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1987 - PANORAMA RESORT AND AREA

MOUNTAIN PINE BEETLE CONTROL PROGRAM

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by

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Summary

The 1987 discussion paper describing the potential impact from the mountain pine beetle to the Panorama Resort and the surrounding area was presented to all of the affected groups. Agreements were reached with three of the four groups to initiate a control program using pheromones and monosodium methanearsonate (MSMA) in specific areas. Training and assistance in insect identification, pheromone placement and control measures (ie. MSMA application) were conducted. The fourth land owner affected indicated he planned to selectively log mountain pine beetle infested trees on his property in the summer of 1988.

In addition to the known pockets of attack, a few new areas were discovered and treated. One of the new areas could not be treated with MSMA due to the location (within the ten metre pesticide free zone).

In one area, follow-up, selective removal of red attack and MSMA treated trees for firewood has been started. This has reduced the risk for fires and blowdown. The remaining stand and reduced mountain pine beetle population may act as a "beetle proofing" with reduced tree losses.

The following report reviews the work completed to date with recommendations for a 1988-89 control program by area.

Project Objectives

The project objectives were to reduce the rate of spread of the mountain pine beetle and subsequent mortality of the pine trees around the Panorama Resort. The extensive recreational use of the area made it more important to provide an optimum level of control with a minimum impact. In an effort to maintain a high level of quality outdoor experience several methods of control were discussed. These methods included an awareness program to provide the land owners with the information required to identify the problem. It also included training in a few of the recognized control methods used to reduce the success of the mountain pine beetle. A combination of the control methods were used with an optimum level of success achieved.

Procedures

The area was flown with 35 mm photography to identify the pockets of mountain pine beetle attack. Once mapped onto a 1:20 000 scale map, a control plan was prepared. Information derived from discussions with Les Safranyick (Pacific Forest Research Center) and Dr. Hal Wieser (University of Calgary) was also incorporated into the plan. A combination of attractants, repellants, funnel traps and MSMA were utilized. Ground surveys were conducted to determine the species mix, location of mountain pine beetle green attack and to select a baiting strategy.

Methods

The area was divided into project areas based on land ownership and mountain pine beetle attack location. Copies of the discussion report were presented to the land owners. After a few meetings and phone conversations written agreements were reached with three of the four owner groups to conduct a pheromone - MSMA program. One owner has chosen to treat the problem by selective logging.

Ground surveys were conducted in all of the areas. In a few an intensive thirty metre grid was used, in others a walk through proved to be adequate. Attractants, repellants and funnel traps were placed in specific areas in an attempt to manipulate the population to obtain the minimum loss of healthy pine trees. Two entries were made to apply the MSMA. Several entries were made to monitor the flight period and timing of the chemical treatment. Field reviews by Dr. Hal Wieser and his group were also conducted to review the effects and provide additional assistance and guidance.

Conclusion

The project was successfully completed with up to 98% of the lodgepole pine remaining healthy (Area A - high percentage of smaller diameter pine, 17.4 cm average). In one area - added to area D only 43% of the pine has survived. In all the trees checked and treated with MSMA no brood survival was recorded.

The cooperation received by the people concerned was a major factor in attaining the high level of success. A report on each area follows.

A total of 3 906 trees were treated with MSMA. The mountain pine beetle has been reduced from up to 35% to 2-4% attack in specific treatment areas. A follow-up program is strongly recommended due to the high survival (93%) recorded in other areas of the Timber Supply Area and to prevent the buildup of mountain pine beetle to previous high population levels.

The work was conducted within Region 21, Compartment 11 of map 82K049. The total volume including all the timber species and using a 12.5cm diameter (minimum) is 1,497,700 m³. Of this pine represents 368,500 m³ or 24.6%. The total area involved is 5991 ha.

The majority of the funding for the project was obtained through the Provincial Special Bark Beetle program. Land owners also provided funding to purchase pheromones and MSMA as well as employees to assist with the program.

Pesticides were applied under permit No. 400-366-87.

AREA A - Lot 4609 (North) - Owner: Panorama Resort

Treatment

The area was surveyed by air and ground. Attractants purchased from PheroTech were placed within attack centres on a thirty metre grid. Repellants purchased from the University of Calgary were placed around the attack centres. MSMA was applied to every green attack tree identified.

An additional area was located and treated adjacent to the heliport on the north side of Toby Creek.

Results

Three trees per hectare (including trees not treated in Lot 4617) were missed (0.4%). Ninety seven percent of the pine remains healthy. Twenty trees per hectare (3%) were attacked up to 1986. Approximately 1078 trees were treated. In the trees checked there was no evidence of mountain pine beetle brood development. The area attacked expanded slightly from the original location.

Follow-up

There are still a few mountain pine beetle attacked trees remaining on this private land. To ensure the mountain pine beetle do not dramatically increase (due to the high overwinter survival 93% identified in the district) we suggest a similar style program on a reduced scale be undertaken. The following method is suggested.

1. Identify the location of the remaining attacked trees.
2. Place pheromone baits (attractants) on one adjacent large diameter lodgepole pine for every four green attacked pine.
3. Place pheromone baits (repellants) in an area with an approximate radius of fifteen metres around the attack at the rate of six repellants for every green attacked tree for up to forty repellants per hectare.

4. Monitor the flight - start application of MSMA when beetle attack density reaches 20 pitch tubes in the area from the ground to 3.5 metres up the trees.
5. If MSMA treatment is not available, a cut and burn program should be undertaken in early December.

AREA B - Lot 4617 - Owner: Becker Properties Ltd.

Treatment

No treatment was undertaken at the request of the owner. He has chosen to remove the infected pine in 1988 by logging. We did conduct a survey to identify the location and extent of the mountain pine beetle problem. The remaining pine should absorb the beetles. The unknown factor will be derived from the wind currents. It was difficult to identify property boundaries during the surveys. A flagged line has been placed by the Ministry of Forests and Lands where we feel the boundary may be. The exact location should be identified by legal surveyors to avoid any conflicts.

Follow-up

Contact should be re-established with the owner to verify logging dates and to discuss the use of pheromones (attractants) during the mountain pine beetle period. Selective logging of susceptible and attacked pine may prove to be ecologically the best method for removal. An appropriate timber mark should be obtained soon.

AREA C - Lot 4609 (South East Section) - Owner: Numerous lot owners, approximately 75. Thirty have been contacted through the Panorama Homeowners Association.

Treatment

A walkthrough was conducted to determine if there was any current attack. A few trees which had been unsuccessfully strip attacked were identified. These trees had been sprayed with Sevin in 1986. Repellants were placed in areas where large diameter pine existed. Several weekend field trips were made to discuss the problems and to monitor the mountain pine beetle activity with the residents. Two funnel traps were also placed at the north west end to divert the mountain pine beetle.

Results

Two pockets of mountain pine beetle green attacked trees adjacent to lots 32, 33, 60 and 59 were located after the flight. They have been treated by cut and burn by the owners. Other susceptible pockets remained unattacked. The funnel traps captured approximately 1 800 mountain pine beetle over a two month period.

Follow-up

A similar program using a higher number of repellants in selected areas should be undertaken by the home owners. Spraying a few of the larger diameter trees with Sevin may result in a few unsuccessfully attacked trees. Placing funnel traps in other selected areas would be useful to monitor the mountain pine beetle activity. Caution should be exercised by the owners when bringing fire wood into their homes to ensure other insect problems are not brought in.

