



Parliamentary Standing Committee on Public Works

REPORT

relating to the

DEVELOPMENT OF FACILITIES FOR 10 TERMINAL REGIMENT AND THE ARMY MARITIME SCHOOL, TOWNSVILLE

(Eighteenth Report of 1995)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
1995

The Parliament of the Commonwealth of Australia
Parliamentary Standing Committee on Public Works

Report Relating

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**Development of facilities for 10 Terminal
Regiment and the Army Maritime School,
Townsville**

(Eighteenth Report of 1995)

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**MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS**

(Thirty-First Committee)

Mr Colin Hollis MP (Chair)
Senator Paul Henry Calvert (Vice-Chair)

Senate

Senator Bryant Robert Burns
Senator Shayne Michael Murphy*

House of Representatives

Mr John Neil Andrew MP
Mr Raymond Allen Braithwaite MP
Mr Russell Neville Gorman MP
Mr Robert George Halverson OBE MP
Hon Benjamin Charles Humphreys MP

* replaced Senator John Devereux on 10 February 1995

Committee Secretary: Peter Roberts

Inquiry Secretary: Denise Denahy

Secretarial Support: Mahesh Wijeratne
Belynda Zolotto

**EXTRACT FROM THE VOTES AND PROCEEDINGS OF
THE HOUSE OF REPRESENTATIVES**

No. 116 dated Wednesday, 1 February 1995

**PUBLIC WORKS – PARLIAMENTARY STANDING
COMMITTEE – REFERENCE OF WORK - DEVELOPMENT
OF FACILITIES FOR 10 TERMINAL REGIMENT AND THE
ARMY MARITIME SCHOOL, TOWNSVILLE**

Mr Walker (Minister for Administrative Services), 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: Development of facilities for 10 Terminal Regiment and the Army Maritime School, Townsville.

Question - put and passed.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

DEVELOPMENT OF FACILITIES FOR 10 TERMINAL REGIMENT AND THE ARMY MARITIME SCHOOL, TOWNSVILLE

By resolution on 1 February 1995, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for consideration and report to Parliament the development of facilities for 10 Terminal Regiment and the Army Maritime School, Townsville.

THE REFERENCE

1. The Department of Defence (Defence) wishes to relocate the 10 Terminal Regiment and the Army Maritime School (AMS) from Sydney to Townsville to meet operational and training requirements. The 10 Terminal Regiment provides the Army's terminal capability and most of its water transport capability. The Army Maritime School conducts individual training in maritime and terminal subjects, including maritime maintenance and most of its effort supports the capability provided by 10 Terminal Regiment.
2. This proposal will place the 10 Terminal Regiment close to its primary user 3rd Brigade which is located in Townsville and will also allow for the vacation of current locations on Sydney Harbour.
3. The proposal will provide office accommodation, instructional facilities, marine facilities, repair facilities and storage facilities.
4. The estimated outturn cost of the proposal at the time of referral to the Committee was \$25.5m. However, at the public hearing Defence advised that the outturn cost had risen to \$25.914m due to variations in the outturn cost indices.

THE COMMITTEE'S INVESTIGATION

5. The Committee received a written submission from Defence and took evidence from its representatives at a public hearing in Townsville on 3 July 1995. Prior to the public hearing the Committee inspected the proposed site for the proposal and also the three alternative sites in Townsville. On 15 June 1995 the Committee inspected the existing facilities of the 10 Terminal Regiment and the Army Maritime School in Sydney. The public hearing was originally scheduled for early May but at the request of Defence the hearing

was postponed pending clarification of issues relating to the uncertainty over future access to the Ross River site (see paragraph 36).

6. At the public hearing evidence was also taken from the following:

- . Queensland Department of Transport
- . North Queensland Conservation Council
- . Queensland Department of Lands
- . Queensland Department of Primary Industries
- . Queensland Department of Environment and Heritage
- . Townsville City Council

7. Written submissions regarding the proposal were also received from the following organisations and are incorporated in the Committee's proceedings:

- . Australian Heritage Commission
- . Department of Business Industry and Regional Development
- . Commonwealth Fire Board
- . Environment Protection Agency
- . Commonwealth Department of Primary Industries and Energy

8. A list of the witnesses who gave evidence at the public hearing is at Appendix A. The Committee's proceedings will be printed as Minutes of Evidence.

THE NEED

Relocation and Collocation of 10 Terminal Regiment and Army Maritime School

9. Defence proposes to relocate 10 Terminal Regiment and the AMS from Sydney to Townsville. 10 Terminal Regiment is currently located in the Sydney metropolitan area over three separate sites - Middle Head, Georges

Heights and Woolwich. The AMS is currently located at Chowder Bay.

10. 10 Terminal Regiment has a strength of 321 all ranks (150 Regular Army and 171 General Reserve personnel). The unit is organised into four major elements: the regimental headquarters, a terminal squadron, a water transport squadron and a workshop squadron. The AMS will have a strength of around 30 Regular Army personnel when collocated with 10 Terminal Regiment. The AMS trains primarily 10 Terminal Regiment personnel.

11. It is proposed to locate 10 Terminal Regiment and AMS in Townsville on the Ross River at Ross Island. This site is currently owned by the Queensland Department of Lands and disposal to the Commonwealth is being negotiated. It is proposed to construct new facilities encompassing marine and land based structures to accommodate 10 Terminal Regiment and AMS.

12. Vacation of the Sydney sites will allow Defence to rationalise its property holdings on the Sydney Harbour foreshore. Facilities development costs at Townsville will be offset by revenue generated from the rationalisation exercise. Defence is permitted to retain revenue from property sales up to a limit of 1% of the Defence outlay on any one year. This does not imply a direct offset as the cost of this proposal has already been included in the defence capital investment program and the proposal does not rely on the creation of any revenue from property sales. However, in the longer term as Defence rationalises its property holdings in Sydney it does expect to get enough revenue to more than cover the cost of this project.

13. The Committee notes that in relation to the land to be vacated by 10 Terminal Regiment and AMS that the Minister for Defence has given a commitment that any existing bushland will be retained in its natural state and incorporated in the Sydney Harbour National Park. The Chowder Bay site occupied by AMS will not be developed for commercial purposes and a study is underway to determine what might happen to land that is not bushland.

14. Activities of 10 Terminal Regiment involve terminal and watercraft operations which can be conducted anywhere within an area of operations. 10 Terminal Regiment provides Army's terminal capability and most of its water transport capability. Terminal operations include the operation of road and rail terminals, military ports, and assistance in the operation of air terminals. In essence, terminal operations primarily involve the transshipment of cargo from one mode of transport to another. This includes the receipt, storage and in-transit handling of cargo as well as the transit of troops.

