[redacted]

Type T Patch Code (New Document)

For use with Documents with Protective Markings up to and including [redacted]

Document UIN

1 0 0 0 3 7 7

PM

0 3

Caveat

0 0

NOTE: [redacted] and other Caveats are NOT PERMITTED. Give document special handling.

Prepared By

4

Number of Sheets

2 0 8

Note: See coding sheet for Protective Marking (PM), Caveat and Prepared By codes.

For use with Documents with Protective Markings up to and including [redacted]

AUSTRALIA

ROYAL COMMISSION INTO BRITISH NUCLEAR TESTS IN AUSTRALIA

PRESIDENT: [redacted]
COMMISSIONERS: [redacted]

SECRETARY: [redacted]

GPO Box 4044
SYDNEY NSW 2001

TELEPHONE:

RC 78
RC 78
pg 999
17-10-84

RC 78

EXHIBIT

Exhibit No. Rc 78 Date 17.10.84 Place Brisbane

Tendered by [redacted]

Witness —

Source/Circumstances —

Description 3 Documents

- 89/25/AIR File of Dept of AIR
- Series of Document behind sheet marked 'Unclassified' and 'Attachment 4 Letter DRE 6.10.83 P. 49 in DRE File.
- Department of Air File Number 60.501.287.

Transcript

RC 162
15.11.84

Three (3) files being files from Commonwealth X Ray and Radium Laboratory as follows:

CX RL No.	Marked	RL No.
950/2	Discovery File No 41	R 30.4
950/3	" " No 42	R 30.4
R/1/1	" " No 43	R 30.4

(Declassified 29-30/10/84)

ROYAL COMMISSION INTO BRITISH NUCLEAR TESTS IN AUSTRALIA

PRESIDENT: [redacted]
COMMISSIONERS [redacted]

SECRETARY: [redacted]

GPO BOX 4044
SYDNEY NSW 2001

TELEPHONE:

EXHIBIT

Exhibit No. RC 142 **Date** 15.11.84 **Place** Sydney

Tendered by [redacted]

Witness [redacted]

Source/Circumstances

Description

3 [illegible] [illegible] X [illegible] [illegible]

Transcript

JOHNSTONE v THE COMMONWEALTH

DISCOVERY FILE 41

DOCUMENT — BINDER

RC 30.41

Gate-Inlet Permit 1A

October 1956

to

September 1964

Woomera 405

Telegrams: ~~Atomic Adelaide~~

Teleprinter: 339 1st floor

Ten-Year Period

1st [illegible] 8/11/56

Last one ended 9/12/64

XC 21
Introduced Dec 80

Department of Defence

DOWNGRADING OF CLASSIFIED DOCUMENTS

PART 1 – REQUEST FOR DOWNGRADING OF CLASSIFIED DOCUMENTS

To:	From:
Dept. of Defence	Royal Commission into Nuclear Tests.

1. The document/s listed below are considered to be overclassified and it is requested that their classification be reviewed.
2. If downgrading/declassification is agreed, please state new classification in column (g); otherwise insert 'Nil Change'. The classification/s or other marking/s considered appropriate are shown in column (f) below.

Serial	Reference No	Description, eg letter, report, file etc	Date of Origin	Present Classification	Proposed Classification	Revised Classification
(a)	(b)	(c)	(d)	(e)	(f)	(g)
	950/2.	C'wealth X-Ray & Radium Lab. file	20/9/56.	[redacted]	U/C.	

Signature [redacted] Date 29/6/89

DEFINITIONS OF SECURITY CLASSIFICATION

1. **TOP SECRET** – Official matter the unauthorised disclosure of which would cause EXCEPTIONALLY GRAVE DAMAGE to National Security. To be used with the utmost restraint.
2. **SECRET** – Official matter the unauthorised disclosure of which could be expected to cause SERIOUS DAMAGE to National Security. To be sparingly used.
3. **CONFIDENTIAL** – Official matter the unauthorised disclosure of which could be expected to cause DAMAGE to National Security. Most National Security matter will merit classification no higher than CONFIDENTIAL.
4. **RESTRICTED** – Official matter the unauthorised disclosure of which could be HARMFUL to National Security.

NOTE: The 'privacy' or 'covering' marking system should be used rather than a security classification if official matter requires protection for reasons of administrative privacy rather than National Security.

Once UK classified material has been declassified [illegible] file may be declassified (Brit. docs. tagged) [redacted]

PART 2 – AUTHORITY TO DOWNGRADE CLASSIFIED DOCUMENTS

To:	From:

1. Please note that the document/s listed above should now be graded as shown in column (g) above.
2. Other addressees of the document/s listed above have been informed of the revised classification.

Date ..... Signature ..... Rank/Grade .....

FILE NO. 41 COMMONWEALTH X RAY AND RADIUM LABORATORY FILE 950/2

1. Plan entitled Tietken's Plain Tracks and Telephones.

2. Document dated 20 September 1956 entitled Interpretation of Instrument.

3. Hand written notes made at meeting with Dale Dagg and Turner on 9 October 1956.

[redacted] 7/x/17

You may like
to see the
report on
C 5990 !

17/12/56

[redacted]

Finds the University
Observatory

Abbreviated from this file
but although we hold
much detailed information
on exactly what we observed
the large and this must be
preserved without Retrain
originally interpreted.
(The chart stops within my interpret!)

File Closed
15/9/64

Continued on
File 950/5

950/2 Inter-tribal Council A
" " " B
" " " C
" " " 1964

JPR/L

14th September 64.

050 2

MEMORANDUM to :-

Director-General of Health,
Department of Health,
CANBERRA, A.C.T.

Health Control - Maralinga

Your memorandum PS3451 of 8th September refers

As proposed, I returned to the Laboratory today.

The short visit to Maralinga was most valuable, despite the limited time. It is likely that I shall have to seek approval to return for at least one week in November but I shall discuss this with [redacted] when he returns to the Laboratory.

Acting Director.

950/2

TELEPHONE 69
TELEGRAMS HEALTH CANBERRA
P.O. BOX NO 83
CANBERRA, A.C.T.

IN REPLY PLEASE QUOTE PS.3451

DEPARTMENT OF HEALTH.
CANBERRA, A.C.T.

MEMORANDUM TO:

The Acting Director,
Commonwealth X-Ray and Radium Laboratory,
30 Lonsdale Street,
MELBOURNE C.I. VIC.

Health Physics Control - Maralinga

Your memorandum 950/2 of 31st August, 1964, refers

Approval is given for the proposals outlined in your memorandum under reply.

[redacted]

Acting Director-General of Health

[redacted]

950/C

TELEPHONE: 32 0261
TELEGRAMS:
"S[illegible]P." MELBOURNE.
POSTAL ADDRESS: BOX 2286 U.
G.P.O., MELBOURNE.

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF SUPPLY

In Reply Quote: 6012/1/141

339 SWANSTON STREET,
MELBOURNE.

Secretary,
Department of Defence,
CANBERRA. A.C.T.

HEALTH PHYSICS CONTROL - MARALINGA

[redacted] of Commonwealth X-ray and Radium Laboratory, has recently been promoted to your Department in Canberra. [redacted] has for a number of years occupied the position of Australian Health Physics Representative at Maralinga, and his knowledge of the physical and radiological state of the Range is unrivalled.

Arrangements have been made with Department of Health for [redacted] responsibilities to be assumed, first by [redacted] of C.X.R.L., and later by an officer yet to be appointed to C.X.R.L. Every effort is being made to ensure that an adequate hand-over is achieved, but by the nature of [redacted] experience in this work it is extremely unlikely he will be able to pass on before his departure everything his successors will need to know.

It would therefore be appreciated if you could agree to permit [redacted] to visit Melbourne occasionally during the first few months of his employment in your Department, to assist by advice and comment in finalising various matters now under way. Such visits would be confined to cases of necessity and be kept to the absolute minimum. This request is supported by C.X.R.L.

[redacted]

Acting Secretary

c.c. Director
C.X.R.L. - 30 Lonsdale St.
[redacted]

JFR/L

31st August 64.

950 2

MEMORANDUM to :-

Director-General of Health,
Department of Health,
CANBERRA, A.C.T.

Health Physics Control - Maralinga

Your reference P.S.3451 of 9th June, 1964.

When assessing the implications of the transfer of [redacted] from our Department to the Department of Defence it was realised that there would necessarily be some delay in appointing a successor. It was arranged that during the hiatus caused by [redacted] departure I would be responsible for providing effective supervision of Health Physics control at Maralinga. It was agreed that as I had not visited Maralinga since 1959 I should spend some time there with [redacted], familiarising myself with current administrative and technical arrangements, inspecting records, plans and sites and meeting the Range Commander and his officers.

Due to pressure of other commitments on both [redacted] and myself it has not been possible to visit Maralinga to date. This visit has now become urgently necessary, as [redacted] leaves the Laboratory on Friday, 11th September, to take up duty with the Department of Defence on the following Monday.

Accordingly, I am intending, with [redacted] knowledge and approval, to proceed to Maralinga on Monday, 7th September and to return to Melbourne on Friday, 11th September. This will allow me four full days on the site.

I propose, subject to your concurrence, that during my absence [redacted] Physicist Class 3, should be in charge of the Laboratory. Correspondence would still be signed in my name as Acting Director. [redacted] is the officer next to me in seniority on our staff and it appears appropriate that he should act in this way.

I suggest that [redacted] could exercise the normal delegations of the Director for routine matters and hold any others for my attention on Monday, 14th September. Urgent matters could be dealth with by a telephone calls to Maralinga, if necessary.

Your approval is sought for these proposals. I realize that there could be some inconvenience in my being absent from the Laboratory at a time when the Director is overseas but I see no satisfactory alternative.

Acting Director.

95/2

IN REPLY PLEASE QUOTE P.S.3451

DEPARTMENT OF HEALTH.

CANBERRA, A.C.T.

MEMORANDUM to:

The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE. C.1.

Health Physics Control - Maralinga
Your reference 6012/1/141

It is understood that the provisional promotion of [redacted] to a position in the Department of Defence is the subject of an appeal.

If his appointment is confirmed, the position previously occupied at the Commonwealth X-Ray and Radium Laboratory by [redacted] will be advertised immediately.