AREA D - DL 5533 - owner: Radium Hot Springs Glacier Skiing Ltd.
DL 14836 - owner: under application by Panorama
DL 16352 A & B - owner: Panorama
DL 16352 C - owner: Crown (under application by Panorama)
Remainder - owner: Crown under lease to Panorama

Treatment

This area contained the heaviest concentration of mountain pine beetle attacked trees. As it is in a heavily used area extra care was taken to ensure a high level of success with minimum disruption to the site. Area D was split into two project areas: 1) Luke's Run - Cross Country trail and DL 5533 and 2) the Golden Triangle - adjacent to Fritz's run near the cross country trails.

Luke's Run

A trail traverse was completed to map in the boundaries of the area involved. With the use of 35 mm air photos and a ground recce a baiting strategy was developed. An intensive thirty metre grid pattern using attractants and repellants was completed. The intent was to contain the mountain pine beetle within a limited area to reduce it's spread throughout the trail area.

At every thirty metre interval an assessment on the level of green attack was made as well as an estimate of the risk the remaining trees were under. An attractant was placed if there were any green attack trees. A repellant was placed if there were no green attack trees.

Information derived through discussions with Les Safranyick from the Pacific Forest Research Center and a research trial conducted in 1986 with Hal Weiser from the University of Calgary were used to formulate the plan. After baiting the core area with attractants and repellants a repellant bait line was established around the area. The area was then monitored to determine when to apply the MSMA. Two entries were made over a six week period to ensure all fresh attacked trees were treated.

Results

Thirteen hundred and forty-three current attacked pine trees were attacked (34%). Forth-three percent remain healthy. Approximately two percent of the pine trees (10 per hectare) were not treated. One pocket of approximately fifteen green attack was located outside of the core area. None of the trees checked for the effectiveness of the MSMA treatment had a brood. The attack was concentrated within the identified areas except for one pocket. A few attacked trees have been removed by the land owners for various uses. This is providing a form of beetle proofing.

Follow-up

A few trees were either missed during the main flight period or became attacked as the result of an extended flight. The few remaining trees should be removed by cut and burn or selective logging as soon as possible. If this is not possible a smaller scale program similar to 1987 should be initiated. This program would involve identifying the missed trees, applying an attractant to adjacent non-attacked trees at the rate of one attractant to four attacked trees. Application of MSMA would follow once mountain pine beetle attack levels reached 20 pitch tubes per 3.2 metre of height measured from the ground. As a golf course is proposed for the area, repellants at the rate of 40 per hectare should be placed within the leave areas. An attractant baiting program should be considered for the areas of pine which will be removed.

The Golden Triangle

The area was predicted as being highly susceptible to attack in the 1987 discussion paper. After discussing this with Harley Portman, we discovered the area was heavily current attacked and had not been previously identified. Air photos (35 mm) were taken and an intensive

thirty meter grid pattern was set up. In addition to the attractants and repellants placed in locations described under Luke's Run, funnel traps were incorporated. The funnel traps were placed at fifteen metre intervals in conjunction with the other baits in areas where no healthy pine existed. The intent was to trap out a portion of the mountain pine beetle population.

Results

Twelve hundred and seventy trees were treated with MSMA (35% fresh attack). Fifty-three percent of the pine remains unattacked. Four percent of the pine trees were missed (twenty-seven trees per hectare). As in the other areas some of the missed trees were unsuccessfully attacked and the trees' defense mechanism may have been successful.

Follow-up

The same method suggested for Luke's run should be used here. In addition selective removal of the dead pine may further improve the remaining stands resistance by providing a beetle proofing.

AREA E - Schober's Dream

Treatment

An intensive thirty metre grid was also used here. It is approximately halfway up the hill and a little more difficult to access. Attractants and repellants were used to contain the attack.

Results

Two hundred and fifteen trees were treated with MSMA. No additional data was obtained. It is assumed we obtained similar success rates to the Luke's Run area.

Follow-up

A survey should be conducted to determine how effective the treatment was and what follow-up action is required. A similar baiting - MSMA program should be considered.

APPENDIX A

Pheromone Sources

1. Semiochemicals International Limited - Canada

3338 Point McKay Gardens N.W.

Calgary, Alberta

T3B 4VB

(403) 283-3082

Contact: Dr. H. Weiser or Dr. Lis Dixon (University of Calgary)

2. Phero Tech Inc.

1140 Clark Drive

Vancouver, B.C.

V5L 3K3

(604) 355-7381

Contact: Steve Burke

MSMA Source

1. Yellowstone Agri Products

12080 Horseshoe Way

Richmond, B.C.

