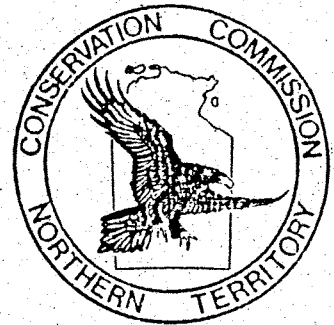


ASSESSMENT REPORT - NUMBER 6

**TINDAL RAAF BASE
DEVELOPMENT.
ENVIRONMENTAL
ASSESSMENT REPORT.**



JUNE 1984

CONSERVATION COMMISSION OF THE NORTHERN TERRITORY
DARWIN N.T.

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Appendix 1: Membership of the Joint Consultative Committee May 1984

1.0 Summary

This report relates to the proposal by the Department of Defence to upgrade the current 'bare base' facilities at Tindal Airfield, 17km south of Katherine, to fully operational status.

On-base developments will include expanded runway/taxiway/dispersal areas, ordnance storage areas, maintenance facilities, administration buildings, residential accommodation and related community and recreational facilities. 15km of the Stuart Highway will need to be realigned, Katherine/Tindal water and electricity supplies will need upgrading and a maximum of 440 residences constructed in Katherine East.

The proposal will involve the siting and construction of a number of off-base facilities - HF Remote Receiving Station (HFRRS), Instrument Landing System Beacons, Airfield Surveillance Radar and an air-to-surface weapons range - and the enlargement of the current base site from 45km² to 122km².

The draft EIS and supplement, which together form the final EIS, have addressed the direct effects of the proposal, while some related aspects, considered outside the responsibility of the proponent (highway realignment, water supply augmentation, general economic effects on the regional business and pastoral communities and electricity supply upgrading) have not been discussed in detail.

The assessment of this proposal has benefitted from a high degree of public input during the draft review stage and from the accessibility of the proponent's environmental consultant.

The major environmental effect of the proposal will be social. A virtual doubling of the Katherine population, with the incoming populace mainly young married couples and single males, will alter the social and demographic structure of the community.

Concern has been voiced by the existing Aboriginal section of Katherine society; this section, currently a minority group but generally with a degree of access to the local decision making process, will not receive an increase to its numbers proportionate to the overall increase in the Katherine population and has expressed concern at having less say in community development.

Through the current assessment process, it has become clear that the most effective counter to the potential disaffection of the Aboriginal

community will be through communication. It has been attempted, through the framing of suitable recommendations in Section 7, to create a clear, widely accepted and understood communication mechanism that will help the early identification and mitigation of Aboriginal social impacts.

Another aspect of social effect, the increasing disparity of the sexes through the immigration of numerous single males, will be largely mitigated, despite the concern expressed by some Katherine residents. This is because firstly, RAAF are experienced in having to gain community acceptance for their presence and various aspects of the development have been designed to aid integration of RAAF personnel into the community, and secondly, Katherine civil community leaders, aware of the economic benefits available due to the RAAF presence, will be actively encouraging good community relations.

The second major environmental effect relates to the off-base requirements of the proposal; the Delamere air-to-surface weapons range and the HF Remote Receiving Station (HFRRS) will alienate large areas of land and were the subject of a number of public comments during the draft EIS review. The weapons range will however be the subject of a management plan that will cover, among other things, aspects of bush-fire control and access; it is anticipated that this plan will be the subject of appropriate consultation before finalisation. The location of the HFRRS has been the subject of considerable debate and it is the Conservation Commission view that the selection of the 40km² proposed site has not been sufficiently justified and should be the subject of further, separate, assessment.

Given that proposals to augment Katherine water supply, the development of off-base housing subdivisions, augmentation of electricity supply and realignment of the Stuart Highway will all be subjected to separate assessment, the environmental impacts of the proposal can be minimized provided the recommendations presented in Section 8 are adopted in full. These recommendations relate to effects on Aboriginal sites, aspects of archaeological investigations, noise effects, soil erosion, the supply of construction materials and machinery, landscaping, insect and bird attraction to floodlighting, water pollution, road construction, supplementary funding and

communication channels.

Access to the RAAF Base Tindal and Delamere air-to surface weapons range management plans is required at the draft stages for N.T. Government review; this will allow more detailed impact amelioration techniques to be developed for the mechanics of proposal implementation and operation.

The adoption of the recommendations from this and the Commonwealth Assessment Report will result in the economic and social benefits of the proposal outweighing its detrimental environmental impacts.

2.0 Introduction

2.1 Background

In 1981, the Commonwealth Government ordered 75 FA18 fighter aircraft to re-equip the RAAF; these aircraft will be delivered between 1984 and 1988.

Initial deliveries will be located at Williamtown, NSW with 77 Sqn, later deliveries - scheduled from mid 1987 - will be used by 75 Sqn previously located at Butterworth, Malaysia and currently at Darwin.