In view of the circumstances, [redacted] will be retained at the laboratory until after 6 weeks from the confirmation of his appointment in the position in the Department of Defence. Before the departure of [redacted], arrangements will be made for [redacted], Assistant Director of the Commonwealth X-Ray and Radium Laboratory and Senior Australian Health Physics Representative at Maralinga, to visit the area with [redacted] to familiarise himself with the present administrative and technical arrangements for health physics control there. Should there be any delay in the appointment of a replacement for [redacted], it is proposed that [redacted] should provide continuing effective supervision of health physics control at Maralinga. [redacted] will also be responsible for indoctrinating the officer appointed to fill the vacancy arising from the promotion and transfer of [redacted].

[redacted])
Director-General of Health

The Director,
Commonwealth X-Ray and Radium Laboratory,
30 Lonsdale Street,
MELBOURNE.

For your information.

[redacted]
Director-General

DJS/L

1st June 64.

950 2

MEMORANDUM to :-

Director-General of Health,
Department of Health,
CANBERRA, A.C.T.

Health Physics Control - Maralinga

Your reference P.S.3451 of 22/5/64

With reference to your above memorandum and the attached memorandum (reference 6012/1/141) from the Department of Supply, the following comments are made.

It is understood that the provisional promotion of [redacted] to a position in the Department of Defence is the subject of an appeal. If his appointment is confirmed, the position previously occupied at this Laboratory by [redacted] will be advertised immediately. In view of the circumstances, it is recommended that [redacted] should not be released from the staff of this Laboratory until after six weeks from the confirmation of his appointment in the position in the Department of Defence. Before the departure of [redacted] arrangements will be made for [redacted] Assistant Director of this Laboratory and Senior Australian Health Physics Representative at Maralinga, to visit the area with [redacted] to familiarize himself with the present administrative and technical arrangements for health physics control there. Should there be any delay in the appointment of a replacement for [redacted] it is proposed that [redacted] should provide continuing effective supervision of health physics control at Maralinga. In any event, [redacted] would be the officer of this Laboratory responsible for indoctrinating the officer appointed to fill the vacancy arising from the promotion and transfer of [redacted].

Director.

1950/2

TELEPHONE 68
TELEGRAMS HEALTH CANBERRA
P.O. BOX NO 93
CANBERRA A.C.T.

IN REPLY PLEASE QUOTE P.S. 3451

DEPARTMENT OF HEALTH.
CANBERRA, A.C.T.

21 MAY 1951

The Director,
Commonwealth X-ray and Radium
Laboratory,
30 Lonsdale Street,
MELBOURNE ... VIC.

Health Physics Control - Maralinga
and Staffing - Commonwealth X-ray
and Radium Laboratory.

I enclose a copy of a letter from the Secretary Department of Supply, concerning the Health Physics Control at Maralinga following the promotion and pending transfer of [redacted]. Also a minute from the Director, Establishment and Finance stating the present position of the staff negotiations with the Public Service Board.

Could you advise what arrangements can be made for the Health Physics Control to be maintained at Maralinga?

[redacted]

for [redacted]
Director-General of Health.

TELEPHONE 32 0761
TELEGRAMS
"SUPDEP," MELBOURNE.
POSTAL ADDRESS: BOX 2288 U,
G.P.O., MELBOURNE.

25 15/5

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF SUPPLY

In Reply Quote: 6012/1/141

339 SWANSTON STREET,
MELBOURNE, C.1.

Director-General,
Department of Health,
CANBERRA, A.C.T.

HEALTH PHYSICS CONTROL - MARALINGA

It has been noted that in Gazette No.33, dated 16th April 1964, there is notification of the provisional promotion of [redacted] of Commonwealth X-ray & Radium Laboratory to a position in Department of Defence, Canberra.

As [redacted] although employed at C.X.R.L., is responsible for Health Physics Control at Maralinga, this Department is anxious to ensure that the continuity of effective control of this aspect of Australian responsibility at Maralinga is maintained.

Your early advice of proposed arrangements to provide continued Health Physics Control at Maralinga will be appreciated.

[redacted]
Secretary

[redacted]
Senior Medical Officer-in-Charge,
Laboratories Services

Staffing - Commonwealth X-Ray and Radium Laboratory

In view of the fact that there will be no available positions in the new organisation at the Commonwealth X-Ray and Radium Laboratory higher in classification than the position to which [redacted] has been promoted in the Defence Department, there is nothing this Department can do to counter-act this promotion and retain his services.

Negotiations are continually taking place with the Board to expedite the decisions regarding the review of Science Officers other than Chemists, Biochemists and Bacteriologists and the proposed re-organisation of the Commonwealth X-Ray and Radium Laboratories.

It is expected that a decision will be given by the Board in the near future on the matters raised by [redacted].

[redacted]
Director. (S & I)
11.5.64.

TELEPHONE 32 0261
TELEGRAMS
"SUPPLY" MELBOURNE
POSTAL ADDRESS BOX 2288 U.
G.P.O. MELBOURNE.

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF SUPPLY

In Reply Quote 6012/1/141

339 SWANSTON STREET.
MELBOURNE. C.1.

Director-General,
Department of Health,
CANBERRA. A.C.T.

AUSTRALIAN HEALTH PHYSICS CONTROL AT MARALINGA.

During the period when active nuclear tests were conducted at Maralinga, Health Physics control was exercised in two phases. During actual Trials periods, a qualified U.K. officer assumed responsibility for Health Physics control of the area; between Trials, known as the Inter-Trial period, an Australian took over this responsibility. The Australian officer since 1956 has been [redacted] an officer of your Department, whose salary has been paid by the U.K.

After the cessation of nuclear testing at Maralinga, in 1957, the work of Health Physics Control remained at a high level of effort and responsibility until, in 1962, it was reviewed by the Atomic Weapons Tests Safety Committee. As a result of this review, it was agreed that [redacted] could be more effectively located at Commonwealth X-Ray and Radium Laboratories in Melbourne, but with the continuing responsibility for general supervision of the Health Physics operations at Maralinga. In return for the latter supervision, the U.K. authorities agreed to pay half [redacted] salary.

The Board of Management for Atomic Weapons Tests, which is responsible to the Minister for Supply for the management of Maralinga, agreed with the proposal, and arrangements were made for [redacted] to take up duty in Melbourne while normal organisational arrangements were put in hand by C.X.R.L. Meanwhile, the U.K. has continued to pay the whole of [redacted] salary since July 1962.

From time to time the U.K. representatives in Australia have raised with this Department the question of [redacted] salary, as for a period of now over 18 months they have been meeting the whole cost. In so doing they have exceeded their authority, and both they and this Department are concerned lest this situation continue much longer.

[redacted]

From discussions with the Director, C.X.R.L., it is understood that you have experienced considerable difficulty in processing proposals which include the necessary position for [redacted] These difficulties are appreciated; possibly this memorandum may assist you in urging the early provision of a position and funds to meet the 50% of [redacted] salary as from July 1962.

[redacted]

Secretary

c.c. Director,
Commonwealth X-Ray & Radium Laboratory,
30 Lonsdale Street,
MELBOURNE C.1

[redacted]

6012-1-141

Director-General,
Department of Health,
CANBERRA, A.C.T.

AUSTRALIAN HEALTH PHYSICS CONTROL AT MARALINGA

During the period when active nuclear tests were conducted at Maralinga, Health Physics control was exercised in two phases. During actual Trials periods, a qualified U.K. officer assumed responsibility for Health Physics control of the area; between Trials, known as the inter-Trial period, an Australian took over this responsibility. The Australian officer since 1956 has been [redacted], appointed to your Department, but with his salary paid by the U.K.

After the cessation of nuclear testing at Maralinga, in 1957, the work of Health Physics Control remained at a high level of effort and responsibility until 1962, when it was reviewed by the Atomic Weapons Tests Safety Committee. As a result of this review, it was agreed that [redacted] could be more effectively employed at Commonwealth X-Ray and Radium Laboratories in Melbourne, with the added responsibility for general supervision of the Health Physics operations at Maralinga. In return for the latter supervision, U.K. authorities agreed to pay half [redacted] salary.

The Board of Management for Atomic Weapons Tests, which is responsible to the Minister for Supply for the management of Maralinga, agreed with the proposal, and arrangements were made for [redacted] to take up duty in Melbourne while normal organisational arrangements were put in hand by C.X.R.L. Meanwhile, the U.K. has continued to pay the whole of [redacted] salary since July 1962.

From time to time the U.K. representatives in Australia have raised with this Department the question of [redacted] salary, as for a period of now over 18 months they have been meeting the whole cost. In so doing they have exceeded their authority, and both they and this Department are concerned lest this situation continue much longer.

From discussions with the Director, C.X.R.L., it is understood that you have experienced considerable difficulty in processing proposals which include the necessary positions for [redacted]. These difficulties are appreciated; possibly this memorandum may assist you in urging the early provision of a position and funds to meet the 50% of Mr. Turner's salary as from July 1962.

[redacted]
Secretary

DJS/L

12th February 64.

950 ?

MEMORANDUM to :-

Director-General of Health,
Department of Health,
CANBERRA, A.C.T.

Health Physics - Maralinga - Position of Australian Health Physics Representative

On a number of occasions I have discussed with officers in your Office, the problem which exists with respect to the employment of [redacted], Senior Physicist. Your memorandum 1200/2/10 of 24/5/57 to the Secretary, Department of Supply, and your memorandum 1200/2/10 of 4/7/57 to the Secretary, Public Service Board (and related correspondence) outline the arrangements under which [redacted] first joined the staff of this Laboratory. He was for the major part of the period until the end of June 1962 located at Maralinga. On occasion he was recalled to the Laboratory for discussions or special duties.

The amount of high grade scientific work to be done at Maralinga declined through late 1961 and simultaneously there was a build-up of special facilities at this Laboratory. On occasion it was more effective for [redacted] to carry out scientific measurements on samples on our apparatus.