15. An essential element of terminal operations is the capability to conduct what is known as Logistics Over The Shore Operations (LOTS) where troops and cargo are moved between the shore and an off-shore vessel or vice versa. LOTS operations are undertaken to supplement the capacity of an existing port or to provide the means of discharging ships where no fixed port facilities exist. Other tasks include the operation of landing craft and lighterage equipment in support of coastal, harbour and inland waterways operations.

16. 10 Terminal Regiment has been substantially downsized and restructured under the recent ADF Force Structure Review (FSR) and is currently dispersed over three sites in Sydney and the unit must now concentrate to remain viable. At present 10 Terminal Regiment has a supplement of 34 staff to enable the organisation to work in an administrative sense because it is dispersed. AMS conducts individual training in maritime and terminal subjects, including marine maintenance and most of its effort supports the capability provided by 10 Terminal Regiment. AMS has also been downsized as a consequence of FSR. Sharing of administrative support, maintenance and facilities with 10 Terminal Regiment on one site will provide additional manpower and administrative savings. Some \$3m in salaries (representing 59 positions) and administrative overheads can be saved annually if 10 Terminal Regiment and AMS can be concentrated onto the one site.

ADF Amphibious Capability

17. Studies undertaken by Defence support the retention of an amphibious capability and also support the siting of that capability in the North. As part of the ADF capability, Army is to retain a water transport capability based on Landing Craft Mechanised Class 8 (LCM8), Naval Lighterage Equipment (NLE) and inshore and off-shore safety craft. At the public hearing the Committee was advised that the water transport and terminal capability is at a minimum level and with any further reduction would be difficult to sustain.

18. The preferred location and level of capability for 10 Terminal Regiment have been the subject of considerable review within Defence over the last five years. These reviews have supported the retention of the capability, albeit at a reduced level, and have recommended that the unit be located at Townsville. Additionally, in the course of project development the issue of location was further investigated and the alternative locations of Brisbane, Cairns, Mackay, other Sydney sites and Darwin were analysed.

Location Options Considered

19. The determination of a suitable location took into account the following considerations:

- the major users for water transport and terminal operations are located in the north of Australia with the major ADF customer being located in Townsville; closer location would provide increased opportunities for training and thus improve operational effectiveness
- the water transport squadron and the terminal squadron work together to support water transport operations; they should be located close to each other to maximise this interaction and reduce administrative and training costs
- the terminal elements are best located at a major transportation node along the Main Supply Route, noting that it is easier to deploy from a location that has access to airports, rail and road terminating points
- the facilities requirements are specialised, particularly noting the water access requirement
- the proposed location should allow the maximum level of concentration to optimise personnel and operating cost savings
- the Navy has considerable assets (Landing Craft Heavy-LCH) home berthed in Cairns and close proximity would enhance training and joint operations
- relocation is driven by the timing of programmed personnel reductions and the desire to rationalise properties on the Sydney Harbour foreshore.

20. The main location options considered were Sydney, Brisbane, Cairns, Darwin, Mackay and Townsville. Remaining in Sydney is not considered viable in the long term as it does not maximise the operational and training advantages by locating the unit closer to its main customer nor does it maximise revenue return from property rationalisation. Sydney does not allow the unit to concentrate and thus achieve the maximum operating cost savings.

21. Brisbane offers a viable site at Bulimba; however, it does not maximise training and operational effectiveness and relocation will be delayed until at

least the year 2000 pending the resolution of the long-term facilities requirements for Brisbane Logistic Group (the current occupant of the site).

22. The use of Cairns, Darwin or Mackay would allow the units to concentrate and provide increased opportunities for northern training. The major disadvantages are the distances from the 3rd Brigade in Townsville and the need to incur additional operating cost penalties (as the unit has to travel to train with the 3rd Brigade) and a lack of available land and wharfage facilities in all three locations. A Darwin location would place the unit remote from the 3rd Brigade and from suitable training areas which would increase training and operating costs. Mackay does not have an existing Defence support infrastructure and would require extensive development of port and support facilities.

23. Townsville would allow the unit to concentrate, maximise operational and training opportunities, allow one embarkation point for Navy support and reduce training and administrative overheads. Townsville is also a key defence base with a military infrastructure which can easily cater for the additional needs of 10 Terminal Regiment and AMS. In summary Townsville is the preferred location option because:

- . it will place 10 Terminal Regiment close to its primary user, 3rd Brigade, and to Shoalwater Bay and other local training areas
- . effectiveness is improved as the terminal and water transport elements can be collocated
- . Townsville is a major nodal point on the Main Supply Route and thus supports location of both the terminal and water transport elements
- . the site is located on the Ross River and thus satisfies the water access requirement
- . the unit can be concentrated on the one site and thus provide the maximum personnel and operating cost savings (see paragraph 24)
- . a Townsville location for 10 Terminal Regiment will also be of benefit to Navy operations when supporting 3rd Brigade training or operations and would also lead to greater interaction between Army and Navy landing craft personnel
- . relocation to Townsville allows rationalisation of Defence property assets on Sydney Harbour to take place.

24. The relocation of 10 Terminal Regiment and AMS will result in the following savings:

- . 34 supernumerary personnel positions will be saved (\$1.53m per annum) through the collocation of the presently dispersed elements of 10 Terminal Regiment
- . 25 personnel positions will be saved (\$1.125m per annum) through the collocation of 10 Terminal Regiment and AMS
- . sea transit costs associated with training exercises will be reduced from \$88 000 per annum to \$32 000 per annum if the unit is located in Townsville closer to existing training areas.

Committee's Conclusions

25. There is a need to relocate the 10 Terminal Regiment and the Army Maritime School from their current locations in Sydney as part of the rationalisation of Department of Defence property holdings in Sydney.

26. There is a further need to collocate the 10 Terminal Regiment and the Army Maritime School on a single site to maximise financial, personnel and infrastructure resources following the downsizing of both units as a result of the Force Structure Review.

27. Following an examination by the Department of Defence of location options in Sydney, Brisbane, Cairns, Darwin, Mackay and Townsville the Committee believes that a Townsville location will optimise operational and training opportunities, particularly as the 3rd Brigade, which is 10 Terminal Regiment's primary user, is also located in Townsville.

THE PROPOSAL

Townsville Location Options

28. Four site options were considered within Townsville. The sites are shown at Appendix C. Three options are located in the Ross River and the other option is located in the yet to be reclaimed area of the port. In all options, only working facilities would be provided at the waterfront with living-in and messing accommodation being provided at Lavarack Barracks.

29. The first site, known as the 'BP' site was considered to be too small (six hectares instead of the required 10), was surrounded by residential

development, would have high berthing costs due to the closeness of the main access channel in the Ross River and had been exposed to contamination.

30. The second option, known as the Raptus/Capricornia/Port Authority site, is located at the mouth of the Ross River. It could only support a dysfunctional layout over a split site with an insufficient number of berthing facilities (five instead of the required eight), and considerable likely marine congestion at the river mouth. While access was good, residential buffering is limited. The mouth of the Ross River is exposed to the prevailing weather and the channel at the mouth is quite narrow and close to the facilities at that location.

