

**Final Report of 1997 Surveys for Lesser Prairie Chickens on New Mexico
Department of Game and Fish Prairie Chicken Management Areas
and Trapping and Radio Telemetry on BLM Lands**

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22 September, 1997

Introduction

Over the last 100 years, Lesser Prairie Chicken (LPCH, *Tympanuchus pallidicinctus*) populations have been declining sharply over the bird's entire range in Kansas, Oklahoma, Texas, Colorado, and New Mexico. In 1995, the US Fish and Wildlife Service received a petition to list the LPCH as threatened. A recent 90-day finding concludes that a thorough review of the species' status is warranted.

Long-term lek survey data collected by the Bureau of Land Management (BLM) Roswell Resource District suggest that LPCH populations in New Mexico, although still larger than in some states, are no exception to the range-wide trend. In response to the apparent decline, the New Mexico Department of Game and Fish (NMDGF) recommended that the 1996 LPCH hunting season be closed. The Department retained that closure for 1997. The New Mexico Natural Heritage Program is currently analyzing the BLM data to determine long-term trends, as well as relationships among management practices and lek attendance.

The purpose of this study was to establish yearly surveys of lekking birds on NMDGF Lesser Prairie Chicken Management Areas (PCAs). NMDGF also cooperated with BLM by providing matching funds for a trapping and radiotelemetry study on the BLM's Caprock Wildlife Management Area. After another season of survey data are collected, trapping and radio-tracking procedures developed during the BLM study will be applied to a telemetry study on NMDGF management areas. The results of the 1997 BLM trapping and telemetry study are summarized here.

Methods

Surveys

During April, 1997, we surveyed New Mexico Department of Game and Fish (NMDGF) Lesser Prairie Chicken Management Areas for the presence of lekking Lesser Prairie Chickens. We surveyed the following management areas: Black Hills, Claudell, Crossroads #1, Crossroads #2, Gallinas Wells, Liberty, Marshall, Milnesand, North Bluit, and South Bluit (Maps 1-10). We attempted to survey all areas during the first week of April. However, because the weather was not optimal for lekking, we discontinued the early survey before visiting the Crossroads, Marshall, or Gallinas Wells areas. All areas were then visited for a first or second time between April 12 and 15.

Surveys were conducted between 0550 and 0815 hours. Surveyors approached survey sites by vehicle and listened for booming males. Where possible, we attempted a closer approach on foot. If we could not approach closely enough to see the birds on the leks, we recorded numbers of individuals estimated auditorially. Birds were counted and sex recorded whenever possible. We attempted to avoid flushing birds from the leks. If exact counts were not possible either auditorially or visually, we recorded the maximum number we could confidently estimate.

We mapped leks located by NMDGF in 1996, adding a "G" to each lek designation to distinguish Game and Fish leks from BLM leks in our database. We then numbered and mapped the new leks that we detected in 1997. Leks from 1996 retain their management area designations and lek numbers, and new 1997 leks are numbered accordingly. For example, the first lek located on the Liberty PCA is now designated GL-1 (Appendix 1). Minor location shifts of historical lek sites have been observed at both BLM and NMDGF leks. Therefore, leks that moved one kilometer or less between years are given the same designation as in the previous year. In the future, any leks that move more than one kilometer between years will be re-numbered.

Trapping and Telemetry

During April and early May, 1997, we trapped Lesser Prairie Chickens on BLM lands in the Caprock Wildlife Habitat Area. We, along with BLM surveyors, located only three BLM leks with large enough numbers of displaying males to justify trapping efforts: 45N, 10N, and 2N, with male populations of 7, 10, and 10, respectively.

We set up wire leads and walk-in traps for nine days at 45N, seven days at 10N, and six days at 2N, for a total of 22 trap mornings. On days that we trapped a lek, we observed the lek from before the beginning of booming (usually around 0500) until all birds had left the lek for the morning (around 0900), such that we observed all males and all females that attended the lek.

All trapped birds were banded with a NMDGF aluminum leg band on the left leg, two colored plastic bands on the right leg, and one colored plastic band on the left leg, above the aluminum band. Each bird received a unique color combination. Band color combinations are designated as follows: G/G G indicates green over green on the right leg and green over aluminum on the left leg. The following measurements were also taken for each bird captured: sex, age, weight, right and left wing chord, right and left tarsus. Birds were released as soon as they were processed.

Results

Surveys on Prairie Chicken Management Areas

A minimum of 30 birds was observed on 10 active leks (Table 1). The largest number of birds counted was 6, at North Bluit, but the lek heard at Marshall, off NMDGF land, may have had as many as 10 males booming. Most leks were small, having fewer than 10, and probably fewer than 5, males in attendance.

Three leks, GCI-3, GCI-4, and GB-3 moved less than one kilometer between 1996 and 1997 and so retained their designations.

Two females were seen at Gallinas Wells #2, and some of the 10 individual birds not identified to sex could have been females, giving a maximum of four of eleven leks that

could have had females in attendance during our surveys. Of the six areas visited in both early and mid-April, only Milnesand had birds present during both visits; birds were

Management Area	Lek #	Survey Date	# Males	# Females	# Sex Unknown	Total
South Bluit		4/1/97	0	0	0	0
South Bluit		4/12/97	0	0	0	0
Claudell		4/2/97	0	0	0	0
Claudell		4/12/97	0	0	0	0
Black Hills		4/1/97	0	0	0	0
Black Hills	GB-3	4/12/97	≥2	0	0	≥2
Liberty		4/2/97	0	0	0	0
Liberty	GL-1	4/13/97	≥1	0	0	≥1
North Bluit		4/1/97	0	0	0	0
North Bluit	GNB-1	4/12/97	2	0	4	6
Milnesand	GM-4	4/1/97	0	0	2	2
Milnesand	GM-4	4/12/97	≥2	0	0	≥2
Milnesand	GM-2	4/1/97	3	0	1	4
Milnesand	GM-2	4/12/97	>1	0	3	≥4
Marshall	GMA-1	4/14/97	>4	0	0	>4 (up to 10)
Crossroads #1	GCI-4	4/13/97	≥2	0	0	≥2
Crossroads #1	GCI-3	4/13/97	≥2	0	0	≥2
Gallinas Wells #2	GWII-1	4/15/97	2	2	0	4
Crossroads #2	GCII-1	4/13/97	≥3	0	0	≥3

Table 1. Results of lek surveys on NMDGF Prairie Chicken Management Areas, 1997.

present at two leks on Milnesand on April 1. Because we visited each lek for just long enough to count the birds present, and because all birds were not identified to sex, our data do not allow estimation of sex ratios.

Trapping and Telemetry on BLM Lands

Seventeen sightings of females were made, all except one at lek 45N (Table 2).

Date	Lek	# of Females	Copulations
4/9/97	45N	5	
4/10/97	45N	2	
4/14/97	45N	1	
4/15/97	45N	3	1
4/16/97	45N	2	
4/18/97	45N	3	1
4/24/97	2N	1	

Table 2. Females sighted during trapping and surveys at BLM lands, April, 1997.

One radio-tagged female was observed twice at lek 45N, once on the day she was captured and again when she returned two days later. Because only two copulations were observed, both at 45N, it appears that females visit a lek at least twice before copulating. Thus, we probably observed substantially fewer than 16 individual hens total.

Eight birds, seven males and one female, entered traps (Table 3). Two males escaped before we reached the trap. The first escaped out a trap top that was not securely fastened. The second happened to be trapped in the same trap as another male and may have been chased out by the other male. Four males were measured, banded, and released (color bands P/P P, P/G P, B/B B, Y/Y Y). One male died while being handled, for a total of seven males entering traps. The female (G/G G) was measured, banded, radio-tagged and released. The dead male was donated to the New Mexico Department of Game and Fish to be made into a study skin. Tissue was taken and frozen for possible DNA study at a later date. The crop contents and gut contents will be examined for dietary and parasite analysis, respectively.

Lek	Dates Trapped	# Males Caught	# Females Caught	Total for Lek
45N	4/15-4/23		1	1
10N	4/17-4/23	2		2
2N	4/24,25,29;5/1-3	3		3

Table 3. Results of trapping efforts, April and May, 1997.

The radio-tagged female was re-located on five days subsequent to her capture date: 4/17, 4/18, 4/21, 4/22, and 4/24 (Table 4, Maps 11-14). We attempted to locate her on 4/29, 4/30, and 5/1, without success, but we were unable to access the area NE of lek 45N, which contains good nesting habitat. She was subsequently found dead south of lek 45N on 8 May, 1997 by a BLM biologist (Map 15). The mortality sensor on the transmitter was operating and led him to the remains. Only feathers remained, and the wire loop on the transmitter was bent, suggesting predation by a strong-jawed predator such as a coyote. Because this female was not located at a nest before she was predated, we have no nest site data for her, and her reproductive success was zero.

In summary, trapping efforts resulted in four males being banded and one female being banded and radio tagged. The single radio-tagged female was predated approximately three weeks after she was tagged. Trapping efforts will continue during the 1998 lekking season.

Date	Female Located	Approximate UTM Easting	Approximate UTM Northing
4/17	Y	612360	3703880
4/18	Y	611860	3704140
4/21	Y	614700	3703800
4/22	Y	614100	3702700
4/24	Y	612900	3713900
4/29	N		
4/30	N		
5/1	N		
5/8	Y, found dead	612100	3702700

Table 4. Results of telemetry study of one collared hen, April and May, 1997.

Discussion and Recommendations

NMDGF Surveys

The NMDGF Lesser Prairie Chicken Management Areas contain several prairie chicken leks, most of which were attended in 1997 by fewer than five males. Historical data on these leks are not available, and it is possible that they have always been small. However, anecdotal evidence from NMDGF personnel suggests that lek sizes have decreased on Prairie Chicken Management Areas. The preponderance of leks having fewer than five males is possibly a cause for concern. Leks of two or three males in particular are probably less likely to persist than larger leks.

The largest lek observed on NMDGF lands was GNB-1, at North Bluit, with 6 birds in attendance (Table 1). Up to ten birds may have been present at lek GMA-1, off of Game and Fish land near the Marshall area. If permission could be acquired from the land owner, lek GMA-1 would be a possible candidate site for trapping and telemetry, as would lek GNB-1. However, we recommend that at least one more year of survey data be collected before beginning a telemetry study on Game and Fish Lesser Prairie Chicken Management Areas. A 1999 start date will also allow us to test alternative trapping and radio-collaring methods during the 1998 BLM study.