Towards the end of 1961 it was clear that [redacted] was concerned at the lack of requirements at Maralinga on his specialist scientific knowledge and experience and the possibility existed that he would seek other employment. It was considered important by the Board of Management for Atomic Weapon Tests and the Atomic Weapons Tests Safety Committee both of the Department of Supply that means should be established to ensure continuity of adequate Health Control at the Maralinga Range, preferably through retaining the services of [redacted]. One particular alternative which the Atomic Weapons Tests Safety Committee explored informally with the U.K. authorities responsible for activities at Maralinga was that [redacted] should be physically located at this Laboratory while maintaining general oversight and consultative functions in respect of Health Physics Control at the Maralinga range. This was agreed in principle by the U.K. authorities. An apportionment of his time on the basis of 50 per cent to activities of this Laboratory and 50 per cent to activities associated with the Maralinga Range was suggested as appropriate.

You will be aware that under the original conditions of appointment, the whole of the salary of [redacted] was reimbursed by the U.K. authorities. Under the modified proposal outlined above it was the intention that the U.K. authorities would reimburse only half the salary of [redacted].

The above modifications I reported to officers of your Office verbally at the time and pointed to the need for a review of the organisation of the Laboratory by the Public Service Board to meet the new arrangement. In fact the arrangement whereby [redacted] has been located at the Laboratory has been operative since 1st July 1962.

A preliminary examination of the organisation of the professional and technical positions at the Laboratory was undertaken with one of your officers late in 1962 and this resulted in your submission to the Public Service Board (reference 62/5169) of 11/2/63. In the supporting statement attached to the above memorandum to the Public Service Board the position of [redacted] was raised and briefly discussed.

The delay of a complete year since your above memorandum without any decision being forthcoming from the Public Service Board on the re-organisation has given rise to the circumstance where the new arrangement for [redacted] de facto, has operated with the exception that the U.K. has continued to pay the whole of his salary.

I have had a number of verbal approaches from officers of the Department of Supply on the question of payments by the U.K. authorities. I have represented these matters verbally to your Office and informed the officer of the Department of Supply that the question of [redacted] had been included in your re-organisation proposal for this Laboratory to the Public Service Board.

You will recall that I discussed this matter with you briefly during your visit to the Laboratory in late December 1963 with [redacted].

As the position now stands the U.K. authorities in Australia located at the Department of Supply, Melbourne, have since 1st July 1962 continued to pay the whole of the salary of [redacted] and under the arrangements which have in effect operated since that date, the U.K. authorities would be entitled to a refund of half the amount paid.

I am informed by an officer of the Department of Supply that the position with respect to [redacted] and the payments made by the U.K. authorities for the whole of his salary for the period since 1st July 1962, is a matter of considerable embarrassment to the U.K. authorities located at the Department of Supply in Melbourne. I understand that a reimbursement of half the amount of the salary of Mr. Turner is sought to correct the matter in the U.K. accounts. I report this matter to you for your advice.

In conclusion I would indicate that the 50-50 allocation of the time of [redacted] is a generous one from the point of view of our Department. In the period since 1st July 1962, due to staff shortages which have not been corrected, [redacted] has been devoting considerably more than 50% of his time to Laboratory activities not associated with Maralinga.

Director.

THE PROTECTION AND MARKING OF RADIOACTIVE AREAS AT MARALINGA

1. Introduction

As a consequence to the testing and experimental programme at Maralinga there remain concentrations of radioactive material that may not be readily moved and are a potential biological hazard. This radioactive material exists in three forms:

(a) Buried and contained (in the official cemetery)
(b) Buried and uncontained (in pits near testing sites)
(c) Surface contamination which is uncontained (surrounding weapon sites).

As the duration of thehazard from these radioactive materials vary from a few years to many thousands of years depending on the quantity and half-life of individual isotopes, it would appear desirable to estimate the protection and long-term marking required for these radioactive materials for many years to come, particularly if there should be any tendancy to reduce the supervisory staff at Maralinga.

2. Present Status

2.1 Airfield radioactive cemetery LA 5.4

2.1.1 Description

The official radioactive burial ground is situated close to the southern end of the airfield. It is enclosed by a seven foot high cyclone wire fence surmounted by barbed wire, to provide a protected area 100 yards long by 50 yards wide. Within this area, burials are made in three categories according as to whether the activity is at the curie, millicurie or microcurie level.

2.1.2 Hazards

Radioactive material at the curie level is adequately sealed in metal or plastic containers and deposited in a pre-cast concrete coffin which is then covered with a layer of concrete and three feet of earth. Sufficient concrete is used to reduce the dose-rate at one metre from the concrete to less than 10 mr/hr. The additional shielding of earth reduces the surface dose rate to levels comparable with natural background.

Millicurie amounts of radioactive material are also contained in concrete, often as a concrete-lined drum.

Microcurie amounts are normally contained in an unlined metal drum buried in a large communal pit.

In all cases, there is absolutely no external hazard to personnel who may occupy the area above ground.

The hazard to individuals who may recover any of these items from the soil would be slight even if no care is taken due to lack of knowledge of their contents. However, if any of the curie burials, and to a lesser extent the millicurie items, were removed and broken open, the ingestion and inhalation hazards could be serious, even fatal. Consequently, all dangerous items have had attached directly to the outside casing, phosphor-bronze plaques stating "Danger - Radioactive Material".

...2/..

2.1.3 Duration of Hazard

There are two types of dangerously radioactive material, one of which will decay to a safe level by the year 2000 when account is taken of its quantity, half-life and distribution within the burial plots. The other type of material will remain dangerous for many millennia, and as a consequence, special provision has been made for its future recovery from the cemetery, especially as it has some commercial value.

2.1.4 Controls

Entry to the radioactive cemetery is via a double gate that is normally kept locked, the key being held by Health Physics with the duplicate held by Security. As all entries are controlled, and as there is no external hazard the area warrants only one warning notice which is attached to the entrance gate. Burial sites are located by stakes bearing plot numbers. Excavations are undertaken by the Engineer group, the concrete construction by the Department of Works, and the burial by Health Physics and Engineers. Normal Health Physics supervision and monitoring has ensured that no internal hazard has arisen, and that any external doses received have been minimised and recorded.

2.2 Experimental area pits

At the conclusion of certain sections of the Maralinga experimental programme, it has become the habit of the controlling U.K. authorities to bury radioactive debris in bull-dozed excavations as part of the process of cleaning up. The haste that is usually associated with this method of disposal tends to preclude any reliable information concerning the depth of the hole, the depth of earth cover, the nature of the debris buried and the quantity of activity that has been included. The known facts are the location of the pit, the isotope concerned, and that most of the activity buried is not contained and is therefore an immediate ingestion hazard to anyone who cares to dig in these pits.

The pits have been enclosed by metal pickets linked with mine tape and are adequately sign posted for the present. There are eight such pits, two of which are inside the boundary fence around the weapon testing area.

2.3 Weapon Test Sites

2.3.1. Glazed Areas

Of the seven nuclear weapons tested at Maralinga, four have produced glazed areas which have retained sufficient radioactivity to warrant long-term precautions. The principal hazard is the possible ingestion of strontium 90 which could occur if people were to live or work within the glazed areas. At present, each of the four glazed areas is completely enclosed by a barbed wire apron fence to which is attached a number of warning signs. The duration of the hazard largely depends on the weathering action, but it is likely to last until 1980 or later.

2.3.2 Fall-out Area

An eight mile single fence has been erected along the southern edge of the fall-out and partly along the western and eastern perimeter to restrict local movement. The ingestion hazard is estimated to be such that occupants even living under primitive conditions would require more than three months to accumulate a body burden of strontium 90.

[redacted]

...3/..

Preliminary measurements of local plant uptake indicate that the whole of the fall-out area outside the glazed areas wouldbe safe for the grazing of stock.

2.3.3 Experimental Firing Sites

All experimental firing sites have been taped or fenced off. Much of the radioactive debris has been collected and buried. There is a current programme of further reducing the level of surface activity.

3. Considerations for the Future

3.1 General

The potential radioactive hazard to future inhabitants of the Maralinga area will depend not only on the amount of radioactive material present but also on the degree of control that is exercised and the nature of the work involved. Various forms of control may be envisaged, such as under health physics or scientific or police supervision. The area itself may be restricted and occupied, restricted and unoccupied, unrestricted and unoccupied or unrestricted and occupied. These alternative situations considerably modify any recommended policy for health control of the Maralinga area.

Some of the problems that may be anticipated are outlined below.

3.2 Assumption of the present Status Being Maintained

The experimental area pits should be fenced more permanently and if possible a better estimation obtained from the U.K. as regards the depth of hole, depth of covering soil and the amount of active material buried in these pits. Some consideration should be given to the replacement of all radiation warning signs throughout the area that show signs of fading or deterioration. Painted wood or metal signs should be replaced by plastic lettering signs, baked enamel signs or other forms that have a greater life expectancy. Simple and clear wording should be used on all signs.

As long as a health physics group continues to operate, there does not appear to be a need for any other change to the present system.

3.3 Assumption of a Range Close-down

3.3.1 Restricted Area with Good Security

Should the Range be closed down but remain a restricted area with Commonwealth Police maintaining a guard over entry from the Watson - 11 mile camp road and Emu - 25 Avenue track, it should only be necessary to institute a regular inspection and maintenance of fences around radioactive areas and the associated warning signs. The signs should be as in 3.2 above.

If there should be any oil or mining exploration or operation in the vicinity, it may be advisable to complete the fencing enclosure of the close-in fall out from the weapon test sites. This would require approximately an additional ten miles of single strand fence.

3.3.2 Restricted Area with Poor Security

This condition would apply, for example, if entry to the Maralinga area was restricted by public gazette, but the control was limited to the display of warning notices on all approach roads. Under these circumstances, one must expect the occasional intruder, both accidental and intentional. Anyone wishing to dig in limestone areas such as Tietken's Plain would naturally tend to

...4/..

choose those soft surfaces which occasionally occur, usually in association with old rabbit warrens. As many of the experimental area pits were dug in such isolated soft soil patches, there is a reasonable probability that an uninformed newcomer wishing to dig into the ground would choose one of the burial pits, thereby possibly exposing loose active material.

To ensure that this would not occur, all burial pits should be either disinterred or else have man-proof fencing and long-lasting clearly worded signs including an indication of the duration of the hazard.

3.3.3 Unrestricted Area Without Permanent Occupation

Should the Range area become unrestricted to public entry, but remain undeveloped, one may expect to find tourists and souvenir hunters adding their ranks to rabbit trappers, prospectors and other itinerants. Usually, fences and warning notices serve no deterrent to souvenir collectors - indeed, the notice itself would be prized as a souvenir - so that theprospect exists that under these conditions there could be a slow drift of radioactive material, particularly glazing, from Maralinga to the various suburbia to form a potential ingestion hazard to children.