31. The third option, known as the Ross Island site, allowed a functional layout at reasonable cost, provided better protection, was buffered from residential development but required an access road off the major industrial road known as Boundary Road, was subject to environmental considerations and was part of a larger undeveloped site owned by the Queensland Department of Lands.

32. The fourth option, the yet to be reclaimed land in Cleveland Bay, is located in an industrial port area with good access. However, this option had the highest capital cost (some \$3m higher than the other options) due to the extensive reclamation works necessary and the site is very exposed to the prevailing weather which would increase on-going maintenance costs associated with use and storage of non-marine protected equipment (the unit has around 100 pieces of non-marine vehicles and plant).

33. Despite the environmental and developmental issues associated with the Ross Island site, it is considered by Defence that this option offers the better long term solution for a practical and efficient operational layout in a location reasonably well buffered from residential development.

34. It is proposed to locate the unit on 11 hectares of a 90 hectare site known as Ross Island in South Townsville. The proposed site fronts the Ross River and also opens into Goondi Creek. It is currently owned by the Queensland Department of Lands, has been partially filled and is essentially undeveloped. Detailed environmental investigations are being undertaken and have identified that mangroves and local planning issues are the major environmental issues. Further details on environmental considerations are provided at paragraphs 41 to 58).

35. A preferred concept layout of the buildings on the proposed site is at Appendix C. This layout has been developed on the basis that any removal

of mangroves is kept to an absolute minimum and the mangroves are used as a riparian buffer zone. It should be noted that this is an initial concept layout only, completed as part of project development to determine a project cost and to initiate negotiations with the Queensland Government. Detailed siting of actual building locations will be done as part of the design and environmental approval processes.

36. As indicated at paragraph 5 the public hearing was delayed at the request of Defence pending clarification of issues relating to the uncertainty of future access to the Ross River site. The Committee was advised by Defence that the Queensland Department of Transport has been coordinating a review of options for improved rail and road access into Townsville and one of the options involved the construction of a bridge across the mouth of the Ross River. Defence sought a written assurance that any such bridge would be an opening bridge in order to ensure access to the Ross River. Defence has now received a ministerially approved undertaking from the Queensland Department of Transport that should any bridge be built in the future, Defence clearance requirements of six metres can be met. At the public hearing the Queensland Department of Transport confirmed this undertaking and stressed that it believed that the necessary undertakings had been provided to Defence which would remove the bridge issue as a factor in the site in the site determination process.

Committee's Conclusion

37. The Ross Island site is the most suitable of the four sites in Townsville examined by the Department of Defence for the collocation of 10 Terminal Regiment and the Army Maritime School.

Proposed Facilities

38. The proposed facilities are as follows:

- . Regimental Headquarters Building to accommodate 25 staff and including offices, conference room and duty accommodation with a total floor area of approximately 864m². A parking area for 72 vehicles including a flag station completes this facility
- . Army Maritime School includes instructional and training rooms, lecture facilities and library of approximately 800m²
- . 30 Terminal Squadron consists of offices and stores of approximately 285m² and parking areas to accommodate 42 vehicles

- the Regimental Transport facility incorporates a total of 17 000m² of hardstand area with 1 500m² of covered vehicle parking. A vehicle wash down area of 200m² including a water blaster and oil trap facilities are included together with vehicle pits, and a refuelling area of 30 000 litre capacity. Office areas and a vehicle accessories store of 136m² are also included
- a combined Q-Store area of 3 272m² providing storage for equipment, weapons, clothing, field kit and bulk storage
- a dry store area of 61m x 26m together with a 30m x 26m LCM8 repair section provided for vessel storage and repair. A three tonne gantry crane is incorporated in the LCM8 repair section to service these vessels. A travel lift crane is used for vessel storage in the dry store area
- workshop facilities of 3 461m² comprising offices and repair areas. An 8 tonne gantry crane is provided to access the repair areas
- hardstand of 3 300m² between the workshop and LCM8 dry store is provided for travel lift crane access and for additional vessel storage areas in the event of a cyclone
- 35 Water Transport Section incorporates a building area of 763m² of waterside offices, amenities and stores together with waste oil and sullage tanks and wharf refuelling facilities of 30 000 litres
- various marine facilities including a landing craft ramp of 1 260m², wharf structure of 2 000m² including a dummy strip area, finger docks for an 80t travel lift crane and a mooring dolphin
- limited messing, canteen, change and recreational facilities of approximately 1 000m²
- construction of stormwater drainage, sewerage reticulation and pump station/rising main and water reticulation
- construction of electrical reticulation and pad mount transformer
- roadwork construction providing 900m of internal roads, and 650m of access road. The access road will be constructed by the Townsville City Council with the cost of construction being included as part of the acquisition price of the site

- concrete hardstand areas including 2 500m² of roadway at the landing craft ramp and 2 000m² adjacent to the 35 Water Transport Squadron
- fire protection including water storage, booster pumps and dockside diesel pumps
- paved dummy cargo area of 9 540m² incorporating mechanical handling equipment and dummy rail siding.

39. Further construction details are at Appendix C.

Personnel

40. The combined 10 Terminal Regiment/AMS organisation will total around 180 Regular Army personnel. Of this total, some 60 personnel would live in at Lavarack Barracks with some 120 married personnel being accommodated within the Townsville civilian community. Initially it is likely that the General Reserve personnel from the south will parade 2-3 times each year under General Reserve special conditions. Living-in accommodation for the General Reserve personnel would also be provided at Lavarack Barracks. The relocation to Townsville of an additional 180 personnel and their families will result in an estimated population increase of 450. Defence expects that over time the 10 Terminal Regiment will be attractive to prospective part-time soldiers from the Townsville area and that the General Reserve positions in 10 Terminal Regiment will eventually be substantially filled from the local region.

Environmental Considerations

41. In its submission Defence advised that an Environmental Impact Assessment (EA) and Community Consultation Program (see paragraphs 68 to 76) were being implemented to ensure environmental issues relating to the proposed site could be satisfactorily addressed. At the time of the public hearing the EA and the majority of the public consultation had been completed while the Notice of Intention was shortly to be forwarded to the Commonwealth Environment Protection Agency (EPA).

42. Development of the Environmental Management Plan (EMP) to cover the construction and operation phases had commenced and was being developed under the guidance of a steering group consisting of the relevant Commonwealth, State and local government and environment authorities. The EMP was scheduled for completion in September 1995.

43. The results of the EA indicated that while development will need to consider a number of issues and factor them into detailed design and operating procedures, the proposal can be responsibly integrated with the surrounding environment. Further consultation with the Department of Lands has resulted in a slight boundary change in order to retain part of the mangrove nursery area extending in a south-east direction from the unnamed tributary, under Defence control in order to provide an adequate buffer zone - see Appendix C.