The surveys during the first week of April revealed birds at only 40% (2/5) of leks where birds were detected during mid-April. This may mean that lekking does not peak until later, or may simply be a result of windy, wet weather during the first week of April, 1997. We suggest that surveys performed during dry weather in the second week of April will be most productive. Another field season at BLM and Game and Fish leks will help us to determine the appropriate window for maximum survey success.

Substantial numbers of cattle were observed at GM-2 on Milnesand, GCI-3 and GCI-4 on Crossroads, and GMA-1 on Marshall, apparently due to fences being in disrepair. Due to

the presence of lekking birds on all four areas, we recommend that these fences be repaired as soon as possible. The existing grazing lease at Milnesand should be re-evaluated in light of LPCH habitat needs.

Trapping and Radio Tracking on BLM Lands

The number of females attending BLM leks is substantially smaller than the number of males, which is greatly reduced relative to previous survey years (BLM unpublished data). Females appear to visit leks more than once before copulating; thus, we conclude that we observed fewer than 16 females in over five weeks of working at BLM leks. The small numbers of both males and females attending these historically large leks is cause for concern.

Males more readily enter traps than do females. Trapping success of males was comparable to that reported in other studies (Schroeder and Braun 1991) but nevertheless still low (7/27 males, or 26% of all lekking males over 22 trap mornings). We will attempt to have two teams trapping during the peak weeks of the 1998 lekking season. Provided that lek attendance is at least as high as during 1997, this should result in increased trapping success in 1998.

The telemetry methods, although not thoroughly tested with only one female, gave mixed results. We were not able to locate the female at every attempt, probably due to the topography of the dunes. It is clear that females moved while we were tracking them; thus, it was not always possible to determine precise locations (Maps 11-14). Next year we will attempt to locate radioed females while standing on top of the truck, a method that proved fruitful in finding the dead hen in 1997. In addition, a paired triangulation method may be required to effectively track hens to nests. Even then, we expect that considerable effort will be required to find collared females in the dune habitat.

The scanner, receiver, and transmitter appeared to function well, as did the mortality sensor. We have concerns about the weight of the transmitters. The transmitters we are using will weigh between two and three percent of the hen's body weight, which is higher than recommended by some workers (Terry Riley, Ken Giesen, pers. comm.). We will recommend to BLM that a trade-off between weight and transmitter life could be rewarded in hen mobility and survival.

Our telemetry data suggest that the hen we tagged stayed near the lek where she was captured. If many females behave similarly, the habitat around leks may constitute nesting habitat. The collared female also returned to the lek a few days after she was captured, suggesting that at minimum the habitat near leks should provide adequate cover for females and males that are in the area to attend the lek.

It is very disappointing that the only hen we collared was predated so soon after she was tagged. Only further study will reveal how common such predation is, and how frequently hens are able to complete a nesting effort.

Literature Cited

Schroeder, M.A. and C.E. Braun. 1991. Walk-in traps for capturing greater prairie-chickens on leks. *J. Field Ornithol.* 62:378-385.

Map Legends

On all maps, solid, uniform, numbered dots represent historical lek sites, which may or may not be currently active. X or * represents lekking birds detected during these surveys. Lighter dots or circles represent listening points.

Map 1. Listening points on South Bluit Area. Surveys were negative.

Map 2. Listening points on Claudell Area. Surveys were negative.

Map 3. Listening and detection points on Black Hills Area.

Map 4. Listening and detection points on Liberty Area.

Map 5. Listening and detection points on North Bluit Area.

Map 6. Listening and detection points on Milnesand Area.

Map 7. Listening and detection points on Marshall Area.

Map 8. Listening and detection points on Crossroads I Area.

Map 9. Listening and detection points on Gallinas Wells Area.

Map 10. Listening and detection points on Crossroads II Area.

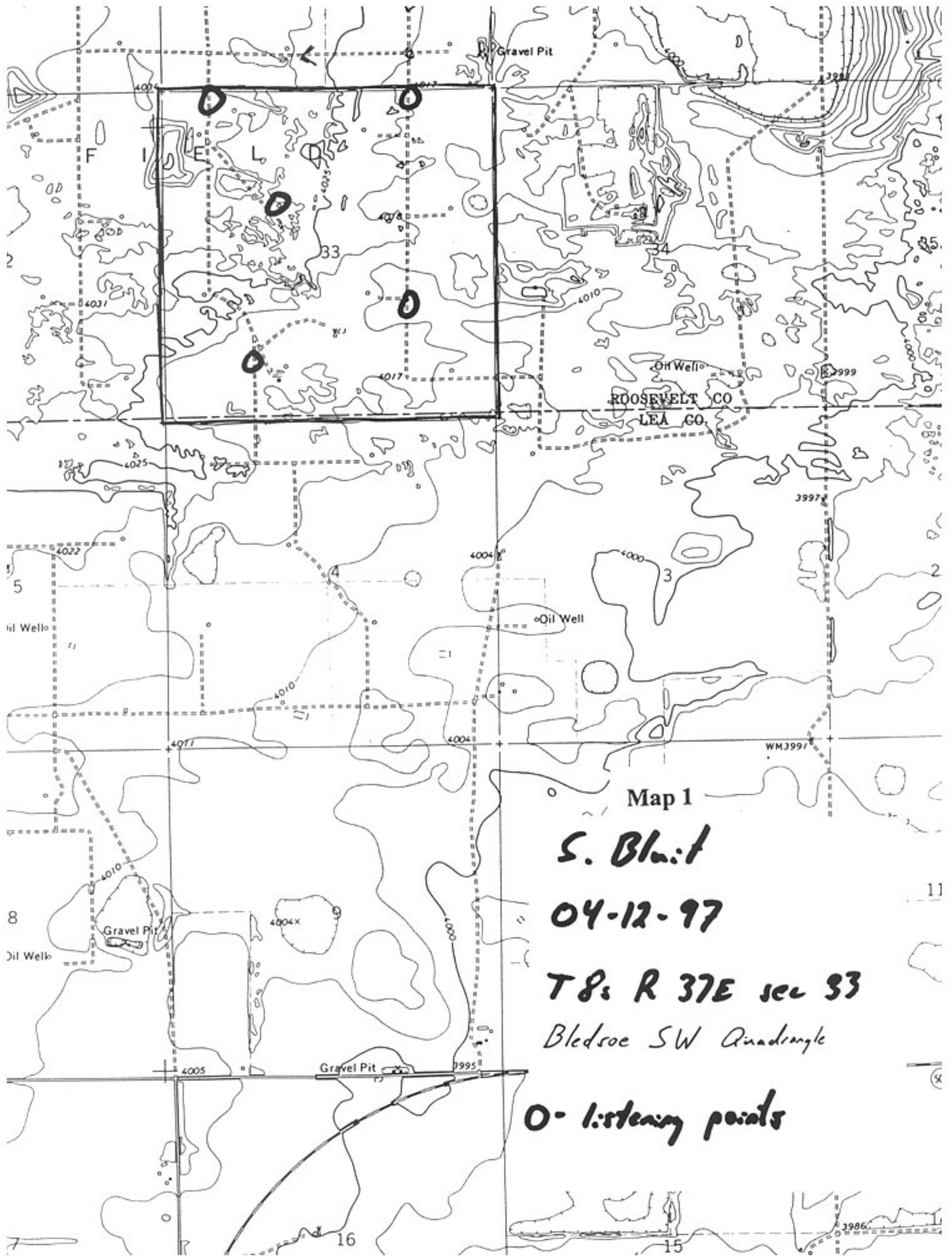
Map 11. Location via telemetry of hen GGG on 4/17/97 and 4/18/97.

Map 12. Location via telemetry of hen GGG on 4/21/97.

Map 13. Location via telemetry of hen GGG on 4/22/97.

Map 14. Location via telemetry of hen GGG on 4/24/97.

Map 15. Location via telemetry of hen GGG, found dead on 5/8/97.



Map 1

S. Blunt

04-12-97

T8s R 37E sec 33

Bledsoe SW Quadrangle

O - listening points

11

8

3986

15

16

7995

Gravel Pit

4005

Oil Well

8

Gravel Pit

4010

Oil Well

5

4022

Oil Well

ROOSEVELT CO

LEA CO.

3997

7999

4017

4010

33

Gravel Pit

3981

F

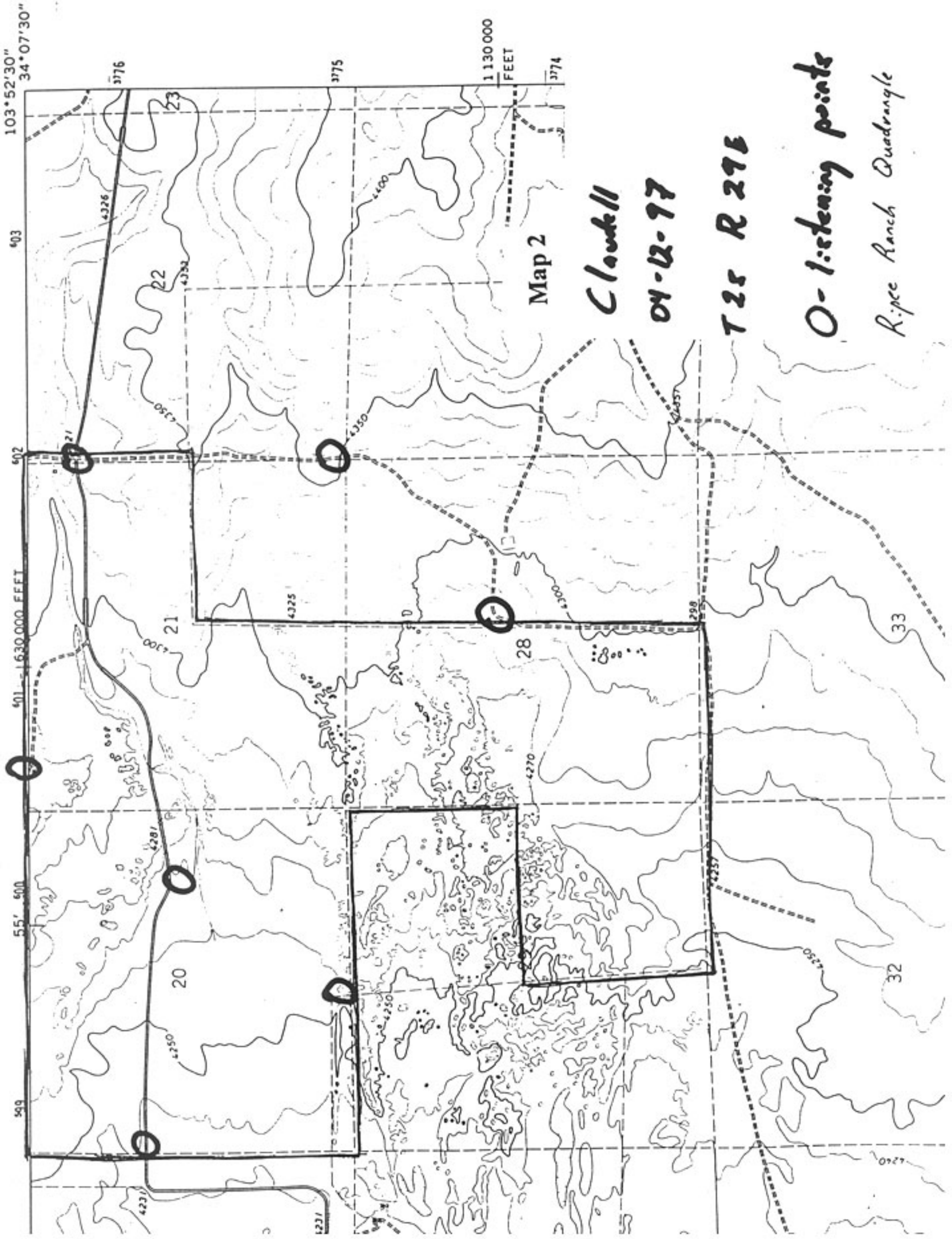
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E