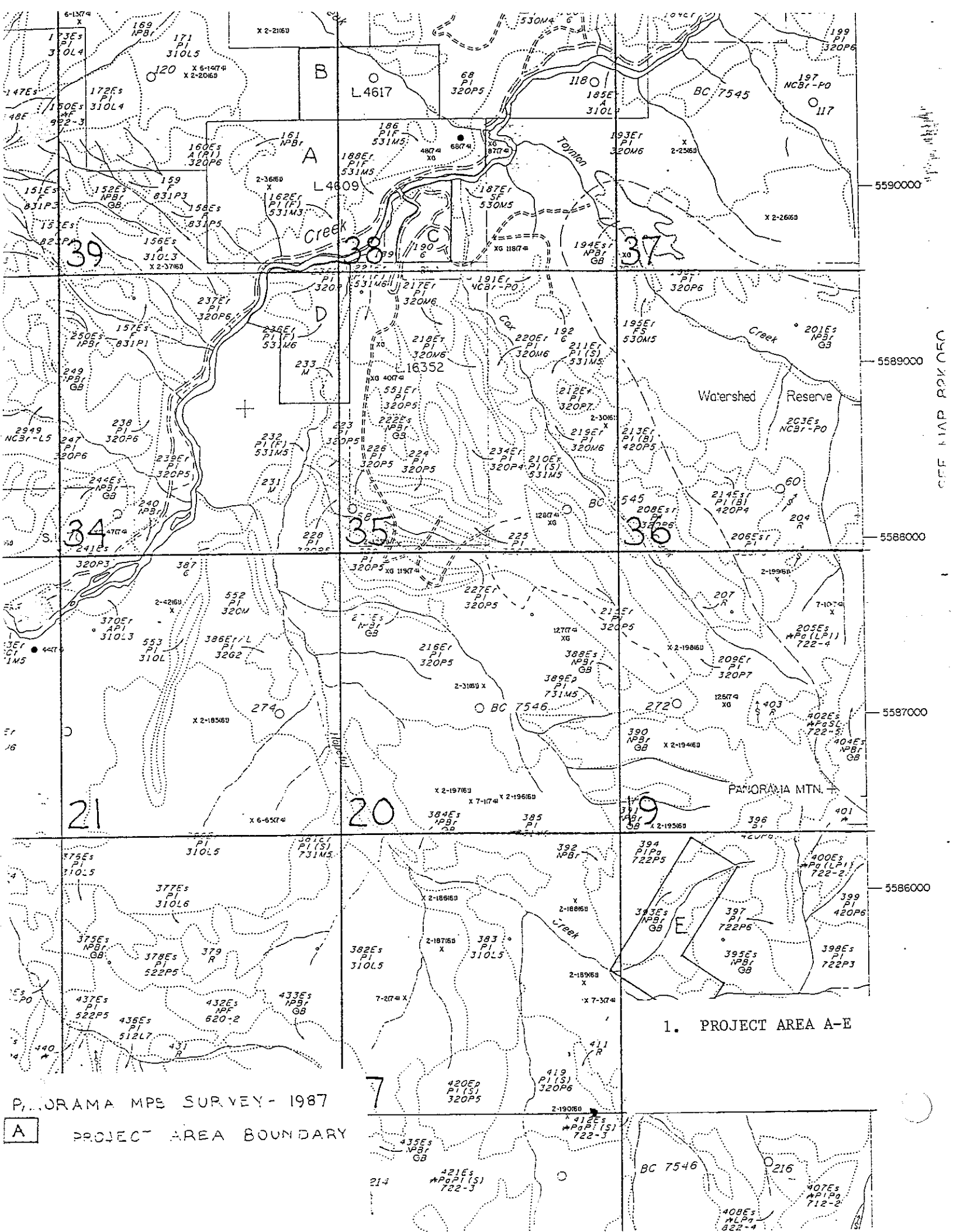
V7A 4VS

(604) 271-6939

A P P E N D I X

B

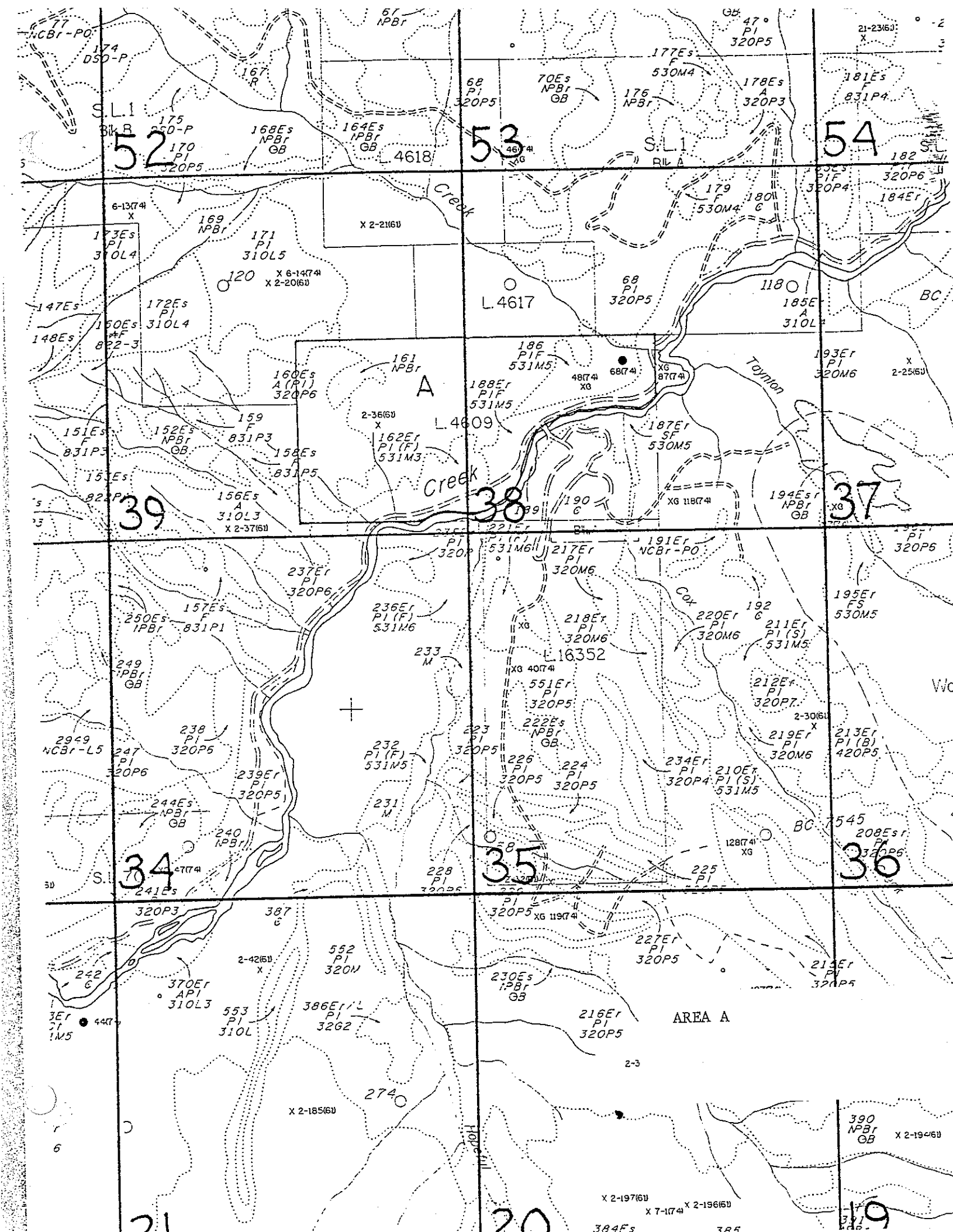
M A P S



SEE MAP BOOK FOR

1. PROJECT AREA A-E

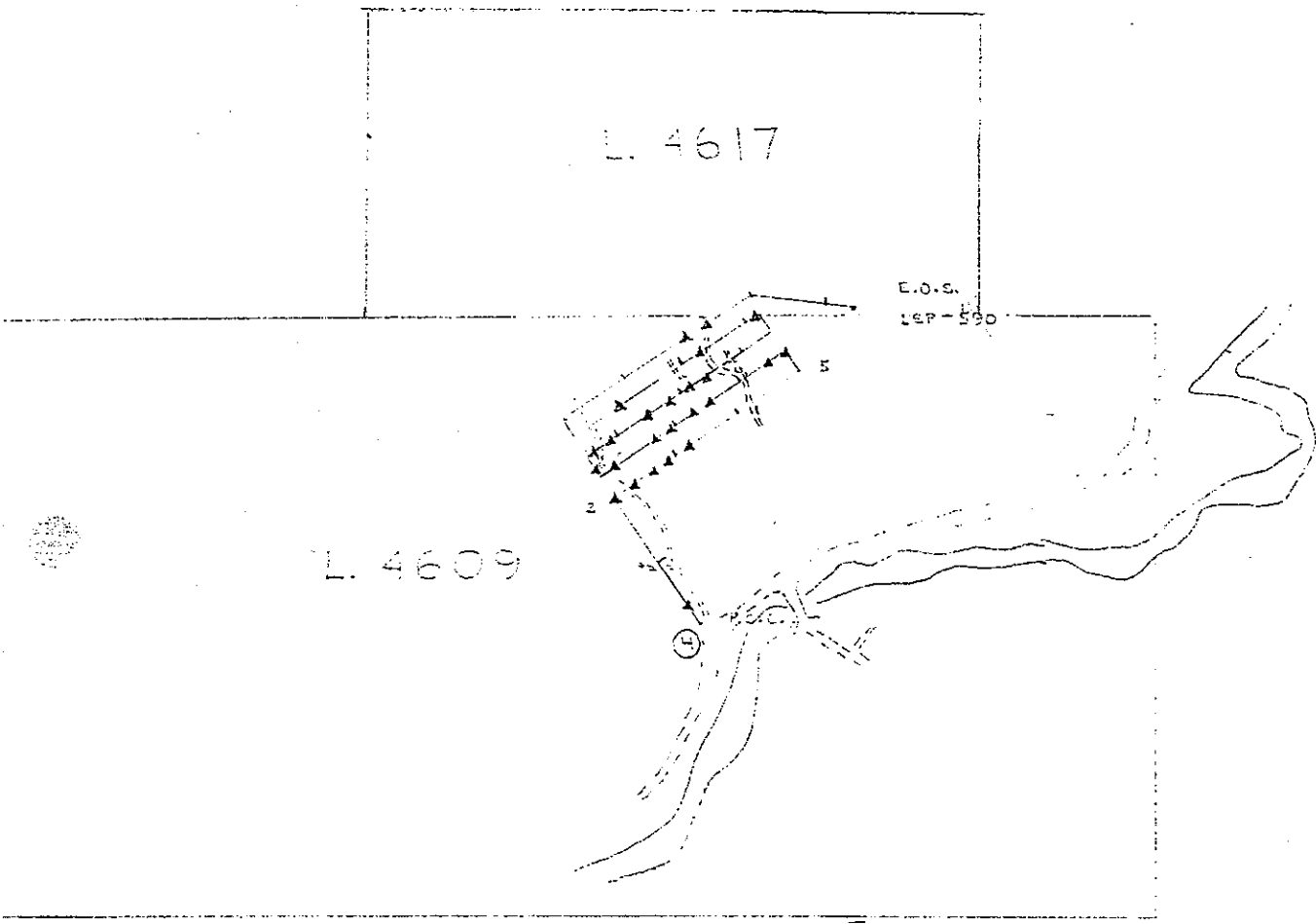
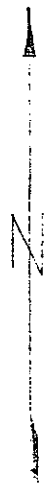
PAMORAMA MPB SURVEY-1987
 A PROJECT AREA BOUNDARY



