

Cardell

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(DHA Tindal)

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RAAF Base Tindal

Statement of evidence to the
Parliamentary Standing Committee on
Public Works

Proposed development of housing for Defence at
RAAF Base Tindal, Northern Territory

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Proposed Development and Construction of Housing for Defence at RAAF Base Tindal, Northern Territory

Need for works

Identified need

1. There are currently about 330 Defence members with dependants who reside in the Tindal/Katherine area in the Northern Territory (NT). The township of Katherine is 320 kilometres southeast of Darwin and RAAF Base Tindal is a further 18 kilometres southeast of Katherine (Supplementary Item 1 – Map of Katherine/Tindal).
2. To meet the housing needs of these families, DHA manages about 320 dwellings in the Katherine/Tindal area - 193 Defence owned dwellings on RAAF Base Tindal and the remainder are Defence and DHA properties in Katherine. At 1 November 2013, an additional 10 families or 3 percent of the total were in private rental accommodation and receiving a housing subsidy in the form of Rent Allowance (RA).
3. The proportion of families receiving RA is low because of the constrained nature of the private rental market in this remote locality and because rental accommodation in the region is of a generally low standard.
4. The medium term requirement for Defence family housing in the Katherine/Tindal area is largely unchanged. In order to maintain the overall number of houses in the Tindal/Katherine portfolio, while replacing houses that do not meet the new standard¹ and houses for which leases will expire, DHA has programmed the addition of 71 dwellings, through constructions and acquisitions, over the financial years 2013/14 to 2016/17. These figures are derived from DHA's capital investment and residential construction program for the NT region.

¹ In 2006, Defence introduced its New Housing Classification Policy that increased the minimum standard for Defence housing. Some of DHA's Katherine portfolio does not comply with the new minimum standard. These dwellings cannot be candidates for lease renewal, adding to the 'churn'.

5. There will be a mix of unrelated constructions and acquisitions, totalling 21 dwellings, in Katherine to ensure that a proportion of Defence families continue to reside within the local community. Nine of these Katherine dwellings were previously approved on 29 November 2012 following a Medium Works submission to the Parliamentary Standing Committee on Public Works (PWC) and are now in construction. The residual 12 dwellings are scheduled for delivery by November 2014.

Options considered for meeting the need

6. The acquisition of 'broad acre' land within local communities followed by development and construction is DHA's preferred delivery method because of the economies of scale associated with bulk procurement of house constructions, surety of supply and higher margins associated with wholesale land development.
7. Other options include the construction of on-base housing, the purchase of developed land (serviced allotments) followed by construction, the purchase of established houses, the upgrade of current houses and direct leasing of suitable housing where possible.
8. Currently none of the 69 leased houses in Katherine meet the new Defence housing standards and all will be returned to the owners at end of lease. DHA has evaluated the option of jointly funding upgrades of leased properties with the costs shared between DHA and its lessors. This option, while initially cheaper, only secured an upgraded property for an extended lease period and lacked the long term viability of building on RAAF Base Tindal.
9. DHA leases in Katherine expire gradually between 2013 and 2018, with options for DHA to extend leases on selected dwellings to ensure that there is no overall reduction in family accommodation for Defence members. On return of the dwelling to the investor, the addition of this existing housing into the Katherine community will serve to reinvigorate the market and provide a greater level of housing choice for the public in this housing constrained remote region.
10. In relation to this proposal, a 'broad acre' development in Katherine is not viable because of the lack of developable land and generally underdeveloped nature of the local housing market which could not sustain a new development of this size. DHA has

held discussions with local developers and evaluated the large scale development option as not viable within the medium term.

11. Accordingly, in ensuring the best mix between on-base housing and constructions in Katherine, Defence and DHA have jointly determined that a major project to build 50 new on-base dwellings is the most cost-effective means of supplying bulk housing that meets the new minimum standard for families posted to RAAF Base Tindal while maintaining an optimum balance between social inclusion and addressing the realities of inserting mainly young families in this remote area.

Historical background

12. Often called the 'Crossroads of the North' because of its location, Katherine is the fourth largest town in the Northern Territory and is located 320 kilometres southeast of Darwin on the Katherine River. With a population of about 10,000, Katherine is a modern thriving regional centre that offers a wide range of services to communities from the Western Australian border to the Gulf of Carpentaria on the Queensland border. There is a modern air conditioned shopping centre, hospital, sports grounds, parks and gardens as well as a large number of Commonwealth and Territory Government services.
13. In 1956, the then government decided that a site was to be selected for an airfield which would be '*mutually supporting with Darwin*'. The present site satisfied the conditions that the site not be '*subjected to fall out from a nuclear weapon aimed at Darwin, be easily accessible by road or railway, have an adequate water supply and to be no further from Darwin than 200 miles (322 kilometres)*'. RAAF Base Tindal, a former World War II airfield, was subsequently reconstructed as a bare base, with facilities for deployed squadrons, during the 1960s. In 1984 the Government made a decision to establish the base as a manned, operational military airfield. The first stage of its development, providing for the permanent basing of a tactical fighter squadron, was the subject of the PWC's Twelfth Report of 1984.
14. The base is a link in a chain of Australian Defence Force airfields stretching across northern Australia from Learmonth in Western Australia to Townsville in northern Queensland. It is the home base for No 75 Squadron, a tactical fighter squadron

equipped with F/A-18 Hornets. RAAF Base Tindal is also a staging base for exercises conducted in the area and, in conjunction with Delamere Air Weapons Range located some 150 kilometres to the southwest, it is used extensively to exercise deployed RAAF elements. The range, through bilateral Defence agreements, also accommodates a number of international air force exercises.

15. The base has become an important part of the Katherine community, with Defence personnel and families accounting for around 25 per cent of Katherine's total population. Concurrently, a program is underway to refurbish and upgrade existing housing on-base at RAAF Base Tindal. This program will take place alongside the proposed construction of new homes. PWC Report 6/2012 describes the current upgrade project.
16. The proposed new Tindal residential development site is on Commonwealth land adjoining existing Defence housing, measuring approximately 17 hectares (Supplementary Item 2 – Tindal housing site). The new Tindal site is vacant land, within a residential zoning and extends the Married Quarters Precinct where existing houses and associated services are available.