L

NEW MEXICO
7.5 MINUTE SERIES (TOPOGRAPHIC)

Clauvill



Map 2

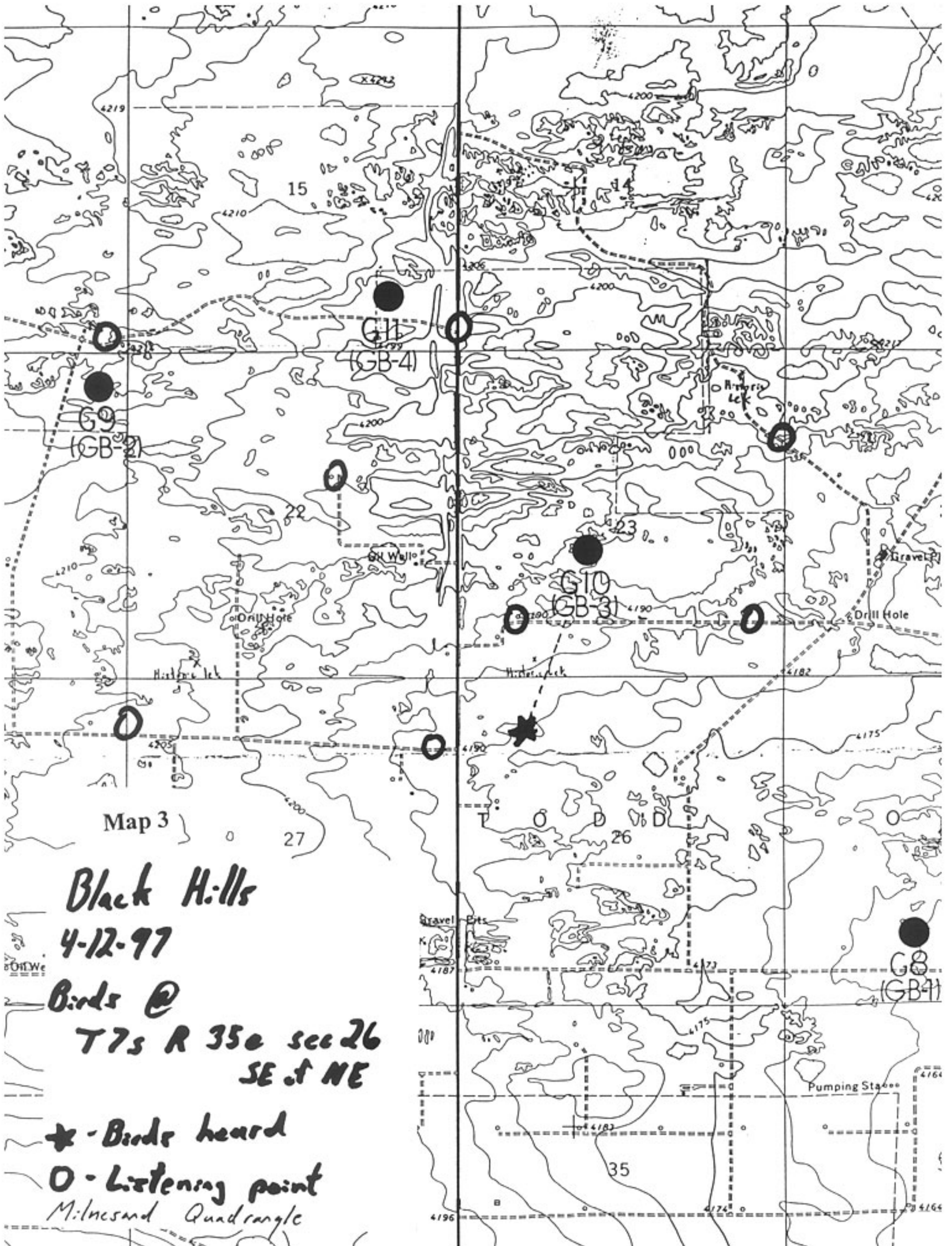
Clauvill

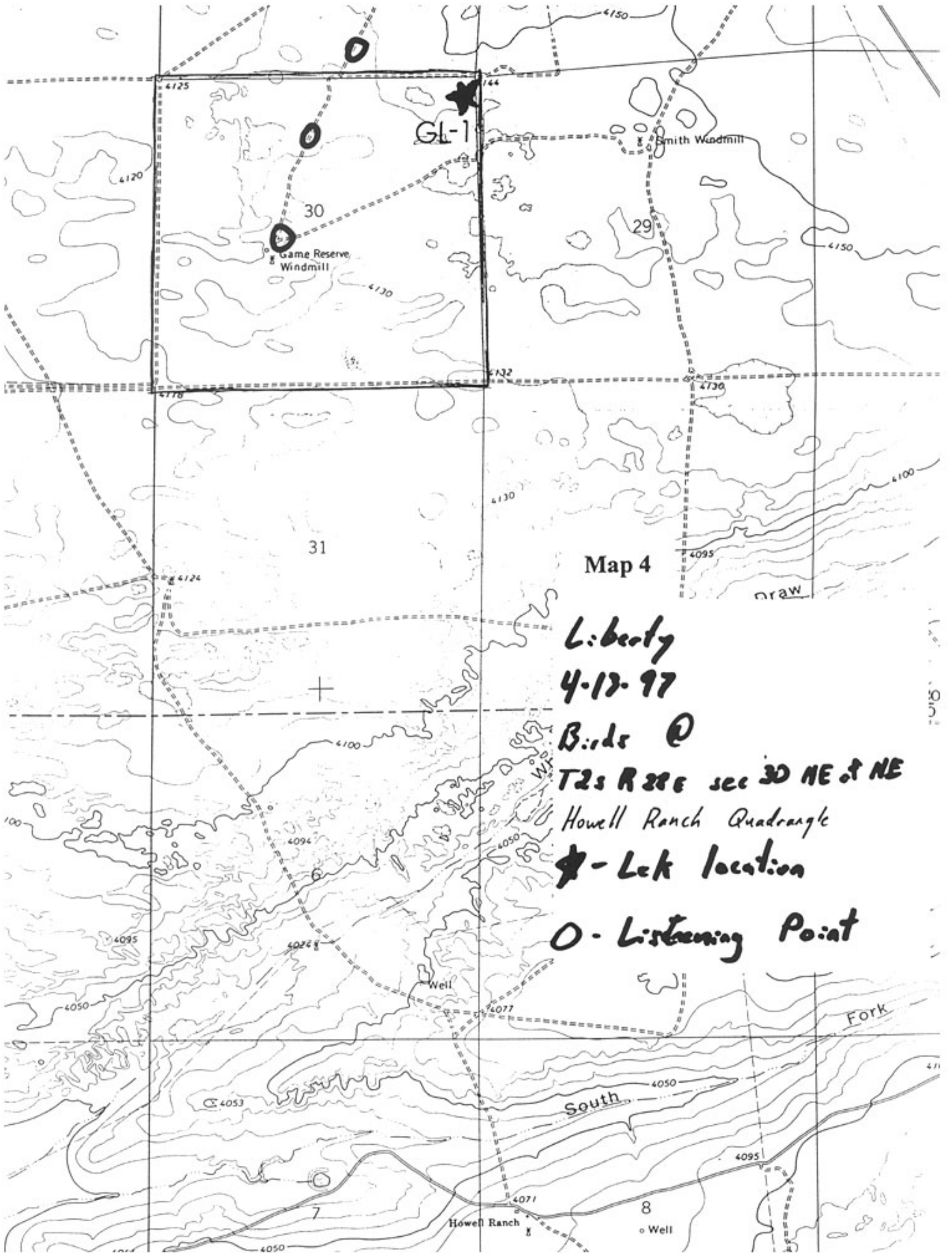
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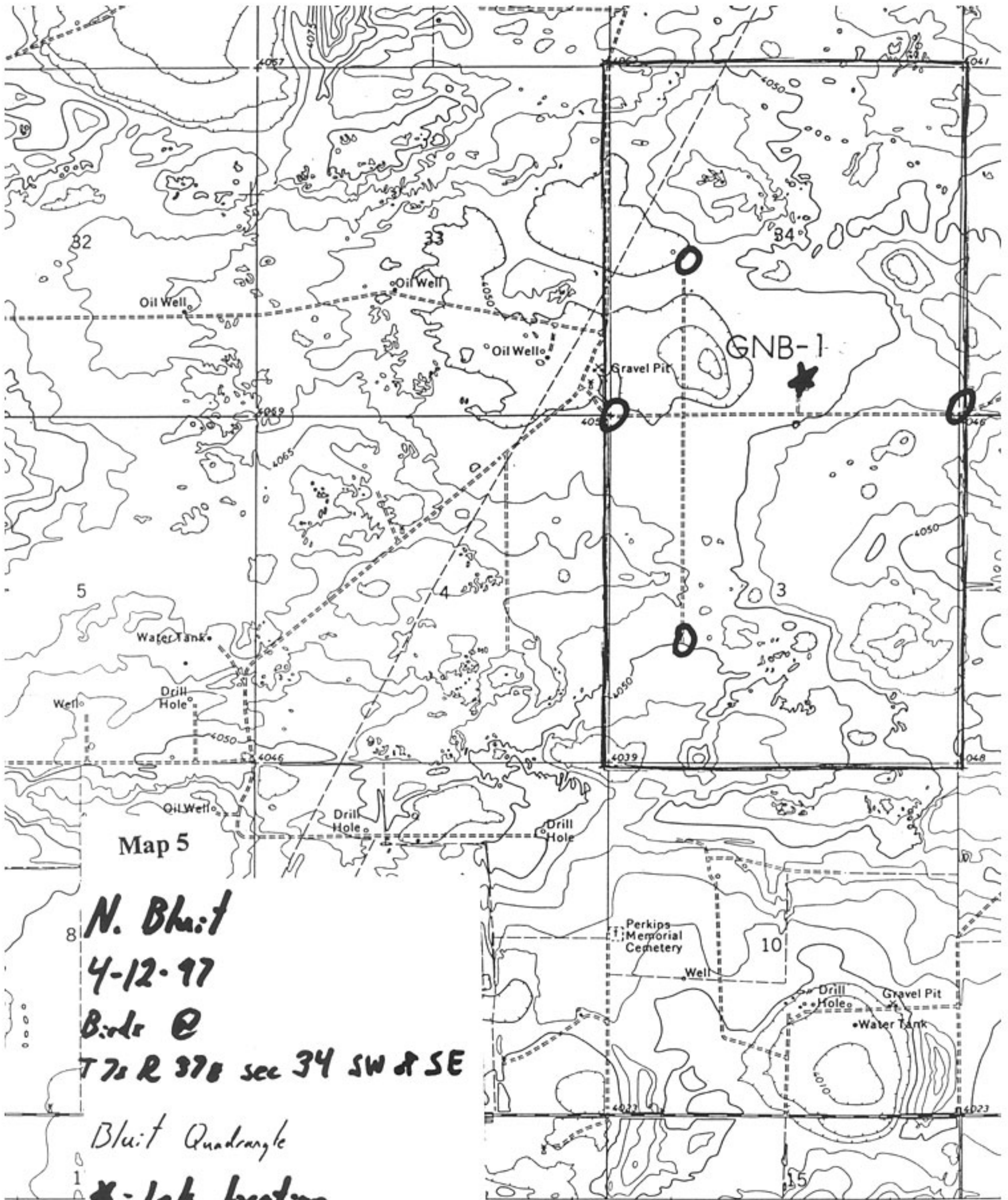
T2S R 29E