44. The proposed development is assessed as having a minimal environmental effect on the proposed site. Managing the environment is a key objective and goal of the proposed development strategy. In ensuring this occurs, both Federal and State Government requirements are being accommodated as well as the requirements of local Authorities and interested stakeholders. Defence believes that development of the EMP is in accordance with the recently announced Commonwealth coastal policy.

45. A detailed flora and fauna survey was conducted by external consultants as part of an environmental audit of the Department of Lands site. The main outcomes and recommendations are as follows:

- . no rare or threatened plant species were recorded on the site during the field survey; however, the riparian mangrove community contains up to eight different species of mangrove
- . a total of 42 native and two introduced bird species, one native and one introduced mammal species, three reptile species and one introduced amphibian species were recorded during the surveys. Two of these bird species, the Eastern Curlew and the Bush Thick-Knee are of conservation significance
- . the Goondi Creek tributary and adjacent mangrove riparian areas are ecologically important to support the flora and fauna of significance, have conservation significance and should be retained
- . the mangroves along the Ross River should also be retained as transient bird habitat and for their aesthetic value and bank stabilisation properties
- . most of the proposed 10 Terminal Regiment site is already degraded and, given appropriate management/protection of the important mangrove areas, the proposed development is unlikely to impact significantly in a local or regional context

- . an EMP should be prepared for the proposed development and should include removal of existing rubbish from mangrove areas.

46. At the public hearing a number of issues of environmental concern were raised and these are outlined in the following paragraphs.

Queensland Department of Primary Industries (DPI)

47. DPI is charged with fostering and promoting primary industries while ensuring the sustainable management of the natural resources upon which these industries are based. From a strategic viewpoint in terms of such issues within DPI interest such as quarantine and regional development, the relocation of 10 Terminal Regiment and AMS to Townsville is strongly supported by DPI. From a land/water management perspective and as a neighbour to areas of DPI interest such as the marine resources provided by mangroves, saltmarshes and tidal waters, it is DPI's experience that Defence is an excellent manager. The various controls and management regimes as proposed will ensure impacts upon adjacent environments are likely to be minimal and in some instances positive because of rehabilitation works.

48. However, DPI is concerned by the incremental, largely piecemeal loss of key marine resources such as saltmarshes and mangroves. DPI believes that the Ross Island Redevelopment study, which was jointly funded by the Queensland Department of Lands, Defence and the Queensland Department of Business, Industry and Regional Development, considered only development potential and did not consider the natural resource values of what is in effect the last area of substantial marine resources on the north bank of the Ross River. DPI also believes that the work undertaken for Defence did not consider the subregional context of marine resources in the Ross River catchment.

49. DPI recognises that the Ross Island site is ideal to meet the need for marine-related industry development in Townsville and with development in the surrounding areas it would appear to make good planning sense to develop this area. However, DPI believes that the significance of losing the total area of marine resources should be recognised and that at least an equivalent area for biological value on the southern bank of the Ross River be identified and the dedicated as fish habitat area under the *Fisheries Act 1994*. All wetlands on the south side of the Ross River should be evaluated as to their most appropriate use and changes in tenure status, reservations and developments should occur accordingly.

50. In response to the issues raised by DPI, Defence made the following points:

- . the Defence proposal seeks to retain the maximum mangrove area both from an environmental perspective and as a buffer to the surrounding residential areas
- . a small number of mangroves will be removed to allow road access across the creeks but have been surveyed to ensure the minimum disruption to the more environmentally sensitive areas
- . the impact on the saltmarsh and mangrove areas will be minimised to the maximum extent possible
- . Defence is seeking to purchase only the area required to meet Defence needs
- . as the adjoining site belongs to the Queensland Government future development of that site is not a matter for Defence consideration
- . the land on the south bank of the Ross River is also owned by the Department of Lands.

51. In summary, Defence believes that as it is not seeking to significantly impact on the mangrove or wetland areas, DPI should discuss the issue of offset areas with the Department of Lands during any proposal for the development of the adjoining Department of Lands site.

Queensland Department of Environment and Heritage (DEH)

52. In its submission the DEH raised the following concerns:

- . it envisages the construction of the access road will have the most significant impact
- . the impact of security lighting, security fencing and power lines on the nearby flying fox, egret and ibis colonies situated on the opposite side of the Ross River
- . in relation to the power lines DEH is suggesting that live power lines be spaced far enough apart to prevent a flying fox straddling two wires. An alternative would be for power lines to be bundled together.

53. Defence in response to the issues raised by DEH made the following points:

- . the access road has been sited with environmental expertise to ensure minimal disturbance to vegetation. Design and construction will be done in conjunction with hydraulic experts to ensure minimum disruption to the mangroves and to ensure that drainage across the site is not adversely impacted
- . the design process will address the need to prohibit off-road vehicle movements to avoid destruction of vegetation and minimise soil erosion. These requirements will be specified in the EMP and DEH advice on these issues will be sought
- . in relation to the impact on flying fox, egret and ibis colonies, Defence has commissioned a number of studies to determine the mitigation measures particularly in relation to the movement of Defence boat traffic and the need to buffer the south bank from noise sources
- . security lighting will be building specific and large areas will not be floodlit
- . barbed wire will not be used for security fencing which will be located on the edge of the fill area to ensure minimal impact on the mangroves
- . discussions will be held with the local electricity authority to address the power line issue and determine the optimum solution.

54. It should be noted that a number of the issues raised by the DEH were also raised by the Australian Heritage Commission.

North Queensland Conservation Council (NQCC)

55. NQCC raised a number of concerns regarding the proposal:

- . it believes that the Cleveland Bay site (option 4) is the most environmentally benign
- . the Ross Island site was chosen prior to community consultation
- . neither the NQCC nor the community have had any input to the decision to rezone the Ross Island site

- . the Environmental Impact Assessment (EIA) excluded invertebrates and marine life
- . the environmental impact of the access road has not been adequately assessed.

56. In response to the issues raised by the NQCC, Defence made the following points:

- . the Ross Island option was selected as the preferred Defence option as it allowed the user requirement to be met on a single site which is protected from prevailing weather conditions and is buffered from residential development
- . while the yet to be reclaimed Cleveland Bay site (option 4) has less environmental impact than the other options, it is exposed to the prevailing wind conditions which would produce a difficult and uncomfortable working environment for the 200 people employed at the unit. Additional maintenance costs would be incurred for the unit's approximately 100 non-marine protected vehicles and plant
- . option 4 would cost some \$4m more to develop than the Ross Island site. Defence believes this to be a significant cost increase rather than a minimal increase as claimed by the NQCC
- . Defence has undertaken a significant and comprehensive consultation program in the four months preceding the public hearing and no concerns regarding the rezoning had been received by Defence. The NQCC was briefed on the project in March 1995
- . the issue of the marine ecosystem was considered in the EIA. It is recognised that further detailed research of the marine ecosystem is desirable for long term management and Defence intends to participate in development of a strategy to obtain this information
- . Defence believes that the proposed access road is the only viable access route as the other possible access options would require traffic to move through residential streets. The Townsville City Council has advised Defence that such use of residential streets would be against the principles of the Better Cities Program and would not be approved by Council
- . Defence has invited NQCC to be a member of the Environmental

Advisory Steering Group which has been established to oversight the development of the EMP.

