
The Parliament of the Commonwealth of Australia

Redevelopment of Willis Island Meteorological Office, Coral Sea

Parliamentary Standing Committee on Public Works

September 2005
Canberra

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Membership of the Committee

Chair Hon Judi Moylan MP

Deputy Chair Mr Brendan O'Connor MP

Members Mr John Forrest MP

Senator Stephen Parry

Mr Harry Jenkins MP

Senator the Hon Judith Troeth

Mr Bernie Ripoll MP

Senator Dana Wortley

Mr Barry Wakelin MP

Committee Secretariat

Secretary Mrs Margaret Swieringa

Inquiry Secretaries Ms Peggy Danaee

Ms Vivienne Courto

Research Officer Mr Raymond Knight

Administrative Officer Mr Peter Ratas



List of Abbreviations

Act	Public Works Committee Act 1969
AWS	Automatic Weather Station
Bureau	Bureau of Meteorology
DEH	Department of the Environment and Heritage
EMP	Environmental Management Plan



Extract from the Votes and Proceedings of the House of Representatives

No. 37 dated Thursday, 2 June 2005

4PUBLIC WORKS--PARLIAMENTARY STANDING COMMITTEE--REFERENCE
OF WORK--OFFICE REPLACEMENT OF THE BUREAU OF METEOROLOGY AT
WILLIS ISLAND, CORAL SEA, QUEENSLAND

Dr Stone (Parliamentary Secretary to the Minister for Finance and Administration), pursuant to notice, moved – That, in accordance with the provisions of the Public Works Committee Act 1969, the following proposed work be referred to the Parliamentary Standing Committee on Public Works for consideration and report: Office replacement of the Bureau of Meteorology at Willis Island, Coral Sea, Queensland.

Question – put and passed.



List of Recommendations

3 Issues and Conclusions

Recommendation 1

The Committee recommends that the Bureau of Meteorology provide the Committee with updates of the project schedule and costs as the works progress.

Recommendation 2

The Committee recommends that the Bureau of Meteorology supply the Committee with budgetary details of items omitted from the commercial-in-confidence quantity surveyor estimate for the project when such information becomes available.

Recommendation 3

The Committee recommends that the proposed redevelopment of Willis Island Meteorological Office, Coral Sea, proceed at the estimated cost of \$7.691 million.

Introduction

Referral of Work

- 1.1 On 2 June 2005 the proposal to replace the Bureau of Meteorology office on Willis Island, Coral Sea, Queensland, was referred to the Public Works Committee for consideration and report to the Parliament in accordance with the provisions of the *Public Works Committee Act 1969* (the Act).¹ The proponent agency for this work is the Bureau of Meteorology (the Bureau).
- 1.2 The Hon Dr Sharman Stone MP, Parliamentary Secretary to the Minister for Finance and Administration, advised the House that the estimated cost of the proposed work was \$8.62 million. She reported that, subject to parliamentary approval, work would commence as soon as possible with a view to completing construction by the end of 2005.

1 Extract from the *Votes and Proceedings of the House of Representatives*, No. 37, Thursday 2 June 2005

Background

The Bureau of Meteorology

1.3 The Bureau is responsible for ensuring that

“Australia benefits from meteorological and related science and services”.²

1.4 The Willis Island meteorological office supports the Bureau’s national operations and severe weather warning services for the north Queensland coast by providing observation data and early warning monitoring of cyclones. The value of the Bureau’s presence at Willis Island lies in its unique maritime location, its long climatological history and its front-line warning capability for tropical cyclones approaching north-east Queensland.³

Location

1.5 The Bureau’s meteorological office is located on Willis Island, a 7.7 hectare parcel of land located 240 nautical miles (approximately 450 kilometres) east of Cairns, in the Coral Sea off the coast of Queensland. The island is controlled by the Commonwealth of Australia and occupied solely by the Bureau for meteorological purposes under the *Coral Sea Islands Act 1969*.⁴