O-listening points

Rippe Ranch Quadrangle







Map 5

N. Bluit

4-12-97

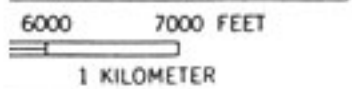
B. L. B.

T 7s R 37E sec 34 SW & SE

Bluit Quadrangle

*** - let location**

O - Listening Post



672 ● ● INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA 673000-E

ROAD CLASSIFICATION

Primary highway, hard surface	Light-duty road, ha improved surface
Secondary highway, hard surface	Unimproved road

McInnesand

Map 6

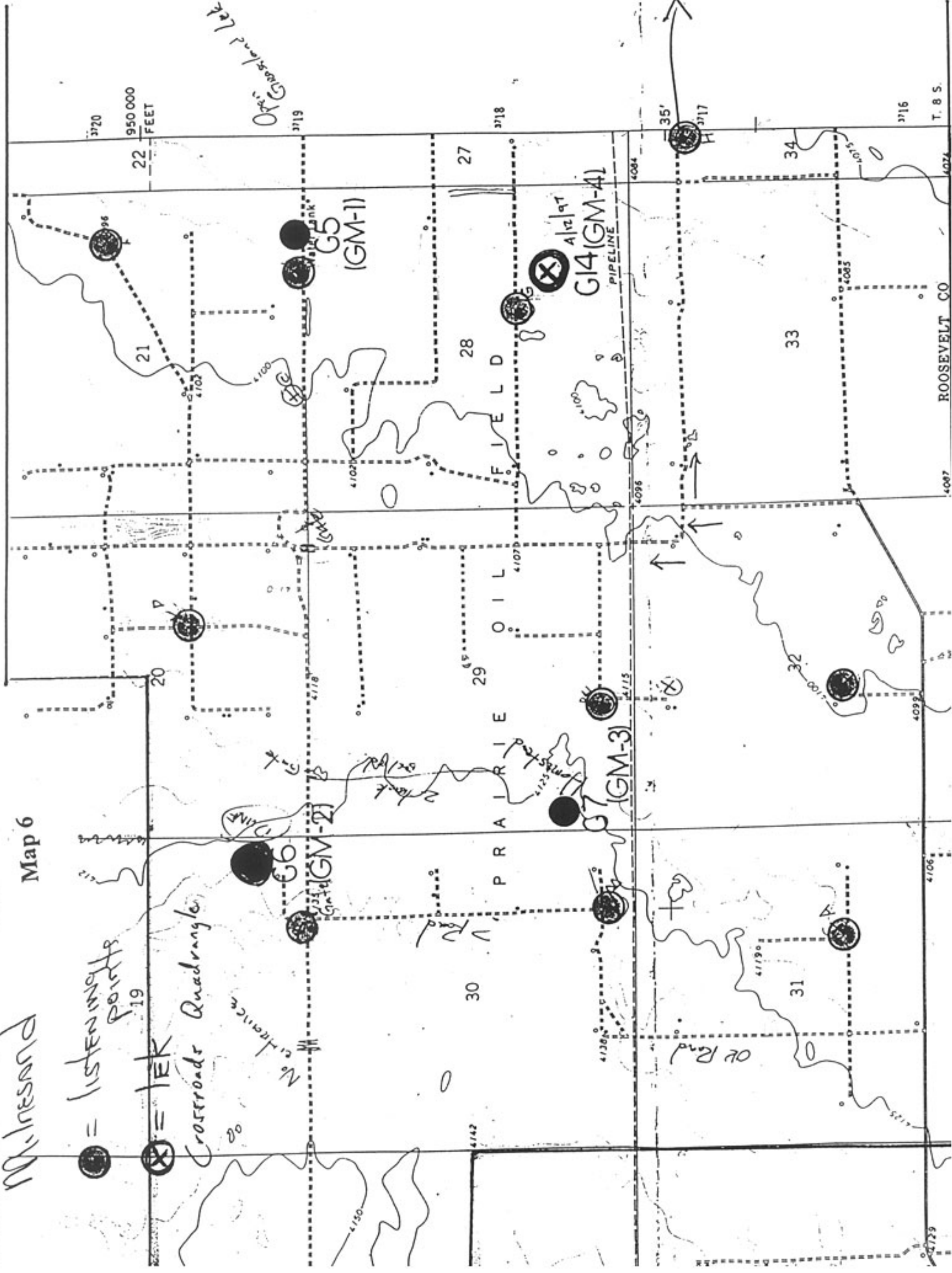
● = listening points

⊗ = LEK

Crossroads Quadrangle

No. 1 Prairie

Open Grounds Leek

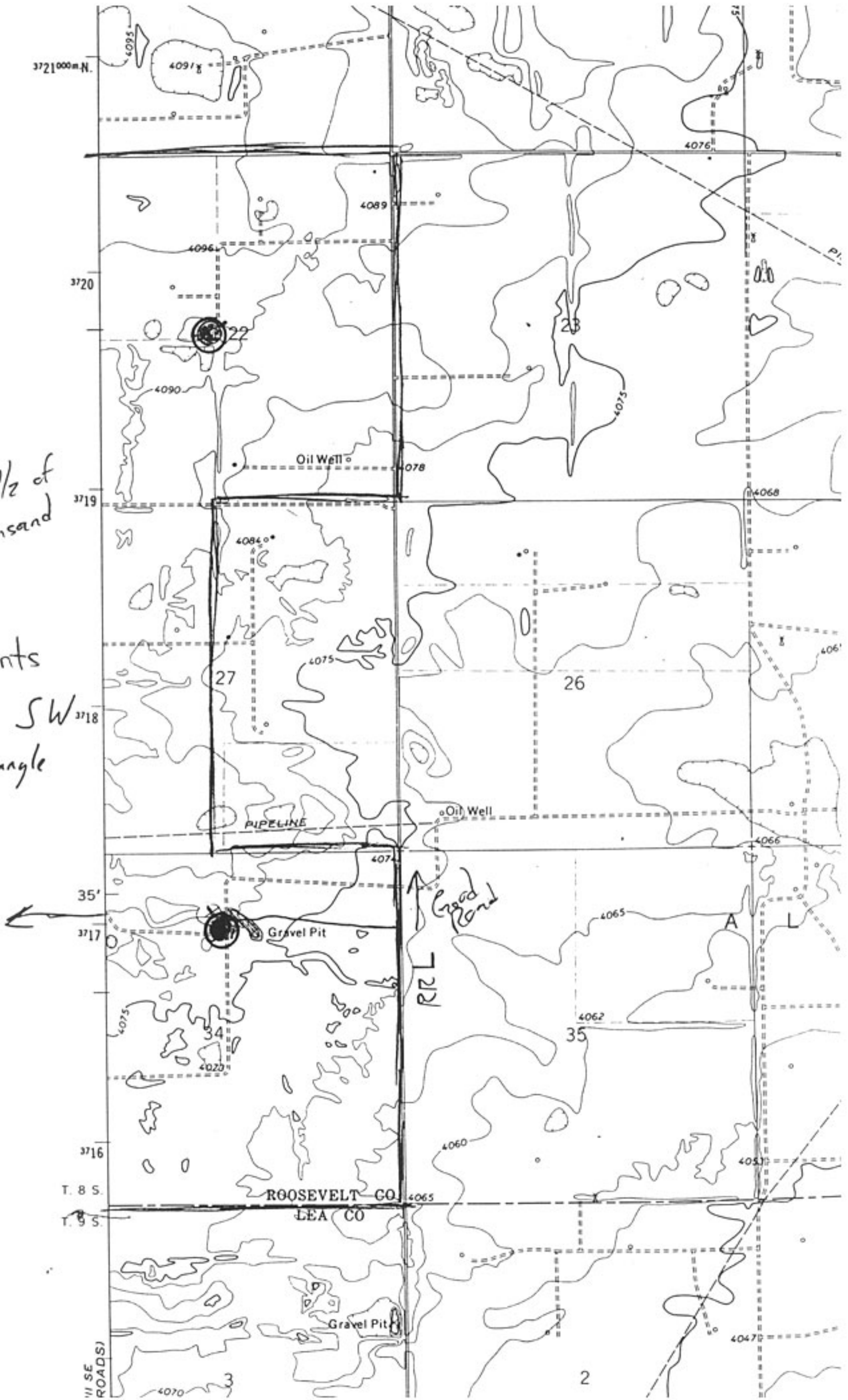


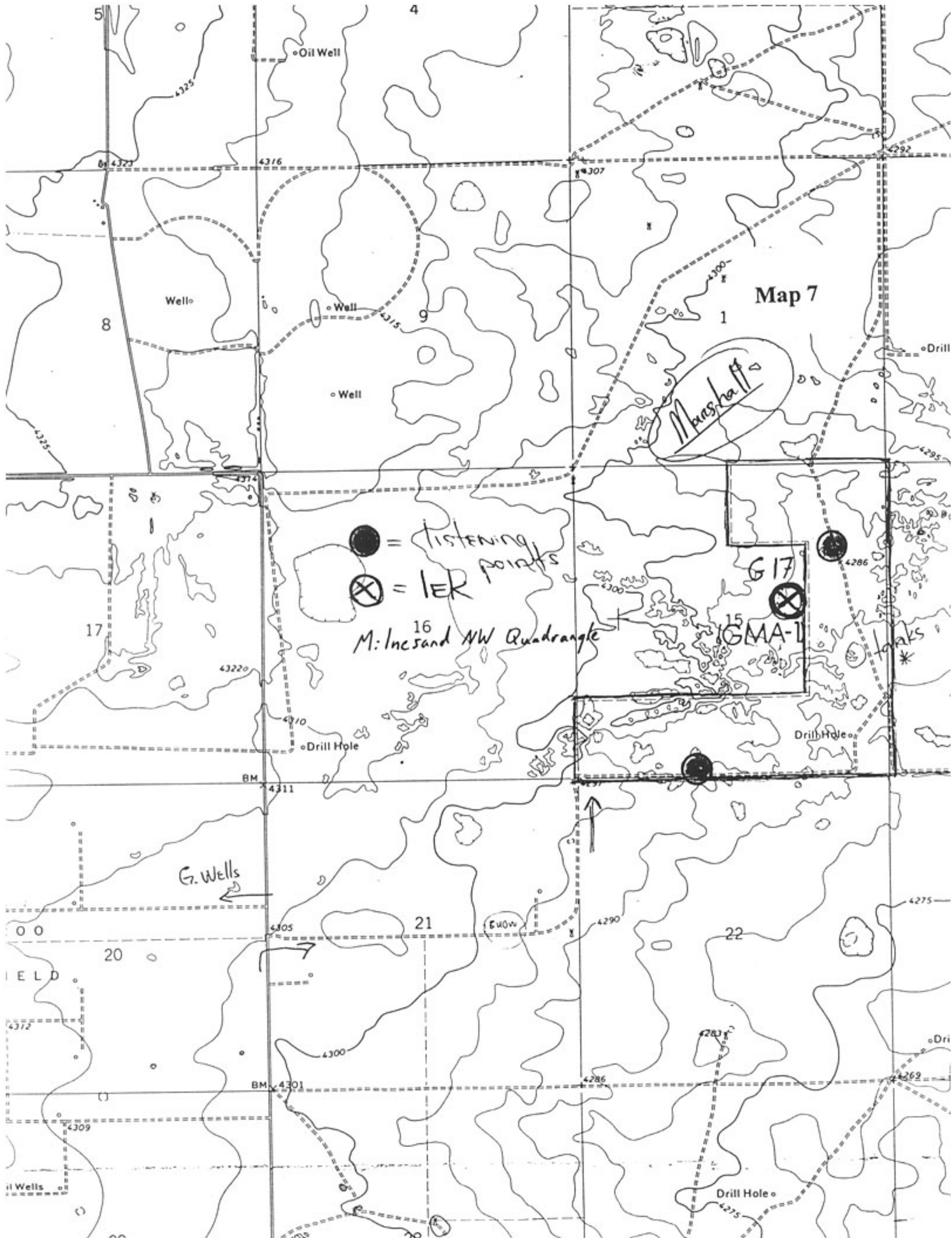
T. 8 S.

ROOSEVELT CO

● = listening points
 Bledsoe SW 318
 Quadrangle

other 1/2 of
 Milensand





● = listening points
⊗ = LER

Milnesand NW Quadrangle

Map 7

Marshalls

G 17

GMA-1

G. Wells

FIELD

Wells

Drill Hole

Drill Hole

Drill

Drill

Crossroads I

Map 8

1:2

- = listening points
- ⊗ = lek

M. Insaad SW Quad

(GCI-3)

(GCI-2)

G1

(GCI-1)

G2

G3

4/15/97

Drill Hole

(GCI-4)

