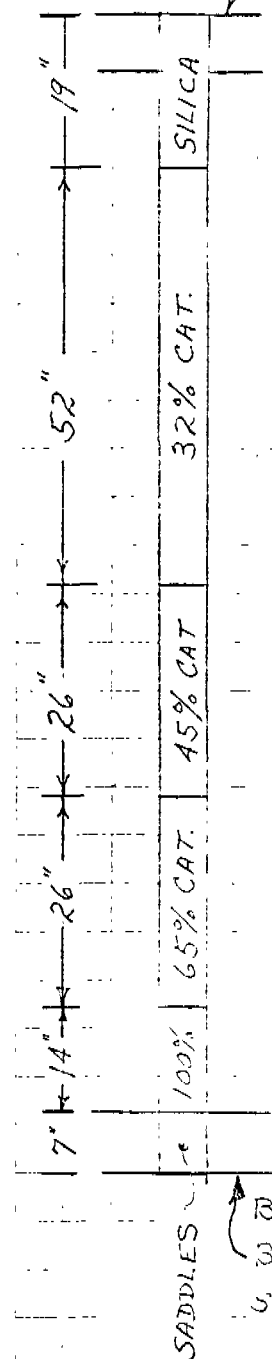
WELL #2

10' 2" long

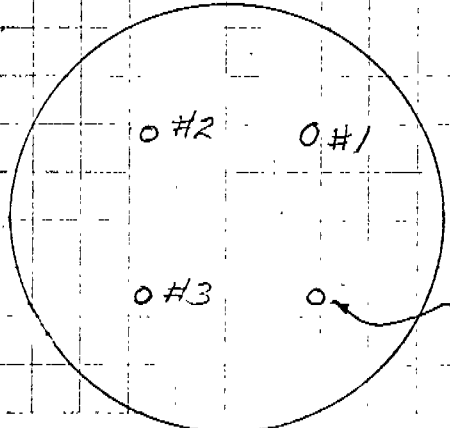
WELL #3

14' 1" long
(note 4' lost)

14' 1" long
4



BOTTOM OF
BOTTOM TUBE-
SHEET



PLAN

TOP OF TOP
TUBESHEET

WELL #1

WELL #2

WELL #3

6" off tube sheet

* 4 in 10" off 7.5

11 5
120
137
142
7
149
⑤

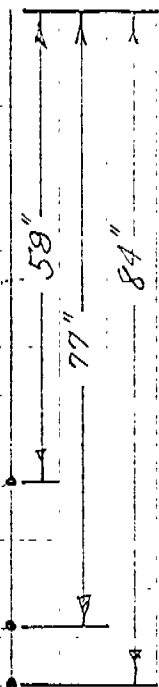
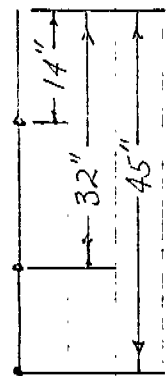
#4 289 1/2
10