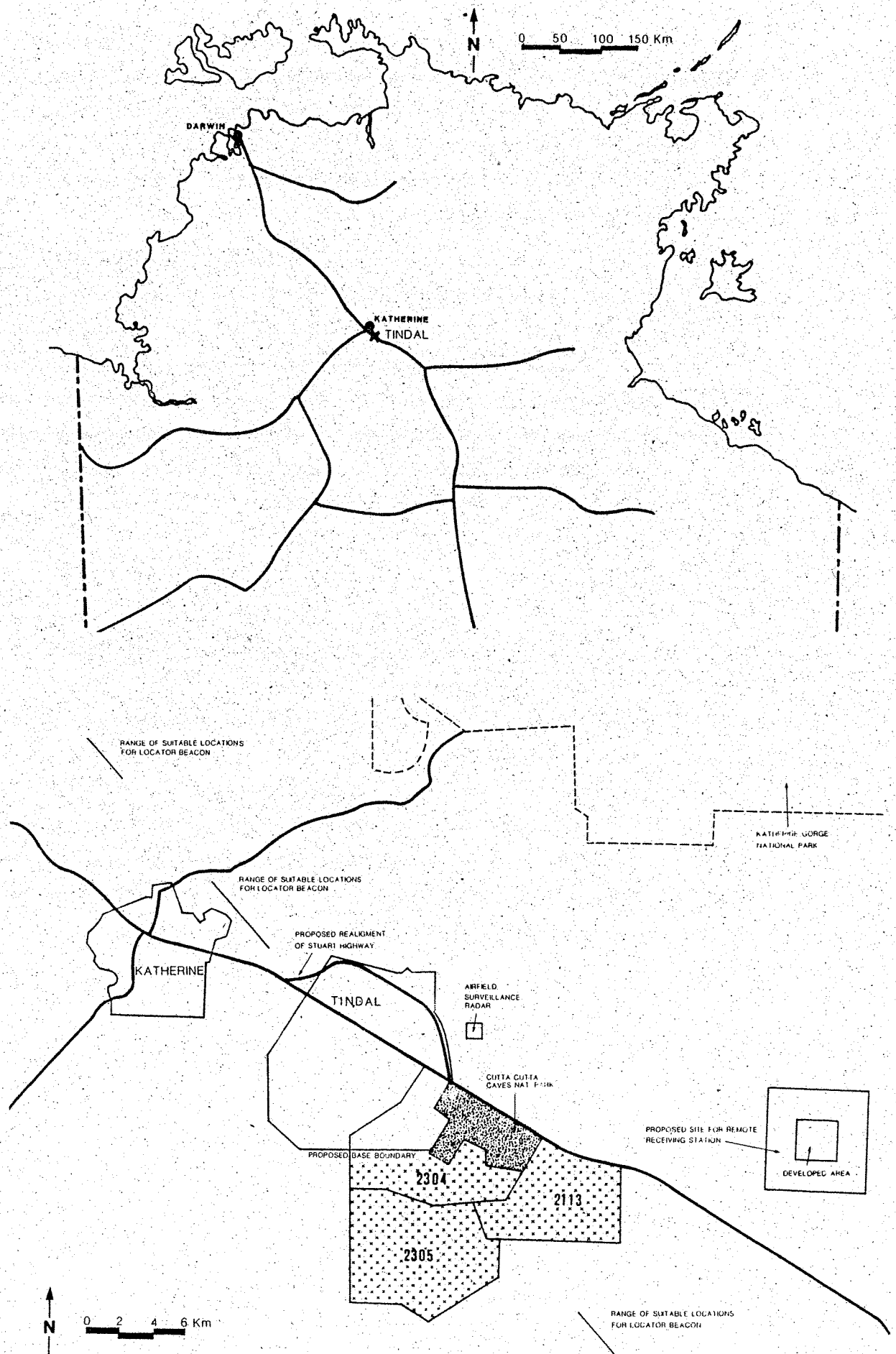
It was initially intended that Darwin would form the permanent base for the re-equipped 75 Sqn, however since mid-1982, this preference has been gradually discounted in favour of a re-development of the current joint-user facility at Tindal, 17km south of Katherine (see Map 1).

In March 1983, the Department of Defence was informed that an Environmental Impact Statement (EIS) would be required and that this EIS would be the subject of joint Northern Territory/Commonwealth assessment (the procedures in fact to closely follow those developed for assessment of the Alice Springs-Darwin railway line proposal). In the same month guidelines for EIS production were agreed on at the inaugural meeting of the Joint Northern Territory/Commonwealth Consultative Committee (JCC) (for membership of the JCC, refer to Appendix 1).

The resultant draft EIS, prepared by Kinhill Stearns Pty Ltd, the proponent's environmental consultant, was available for public and Government review from 7 November to 19 December 1983. Earlier preliminary drafts had been assessed by the Conservation Commission of the Northern Territory and the Commonwealth Department of Home Affairs and Environment prior to this period.

Following the public review period, the environmental consultants produced an EIS supplement in response to the comments received. The first copies of this supplement were released on 12 March 1984.

Throughout the environmental assessment period so far, the proponent and the proponent's environmental consultant have



MAP 1 : REGIONAL AND AREA LOCATION

shown a willingness and degree of co-operation that have been appreciated. The background surveys and data gathering processes that were involved in the producing the EIS led to the accumulation of a very large body of information that will provide excellent source material for any future investigations in the Katherine region.

It is unfortunate that the volume of background data necessitated that it be considerably reduced to create a manageable EIS; this reduction, or summarisation, has led to the mistaken conclusion by some people that aspects of the proposal's impact, particularly with reference to social issues, have been superficially examined. This is not generally so, and is a result of the abridgement process or, in some cases, poor timing, rather than the result of a casual approach.

2.2 This report

This report is an assessment of the environmental impact of the Tindal redevelopment proposal, as presented in the draft EIS and supplement, and reviews the proponent's response to comments received in the public review period.

The contents of this report form the basis of the advice forwarded by the Conservation Commission to the Northern Territory Minister for Conservation and the Minister's Commonwealth counterpart on the project as agreed under the joint assessment agreement, ratified in July 1983.

3.0 The Proposal

The Tindal RAAF base is currently operated as a 'bare base' with limited or no aircraft storage, maintenance, arming, fuelling or controlling facilities. Built between 1963 and 1970, Tindal has a 2750m long runway (also used in civil operations) and associated taxiways and aprons, four hangers, a disused construction camp, a number of demountables, a power house and various Department of Aviation facilities.

The re-development of the base to the status of a fully operational major facility has been structured through a Master Plan. This Plan, which incorporates all facets of the proposal, is based on a two phased expansion. Phase 1 is designed to provide a home base for the re-equipped No. 75 Squadron, phase 2 involves the construction of facilities at Tindal to accommodate those functions currently performed by RAAF Base Darwin.

The project will involve the enlargement of the current base from approximately 45km² to 122km² and the aquisition and development of a variety of sites off the main base.

The enlarged base itself, by the completion of Stage 1, is proposed to house an extended runway and taxiway, a new V-shaped taxiway, aircraft dispersal areas, flight line servicing and arming facilities, aircraft maintenance and personnel support facilities and administrative, residential, ordnance storage, navigational and communication facilities. At this stage the base will be manned by approximately 650 RAAF and 120 civilian personnel (rising to 1000 and 190 respectively on completion of Stage 2) with all single and 100 married RAAF personnel (150 in Stage 2) housed on-base. At least 200 off-base houses will be required.

Expansion of the base will require re-alignment of the Stuart Highway and the proposed Darwin - Alice Springs Railway line as shown on Map 1, and upgrading or redevelopment of existing sewage treatment works and power and water supplies. Various recreational facilities will be located on-base.

Off-base developments, apart from off-base housing which will be largely located in Katherine East, include the site preparation for a high frequency remote receiving station, the airfield surveillance

radar, and three location beacons. The development of part of Delamere Pastoral Lease as a weapons range is also proposed.

The EIS has discussed the development of on-base and off-base facilities and the relevant existing environment in considerable detail, has addressed the need for, and alternatives to the proposal, and has identified a variety of potential environmental impacts.

4.0 Existing Environment

This section is divided into discussions of the Katherine - Tindal region, (4.1) and the proposed air-to-surface weapons range (4.2).