Existing facilities

1.6 Willis Island accommodates eight buildings of varying structure, including a main building that houses living, recreation and office areas; storage structures; laundry facilities; power generation facilities; and water pumps.⁵

2 Appendix C, Submission No. 1 from the Bureau of Meteorology, paragraph 15

3 *ibid*, paragraphs 1 and 3

4 *ibid*, paragraphs 1, 6 and 40

5 *ibid*, paragraph 6

Inquiry Process

- 1.7 The Committee is required by the Act to consider public works over \$6 million⁶ and report to Parliament on:
- the purpose of the work and its suitability for that purpose;
 - the need for, or the advisability of, carrying out the work;
 - whether the money to be expended on the work is being spent in the most cost effective manner;
 - the amount of revenue the work will generate for the Commonwealth, if that is its purpose; and
 - the present and prospective public value of the work.⁷
- 1.8 The Committee called for submissions by advertising the inquiry in *The Australian* on Wednesday 13 July 2005. The Committee also sought submissions from relevant government agencies, local government, private organisations and individuals, who may be materially affected by, or have an interest in, the proposed work. The Committee subsequently placed submissions and other information relating to the inquiry on its web site in order to encourage further public participation.

Inspections and Public Hearing

- 1.9 A public hearing into the proposed works was held at Parliament House, Canberra, on 12 August 2005.⁸

6 *Public Works Committee Act 1969*, Part III, Section 18 (8)

7 *Public Works Committee Act 1969*, Part III, Section 17

8 See Appendix D for the official Hansard transcript of the evidence taken by the Committee at the public hearing on Friday, 12 August 2005 in Canberra

The Proposed Works

Need

- 2.1 The Bureau's meteorological station at Willis Island was established in 1921. Most of the current facilities on the island were constructed in either 1950 or 1968 and are either nearing the end of, or have already exceeded, their useful economic lives.¹
- 2.2 The Bureau's assessment of Willis Island identified a need for redeveloping the facilities, based on:
- substantial damage to the structural support of existing facilities, with some areas no longer able to be made safe for operational use;
 - health and safety hazards for station staff, visitors and maintenance personnel as a result of the presence of asbestos and ageing services infrastructure, including electrical wiring and plumbing;
 - the considerable cost of maintaining the existing facility, which is expected to increase over time, due to the harsh and remote location; and
 - the need to enhance the station's desirability as a staff posting, noting existing difficulties in attracting suitable staff to the station.²

1 Appendix C, Submission No. 1 from the Bureau of Meteorology, paragraphs 9 - 10

2 Appendix C, Submission No. 1, paragraph 9

Purpose

- 2.3 The proposed work is intended to replace facilities on Willis Island that enable the Bureau to staff, operate and house its meteorological office. Facilities earmarked for replacement have significantly deteriorated and exceeded their economic lives, and also present potential health and safety hazards.³
- 2.4 The proposal includes demolition and removal of existing facilities, and replacement with a new, more appropriate facility that meets current and expected future requirements.⁴

Scope

- 2.5 The proposal includes the demolition and removal of the following facilities:
- meteorological office, accommodation, messing and recreational structures;
 - power house and paint store;
 - balloon filling and hydrogen storage building;
 - cyclone shelter and flammable storage bunkers;
 - fresh water storage tanks;
 - external paths and paving; and
 - underground services.⁵
- 2.6 The following existing system elements are proposed for reuse:
- desalination plant;
 - fire and salt water pumps;
 - enviro-cycle sewage treatment plant; and
 - fuel storage tanks and refilling pump.⁶