#4 well
in 10" off tubesheet
bottom rows
17" off bottom only

144
137
10
127

131
127

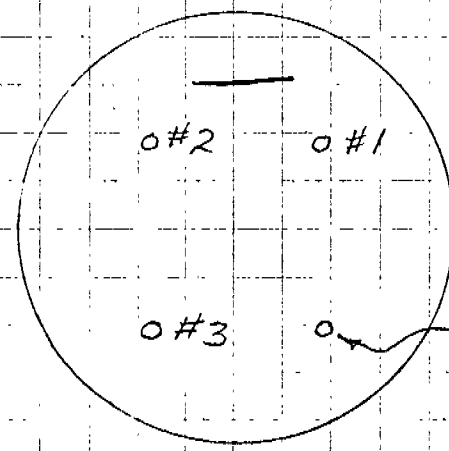
53
12
26



137
84
53

137
54

BOTTOM OF
BOTTOM TUBE-
SHEET



PLAN

MADE BY RX/14

OPERATED BY

DATE

PAGE OF

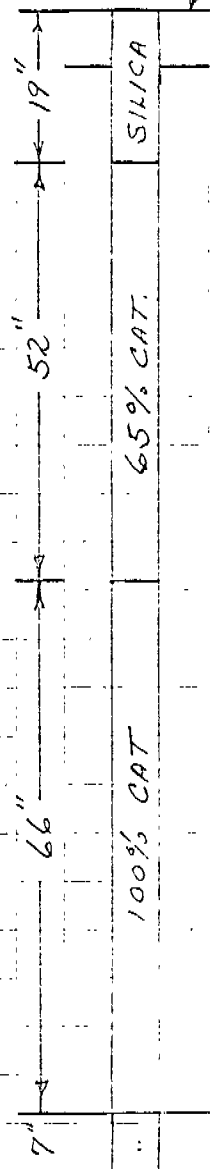
CONTINENTAL OIL COMPANY
CALCULATION SHEET

JOB NO. CCR 000008241

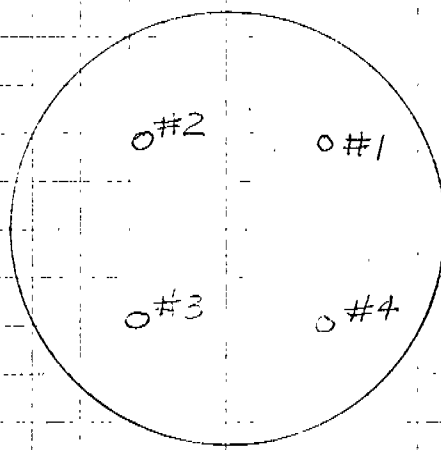
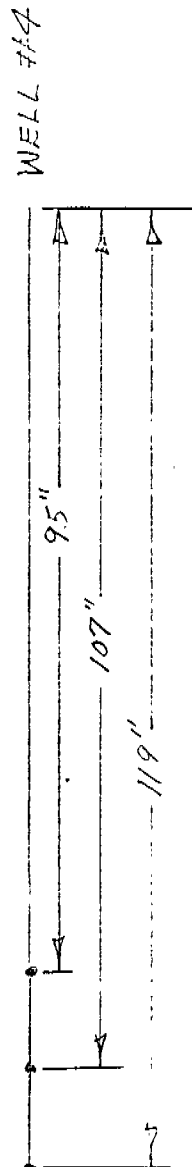
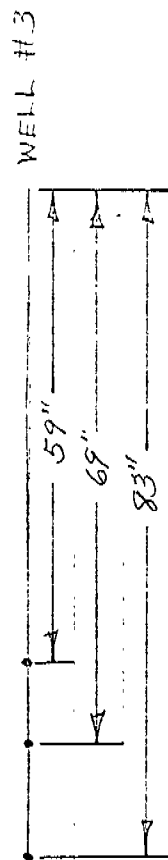
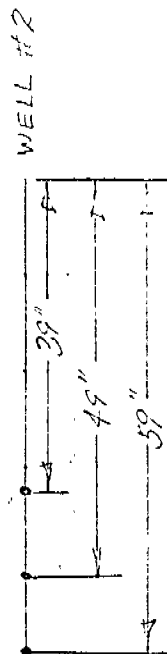
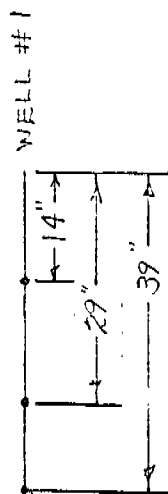
TITLE R-302 THERMOWELLS FIELD

STATE

TOP OF TOP
TUBESHEET



BOTTOM OF
BOTTOM
TUBESHEET



PLAN

$$\begin{array}{r} 144 \\ 7 \\ \hline 137 \\ 11 \\ \hline 123 \end{array}$$

$$\begin{array}{r} 39 \\ 19 \\ 21 \\ \hline 42 \\ 22 \\ \hline 134 \\ 14 \end{array}$$

THERMOCOUPLES IN
WELLS 1, 2 + 3 SHOULD
BE ON THE BOARD

R/K

CONTINUED FROM ANY
CALCULATION SHEET

JOB NO.