Heritage impact

17. Archaeological and anthropological assessments have been undertaken for the entire RAAF Base Tindal area in the 1980s and early 2000s, with culturally significant sites being identified and subsequently mapped. An Aboriginal Areas Protection Agency (APPA) search has confirmed the validity of this mapping. It has been established that any recorded sites of significance are well away from the proposed development area.
18. A more recent archaeological study undertaken in 2012 by Defence documented the presence of an engraving on a quartzite boulder, known as the Imparja Rock, which may potentially be of medium significance. The proposed development site boundary is not closer than 350 metres from this potential anthropological site. Further investigations are currently being undertaken by Defence in consultation with APPA on the level of significance of this site.

19. If required by APPA, an APPA Certificate for the proposed development works will be undertaken prior to development to identify any specific management measures to be implemented before, during or following construction.

Environmental matters

20. All work on Defence bases requires submission and approval of an Environmental Clearance Certificate (ECC). The ECC must be submitted by the principal contractor and is reviewed and approved by the Environmental Officer at RAAF Base Tindal. No works can commence until this approval is received. The ECC addresses all potential environmental issues and covers the scope of works, site plan, construction program, Environmental Management Plan (EMP), Defence Green Building Requirements and Safety Management Plan (SMP).
21. The proposed development site was subject to an Initial Environmental Review in 2012. This report concluded that potential environmental impacts associated with the proposed development are likely to be mitigated sufficiently to be assigned a low risk rating in accordance with the Defence Estate Risk Assessment Tool (ERAT). This recommendation was subject to compliance with existing Defence procedures, implementation of the recommendations contained in the report and continuation of existing environmental monitoring programs already in place at RAAF Base Tindal.
22. A flora and fauna study was undertaken in 2011 and has been referenced in the Initial Environmental Review and Construction Environment Management Plan (CEMP). The study reviewed the presence of flora and fauna on site, or with potential to occur on site, against the listed threatened ecological communities and species identified in both the *Environment Protection and Biodiversity Conservation Act* (EPBC Act) and *Territory Parks and Wildlife Conservation Act* (TPWC Act). With regards to flora, the study concluded that no EPBC Act or TPWC Act listed threatened ecological communities or flora species had been recorded, nor would they likely occur, at RAAF Base Tindal or the subject site area. With regards to fauna, the study concluded that the development is unlikely to have any impact on any listed threatened fauna populations.

23. In response to the pre-existing flying fox problem at the base, a RAAF Tindal Flying Fox Management Plan was prepared by Defence. Excessive numbers have at times frequented the site, causing concern for the safety of residents and aircraft operations. The new development has been designed to adhere to an approved vegetation species list and includes the use of flying fox repellent vegetation. As an example, lemon scented tree species are incorporated into the landscape plans for the site.

Contamination

24. The project area does not contain any known contamination sites and, given it is a relatively undisturbed bushland site, existing contamination is unlikely. Some contamination is known to have occurred at RAAF Base Tindal, including hydrocarbon contamination of soils in the smear zones surrounding the Fuel Farms and a hydrocarbon plume in the groundwater near the motor transport area. The base maintains a Contaminated Site Register which lists 24 sites classified as having medium or high contamination risk. The closest registered site is 1.2 kilometres away and no effect is predicted.

Key legislation

25. The following key legislation is relevant to this project:
- a. *Environmental Protection and Biodiversity Conservation Act 1999*
 - b. *National Environment Protection Council Act 1994*
 - c. *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
 - d. *Defence Housing Australia Act 1987*
 - e. *Building and Construction Industry Improvement Act 2005*
 - f. *NT Bushfires Act 2009*
 - g. *NT Environmental Assessment Act 1994*
 - h. *NT Heritage Act 2011*
 - i. *Northern Territory Aboriginal Sacred Sites Act 2012*
 - j. *Territory Parks and Wildlife Conservation Act 2011*

- k. *NT Soil Contamination and Land Utilisation Act 2009*
- l. *NT Water Act 2011*
- m. *NT Waste Management and Pollution Control Act 2011, and*
- n. *NT Weeds Management Act 2001.*

Impacts on local communities

- 26. RAAF Base Tindal is located in an isolated area on Commonwealth land with approximately 5 kilometres of rural land between the western boundary of the base and the suburban edge of Katherine.
- 27. DHA has engaged a Social Planning consultant to undertake a review of existing on-base and Katherine social infrastructure, including facilities and services. The *Social and Cultural Planning Report – Services and Facilities Needs Analysis* (October 2013) summates that the needs of the new residents will be met through a range of existing facilities and services. It also recommends specific facilities to be provided as part of the proposed development, such as the central park complemented with a range of facilities including playground, gazebo and barbeque facilities, the community garden and shed, all of which offer a range of outlets for creative activity and community education.

“The proposal for 50 new dwellings, specifically designed to a high standard, to meet the needs of family households and for tropical conditions, is considered an important benefit of this project. Further benefits of the design include landscaped setting, walkable neighbourhoods, areas for passive and informal recreation and the integration of officer and other ranked dwellings within neighbourhoods.” This aligns with Defence Families Australia issues on life at Tindal...*“housing that supports the close-knit residents community and working environment will benefit networking and relationship building, and foster the establishment of social networks and support.”* (Social and Cultural Planning Report – Services and Facilities Needs Analysis (October 2013)

- 28. The report’s findings include a range of recommendations to better meet the particular needs of Defence Members and their families and assist in overcoming feelings of isolation and exclusivity of living at Tindal.

