A-53

BERYL PROJECT
IRON COUNTY, UTAH

LOCATION AND ACCESS: The project site, which consists of two lease packages, is located in southwestern Utah, approximately 40 miles west of Cedar City. The project site is reached from State Highway 56 via County Road 18.

LEASE POSITION: T32S, R15W, Sections 30 and 31
T32S, R16W, Sections 25, 34 and 35
T33S, R16W, Sections 4, 14, 22, 23, 24, 27 and 28

GEOTHERMAL AND GEOLOGIC DESCRIPTION: High heat flow values, ranging from 3.8 HFU to 15.3 HFU, and elevated Cl levels in the local ground water, indicate that the project site overlies a shallow, hydrothermally active zone. The site is adjacent to the Tertiary volcanic Wah Wah and Needle Ranges to the north, and lies in close proximity to the range front fault forming the southern boundary of these ranges.

ENERGY MARKETING POTENTIAL: The project site is located within 40 miles of the rapidly growing agricultural and recreational center of Cedar City. Extensive farming in the valleys adjacent to the project relies entirely on electrical pumping for irrigation needs.

APPENDIX E. BERYL

PROJECT: Beryl, Utah. Comm Cities

LOCATION: The property consists of two parcels centered on 113° 35' WLong., 37° 55' NLat. (T33S, R16W) in southwestern Utah in the Basin and Range Province.

LEASE POSITION: Pending:

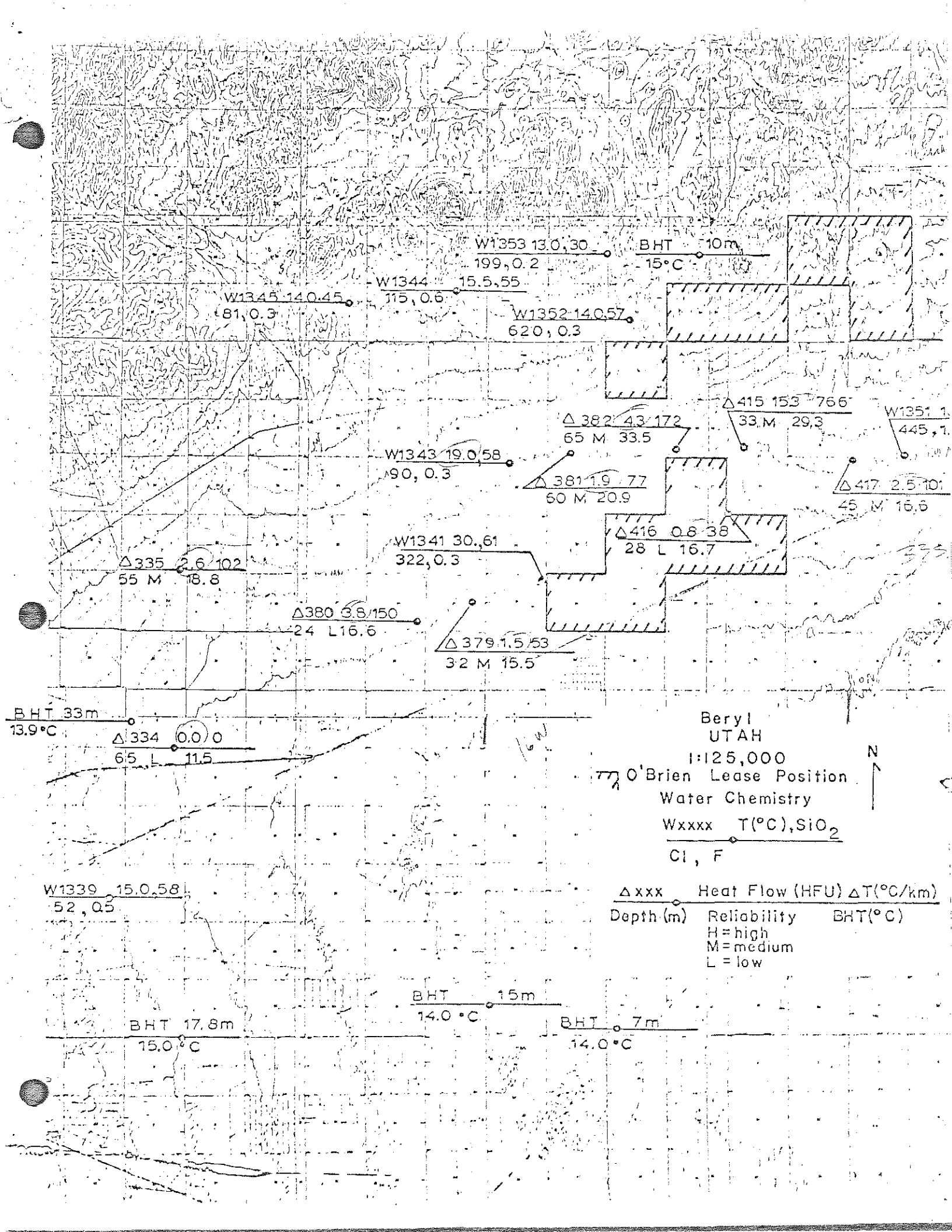
T32S, R15W Sections 30 and 31
T32S, R16W Sections 25, 34 and 35
T33S, R16W Sections 4, 14, 22, 23, 24, 27 and 28