TITLE R-303 THERMOWELLS

FIELD

STATE

CCR 000008242

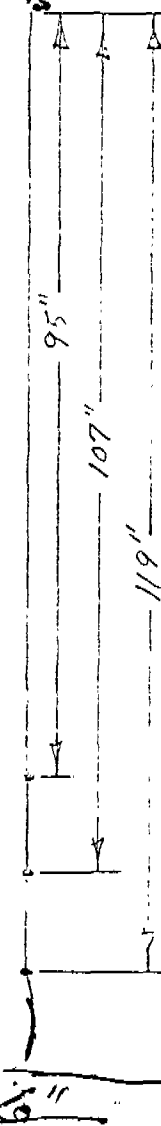
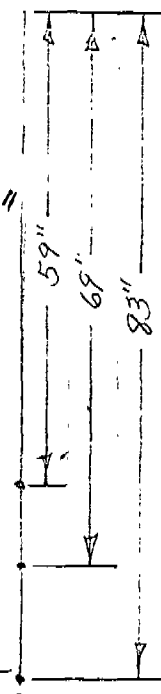
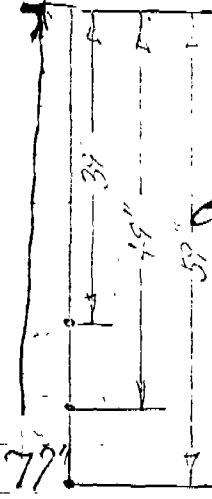
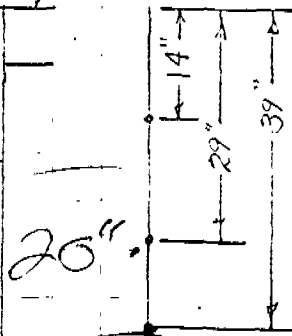
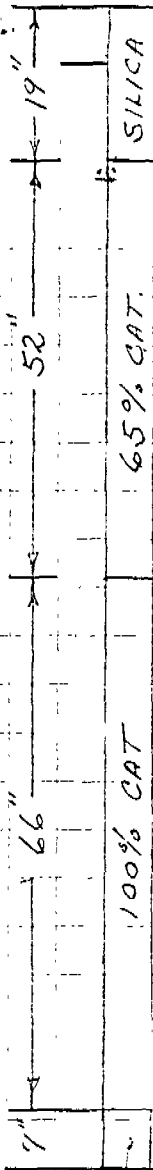
TOP OF TOP
TUBESHEET

WELL #1

WELL #2

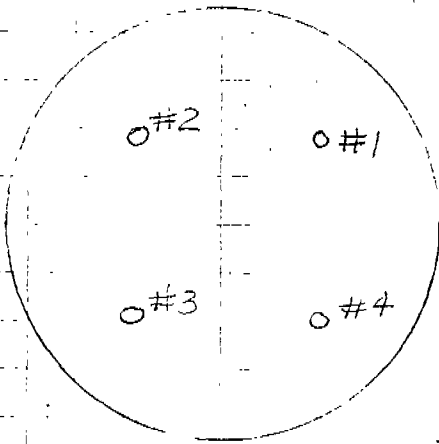
WELL #3

WELL #4



194
39
105
73
32 194
17
67
60"

BOTTOM OF
BOTTOM
TUBESHEET



PLAN

THERMOC. PLES IN
WELLS 1 2 & 3 SHOULD
BE ON THE BOARD

N

MODEL
DATE
PAGE

RX

CONF. IN
CALCUL.

