1974

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

Parliamentary Standing Committee on Public Works

REPORT

relating to the proposed construction of an

AUSTRALIAN RADIATION LABORATORY

at

Yallambie, Victoria

(FIFTH REPORT OF 1974)

CONTENTS

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

AUSTRALIAN RADIATION LABORATORY
YALLAMBIE, VICTORIA

REPORT

By resolution on 3 April 1974, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for investigation and report to the Parliament, the proposal to construct premises for the Australian Radiation Laboratory at Yallambie, Victoria. With the dissolution of the Twenty-eighth Parliament the reference lapsed. The proposal was referred to the present Committee on 30 July 1974.

The Committee have the honour to report as follows:

THE REFERENCE

1. The proposal referred to the Committee is for the construction of a laboratory and administrative complex to accommodate all of the activities of the Australian Radiation Laboratory.

2. The proposed premises have been designed to separate the different levels of radioactivity and radiation by providing two single-storey wings for scientific functions connected by a two-storey central block containing administrative and other non-scientific support services.

3. Other facilities provided will be a staff amenities area opening onto a garden courtyard, car parking and landscaping.

4. The estimated cost of the work when referred to the Committee on 3 April 1974 was $3.25 million and when referred on 30 July 1974 was $3.6 million.

THE COMMITTEE'S INVESTIGATION

5. The Committee received written submissions and drawings from the Departments of Health and Housing and Construction and took evidence from their representatives at public hearings at Lower Plenty, a suburb of Melbourne. The Committee also received written submissions and took evidence from the Heidelberg City Council, the Yallambie Progress Association, the Lower Plenty Pony Club and Mr. J.A. O'Connor of the Centre for Environmental Studies, Preston Institute of Technology. A written submission was received from the Shire of Eltham.

6. Prior to the public hearings, the Committee inspected the existing premises of the Australian Radiation Laboratory and the site for the proposed building.

7. The Committee's proceedings will be printed as Minutes of Evidence.

FUNCTIONS OF THE AUSTRALIAN RADIATION LABORATORY

8. The present functions of the Australian Radiation Laboratory are to:

- maintain standards for the precise measurement of ionising radiations and of radioactive substances;
- procure and distribute all radiopharmaceuticals used in Australia for diagnostic investigations and the treatment of patients;
- maintain a surveillance of the levels of radioactivity in the Australian environment and provide a consultative service on the protection of people against ionising radiations, laser radiation and microwave radiation.

The Laboratory also provides advisory services in the physical aspects of medical radiology, including radiotherapy, and the physical and chemical aspects of nuclear medicine.

9. The Laboratory was established in 1929 as the Commonwealth Radium Laboratory to make radium available under formal agreements to public hospitals in Australia for the treatment of cancer.

10. In 1935, the Laboratory's activities were extended to include the physical aspects of x-ray therapy and it then became known as the Commonwealth X-Ray and Radium Laboratory.

11. Since its inception, the functions of the Laboratory have grown in response to the increasing use of radioactive substances in both medicine and industry and the need to maintain proper precautions against excessive exposure to radiation.

12. A rapid expansion is planned in the work programmes within the approved functions of the Laboratory with respect to

- the supply of radiopharmaceuticals for use on patients;
- the quality assurance of radiopharmaceuticals;
- the investigation of physical aspects of safety in the use of microwaves and lasers;
- the standarising responsibilities of the Laboratory as an agent of C.S.I.R.O. under the Weights and Measures (National Standards) Act and Regulations;
- the development, construction and maintenance of a wide range of mechanical and electronic equipment.

13. To more accurately depict the present role of the Laboratory, its name has recently been amended to the Australian Radiation Laboratory.

THE NEED

14. The Laboratory is at present carrying out its functions in eight separate buildings. Of these, six are located in old buildings on the Australian Government Centre block in Melbourne, one is located in the grounds of the University of Melbourne and one is located at Maribyrnong.

15. The Department of Services and Property advised the Department of Health in August 1972 that buildings used by the Laboratory in Lonsdale and Spring Streets on the Australian Government Centre block were to be vacated because of proposed redevelopment of the area.