LEGEND

MAP NO: 82K049
PROJECT AREA: A
LOCATION: PANORAMA
DATE SURVEYED: 25/06/87
R.O.C.: HELIPAD
SCALE: 1:10,000
DRAWN BY: S. PENNER

▲ LOCATION OF TREE BAITS FIG. 1

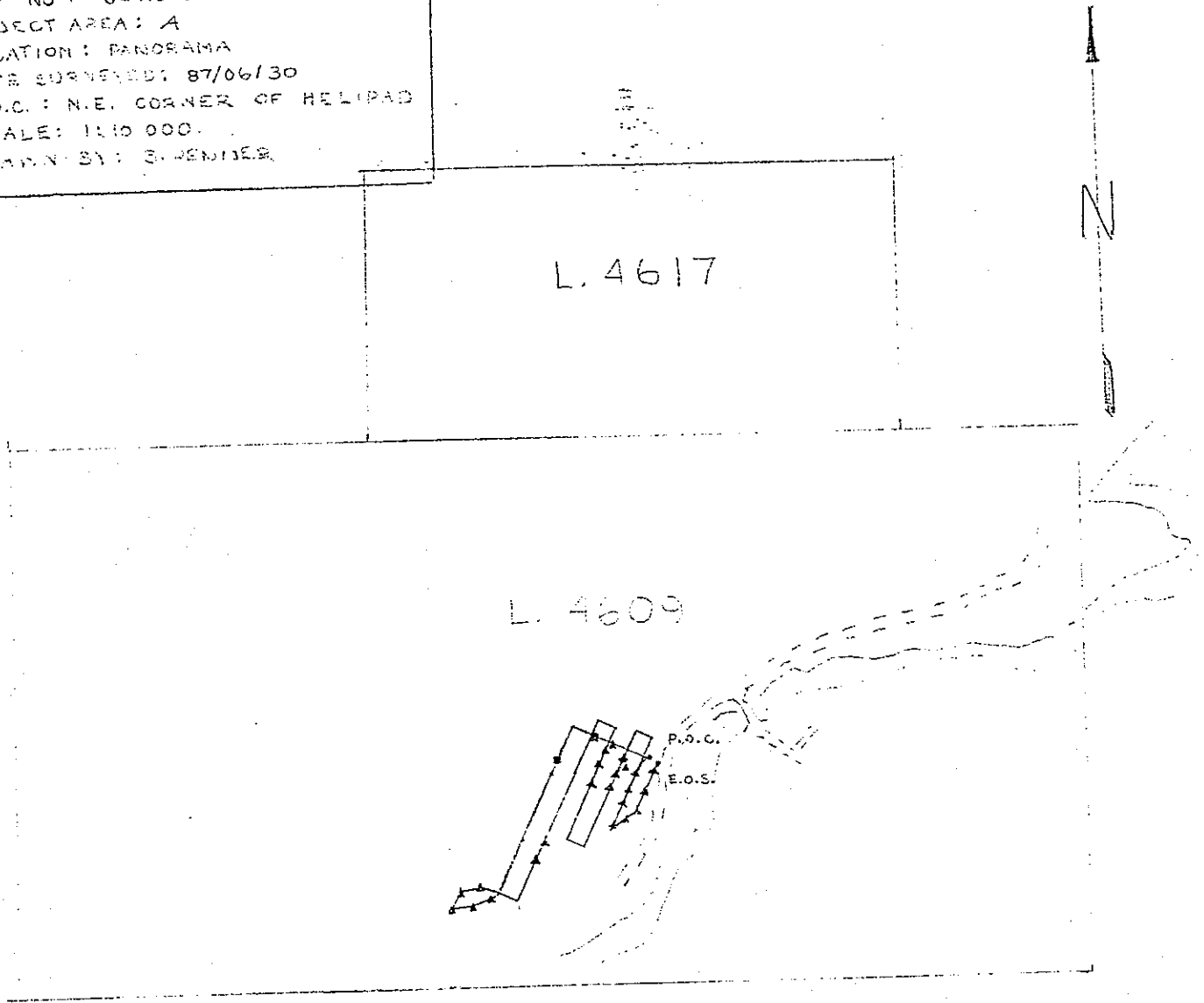


2. AREA A

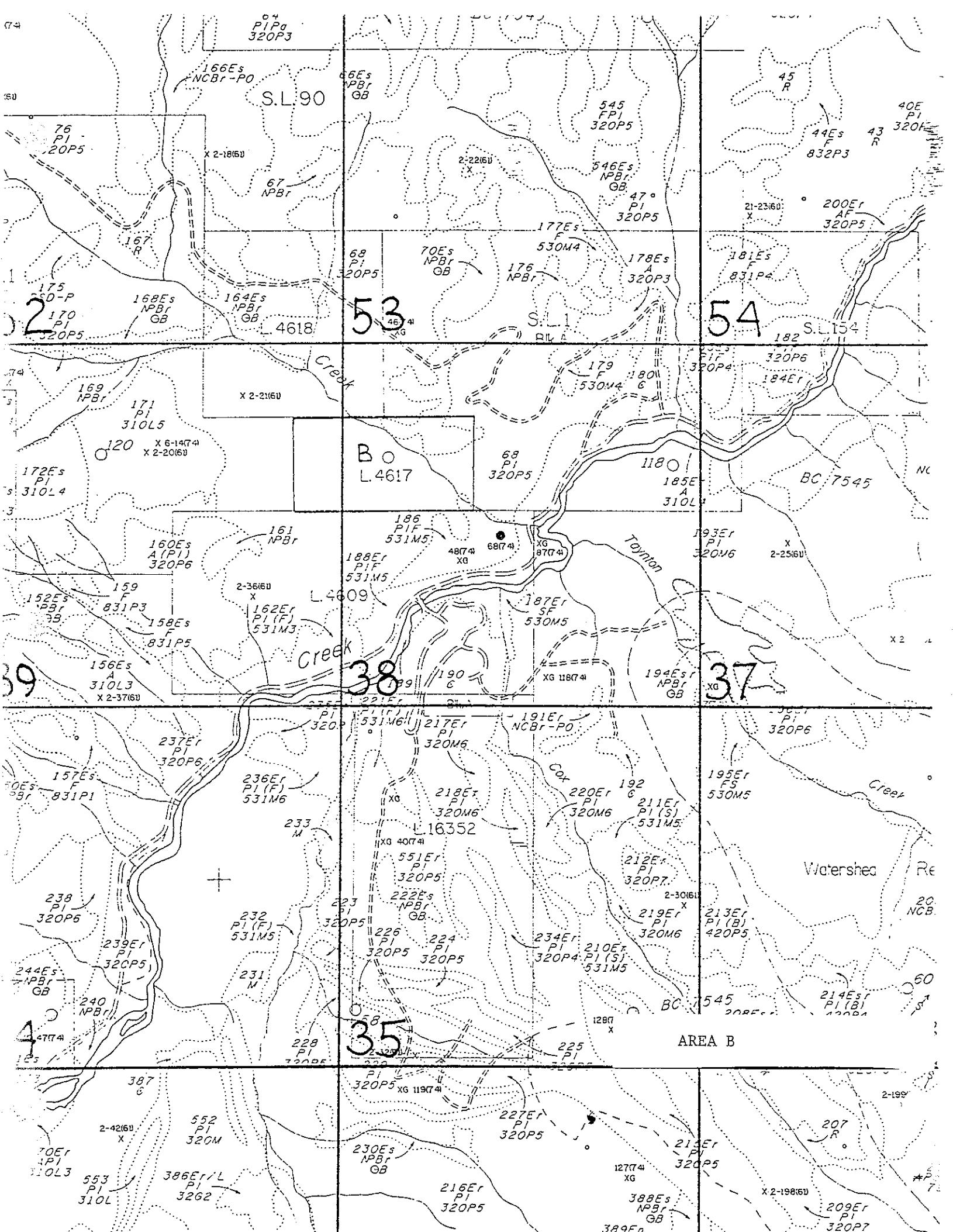
LEGEND

MAP NO : 82 K049
PROJECT AREA : A
LOCATION : PANORAMA
DATE SUBMITTED : 87/06/30
P.O.C. : N.E. CORNER OF HELIPAD
SCALE : 1:10 000
DRAWN BY : S. PENNER

FIG. 2



AREA A



S.L. 90

S.L. 1

S.L. 154

53

54

2

38

37

39

35

AREA B

Creek

Tonion Creek

Watershed

+

X 2-18(6)

X 2-21(6)

X 6-14(74)
X 2-20(6)

X 2-36(6)

X 2-37(6)

X 2-25(6)

X 2-30(6)

X 2-23(6)

X 2-22(6)

X 2-42(6)

X 2-19(6)

4618

4617

4609

4609

46352

4609

182

184E1

185E1

193E1

195E1

213E1

214E1

209E1

179

180

187E1

190

218E1

224

227E1

216E1

177Es

176

186

187E1

191E1

220E1

225

230E1

178Es

177

188E1

191E1

211E1

222Es

226

234E1

181Es

180

187E1

192

211E1

212E1

219E1

213E1

182

184E1

193E1

195E1

211E1

212E1

219E1

213E1

182

184E1

193E1

195E1

211E1

212E1

219E1

213E1

182

184E1

193E1

195E1

211E1

212E1

219E1

213E1

Creek

Tonion Creek

Watershed

+

X 2-18(6)

X 2-21(6)

X 6-14(74)
X 2-20(6)

X 2-36(6)

X 2-37(6)

X 2-25(6)

X 2-30(6)

X 2-23(6)

X 2-22(6)

X 2-42(6)

X 2-19(6)