3.3.4 Area Unrestricted and Populated

The circumstances in which the area might be thrown open to private or public enterprise could be related to such possibilities as the discovery of oil or other mineral wealth, the extension of grazing leases or the establishment of some scientific centre requiring a remote setting but not directly related to weapon testing. Whatever the cause for any population influx, the presence of an airfield, the road network and other nearby facilities would be a strong incentive to re-establish the existing Maralinga layout. This would place the official radiation cemetery in close proximity to an important focal centre, and place all other radioactive areas within ready road access from the living area.

It would be a natural temptation for Maralinga inhabitants to "borrow" existing fencing whenever an apparently more useful purpose arose. Thus the more elaborate and expensive the fencing is that may be erected around radioactive areas, the more tempting it may be for the new residents to remove. Although the persons removing such a fence may rationalise that the now exposed radioactive area would be always remembered as an area to be avoided, this would not protect subsequent occupants.

3.4 Comments

It would seem appropriate to list a few comments which appear to have the greatest bearing on future control -

(i) There are several localities in which radioactive material is buried and which will remain in some cases potentially lethal for hundreds of thousands of years.

(ii) Some of this potentially lethal material is not protected should it be dug up.

(iii) Fences and warning signs should not be regarded as a sufficient means of control if they are not policed and maintained.

[redacted]

...5/..

(iv) All notices should be designed for long endurance and to prevent them being out-dated, they should include an estimate of the duration of the hazard that is involved.

(v) Before the supervisory capacity of the current staff at Maralinga be reduced to any considerable extent, it is suggested that a reappraisal of the overall situation be made by a responsible authority.

4. Recommendations

4.1 Recommended Action Now

(a) Enclose experimental pits with, say, two strand barbed wire fences.

(b) Ascertain the best material for the longevity and clarity of all warning signs and commence a replacement programme. An estimate of the duration of the hazard should be included. If security considerations prevent an accurate statement, it is recommended that notices connected with glazing and fall-out areas indicate that a hazard exists until at least 1980, and notices dealing with those burial grounds containing either of the two isotopes mentioned in section 2.1.3 should indicate that it is not safe to dig before the year 2,000.

4.2 Recommended action should Maralinga tend to close down.

(a) Ensure the continued regular inspection and maintenance of all fences and signs associated with radioactive areas.

(b) Request the Safety Committee or some other authority to consider -

(i) the possibility of transferring radioactive material out of Maralinga;

(ii) whether the expense is justified of completing the enclosure of the close-in fall out from Operations Buffalo, Antler and Vixen B;

(iii) the problems associated with people possibly souveniring radioactive material, misusing fences and notices, and preferring to dig in soft soil;

(iv) the implications arising from a concept that protective control could be required for many generations yet, into a future when the status of Maralinga may well be considerably different from that of the present or the past.

5. Summary

An attempt has been made to evaluate some of the problems associated with residual radioactive material on the Maralinga range. It is considered that while an adequate control of the area is exercised, then suitable fences and signs are a sufficient safeguard. With any reduction in control, there is an increase in the risk of some person being accidentally exposed to injurious radiation. The greatest risk is from an ingestion hazard associated with excavating the experimental area pits or breaking open the concrete coffins in the official cemetery. Some recommendations to reduce these risks have been made.

[redacted] [redacted]

25th May, 1962.

950/2.

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF HEALTH

HT:JC

ALL COMMUNICATIONS SHOULD BE ADDRESSED TO THE DIRECTOR.

TELEPHONE NOS. FB 1823, FB 1826 AND FB 1827

TELEGRAPHIC AND CABLE ADDRESS "COMEXRAY MELBOURNE"

IN REPLY PLEASE QUOTE

/

COMMONWEALTH X-RAY AND RADIUM LABORATORY
30 LONSDALE ST., MELBOURNE, C.1.

30th May, 19 62.

Range Commander,
M.R.S.U.,
MARALINGA, S.A.

Long-term Protection of Radioactive Areas

The attached report is in accordance with your request for a statement regarding the permanent marking of radioactive burial grounds and other radioactive areas. It is hoped that this matter and others matters raised in the report will form a basis for consideration when decisions are being made on the future status of Maralinga.

A signal has been sent to U.K. by [redacted] requesting further information on the experimental area pits, and this aspect may possibly be clarified before very long.

[redacted]
Health Physics Representative.

Copies to:-

The Secretary,
Board of Management for Atomic Weapons Tests,
C/- Department of Supply,
339 Swanston Street,
MELBOURNE.

The Director,
Commonwealth X-Ray and Radium Laboratory,
30 Lonsdale Street,
MELBOURNE.

TELEPHONE. 32 6281
TELEGRAMS
"DEPSUP" MELBOURNE.
POSTAL ADDRESS BOX 2288 U.
G.P.O. MELBOURNE.

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF SUPPLY

339 SWANSTON STREET.
MELBOURNE, C.1.

In Reply Quote 6012/1/141

7 . . . 2

The Director,
Commonwealth X-Ray and Radium Laboratory,
30 Lonsdale Street,
MELBOURNE. C.1.

HEALTH CONTROL, MARALINGA - POSITION OF AUSTRALIAN HEALTH PHYSICS REPRESENTATIVE

You will recall that during August 1961, some discussion took place between [redacted] of your Laboratory and the Secretary of the Board of Management for Atomic Weapons Tests, concerning the possibility that [redacted] might leave Maralinga, and the need for making some arrangements for future Health Control at the Range.

2. The questions of [redacted] work at the Range, and the means of ensuring continuity of adequate Health Control were put to the Atomic Weapons Tests Safety Committee for consideration, and on 5th Arpil, 1962 the Secretary of the Safety Committee forwarded some recommendations to the Board of Management. A copy of the Safety Committee's memorandum is attached.

3. These recommendations were considered by the Board of Management for Atomic Weapons Tests, on Tuesday, 10th April. The Board noted the proposals, which had been in effect supplemented by a paper prepared by the Range Commander along similar lines. While no decision was made, pending completion of a Health Physics programme which had been prepared in outline by [redacted], the Members of the Board were generally in favour of the proposals.

4. It is therefore agreed that the proposed arrangements, whereby [redacted] will work at C.X.R.L. but will exercise general oversight and consultative functions in respect of Health Physics at Maralinga, may be implemented. It is assumed that you will have obtained the necessary assurances from the U.K. that half [redacted] salary will be paid by A.W.R.E.

5. It will be necessary for the Safety Committee, the Board of Management, and the U.K., to agree upon a statement of [redacted] new duties and responsibilities, and of the revised Health Physics Programme at the Range. I attach a copy of the outline prepared by [redacted] and referred to at paragraph 3 above and should be glad of your comments.

[redacted]
fo
Secretary

[redacted]

TELEPHONE 32 0261
TELEGRAMS:
"DEP." MELBOURNE.
POST. ADDRESS BOX 2268 U
G.P.O., MELBOURNE

[redacted]

In Reply Quote 357/6/27

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF SUPPLY

339 SWANSTON STREET,
MELBOURNE, C.1.

5th April, 1962

MEMORANDUM FOR :

Secretary,
Board of Management for
Atomic Weapons Tests

AUSTRALIAN HEALTH PHYSICS REPRESENTATIVE AT MARALINGA

I refer to recent discussions and correspondence on the desire of [redacted], Australian Health Physics Representative (HPR) at Maralinga [redacted] relieved of his duties at the Range. [redacted] has occupied the position of HPR at Maralinga since 1956. Although the Committee has given considerable thought to a suitable replacement for [redacted] within the present arrangements, none appears to be available.

It is clear from an examination of the current situation that there are conflicting requirements for the position of HPR at the Range. For example, for a number of reasons, it is necessary that the HPR should be of a reasonable scientific status, but the duties to be performed are now becoming more and more routine. Accordingly, a revision of the present arrangement is appropriate, although because of [redacted] knowledge and experience, it is desirable that his services be retained against possible problems and future activities at Maralinga.

Several possible alternative arrangements have been considered by the Committee, and one in particular has been explored informally and agreed in principle with the U.K. Atomic Weapons Research Establishment (AWRE) authorities responsible for activities at Maralinga. It is proposed that [redacted] be retained at Commonwealth X-Ray & Radium Laboratory (CXRL) in Melbourne to generally supervise, as directed, the appropriate health physics operations at Maralinga. These operations would become the immediate responsibility of the senior U.K. health physicist at the Range. The Australian technical assistants on Turner's staff would be responsible to this U.K. health physicist.

With his thorough knowledge of health physics activities at the Range, [redacted] should have little difficulty in performing the necessary tasks on a part-time basis while located in Melbourne, where he would be available for consultation by AWRE staff at the Range. He may need to visit Maralinga at intervals or on demand as special problems arise. [redacted] is at present a member of the staff of CXRL, although AWRE re-imburse CXRL for his salary. Under the proposed arrangement, [redacted] would undertake some duties for CXRL who would be responsible for half his salary; AWRE would re-imburse CXRL for the remainder.

Some minor problems would be raised by the proposed change in establishments, and it would be necessary to examine them in due course. The monthly Health Physics Report would be continued; it may be best if [redacted] edited the Report before it was finalized and circulated. This would help, in part, to keep [redacted] informed of health physics activities at the Range. A statement of duties of the HPR at Maralinga, revised 10th April, 1961, would require further revision in accordance with these proposals.

/2.

C.D.O. 2933 8750

[redacted]

[redacted]

The Committee recommends to the Board of Management the adoption of the proposed revision of the arrangement for the Australian Health Physics Representative at Maralinga. Should the Board of Management concur in this recommendation, the Director, CWRL, would make the necessary representation to the Public Service Board through the Department of Health.

[redacted]

SECRETARY
ATOMIC WEAPONS TESTS SAFETY COMMITTEE

[redacted]

[redacted]

Annex 'B' to
MAR/23/07

OHT/RFR

AHP/1/6

Ext. 284

Health Physics Group,
MARALINGA,
South Australia.

23rd March, 1962.

Range Commander,
MARALINGA.

HEALTH PHYSICS PROGRAMME PENDING M.E.P.