⊗

1/15/97

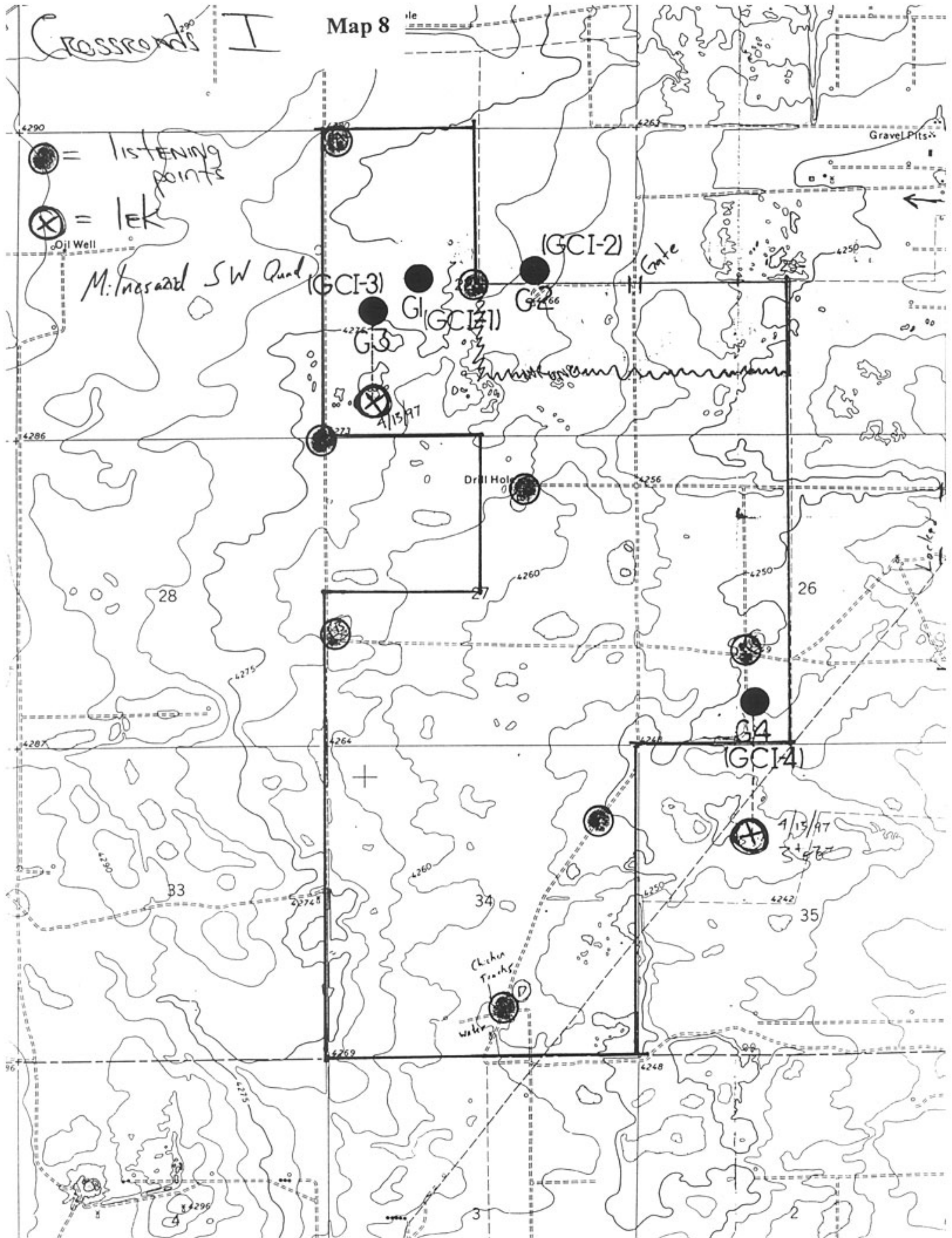
3+4/76

Chicken Tracks

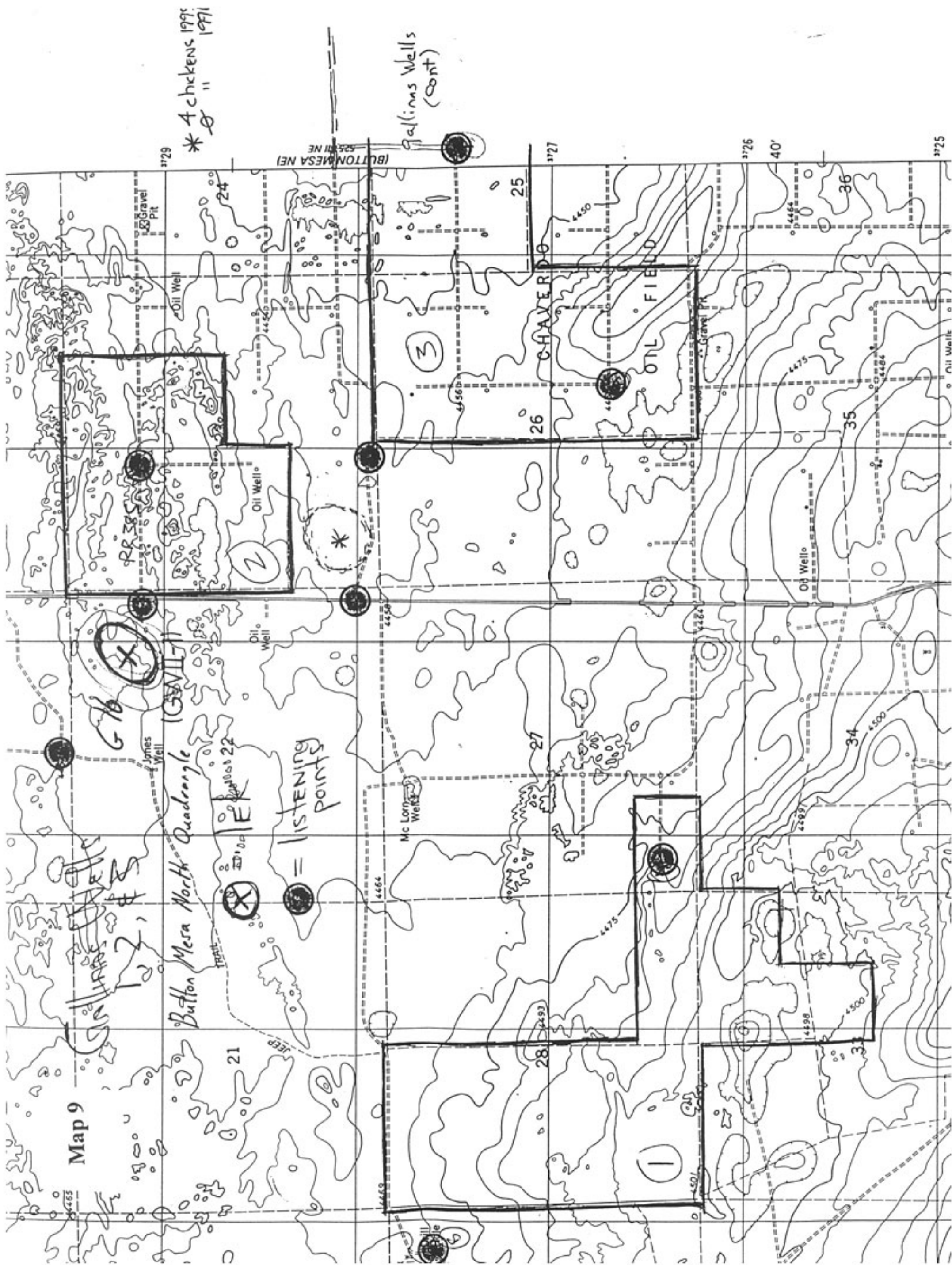
water

Gravel Pits

Gate



Map 9



* 4 chickens 1991
" " " 1971

Gallinas Wells
(cont)

Button Mesa North Quadrangle
(GSMV)

76

X = LISTENING
points

CHAYERO OIL FIELD

Oil Well

Oil Well

Oil Well

Oil Well

James Well

Oil Well

Mc Lorn Wells

Oil Well

Oil Well

Gravel Pit

Gravel Pit

525 NE
1/4 NE

21

28

27

26

25

34

35

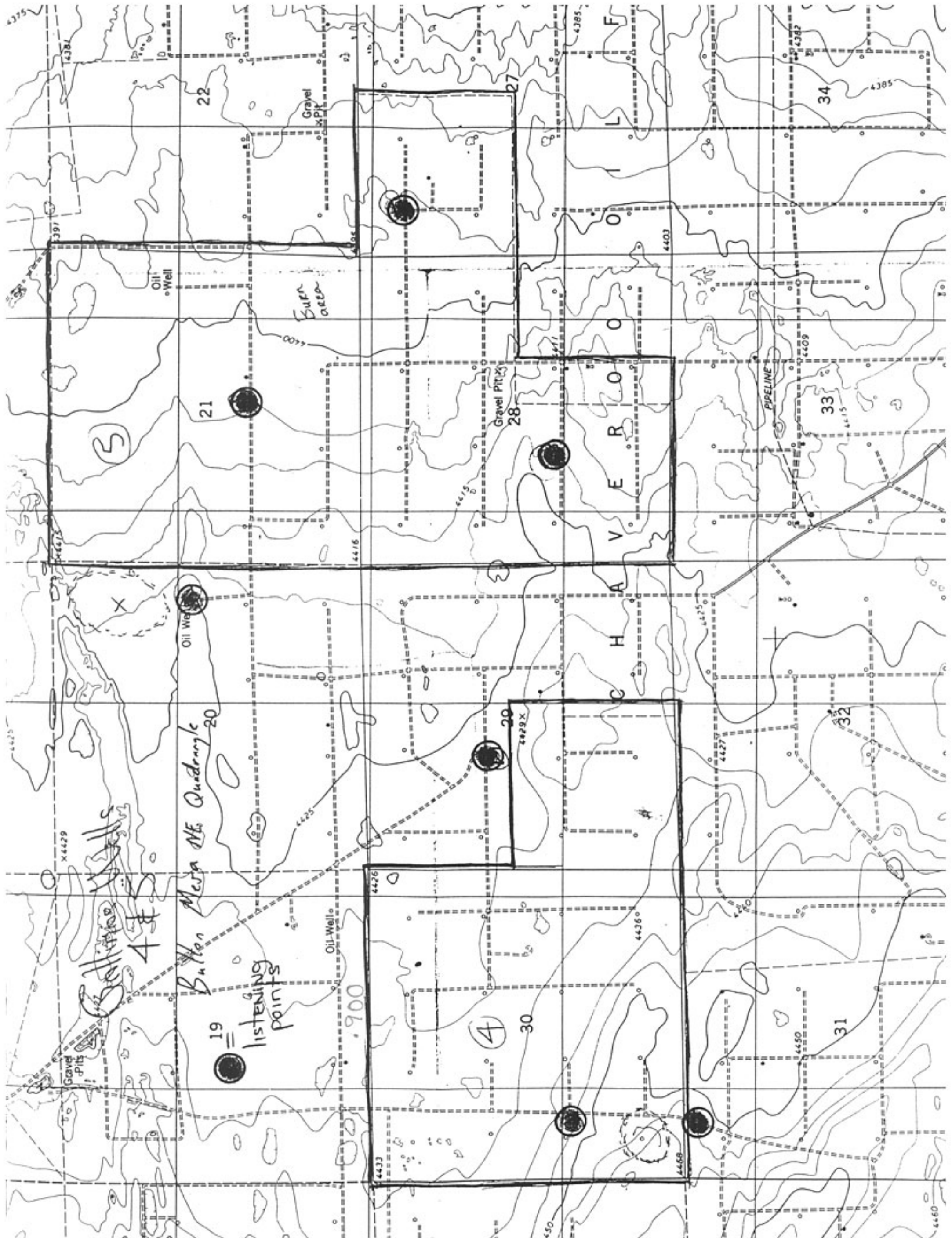
36

3726

40'