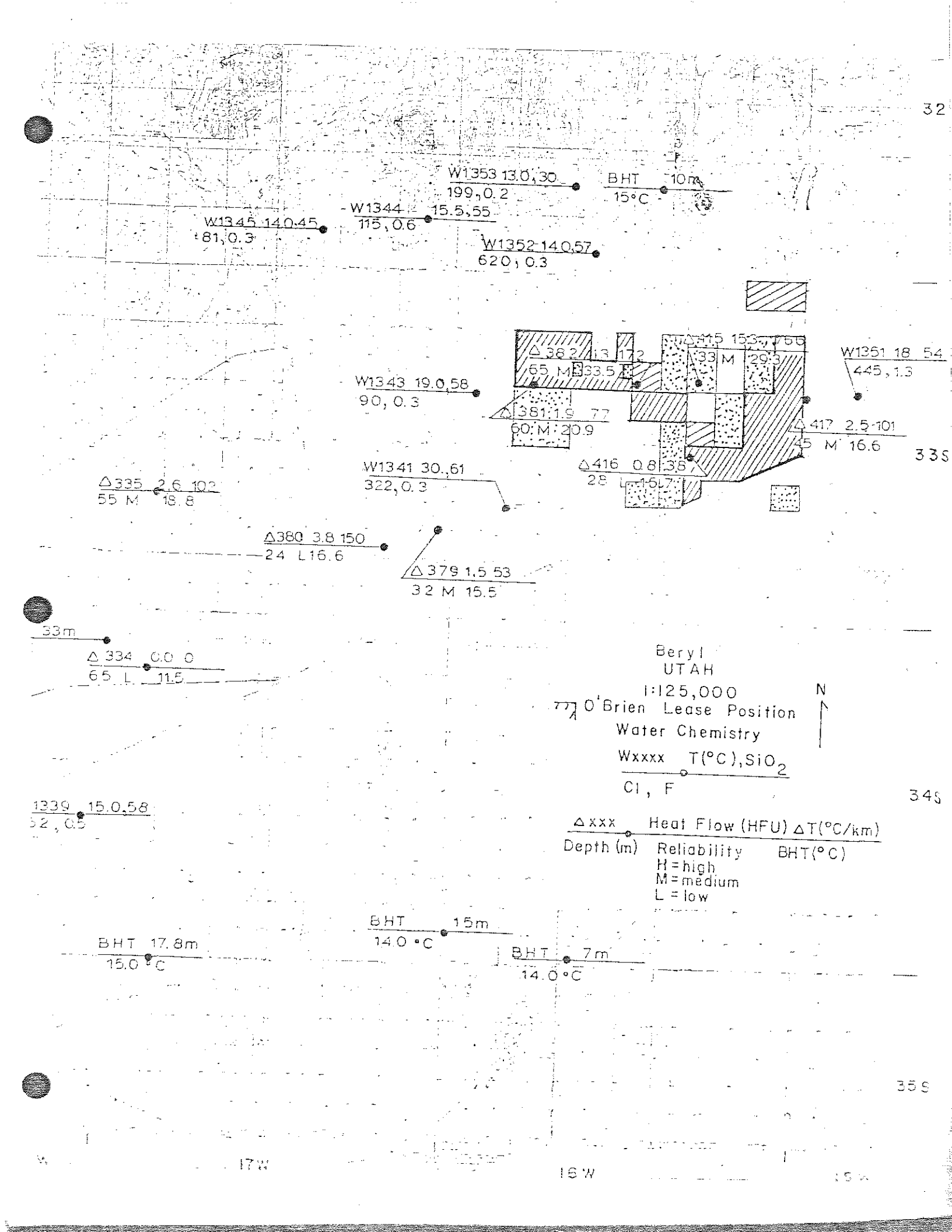
AVAILABLE DATA: Figure E-1: The lease position is north of Phillips Petroleum's Newcastle prospect, west of Cedar City. Heat flow values of 15.3, 4.3 and 3.8 HFUs have been measured in the area. Waters in the area have chloride concentrations ranging from 199 to 620 ppm.