The following, sub-titled under headings of Control and Measurements, is an indication of Range Health Physics requirements.

CONTROL

(1) Maintain health control of all radioactive areas and buildings by ensuring the maintenance of associated barriers, signs, fences and monitoring equipment.

(2) Maintenance of a film badge service.

(3) Ensure that any work undertaken in a declard radioactive area is smear checked clean before being touched by the Department of Works, or if found active, appropriate control is exercised over the work force (which will not include the Department of Works).

(4) The clearing and decontamination of radioactive material from various firing sites including Wewak and Cumbo.

(5) Control and issue of radioactive sources.

MEASUREMENTS

(1) Routine air and water sampling.

(2) Determination of the effect of weather on fall-out and specially seeded areas.

(3) Sr 90 uptake in plants in the vicinity of major test sites.

This involves the collection and ashing of specific plants from the forward area. If Mr Hoskins returns in May, it is expected that he will undertake a Sr 90/Y 90 chemical separation and subsequent counting. In the absence of Mr Hoskins, the chemistry and counting may be done at C.X.R.L., Melbourne.

(4) Consolidation of earlier results will be continued in Melbourne when the opportunity permits.

[redacted]

HEALTH PHYSICS REPRESENTATIVE

[redacted]

[redacted]

Annex 'C' to
MAP/23/07

HEALTH PHYSICS STAFF AND PROGRAMME 1962

GENERAL

1. With the decay of the major firing sites and earlier M.E.P. sites, together with the current tendency to slow down the overall M.E.P., there is no longer the need to maintain the Health Physics Group at its current strength.

2. The first move in this direction was for the Health Physics Representative applying for a transfer to MELBOURNE and suggesting that a watching brief be held for MARALINGA Health Physics matters. This action will tend to reduce the amount of research undertaken by the group, and will thereby further reduce the staff requirement.

3. The following programme is suggested as being a possible development during the remainder of 1962. It aims towards the present technical assistant staff being ultimately reduced from three [redacted] and [redacted] now; [redacted] later) to two [redacted].

[redacted]

1. To reside in MELBOURNE, devoting approximately half the time to Range Health Physics matters.

2. Visit the Range as required by Health Physics matters and when requested by the Range Commander.

3. Be responsible for the preparation of the monthly Health Physics report.

4. Prepare consolidated reports of work undertaken by the Range Health Physics Group since 1956 along the lines suggested by S.R.I. Aldermaston. (Annex 'A')

5. Prepare a plan for the long term marking of disposal areas of radioactive material.

6. Advise the Range Commander of a suggested 1963 Health Physics programme when the 1963 M.E.P and Australian Health Physics requirements become known.

[redacted]

7. To reside at MARALINGA, full time. (except fortnightly absence on leave).

8. Be responsible for M.E.P. Health Physics and the maintenance of Health Control of the Range (e.g. entry to the radioactive areas, boundaries, signs etc.).

9. To be acting Health Physics Representative during the absence of the Health Physics Representative.

[redacted]

10. To reside at MARALINGA, full time.

11. Be responsible for the maintenance and calibration of all electronic equipment, mains and portable, held by the Health Physics Group.

12. With the gradual lessening of the use of this equipment (e.g. the gamma spectrometer, portable monitors) there will be an increasing amount of time available which it is intended

[redacted]

to be used by taking over the duties of [redacted] later in the year.

[redacted]

13. To reside at MARALINGA, full time, except for annual leave (18 Apr - 7 May).

14. Anticipates leaving permanently sometime in Jun/Jul.

15. Main duty is to work with [redacted] on the clearing and decontamination of M.E.P. sites. He also has the responsibility of film badge issue and development, radioactive source issue and control, and radioactive waste burial.

[redacted]

16. To reside at MARALINGA, full time, after his arrival here from W.R.E. SALISBURY about Jun/Jul.

17. Tour of duty at MARALINGA to commence at about the time that [redacted] leaves (but not to undertake his work, which will be done by [redacted]).

18. If [redacted] elects to return to W.R.E. SALISBURY at the end of the year, there will be only [redacted] left on the Technical staff, and it would be necessary to recruit another member.

19. Primary duty will be to continue his work on Sr 90 analysis of plant ash. This will occupy his time fully if [redacted] is still here. Otherwise, he will have to undertake some of [redacted] work.

[redacted]

20. To reside at MARALINGA, full time except for annual leave (3 weeks in Jul/Aug).

21. If an application for a position with the Antarctic Division is accepted, he will not return to MARALINGA after leave as he will be required to attend a course commencing in MELBOURNE on 22 Aug. If the application is unsuccessful, he would return to MARALINGA until Christmas of this year after which he would not come back.

22. If [redacted] remains after August, he will undertake [redacted] work. If he were to leave in July, [redacted]'s work would be shared between Messrs. [redacted], [redacted] and [redacted].

23. Responsible now for water, air, soil and smear sampling on a routine basis as well as for special circumstances. This is later to be taken on by [redacted] (see 12).

[redacted]

24. To reside at MARALINGA, full time.

25. Continue his clerical duties for the section.

26. To take over, when [redacted] leaves, the maintenance of records dealing with film badges and radioactive sources.

[redacted]

950/- L

TELEPHONE [redacted] 0661
TELEGRAMS: [redacted]
MELBOURNE

POSTAL ADDRESS: BOX 2288 U.
G.P.O., MELBOURNE.

[redacted]

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF SUPPLY

In Reply Quote E57/6/27

339 SWANSTON STREET.
MELBOURNE, C.1.

5th April, 1962

MEMORANDUM FOR :

Secretary,
Board of Management for
Atomic Weapons Tests

AUSTRALIAN HEALTH PHYSICS REPRESENTATIVE AT MARALINGA

I refer to recent discussions and correspondence on the desire of [redacted] Australian Health Physics Representative (HPR) at Maralinga to be relieved of his duties at the Range. [redacted] has occupied the position of HPR at Maralinga since 1956. Although the Committee has given considerable thought to a suitable replacement for Turner within the present arrangements, none appears to be available.

It is clear from an examination of the current situation that there are conflicting requirements for the position of HPR at the Range. For example, for a number of reasons, it is necessary that the HPR should be of a reasonable scientific status, but the duties to be performed are now becoming more and more routine. Accordingly, a revision of the present arrangement is appropriate, although because of [redacted] knowledge and experience, it is desirable that his services be retained against possible problems and future activities at Maralinga.

Several possible alternative arrangements have been considered by the Committee, and one in particular has been explored informally and agreed in principle with the U.K. Atomic Weapons Research Establishment (AWRE) authorities responsible for activities at Maralinga. It is proposed that Turner be retained at Commonwealth X-Ray & Radium Laboratory (CXRL) in Melbourne to generally supervise, as directed, the appropriate health physics operations at Maralinga. These operations would become the immediate responsibility of the senior U.K. health physicist at the Range. The Australian technical assistants on [redacted] staff would be responsible to this U.K. health physicist.

With his thorough knowledge of health physics activities at the Range, [redacted] should have little difficulty in performing the necessary tasks on a part-time basis while located in Melbourne, where he would be available for consultation by AWRE staff at the Range. He may need to visit Maralinga at intervals or on demand as special problems arise. [redacted] is at present a member of the staff of CXRL, although AWRE re-imburse CXRL for his salary. Under the proposed arrangement, [redacted] would undertake some duties for CXRL who would be responsible for half his salary; AWRE would re-imburse CXRL for the remainder.

Some minor problems would be raised by the proposed change in establishments, and it would be necessary to examine them in due course. The monthly Health Physics Report would be continued; it may be best if Turner edited the Report before it was finalized and circulated. This would help, in part, to keep [redacted] informed of health physics activities at the Range. A statement of duties of the HPR at Maralinga, revised 10th April, 1961, would require further revision in accordance with these proposals.

/2.

[redacted]

[redacted]

The Committee recommends to the Board of Management the adoption of the proposed revision of the arrangement for the Australian Health Physics Representative at Lucas Heights. Should the Board of Management concur in this recommendation, the Director, CSIRO, would make the necessary representation to the Public Service Board through the Department of Health.

[redacted]

SECRETARY
ATOMIC WEAPONS TESTS SAFETY COMMITTEE

[redacted]

HT:JC

24th January, 62.

[redacted],
Health Physics,
PARALINGA, S.A.

Dear [redacted]

May I congratulate you on your scientific appraisal of the Taranaki samples and RHI air sampling. Dealing with the soil activity first, may I make a few suggestions.

1. To ensure uniform autoradiographs, it would pay to adopt a standard film and exposure.
2. Have you tried using positive transparencies to locate the sources of activity?
3. As one of the main ideas of the experiment is to determine the extent of shielding by sand on the sticky paper, it would be worth-while trying to collect all of the particles from some of the papers and determine the ratio of counting rates.
4. Your concept of some pellets, particularly a hollow sphere variety, being crushed into numerous minute fragments seems sound.
5. As active samples appear to be associated with the grey-black metal (presumably Ru) and low active samples with a red-black metallic surface, I wonder whether [redacted] could check to see (or enquire) whether the red-black material is iron. The sequence of melting points fit the hypothesis of SeO_2, Fe, Pu condensation layers, although we do not appear to have particles from a point in the cloud hot enough to actually melt the silica.
6. I would like to try a few samples here, although we have no alpha counting facilities. However, we do have better darkroom facilities and a travelling microscope that should be worthwhile. I propose making a pair of tweezers out of steel needles to use under the microscope. Would you mind forwarding say six sticky paper samples for us to play with, together with a couple of dozen 1" aluminium trays to which I will attach particles for you to count. Would you like the specimens you sent to me, returned to yourself?

Air Sampling

It would be worthwhile doing a one minute check run of the anemometer flow prior to changing filters (if you don't already do so) in order to quickly ascertain any marked variation from the current 200 ft/mt. flow.

I am attaching a consolidated result sheet that Rodney could make into a pro-forma and after ronoeing, could type out the the results for September-January. I have written out a November sheet to illustrate my concept of the extent to which values should be rounded off. I will expect, of course, for Rodney to make the form look more aesthetic.

...2/..

[redacted] apparently sometime between samples 47 and 49 the pump and anemometer recovered. How would you determine between these two possibilities?