3725

3729



Sullivan Wells
4 E S

Bull Run NE Quadrangle

19
listening points

Supr Area

Gravel Pit

Gravel Pit

PIPELINE

F

L

O

R

A

H

C

I

J

K

L

M

22

21

20

19

27

28

29

30

34

33

32

31

4375

4381

4397

4413

4429

4435

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4419

4429 X

4436

4450

4382

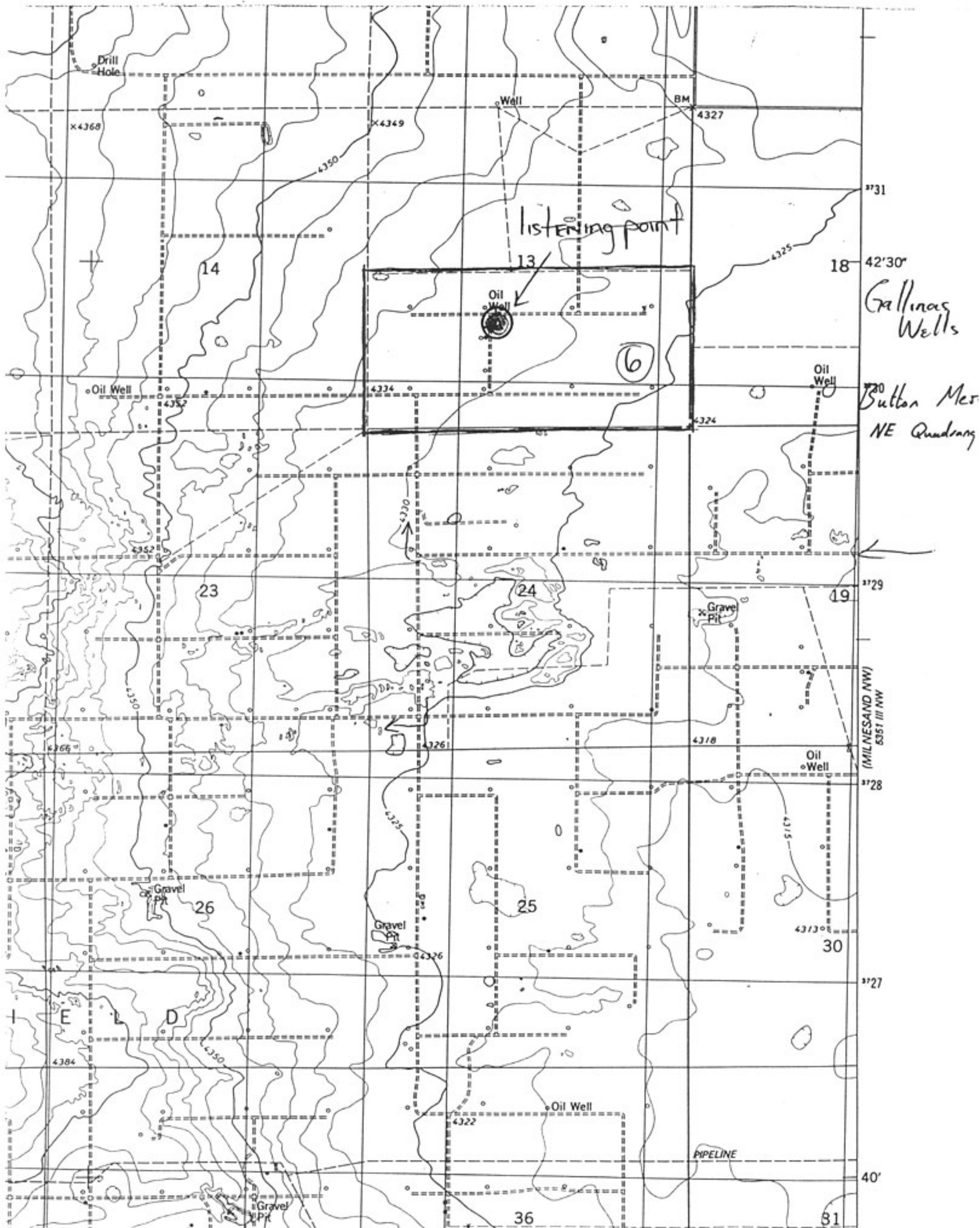
4409

4415

4427

4450

4460



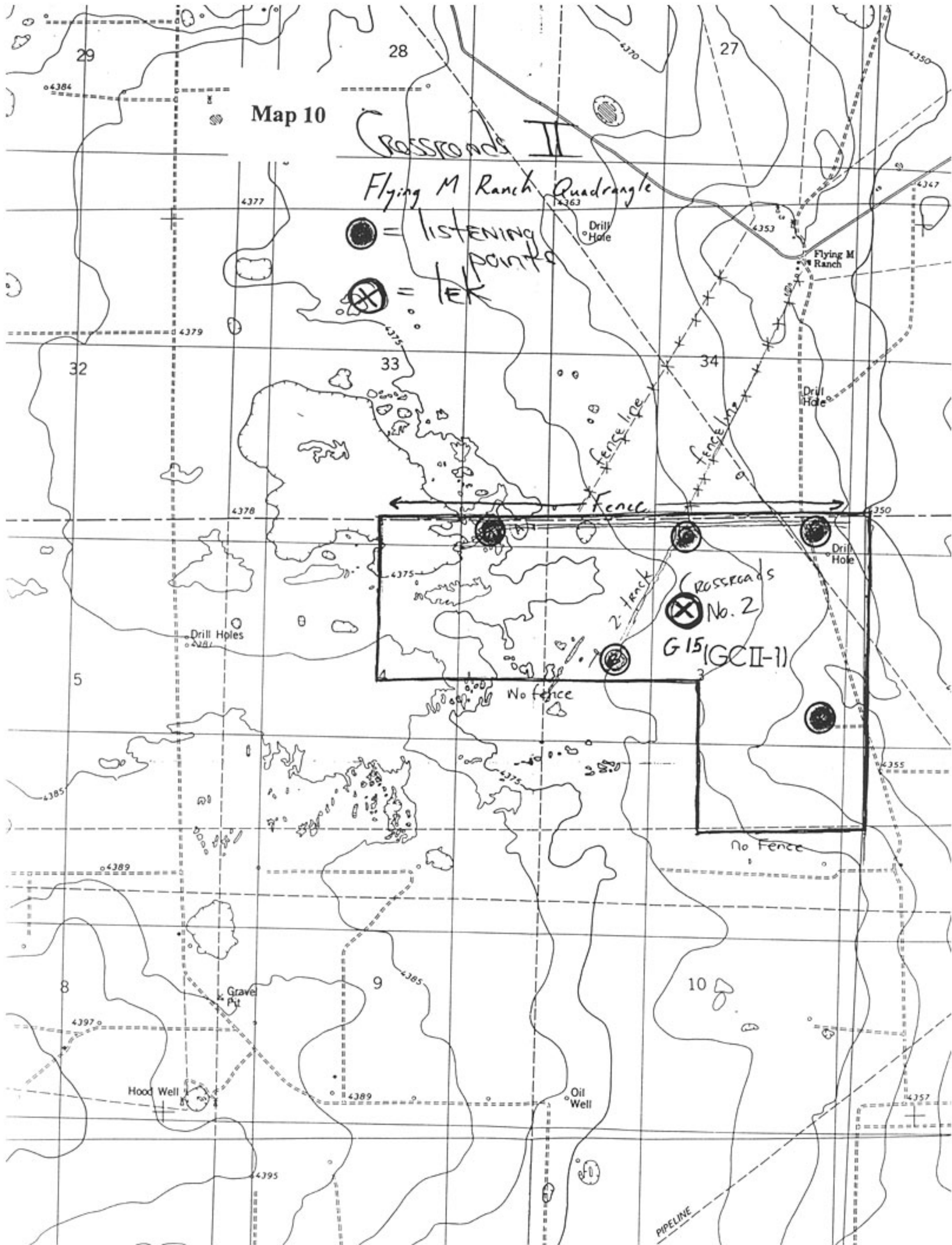
Gallinas Wells
Button Mer
NE Quadrang

(MILNESAND NW)
5351 III NW

Map 10

ROSSCOATS II
Flying M Ranch Quadrangle

● = LISTENING POINTS
⊗ = TEK



Walk-In Telemetry Locations

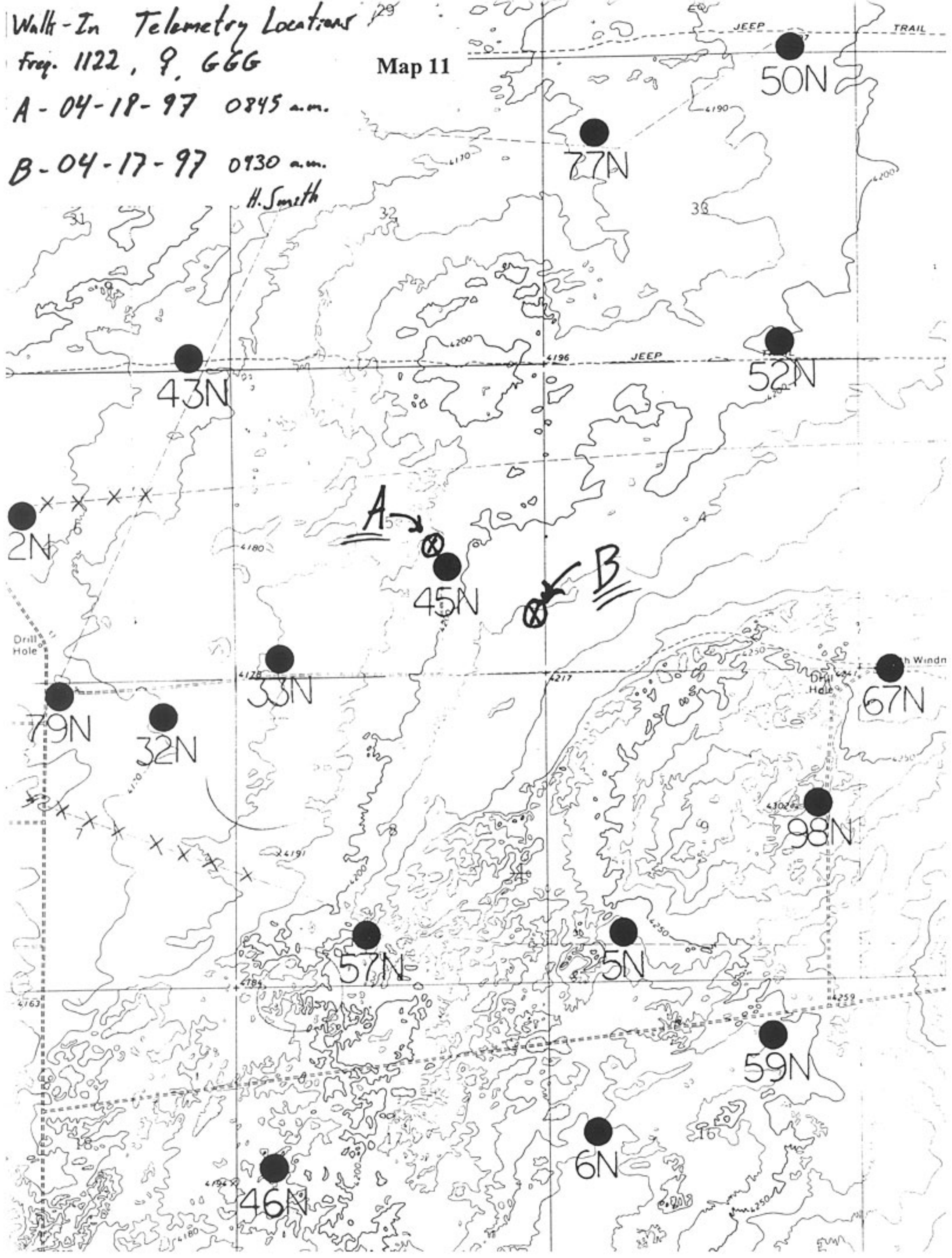
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Map 11

A-04-18-97 0845 a.m.

B-04-17-97 0930 a.m.