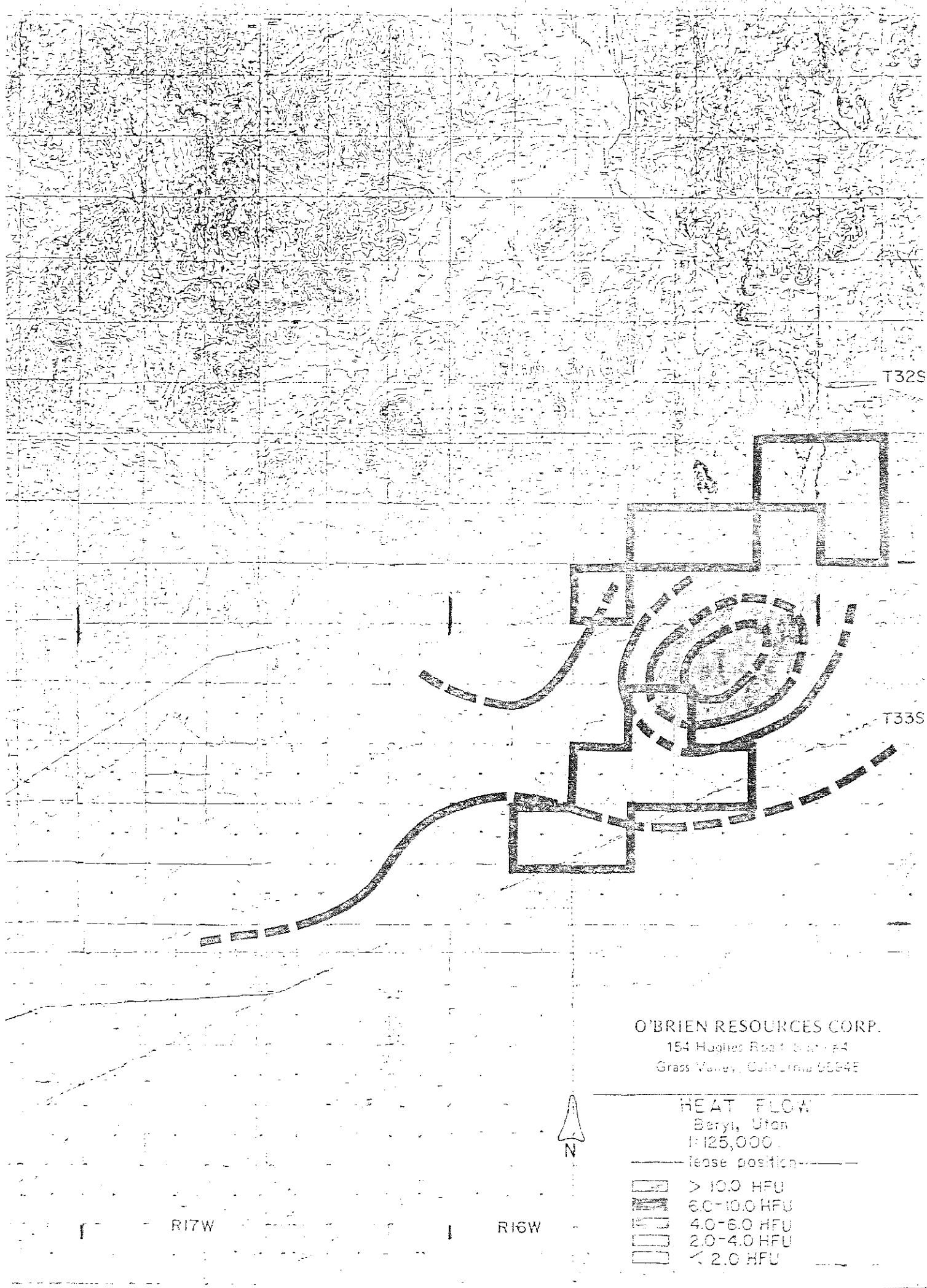
GENERALIZED GEOLOGY: The lease position is located on Quaternary alluvium. The mountains to the north are composed largely of Tertiary extrusive volcanics. These mountains are the junction between the Needle Range and the Wah Wah Mountains. An extension of the range front fault systems forming these mountains is the most likely conduit for ascending thermal fluids, thus representing a slight variation of a traditional "range front fault system" type anomaly.