Committee's Conclusion

57. The Committee acknowledges the efforts made by the Department of Defence to ensure that the proposal to locate the 10 Terminal Regiment and the Army Maritime School on the Ross Island site has minimal environmental impact.

Committee's Recommendation

58. The Department of Defence advise the Committee of the results of the environmental assessment of the project being conducted by the Commonwealth Environment Protection Agency.

Contamination

59. The extent of contamination of the site was determined by inspection and sampling and chemical analysis as part of the Master Planning Study. This contamination assessment indicated the following:

- . no elevated heavy metal results recorded in analyses. All levels are well below ANZECC/NHMRC investigation criteria
- . petroleum hydrocarbon contamination observed around the aboveground fuel storage tank at the existing Palm Island Barge Service. Estimated extent of contamination is an area of 5m by 5m to a depth of 0.4m. Approximate volume of material impacted by hydrocarbon contamination is 10m³
- . on the basis of the site history and the field reconnaissance to date, groundwater is not considered to have been impacted by contamination from the site. The cost of remediation will be about \$1500. This cost is based on a volume of 10m³ to be removed at a unit rate of \$150m³ for clean-up.

Geotechnical Investigation

60. The development of the preferred site will require 64 000m³ of fill to raise the site above known flood levels. The filled level of the site will be consistent with Townsville City Council's minimum allowable floor level. Detailed geotechnical investigation has shown that:

- . land based lightly loaded structures can be founded on conventional shallow foundations
- . piled foundations will be used where structures are sensitive to movement such as the LCM8 repair workshop
- . marine based structures will be piled.

61. The cyclone standard for Townsville is category 2 and all buildings will be designed to withstand this wind loading. Townsville is within the category B earthquake zone which has a lesser requirement than the category 2 wind loading to which the buildings will be designed.

Tropical Diseases

62. Both Dengue Fever and Ross River virus, both mosquito-borne diseases, are present in the Townsville area. Defence believes that the spread of infection can be reduced by screening buildings, fogging, preventing pools of fresh water collecting, the use of mosquito repellent and the wearing of loose long sleeved protective clothing. These housekeeping measures will be further detailed in the EMP. Defence believes that the risk of infection is at a very low level.

Property Considerations

63. The preferred site represents less than 15% of 90ha of Crown Land controlled by the Queensland Department of Lands. The current Townsville City Strategic Plan zoning for the area includes a mixture of both industrial and residential uses. However, the Council has agreed to rezone the Defence portion of the Ross Island site as "Defence Special Purposes".

64. The 90ha site has been identified by Department of Lands, Department of Business Industry and Regional Development (DBIRD) and Council as a key area of available land for development, particularly for marine-related industry. The Defence proposal to locate 10 Terminal Regiment on the site is seen as providing a catalyst to further develop the rest of the site. Given the need to finalise the access requirements and present concept plans for public scrutiny, the Department of Lands, Defence and DBIRD commissioned a 'Precinct Based Planning Study' for the entire site. This study addressed the following:

- . physical attributes and environmental and cultural constraints
- . the capacity and timing of service infrastructure

- . the need for buffering of existing adjacent uses
- . the overall planning intent of the Townsville City Council and the proposed development of the 10 Terminal Regiment facility
- . the need to optimise use of waterfront land for uses reliant on water frontage.

65. The outcomes from the study were as follows:

- . there was general agreement from the Department of Lands, DBIRD and the City Council that the non-Defence part of the site, would be best developed on an industrial/light industrial basis rather than a residential or mixed basis. The general concept plan has been endorsed 'in principle' by Council
- . there was general agreement that the mangrove riparian zone would be retained for environmental/buffer purposes
- . there was agreement that, prior to any development of the non-Defence part of the site, a comprehensive environmental impact assessment according to Queensland State Government legislation would be completed
- . there was agreement that an access road off Boundary Road needed to be constructed to service the 10 Terminal Regiment site. The access road is to be considered as part of the land acquisition negotiations and requests for environmental clearances by Army would include the requirements for the access road.

66. The land for the proposed site will need to be purchased from the State Government and expenditure is planned, after Parliamentary approval for the project is received. 'In principle' agreement has been obtained from the State Minister for Lands and detailed negotiations are in hand following the completion of the precinct landuse study. Part of the conditions of sale is that the land is clear of any native title claims. The Committee was advised at the public hearing by the Queensland Department of Lands that native title clearance on that part of the site to be purchased by Defence has been received, mainly because filling of the site is inconsistent with native title.

67. At the public hearing Defence advised the Committee that it did not see any need to acquire any additional land to that proposed as any expansion of 10 Terminal Regiment and AMS was considered to be remote. However, should there be a need to expand the water transport capability

in the future, one option for achieving this could be by relocating the non-marine elements to Lavarack Barracks.

CONSULTATION

68. Consultation with the Minister for Lands, Department of Lands, the Townsville City Council, the Department of Business, Industry and Regional Development and the Port Authority has occurred. All the key authorities support the proposal. Consultation on site specific issues such as power, water and sewerage supply, availability and access to fill from the Ross River and access to the Ross River has occurred with the relevant authorities during the development of the proposal.

69. Consultation with the Commonwealth Environment Protection Agency, the Queensland Departments of Environment and Heritage and Primary Industries has occurred. These authorities indicate that they have no major difficulties with the 10 Terminal Regiment/AMS proposal.

70. A comprehensive public communication strategy has been undertaken by Defence during the development of the proposal and will continue during the remaining phases of the project. The aims of the strategy are to inform the community and affected/interested stakeholders about the proposed relocation, identify the issues within the community and seek to alleviate and manage these issues.

71. The consultation included:

- . distribution of letters and a newsletter advising the details of the proposal to landholders and residents in the area surrounding the proposed site (approximately 750)
- . distribution of letters and a newsletter advising the details of the proposal to identified industry, community and interest groups
- . establishment of a dedicated toll-free telephone line for community enquires
- . meetings with Townsville City Council government and agencies
- . placement of public notices in the Townsville Bulletin to inform the community that their input was being sought and that an open day was being held

- . distribution of media releases and subsequent media interviews
- . the conduct of a community open day at the Strickland shopping centre on 20 April 1995.

72. The community consultation program indicated that there was significant local community interest (Railway Estate/South Townsville) in the proposal. General concerns centred on noise, traffic and environmental issues. Defence believes that these concerns have been taken into account and positive action will be taken to ensure they are properly addressed in the development of the EMP.