Feet	ft/mt	litres	cpm/l	fpm/l
50,717	33.8	30,940	15.2	182
150,717	100.5	91,900	5.1	61

If you have reason to consider the second a possibility, it would pay to have Rodney insert it as a footnote, or if it is a probability, it should replace the present set of figures.

There has been no further progress from the meteorological point of view.

I shall now endeavour to get on to Graham's work. Thank you for your co-operation, and I hope that all goes well with the rest of the staff, including the cat and go-kart. Trust Jim enjoyed his leave without losing too much cash on horses and women etc.

Yours sincerely,

[redacted]

P.S. For [redacted]. On checking over your data again, [redacted] I realise that my request for the statistical spread of a given set of ratios for a given area on a given day is impractical owing to the uncertainty of assigning statistical weights. My apologies for having caused you this bother.

JFR/L

14th August 61.

950 2 and 968

The Secretary,
Board of Management,
Atomic Weapons Tests,
Department of Supply,
339 Swanston Street,
MELBOURNE, C.1.

Health Control, Maralinga - Position of Australian Health Physics Representative

The office of Australian Health Physics Representative (HPR) at Maralinga was created in 1955 as part of the preparation for Operation Buffalo.

In 1956 courses of training in Health Physics were conducted by this Laboratory for servicemen and others going to Maralinga to take part in Operation Buffalo. The proposal at that time was that men from one of these courses would subsequently occupy the position of HPR in rotation. After Operation Buffalo, however, other arrangements were found expedient and the HPR since 8th November, 1956, has been [redacted], at present a Senior Physicist on the staff of this Laboratory.

In November of this year [redacted] will have completed five years as HPR and during a recent visit to Melbourne he indicated the possibility that he may desire to leave Maralinga permanently in December, 1961.

Whether [redacted] leaves then or later it does not appear reasonable to assume that he will remain indefinitely in an area as remote as Maralinga. This raises the matter of future arrangements for continuing health control at Maralinga.

The duties of the HPR were decided in principle by discussion between U.K. representatives and the Atomic Weapons Tests Safety Committee at its 29th Meeting. Subsequently the duties were defined in greater detail in my letter 950/2 of 11th November, 1957, to [redacted]. Copies of this letter were sent to all parties concerned with health control at Maralinga.

Conditions have altered considerably since 1957 when the year was divided into major trials and inter-trial periods. There is at present a

continuing Maralinga Experimental Programme from February to December of each year and the duties of the HPR (and of the Assistant HPR) have changed accordingly.

It is considered that any person holding the office of Australian Health Physics Representative at Maralinga should have had appropriate previous experience and should be of sufficient standing to retain the confidence of the Range Commander. The latter point appears particularly important.

There are many facets of the situation which may arise if [redacted] relinquishes his position as HPR. It may, for example, be desirable to re-define the duties of the position and the arrangements made for appointment to it.

It is felt desirable that the matter should be discussed between interested parties with a view to ensuring continuity of adequate health control at Maralinga.

Director.

Annexe
dossier
13/4/16

A ..... of the Duties of the Health Physics Representative at Maralinga (with notes and recommendations)

1. Introduction

The responsibilities and duties of the Health Physics Representative (HPR) at Maralinga were decided in principle at the 29th Meeting of the Atomic Weapons Tests Safety Committee on 8th October 1957 and subsequently defined in greater detail in a letter (Ref.950/2, dated 11th November 1957) to [redacted] (HPR) from [redacted], Director, Commonwealth Radium and X-ray Laboratory. These documents refer to 'major trials' and 'inter-trial periods' and, in this respect alone, are out of date and no longer describe the state of affairs existing at Maralinga. There is now an annual Maralinga Experimental Programme (MEP) which begins in February and continues through the year, with experiments being performed as required at most of the existing 'firing sites', until December. It is considered opportune, therefore, to re-examine and, if necessary, re-state the duties of the Health Physics Representative and the Assistant Health Physics Representative.

In addition to the duties laid down in Ref.905/2 the HPR has, in the course of time, 'collected' certain other duties which are not clearly defined. It is proposed, here, to clarify the situation and, in particular, to define the position of the HPR in respect of the DC Area and the Yellow Fleet.

The biggest single consequence of the programme change mentioned above has been the considerably increased load of work on the Assistant HPR. The 'part-time responsibility' referred to in Ref.950/2 has now grown to more than a full-time occupation for one man, being the responsibility for ensuring radiological safety for the whole of the Maralinga Experimental Programme (except for certain series of experiments for which it is usual to provide a separate HP Group). (See Section 7. Staff, below).

2. Responsibilities

The responsibility for radiological safety at Maralinga is fundamentally that of the United Kingdom with the Commonwealth X-ray and Radium Laboratory supervising on behalf of A.W.R.E. the activities of the Health Physics Representative.

The Health Physics Representative has direct scientific responsibility to A.W.R.E. The Commonwealth X-ray and Radium Laboratory will be administratively responsible for the Health Physics Representative and will also be available to him for on-the-spot consultation should this be necessary.

3. Duties

3.1 The duties of the HPR are to:

(a) Advise and assist the Range Commander on all matters of radiological safety and in the implementation of the Radiological Safety Regulations, Maralinga and other relevant Regulations and Instructions.

[redacted]

/ ...

(b) Render a regular (monthly) report on the conditions on the Range to the Range Commander who will forward six copies to D.A.W.R.E.

(c) Exercise radiological control of all movements into, out of and within Yellow Areas and radiological supervision in all Active Areas. (But see 3.2 below).

(d) Maintain records of individual exposures and of the location of Active Areas, materials and sources. (But see 3.2 below).

(e) Investigate promptly all accidents and abnormal circumstances reported to him.

3.2 Amendments to the duties detailed in 3.1 are required in some circumstances as follows:

(a) Security restrictions will normally require that only U.K. members of HPR's staff may enter MEP sites while a series of experiments is in progress.

(b) For some experiments within the MEP, a Health Physics Group will be provided from U.K. The Group Leader will assume duties 3.1(c) and 3.1(d) in respect of the particular experiments with which he is associated.

3.3 Some aspects of HPR's duties are also referred to in Sections 4 and 5.

3.4 HPR may wish or be requested to carry out work in addition to the duties laid down in 3.1 above. This work must always be submitted to A.W.R.E. for approval.

4. Yellow Transport Fleet

4.1 Allocation

O.T.U./A.W.R.E. will take-over the whole of the Yellow Fleet except for one SWB Land Rover and one LWB Land Rover which will be permanently allocated to HPR. O.T.U./A.W.R.E. will allocate Yellow Vehicles to MEP Groups as advised by PFE/AWRE.

4.2 Maintenance

Maintenance of Yellow Vehicles will continue to be the responsibility of M.T. Officer/MARSU and will be carried out, as at present, in the M.T. workshops in the DC Area.

It is the responsibility of OTU/AWRE and HPR to ensure that routine maintenance is carried out on the vehicles allocated to them.

4.3 Decontamination

Decontamination of Yellow Vehicles will be carried out, as at present, in the DC Area by the attached REME M.T. mechanic. HPR will provide advice on decontamination procedures and will be responsible for radiological safety. (Note: PFE/AWRE will ensure that suitable MT tradesmen are available in the REME establishment).

5. DC Area and Laundry

5.1 OTU/AWRE will be responsible for the DC Area as a whole. It is noted that the M.T. Workshop within the

[redacted]

/ ...

DC Area remains the responsibility of the MTO/MARSU.

5.2 Laundry

(a) OTU.AWRE will take over the DC Laundry, will be responsible for the maintenance of the equipment and will provide a DC laundry service.

(b) When a DC Group is provided from U.K. the OTU/AWRE will allocate the DC Laundry to that Group who will then provide a DC laundry service.

(c) HPR is, at all times, responsible for radiological safety in the DC Laundry.

(d) HP instruments for use in the DC Laundry will be provided by OTU/AWRE.

6. RB Area

HPR will continue to occupy the buildings in the RB Area.

7. Staff

7.1 In view of the increased burden resulting from the MEP it has been decided to increase the number of U.K. staff in HPR's team to two. Arrangements are in hand to post another A.E.O. to Maralinga as soon as possible. These U.K. staff will report to HPR but it is to be clearly understood that their work in connection with MEP has first priority at all times.

7.2 HPR will submit to SSFE/AWRE (2 copies) a simple record of the time spent by U.K. staff on the duties outlined above.

[redacted]

Maralinga.
15.3.1961

S.R.I.

[redacted]

MARALINGA RANGE

EXTERNAL ISSUE VOUCHER — **TRIPLICATE : CONSIGNEE RECEIPT COPY**

R.V. No. 1

Date

Posted

CONSIGNEE
STORES OFFICER,
MARALINGA PROJECT OFFICE,
A.W.R.E. SALISBURY
ATTN: DR. C.[illegible]

CONSIGNOR
SCIENTIFIC STORES,
A.W.R.E. MARALINGA,
SOUTH AUSTRALIA.

I.V. No. GEN/94/SAL/60

Mode of Conveyance Safe Hand.

Case No. GEN/94/SAL/60

Weight 5 lbs.

TERMS OF ISSUE: Transfer.

Part No.	Description	Denom. of Qty.	Issued S	Issued D	Balance	Line No.	Remarks
	Cotton Overshoes	prs	12				Dimensions- 15x8xd.
							Ex DC Inventory

Issued by [redacted]

Date 8-2-60

Posted to Stock Record Card

Initials

Date

Received by

Date

S 13

100blks50—3.59 807

JFR/L

7th February 61.

950 2

[redacted],
Senior Technical Liaison Officer,
Maralinga Project Office,
Weapons Research Establishment,
SALISBURY, S.A.

Dear [redacted]

I refer to your telephone conversation with o/r [redacted] this morning about the possibility of purchasing a small number of over-shoes from the stocks held at Maralinga.

[redacted] has informed me that such a purchase can be arranged. This being the case I should be grateful if you would let me know

(a) the approximate cost of 12 pairs of over-shoes (8 large pairs and 4 small pairs) and

(b) with whom our order should be placed.

Yours faithfully,

Director.

JFR/L

7th September 60.

631 and 950/2

[redacted],
Health Physics Group,
MARALINGA, S.A.

Dear [redacted]

The University of Adelaide wishes to dispose of some radioactive waste. There has been correspondence between the University of Adelaide, Department of Supply and ourselves on this project and it has been agreed to dispose of this waste material by burial in the Maralinga Cemetery.

