GIBSON DESERT AERIAL BURN PROJECT

SUMMARY OF PROPOSED AIRCRAFT OPERATIONS

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Background

There is mounting evidence (Burbidge, 1985) to suggest that losses of fauna from our desert reserves is as a result of a dramatically changed fire regime over the last 60 years or so. There is a need to return to a patch burning mosaic, as practiced by Aborigines in the past. This promotes animal habitat and breaks up major wildfires. Currently, many of the reserves exist in a homogenous state, both in terms of fuel age and vegetation floristics and structure.

Research is currently aimed at understanding past Aboriginal burning, the effects of fire on plants and animals and fire behaviour. We have sufficient understanding and knowledge to attempt an operational scale aero burn trial to burn patches of the Gibson Desert Nature Reserve. Being remote, vast and inaccessible, the use of aircraft to conduct this burning trial is the only realistic option at the moment. This proposal spells out aims, strategies and costs associated with the trial aerial burn planned for the GDNR in September 1988. Only those costs for which there is currently no budget have been included.

The aims and methods presented here should not be binding. They are merely guidelines. The nature of this research, with imperfect knowledge of fire behaviour and weather conditions and the remoteness of the study site, means that we may need to make adjustments as we proceed with the study. In setting burn prescriptions I have opted for extremes; combinations which should generate mild fire behaviour and small burnt patches to significant fire behaviour and large burnt patches.

GIBSON DESERT AIRCRAFT BURN PROJECT - AIRCRAFT OPERATIONS

1. General Objectives

* To evaluate the effectiveness and the costs of using aircraft ignition systems, natural firebreaks and weather conditions to create a range of patch burn mosaics in major vegetation types in the Gibson Desert Nature Reserve.

* To evaluate the effectiveness of aerial photography for mapping landform units and major vegetation types.

* To evaluate aerial photography as a means of assessing effectiveness of aircraft ignition to achieve patch burns.

2. General Methods

Fixed wing aircraft (Islander VH-ISA) fitted with standard incendiary machine will be used to ignite 4 burns, each of about 6 000 - 9 000 hectares. The same aircraft will be used for vertical 70mm aerial photography and as an observation platform. prior to burning, the study site (Figure 1) will be flown and photographed. Frame speed and altitude will be such to provide stereo coverage at a scale of 1:20 000. Photographs will be in black and white. A single flight line will run north from the Gunbarrel Highway/Gary Highway Junction (Everard Junction).

This flight line will run for 45km north of Everard Junction and include the Gary Highway on the eastern most boundary. The flight line will be re-flown on the completion of burn operations.

3. Specific Burn Objectives

3.1 Aim 1

To burn out patches of approximately 10 - 30 ha. The total area burnt not to exceed 30-40% of the delineated burn boundary (9 000 ha). Fires to self extinguish.

3.1.1 Method: (see figure 2)

- flight lines 200m apart and across the wind direction (see figure 2).
- incendiary spots in clusters 500m in length and separated by a break of 500m.
- incendiary distance to be as close as possible with aircraft system and taking account of normal safety procedures.
- weather conditions: temp 22-28^{o}c
  RH 15-40%
  Wind at 2m: 15-25kph
- ignition time: to commence 2 hours prior to forecast lull in wind strength. Winds to fall below 12kph 2 hours after ignition.

NOTE: Burn areas refers to area over which plane will fly. It does not mean area burnt.

3.2 Aim 2

To burn out long strips of 50-200m wide and up to 4km long to maximise fire perimeter to area ratio (edge effect). Burnt strips should be 100-200m apart with intervening country unburnt. Total burn area of 9 000ha, but aim for a maximum burn out of 50% of total burn area.

3.2.1 Method: (see figure 3)

- flight lines 400m apart and downwind
- incendiaries 100m apart
- weather conditions: as for aim 1 above, except winds over 15kph
- ignition time: 4hours prior to forecast drop in wind strength. Winds to drop below 12kph.

3.3 Aim 3

To burn large patches of 1 000 - 2 000ha. The total burn area to be 9 000ha, but total area burnt not to exceed 50% of total burn area.