3 *ibid*, paragraphs 7 and 9 - 10

4 *ibid*, paragraph 20

5 *ibid*, paragraph 21

6 Appendix C, Submission No. 1, paragraph 8

- 2.7 The proposal includes the construction of the following new facilities and services:
- meteorological office, messing area, accommodation, recreational area, powerhouse;
 - hydrogen generator building and gas storage, including associated site works;
 - relocation of fuel storage tanks to new fuel area;
 - new underground services including communications, power distribution, water, sewage and fire hose services;
 - relocation of satellite dishes and radar tower; and
 - refurbishment of the salt water pump building.⁷
- 2.8 The new facility will incorporate a central north-south corridor linking a series of five functional wings:
- meteorological office;
 - living accommodation;
 - personal accommodation;
 - laundry / visiting personnel accommodation; and
 - stores / workshop.⁸
- 2.9 The proposed facility will support a four-person deployment. The proposal allows for a six-monthly resupply and staff changeover period, during which the facilities will be required to accommodate a further 15 persons (incoming crew, Bureau support personnel and maintenance contractors) for about three days.⁹

7 *ibid*, paragraph 23

8 *ibid*, paragraph 24

9 *ibid*

Options considered

- 2.10 The Bureau considered a number of options, with the feasibility of each assessed on the basis of its responsiveness to meteorological requirements, capital rebuild and re-equipment costs, maintenance costs and risk.¹⁰ Based on its investigations, the Bureau concluded that the fully-staffed observations program, requiring the proposed redevelopment, was the best option.¹¹

Project delivery

- 2.11 The Bureau initiated a temporary, 18-month de-staffing of Willis Island meteorological office on 2 June 2004 to enable refurbishment of the facilities, with ongoing synoptic observations from Willis Island being provided by an Automatic Weather Station (AWS) system to provide basic monitoring functions until the full operations are restored.
- 2.12 Subject to parliamentary approval, the Bureau proposes to commence construction immediately, with works targeted for completion by the end of 2005, before the commencement of the 2005-06 tropical cyclone season.¹²

Cost

- 2.13 In its main submission to the Committee, the Bureau identified the estimated cost of construction as \$7 million.¹³ This cost was later revised to \$7.691 million due to the inclusion of professional fees.¹⁴

10 *ibid*, paragraphs 11 - 12

11 Appendix C, Submission No. 1, paragraph 18

12 *ibid*, paragraphs 5 and 16

13 *ibid*, paragraphs 11 - 12

14 Appendix D, Official Transcript of Evidence, page 13

Issues and Conclusions

Procedural Issues

- 3.1 According to its submission, the Bureau started preparing for the project on 2 June 2004 by initiating a temporary, 18-month de-staffing of the Willis Island meteorological office.¹ Members noted that the work was not referred to the Committee until 12 months later, on 2 June 2005, and sought an explanation for this delay. The Bureau assured Members that its intention was not to bypass the Committee, but that, in error, it had referred the work to the Committee too late in the process. The Bureau added that, once it was aware of the oversight, it had ensured that no further work was carried out prior to the conclusion of the Committee's inquiry into the proposal.²
- 3.2 The Committee expressed concern that the Bureau had contravened the Act by undertaking documentation and design work prior to parliamentary approval of the work. The Bureau explained that it was necessary to undertake some design work in order to determine the feasibility of pursuing the project, and that detailed costings had been required before a decision could be taken by its executive as to whether or not the proposal should proceed.³

1 Appendix C, Submission No. 1, paragraph 4

2 Appendix D, Official Transcript of Evidence, page 3

3 Appendix D, Official Transcript of Evidence, page 3

- 3.3 While the Committee accepted the Bureau's argument that some funds needed to be expended to determine the viability of the project, it did not feel that the Bureau was justified in proceeding to tender before referring the work to the Committee. The Bureau explained that this had been the result of an oversight and a misunderstanding of how early in the process the work needed to be referred to the Committee. The Committee maintained, however, that the Act was very clear on this point and emphasised the problems caused by agencies failing to refer relevant works to the Committee in a timely manner.⁴