4.1 The Katherine-Tindal region

Chapters 3 of the draft and EIS supplement describe the existing regional environment in terms of climate, landforms, hydrology, ecology, history, land-use, transport and communications, land tenure, aboriginal sites and economic use of land, archaeology, noise and utilities, and provide a socio-economic profile.

The proponent recognized that the siting of off-base facilities would be constrained by a number of existing environmental factors, particularly in the areas to the north-west, north, north-east, east and south-east of the Base. Items identified as significant constraints included the land currently under agricultural development north-west of Katherine, the area of the Jawoyn land claim, areas of conservation significance on the Arnhem Land plateau to the north-east and Beswick Aboriginal Land to the east.

Many of the systems involved in the conduct of the base have specific siting criteria necessary to ensure their effective operation. In these cases, the philosophy adopted by the proponent has been to develop a suite of siting options based on the technical criteria - either on or off base as appropriate and reach the preferred option on environmental grounds using the information generated by the enquiries and surveys over the existing environment.

4.2 Air-to-surface weapons range

Chapter 6 of the supplement to the draft contains information on the selection, operation, existing environment and environmental impacts associated with the proposed range.

The existing environment of the preferred option, a segment of the Delamere Pastoral Lease, has been defined in terms of its flora, fauna, archeology, Aboriginal sites and land use, and pastoral development.

5.0 Review of submissions

The draft EIS attracted 28 submissions; most (25) of these submissions were offered in response to specific invitations either from the Conservation Commission of the Northern Territory or from the Commonwealth Department of Home Affairs and Environment, who are required to co-ordinate assessment under the Environment Protection (Impact of Proposals) Act.

The following is a summary of the submissions addressed to this Commission, and includes additional notes drawn from the respondents' reviews of the supplement to the draft and comments from this Commission on the suitability of the proponent's revision.

Assessment of the project by Commonwealth Departments has been co-ordinated by the Department of Home Affairs and Environment and is reviewed in that Department's Assessment Report. Relevant Departments here include Resources and Energy, Communications, Administrative Services, Aboriginal Affairs and Aviation.

5.1 Office of Aboriginal Liaison, Department of the Chief Minister: the Office, in commenting on the draft EIS, was generally satisfied with the assessment of likely social problems and associated mitigative actions. In commenting on the adequacy of the supplement, however, the Office expressed concern over the renewed response of local Aboriginals - particularly in forming the Katherine Aboriginal Action Group - and undertook to maintain close contact with them and try to anticipate and avoid the development of confrontation situations. This aspect - the disaffection of local Aboriginals - is considered a major potential impact of the proposal and was a consequence poorly understood initially by the proponent. Recommendations 11 and 13 (Section 8) are aimed at augmenting the proposal's acceptance by the Aboriginal community.

5.2 Office of Policy and Planning, Department of the Chief Minister: the Office, in reviewing the draft EIS, made several comments on the format and interpretation of the input-output analysis used (section 8.1 of the draft EIS) and noted that employment effects

outside of the Katherine region have not been considered. The proponent, while acknowledging in the supplement that these comments were valid, considered that the general thrust of the resulting conclusions were unchanged and commented no further. This Commission does not consider that the information provided by the Office of Policy and Planning would greatly change the predicted environmental impacts of the proposal, although there would be some benefit in the proponent providing employment requirements to appropriate agencies as far in advance of start-up times as possible (see Recommendation 10).

- 5.3 Department of Community Development: in reviewing the draft EIS, the Department confirmed the identified social impacts and considered that the structure of community and information services would need review to cater for the changed needs of the community. Although some aspects of potential social issues, particularly the timing and funding of services and facilities upgrading, were considered largely outside the scope of the EIS, continuing discussions by the Joint Consultative Committee, which has representatives from Katherine Town Council and Territory and Commonwealth Departments, should ensure that proper consultation on these aspects by the various bodies concerned will take place. Recommendation 10 relates to the role of the J.C.C..
- 5.4 Museums and Art Galleries Board of the Northern Territory: the Board's review of the draft led to an expression of concern over the proponent's awareness and recognition of the requirements of the *Native and Historical Objects and Areas Preservation Act 1980* and the lack of Board input opportunities to the conduct and interpretation of on-site archaeological surveys. While the proponent has responded sympathetically and allowed the Board access to the original survey reports, some difficulties still exist over the definition and interpretation of the Board's and the proponent's roles within the legislation. Recommendation 9 has therefore been framed to resolve these difficulties.

5.5 Department of Primary Production: the Department was concerned that the various acquisition requirements for base expansion and the weapons range would affect the viability, or limit the development potential, of the relevant pastoral leases and offered the general criticism that the EIS was deficient in its coverage of the regional agricultural and pastoral industries. In response to the first aspect, the proponent noted that the manner and exact extent of land to be acquired for base expansion has still to be determined and will be the subject of negotiation between all parties concerned and further, that all possible options for the expansion of the base would require land acquisition of some form or other. The supplement also contains enough information (sub-Section 4.4.1) on acquisition of land for the air-to-surface weapons range to lead to the conclusion that the future viability of Manbulloo Pastoral Lease need not be directly affected by the current proposal.

The second concern of the Department, over coverage of the impact on regional agricultural and pastoral industries is considered by this Commission to be a type of general criticism that is difficult for the proponent to address. The proponent has identified local and regional land uses, and indicated land with potential for cash crop development or dry land farming; any further analysis of the local agricultural and pastoral industries, beyond the assurance of future viability, must be considered outside the scope of this environmental impact assessment.

5.6 Department of Education: the Department provided the proponent with updated information on school capacities and an alternative demographic analysis in its review of the draft EIS; this information has been included in the supplement. The Department has since expressed concern over possible interference by RAAF radar facilities with Katherine School of the Air programmes. Recommendation 15 has been formulated to resolve this concern.