TITLE R-303 THERMOWELLS

CCR 000008243

May 12, 1969

3
00
2000
100
1.03
33

144' deep

R-303 total length above head below

- #4 - 14'1" = 169" - 38" = 131" = 13" off bottom (6" up into 100%)
 #3 - 14'1" = 169" - 38" = 131" = 13" off bottom (6" up into 100%)
 #2 - 8'1" long = 97" - 38" = 59" = 12" off (12" up into 40%)
 #1 - 6'5" long = 77" - 38" = 39" = 3" up into 40%

52
19
71"
59
12

R-301

- #4 14'1" = 169 - 38 = 131" = 13" off bottom
 #3 13'9" = 165 - 34 = 131" = 13" off bottom
 #2 10'2" = 122" - 38" = 84" N
 #1 6'11" = 83" - 38" = 45"

2

3

4

CCR 000008244

THIS SHIPPING ORDER

RECEIVE, EXHIBIT, AND RETURN TO THE CARRIER

GREYHOUND BUS LINES

Carrier's No. _____

Shipper's No. _____

221

From
AtCONTINENTAL V.C.M. Plant
Westlake, Louisiana

10-23-70, 19

The property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Freight Bill of Lading set forth (1) in Official, Southern, Western and Illinois Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to CONTINENTAL OIL COMPANY, ATT: DR. FRED RADD, RESEARCH & DEVELOPMENT BUILDING

(Mail or street address of consignee—For purposes of notification only.)

Destination PONCA CITY State OKLAHOMA County _____

Delivery
Address ★

(*To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Route LAKE CHARLES TO TULSA -- GREYHOUND
M-T-60 - TULSA TO PONCA CITY

Delivering Carrier

Car or Vehicle Initials

No.

No. Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Sub. to Correction)	Class or Rate	Check Column	Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
1	5-Gal DRUM 100% HARSHAW CATALYST LOT # 70	40#			(Signature of Consignor.) If charges are to be prepaid, write or stamp here, "To be Prepaid" To Be Prepaid Received \$ _____ to apply in the prepayment of the charges on the property described hereon Agent or Cashier Per _____ (The signature here acknowledges only the amount prepaid.) Charges advanced: \$ _____
1	5-Gal DRUM TECO-SIL	48#			
	(Per C.L. Shaddock)				

Collect On Delivery and remit to

C. O. D. Charge

Shipper ☐

to be paid by

Consignee ☐

\$

*Shipper's imprint in lieu of stamp, not a part of bill of lading approved by the Interstate Commerce Commission.

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight."
 NOTE: Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.
 The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

Continental VCM Plant

P.O. Box 605

Shipper, Per Jesse H. Coplin

Westlake, Louisiana 70669

Permanent postoffice address of shipper

Greyhound Bus Lines

Agent, Per

Agent must detach and retain this Shipping Order and must sign the Original Bill of Lading


 SNAP-A-PART
 47-413
 MADE IN U.S.A.

CCR 000008245

"Flats" Catalyst Loading

11/10/70

Use 50% of normal strength of catalyst.

R-303 - 2 tubes (1 re. T.W.) - 50% catalyst.

R-302 - None

R-301 - 2 tubes (50% normal) if silica deficient

If Nickel is used as deficient, use 3 tubes 2 Nickel + 1 Silica

1 Nickel with str. cat. + nickel - 100% str.

1 " " flats " - 50% "

1 Silica " " " - 50%

Sent pictures + XPR dates to Fred. later.

Check R-302 - T.C. check lining the organometal load capel.

Tree diameters, NOV 1970

R-301

	8" from top	15" from top of take sheet	8" from bottom of take sheet	15" from bottom
1)	1.0092	1.0089	1.0138	1.0142
2)	1.0071	1.0072	1.0108	1.0107
3)	1.0013	1.0113	1.0072	1.0073
4)	1.0115	1.0114	1.0106	1.0112
5)	1.0119	1.0114	1.0096	1.0101
6)	1.0103	1.0087	1.0114	1.0114
7)	1.0113	1.0117	1.0093	1.0106
8)	1.0099	1.0097	1.0086	1.0116
9)	1.0112	1.0113	1.0078	1.0081
10)	1.0097	1.0098	1.0085	1.0097
11)	1.0107	1.0096	1.0104	1.0103
12)	1.0106	1.0107	1.0107	1.0120
13)	1.0109	1.0108	1.0099	1.0111
14)	1.0110	1.0109	1.0111	1.0111
15)	1.0109	1.0110	1.0092	1.0100
16)	1.0127	1.0128	1.0088	1.0109
17)	1.0124	1.0108	1.0126	1.0133
18)	1.0113	1.0119	1.0094	1.0110
19)	1.0100	1.0091	1.0120	1.0119
20)	1.0106	1.0102	1.0092	1.0107
21)				

all measurements are inches.