3.3.1 Method: (see figure 4)

- flight lines 100m apart, across the wind direction
- incendiaries 100m apart
- weather conditions: as for 1 above, except wind strength over 20kph
- ignition time: 4 hours prior to forecast drop in winds (down to less than 12kph

3.4 Aim 4

To burn small patches of 2 - 10ha. The total area burnt not to exceed 30% of the total burn area (9 000ha).

3.4.1 Method: (see figure 4)

- flight lines 200m apart
- incendiaries 200m apart
- weather conditions: as for method 1 except winds 12-18kph
- ignition time: 3 hours prior to forecast drop in wind strength (to fall below 12kph)

4. Logistics

* Aircraft (VH-ISA) to operate from the Hunt Oil Airstrip on the Gunbarrel Highway, GDNR west boundary.
  - location 25°10'S - 124°40'E
  - length: 900m, surface loam
  - map sheets: WAC - 3345 Wiluna, Warri SG51-4 and Browne SG51-8

The Beadell Airstrip
  - location 25°34'S - 125°19'E
  - length 1 000m, surface gravel
  - map sheets: WAC - 3345 Wiluna, Warri SG51-4 and Browne SG51-8

is an alternative airstrip and available for emergencies and backup. Decker Field Airstrip (if prepared) is another alternative, (location 25°14'S - 125°07'E).

* Aircrew 3 people:
  - pilot
  - navigator
  - incendiary machine operator/photographer

* Aircrew to be self contained re: food/bedding.
  - water to be supplied by ground party

* Incendiaries and glycol to be carried in by vehicle (Research - Manjimup, 15 000 capsules, 11 boxes, 1 drum glycol).

* Communications:
  - fit frequency 5270 and 5833 in HF set
  - fit simplex in A/C VH-ISA

* Petrol: Avgas 16 drums - trucked into Hunt Oil Airstrip

* Aircraft and crew depart Jandakot on Sunday 11th September 1988. Flight time to Hunt Oil Airstrip 5.5 hours. Arrive on site 1550 hours.

* Commence aircraft operations (photography and then ignition) on Monday 12th September. Complete aircraft operations on Thursday 22nd September.

* Aircraft return to Perth on Friday 23rd September, arrive Jandakot 1600 hours.

5. Estimate of Aircraft Operations Costs

Aircraft:

- flight time 40 hours @ $83/hr	= $3 320
- fuel costs 40 hours (16 drums Avgas)	= $2 600
- fuel cartage 2 x $600 (ex Wiluna)	= $1 200
	$7 120

Pilot:

- salary for equivalent of 2 weeks	= $1 500
- pilot travel and contingency expenses	= $ 760

Aircrew:

- Travel Allowance, 2 people	= $ 940

Aerial Photography:

- 2 rolls - 70mm 2448 Film - Neg.Rev.	= $ 200
- Development costs and printing	= $ 660
- 10 rolls - 35mm Kodachrome 200	= $ 160
Weather Forecasts:	= $ 460
Thematic mapping, tapes and images:	= $2 500
GRAND TOTAL:	$14 300

Note: this assumes:

* aircraft standing charges met by Protection Branch.
* incendiaries,and glycol costs met from existing budgets.
* salaries (IMO and navigator) met from existing budgets.
* modifications to aircraft (communications and aerial photography) met from existing budgets.
* research and operations staff salaries, vehicle running and allowances met from existing budgets.