ASSESSMENT WORK COMPLETED: In April 1980 initial exploration was conducted which generated the data shown in Figure E-1. No subsequent work has been accomplished.

PROPOSED ASSESSMENT WORK: Assessment should be coordinated with evaluation of other Utah properties and completed as soon as possible. One geologist performing a mercury survey and doing detailed geologic mapping could complete preliminary assessment of the prospect in approximately nine days. This would include flagging 25-30 prospective drill sites. Available aerial coverage could be used in mapping, or new coverage could be obtained at higher cost.


W1353 13.0,30
199, 0.2
BHT 10m
15°C
W1344 15.5,55
115, 0.6
W1345 14 0.45
81, 0.3
W1352 14 0.57
620, 0.3
Δ 382 43 172
65 M 33.5
Δ 415 153 766
33 M 29.3
W1343 19.0,58
90, 0.3
Δ 381 1.9 77
60 M 20.9
Δ 417 2.5 101
45 M 16.6
Δ 416 0.8 38
28 L 16.7
W1341 30.,61
322, 0.3
Δ 335 2.6 102
55 M 18.8
Δ 380 3.8 150
24 L 16.6
Δ 379 1.5 53
32 M 15.5
BHT 33m
13.9°C
Δ 334 0.0 0
65 L 11.5
Beryl
UTAH
1:125,000
O'Brien Lease Position
Water Chemistry
Wxxxx T(°C), SiO2
Cl, F
N
W1339 15.0,58
52, 0.5
Δxxx Heat Flow (HFU) ΔT(°C/km)
Depth (m) Reliability BHT(°C)
H = high
M = medium
L = low
BHT 15m
14.0 °C
BHT 17.8m
15.0 °C
BHT 7m
14.0 °C