73. In relation to noise Defence advised the Committee that the following measures will be taken to lessen noise impacts from the site:

- . the need to limit noise emissions will be taken into account in design of buildings
- . any forklift training will take place at Lavarack Barracks and not on the site
- . workshop type activities will be conducted within fully enclosed buildings
- . a noise monitoring system will be established.

74. Traffic flow to and from the site will consist of domestic vehicles (around 100 each morning and night) and two buses transporting personnel to and from their workplace. A small number of low loaders will transport off-terrain forklifts to Lavarack Barracks about once or twice each fortnight. Additionally the unit deploys up to five times a year and on these occasions, seven low loaders and two semi-trailers would move out of the site over a two day period and return after a period of 4-12 weeks. A major regimental exercise occurs once every three years and on these occasions 12 low loaders and two semi-trailers would depart from the site and return after about three months.

75. Data obtained from the Queensland Department of Transport indicate a current traffic volume of 10 000 vehicles per day (vpd) on Boundary Street. Defence believes there is likely to be a maximum trip generation of 1100 vpd by 10 Terminal Regiment. This means in the worst case a 10% increase in traffic on Boundary Street. Defence believes that such an increase would have little impact on road characteristics or local residents.

Committee's Recommendation

76. The Committee recommends that the Department of Defence continue the public consultation process during the detailed design and construction phases of the project.

CONSTRUCTION PROGRAM

77. Works are planned to commence upon Parliamentary approval being obtained with construction completed by December 1997. Defence proposes to engage a managing contractor who will be required to have a certified quality assurance system. Subcontractors will also be selected on the basis of the quality assurance systems they have in place.

78. Defence advised the Committee that while Commonwealth purchasing is based on the principle of best value for money, a policy is being developed which will require Defence to maximise the opportunities for regional industries and small business enterprises to be in a position to bid for Commonwealth Government work. The final purchasing decision will be made on a value for money consideration. Defence believes that the managing contractor delivery method will allow the greatest opportunity for local contractors as the work will be let as a series of trade packages.

79. In relation to the protection of subcontractors, Defence believes that the managing contractor form of delivery for this project will provide adequate protection. While the managing contractor engages the subcontractors, payments to subcontractors are made out of a trust account which is controlled by Defence.

COST ESTIMATE

80. At the time of referral to the Committee on 1 February 1995 the estimated outturn cost was \$25.5m. However, at the public hearing the Committee was advised that the construction cost was now estimated to be \$24.396m with an outturn cost of \$25.914m due to variations in the outturn cost indices.

81. The outturn cost does not include the cost of the site which Defence proposes to acquire at a cost of \$2.3m during 1995/96.

Committee's Recommendation

82. The Committee recommends the development of facilities for the 10 Terminal Regiment and the Army Maritime School at Townsville at an outturn cost of \$25.914m.

CONCLUSIONS AND RECOMMENDATIONS

83. The conclusions and recommendations of the Committee and the paragraphs in the report to which they refer are set out below:

- | | Paragraph |
|--|------------------|
| 1. There is a need to relocate the 10 Terminal Regiment and the Army Maritime School from their current locations in Sydney as part of the rationalisation of Department of Defence property holdings in Sydney. | 25 |
| 2. There is a further need to collocate the 10 Terminal Regiment and the Army Maritime School on a single site to maximise financial, personnel and infrastructure resources following the downsizing of both units as a result of the Force Structure Review. | 26 |
| 3. Following an examination by the Department of Defence of location options in Sydney, Brisbane, Cairns, Darwin, Mackay and Townsville the Committee believes that a Townsville location will optimise operational and training opportunities, particularly as the 3rd Brigade, which is 10 Terminal Regiment's primary user, is also located in Townsville. | 27 |
| 4. The Ross Island site is the most suitable of the four sites in Townsville examined by the Department of Defence for the collocation of 10 Terminal Regiment and the Army Maritime School. | 37 |

5. **The Committee acknowledges the efforts made by the Department of Defence to ensure that the proposal to locate the 10 Terminal Regiment and the Army Maritime School on the Ross Island site has minimal environmental impact.** 57

6. **The Department of Defence advise the Committee of the results of the environmental assessment of the project being conducted by the Commonwealth Environment Protection Agency.** 58

7. **The Committee recommends that the Department of Defence continue the public consultation process during the detailed design and construction phases of the project.** 76

8. **The Committee recommends the development of facilities for the 10 Terminal Regiment and the Army Maritime School at Townsville at an outturn cost of \$25.914m.** 82



Colin Hollis MP
Chair

18 September 1995

APPENDIX A

LIST OF WITNESSES

CREIGHTON, Mr Colin, Acting Regional Manager, Resource Management, Department of Primary Industries, QDPI, Abbot Street, Oonoonba, Townsville, Queensland 4810

FORD, Mr Leslie Raymond, Executive Director Northern Region, Queensland Department of Transport, 146 Wills Street, Townsville, Queensland 4810

FORURIA, Mr Jose, Principal Engineer-Manager, Townsville Office, Gutteridge Haskins & Davey, 3rd Floor, Suncorp Plaza, 61-73 Sturt Street, Townsville, Queensland 4810

HINCHON, Lieutenant Colonel Anthony Derek, Commanding Office 10 Terminal Regiment, Department of Defence, Headquarters 10 Terminal Regiment, Middle Head Barracks, Middle Head Road, Mosman, New South Wales 2088

HOWARD, Mr Andrew James, Senior Environmental Officer, Queensland Department of Environment and Heritage, Pallarenda, Queensland 4810

McCANN, Brigadier Raymond Leslie, Director General, Accommodation and Works, Department of Defence, CP-3-2-15, Campbell Park Offices, Campbell Park, Canberra, Australian Capital Territory 2600

O'BRIEN, Major Christopher John, Office Commanding/Chief Instructor Army Maritime School, Army Maritime School, Chowder Bay Road, Chowder Bay, New South Wales 2088

RESING, Ms Joann Marie, Member, North Queensland Conservation Council, 340 Flinders Mall, Townsville, Queensland 4810

STRACHAN, Lieutenant Colonel Olga Nina, Project Manager 10
Terminal Regiment and Army Maritime School Relocation, CP-3-2-21,
Campbell Park Offices, Campbell Park, Canberra, Australian Capital
Territory 2600

TODD, Mr Leslie Sherwood, Regional Director, Northern Region,
Queensland Department of Lands, State Government Building, Cnr
Stanley and Walker Street, Townsville, Queensland 4810

WEATHERLEY, Ms Sue Michelle, Director of Planning and
Development Services, Townsville City Council, 103 Walker Street,
Townsville, Queensland 4810

CONSTRUCTION DETAILS

Project Elements

1. The proposed facility is located on predominately undeveloped land. The proposal includes marine and berthing facilities, workshop facilities for marine vessels and other equipment, finger docks, several administration and other buildings, including a training facility for training in marine-related skills, and external storage for vehicles, plant and equipment.