N. Burrows pp Abk

Neil Burrows
FIRE PROGRAMME LEADER

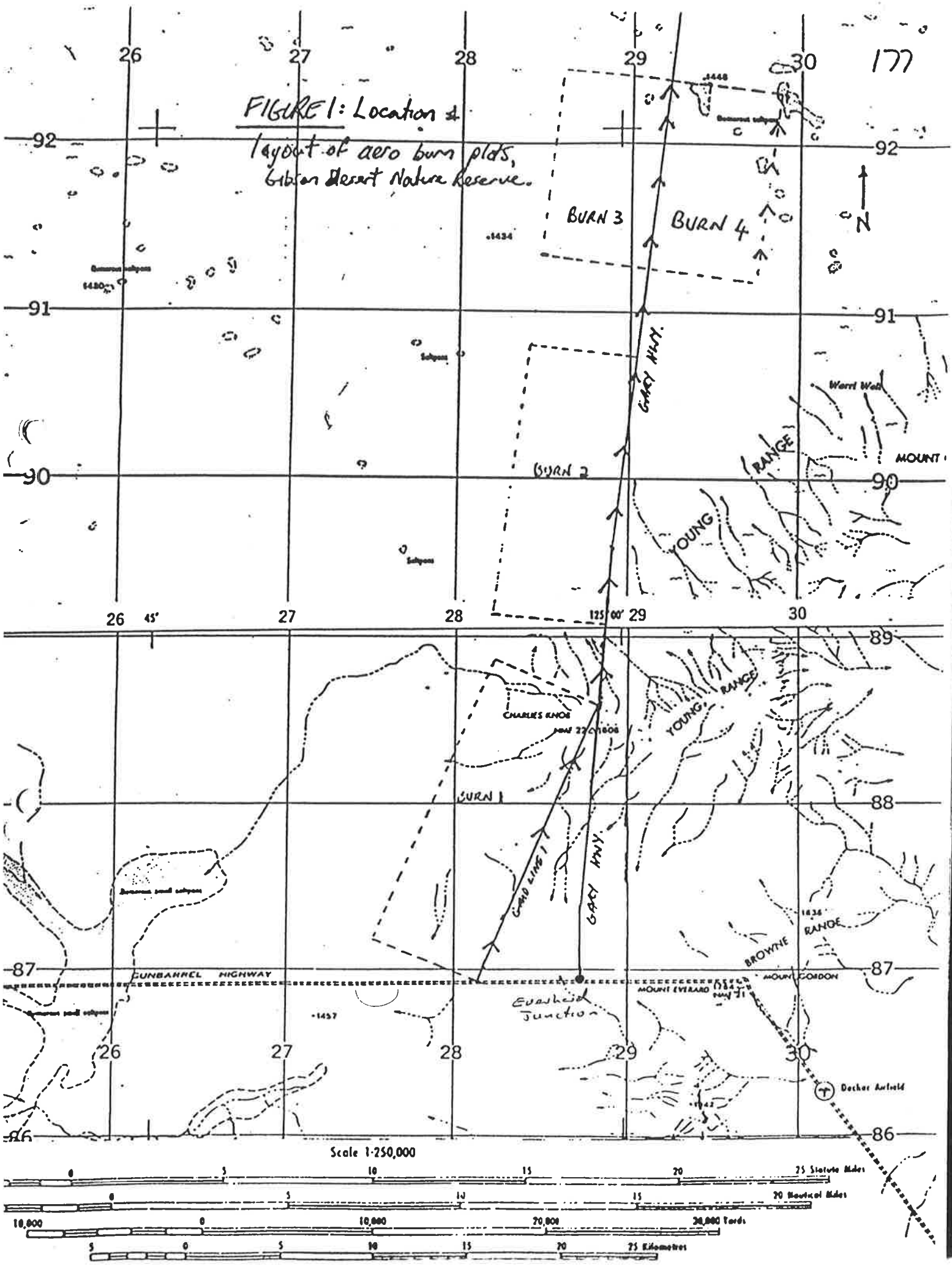
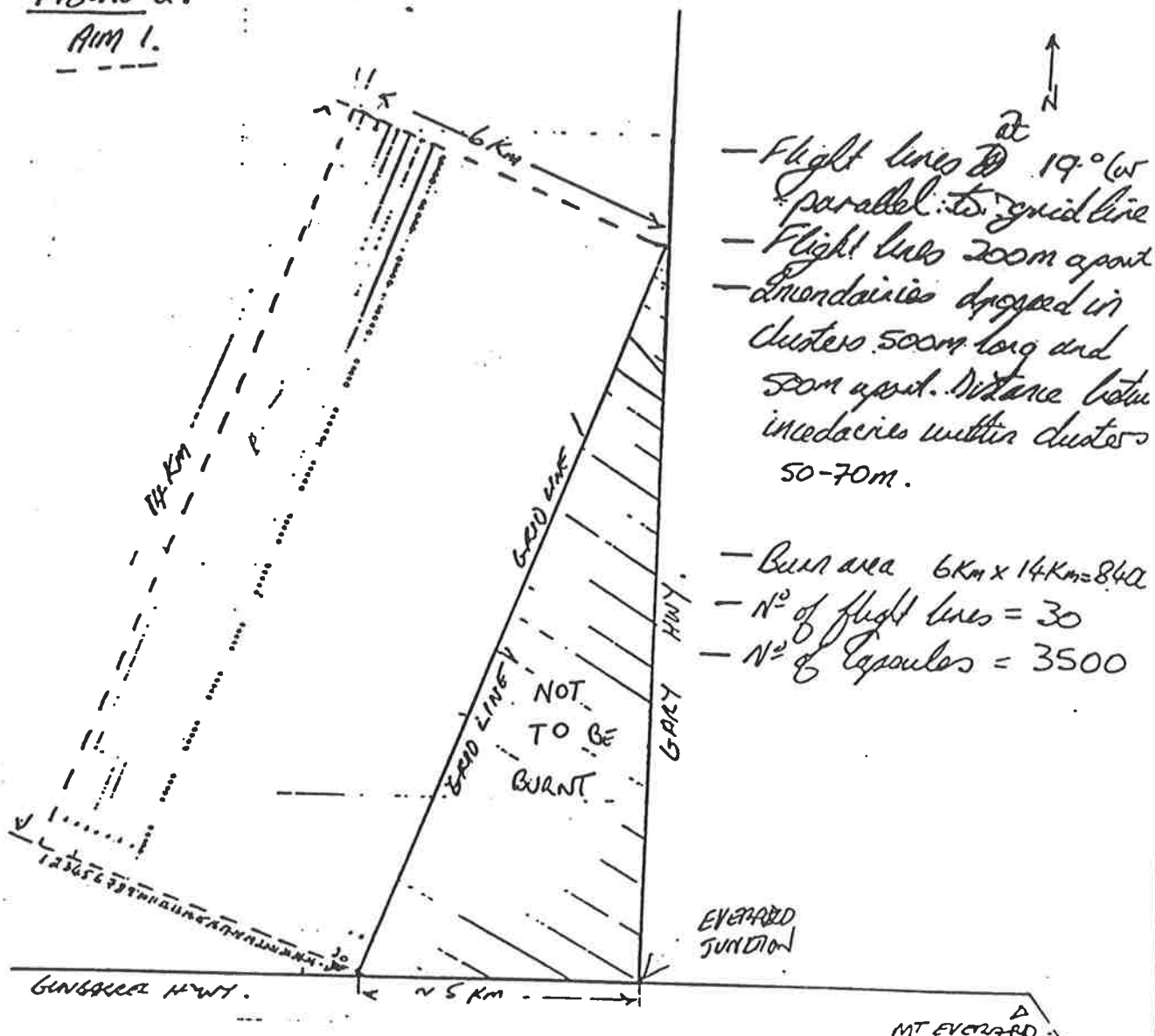