Alternatives Considered

- 3.4 The Bureau considered a number of options for the redevelopment of Willis Island, including:
- restoration of year-round, fully staffed observations and monitoring program;
 - restoration of a manual program, but only staffed during the tropical wet season; and
 - termination of the manual program but retention of an automated program.⁵
- 3.5 The feasibility of each option was assessed on the basis of its responsiveness to meteorological requirements, capital rebuild and re-equipment costs, maintenance costs and risk.⁶ Based on these assessments, the Bureau concluded that the resumption of a full observations program, with accompanying full redevelopment of the Willis Island meteorological office, was the preferred option.⁷
- 3.6 The Committee noted that the meteorological office had been established in 1921 and was operated initially by two people, and asked why this had expanded over time to require four people. The Bureau explained that the nature of the observations program had expanded to include upper air monitoring as well as surface observations, thus requiring additional staff members.⁸
- 3.7 The Committee questioned why the Bureau had not pursued the option of staffing the meteorological office only during the wet season. The Bureau
-

4 *ibid*, page 4

5 Appendix C, Submission No. 1, paragraph 17

6 *ibid*, table on page 9

7 *ibid*, paragraph 18 and table on page 9

8 Appendix D, Official Transcript of Evidence, pages 6 - 7

explained that this option would not meet all meteorological requirements as it would result in the cessation of the upper air program and would also cause gap in the climate record. Additionally, this option would result in only a marginally lower refurbishment cost and would also present security risks for the facilities and equipment on the island.⁹

3.8 The Committee was interested to learn whether the Bureau had considered using new technologies to provide information presently generated by the Willis Island meteorological office. The Bureau explained that it had undertaken a rigorous evaluation of the office's contribution to meteorological outcomes and had concluded that, whilst the data provided through Willis Island was not as unique as it once had been, the office was still valuable. The Bureau's presence at Willis Island was particularly valuable due to its capacity to provide early detection of tropical cyclones approaching the Queensland coast, and this was a function that could not be replaced at this stage by other technologies, such as satellite.¹⁰

3.9 The Committee inquired whether the Willis Island radar could be monitored remotely, and was informed that establishing a remote radar on the island would not be appropriate due to the absence of grid power. The Bureau explained that, on Willis Island, the radar would need to be powered by renewable energy, the reliability of which could not be guaranteed.¹¹

Future Requirement

3.10 Noting that the life of the proposed facility was intended to be 50 years, the Committee was interested to learn whether there was any potential for future technologies to provide the same services without requiring a physical human presence. The Bureau explained that, although satellite technology was constantly improving, weather balloons were still the most accurate means of detecting atmospheric conditions and that a physical human presence was therefore necessary. While the Bureau accepted that this would need to be reassessed when the proposed facility's expected life had expired, it assured the Committee that the office would continue to be necessary over the next 20 to 30 years.¹²

9 *ibid*, page 8

10 *ibid*, page 5

11 *ibid*, page 7

12 Appendix D, Official Transcript of Evidence, pages 7 - 8

Hazardous Materials

- 3.11 In its main submission, the Bureau had stated that
- ... some of the Island facilities ... experienced significant deterioration. The presence of asbestos in the buildings presents a potential health hazard.¹³
- 3.12 The Committee sought advice as to what analyses had been undertaken to determine the presence of hazardous materials in the buildings being demolished, and what the strategies were for managing the storage and disposal of hazardous materials. The Bureau confirmed that asbestos products were present on the island, mainly in the form of roof sheeting, and that whilst it believed that other asbestos products were present in concealed spaces, destructive testing had not been carried out to locate these.¹⁴
- 3.13 The Bureau noted that asbestos would need to be removed from the island in accordance with the workplace safety and health act (*Occupational Health and Safety Regulation 2001*). In response to the Committee's queries, the Bureau expressed confidence that the tenders, including shipping costs, would cover the asbestos-related costs in a worst-case scenario.¹⁵

Environmental Issues

Environmental Management Plan (EMP)

- 3.14 In response to questions regarding the environmental impact of the proposed work, the Bureau stated that it had submitted a referral to the Department of Environment and Heritage (DEH) under the terms of the *Environment Protection and Biodiversity Conservation Act 1999*, and that the DEH had determined that the work was not a controlled action. The Bureau explained that the successful construction contractor would be required to prepare and implement an EMP for the works. The EMP is a requirement of the DEH and stipulates, among other things, provisions for the protection of the resident green turtle population and other fauna and flora.¹⁶ The Bureau undertook to provide the Committee with a copy of

13 Appendix C, Submission No. 1, paragraph 7

14 Appendix D, Official Transcript of Evidence, page 11

15 *ibid*, page 12

16 Appendix D, Official Transcript of Evidence, page 11

the EMP following the hearing, and this document was provided on 5 September 2005, to the Committee's satisfaction.