4618

4617

4609

4609

46352

4609

182

184E1

185E1

193E1

195E1

213E1

214E1

209E1

179

180

187E1

190

218E1

224

227E1

216E1

177Es

176

186

187E1

191E1

220E1

225

230E1

178Es

177

188E1

191E1

211E1

222Es

226

234E1

181Es

180

187E1

192

211E1

212E1

219E1

213E1

182

184E1

193E1

195E1

211E1

212E1

219E1

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211E1

212E1

219E1

213E1

182

184E1

193E1

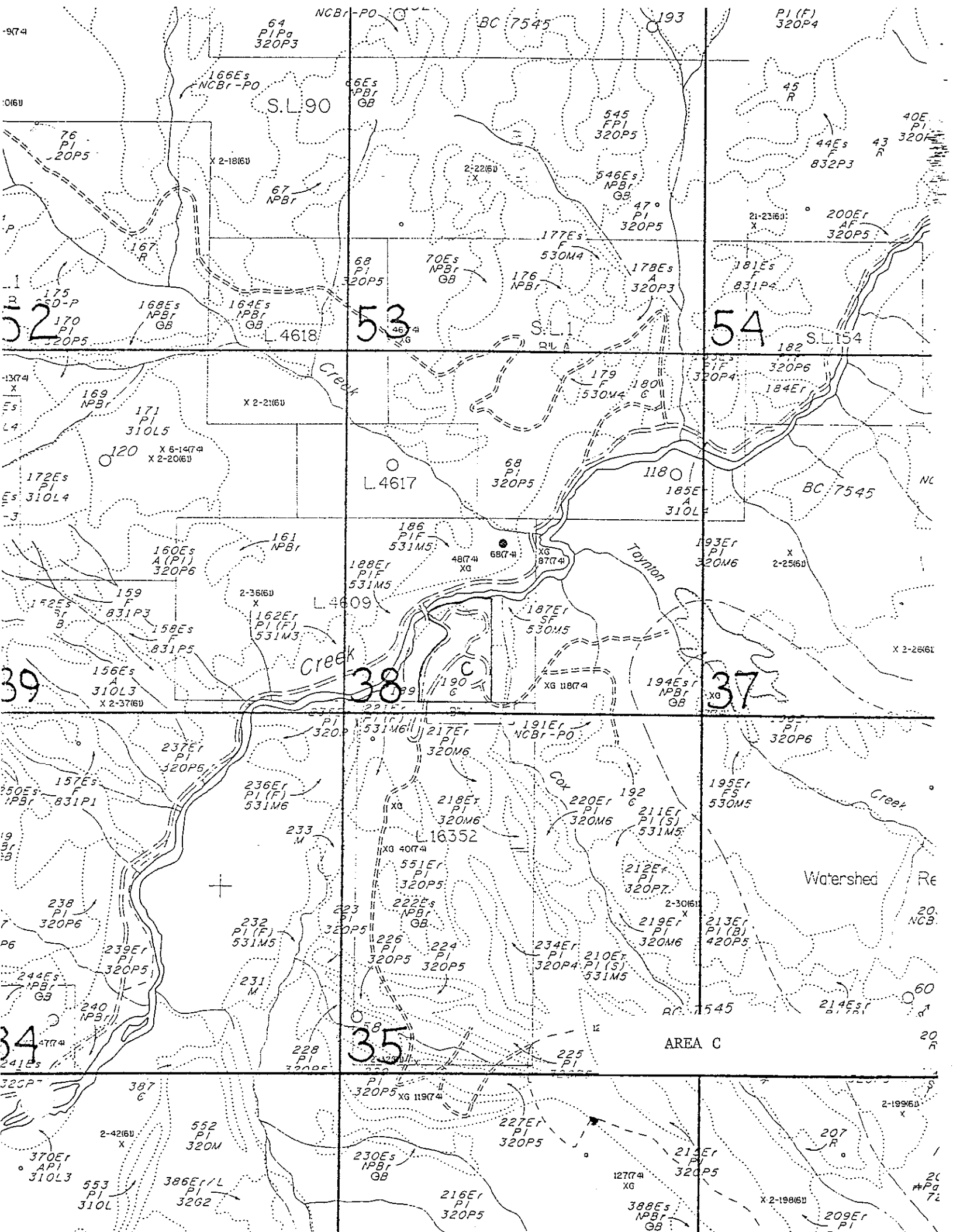
195E1

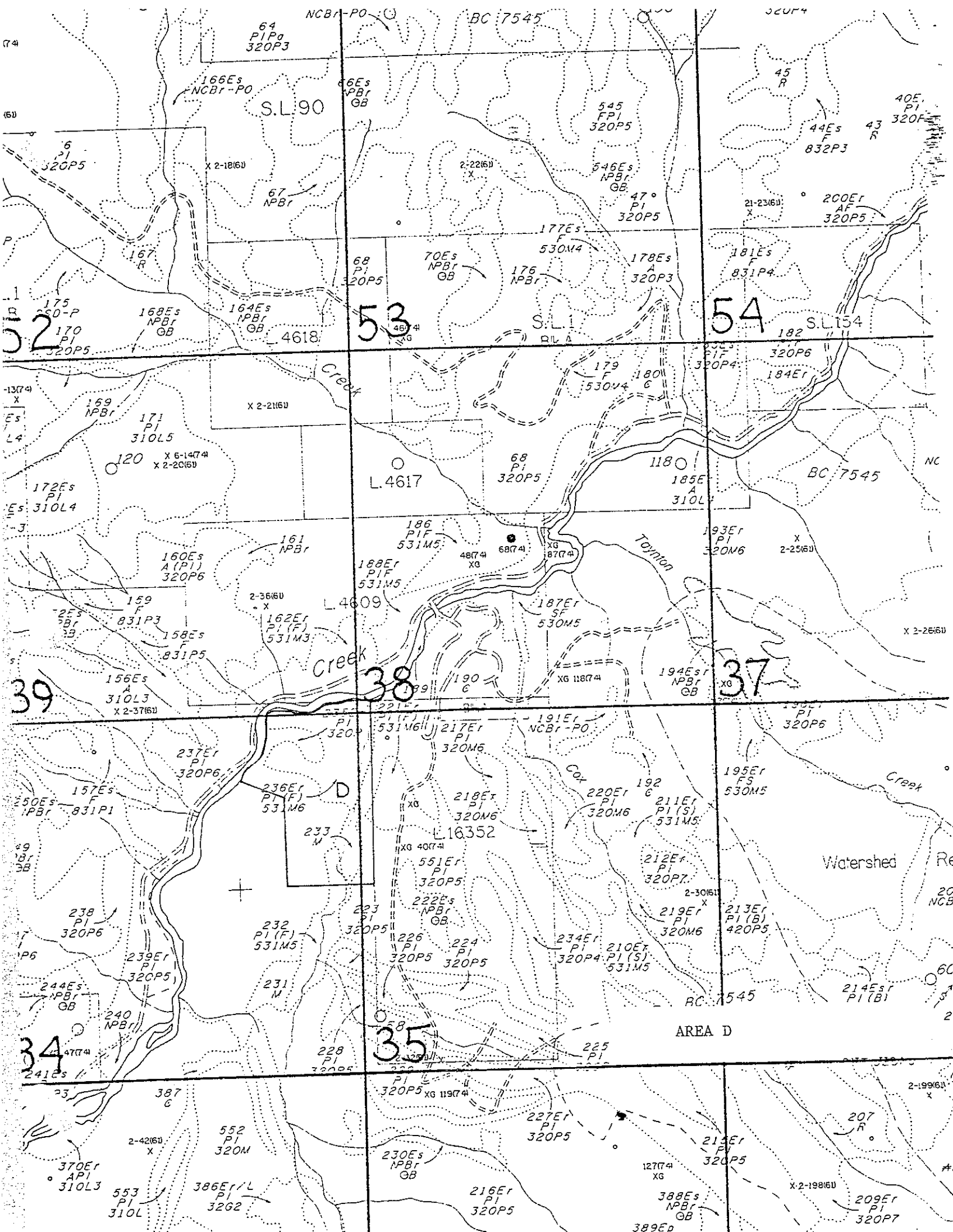
211E1

212E1

219E1

213E1



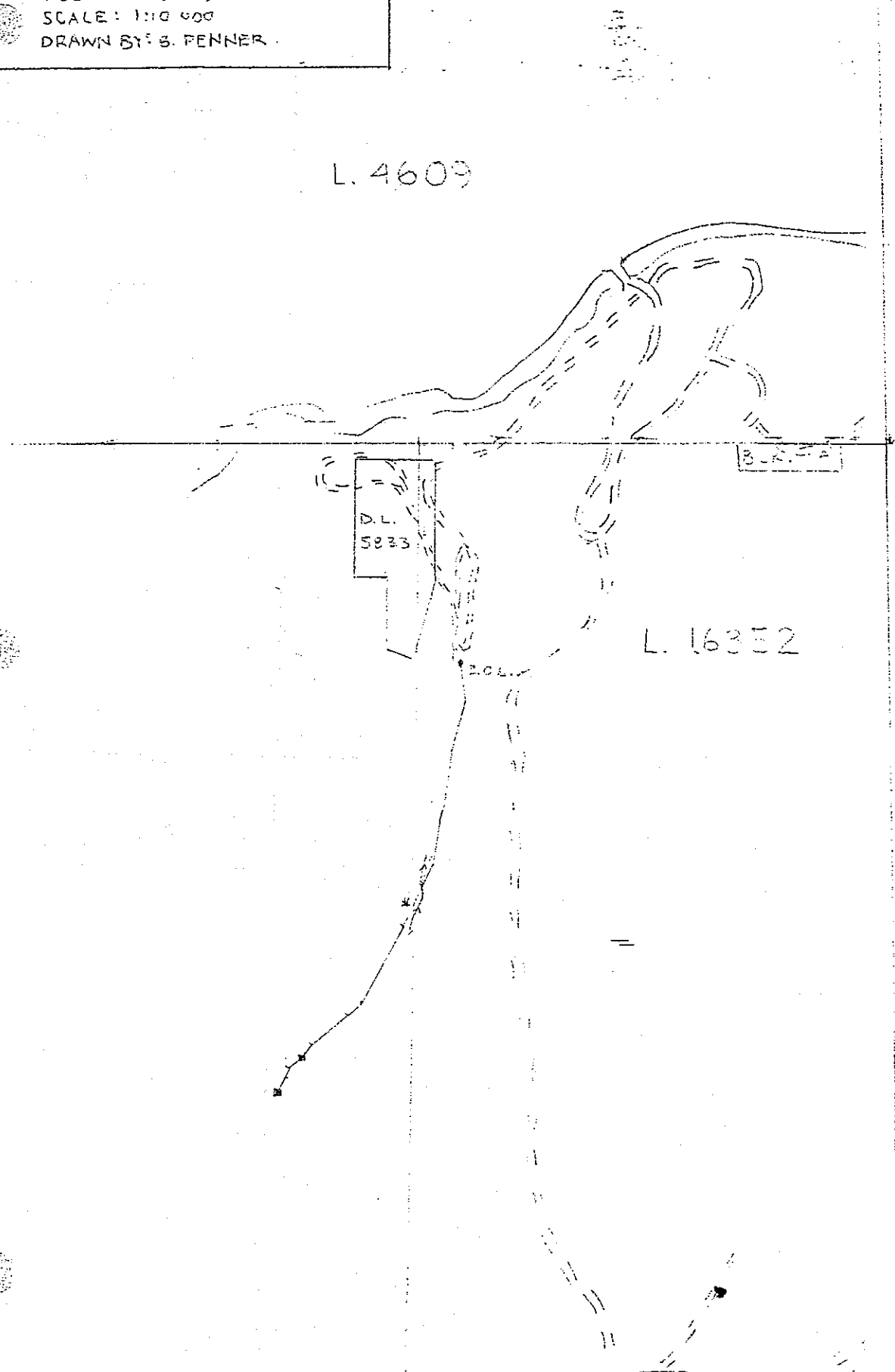


LEGEND

MAP NO: 82K049
PROJECT AREA: D
LOCATION: PANDRAMA
E.O.S.: HORSE BARN
SCALE: 1:10 000
DRAWN BY: S. FENNER

LINE SOUTH OF BARN LOCATION OF PHERMONES:

▲ AGGREGATE
■ ANTIAGGREGATE



LEGEND

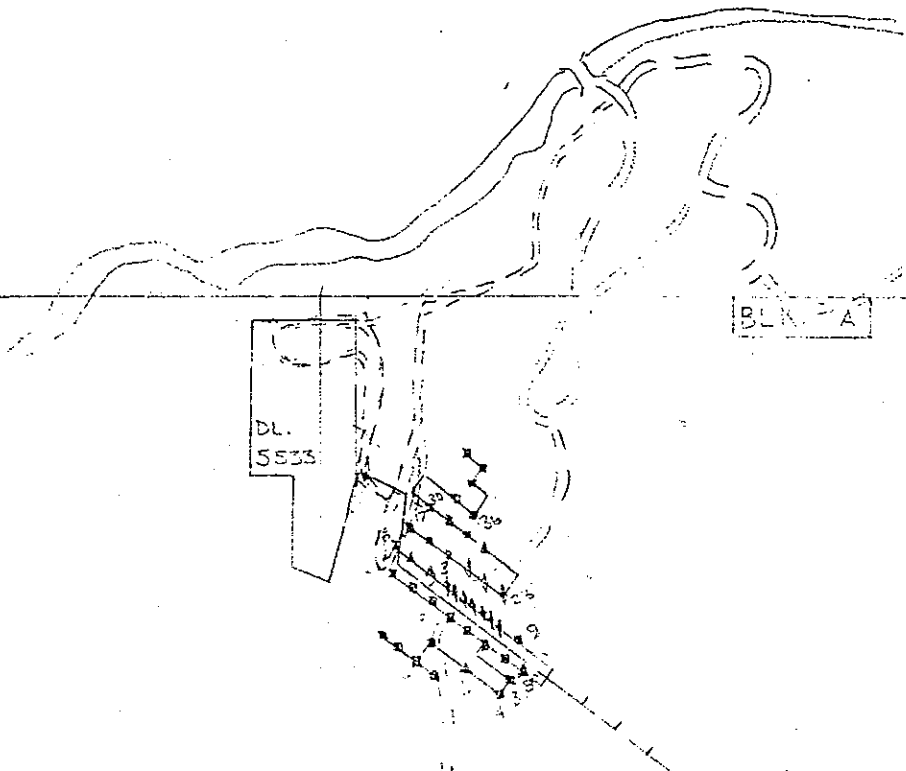
MAP NO: 82 K049
PROJECT AREA: D
LOCATION: PANORAMA
P.O.C.: MADSONS R.D. AND BARN R.D.
SCALE: 1: 10,000

LINE D

LOCATION OF PHERMONES:

- ▲ AGGREGATE
- ANTIAGGREGATE
- ◇ FUNNEL TRAP

L. 4609



L. 16352

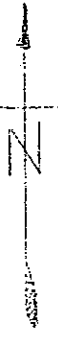
AREA D

LEGEND

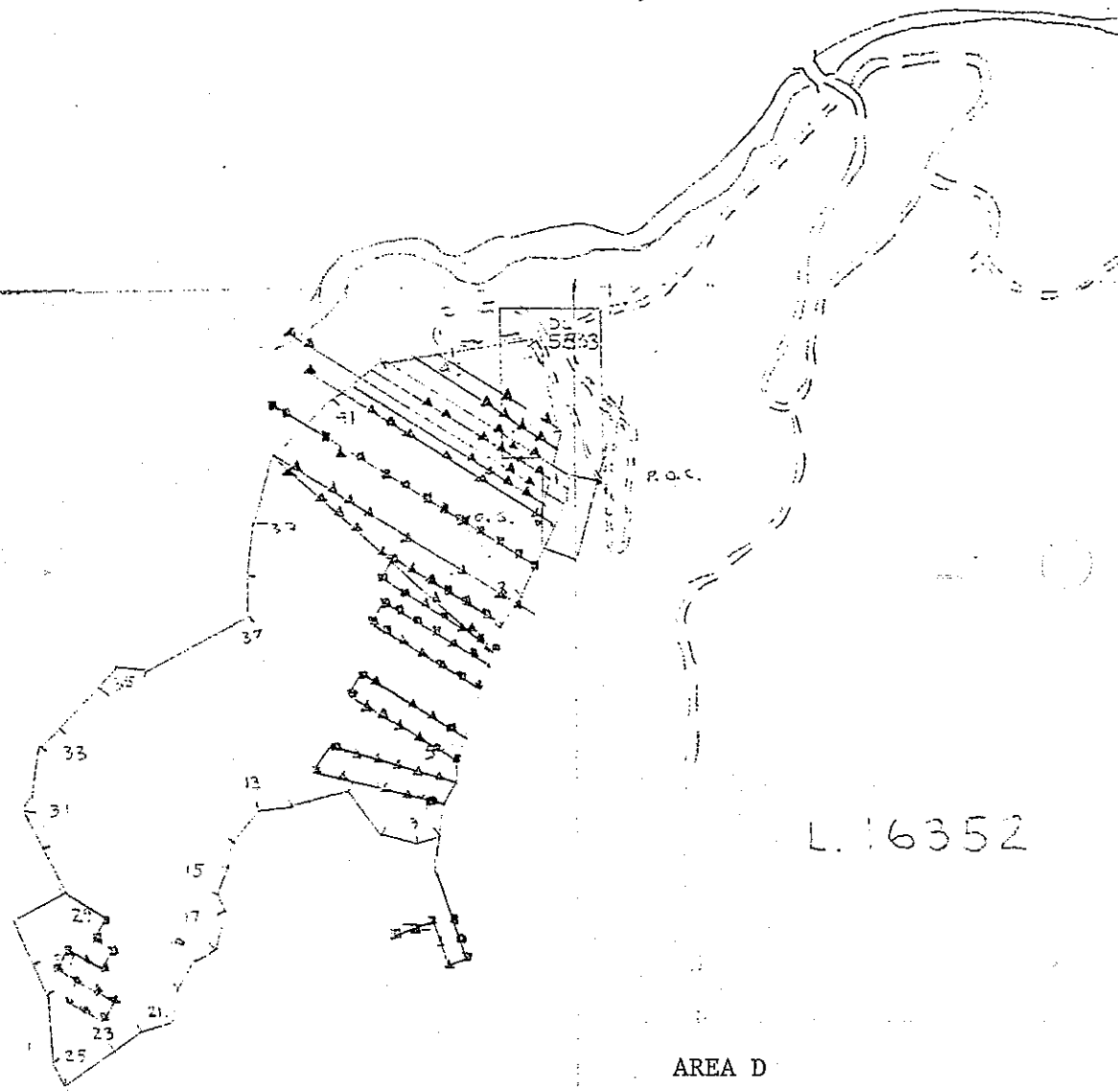
MAP NO: 82R049
PROJECT AREA: D
LOCATION: PANORAMA
P.O.C. MADSONS RD. SAANND.
SCALE: 1:10,000
DRAWN BY: B. PENNER