Construction Detail

2. The buildings will be designed in accordance with the relevant Australian codes and standards, building regulations and local by-laws. Particular reference is made to the site being located in a cyclone prone area subject to storm surge. These loadings will be taken into consideration in the building and siteworks design. Materials with minimum maintenance requirements will be specified.

Building Envelopes

3. The buildings will be single storey to permit the use of stiffened raft foundations comprising conventional footings/slab construction. The buildings to accommodate the travel lift crane (LCM8 repair section and dry storage area) will be higher than the other buildings. The roof line to the LCM8 repair section wherein a gantry crane also operates will be about 13m.

4. The detailed envelope of the buildings, particularly roof lines, has some flexibility in its design. A likely outcome of the public consultation process will be input from stakeholders (eg Council, residents etc) about the form of the buildings, colour and type of roofs and their general aesthetic appearance to nearby residents. These inputs will need to be assessed and addressed in the detail design.

5. The height of buildings detailed in the attached drawings is dependent on the type of roof (ie pitch) and the ceiling height required for airconditioning ducting. These constraints are highlighted in the drawings. Because of the influence of these factors, the drawings detail the required

wall heights at the eaves for the various building types. These heights are commensurate with normal construction in North Queensland.

Building Fabrics

6. The geotechnical investigation indicates the site is characterised by the variability of the subsurface profile both due to deposition of alluvium and also previous reclamation activities. As some locations, up to 3.5m (but generally less than 2m) of loose, medium to coarse grained sands are evident, and it is understood that they have been in place for some 12 years as a result of reclamation activities. Underlying the variable thickness sand reclamation is up to 7m of soft compressible clays grading to clay sand at lower depths. At some locations the compressible clay is non-existent, and the profile is comprised of loose sands/gravel overlying a basement of very stiff to hard clays and silts at about RL-6 to -8m.

7. Land based lightly loaded structures such as single storey buildings can be founded on conventional shallow footings. The surface sands will support conventional footings provided normal engineering standards for compaction of the upper layers are met. Where structures are sensitive to differential settlements or structure levels are significant, (e.g. workshop area or LCM8 with gantry cranes) deep foundations such as piles will be required. Either driven pre-cast concrete or cast-in-place piles would be appropriate. Placement of fill will require monitoring to assess the amount and rate of settlement but this is not expected to prove restrictive. Surcharging of fill above the platform level may be desirable to accelerate settlements and minimise post-construction displacements.

8. Water-based structures will have to accommodate the 7m approximately of soft clays identified from the river bed surface. This will not affect piled foundations in that adequate pile capacities will be achieved for either vertical or lateral loadings by the appropriate pile embedment. Cantilevered structures (e.g. mooring piles) will need to be designed to accommodate this soft clay layer.

9. Marine structures will be concrete designed to the relevant Australian Standards.

10. Administration and office buildings will use reinforced concrete slabs and foundations, reinforced masonry block walls with a prefabricated timber truss roof and colourbond steel cladding. A generally open plan office environment is proposed.

11. Storage sheds and workshop buildings will be reinforced concrete

slabs, and foundations with steel portal framing with colourbond steel cladding. Piled foundations will be used for areas with overhead gantry cranes to reduce any effects of differential settlements. Walls will be either masonry block or colourbond steel cladding.

12. All buildings will be insulated with minimum R2.5 roof insulation to be provided to reduce summer heat loads.

Stormwater

13. No infrastructure exists on the site. It will be necessary to construct piped drainage outlets to Ross River and the marina/Goondi Creek. Discharges to Goondi Creek tributary will be avoided for ecological reasons.

14. Oil and silt traps will be provided at vehicle wash points and service pits and allowance has been made for bunding of POL areas with concrete floors thereto. Similar facilities will also be provided at the workshop and the LCM8 repair section.

15. Runoff from the balance of the sealed vehicle compound and the hardstand area adjacent to the wharf will be comparable to normal runoff from a suburban street. Water pollution from well maintained LCM 8s should be minimal.

16. Development of the site will not increase flood levels in adjacent areas. Development of adjoining lands will require provision of sufficient drainage paths to contain flood levels.

Sewerage

17. It will be necessary for domestic wastewater to be pumped from the site to the adjacent Council collection system adjacent to Boundary St. Duplicate pumps and emergency storage will be provided.

18. Good housekeeping practices associated with all of the above matters will be assessed in the Environmental Management Plan currently being prepared. Provided measures included in the plan are implemented, impact on adjacent facilities will be minimal.

Waste Disposal

19. Waste water (sewage) will be collected and pumped from the site to Townsville City Council's collection system. Similarly sullage water from the

vessels, provided it does not contain any salt water or waste oil, can be disposed of into the sewerage system.

20. Waste oil and greases will be removed from the site by tanker truck for treatment elsewhere as is usual practice for industrial sites.

21. Garbage and refuse will be removed by arrangement with Townsville City Council.

Water Supply

22. Three hydrants (total 30 litres per second) will be provided to meet fire fighting requirements.

23. Apart from a diesel fire pump at the wharf (using salt water) the nearest source of water is from a 150mm diameter main in Barnicle Street. Townsville City Council advises that there will be 15m residual head at the end of this main under the above conditions which is not adequate. Therefore, the water supply will be provided by construction of a pipeline off the major trunk main in Boundary Street along the access road.

Electricity Supply

24. Preliminary indications are that the development will be revenue positive to NORQEB and so no allowance is necessary for external works. However, cabling to an on-site transformer has been costed in the preliminary costings.

Lighting System

25. Lighting systems for general storage and workshops will be high bay luminaries in accordance with Australian Standards. For office spaces low brightness fluorescent luminaries suitable for use in screen based work areas are proposed. Emergency back up exit lighting will be provided. General street lighting and security system lighting will be provided in appropriate areas throughout the complex. The use of energy efficient lighting systems will be pursued during the detailed design phase.

Communications

26. Preliminary indications from Telecom are that a telephone connection can be provided from existing infrastructure. A direct dial PABX system and fax connections will be provided.

27. Computer network with required network cabling to all specified areas will be provided.

Mechanical Services

28. The site is subject to prolonged periods of cooling from sea breezes. All buildings where possible will be located to utilise these breezes. Workshops and storage areas will be provided with roof ventilators (mechanically or electrically powered). Offices will be air-conditioned.

Fire Detection and Protection

29. All buildings and storage areas are to be fitted with fire and smoke detection systems in accordance with the Building Code of Australia, Australian Standards and statutory requirements: The level of detection and protection afforded is to be in accordance with that detailed in the Department of Defence's Facility Manual 2 (FACMAN 2).

Security

30. Public access by land is restricted by the mangroves and the Goondi Creek tributary to the North and West, and could easily be further restricted by fencing. While the water frontages cannot be physically secured, duty staff will be maintained during non-working hours. Additionally, where necessary, security controls will provide for controlled access to the various depot security areas.