Copies of the most recent correspondence are attached. I am also enclosing a copy of the list "Radioactive Waste Held by the University of Adelaide," sent to us some time ago by [redacted] of the University.

The R.A.A.F. has about 2,000 pounds of radioactive waste at Edinburgh and the intention is to fly this, with the material from the University, to Maralinga in a Bristol aircraft.

You will note that one of the conditions of disposal at Maralinga is that the material held by the University is to be inspected by you, as Health Physics Representative, before it leaves the University. We shall keep you informed of developments.

It appears probable that in the future there will be an increasing tendency to dispose of radioactive waste material of long half-life (particularly radium) by burying it in the cemetery at Maralinga under the supervision of the Health Physics Representative. We should be glad to have your general comments on the practicability of doing this. Unfortunately it is not possible at the present time to assess the quantities which may come forward for disposal in this way.

Yours sincerely,

Director.

[redacted]

NOTES ON INTERVIEW WITH [redacted] F.S.H.R.L.,

14/4/60.

1. Fencing

The active area at Emu has been fenced off but not sign-posted. Appropriate signs have been on order for a considerable time but are not yet available. They will be mounted in position as soon as they are available. It is hoped to fence the active areas at Maralinga using Dennet wire but indications are that a more economical way may have to be used.

2. Health Physics Commitments

(a) U.K. Requirements. There will be occasional requirements by the U.K. during the year, for example, DC12, Vixen, etc.

[redacted] and [redacted] are no longer associated with the Health Physics at Maralinga. [redacted] principal contact in the U.K. is [redacted], through the U.K. Senior Representative at Salisbury.

(b) The programme for this coming year is well in hand. The Works Programme for next year will begin after the minor trials have finished.

After a minor trial the Health Physics Group checks the area and arranges that no health hazard will be present afterwards. The Health Physics Representative is usually told what material has been used and sometimes how much.

(c) Decontamination. This ~~was~~ necessary after trials as there ~~was~~ usually contamination left in the sheds afterwards and there ~~was~~ ~~always~~ always some laundry to be processed.

(d) Health Physics Information. [redacted] has to press for information from the U.K., is seldom told what is proposed or what is done. He considers that the U.K. people have little regard for Health Physics requirements and that there is virtually no Health Physics in operation. [redacted] is always too busy to consider details of contamination, how much there might be and where it is.

As time goes on fewer people on the Range know what has been done in the past and where the material from previous trials has gone. Thus the radioactive material tends to accumulate on the ground from one trial to another and there is a definite need for reporting the state of the ground after each minor trial. Australians have no direct control over any contamination which may be produced.

(e) Inventory. The Health Physics Representative is responsible for the inventory of all equipment relating to Health Physics on the Range and its out-stations.

3. Safety Committee

The Safety Committee has never had any requirements for the Health Physics Representative and very seldom approaches him in any way. It has not sought information at any time.

[redacted]

[redacted]

4. Future Arrangements

The matter of a possible successor for [redacted] was discussed. He stated that any future Health Physics Representative would have work which would be almost purely administrative provided that no future major trials were held. It is possible that Army men who had received adequate training would be able to carry on such work as was necessary with short-term postings. [redacted] would give as much notice as possible when he wishes to leave the Range permanently.

[redacted]

JFR/L

21st January 60.

950 2

[redacted],
Health Physics Group,
MARALINGA, S.A.

Dear [redacted]

Since August, 1957, a series of papers relating to radioactive fallout from the testing of atomic weapons has appeared in the Australian Journal of Science.

Reprints of these papers are available and you may already have some, but I am sending you herewith a complete set as you may find them useful in your work.

Yours sincerely,

Acting Director.

JFR/L

21st December 59.

950 2 and 105/1/11

[redacted],
Health Physics Group,
MARALINGA, S.A.

Dear [redacted],

Your recent application for recreation leave, from 24/12/59 to 5/1/60 inclusive, has been approved. You will be aware that, owing to the incidence of the Christmas and New Year holidays, only six working days are included in the above period.

Yours sincerely,

Director.

JFR:AP.

10th November 59

950 2

MEMORANDUM for :-

The Acting Secretary,
Board of Management
for Atomic Weapons Tests,
Department of Supply,
339 Swanston Street,
MELBOURNE, C.1.

Radiation Detection Course

Thank you for forwarding a copy of your letter 6012/1/141 of 28th October 1959, addressed to the Range Commander, Maralinga, and the attached copy of a letter from the Secretary, Department of the Army, addressed to yourself, both referring to the recent assistance given by our [redacted].

As you mentioned in your letter to the Range Commander, it is pleasing to note the appreciation expressed.

Director.

JFR/L

4th November 59.

950 2

[redacted]
Range Support Unit,
MARALINGA, S.A.

Dear [redacted],

Attached for your information is a copy of a letter received by the Secretary, Board of Management, Atomic Weapons Tests, from the Secretary, Department of the Army.

It is always pleasing to know that one's efforts are appreciated and you will doubtless be as pleased as we are at the contents of this letter.

Yours sincerely,

Director.

UNCLASSIFIED

TELEPHONE: FB 0261
TELEGRAMS:
"SU[illegible]" MELBOURNE.
POSTAL ADDRESS: BOX 2226 U.
G.P.O., MELBOURNE.

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF SUPPLY

339 SWANSTON STREET,
MELBOURNE, C.1.

In Reply Quote: 6012/1/141

Range Commander,
Maralinga Range Support Unit,
Maralinga,
SOUTH AUSTRALIA

RADIATION DETECTION COURSE

Forwarded herewith are two copies of a memorandum received from the Department of the Army concerning the recent R.D.U. Course held at Maralinga.

It is pleasing to note the appreciation expressed in this memorandum, and I would be glad if you would pass on a copy to [redacted]

[redacted]
A/g Secretary, Board of Management
for Atomic Weapons Tests

C.C.:

Director,
C.X.R.L.,
Surry Place,
MELBOURNE

A/D [illegible] UNCLASSIFIED

C
O
P
Y

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF THE ARMY,
MELBOURNE, S.C.1

A 323-1-1337(04)

19th October, 1959

The Secretary,
Board of Management,
Atomic Weapons Test,
Department of Supply,
339 Swanston Street,
MELBOURNE

RADIATION DETECTION COURSE

I would be grateful if you would convey to [redacted] the thanks of this Department for his most outstanding help and co-operation in the conduct of the Radiation Detection Course. Without his aid and guidance, it is clear that the course would not have achieved the success which it did.

I would also like to place on record the Army's appreciation of your help in making the facilities of Maralinga and the services of [redacted] available for the conduct of this course.

[redacted]
Secretary

SAMPLES FOR CIVIL DEFENCE SCHOOL MELBOURNE

Sample No.	Round	Description	Dose rate mr/hr	Dose rate mrep/hr	c.p.s. γ	c.p.s. β+γ	Amount of activity	Smear test	Remarks
1	One Tree	Glazing	nil	nil	5	180	2μc approx,	N.A.	Covered with film of Perspex
2	" "	"	nil	10	60	950	3μc "	"	" " " " "
3	Biak	"	nil	2	15	300	2μc "	"	" " " " "
4	One Tree	Fall-out pellets	nil	2	12	280	2μc "	"	" " " " "
5	" "	Stone	nil	7	45	800	3μc "	"	" " " " "
6	" "	Heat affected iron	8	16	1300	1900		Negative	Induced activity only
7	Biak	" " "	6	40	1500	4000		"	Mainly induced activity
8		(Withdrawn)							
9	Biak	Heat affected light alloy	nil	14	300	2000	1.5μc "	Negative	
10	"	Heat affected cable	nil	3	50	500	0.3μc "	"	
11	One tree	Galv. iron cladding	nil	nil	nil	nil	---	not made	
12	" "	Mulga wood with heat flash	nil	nil	nil	nil	---	" "	
13	" "	Mulga wood	nil	nil	nil	nil	---	" "	

Copy of list received from
M. Turner & sent to [illegible]
22/9/55

JFR/L

950 2 18th September 59.

MEMORANDUM for :-

The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE, C.1.

Proposed Visit to Maralinga

As you know, [redacted], Health Physics Representative at Maralinga, is an officer of this Laboratory, directly responsible to the Assistant Director, [redacted].

[redacted] has visited the range on a number of occasions but his most recent visit was late in August, 1957, in connection with Operation Antler. It appears to us desirable that [redacted] should again visit the range to discuss with [redacted] matters relating to Health Physics, to obtain first-hand information on present conditions in the forward area and on the work currently being undertaken by the Health Physics Group, with particular reference to the disposal of radioactive waste.

It is not proposed that [redacted] should visit, or take any active interest in, those areas under the direct surveillance of the United Kingdom representatives, unless invited to do so.

The opportunity for such a visit has now arisen. [redacted] commitments are such that he will be in Adelaide early in October and would be able to visit the range for a few days.

If you approve of the proposed visit, it would be appreciated if you would arrange for [redacted] to travel by air from Adelaide to Maralinga on Friday, 9th October, to be accommodated at the range until Tuesday, 13th October, and to return that day by air to Adelaide.

Director.

Ext. 284

[redacted] Underestimate of future test requirements [redacted]

AHP / 1 / 14

Health Physics Group,
Maralinga,
SOUTH AUSTRALIA.

25th. June, 1959.

25 JUN 1959

The Director,
Commonwealth X-Ray and Radium Laboratory,
Surry Place,
MELBOURNE. VIC.

(For the attention of [redacted] [redacted]

ASSESSMENT TESTS - MARALINGA 1959

1. Reference your 950/2 of 19th. June, 1959, Wewak is centered on J 12. The prohibited area related to Wewak operations (Vixen firings) is the area enclosed by the roads Roadside - Kite - Nawa -- Roadside.

2. Simultaneously, we have TM and Rats firings. TM firings impose negligible health physics requirements. Rats terminate in a few days, and the consequences are scheduled to be concluded on July 2nd.

3. Wewak should conclude at the end of August.

4. Rats reopen in October.

5. The third radiation detection course is designed to fit in between Vixen and Rats firings.

6. Kittens firings terminated in May.

7. As regards the purpose of these operations, I am afraid I can only suggest that you contact the Director of A.W.R.E. for any information.