32
W1353 13.0,30
199, 0.2
BHT 10m
15°C
W1344 15.5,55
115, 0.6
W1345 14 0.45
81, 0.3
W1352 14 0.57
620, 0.3
Δ 382 1.3 172
65 M 33.5
33 M 29.3
Δ 415 153 1.56
W1351 18 54
445, 1.3
W1343 19.0,58
90, 0.3
Δ 381 1.9 77
60 M 20.9
Δ 417 2.5 101
45 M 16.6
33S
W1341 30.,61
322, 0.3
Δ 416 0.8 38
28 L 16.7
Δ 335 2.6 102
55 M 18.8
Δ 380 3.8 150
24 L 16.6
Δ 379 1.5 53
32 M 15.5
33m
Δ 334 0.0 0
65 L 11.5
Beryl
UTAH
1:125,000
O'Brien Lease Position
Water Chemistry
Wxxxx T(°C), SiO2
Cl, F
N
34S
1339 15.0,58
52, 0.5
Δxxx Heat Flow (HFU) ΔT(°C/km)
Depth (m) Reliability BHT(°C)
H = high
M = medium
L = low
BHT 15m
14.0 °C
BHT 17.8m
15.0 °C
BHT 7m
14.0 °C
35S
17W
16W



O'BRIEN RESOURCES CORP.
154 Hughes Road [illegible] #4
Grass Valley, California 95945

HEAT FLOW
Beryl, Utah
1:125,000
lease position

> 10.0 HFU
6.0-10.0 HFU
4.0-6.0 HFU
2.0-4.0 HFU
< 2.0 HFU

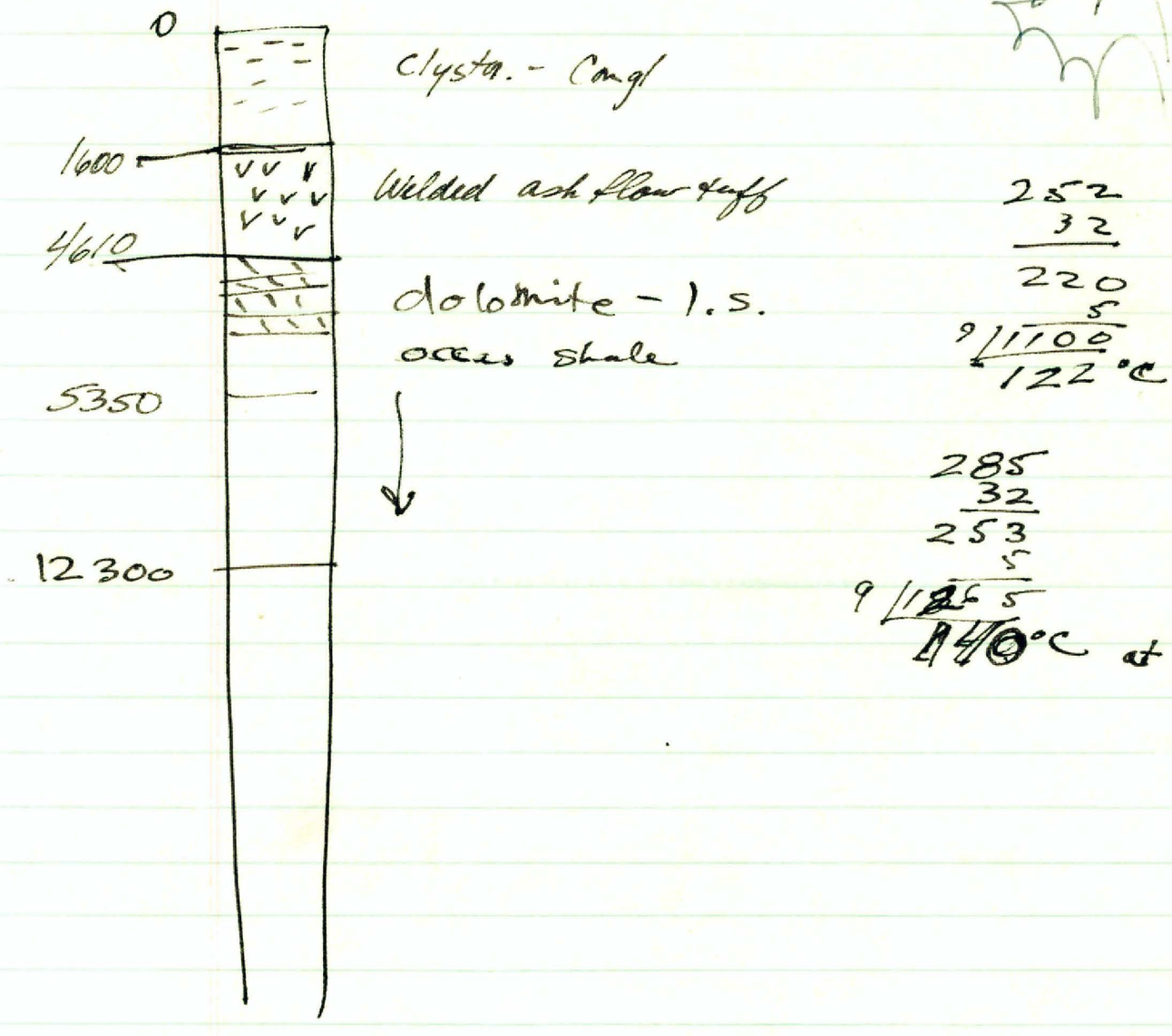
Beryl
Water Chemistry
(ppm)