- 5.7 Department of Transport and Works: in its review of the draft EIS, the Department generally endorsed the proposal, considering that it was a more positive option than the alternative of upgrading RAAF Base Darwin; there remained however an area of confusion with regard to the overall question of water supply. The proponent has responded to these comments, however the Department has considered it necessary to provide a further updating and clarification of the situation in its review of the supplement, particularly with regard to the current status of Katherine water supply augmentation feasibility studies. This information has subsequently been forwarded to the proponent and this Commission will be working closely with Transport and Works on environmental assessment of Katherine water supply options, as an issue distinct from the assessment of the current proposal.
- 5.8 Development Corporation: the Corporation queried the depth of the proponent's investigation of social issues - in particular the effect on the existing Katherine economic and social community. The proponent has responded in the supplement by providing more details of its social impact surveys and public information programme and added the consideration that the function of the EIS is not to encourage the role of others (i.e. entrepreneurial activities), but rather to provide information on which informed decisions may be made. The Corporation has subsequently accepted this argument, however it is felt by this Commission that the J.C.C. has a role to play in co-ordinating the dissemination of information through the Katherine business community and has framed Recommendation 10 to address this aspect.
- 5.9 Housing Commission: the Housing Commission restricted its comments on the draft EIS to questioning the procedure of incorporating the demands of the proposed Alice Springs to Darwin railway in housing projections. The Commission has subsequently considered it necessary however to forward a general comment on the accuracy of these projections, considering them

to be too low and providing updated estimates. These estimates have been communicated to the proponent. The Commonwealth Department of Home Affairs and Environment has addressed the question of funding for off-base housing in its assessment of the proposal and its findings and recommendations are endorsed by the Conservation Commission (see Recommendation 16).

5.10 Department of Health: the Department, in its review of the draft EIS, made a number of comments on mosquito control and addressed some apparent deficiencies in the draft on the issue of health services in the region. The response by the proponent in the supplement has been considered satisfactory by the Department.

5.11 Department of Lands: the Department, in reviewing the draft, commented on the lack of information on acquisition costs for extending the base and realignment of the Stuart Highway, and a shortage of discussion with regard to construction workforce accommodation and impacts on the Katherine business community. The proponent has responded to these comments by presenting an estimate of acquisition costs and the assurance that, "the Commonwealth is taking the necessary planning steps to ensure a timely provision of workforce accommodation for Commonwealth construction activities" (Sub-section 2.1.4 of the supplement). It is noted that the final option to be adopted for construction workforce accommodation has not yet been determined, however this Commission will require input to environmental aspects of this determination and Recommendation 2 has been framed to ensure this. Comments provided under sections 5.3 and 5.8 of this report relate to aspects of the proposal's impact on the Katherine business community, as does Recommendation 10, and it is not considered necessary to comment further here.

5.12 Katherine Skydivers Club: the Club expressed concern over the interference and possible curtailment of Club activities by the proposal. The proponent's response, that club activities should be able to continue largely unimpeded provided suitable liaison

channels are employed, is considered satisfactory; it is in fact highly likely that the Club will benefit from the immigration of a large number of aviation-minded personnel.

- 5.13 Aboriginal Sacred Sites Authority: the Authority considered the draft EIS to be deficient in many areas including: the overall adequacy of the document in providing sufficient, accurate information to allow proper assessment to be made in the context of the impact on Aboriginal sites; the understanding of the proponent's legal obligations with respect to the *Aboriginal Land Rights (Northern Territory) Act 1976* and the *Aboriginal Sacred Sites Act 1978*; the survey, documentation and terminology of reporting sacred site investigations; the identification of Aboriginal food collection areas, the impacts of Katherine township expansion on Aboriginal sacred sites. The Authority also considered the inclusion of comments by a European caretaker on the question of Aboriginal land-use misleading and inappropriate, and was concerned that it had not had the opportunity to assess the impact of the weapons range proposal.

The Authority, in an effort to satisfy itself that the effects of the proposal on Aboriginal sites are fully assessed, has written in detail to this Commission and the Commonwealth Department of Home Affairs and Environment, and has presented a submission at the Public Works Committee hearings on the project. The Authority is still concerned at the time of writing that governmental assessment is being finalized while various studies and reports are outstanding, and that the assessment cannot therefore be considered complete. The Authority is further concerned that in light of a recent land claim in the vicinity, it is likely that the weapons range itself could have significant traditional Aboriginal association.

In responding, the proponent has offered various explanations for the supposed shortcomings and elaborated in some areas where detail was considered insufficient or confusing; the overall impression remains however that liaison and consultation over Aboriginal issues in general is poor and this situation has been reviewed further in Section 7 and addressed in the recommendations of Section 8.

5.14 Northern Territory Agricultural Development and Marketing Authority: in its review of the draft EIS, the Authority showed concern over the inability of local suppliers to cope with sudden peaks in demand for agricultural products and considered the loss of segments of N.T. portion 2034 a major impact.

The proponent, in response to the first point, noted that development timing was dependent on a number of factors and could not necessarily be constrained to suit agricultural marketing difficulties, and, in reference to the aquisition of part of N.T. portion 2034, has undertaken to liaise with the Authority and relevant landholders if and when the aquisition programme proceeds.

5.15 Northern Territory Electricity Commission: N.T.E.C. queried the predicted load growth due to Tindal in the Katherine region, however, as pointed out by the proponent in the supplement, a degree of ambiguity in the summary of the draft EIS led to a misinterpretation by NTEC; this has now been clarified.

5.16 National Trust of Australia (Northern Territory): the Trust was concerned over, (i) the treatment of noise impacts, (ii) the lack of Aboriginal and environmental representation on the J.C.C., (iii) aspects of the coverage of potential cumulative impacts and indirect effects of the proposal, suggesting that option E would have advantages over option F (draft EIS, section 4.3) in the location of on-base facilities, and (iv) lack of access to the impact assessment studies for the air-to-surface weapons range.

(i) With regard to noise levels, the proponent has provided further information on the use and effectiveness of the investigative procedures summarized in the draft EIS, and has reiterated the critical statement in the draft that flight paths would be the subject of review during Base operation. This Commission feels that provided a suitable mechanism for liaison is in place and freely accessible by the public, the effect of noise on human activities can be reduced to the satisfaction of the

majority of the community (see Recommendation 12). The effect on fauna is less easily quantified and while the supplement contains valuable additional information on potential disturbances, the critical statement remains that the fauna of at least the western portion of Cutta Cutta Caves Nature Park will be subjected to some disturbance (supplement subsection 9.2.3). It is proposed that this disturbance should be monitored by a co-operative RAAF/CCNT exercise during early base operations, and Recommendation 6 has been framed to allow for this.

- (ii) With regard to Aboriginal and environmental representation on the J.C.C., this Commission is informed that the former is now in place; representation to the J.C.C. of environmental matters outside or beyond the scope of the formal environmental assessment process can take place through sitting representatives if necessary.
- (iii) The major indirect effects of the proposal will be related to the off-base housing of personnel and the augmentation of Katherine water supply. With regard to housing, the design of all subdivisions is routinely assessed, and impacts on natural drainage and other construction aspects are subject to the provisions of the *Planning and Building Acts*. Studies relevant to the augmentation of Katherine water supply have been discussed in section 5.7.