CCR 000008247

R-302 Tube Diameters

Nov 1970

	8" from top	15" from top	8" from bottom	15" from bottom
1)	0.9996	0.9999	1.0011	0.9997
2)	0.9964	0.9955	1.0000	0.9996
3)	0.9993	0.9992	0.9998	0.9996
4)	0.9984	0.9972	1.0011	1.0005
5)	0.9999	0.9998	1.0008	1.0021
6)	1.0002	0.9996	1.0021	1.0003
7)	0.9965	0.9963	1.0010	0.9997
8)	0.9988	0.9983	1.0017	1.0013
9)	0.9982	0.9997	0.9999	1.0000
10)	0.9958	0.9956	1.0013	1.0008
11)	0.9979	0.9981	1.0010	1.0008
12)	1.0019	1.0020	1.0011	1.0014
13)	1.0015	1.0020	1.0005	1.0005
14)	1.0007	1.0013	1.0014	1.0015
15)	0.9997	0.9994	0.9991	0.9986
16)	0.9998	1.0000	0.9999	1.0001
17)	0.9999	0.9994	1.0031	1.0031
18)	0.9987	0.9984	1.0023	1.0019
19)	1.0001	0.9999	1.0012	1.0015
20)	1.0010	1.0011	1.0016	1.0018
21)	1.0121	1.0025	1.0016	1.0019

Tube Diameters - R-303
NOV-1970

8" from top	15" from top	8" from bottom	15" from bottom
----------------	-----------------	-------------------	--------------------

1)	1.0132	1.0137	1.0067	1.0072
2)	1.0089	1.0094	1.0136	1.0138
3)	1.0135	1.0129	1.0085	1.0076
4)	1.0117	1.0121	1.0120	1.0125
5)	1.0083	1.0072	1.0137	1.0131
6)	1.0115	1.0113	1.0134	1.0130
7)	1.0062	1.0077	1.0091	1.0091
8)	1.0015	1.0109	1.0084	1.0077
9)	1.0102	1.0100	1.0101	1.0088
10)	1.0115	1.0108	1.0137	1.0135
11)	1.0083	1.0081	1.0126	1.0116
12)	1.0133	1.0144	1.0105	1.0082
13)	1.0116	1.0122	1.0113	1.0117
14)	1.0085	1.0079	1.0114	1.0115
15)	1.0114	1.0115	1.0127	1.0131
16)	1.0100	1.0113	1.0128	1.0138
17)	1.0091	1.0095	1.0121	1.0101
18)	1.0087	1.0093	1.0110	1.0118
19)	1.0117	1.0126	1.0083	1.0091
20)	1.0127	1.0111	1.0106	1.0118
21)	1.0106	1.0110	1.0131	1.0131

from

C. L. SHADDOCK, Jr.

11/16, 19 70

To

JDM

Thanks for your assistance.

CCR 000008250

Loadings for Special Harshaw Catalyst 4/16/70

reduce cal. Concentration by 0.79

R-301	Original Conc, %	Conc for Sp. Harshaw, %	Zone length inches	total	Volumes, cc diluent CAT	
①	100	79	26	393	83	310
②	65	51	26	393	192	201
③	45	36	26	393	252	141
④	32	25	40	604	453	151

R-302

①	100	79	52	786	168	621
②	65	51	26	393	192	201
③	45	36	40	604	387	217

R-303

①	100	79	118	1785	375	1410
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The catalyst zones were made up to fill one tube/reactor. Volumes used were 10% greater than listed above to include a safety factor.