Sample No	Na	K	Ca	Mg	SiO_2	Cl^-	NH_3	F^-	Li	B	pH	SO_4
A	330	13	170	33	54	445	<0.1	1.3	0.9	0.8	7.21	215
B	350	24	100	15	87	371	<0.1	2.8	1.2	0.7	7.40	220
C	400	35	140	19	65	475	<0.1	3.1	1.2	1.0	7.49	215
D	52	11	220	46	61	322	<0.1	0.26	<0.1	0.6	7.21	140
E	59	3.1	54	46	30	199	<0.1	0.24	<0.1	<0.2	9.07	75
F	76	0.4	320	95	57	620	<0.1	0.28	<0.1	0.3	7.29	200
G	67	0.8	95	20	55	115	<0.1	0.59	<0.1	<0.2	7.40	33
H	31	3.0	82	18	45	81.0	0.91	0.31	<0.1	<0.2	7.20	57
I	40	2.4	70	27	58	90	<0.1	0.33	<0.1	<0.2	8.33	81
J	335	34	145	14	52	402		3.9	1.07	1.0	709	376
K	343	34	140	18	49	447		3.1	1.06	1.1	7.15	367
L	333	12	159	24	42	419		1.9	0.9	0.9	7.0	369
M	204	12	186	30	45	346		1.5	0.2	1.0	7.69	382
N	585	30	693	131	50	1674		1.9	1.02	1.2	6.99	1229
O	319	24	145	14	44	366		4.0	0.96	0.9	7.13	359

Base Map Number	Geochemistry Stations - Source
A	Data Base W 1351
B	" " W 1342
C	" " W 1354
D	" " W 1341
E	" " W 1353
F	" " W 1352
G	" " W 1344
H	" " W 1345
I	" " W 1343
J	MX
K	"
L	"
M	"
N	"
O	Klauk et. al. Table 1 #EV-150

Schlumberge Temp logs

BHTS °F		Shut in time hr.
244.5	11835	9
92.5	1469	9
215	6150	18
215	7480	4½
237	7480	19
236	8210	flowing water
248	12295	" "
285	7790	" "
268	7786	
242	12295	
252	12295	- 45 hrs.