With regard to the location of on-base facilities, the proponent has eliminated the major cause of concern by the Trust - the location of the engine run-up facility - by repositioning this facility to a more central location within the base, thus reducing the possibility of excessive off-base noise levels.

- (iv) The details of the air to surface weapons range surveys have been incorporated into the supplement.

- 5.17 Bureau of the Northern Land Council (NLC): the NLC addressed its comments to the context of social impacts on the existing Katherine region Aboriginal population. The issues that have been raised by the NLC and other Aboriginal interest groups have led to the independent formation of the Katherine Aboriginal Action Group as discussed previously in subsection 5.1. The principal achievement of this group to date has been to encourage more active liaison and input for Aboriginal interests to the decision-making processes by demanding, and obtaining, the right of Aboriginal representation on the J.C.C.

It is felt by the Conservation Commission that this development, plus the normal communication channels available to the NLC and other Aboriginal representative bodies, will serve to create a climate whereby adequate mechanisms will exist to allow the early identification and resolution of social impacts on the local Aboriginal population. At present the Commonwealth has proposed incorporating provisions in tender documents that are designed to assure local Aboriginals full access to employment opportunities arising from the project (section 8.1 of the supplement).

- 5.18 Darwin Environment Centre: the Centre's initial comment, that the Government had decided to go ahead with the project on December 14 - thus negating the validity of the environmental assessment exercise - high-lighted a widespread misconception that has led to concern throughout the Katherine community. The decision referred to was in fact, as explained in the supplement, that of the Senate directing the proponent to proceed with the preparation of a hearing with the PWC. This does not pre-empt any of the environmental assessment findings.

The Centre also commented on possible contamination of Tindal aquifer and Four Mile Creek; with respect to Tindal aquifer, this Commission shares the Centre's concern and is not satisfied with the proponent's response (that Tindal aquifer is anticipated to flow towards Katherine River where any pollutant would be diluted). Recommendation 1 addresses this issue. The proponent has designed and commenced implementation of a water

sampling and monitoring programme that will survey the effects of the development on Four Mile Creek.

The Centre also expressed concern over the possibility of sinkholes beneath the proposed development area, and commented on the adverse affects of noise on Cutta Cutta Caves fauna. The possibility of sinkholes is well known to the proponent and is the subject of extensive geophysical investigation by the Department of Housing and Construction (refer subsection 4.1 of the supplement). This Commission's position on possible noise effects to Cutta Cutta Caves fauna has been previously discussed in sub-section 5.16.

- 5.19 Mr K Lansdowne, local property owner: Mr Lansdowne expressed concern over the lack of prior consultation on the subject of land aquisition and the loss of a portion of his property that receives valuable early rainfall, and further considered that the viability of his property was put unnecessarily at risk due to the 'broad bush' approach adopted by the proponent.

The proponent, while apologising that this landowner was not informed, has undertaken that discussions will take place with affected landowners at the appropriate planning stage and will cover access and lease-back arrangements. This is considered the most appropriate response at this stage and is reinforced in this report's recommendations (section 8).

- 5.20 Mr M K Presnell, private citizen: two of Mr Presnell's comments {effects on Cutta Cutta Cave fauna (5.16) and the question of water supply (5.7)} have been previously addressed in referring to those of other respondents, and a further concern - on-site storage of domestic wastes - has been negated by a changed strategy from the proponents (subsection 2.2.6 of the supplement). Mr Presnell also commented on (i) the question of compatability between civil and military operations, (ii) the need for further information on the rationale of developing Tindal as opposed to alternatives, and the effect of downgrading RAAF Base Darwin, (iii) potential soil erosion by levee bank formation, (iv) the need for information on the sources of

construction materials, (v) the lack of information on the weapons range at Delamere, and, (vi) the land requirements for the HF remote receiving station.

- (i) Fears over poor compatibility between civil and military operations have been negated by the Commonwealth Department of Aviation who is responsible for civil operations (subsection 4.7.2 of the supplement).
- (ii) The proponent considered that alternatives to the current development had been discussed as far as possible, within the context of security requirements, in the draft EIS, and offered no further comment. In this Commission's opinion, the only real alternative given the proposed function of the Base as a forward defence operation, was RAAF Base Darwin, and the arguments against further development of this Base were adequately presented in the draft EIS and subsection 2.1.2 of the supplement. The comment by Defence that the strategic importance of Katherine is virtually unchanged by the proposal (4.7.3) is largely accepted and should be properly communicated to concerned members of the public (see Recommendation 14). The effect of reducing RAAF Base Darwin back to its pre-September 1983 level - that is, prior to the relocation of 75 Squadron from Malaysia - has been addressed by the proponent in the supplement (7.5) and this Commission agrees that the economic effect of this will be minimal.
- (iii) On the question of potential soil erosion in the vicinity of levee banks, the proponent's response, that flow rates should be low enough to preclude erosion, should prove correct. It is proposed however that this Commission's Land Conservation Unit be invited to closely liaise with the proponent on various aspects of soil erosion, particularly during the construction phase and the first few wet seasons, to ameliorate any potential impacts (see Recommendations 3, 7).
- (iv) Potential sources of construction material have been identified in the supplement although at this stage details on sources and supply are not finalized. The development and

operation of extractive industries is subject to the provisions of the *Mining Act* administered by the Northern Territory Department of Mines and Energy; this administration involves responsibility for environmental assessment including the effects of mining river beds and the standards of rehabilitation required.

(v) The lack of information on the air-to-surface weapons range was the subject of many comments and it is unfortunate that the relevant survey information was not available during the public review period. Wide circulation of the supplement has not produced adverse comment on this aspect from previous respondents, with the exception of the Aboriginal Sacred Sites Authority. The proponent will be incorporating all factors relevant to the operation of the range into a Management Plan similar to that proposed for Tindal itself; Recommendation 3 has been designed to ensure input to the plan by this Commission and other appropriate authorities.

(vi) The HF Remote Receiving Station (HFRRS) will require a 4000 ha area, 90% of which will be available for pastoral and foraging use but which will be controlled to exclude unsuppressed electrical ignition systems and electric arc welding equipment. In other words, 3600 ha of the area can be used, although farm machinery or vehicles will not be admitted. This fact, in addition to the technical requirement that the 5km² core of the HFRRS site be virtually flat and treeless, renders the facility a major impact on the existing environment and local land use practises. Mr Presnell's comment, that further details of alternative sites are needed and that the need for such a large parcel of land to be alienated should be addressed, are valid and are the subject of a detailed response in the supplement (subsection 5.1).

It is this Commission's view that the removal of all vegetation from a 5km² area and the alienation of a further 35km² of land is of sufficient importance to warrant separate assessment. Recommendation 4 relates to this.