Hybrid Power Generation

- 3.15 The Committee sought details of the hybrid power generation system proposed for the facility. The Bureau explained that power generation would involve two systems – the first consisting of a wind turbine, solar panels and diesel generator; and the second consisting of a larger diesel generator that would provide sufficient power to the meteorological facility in the event that the first system was not operational. The Committee was pleased to learn that the design was such that the renewable energy component of the first system could be increased without requiring any changes to the infrastructure.¹⁷

Desalination Plants

- 3.16 The Committee was interested to hear about the desalination plants operating on the island. The Bureau confirmed that the plants could generate up to 3,000 litres of water per day, which was sufficient to ensure an ongoing supply of fresh water. Following the hearing, at the Committee's request, the Bureau advised that the operating cost of the desalination plant equated to \$7.15 per kilolitre.¹⁸

Project Schedule

- 3.17 The Bureau expressed an expectation that the project would be completed in six months, subject to Parliamentary approval.¹⁹ Noting that the outcome of the parliamentary inquiry was not expected to be known until September 2005, the Committee sought further information on the Bureau's schedule for the project, particularly with reference to the approaching tropical wet season. While the Bureau could not be certain of the cyclone season's impact on the construction program, it suggested that surface observations and the radar program would likely be operational by the end of 2005, with the completion of works and resumption of the upper air program expected to take place by March-April 2006.²⁰

17 *ibid*, page 8

18 *ibid*, page 10

19 *ibid*, page 6

20 Appendix D, Official Transcript of Evidence, page 9

- 3.18 Noting the revised projected completion date, the Committee inquired whether this delay would significantly impact on the project cost. The Bureau advised that some of the costs associated with the extended timeframe would be absorbed by the contingencies budget, but noted that this depended on the severity of the wet season and could not be confident in predicting the cost impact.²¹ The Bureau did, however, inform the Committee during the confidential briefing that the tenders were not based on there being a break in construction over the wet season.

Impact on Operations

- 3.19 The Committee was concerned to learn about the impact of the construction process on the meteorological office's operations. The Bureau advised that the office had been de-staffed in June 2004 to expedite construction and that it had, in the meantime, maintained a surface observation program on the island through an automatic weather station. While there were risks associated with the temporary cessation of the upper air and radar programs, the Bureau was confident that additional information gathered through other Queensland offices and satellite imagery could be synthesised to provide adequate forewarning of cyclone approaches. The Bureau gave the Committee its undertaking to ensure that as many elements of the meteorological office were operational as soon as was possible, and was confident that, subject to Parliamentary approval, the Willis Island radar would be operating by the commencement of the cyclone season.²²
- 3.20 The Committee heard that the construction team will be accommodated on the island during construction in temporary buildings that will be constructed by the building contractor.²³

21 *ibid*, page 10

22 *ibid*, pages 6 and 9

23 *ibid*, page 12

Recommendation 1

The Committee recommends that the Bureau of Meteorology provide the Committee with updates of the project schedule and costs as the works progress.