CCR 000008251

Wendell Kroshave
4-16-70

Tube Diameters - R-301

I.D. (inches)

Traverse
Center to East Wall
on center line
tube start of cut
↓

	<u>top</u>		<u>Bottom</u>	
	15" depth	8" depth	15" depth	8" depth
1)	1.0102	1.0115	1.0112	1.0118
2)	1.0089	1.0105	1.0107	1.0102
3)	1.0122	1.0110	1.0111	1.0109
4)	1.0078	1.0102	1.0110	1.0108
5)	1.0099	1.0104	1.0130	1.0106
6)	1.0119	1.0102	1.0108	1.0064
7)	1.0121	1.0114	1.0092	1.0066
8)	1.0115	1.0104	1.0103	1.0091
9)	1.0077	1.0101	1.0089	1.0106
10)	1.0033	1.0086	1.0086	1.0122
11)	1.0091	1.0112	1.0107	1.0102
12)	1.0117	1.0113	1.0112	1.0094
13)	1.0101	1.0114	1.0096	1.0118
14)	1.0101	1.0102	1.0117	1.0113
15)	1.0119	1.0036	1.0111	1.0091
16)	1.0101	1.0104	1.0115	1.0024
17)	1.0109	1.0106	1.0108	1.0089
18)	1.0105		1.0102	1.0118
19)	1.0099		1.0118	1.0121
20)	1.0101		1.0084	1.0085
21)	1.0119			

R-301 top at 15" depth (Cont.)

22)	1.0113
23)	1.0102
24)	1.0084
25)	1.0106
26)	1.0117
27)	1.0102
28)	1.0094
29)	1.0100
30)	1.0103
31)	1.0117
32)	1.0072
33)	1.0095
34)	1.0103
35)	1.0110
36)	1.0017
37)	1.0073
38)	1.0099
39)	1.0105
40)	1.0113

Tube Diameters R-302

Tube I.D. (inches)

	<u>Top</u> 15" depth	15" (Cont) 8" depth	<u>Bottom</u> 15" depth	8" depth
1)	1.0023 1.0102	0.9977	0.9966	
2)	0.9998 1.0087	0.9982	0.9988	
3)	0.9993 1.0	0.9985	0.9988	
4)	1.0004	0.9988	0.9994	
5)	1.0012	0.9983	1.0017	
6)	1.0010	1.0015	0.9991	
7)	1.0034	0.9994	0.9990	
8)	1.0007	0.9984	1.0036	
9)	0.9964	0.9980	0.9996	
10)	1.0005	0.9999	1.0016	
11)	0.9997	1.0001	1.0008	
12)	1.0015	1.0022	1.0021	
13)	1.0004	1.0027	1.0026	
14)	1.0018	1.0011	1.0020	
15)	1.0003	1.0002	0.9988	
16)	0.9974	1.0016	1.0018	
17)	0.9913	0.9997	0.9986	
18)	0.9915	0.9970	1.0015	
19)	1.0004	1.0001	1.0024	
20)	1.0017		1.0012	
21)	0.9992			

R-303 Tube inside diameters.

(Tubes had not been washed ^{or hydroblasted} but had been air blasted)

(1) Traverse East on Center line from Center to Wall - alternate tubes starting at tube nearest Center.

Tube i.d. inches

15" from bottom

8" from bottom

1)	1.0091	1.0086
2)	1.0076	1.0059
3)	1.0100	1.0067
4)	1.0084	1.0073
5)	1.0124	1.0104
6)	1.0128	1.0116
7)	1.0146	1.0136
8)	1.0136	1.0130
9)	1.0129	1.0122
10)	1.0120	1.0114
11)	1.0118	1.0124
12)	1.0118	1.0094
13)	1.0106	1.0103
14)	1.0141	1.0146
15)	1.0129	1.0132
16)	1.0135	1.0141
17)	1.0075	1.0065
18)	1.0119	1.0125

2) ~~Traverse~~ west from Center on Centerline,
alternate tubes starting with tube nearest
Center

Tube i.d., in ches, 15" from bottom.