LUKES RUN BASELINE LOCATION OF PHERMONES

- ▲ AGGREGATE
- ANTIAGGREGATE
- ↓ FUNNEL TRAP



L. 4609



L. 16352

AREA D

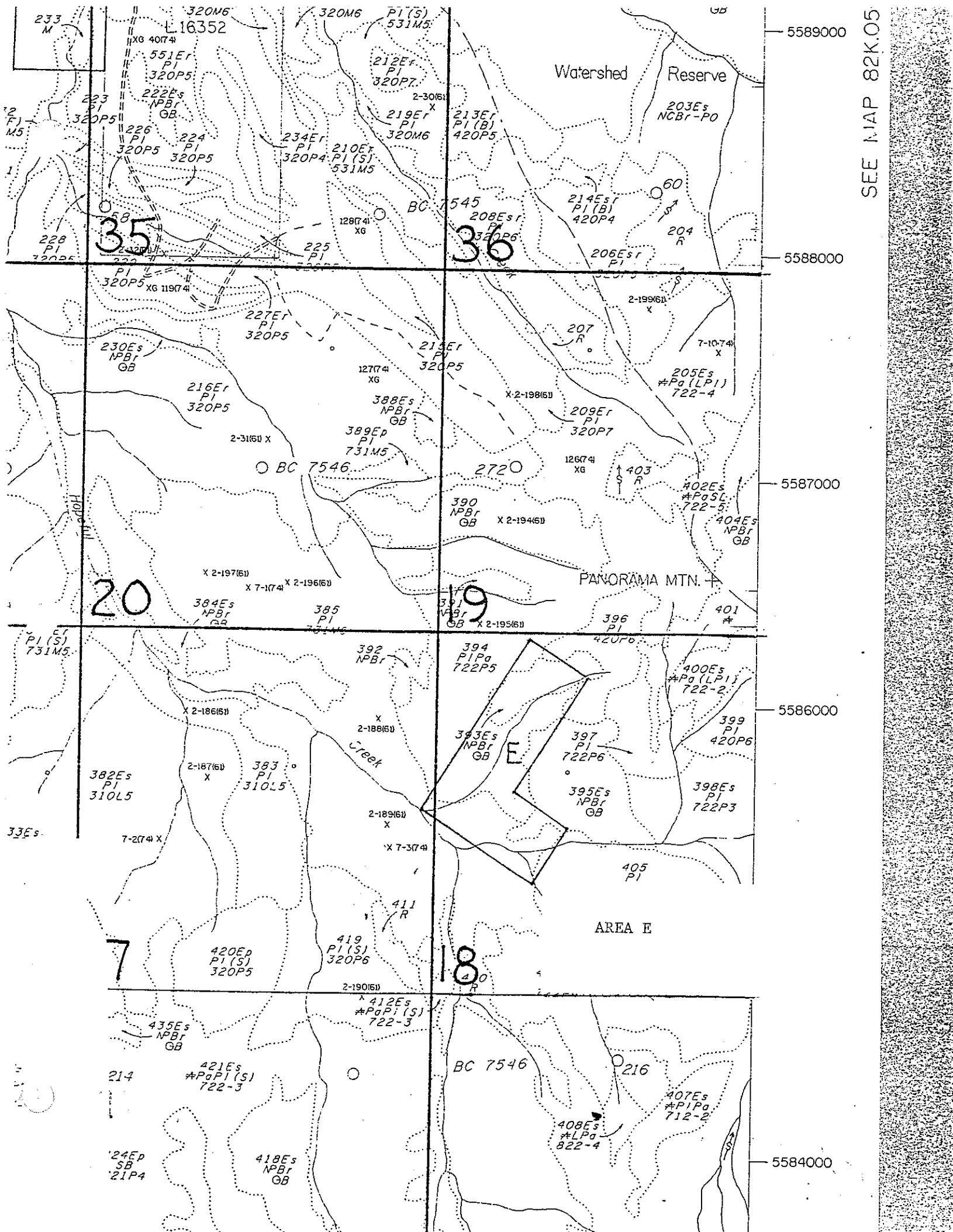


TABLE 1

MSMA APPLICATION

Project Area	Location	First Application Date	No. MSMA	Second Application Date	No. MSMA	Total
A	Helipad	July 22-23	497	Aug. 12-18	581	1078
D	Lukes Run	July 16-21	342	Aug. 4-12	1001	1343
D	Golden Tr.	July 16-21	927	Aug. 17	343	1270
E	Showbers	July 20-21	215			215

TABLE 2

1988 COST ESTIMATE

AREA A

1. 30 Mountain Pine Beetle Attractants at \$7.85 each	235.50
Labour at \$7.85 each	235.50
2. 50 Repellants at \$2.05 each	102.50
Labour at \$7.85 each	392.50
3. 200 trees to treat with MSMA (1 - 20 litre pail can be used in area D)	209.00
Labour (3 men at \$350.00/day including truck for 4 days)	1,400.00
4. General pre-survey (3 men at \$350.00/day including truck for 2 days)	\$700.00
TOTAL ESTIMATED COST	\$3,275.00

AREA B

1. 21 Attractants for 3 pockets of attack at \$7.85 each	164.85
Labour at \$7.85 each	164.85
2. General pre-survey (3 men at \$350.00/day)	<u>350.00</u>
TOTAL ESTIMATED COST	\$679.70

AREA C

1. 20 Repellants per lot at \$2.05 each (maximum)	\$41.00
Labour - each homeowner (@ 40 per acre)	
TOTAL ESTIMATED COST	41.00

AREA D DL 5533

1. 60 repellents at \$2.05 each	\$123.00
Labour at \$7.85 each	471.00
2. 20 attractants at \$7.85 each	157.00
Labour at \$7.85 each	157.00
3. 100 litre MSMA at \$10.50/litre	26.25
Labour (3 men at \$350.00/day)	350.00
TOTAL ESTIMATED COST	1,284.25

AREA D - PANORAMA

1. 80 repellents at \$2.05 each	\$164.00
Labour at \$7.85 each	628.00
2. 80 attractants at \$7.85 each	628.00
Labour at \$7.85 each	628.00
3. 200 trees MSMA trees to treat (20 litre pail purchased under A)	
Labour	350.00
4. General Pre-Survey (3 men at \$350/day for 2 days)	700.00
TOTAL ESTIMATED COST	3,098.00

AREA E

1. 20 attractants at \$7.85 each	157.00
Labour at \$7.85 each	157.00
2. 100 trees MSMA to treat (20 litre pail purchased under A)	
Labour	350.00
3. General pre-survey	700.00
TOTAL ESTIMATED COST	\$1,364.00

COST ESTIMATE SUMMARY

Panorama

Area A	\$3,275.00
Area D	\$3,098.00
Area E	<u>\$1,364.00</u>
Total	\$7,737.00

Becker Properties Ltd.

Area B	\$679.20
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Panorama Homeowners Association

Area C (maximum per .5 acre lot)	\$41.00
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REFERENCES

1. Ryker, L.C. and Yandell, K.L.; 1982; Effect of Verbenone on aggregation of *Dendroctonus ponderosae* Hopkins (Coleoptera, Scolytidae) to synthetic attractant; Oregon State University

2. Safranyik, L., Shrimpton, C.M., and Whitney, H.S.; Oct 1974; Management of Lodgepole Pine to Reduce Losses from the Mountain Pine Beetle; Forestry Technical Report 1; Environment Canada.