Costs

- 3.21 At the public hearing, the Bureau informed the Committee that the total construction cost estimate for the project was \$7.691 million, rather than the \$7 million stated in the main submission. The Bureau explained that the initial \$7 million figure²⁴ did not incorporate professional fees or land costs.²⁵
- 3.22 The Bureau added that the \$1.662 million re-equipment cost referred to in its submission²⁶ was not considered part of the project cost as the replacement of radars and other meteorological equipment would be achieved through the Bureau's operational budget.²⁷

Shipping and Logistics

- 3.23 During a confidential briefing on project costs, the Committee was informed that there was roughly a 75 per cent loading on the construction costs as a result of the island's remote location, and that this premium was in addition to the high logistical expenses that would be incurred for the same reason.
- 3.24 Noting the remote location of Willis Island, the Committee sought information from the Bureau regarding shipping and logistics, and whether there was a competitive market for the provision of these services. The Bureau explained that there were a limited number of companies that would service Willis Island, but that the tenders received had included shipping costs. The Bureau added that the tenders incorporated various logistical combinations for different materials. At the Committee's request, subsequent to the hearing, the Bureau provided details of the expected volume of materials to be transported to and from the island, as well as a summary of each tender. In each case, the Committee was satisfied with the information it received.

24 Appendix C, Submission No. 1, paragraphs 11 and 12

25 Appendix D, Official Transcript of Evidence, page 13

26 Appendix C, Submission No. 1, paragraphs 11 and 12

27 Appendix D, Official Transcript of Evidence, page 13

Costs Unknown at the Time of Estimate

- 3.25 The Committee observed that the detailed commercial-in-confidence cost estimate provided by the Bureau omitted a number of items which might be expected to impact significantly upon project costs. The Bureau explained that these were items that the quantity surveyor had not been able to quantify, but assured the Committee that they would be provided for in the tender documentation and allowances. The Committee requested that the Bureau supply details of these costs and the provision made for them, when the information became available.
- 3.26 Subsequent to the hearing the Bureau advised that some items excluded from the cost estimate (for example, TV dish, relocation of meteorological equipment, insurance and relocation of Satweb) had been provided for in the tenders received. The Bureau also supplied information on the cost of communications hardware, and undertook to provide further details as they became available. The Committee was satisfied with the information it had received this far.

Recommendation 2

The Committee recommends that the Bureau of Meteorology supply the Committee with budgetary details of items omitted from the commercial-in-confidence quantity surveyor estimate for the project when such information becomes available.

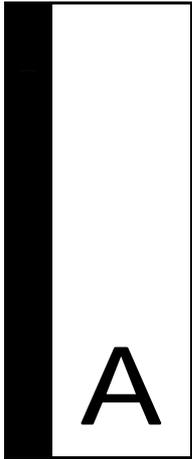
Recommendation 3

The Committee recommends that the proposed redevelopment of Willis Island Meteorological Office, Coral Sea, proceed at the estimated cost of \$7.691 million.

Hon Judi Moylan MP

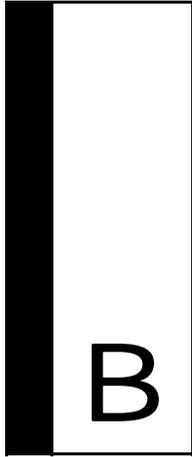
Chair

14 September 2005



Appendix A - List of Submissions

1. Bureau of Meteorology



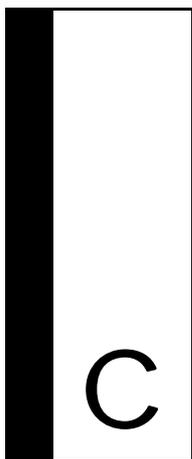
Appendix B – List of Witnesses

Dr Susan Barrell, Assistant Director, Observations and Engineering, Bureau of Meteorology

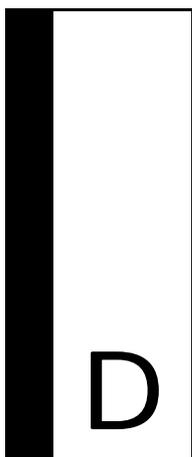
Mr Laurence McBean, Supervisor New Facilities, Engineering Services, Bureau of Meteorology

Mr Craig Brown, Project Manager, GHD Pty Ltd

Mr Michael Whitehead, Acting Executive Officer, General Services, Bureau of Meteorology



Appendix C – Submission No. 1 from the
Bureau of Meteorology



Appendix D – Official Transcript of Evidence