16. The University of Melbourne has given notice that it wishes to use the land occupied by the Laboratory in the grounds of that university for the construction of part of a major complex of its own.

17. The premises at Maribyrnong accommodate part of the former Fallout Studies Unit of the Department of Science which was transferred to the Laboratory on 14 December 1973. This unit is being integrated into the Environmental Radiation Sub-Section of the Laboratory.

18. The accommodation located in the Australian Government Centre is in renovated buildings which inevitably suffer from the disadvantage that the scientific, technical and administrative work space has been fitted into them rather than the building having been designed to meet special needs and work flow patterns. This accommodation is considered unsatisfactory for a number of reasons:

- it does not provide adequate floor space;
- results in inefficiencies due to difficulties in communication and in inter-disciplinary liaison on scientific and technical problems between the various sub-sections of the Laboratory;
- increases the risk of injury from accidents within the Laboratory and in some areas potentially leads to staff being unnecessarily exposed to high radiation doses;
- limits the Laboratory in the effectiveness with which it can discharge its full functions.

19. The effectiveness of the work of most sections and sub-sections of the Laboratory is impaired by the present accommodation and in the absence of additional suitable accommodation, some of the important functions of the Laboratory would have to be set aside or at least undertaken at a reduced level.

20. Consideration has been given to purchasing or leasing existing premises in Melbourne and modifying these to the needs of the Laboratory. Between August 1972 and July 1973, eight buildings were examined and plans were prepared of the modifications required to convert five of those into laboratory premises (one in detail by the Department of Housing and Construction). However, the Department of Services and Property advised in July 1973 that the modification of existing buildings was proving to be impracticable and that the only satisfactory method to obtain suitable accommodation was by constructing new premises with adequate floor area and facilities.

21. Committee's Conclusion The Committee consider that the Australian Radiation Laboratory's present accommodation is unsatisfactory and that it should be relocated in premises specifically designed to meet its particular requirements.

THE PROPOSAL

22. The objective of this proposal is the unification of all sections of the Australian Radiation Laboratory in a single complex specifically designed to meet the particular requirements of the Laboratory. Because of the diverse nature of the activities of the Laboratory, it is essential that the new premises should take account of the special requirements of some activities. These requirements include

- high weight bearing capacity for some floor areas. Floor loads will vary from 9.6 kPa to 23.9 kPa (200 to 500 lbs per square foot);

- isolation of "high" and "low" level radiation areas, e.g. the design will prevent activities in the radiopharmaceutical dispensing and preparation areas from interfering with measurement of low levels of radioactivity such as fall-out measurement programmes and radioactivity standardisation.

23. The proposed building will provide 4,925 square metres of usable space compared with 2,230 square metres in the existing premises. This additional space will ensure that work programmes can be carried out under conditions which meet recognised standards for work involving:

- ionizing radiation;
- radioactive substances;
- microwaves, lasers and toxic substances;
- mechanical and electronic equipment;
- machine tools.

24. The Committee were told that it was not proposed to change the present location of the Laboratory from the Melbourne area. The Laboratory works in close liaison with the Australian Atomic Energy Commission in Sydney in the distribution of radiopharmaceuticals. These two separate sources of supply provide a more satisfactory coverage than a single source for hospitals in the heavily populated areas and for the overall Australian requirement.

25. Description of the Proposal The proposed premises have been designed to separate the different levels of radioactivity and radiation by providing two wings for scientific functions. These single-storey wings are combined into an integrated structure by a double-storey connecting central block containing administrative and other non-scientific support services.

26. Advantage has been taken of the undulating terrain of the site to place high radioactive areas in the basement of the east wing with the direction of radiation westwards into the hillside. As earth is an excellent absorber of radiation, this has lowered the amount of shielding that would have been required by other means. The digging into the hillside of the lower ground

floor to the west wing and the raising of the east wing above ground level to achieve the same floor level have enabled the majority of the radiation sections to be kept on the one level.

27. The proposed premises have a low population density expressed as net area per officer mainly because most areas are physics laboratories which require a larger floor area than conventional chemistry laboratories and because of the need for radiation shielding of personnel and equipment.

28. The east wing will provide accommodation for the following sub-sections; Radiopharmaceutical, Dosimetry and Sealed Sources, Health Physics and Radiographic.