FIGURE 1: Location & layout of aero burn plots, Gibson Desert Nature Reserve.

FIGURE 2:
AIM 1.



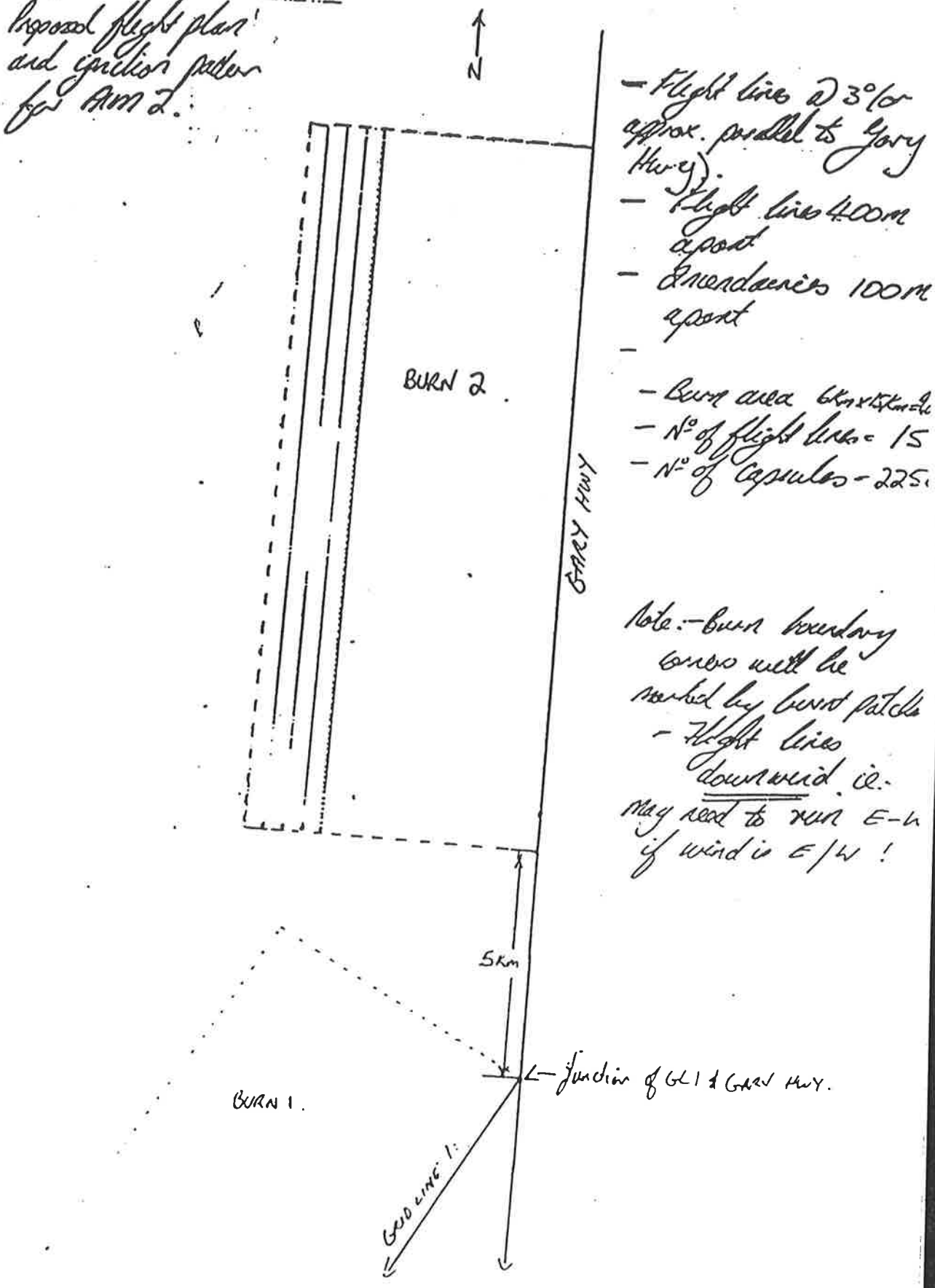
Proposed flight plan and ignition details for Aim 1.

Note: - Ground party to mark corners of burn boundary with burnt patch ~ 20m radius
- NE corner is junction of grid line 1 & Gary Hwy
- SE corner is junction of grid line 1 & Gunbarrel Hwy
- Area between GL1 & Gary Hwy not to be burnt.
- Flight lines across wind direction

FIGURE 3:

AIM 2.

Proposed flight plan and ignition pattern for Aim 2.