Recommendations include:

- The establishment of a dedicated Community Development Officer (CDO), with the aim of building relationships on the Base and between RAAF Base Tindal and the Katherine community
 - Staggering family arrivals and departures so that an entire community does not arrive at this remote location at once, unsupported and during the build up / wet season
 - Improving transport options for connections to Darwin, particularly for medical visits
 - Provision of short-term accommodation for visitors and relatives
 - Improving facilities and recreational opportunities for teenagers, and
 - Improving the on-going repairs and maintenance regime to ensure a high visual quality of facilities.
29. A key part of the Defence vision for the new housing development at RAAF Base Tindal is to create a community that fosters civil and social engagement, rather than isolation.
30. It is noted that Defence families face unique challenges associated with the transitory and isolated nature of postings and extended absence during deployments. These can include a range of hardships including stress on marital and parental relationships during deployment, social isolation in remote areas, post traumatic stress syndrome, loss of sense of place and lack of engagement with the community.
31. The project has been specifically designed to foster a sense of community and engagement in social activities through the creation of 'pocket neighbourhoods', where the urban design consists of a cluster of houses fronting onto a small park or 'pocket green', with the pocket green acting like a shared yard.
32. Pocket neighbourhoods assist in the reduction of social isolation and foster community through enhancing informal social interaction by residents meeting neighbours and developing friendships more quickly, thus engendering a sense of belonging in a community. The intimately sized green areas and integrated architecture and landscape design enables residents to feel comfortable in a new environment, particularly in Tindal which experiences one of the highest heat discomfort rates in

Australia. Features such as shade structures with barbeques, community gardens, community sheds and hardstand areas facing the shared mews courts provide a number of activities for residents and opportunities for social connections. The connected green areas make walking and cycling the most convenient and enjoyable way to get around, forming a foundation for healthy lifestyles.

33. During construction, impacts will include movement of vehicles related to the construction of new dwellings, noise and dust resulting from site clearance and construction, as well as interruption of services that will be extended and connected to new housing. Relevant construction plans such as a CEMP and Traffic Management Plan will be developed by the contractor to provide mitigation actions associated with construction impacts. These plans will be approved by Defence through the ECC process. A Communications Plan has also been developed by Defence for implementation following PWC approval to inform base personnel and residents of specific construction phase activities.
34. Once delivered, the total of 243 houses (193 upgraded and 50 newly constructed) will greatly improve the amenity for Defence families living in this remote area.

Consultation with stakeholders

35. Defence has undertaken consultation with existing relevant base personnel as part of the Defence Site Selection Board process. The Site Selection Board is established to consider the views of all relevant Defence stakeholders, particularly those residents on the base, to evaluate siting options and to impose any necessary restrictions on the project. This proposal was approved and no restrictions were placed on the site.
36. Numerous meetings have been held with relevant statutory authorities including:
 - a. Katherine Town Council
 - b. NBN Co
 - c. NT Department of Lands
 - d. NT Gas (APA Group)
 - e. Power and Water Corporation

37. The construction program will be funded by Defence and managed by DHA. Supplementary Item 3, a letter from the Director of Relocations and Housing, Mr Alan McClelland, outlines the Defence agreement to the project.
38. This construction program has been the subject of extensive consultation with local base officials. Supplementary Item 4, a letter from Wing Commander Mark Larter, Senior ADF Officer, RAAF Base Tindal provides evidence of the strength of local support. The Deputy Chief of the Air Force has also expressed his support for the program at Supplementary Item 5.
39. The National Convenor of Defence Families of Australia, Ms Julie Blackburn, has been briefed and has provided her support at Supplementary Item 6.
40. The local Katherine community is supportive, as evidenced by the letter of support from Ms Fay Miller, Mayor of Katherine. This letter is at Supplementary Item 7.
41. The NT Minister for Infrastructure, Mr Peter Styles, has also acknowledged his support in a letter included at Supplementary Item 8.

Purpose of works

Project location

42. RAAF Base Tindal is 18 kilometres outside of Katherine which is 320 kilometres by road southeast of Darwin in the Northern Territory. The base is situated on Commonwealth land which includes an airfield, operational buildings and accommodation for Defence staff. The proposed development is located within the north-eastern portion of the site directly adjoining existing Defence housing on an area of land approximately 17 hectares.

Project objectives

43. The project involves the construction of 50 new tropically designed dwellings and associated supporting roads and infrastructure for use by Defence personnel and their families.

Project description and scope of works

44. It is proposed that DHA develop the site for residential purposes in accordance with an approved RAAF Base Tindal Married Quarters Precinct Housing Development Plan. The proposed development plan is included at Supplementary Item 9.
45. Development of the site involves the provision of civil infrastructure to support the construction of the 50 single dwelling allotments (all for Defence use).
46. This 50 dwelling development encompasses the central open space area and associated roadways. The edge drive, still to be named, is to be constructed for access, aesthetics and asset protection.
47. The road design allows for potential extension of the edge drive to provide an infrastructure corridor to future additional housing development.
48. Following the completion of all civil works, it is proposed that 50 dwellings be constructed for Defence use over a period of 15 months.

Details and reason for site selection

49. Housing is in short supply in Katherine and Tindal. The use of land at RAAF Base Tindal has provided an opportunity for DHA to utilise Commonwealth land directly adjoining an existing Defence housing area by extending access and services as well as providing immediate access to operational facilities on the base for Defence personnel. The construction of new housing will also ensure DHA is able to meet Defence standards for housing of personnel.
50. The Katherine Town area lacks the readily developable land to support the construction of this number of dwellings. DHA is already committed to the construction and acquisition of 21 dwellings within the Katherine Town boundary.
51. The development site is located within the confines of RAAF Base Tindal, approximately 18 kilometres from the Katherine Town Centre providing convenient access to local shops, services, schools and amenities. It will provide well located housing for personnel posted to RAAF Base Tindal.
52. DHA is an experienced land developer with an in-house development strategy that creates acceptable returns. In this instance, Defence and DHA concluded that the

combination of business and social requirements determined that the majority of new constructions in the Katherine/Tindal region occur on-base.