29. The west wing will provide accommodation for the following activities: Technical Services, Radionuclide Metrology, Environmental Radiation, Film Badge Service, Lecture/Training Room and Computer Area.

30. The central block between the east and west wings will provide accommodation for a library, conference room, executive offices, administration and amenities area.

31. Site The proposed site is in an area of approximately three hectares on Australian Government land which is at present used by a horse riding school in the south-east corner of the Watsonia Army Camp.

32. The site is approximately 16 km north-east of Melbourne and is bounded on the south by Lower Plenty Road; on the east by a residential development known as Yallambie Estate and on the north and west by the Watsonia Army Camp. The site falls from west to east to a small creek on part of the eastern boundary of the site and falls gently from Lower Plenty Road northwards some 61 metres then gently rises and falls to give an undulating terrain.

33. Committee's Conclusion The site selected is suitable for the proposed Laboratory.

34. Transport The proposed site is 22.4 km by road from the centre of Melbourne and the travelling time is approximately 30 minutes. The Laboratory will be able to provide an adequate service for the delivery of radiopharmaceuticals and other radioactive materials to Melbourne hospitals. Access to air and rail freight depots for the collection and despatch of radioactive materials is considered adequate. The Committee were told that transport services available to the site by road and rail for staff members have been investigated and are considered to be acceptable.

35. In addition, freeways at present under construction or being planned will further improve access to Tullamarine Airport and the city.

36. Landscaping The site at present has on it a number of trees, mainly gums, which will be retained wherever possible. The surrounds to the building will be developed as natural parkland with native trees and shrubs. The garden courts will be developed to provide an attractive landscape and low maintenance gardens for staff recreation and to provide an outlook from the surrounding rooms. It is proposed to plant a wide strip of dense spiky native shrubs along the site frontage in lieu of a security fence.

37. A car park to accommodate 80 vehicles will be carefully blended into the landscape and hidden from view by a 2 metre high mound covered with vegetation. Provision will be made to extend the car parking facilities if necessary on the future expansion of the building.

38. Amenities An amenities area of approximately 110 square metres is included on the ground floor of the central block. This area opens onto a garden courtyard and will provide a central luncheon and passive recreation area and an area for indoor recreation.

39. Future Expansion Provision has been made to expand the west wing northwards, the south wing southwards and the east wing northwards to provide an additional 7,400 square metres. This will enable the floor area

of the Laboratory to be approximately doubled between 1980 and the year 2,000 should this become necessary.

40. Committee's Conclusion The proposed building has been specifically designed to cater for the particular requirements of the Laboratory and will be capable of future expansion if necessary.

LOCAL REACTION TO THE PROPOSAL

41. Opposition to the construction of the proposed building was expressed by the Yallambie Progress Association including a petition signed by 342 residents of Yallambie and surrounding areas. Heidelberg City Council and the Shire of Eltham also objected to the proposal. Their opposition lay mainly in the following areas:-

42. Aesthetics During the course of the public hearing, it became clear that the principal objection of the Yallambie Progress Association was based on aesthetic grounds. The Yallambie Estate borders the eastern boundary of the site which at present is used by the Lower Plenty Pony Club as a riding school. The Committee were told that this semi-rural outlook was an important consideration for members of the Yallambie Progress Association. The Association object to what they regard as the intrusion of an industrial type of activity into their suburb and which they believe will destroy the present semi-rural atmosphere.

43. Whilst appreciating and understanding the concern of the Yallambie Progress Association, the Committee noted that the homes had been erected in the area with the knowledge that the Watsonia Army Camp formed one boundary of the Yallambie Estate.

44. Although it is true that the activities of the Army are concentrated in an area remote from the Yallambie Estate, at no time have the residents been given any undertaking by the Department of Defence that military activities or construction would not occur in the south-eastern corner of the Watsonia Army Camp.

45. Concern was also expressed by the Yallambie Progress Association of the effect of the proposed building on land values in the area. An Environmental Impact Statement prepared by the Preston Institute of Technology on behalf of the Yallambie Progress Association concluded that "the surrounding properties will not increase in value to the same extent as they would in the future if the present use was maintained on the site".