252
32
220
5
9/1100
122 °C

285
32
253
5
9/1265
140°C at 7790

Hole/Location No

Data

Station number

BHT @ Depth(m) 5 ΔT°C/km

Depth to 200°C (km) / T°C at 5000 ft datum plane / HF at TCU

Ex. a. BHT @ depth
b ΔT
c Depth km to 200 °C
d Temp °C at 5000 datum plane
e HFU @ T.C.U

#1 a 16.11 °C @ 55 m
b 52 °C/km
c 3.58 km
d 17.15 °C
e. 1.0 @ 2.0

#2 a 17.11 @ 59 m
b. ΔT = 73. °C/km
c ~~HF = 1.5 HFU @ 2 TCU~~ 2.54 km
d 19.17 °C
e 1.5 @ 2

#3 a. 14.94 °C at 30 m
b. 87 °C/km
c 2.13 km
d ~~2.13 km~~ 21.91 °C
e 1.7 @ 2

#4 a 14.80 °C @ 30 m
b. 22 °C/km
c. 8.43 km
d. 17.29 °C
e 1.3 @ 2

#5 a 32.42 at 60 m
b. 184 °C/km
c 1.01 km
d. 34.07 °C
e. 12.1 at 6.6

#6 a 17.30 °C at 44 m
b. 73 °C/km
c. 2.54 km
d. 21.10 °C
e 1.5 @ 2.0

#7 a. 29.42 °C at 37 m
b. 101 °C/km
c 1.83 km
d. 32.25
e. 13.8 @ 13.6

#8 a. 20.43 at 60
b. 150 °C/km
c. 1.23 km
d. 20.77
e 3.0 at 2.0

#9 a. 16.23 at 24 m
b. 224 °C
c. 0.83 km
d. 23.57
e. 4.5 HFU at 2 TCU

#10 BHT 13.43 °C at 21 m

#11 a. 16.56 at 45 m
b. 100 °C/km
c. 1.85 km
a 19.36 °C
e. 2.0 at 2 TCU

#12 a 16.5 °C at 28 m

#13 18 °C at 60 m

14. ~~BHT~~ T 16°C at 40m ✓

15a. 20.85 °C at 60m
b. 77 °C/km
c 2.41 km
d 22.72 °C
e 1.5 HFU at 2 T.C.U ✓

16. a. 16.59 at 24 m
b. 150 °C/km
c 1.24 km
d. 22.65 °C
e 3 HFU at 2 TCU ✓

17. a. 15.50 °C at 32 m
b. 52 °C/km
c. 3.57 km
d. 16.87
c. 1.0 at 2 ✓

18. BHT 18°C at 60 m ✓

19. a. 22.83 at 57 m
b ~~1.59 °C/km~~ 217 °C/km
c. 1.17 km
d. 26.29
e. ~~3.2 at 2.0~~ 4.2 at 2 ✓

20.a. 19.44 °C at 102 m
b. 58.06 °C/km
c. 3.19 km
d. 28.76
~~e. 1.2 HFU at 1 TCU~~
e. 2.9 HF at 5 TCU ✓

21. a 25.39 at 163 m

b. 64 °C/km

c. 2.90 km

d. 24.25 °C

e. 1.3 at 2 TCu

Maps - Land Position
Geology
Heat Flow — Contour
Geochemical Map
Location Map of heat data

Heat Flow Stations

Base Map No.	Data Source
1	Field Book
2	" "
3	" "
4	" "
5	" "
6	" "
7	" "
8	" "
9	" "
10	BHT 13.43°C at 21 m' in water - windmill - see field map
11	Data base ΔT 417
12	BHT 16.5°C at 28 m' - field map
13	BHT 18°C pumping from ~ 60 m'. -
14	BHT 16°C pumping from ~ 40 m
15	Data Base ΔT 381
16	DataBase ΔT 380
17	Data Base ΔT 379
18	BHT 18°C pumping from ~60 m'
19	U. of U. gradient
20	" "
21	" "