Public transport

53. The NT Government operates a free school bus service facilitated by Travel North between Tindal and Katherine. Three school buses operate in the morning on school days and two buses in the afternoons. There are four bus stops around Newham Circuit on the base for children to use.
54. Outside of the school bus service, there is no public transport available between RAAF Base Tindal and Katherine due to the small population base. However, taxis are available. Long distance bus services are available from Katherine to Darwin, Alice Springs, Queensland or Western Australia and are provided by private operators. The Ghan train travels between Adelaide and Darwin and stops at Katherine.

Local road and traffic concerns

55. The new development is fully integrated and connected to the existing road network via a new edge drive to assist in the reduction of traffic along Newham Circuit. The geometry of the edge drive creates the appearance of smaller street sections rather than one long stretch of road. Its alignment has also been designed to capture breezes and offer a variety of views into the project and desert landscape.
56. The edge drive will be a shared thoroughfare for vehicles, cyclists and pedestrians and it is anticipated that it will become a popular extension of the broader circuit around the base which residents currently use for exercise.
57. The entry avenue to the neighbourhood has been designed to provide a sense of arrival, taking in wide views of the central open space and leading residents to pocket neighbourhoods. The mews courts are shared pedestrian and vehicle spaces which provide vehicle access to houses and additional space for further vehicles and boats. The mews courts are designed as very slow speed environments with narrower pavement widths and tight kerb radii, whilst still accommodating turning requirements of garbage and removal trucks.

58. In addition to the double garage and hardstand area, additional visitor parking is available along the edge drive, the entry avenue and in the mews courts.
59. The addition of 50 new dwellings at the Married Quarters Precinct will have minimal impact on traffic along existing roads.

Zoning and land approvals

60. The proposed development will occur on land that is owned by the Commonwealth and subsequently the Northern Territory Planning Scheme does not apply.

Planning and design concepts

61. Over 28 years ago, Defence articulated a design philosophy for Top End bases which married a respect for military traditions with the creation of a tropical '*sense of place.*' this aimed to combine layout with climate responsive buildings to create liveable communities.
62. The new Married Quarters Precinct at RAAF Base Tindal presents an opportunity to reconcile the timeless values of the original design philosophy with the latest innovations in community design, place making and Defence housing to create pocket neighbourhoods with cohesive and liveable community.
63. A concept plan for the expansion of the Married Quarter Precinct to accommodate 50 dwellings has been produced that provides an integrated response to social challenges, tropical climate and regional identity and sets a benchmark for Defence communities.
64. The concept plan showcases world class approaches to community oriented design, healthy living, passive cooling techniques at the scale of the lot and the neighbourhood, tropical landscaping, site sensitive natural storm water treatment, and climate responsive housing.
65. A set of project objectives were developed in line with the RAAF Base Tindal Design Philosophy. Together they reflect best practice and policies for the development of sustainable and liveable communities for Defence families.

These objectives include the following features:

- Houses will be arranged in clusters of 8-12 households around a shared common green to establish a series of pocket neighbourhoods where people may meet neighbours, establish social bonds and enjoy a sense of community and place.
 - The design provides a central recreational space with a sheltered gazebo, playground, barbeque facilities and other amenities to promote social interaction and identity.
 - The design incorporates a community garden and an associated shed to offer the opportunity to meet neighbours, socialise and be part of a connected community.
 - The layout promotes walking and cycling as a healthy lifestyle by linking the greens and other features with shaded paths. The footpaths and passages will be overlooked by houses and verandas.
 - The design promotes sustainable practices in master planning, landscape design, storm water management and built form to respond to the tropical climate and reinforce a sense of place.
 - The design will create a sustainable community which can become a model for Defence housing and assist in addressing issues such as social isolation and post traumatic stress syndrome.
66. Four house types will be constructed on the site, all with 4 bedrooms or 4 bedrooms plus study. All have been designed to be climate responsive by minimising building frontage to the hot direct sun, allowing for ventilation corridors and aligning dwellings to maintain breeze flows. Green areas are used for natural cooling, providing shading through verandas and awnings, encouraging ventilation through the homes, and integrating courtyards and landscaping with homes for cooling.
67. The architectural style, incorporating the above climate responsive design elements, is known as the Tropical Courtyard Home. This style builds on the tropical setting of Tindal, meets Defence requirements, and incorporates response to the micro-climate

including passive solar design, natural cross ventilation and capturing prevailing breezes.

68. The project has been designed for a diverse community to meet the Defence rank structure and military social requirements. The majority of dwellings will cater for the more senior officers and non-commissioned officers, with all block sizes being in the order of 600 square metres and 20 metre frontages. Some corner lots are slightly larger and ideally suited for the senior officer residences. These 50 new houses are designed to incorporate best practice in both the urban design and the individual house design.
69. To quote the Deputy Chief of the Air Force in his letter (located in Supplementary Item 5):

'The provision of quality housing for our personnel and their families is an important factor necessary to entice members to this remote airbase.'

Dwelling design, construction and civil works

70. All design and construction works carried out as part of this project will comply with, or exceed, NT and Federal Government controls and requirements, and all housing works will meet the requirements of the Building Code of Australia.
71. Civil works will be approved by the relevant servicing authorities. All building construction requiring certification will be undertaken by approved private certifiers.

Utilities, storm water, soils and flood control

72. Underground reticulation is proposed for the site and meetings have been held with the Power and Water Corporation in regards to the proposed development to confirm that they will check and approve design drawings for construction, carry out final connection work and accept the gifted assets for operations and maintenance purposes.
73. Substations for the new development have been designated in areas in coordination with the urban design intent. Power and Water Corporation will advise on any network augmentation on the existing distribution network to accommodate the additional load.