46. The Committee does not believe that construction of the proposed Laboratory will have any appreciable effect on property values in the immediate vicinity.

47. Landscaping Concern was expressed by the Yallambie Progress Association at the likely effects of the construction of the proposed building on flora and fauna particularly birdlife. An assurance was received from the Department of Housing and Construction that only in unavoidable cases would the existing trees on the site be removed.

48. The Department of Housing and Construction has engaged a specialist landscape architect to complete the documentation of the landscaping plan and to select suitable plants. Landscaping work will commence immediately on the completion of the first site preparation and will proceed concurrently with the construction of the building in all areas adjacent to the boundary of the site. In this way, the landscaping of the creek and all boundary work will be undertaken at a very early stage to enable the trees to grow as soon as possible.

49. It is planned that 1,000 native trees and 1,000 native shrubs will be planted on the site. In the selection of plants, special attention will be given to those species which are attractive to native fauna, particularly birds. In addition, a pondage area will be constructed on the creek to provide an area of permanent water.

50. Committee's Conclusion The landscaping proposed by the Department of Housing and Construction will more than compensate for the small number of trees to be removed during construction.

51. Waste Disposal The Heidelberg City Council expressed some concern at the discharge of radio-active or chemical waste into a sewerage system which at the time of the public hearing was not connected to the main Melbourne sewerage system but to the Martins Lane sewerage treatment plant. The Department of Housing and Construction advised that the Melbourne and Metropolitan Board of Works has under construction a by-pass sewer which will connect the sewerage system in the Yallambie area directly into the south-eastern sewerage system.

52. Low level radioactive waste liquid will be disposed of via the sewerage system. The Committee were informed that this is an accepted practice and is provided for in the Victorian Radioactive Substances Regulations and in similar legislation in other States and is based on guidelines laid down by the National Health and Medical Research Council.

53. Three 5,000 gallon holding tanks will be provided to facilitate the disposal of liquid radioactive waste. No waste can be pumped from these tanks until the level of radioactivity is within the limits approved by the Melbourne and Metropolitan Board of Works. The Committee were told that the level of radioactivity in the holding tanks would be at 1/20 to 1/15 000 of the levels provided for by the International Commission on Radiological Protection for drinking water. These levels will be further diluted by mixing with non-radioactive water in the sewerage system.

54. Committee's Conclusion The disposal of low level liquid radioactive waste will follow recognised practices.

55. Radiation It is perhaps only natural that certain misgivings were expressed regarding the possible effects of radiation on the surrounding population. The Committee therefore sought clarification from the Department of Health as to the levels of radiation emission from the proposed Laboratory. The Committee were advised that the "dose limit" for members of the public who might receive radiation from a controlled source such as the Australian Radiation Laboratory is established by the National Health and Medical Research Council having regard to the standards of the International Commission on Radiological Protection.

56. The Committee noted with satisfaction that the proposed Laboratory has been designed to incorporate such radiation protection facilities so that an additional safety factor of 100 below the recognised "dose limit" will apply at the boundary fence of the Laboratory. The effect would be that a person to receive a 1/100 of an acceptable level of radiation would need to live at the boundary fence 24 hours a day 365 days of the year. Radiation from naturally occurring sources such as cosmic rays would contribute something in the order of five times this level.

57. Committee's Conclusion The radiation protection standards provided will ensure that the level of any radiation emissions will not be greater than 1/100 of the acceptable dose level.

CONSTRUCTION

58. Structure The building structure is a pre-cast reinforced concrete frame with external precast infill panels. The metal deck roof is supported on steel beams and purlins. A concrete roof over the plant room holds storage tanks and cooling towers.

59. Foundations The foundation system will consist of column pads to the precast frame. Retaining walls will be in-situ concrete.

60. External Finishes The exterior of the building is a bush hammered pre-cast concrete frame and fascia panels with exposed aggregate infill panels. Windows are P.V.C. coated steel with a reflective double glass unit to reduce solar heat load. The roofing is a pre-coloured steel decking insulated to reduce heat gain or loss through the roof.