- 5.21 Conservation Commission of the Northern Territory: many of this Commission's comments were similar to those provided by various other respondents and the proponent's responses have been previously referred to in the appropriate subsections (e.g. 5.18, 5.7, 5.16.i, 5.20.iv, 5.20.v, 5.20.vi): others have been negated by new information (e.g. queries on garbage disposal, sinkholes).

The proponent has responded satisfactorily to the majority of the remaining CCNT queries (e.g. recognition of assessment requirements, the decision making process with regard to the landing system options, details of previous contamination of the Tindal aquifer, standards for the workplace environment, legal requirements on the handling and disposal of toxic wastes), while further discussion is appropriate for the remainder as follows;

- (i) birdstrike - this Commission recommends that floodlighting using non-attractant wavelengths, as referred to in the supplement (Subsection 4.3.1), be utilized to the widest possible extent on the Base (Recommendation 5)
- (ii) Base Management Plan - this Commission anticipates the opportunity for considerable input to this plan, and will be addressing such areas as potential groundwater pollution, landscaping, waste collection and handling, fire management strategies, road construction techniques, soil erosion control etc, in more detail at that time (Recommendation 3)
- (iii) funding - timing; while it is accepted that Departments/ Authorities other than the proponent have some carriage of responsibility with respect to the provision of additional community facilities, this Commission feels that the proponent has a responsibility to provide adequate information to allow appropriate responses. This is particularly important with regard to the timing of the various responses, and the proponent must provide, through the J.C.C., details of the development strategy

timing as far in advance of events as possible (Recommendation 10)

- (iv) access road construction - the various off-site facilities related to the proposal will require access. The determination of access routes will require inspection by this Commission and officers of the Department of Transport and Works some time in advance of proposed construction schedules in order for the proponent to minimize environmental damage
- (v) Phytophthora control - the proponent has acknowledged CCNT concern over the importation of construction equipment from areas contaminated with the die-back fungus, and has stated that 'the proponent will liaise with the relevant authorities to incorporate reasonable conditions into contract documents'. It is this Commission's view that the only acceptable condition will require thorough cleaning of equipment at its departure point and inspection before acceptance onto the Tindal site (see Recommendation 8)

6.0 Environmental Impacts

This section discusses the expected impacts of the Tindal proposal. Most of these impacts will be reduced by the adoption of the appropriate recommendations from section 8, however some, such as the direct impact of lengthening the runway, cannot be avoided if the proposal proceeds.

6.1 Impacts on Flora and Fauna

Any development that alienates native habitat must affect local fauna and flora. For fauna, this effect includes the reduction of available food resources, destruction or alteration of protective and reproductive habitat, and the interruption of movement corridors. For flora, effects include the possibility of introduced diseases or exotic species, or of complete destruction.

The expansion of the Tindal base itself will alienate a further 77km² of the immediate surroundings with some unavoidable degradation of the natural environment. In terms of the floral community, this will not have a serious effect as local species are well represented regionally. The exception to this is the Ficus community type associated with local karsts; these communities are quite small and specialized and, although they are present elsewhere locally, particularly in Cutta Cutta Caves Nature Park, their destruction should be avoided wherever possible. No other particularly notable species or assemblages have been identified for the areas proposed for off-base developments.

A potential impact of increasing importance for all large-scale development projects is the spread of die-back disease. The fungus responsible for this disease - Phytophthora cinnamoni - can be transported large distances on earth-moving equipment (as well as recreational vehicles, etc) and can affect all levels of the natural community with its destructive effects. An outbreak of die-back disease at Nhulunbuy, on the Gove peninsula, is currently under intensive examination and government is concerned that conditions conducive to further outbreaks do not occur.

Faunal effects, apart from the unavoidable effect of any direct impacts at the air-to-surface weapons range, will be quite widespread but not generally destructive enough to be considered a constraining influence. A small number of uncommon, rare or endangered species are found in the Katherine/Tindal area and the proposal can be expected to directly effect them to some degree; the introduction of domestic pets, the attraction of vermin by poor 'housekeeping' techniques and direct habitat destruction (of, for example, nesting mounds for hooded parrots) will result in an increase in competition for remaining niches.

The habitats facing destruction or alienation by this proposal are represented in the regional national parks and reserves, and the conclusion, of the proponents, that the proposal will not seriously affect local fauna, relies on the assumption that these areas will maintain their integrity.

The assertion that this proposal will not affect the regional conservation areas must be continually reviewed; this is critically important in relation to the water quality of Cutta Cutta Caves deep pools - the habitat of the unique blind shrimps Parisia unguis and P.gracilis. These shrimp, whose taxonomic affinities have only recently been determined, have, as their only direct relative, a congeneric associate in a similar habitat on the island of Madagascar. The species are therefore considered important evidence for continental drift theory, the postulation being that Australia and Madagascar were once joined together as Gondwanaland before separating some 125 million years ago. The protection of these species' habitat must therefore have a high priority.

The indirect effects of the proposal on flora and fauna stem from the virtual doubling of the Katherine population. Recreational facilities will be subjected to increasing pressure, there will be an increase in land clearance for agricultural/horticultural purposes, and leisure - time activities such as hunting, off-road driving and motorized aquatic pursuits will have a greater chronic impact.

Floodlighting of on or off-base facilities will attract insects and insectivorous species, while sewerage treatment ponds will attract insects and wading birds. Bushfire control activities will reduce

some habitat availability and subsequent regrowth from burns is an established attractant of the plague locust. Large areas of mown grass around the airfield will tend to concentrate some species of birds.

6.2 Noise Effects

Noise effects can be divided into effects on human activities (6.2.1) and on the natural community (6.2.2)

6.2.1 Human Activities: the effects of aircraft noise intrusion will stem from the proximity of the receiver to the noise source and the difference of the new noise situation to that previously experienced. Flight paths therefore play an important role in ameliorating intrusive effects and it is expected that chronic noise disturbances may be attended through the appropriate routing of aircraft movements. The paths displayed in figure 9.1 of the EIS supplement have illustrated the basic intention of the proponent to minimise noise intrusion to population or conservation centres.

The effects of the increased aircraft activity on the base itself can be minimized by appropriate siting and acoustic treatment of facilities. Some noise effects must be accepted as part of the occupational environment of RAAF personnel although workplace standards apply to this project as they do to any other.

6.2.2 Natural Community: the major regional conservation centre - Katherine Gorge National Park, should not be noticeably affected by the noise effects of this proposal. This cannot be said for the closer centre of Cutta Cutta Caves Nature Park.