74. Street lighting columns for street lighting purposes will be owned and maintained by the Power and Water Corporation in line with their specifications. Lighting within pedestrian areas and public open spaces will be dedicated to Defence for operation and maintenance and could possibly be of pole-top solar variety.
75. NT Gas Pty Ltd were approached in regards to the provision of reticulated supply to the project site and advised that it was not feasible to construct the lead in main and associated required infrastructure.
76. Telecommunications for the new development will be provided by Telstra. Although it would be desirable for an NBN fibre connection, NBN Co has advised that at present Tindal does not meet the current criteria for consideration of a fibre network extension.
77. Sewerage infrastructure is owned and operated by Defence on RAAF Base Tindal, with both gravity and pressure sewer systems in operation on base with discharge to an on-site sewerage treatment facility located south of the runway. Sewerage reticulation will be entirely serviced by a network of gravity mains and maintenance structures in compliance with the relevant standards.
78. Existing potable water supplies can service the development with two existing water mains located within the vicinity of the subject site.
79. The Power and Water Corporation has advised that the proposed total development of 50 dwellings will increase the current demand from 2.5ML/day to 2.6ML/day. It has been recommended that supply availability to the site be maximised by utilisation of bore-water for irrigation purposes and limiting consumption by the implementation of water efficient fixtures and appliances to the dwellings. Flow rates for fire-fighting purposes have also been accounted for in the site's supply.
80. RAAF Base Tindal currently extracts groundwater for irrigation purposes via five on site bores. It is proposed to establish an additional on-site production bore within proximity to the new housing precinct to supply irrigation water to the public open space areas to limit the consumption of potable water supply.
81. Storm water initiatives including the use of open space areas as above-ground detention basins have been included to minimise the impact of new development on

existing waterways. The design promotes the use of swales to convey water across the site during high flow events and filtering the water through native plants and soil compositions. Pre and post-development catchment analysis has shown that these initiatives would result in a reduction in peak discharge, with downstream flood regime not affected as a result of the development.

82. Soils over the majority of the site include topsoil comprising of orange-brown fine to medium sand of typical depth 0.10m overlying a medium-dense to very dense sand layer of up to 0.30m thick. This layer was found to sit atop of a sandy clay stratum to a typical depth of 1.10m to 2.0m. Limestone was present at depths of 1.10m to 1.80m in many of the test pits.

Fire protection and home security

83. DHA dwelling construction will conform to Australian standards and the Building Code of Australia.
84. Fire breaks exist within the base and are typically 4 metres wide and clear of any vegetation. An additional 6 metre fire break is proposed as part of this development which continues the existing 6 metre fire break to the north of the site. The edge drive is also designed to act as a fire break and form part of a 20 metre asset protection zone.
85. A fire management program is currently observed by the base with associated works including wet and early dry-seasons prescribed burning, infrastructure protection burning and fire-break maintenance/modification.
86. A Fire Management Plan has been prepared as part of the Construction Environmental Management Plan for the prevention and control of fires during construction.

Acoustics

87. The housing precinct is located well away from operational aircraft areas, obviating the need for special noise attenuation construction methods. DHA has been advised by the Air Force that the Australian Noise Exposure Forecast (ANEF) of the area is below ANEF

20.

Under Australian Standards AS 2021:

- a. Below ANEF 20 – There are no restrictions on residential development due to noise
- b. ANEF 20-25 – Residential development is conditionally acceptable with noise attenuation, and
- c. ANEF 25-30 – No residential development is permitted.

Landscaping - Dwellings

88. The DHA Design and Construction Specification² document delivers amenable private outdoor spaces that meet or exceed the Defence requirements. Landscaping of these spaces will use local and exotic species which channel prevailing breezes, are water wise and will not attract flying foxes.
89. Integrated planter boxes with native covers and shrubs will retain and treat storm water from roofs before entering swales.
90. The planter boxes also shade walls from direct sun, cool breezes before entering houses and provide privacy without fencing.

Water and energy conservation measures

91. The Concept Plan incorporates a number of water management features including planter boxes to capture initial storm water runoff, pebble swales with low vegetation, flush kerbs to shed storm water to roadside swales, swales in pocket gardens, and a gently sloping turf swale in the central open space.
92. All dwellings will achieve a minimum six star Energy Efficiency Rating (EER) as certified by an independent accredited assessor, using Nationwide House Energy Rating Scheme (NatHERS) or other equivalent method.
93. The development has been designed so that each individual lot could be provided with its own advanced water meter with data from each household able to be transmitted from a meter interface unit to a wireless network collection system/access point for

² Design and construction specification for DHA residences Version 4.0 December 2011 is available publically via the DHA Website.

transmission to a server for logging. This data can be accessed in real-time through a software interface operated by the user and/or the base personnel.

94. Household domestic water efficiency measures to be included in all houses include minimum four star Water Energy Labelling System (WELS) ratings for tapware and showers and dual flush toilets. Timers are also to be installed on all outdoor taps.
95. The roof pitch of the housing typologies has been designed so that a photovoltaic system complete with panels and inverter can be implemented as a plug-in device to each individual dwelling. The project funding allows for roof mounted electricity generation for individual houses.

Parklands and streetscapes

96. The Concept Plan utilises a tropical landscape, drawing inspiration from the existing site which includes limestone formations, rocky escarpments, eucalyptus forest and savannah woodland. The landscape master plan reflects these characteristics and also incorporates a water strategy based on the site's natural hydrology to provide flow paths during high flow events.
97. Parklands will be integrated throughout the development providing linkages and meeting spaces for residents. These will include a central open space at the heart of the community which will serve as the main community gathering place, pocket greens serving as everyday social spaces that are locally shared, a community garden, and high amenity shaded pedestrian paths linking throughout the Concept Plan.
98. The urban structure adopted for the development includes the entry avenue, which will be tree lined and provide an authentic sense of arrival, interconnected and landscaped pedestrian paths throughout the development. A winding road, initially noted as edge drive, will provide a contrasting experience where the tropical neighbourhood meets the bush, and mews courts will provide common entry to dwellings through a mix of pedestrian and vehicle space.
99. The hierarchical use of parklands and open space has been chosen to maximise chance encounters and support the development of social relationships to develop a sense of community and neighbourhood.