61. Internal Finishes Ceilings will be non flame acoustic tiles or plaster sheets to offices, library, conference and training rooms, passages, toilets and laboratories, depending on the acoustic requirements of each area. Some internal walls are pre-cast concrete or poured in situ where radiation absorption is required. The remainder are non load bearing steel studs faced on both sides with plaster sheets. Finishes are paint, ceramic tile, welded sheet vinyl or sprayed vinyl depending on the requirements.

62. Floor finishes will be selected from carpet, vinyl tile, welded vinyl sheet, ceramic tile or granolithic where appropriate. Benching to laboratories is of modular construction, movable and fitted with attachment points for electricity supply, water supply and drainage.

63. Air Conditioning The building will be fully air conditioned and supplied from two plant rooms. The main plant room will contain central refrigeration and heating plant. Plant discharges will comply with local codes which specify pollution control requirements. The air conditioning plant will not be designed to cater for any possible future expansion.

64. Mechanical Ventilation Mechanical supply and exhaust ventilation systems will be provided for toilets, some workshop and storage areas. Some laboratories will require exhaust ventilation because of fumes produced in the area.

65. Electrical Services Electricity will be purchased from the State Electricity Commission who will be requested to supply power from two separate supply zones. A substation will be located on the site. The electrical installation includes all necessary cabling, switchboards, power outlets, clocks and lighting. Lighting will be designed to suit the task, but will not be less than that recommended by the S.A.A. Lighting Code C.A.30 of 1965.

66. The installation is generally surface mounted and will facilitate the future installation of additional power supplies to meet changes in partitioning layouts and the changing requirements of the Laboratory. Provision has been made for a P.A.B.X. system capable of expansion, together with telephone cabling between the P.A.B.X. and suitably located terminal telephone distribution points. External security lighting is provided to entrances, selected vertical surfaces of the building, roads and car parks.

67. Hydraulic Services The water supply from the Melbourne and Metropolitan Board of Works is suitable for the Laboratory complex. However, some special minor requirements exist for purified water.

68. The sewerage system will be connected to the Melbourne and Metropolitan Works sewer. Waste plumbing includes localising facilities for neutralising any small quantity of corrosive waste. Some special radioactive areas have wastes connected to holding tanks before waste enters the sewer.

69. Storm water from the building and the site run-off will be collected and discharged to an underground storm water drainage outlet nominated by the Melbourne and Metropolitan Board of Works at the eastern boundary of the site.

70. Lifts A small goods lift will be provided in the east wing and a larger goods lift in the west wing.

71. Fire Protection The fire protection provisions fully meet the requirements of the Melbourne and Metropolitan Board of Works. These will include an automatic sprinkler system to all areas with the exception of the Microwave Laboratory and the Electrical Substation which are designed to give a four-hour fire rating. Internal hydrants and hose reels will be provided as necessary to single and two-storey areas. Portable extinguishers will be spaced at vantage points in the building and external hydrants will cover all areas.

72. Roads Roads and parking spaces will be bitumen surfaced with concrete kerbs and gutters.

73. Site Access Access to and egress from the site will be directly onto Lower Plenty Road. For safety reasons acceleration and deceleration lanes will be provided in the first stage of the construction works. The existing service road running westward from Yallambie Road to the eastern boundary of the site will not be extended or used by vehicular traffic to the site.

74. Committee's Conclusion The Committee recommend the construction of the work in this reference.

ESTIMATE OF COST

75. The estimated cost of the work when referred to the Committee was $3.6 million made up as follows:

	$
Building works	2,240,450
Electrical services including lifts	441,000
Mechanical services	630,000
External services including landscaping	288,550
	3,600,000

PROGRAMME

76. As Cabinet authorised the preparation of detailed documentation to proceed concurrently with the Committee's investigation, it is expected that contract documents for the preliminary works for the development of the site will be completed in time to call tenders in November 1974. The project is scheduled to be completed twenty-four months from the time a contract is let.

RECOMMENDATIONS AND CONCLUSIONS

77. The summary of recommendations and conclusions of the Committee is set out below. Alongside each is shown the paragraph in the report to which it refers.