1)	1.0120
2)	1.0119
3)	1.0112
4)	tube cont. cat.
5)	1.0111
6)	1.0131
7)	1.0116
8)	1.0113
9)	1.0117
10)	1.0109
11)	1.0125
12)	1.0133
13)	tube cont. cat.
14)	1.0120
15)	1.0127
16)	1.0134
17)	1.0107
18)	1.0106

3) Traverse North from center on center line, every tube on center line measured. Start at center

Tube I.D. inches, 15" from bottom

1)	1.0073
2)	1.0114
3)	1.0078
4)	1.0110
5)	1.0123
6)	1.0114
7)	1.0079
8)	1.0082
9)	1.0128
10)	1.0111
11)	1.0119

Tube contained cut depth.

12)	1.0113
13)	1.0049
14)	1.0101
15)	1.0105
16)	1.0105
17)	1.0161
18)	1.0130
19)	1.0061
20)	1.0070
21)	

4) Thermowell tube measurements, R-303

Thermowell tube	Tube I.D., inches	
	15" from bottom	8" from bottom
S.W.	1.0106	1.0107
S.E.	1.0077	1.0078
N.E.	1.0066	1.0062
N.W.	1.0123	1.0127

Tubes measured ^{out} by mech. shop had i.d. of
 1.008 — 1.009 inches, questionable
 history.

Tubes are 1 1/4" O.D x 11 gauge, std i.d. = 1.010"

WEK

HARSHAW CATALYST Cu-0932 T 3/16"Specification SheetHarshaw Lot No. Special Harshaw Date received in Richmond 12/15/69Stauffer Code No. 1028-10-1 For Shipment to _____

	<u>Sample</u>	<u>Specification</u>
Cupric Chloride (wt. %)	<u>17.8</u>	18.0 ± 1.0
Potassium Chloride (wt. %)	<u>1.79</u>	1.80 ± 0.25
Iron as Fe (ppm)	<u>1050 *</u>	< 800
Sulfate as SO_4 (wt. %)	<u>2.005</u>	< 0.25
Silica as SiO_2 (wt. %)	<u>0.10</u>	< 0.25
L.O.I. @ 300°C (wt. %)	<u>2.2</u>	< 5.0

Bulk Density (lb/ft ³)	<u>52.9, 53.0 recheck *</u>	40 ± 4
Hardness (wt. %)	<u>97.4</u>	> 90
Fines through 6 mesh	<u>—</u>	< 1.0
Tyler Screen (wt. %)	<u>—</u>	< 1.0

Tablet Size (in.)		$0.172 - 0.203$
Ave. Length (in.)	<u>0.157 *</u>	$0.172 - 0.203$
Ave. Width (in.)	<u>0.185</u>	$0.172 - 0.203$
% Outside Range	<u>77 *</u>	$< 20\%$

B.E.T. Surface Area (m ² /gm)	<u>158 * 154st (Recheck)</u>	195 ± 25
Total N ₂ Pore Volume (cc/gm)	<u>0.43</u>	> 0.40
Pore Volume 80-600 Å Pores (% of TFV)	<u>31</u>	> 50
Average Pore Diameter (Å) (BJH)	<u>72.1</u>	—
Average Pore Diameter (Å) (BET)	<u>137</u>	> 80

REMARKS: *	OUT OF SPEC	
% C - 1.59	% WATER SOLUBLE ALUMINA = 0.17	

CCR 000008259

PORE VOLUME DISTRIBUTION

FIGURE 4

Curve	Code No.	Sample	B.E.T. S.A. (m ² /gm)	B.J.H. S.A. (m ² /gm)	Total Pore Vol. (cc/gm)	Pore Vol. 80-600Å (cc/gm)	Ave. Pore Diameter (B.J.H.) (Å)	Ave. Pore Diameter (B.E.T.) (Å)
①	RJB 20- 122-1	Harshaw Lot-2 Reference	210	239	0.55	0.33	91.4	104
②	102E-10-1	Harshaw Lot-2 Sample 2	152	186	0.43	0.26	92.6	109

CCR 000008260