100. Tree planting has been sensitively chosen to discourage flying fox roosting and the suggested planting palette is also aligned with recommendations and guidelines outlined in the Defence ECC.
101. In the community garden, some vegetable and herb species have been selected to encourage the community to physically interact and gain reward from their open spaces. All vegetable species selected are not liable to attract flying foxes and will provide on-going crops with a minimum of maintenance.

Provisions for people with disabilities

102. As requested in previous PWC reports, all dwellings will be built to the Silver Level of the Livable Housing Design Guidelines (2nd edition, 2012).

Community facilities, childcare and schooling

103. The nearby town of Katherine, despite having a relatively small population, is well supplied with community and social services. The two main health facilities are the Katherine Hospital and Katherine Community Care Centre which are complemented by dentists, private medical specialists and an aero-medical service.
104. Child-care centres, primary schools and secondary schools in Katherine include but are not limited to:
 - a. Katherine School of the Air
 - b. Casuarina St Primary School
 - c. Clyde Fenton Primary School
 - d. St Joseph's College
 - e. Katherine South Primary School
 - f. Katherine High School
 - g. Katherine East Child Care Centre
 - h. Katherine Regional Family Child Care, and
 - i. Little Geckos Child Care Centre and Big Geckos Outside School Hours Care (on RAAF Base Tindal)

105. Katherine Terrace is the main shopping area. This area consists of a variety of shops, including supermarkets, electronics stores, cafes, restaurants and a variety of specialty shops. These businesses are able to service the local shopping demands.
106. Facilities that are located on base include:
- a. Post Office
 - b. AAFCANS
 - c. Defence Bank
 - d. Chapel
 - e. Gym
 - f. Tennis courts
 - g. Squash courts
 - h. Rugby and AFL oval, cricket nets
 - i. Pool
 - j. Australian Air Force Cadets (AAFC)
 - k. Childcare Centre
 - l. Pre-School
 - m. School bus service
 - n. Community groups (playgroup, scouts/guides, craft group) vary with each posting cycle depending on the demand from the community for groups.
 - o. Welfare Clubs – Fishing Club, Golf Club, and
 - p. Moonlight Cinema – dry season only

Occupational health and safety measures

107. DHA contractors delivering works valued at more than \$3 million will be accredited by the Federal Safety Commissioner. Work contractors must also adhere to relevant legislative requirements, including the *Work Health and Safety (National Uniform Legislation) Act 2011* and *Workers Rehabilitation and Compensation Act*.

Cost-effectiveness and public value

Outline of project costs

108. The estimated overall project cost is approximately \$89.4 million including GST, escalation and contingency. The cost will be met by DHA and reimbursed by Defence under an annuity arrangement.

Details of project delivery system

109. A Design and Construct contract package will be contracted on a fixed price lump sum basis through an open tender process. The successful tenderer will be required to comply with the DHA Design and Construction Specifications.

Construction schedule

110. Subject to Parliamentary approval by March 2014, the significant milestones to achieve delivery of dwellings by 30 June 2016 are:

Date	Milestone
December 2013	PWC referral
March 2014	PWC approval process complete
August 2014	Civil construction contract commences
May 2015	Dwelling construction contract commences
June 2016	50 house development delivered

Public value

111. This proposal will contribute 'public value' by adding to the stock of housing used to meet Defence obligations to members of the ADF and their families posted to NT, thus enhancing the key objective of retention of Defence personnel. Key beneficiaries are likely to include families of Defence personnel as well as local Katherine business and service providers. More broadly, while alleviating pressure on the Katherine NT rental market, the Tindal project will create jobs in the development and construction industry.

112. As the overall numbers of Defence personnel will remain largely static, the additional 50 dwellings will release about 50 houses (staged over 5 years as leases expire) into the local market, thus assisting in managing the cost of family accommodation in this remote area.

Revenue

113. Details of the financial aspects of the project are included in a separate commercial in confidence briefing to the Committee.