This Park, generally considered valuable as a tourist resource where an interesting 'live' cave system may be viewed in a safe and controlled way, has many sub-systems that are not particularly suited to guided tour operations and are not open to the public. These sub-systems, as well as the main system and other smaller systems within the park, form an important

habitat for a variety of bat species, of which one, the Grey Ghost Bat (Macroderma gigas), is recorded as an endangered species in the IUCN Red Data Book of Endangered Species, while a second, the Orange Horseshoe Bat (Hipposideros ater), is the subject of a current application for inclusion. The proponent considers that Cutta Cutta Nature Park will be subjected to some level of noise effect however the availability of alternative habitat is not known, nor is the degree of disturbance that can be expected.

Noise effects on regional bird-life are also poorly understood - and this has particular relevance in respect to Australia's requirements as a signatory to international treaties concerning migratory birds (such as the 'Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment', concluded in February, 1974) however the various bird habitats that will be affected by increased noise intrusion are generally well represented in alternative, unaffected portions of the Katherine - Tindal region.

6.3 Land-use effects

For convenience, this section has been divided into effects on Aboriginal land-use (6.3.1) and those on other segments of the community (6.3.2)

- 6.3.1 Aboriginal Land-use: Aboriginal land-use has the potential to be affected by this proposal in the context of the access to, and use of, foraging areas, and by the interruption of general movements. Particular concern has been voiced over the process used to determine siting options for the HF Remote Receiving Station, with the upper King-Roper option - the preferred site of the proponent - not that preferred by the Aboriginal community or the Conservation Commission, either in terms of land-use or the potential impact on flora and fauna.

The recent application for tenure, under the *Aboriginal Land Rights (Northern Territory) Act 1976*, over a portion of pastoral lease immediately south of the proposed air-to-surface weapons range, would seem to indicate the possibility that traditional Aboriginal associations may also extend over part or all of the range; this application has been brought to the attention of the proponent subsequent to the production of the final EIS and its effect on the weapons range part of the proposal has not yet been determined.

- 6.3.2 Other Land-use: the proposal will involve various acquisitions by the proponent, appropriate landholder/proponent compensation arrangements, and the subsequent lease-back of the bulk of the HF Remote Receiving Station (HFRRS) and weapons range sites. The lease-back portion of the HFRRS (35km²) will be alienated however to the extent that the use of non-suppressed electrical ignition systems and arc-welding equipment will not be permitted, therefore restricting the development of the area for any agricultural/horticultural purpose using standard techniques, or its use as a vehicle transit route.

The proposal will reduce the land available for potential agricultural development (on N.T. portion 2304 of Manbulloo and on Kumbidgee and Delamere Stations) and will interrupt the access route to N.T. portions 2304, 2305 and 2113 (see Map 1). It is considered however that firstly, the agricultural potential for the acquired land would not be great in the regional context and secondly, that this potential will be considered in any compensation arrangements arrived at between the proponent and the leaseholders. Access route interference will not be a problem as the proponent has shown an awareness of the issue and will assist in the development of alternatives.

The increase in population brought about by the proposal's implementation will result in increased pressure for recreational land use. Impacts will result from greater use of pastoral leases for hunting activities, from increased fishing

and use of local waterways and from increased activity by off-road recreational vehicles. The integrity of sites with significant conservation value or with sacred Aboriginal connotations will be at greater risk from these increased pressures.

6.4 Social Impacts

The effect of doubling the size of the Katherine community will be considerable, with aspects of the social structure and ambience altered. The proponent is fully aware however, of the potential for a degree of community dislocation, and is familiar with the difficulty of fully integrating its activities with those of the existing community.

Efforts by the proponent to identify and minimize social impact have included a social baseline study, a public information programme, a social survey of Katherine residents, specialized consultation with Aboriginal people, community group discussion sessions and a public meeting in Katherine. This activity has been augmented by social surveys of RAAF personnel and their families, and by extensive discussions with Commonwealth, Northern Territory and local government organizations.

There has been a degree of uncertainty however within the Katherine community over the social effects of the proposal. This was exacerbated by the popular misconception that the decision by the Senate in November 1983 to refer consideration of the proposal to the Parliamentary Works Committee actually gave the proponent permission to proceed thus pre-empting any community input into the development of the proposal; the fact that this is incorrect has been transmitted to the community as clearly as possible by the proponent and the J.C.C.. The effects of abridging the large amount of information accumulated during social impact investigations into a concise EIS format has led to the appearance of deficiency to some community elements, a situation further confused by the timing of some aspects of the public awareness and social survey campaigns.

It is this Commission's view however, that the proponent has at least identified the potential for social impact to be brought about by this proposal, and has demonstrated a willingness to fulfill its responsibilities in this context. The most effective mitigative technique here will be the development of a positive attitude of co-operation and the development of workable liaison channels between the existing community and the proponent.

6.5 Other Effects

6.5.1 Air pollution; some pollution will result from increased residential burning activities (barbecues, garden refuse), RAAF fire drill and incineration practices, bushfire control burns, and aircraft emissions. Impacts to air quality due to the operation of the Tindal base or the air-to-surface weapons range will be addressed in the respective management plans at which time appropriate procedures for impact minimization will be adopted. Impacts from residential activities will be minimal.

6.5.2 Water pollution; soil erosion may affect local water quality when the HF remote receiving site, the various on-base sites, the airfield surveillance radar site, the locator beacon sites, the various access roads and highway relocation works are commenced. For all aspects of the development, soil erosion control guidelines will be required.

Surface water and contaminants (such as hydrocarbon spillages) on the Tindal base itself will have access to the underlying Tindal aquifer. Pollution of this aquifer would affect its potential for human and stock consumption, its use as an irrigant or by native fauna (such as in the deep reservoirs of Cutta Cutta Caves) and the water quality of Katherine River.

7.0 Conclusions

This proposal represents one of the largest developmental projects planned for the Northern Territory. The economic, social and strategic benefits of the Tindal project will be numerous however this assessment has, for brevity sake, concentrated on the potential detrimental impacts in order to identify - and help mitigate as far as possible - the environmental cost, to the extent that this qualitative detriment does not outweigh the quantitative benefit.

The major impacts of this project will be social, with the greatest potential drawback being the effect on the regional Aboriginal population. There will also be potential for the disaffection of other segments of the regional community, and it is felt that the successful strategy to combat these effects will rely on full, well-publicized and easily accessible liaison and communication channels.

Effects on regional fauna are not generally expected to be great, however further review on these effects is considered appropriate, and on the effects of some of the off-base proposals.

The recommendations in the following section have been framed with these findings in mind.