H. Smith



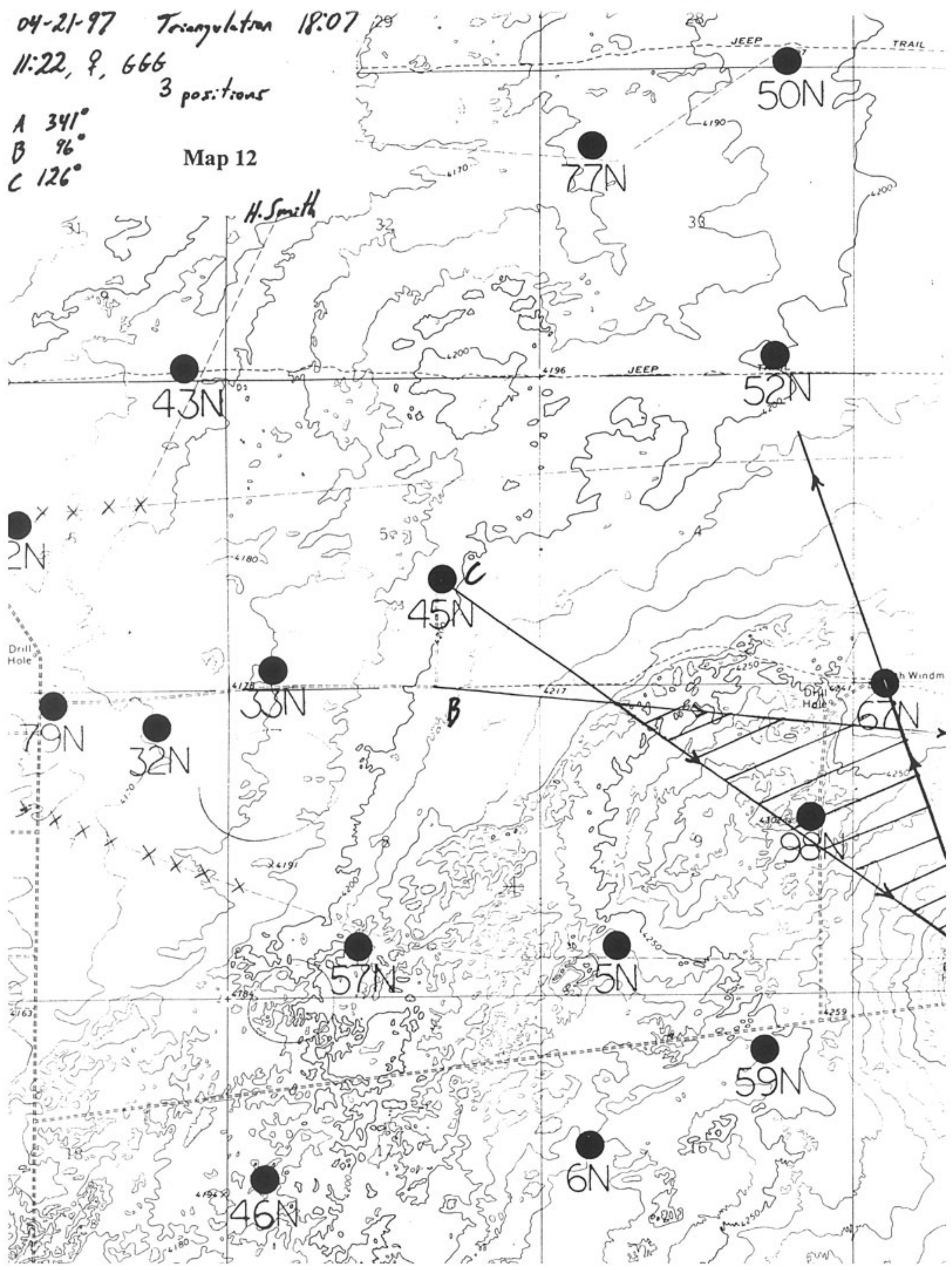
04-21-97 Triangulation 18:07 29

11:22, 9, 666

3 positions

A 341°
B 96°
C 126°

Map 12



04-22-97 Triangulation 0945 a.m. 29

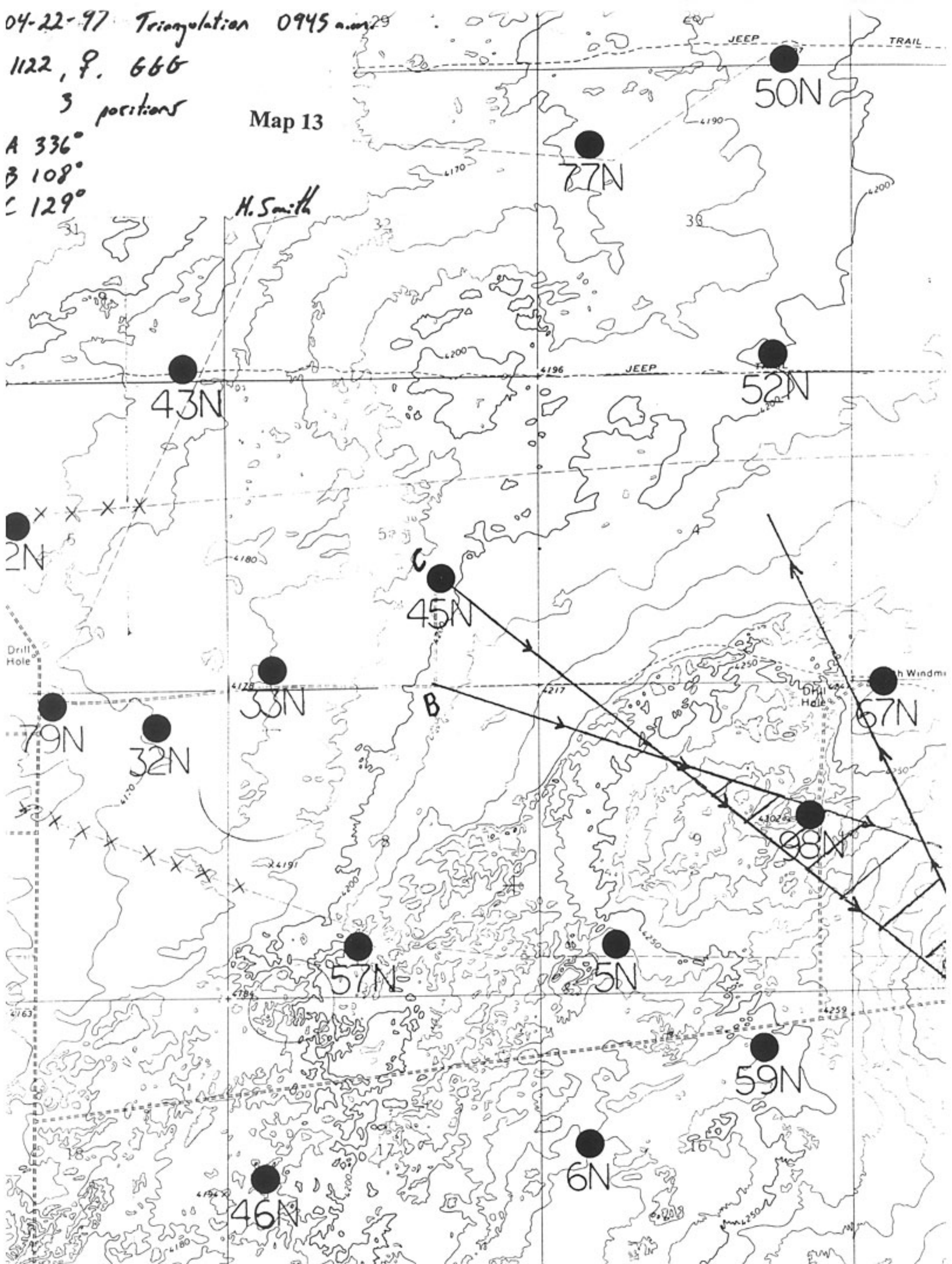
1122, 9. 666

3 positions

A 336°
B 108°
C 129°

Map 13

H. Smith



1122 G/G G Mortality

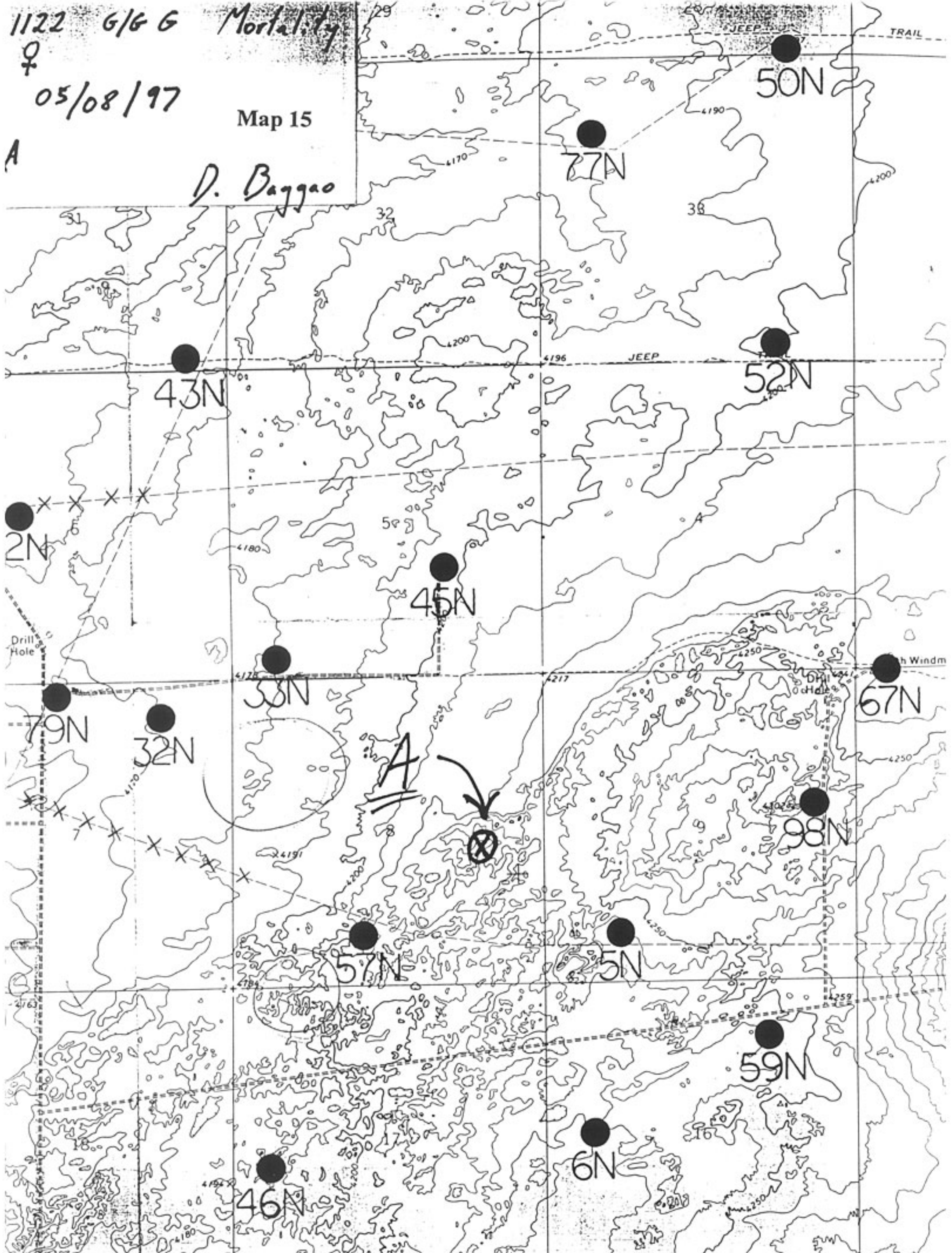
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05/08/97

Map 15

D. Baggio

A



Appendix 1. Lek Designations

1996 Name/ 1997 PCA	Current Name	Active in 1996	Active in 1997
Crossroads I, #1	GCI-1	Y	
Crossroads I, #2	GCI-2	Y	
Crossroads I, #3	GCI-3	Y	Y
Crossroads I, #4	GCI-4	Y	Y
Milnesand #1	GM-1	Y	
Milnesand #2	GM-2	Y	Y
Milnesand #3	GM-3	Y	
Black Hills #1	GB-1	Y	Y
Black Hills #2	GB-2	Y	
Black Hills #3	GB-3	Y	
Black Hills #4	GB-4	Y	
Liberty	GL-1		Y
North Bluit	GNB-1		Y
Milnesand	GM-4		Y
Marshall	GMA-1		Y
Crossroads II	GCII-1		Y
Gallinas Wells II	GWII-1		Y

Appendix 2. Data sheets from LPCH surveys on PCAs.