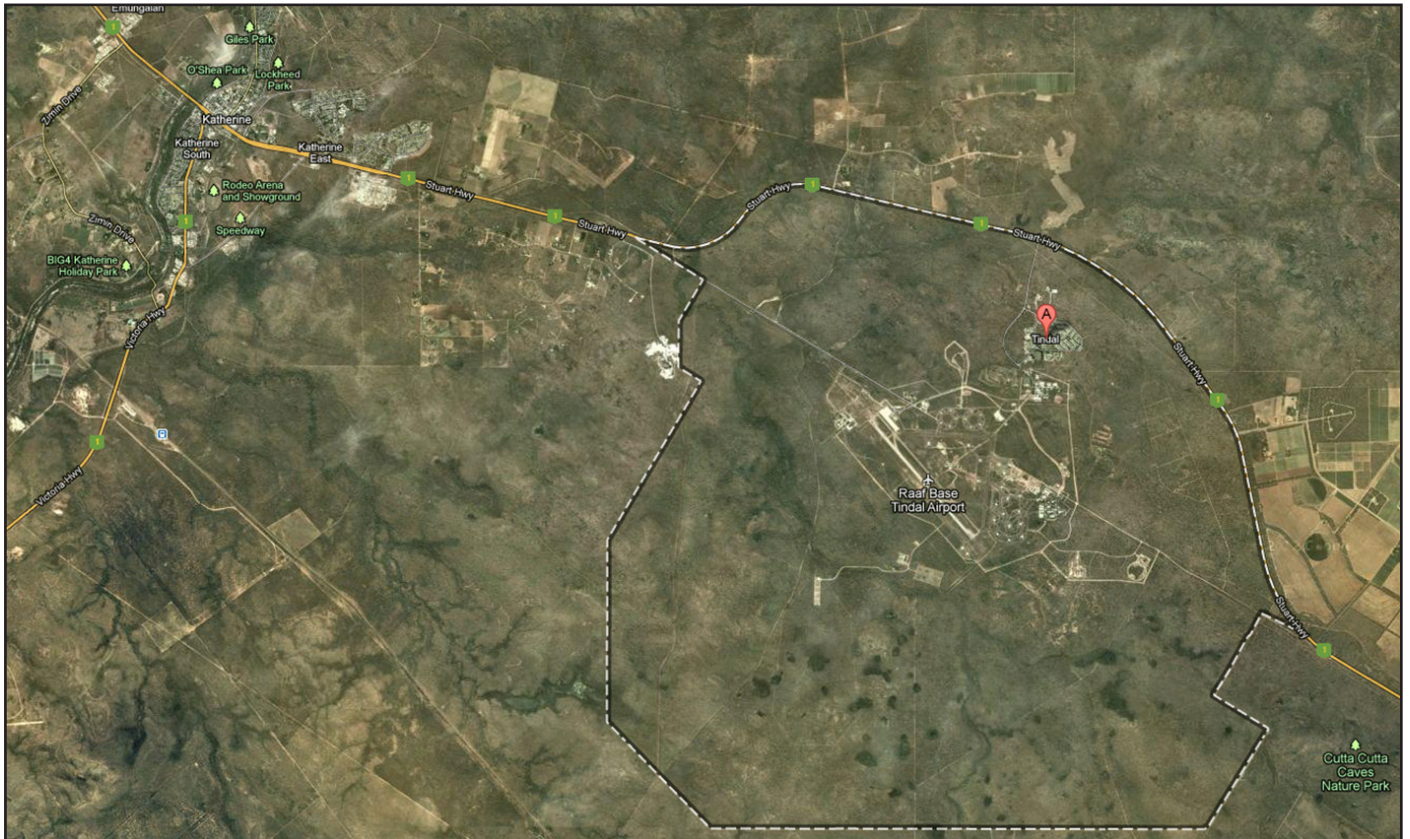
RAAF Base Tindal

Supplementary information

- Item 1 Map of Katherine/Tindal
- Item 2 Tindal housing site
- Item 3 Letter of support – Director, Defence Relocations and Housing
- Item 4 Letter of support – Senior ADF Officer, RAAF Tindal
- Item 5 Letter of support – Deputy Chief of Air Force
- Item 6 Letter of support – Defence Families of Australia
- Item 7 Letter of support – Katherine Mayor
- Item 8 Letter of support – Minister for Infrastructure, NT
- Item 9 Proposed development plan

Supplementary item 1

Map of Katherine/Tindal



Supplementary item 2

Tindal housing site



Supplementary item 3

Letter of support – Director, Defence Relocations and Housing



Australian Government
Department of Defence
Defence Support and Reform Group

Alan McClelland
Director
Defence Relocations and Housing
CP1-5-094
PO Box 7912
CANBERRA ACT 2610

DRH/OUT/2013/R16178606

Craig Smith
Program Director
Defence Housing Australia
26 Brisbane Street
BARTON 2600

Dear Craig,

RAAF BASE TINDAL NEW HOUSING DEVELOPMENT

I recently briefed Mark Jenkins, Head Defence Support Operations on the concept for the new housing development at RAAF Base Tindal including details relating to the costs of the project.

Mark was supportive of the proposed development and understands that the isolated nature of Tindal as added considerably to the cost of the project. He will support the proposal at the Parliamentary Standing Committee on Public Works scheduled to be convened in early 2014.

On Thursday 28 November 2013, I intend to be in Tindal to brief the Commanding Officers and members on our plans for Katherine and RAAF Base Tindal housing.

My point of contact for this matter is Guy Taylor (telephone 6266 4183) or email: guy.taylor@defence.gov.au.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'A. McClelland', written in a cursive style.

Alan McClelland
Director
Relocations and Housing

29 October 2013

Supplementary item 4

Letter of support – Senior ADF Officer, RAAF Tindal



ROYAL AUSTRALIAN AIR FORCE

RAAF TINDAL

BASE INFORMATION CIRCULAR

RAAF Base, TINDAL NT 0853, AUSTRALIA

322ECSS 2013/1035585

Mr Vern Gallagher
General Manager
External Relations PPG
Defence Housing Australia
26 Brisbane Avenue
Barton ACT 2600

Dear Mr Gallagher,

I am writing to you in support of the planned housing upgrade project at RAAF Base Tindal. Currently, the base is in need of additional on-base Service Residences due to the strong preferences of our members and families to live on base; for close proximity to work and welfare/community reasons. The existing stock of 193 on-base Service residences are not sufficient to meet the existing and growing needs of accommodating approximately 400 military families. Families posted to Tindal are often apprehensive about the safety and security of living off-base in Katherine, as well as being confronted with issues of adjustment and the stressors of moving to and living in a harsh remote location. Compounding this housing issue is the enduring lack of availability of quality housing within Katherine's private rental market, leaving members and their families with little to no choice in securing suitable housing.

The ongoing on-base housing upgrades have been warmly received by our military families and has already resulted in an increase in morale and perceptions of security. The provision of additional housing of similar standards will assist greatly in attracting and retaining members serving in Tindal which, ultimately, helps to maintain and deliver Tindal's air capability.

As the Senior Australian Defence Force Officer at Tindal, I unreservedly support the need to provision our Defence families with an additional 90 houses, commencing with the construction of 50 this year, to ensure our members are able to live in safe, modern and convenient community-based housing at RAAF Base Tindal.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'M. Larter', written over a horizontal line.

MARK H. LARTER

Wing Commander

Commanding Officer

No. 322 Expeditionary Combat Support Squadron

Senior Australian Defence Force Officer, RAAF Tindal

Tel: (08) 897 36000

16 Feb 13

Supplementary item 5

Letter of support – Deputy Chief of Air Force



ROYAL AUSTRALIAN AIR FORCE
AIR FORCE HEADQUARTERS

Department of Defence, R1-6-C002, PO Box 7902, CANBERRA BC ACT 2610, AUSTRALIA

OCAF/OUT/2013/AB15627940

Mr Vern Gallagher
General Manager
Business Development and Innovation
Defence Housing Australia
26 Brisbane Avenue
Barton ACT 2600

Dear Mr Gallagher

Vern,

I am writing to you in support of the DHA project to construct 50 new Defence houses at RAAF Base Tindal. RAAF Base Tindal is a critical strategic airbase and is Air Force's sixth largest base by permanent establishment. The provision of quality housing for our personnel and their families is an important factor necessary to entice members to this remote airbase.