- Flight lines @ 3° to approx. parallel to Gary Hwy).
- Flight lines 400m apart
- Ignitions 100m apart
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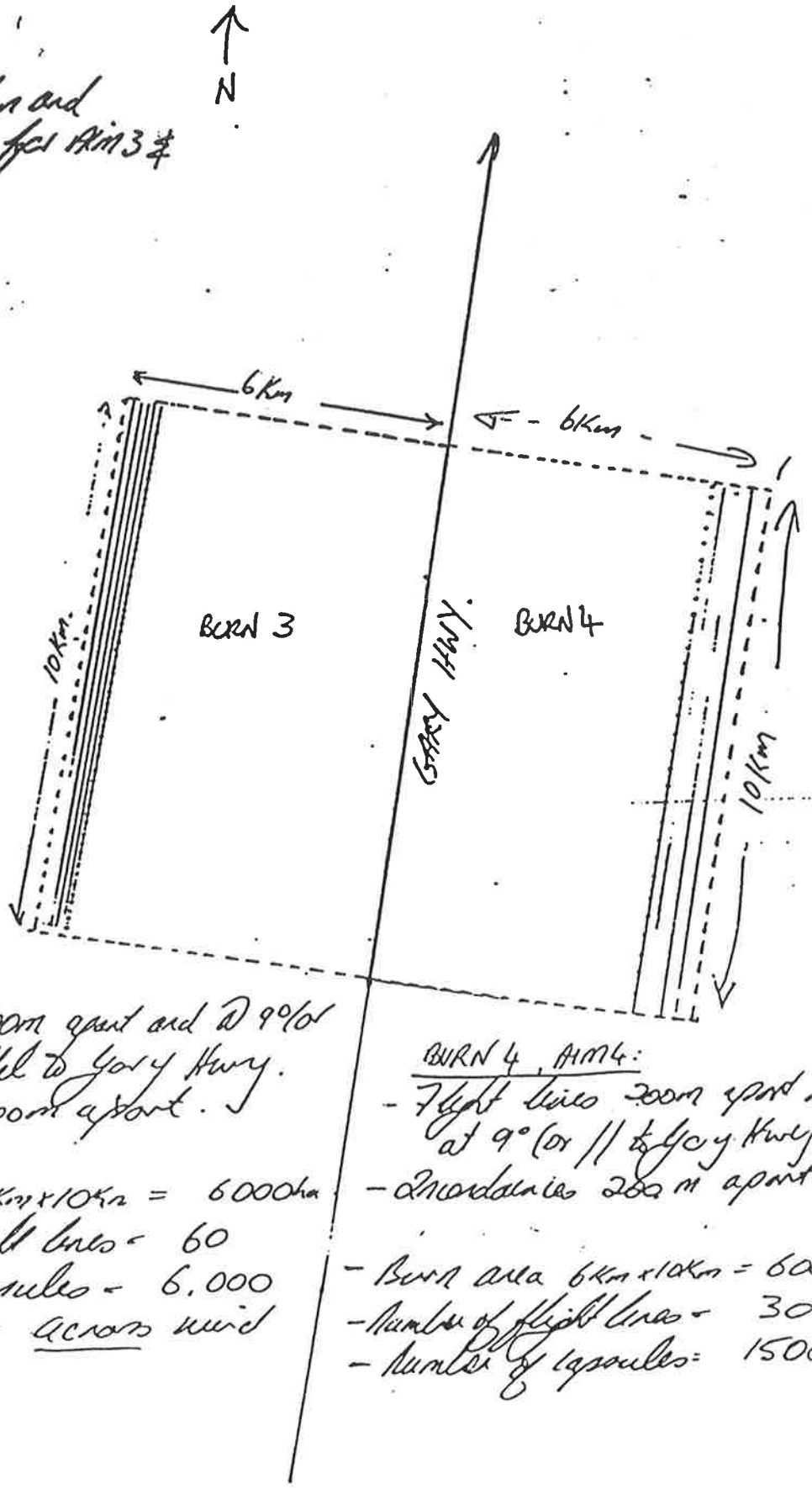
- Burn area 6km x 4km = 24
- N° of flight lines = 15
- N° of capsules = 225.

Note:- Burn boundary lines will be marked by burnt patches
- Flight lines downwind ie. may need to run E-W if wind is E/W !

← Junction of GL1 & GARY HWY.

FIGURE 4:
AIM 3: & AIM 4

Proposed flight plan and ignition patterns for AIM 3 & AIM 4.



BURN 3
AIM 3.

- Flight lines 100m apart and @ 9°/or parallel to Gary Hwy.
- Boundaries 100m apart.

- Burn area 6Km x 10Km = 6000ha
- Number of flight lines = 60
- Number of capsules = 6,000
- Flight lines across wind

BURN 4, AIM 4:

- Flight lines 200m apart @ 9° (or // to Gary Hwy
- Boundaries 200 m apart

- Burn area 6Km x 10Km = 60
- Number of flight lines = 30
- Number of capsules = 150