8.0 Recommendations

These recommendations are the result of environmental assessment of the Tindal proposal: this assessment has taken into consideration the results of the public review programme, the content of the draft and supplement EIS and various subsequent information.

Full implementation of the following recommendations will generally ameliorate the impacts that are an inevitable consequence of such a large-scale proposal. The possibility of unforeseen impacts has been recognized nonetheless, and has been addressed by highlighting the most suitable liaison channels for the development of resolution mechanisms.

It is recommended;

1. that the relationship of the underlying Tindal aquifer to the Tindal Base and the Cutta Cutta Caves Reserve be established to the satisfaction of the N.T. Department of Transport and Works (Water Division) and the Conservation Commission,
(Note: the assumption by the proponent is that water flows via the aquifer in the direction caves - Tindal Base - Katherine River; this is probably valid for the majority of the time, however it is anticipated that this flow may reverse in times of aquifer re-charge with the consequence that groundwater pollution from the Base would access Cutta Cutta Caves deep pools to the detriment of the unique faunal component of the pools. The objective of this Recommendation is to determine the potential for this impact to occur, with the understanding that the results may require action under the *Control of Waters* or *Environmental Assessment Acts*),
2. that the proponent be required to invite environmental impact assessment from the N.T. Government through the Conservation Commission, if it is decided to provide an on-site construction camp with permanent workforce accommodation,
3. that the proponent be invited to submit the Base and air-to-surface weapons range management plans, referred to in section 11.5 of the draft EIS and 6.4.9 of the supplement, to this Commission and to the Commonwealth Department of Home

Affairs and Environment at the draft stage in order that these Departments may assist in the amelioration of potential long-term impacts,

4. that the location of, and alternatives to, the current preferred option for the HF Remote Receiving Station site be the subject of further and separate assessment through the compilation of an additional environmental report at Preliminary Environmental Report level, with the Conservation Commission to liaise with the proponent over a suitable format and scope (Note: the alienation of 40km² of pastoral/Aboriginal foraging land with the clearing of a central 5km² core is a major impact in any context and has not been properly assessed due to its inclusion as a minor aspect of the overall proposal),
5. that the proponent adopt the findings of Van Tets et al referred to in section 4.3.1 of the supplement and maximise the use of floodlighting that excludes wavelengths below 530nm,
6. that the potential effect of noise on the fauna of the Cutta Cutta Caves Nature Park be the subject of a separate consultancy in order that some quantification of this impact be achieved. The scope of this consultancy to be determined by the Conservation Commission in liaison with the proponent,
7. that the proponent formally invite the Land Conservation Unit of the Conservation Commission to provide assistance with the design and construction of the flood mitigation levee banks referred to in section 4.1 of the EIS supplement,
8. (a) that the proponent undertake to require that contractors who wish to transport construction/earth moving equipment into Katherine/Tindal from outside the Katherine region (as defined in Fig 1.6 of the draft EIS) will clean such equipment at the point of departure, and present it for inspection by the Tindal site management: the management will inspect the equipment for transported material - particularly mud or earth on tyres and wheel arches - and refuse admittance (except as referred to in 8b) if the equipment has not been cleaned,
(b) that the management of the site determine, subject to

approval by the Conservation Commission, an area where vehicles contaminated by debris from outside the Katherine region may be cleaned (Note: this Recommendation is designed to minimize the chances of spreading the die-back fungus Phytophthora cinnamoni into the Katherine region, and allocates responsibility for this control to the proponent),

9. that the proponent's environmental consultant liaise directly with the Museums and Art Galleries Board of the Northern Territory to the extent that the Board will be able to inform the Conservation Commission that the provisions of the *Native and Historical Objects and Areas Preservation Act 1978* have been complied with to the Board's satisfaction,
10. that the role of the JCC be enlarged to include the assumption of responsibility for the co-ordination and dissemination of information on the status and progress of the proposal, particularly to the Katherine regional business and pastoral communities, and in relation to the provision of advance warning of workforce requirements to appropriate employee organizations,
11. that the proponent encourages popular acceptance of the JCC Aboriginal representative as the co-ordinator of Aboriginal representations and activities related to this proposal,
(Note: various bodies have responsibility for the Aboriginal social and land-use impacts e.g. Office of Aboriginal Liaison, Aboriginal Sacred Sites Authority, Yulngu Association, Katherine Aboriginal Action Group, Department of Aboriginal Affairs, etc, and the above has been formulated to aid the co-ordination of these bodies' activities.)
12. that the proponent co-ordinate through the JCC to publicise an access channel for noise complaints, with the Conservation Commission to be informed of the structure of this channel,
13. that the focus of liaison for Aboriginal social issues be through Aboriginal representation on the Joint Co-ordinating Committee (JCC); awareness of access for Aboriginals to this liaison channel to be suitably published among those concerned, with all decisions pertinent to the identification and amelioration of Aboriginal social and land-use impacts to be debated, co-ordinated and publicised through this forum,

14. that the proponent act to reassure the public of the Katherine region that the strategic importance of the area would be virtually unchanged by the implementation of the current proposal. This assurance to be based on the argument put forward in section 4.7.3 of the EIS supplement,
15. that the proponent liaise with the Department of Education to effect a satisfactory resolution of that Department's concern at possible interference to 'School of the Air' transmissions, to the extent that the Department can inform the Conservation Commission that a satisfactory resolution has been achieved, and
16. that the findings of the Commonwealth Department of Home Affairs and Environment in consideration of the provision by the Commonwealth of auxiliary funding - required by the Northern Territory Government for the infrastructural developments that will be needed if this proposal proceeds - be endorsed and communicated to the JCC.

Appendix 1

Membership of the Joint Consultative Committee, April 1984.

Core members comprise

- a) Commonwealth
 - 1) Department of Defence
 - 2) RAAF
 - 3) Department of Housing and Construction
 - 4) Department of Finance
- b) Northern Territory
 - 1) Office of the Co-ordination General, Department of the Chief Minister
 - 2) Department of the Treasury
 - 3) Department of Transport and Works
- c) Katherine Town Council

Representation limited to one member from each Department plus advisers as required. Representation from other Departments to be invited when required.

Note: formal Aboriginal membership has been agreed to by JCC, however the specific mode of representation has not yet been determined.

A JCC working party to examine problems related to the provision of housing and land aquisition was formed at the JCC meeting of 7 April 1983. Membership comprises:

Commonwealth	Department of Defence
	Department of Housing and Construction
	Department of Administrative Services
Northern Territory	Office of the Co-ordinator General, Department of the Chief Minister
	Housing Commission
	Department of Lands
	Department of Transport and Works