		Paragraph
1.	THE COMMITTEE CONSIDER THAT THE AUSTRALIAN RADIATION LABORATORY'S PRESENT ACCOMMIDATION IS UNSATISFACTORY AND THAT IT SHOULD BE RELOCATED IN PREMISES SPECIFICALLY DESIGNED TO MEET ITS PARTICULAR REQUIREMENTS.	21
2.	THE SITE SELECTED IS SUITABLE FOR THE PROPOSED LABORATORY.	33
3.	THE PROPOSED BUILDING HAS BEEN SPECIFICALLY DESIGNED TO CATER FOR THE PARTICULAR REQUIREMENTS OF THE LABORATORY AND WILL BE CAPABLE OF FUTURE EXPANSION IF NECESSARY.	40
4.	THE LANDSCAPING PROPOSED BY THE DEPARTMENT OF HOUSING AND CONSTRUCTION WILL MORE THAN COMPENSATE FOR THE SMALL NUMBER OF TREES TO BE REMOVED DURING CONSTRUCTION.	50

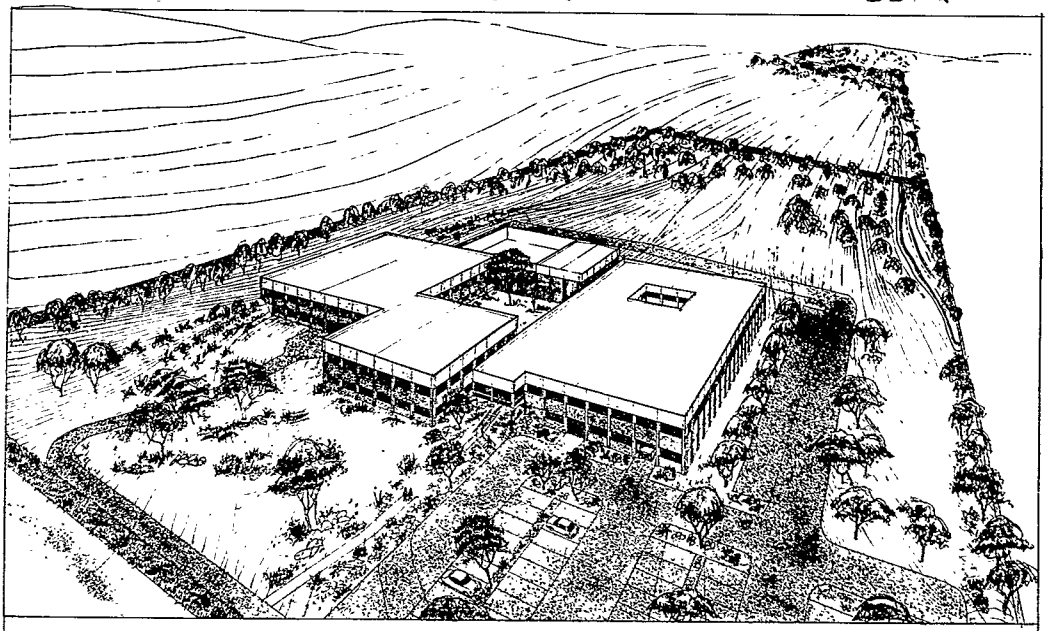
		Paragraph
5.	THE DISPOSAL OF LOW LEVEL RADIOACTIVE LIQUID WASTE WILL FOLLOW RECOGNISED PRACTICES.	54
6.	RADIATION PROTECTION STANDARDS PROVIDED WILL ENSURE THAT THE LEVEL OF ANY RADIATION EMISSIONS WILL NOT BE GREATER THAN 1/100 OF THE ACCEPTABLE DOSE LEVEL.	57
7.	THE COMMITTEE RECOMMEND THE CONSTRUCTION OF THE WORK IN THIS REFERENCE.	74
8.	THE ESTIMATED COST OF THE WORK WHEN REFERRED TO THE COMMITTEE WAS $3.6 MILLION.	75

L. K. Johnson.

(L.K. JOHNSON)
Chairman

Parliamentary Standing Committee on Public Works,
Parliament House,
CANBERRA, A.C.T.

17 October 1974.



VIEW FROM SOUTH EAST.

AUSTRALIAN RADIATION LABORATORY