Energy Conservation

31. The conservation of energy primarily by reduction of lighting, heat load and major machinery loads will be a key consideration of the design. An option to be considered is the provision of solar powered water heating.

Roadworks

32. The site is served by two adjacent urban arterial roads; however both roads go through residential areas. It is considered that use of these roads for access, for any major length of time is undesirable given the likely objections on environmental grounds. Accordingly, it is proposed to construct an access road off Boundary Street to service the site. Defence will pay Townsville City Council the necessary headworks charges to construct the road once Parliamentary approval is obtained for the project. Boundary Street is a major arterial road currently servicing the Townsville Port and the proposed access will not impact on any residential areas. Townsville City Council

supports this option. DEH and DPI have informally advised that they support this access proposal provided the access road is constructed to minimise impact on the mangroves and construction is covered in the Environment Management Plan.

Rail

33. The main northern railway is located in Railway Avenue. There is a rail siding about 1.5km from the site.

Landscaping

34. Native trees and plants in association with mounding and existing mangrove areas will be used to provide effective buffer for the development. This will enable its impact on the streetscape to be minimal. Additional plantings of mangroves will be undertaken to supplement the nature of the area using advice from DEH and DPI. Existing rubbish areas will be removed under the Environment Management Plan.

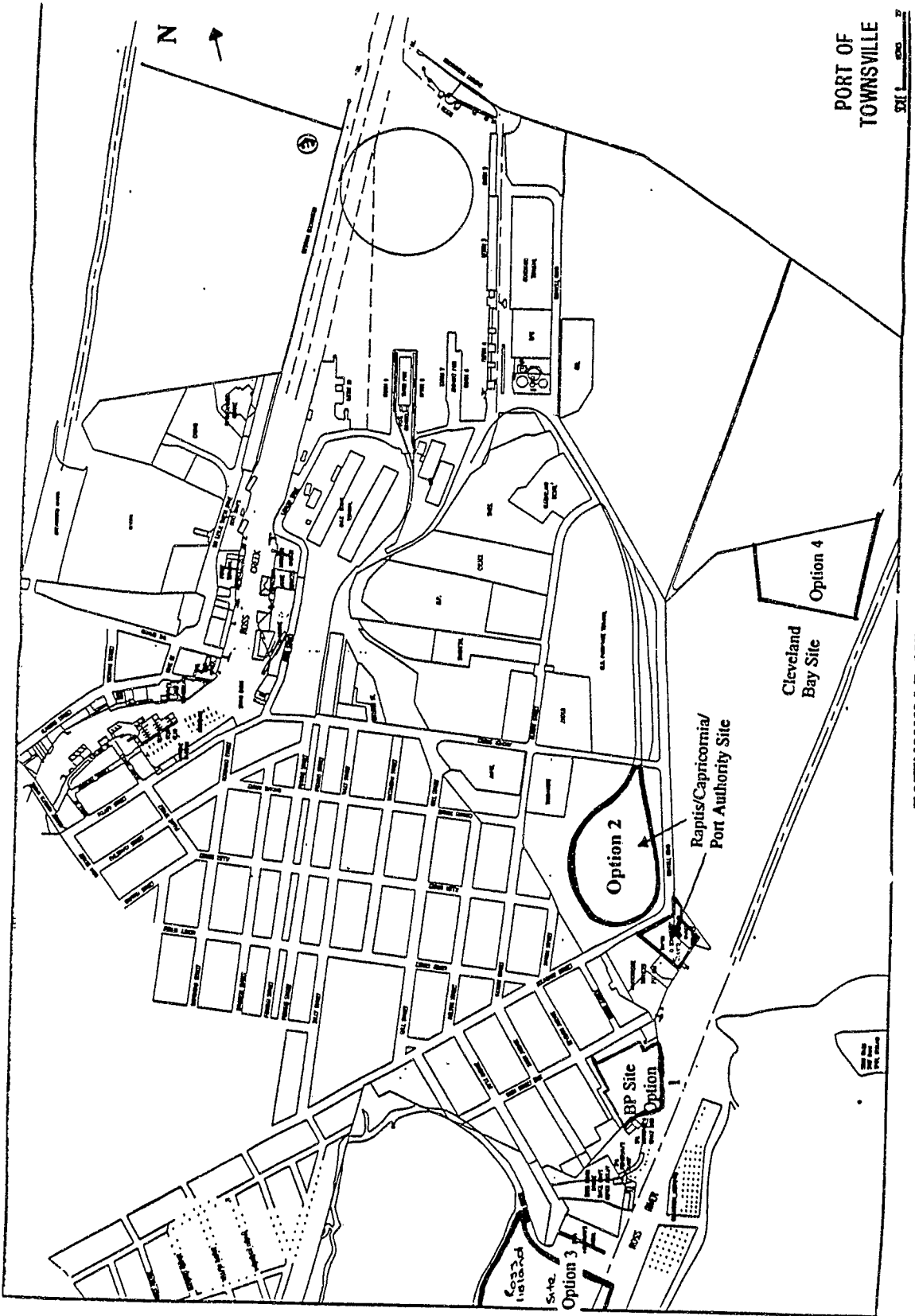
Flooding

35. The proposed development is located above known flood levels, taking into account greenhouse effects. This is consistent with Council's allowable minimum floor level.

APPENDIX C

PROJECT DRAWINGS

Townsville Sites	C-1
Proposed Layout 10 Terminal Regiment/Army Maritime School	C-2



TOWNSVILLE SITES

PROPOSED BOUNDARY OF DEVELOPMENT SITE
13.10 HECTARES AS MARKED.

BARNICLE
YATES ST.

STREET

TOMSWALL ROSS RIVER MARINA

RETAIN RIPARIAN BUFFER ZONE
7100m² compared with
DUMPHY CARGO PHE TRG AREA 10,000m² as required.

WORKSHOP

HARD STAND

LCMR
REPAIR
STATION

DRY
STORAGE
AREA

35
MIS

VEHICLE
HARD
STAND

HARD
STAND

HARD
STAND

FUELING
BERTH

HARD
STAND

HARD
STAND

CONDOR
HD

CAR
PARK
HOLE

LABORATORY

VEHICLE COMPOUND
All 9t & 0 vehicles

LABORATORY

LABORATORY

LABORATORY

LABORATORY

LABORATORY

LABORATORY

LABORATORY

LABORATORY

LABORATORY

LABORATORY

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LABORATORY

LABORATORY

RETAIN NURSERY AREA

LAB PARK
42 VEHICLES

LAB PARK
42 VEHICLES

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RIVER

MOORING AREA

1000A1

ROSS

EXISTING ALLEYS TRAILS
TO BE CLOSED AT THE TERMINAL
PROPERTY BOUNDARY

DEPT OF DEFENCE - 10 TERMINAL
REGIMENT / ARMY MARITIME SCHOOL
PROPOSED LAYOUT

LEGEND

○ BUILDING LOCATION
OR USER REQUIREMENTS