Accordingly, the provision of new housing at RAAF Base Tindal is an important activity and is in line with projected requirements and family preferences. The construction of new Defence housing at RAAF Base Tindal, in line with current Defence standards, is required to replace old housing that is not economically viable to upgrade. RAAF personnel who relocate to Tindal require quality housing to lessen the stress on their families and associated impact on their morale. Furthermore, there is a lack of sufficient non-Defence housing in Katherine as an alternative for Defence members.

Approval of this project will assist Defence and the DHA to provide appropriate accommodation in line with current Defence policies. Not proceeding with this project could adversely affect the retention of Defence members serving in Tindal, and therefore potentially impact Defence operations at the airbase. I therefore believe the provision of additional on base housing will be of great benefit to Defence.

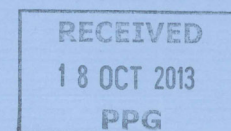
Yours sincerely

A handwritten signature in blue ink, appearing to be 'G.N. DAVIES'.

G.N. DAVIES, CSC
Air Vice-Marshal
Deputy Chief of Air Force

R1-6-C002
Tel: (02) 626 55472

14 October 2013



Supplementary item 6

Letter of support – Defence Families of Australia



Defence Families of Australia
R8-1-007
Russell Offices
Canberra ACT 2600

Mr Peter Howman
Chief Executive Officer
Defence Housing Australia
26 Brisbane Avenue
BARTON ACT 2600

13 October 2013

Dear Peter

Many thanks for the opportunity to view the proposed housing development for RAAF base Tindal. As you know, housing is a prime concern for Defence families irrespective of their location. For families posted to Tindal, quality housing that is in keeping with Defence housing standards, whilst embracing the unique community setting that exists in this area is necessary for the following reasons:

1. For families who are posted to remote locations, they are often confronted with issues of acclimatisation due to new and different surroundings which they may be unfamiliar with and can present them with further challenges in which to adapt to. The provision of good quality housing of a similar standard to that of other posting locations around the country can help reduce some of these challenges. This is considered by some families to be the one aspect of relocating families to remote areas that can actually be controlled.
2. Defence families pay the same rental contribution for housing within their category irrespective of their location. A common complaint that arises from postings to Katherine is that the housing is reported as not being to the same standard as houses they have come from in previous locations despite the fact that the rent they pay is the same. Continuing to improve and develop quality housing in this area will help to reduce some of this complaint.
3. This area already has reduced options for accommodation, and Defence housing solutions are highly visible to all members in the area. Housing that supports the close-knit residential community and working environment will benefit networking and relationships, and foster social supports.
4. Housing availability in both the Defence and private market is limited in Katherine. Completion of the project in the shortest possible time will ensure there is an adequate number of good quality housing available and assist in reducing on-base housing availability concerns.
5. All housing upgrades should take into consideration the location and climate. The tropical backyards of the area are seen as a positive to the environment and it is hoped that this will be maintained.

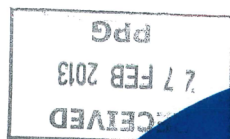
With consideration given to these points, the proposed development for Tindal as explained to me at this time is supported.

Yours Sincerely,

Julie Blackburn
DFA National Convenor
Ph: 0410 626 103
Email: julie.blackburn1@defence.gov.au

Supplementary item 7

Letter of support – Katherine Mayor



Katherine Town Council

PO Box 1071
Katherine NT 0851

Our ref: Community Relations/Enquiries/Request For Support

12 February 2013

Mr Vern Gallagher
General Manager External Relations
Defence Housing Australia
26 Brisbane Avenue
Barton ACT 2600

Dear Mr Gallagher,

On behalf of the Katherine Town Council, I am pleased to advise our support for the proposed construction of 50 additional family houses on RAAF Base Tindal.

Currently, there is substantial on-going work upgrading the current on-base dwellings. This work commands significant local capacity from contractors, suppliers and tradespeople. The construction of infrastructure and new housing will ensure a continuing base level of work for local people.

The links between the town and the base are long standing and substantial. In particular, the social and economic integration of the two communities is important and will only be enhanced with the addition of 50 new families to be based in the region for the long term.

I commend this project to the Parliamentary Standing Committee on Public Works and am available to elaborate further if required.

Yours sincerely

Fay Miller
Mayor

Supplementary item 8

Letter of support – Minister for Infrastructure, NT



MINISTER FOR INFRASTRUCTURE

Parliament House
State Square
Darwin NT 0800
minister.styles@nt.gov.au

GPO Box 3146
Darwin NT 0801
Telephone: 08 8928 6547
Facsimile: 08 8928 6621

Andrew Garforth
Craig and Rhodes
Suite 400, Level 4
16-18 Cambridge Street
EPPING NSW 2121

Dear Mr Garforth

I attended the 2013 Engineering Excellence Awards and would like to congratulate you on being a joint winner of the Reports, Procedures and Systems Award for the RAAF Base Tindal Married Quarters.


The project documentation integrates a multi-disciplinary design approach and will serve as a valuable resources assisting in the project gaining approval from the Public Works Committee.

The implementation of the construction plan will see the delivery of on-base service residences that meet or exceed defence green building policies and provide a sense of community while addressing engineering concerns specific to RAAF Base Tindal.

Once again, I congratulate you and your team of your achievements and success in delivering a construction plan that sees the application of best practice engineering and forward thinking urban design.

I wish you well on all of your future projects and encourage you to continue to seek out avenues to have your skills and achievements publically recognised.

Yours sincerely



PETER STYLES
4/9/13



Supplementary item 9

Proposed development plan