8. Yellow vehicles are required for use in Red as well as Yellow areas. They are also required for Wewak, Dobo (Rats firing site) and DC 12. Maintenance after August can only be undertaken by specific demand from R.E.M.E. Workshops, due to the rundown to "Category C" establishment. This latter establishment in my opinion has since its inception grossly underestimated the requirements for future assessment tests. Again in my opinion, someone has bungled. Either the establishment must be increased, or, alternatively, each team that arrives from United Kingdom should include in its complement such people as mechanics, cooks, and general duties personnel.

9. The drums from Edinburgh were deposited in a pit 30' x 40' x 8', standing upright. There is room for about 250 more drums, 70 already being deposited. The hole will be gradually filled in.

[redacted]

JFR/L.

[redacted]

950 2 19th June 59.

[redacted],
Health Physics Group,
MARALINGA, S.A.

Dear [redacted]

Thank you for the Health Physics Report for May, which has just arrived.

We are particularly interested in your reference (in paragraph 1.3.2) to Wewak. Where is Wewak, and what are the operations referred to? Wewak does not appear on any of the maps we have here.

In paragraph 1.4.2 there is an implication that all maintenance on yellow vehicles is to cease. Is this so? We gather from your report that the yellow area has now contracted into local "pockets" and in this case yellow vehicles may no longer be necessary. But they will be needed in the event of any future trials being held and will surely require some maintenance?

How were the drums from Edinburgh buried? With such very low activities burial should present few difficulties.

Kindest regards,

Yours sincerely,

Director.

[redacted]

/ Ext.284.

[redacted]

CHT/JMcC

AHP / 10 / 5

Health Physics Group,
Maralinga,
SOUTH AUSTRALIA.

18th. December, 1958.

21 DEC 1958

Director,
Atomic Weapons Research Establishment,
Aldermaston,
Berks.,
ENGLAND.

REPORT ON THE CLOSING DOWN OF DC 12

The attached report by [redacted] on the air sampling values for DC 12 from 1st. November, 1957, until 18th. December, 1958, supports the action taken by me in switching off the exhaust fans. From the figures submitted, it would appear that the contaminated filter leaked parent activity through the isolating valve, gradually increasing the level of contamination of the operating filter. The stack sampling apparently responded mainly to the gas emanating from the operating filter rather than the isolated "8 r/hr" filter. Removal of the isolated filter would thus prevent further increase in the activity of the operating filter, but not decrease the stack activity.

The insertion of a fresh filter in the line would limit the stack activity to the sum of leakage from the "2 r/hr" filter plus the accumulated decay products from parent lining the hot box and ducting. The subsequent removal of the "2 r/hr" filter showed that it contributed about half of this total. The values are summarised below.

Average contribution to stack from 2 r/hr filter in circuit - 7×10^{-6} µc/cc.

Average contribution to stack from 2 r/hr filter leakage plus hot box emanation - 1.6×10^{-6} µc/cc.

Average contribution to stack from hot box etc. - 0.8×10^{-6} µc/cc.

By switching off the exhaust fans, the stack activity was reduced by more than a factor of 100. This figure has probably been enhanced by the fact that in taking an air sample, air is being forced up the stack. During this time a careful watch was kept of the activity emerging back from the air inlet to the hot box and the activity of the air within the laboratory. The laboratory sampling was known to fluctuate considerably due to windless low pressure days permitting the decay products to fall to the ground in the vicinity of the stack and being sucked into the laboratory through the inlet fans. Consequently, it was not surprising that reducing the stack activity, also reduced the activity within the laboratory. Laboratory samplings are now virtually the same as background - namely between 0.5 and 5.0×10^{-11} µc/cc. Background runs made several hundred yards from the stack after shut down show this same variability.

Closing the valves isolating the hot box from the filters, delay tanks and stack, reduces the stack activity to almost zero, but tends to increase the laboratory activity. Apparently, as the day warms up, the air inside the hot box expands, forcing air through the inlet. If the wind is towards the laboratory inlet then this active air is sucked into the laboratory. On this account, the valves are left open, allowing a small air flow through the system. The stack activity is then sufficiently low to be of no concern.

[redacted]

HEALTH PHYSICS REPRESENTATIVE

[redacted]

[redacted] [redacted]

CHT/JMcC

REPORT ON D.C. 12

The report is in two Parts followed by a summary/conclusion.

PART ONE:

This deals with the history of the activity which has been continuously released up the stack, beginning in September, 1957, and ending at the end of November, 1958. During this period the exhaust fans from the hot box were run continuously. Stack samples were taken at intervals, and the degree of activity determined. As this activity was too high to leave the stack on continuous sampling, the method adopted was to run the stack sampler pump for 100 linear metres for each sample, the sample being collected on the standard Air Sampling Filter Paper and counted with a one inch β counter. The efficiency of the β counter was determined with a Sr^{90} source.

The following Table gives the history of D.C. 12 Stack Sampling and changes in the filter etc. over the period September, 1957 to November, 1958. All counting was done 20 minutes after sampling.

TABLE I

Date	Time	$\mu c/m^3$ x 10^{-8}	Filter circuit		Remarks
			IN	OUT	
1/11/57		2.0			Source opened.
9/11/57	1325 hrs.	17			Maximum figures recorded during evacuation.
10/11/57	1105 hrs.	11			
11/11/57	1150 "	12			
12/11/57	1417 "	15			
Jan, '58		Aver. 0.58	"2 x/hr"	8 x/hr	Apparently 8 x/hr filter leaked percent to filter in circuit.
Mar, '58		" 1.5			
Jun, '58		" 5.1			
25/7/58					8 x/hr filter removed from D.C. 12.
25/7/58 to 31/7/58		Aver. 7.0			No obvious decrease in activity.
1/8/58					New filter fitted.
2/8/58	1055 hrs.	1.4	New	2 x/hr	
2/8/58	p.m.				2 x/hr filter replaced in circuit whilst checking 1055 sample for percent. This check proved negative.
7/8/58	1600 hrs.	4.5	2 x/hr	New	
	1607 "				Changed to new again.
	1730 "	2.0	New	2 x/hr	
8/8/58	1130 "	2.6	"	"	
9/8/58	1345 "	2.5	"	"	
13/8/58	1615 "	2.6	"	"	
	1620 "				Changed to 2 x/hr again.
14/8/58	1620 "	8.8	2 x/hr	New	
19/8/58	1720 "	5.6	[redacted]		
	1725 "				New back in circuit.

[redacted]

TABLE I (continued)

Date	Time	µc/cc x 10^{-8}	Filter circuit		Remarks
			IN	OUT	
20/8/58	1554 hrs.	1.5	New	2 x/hr	
22/8/58	1717 "	1.6	"	"	
27/8/58	1100 "	1.8	"	"	
28/8/58	1045 "	1.8	"	"	
2/9/58	1100 hrs.	1.5	New	2 x/hr	
5/9/58	1450 "	1.6	"	"	
16/9/58	0755 "	1.8	"	"	
27/9/58	1820 "	1.3	"	"	
20/10/58	1755 hrs.	0.9	New	2 x/hr	Both sources removed to K.A.
21/10/58	0810 "	1.5	"	"	
22/10/58	0945 "	1.5	"	"	
23/10/58	0858 "	1.3			
3/11/58	1545 hrs.	1.2			
4/11/58	1535 "		New		2 x/hr filter taken completely out of circuit, i.e. flexible canvas tubing cut and sealed.
5/11/58	0815 hrs	1.3	"		
6/11/58	1118 "	1.1	"		
7/11/58	0838 "	1.2	"		
8/11/58	0817 "	0.75	"		
10/11/58	0810 "	0.85	"		
11/11/58	0800 "	0.77	"		
12/11/58	0835 "	1.0	"		
17/11/58	0945 "	0.77	"		
26/11/58	1600 "	0.88	"		Large amount of long-lived parent associated with this sample.
27/11/58	1020 "				Exhaust fans switched off. (See Table II for details).

[redacted]

[redacted]

PART TWO:

This gives details of checks carried out at DC 12 since the exhaust fans from the hot box were switched off. It should be noted that the activity in the laboratory is known to vary considerably with wind conditions, a marked increase taking place if the wind is such that stack particles are blown into the laboratory via the inlet fans which suck air into the laboratory. Also, under certain conditions temperature rises affect the activity level inside the laboratory, as will be seen in the following Table.

TABLE II

Date	Time	μc/cc x10^{-11}			Isolating valves	Remarks
		Lab	Inlet H. Box	Stack		
26/11/58	1608 1630	65		8x10^{4}	Open	
27/11/58	0745 0825	6.8				
	1018 1020			9,000	"	Exhaust fans switched off.
	1020 1320	3.2				
	1320 1620	3.9			"	
29/11/58	1025 1330	2.2				
	1335 1632	0.85		225	"	
30/11/58	0955 1055	2.9		48	"	
1/12/58	0825 1055	5.6				
2/12/58	0915 1045	3.6			"	
3/12/58	0925 1325	8.2				
	0925 1325			390	"	
	1330				Closed	Valves closed isolating filter from hot box and delay tank.
	1525 1655	2.7				
4/12/58	0830			74	Closed	
	0945 1055	28.5				Very hot day and wind blowing direct from inlet side of box to laboratory.
	1345				Open	
	1515 1615	5.8				
5/12/58	0955				Closed	

[redacted]

[redacted]

Date	Time	μc/cc x10^{-11}			Isolating valves	Remarks
		Lab	Inlet H. Box	Stack		
5/12/58	1000					
	1100		1.2			
	1100					
	1155		1.4			Inlet to hot box runs with temperature increase but wind blowing away from laboratory.
	1155					
	1355		6.1			
	1000					
	1500	2.2				
	1400					
	1500		18.0			
	1500					
	1600	1.4	25.0			
6/12/58	0700					
	0800		5.2		Closed	
	0700					
	1100	1.8			"	
	0815					
	1100		6.8		"	Inlet increasing with rising temperature. Wind towards laboratory.
	1100					
	1400		32.0		"	
	1555					
	1630		115.0		"	
	1648			Hil		
	1645		130.0		"	
7/12/58	0810					
	0900		60.0		"	
	0910					
	1100	12			"	
	1100					
	1130		110.0		"	
	1350					
	1425		180.0		"	
	1455				Open	
	1715					
	1735		6.9			
8/12/58	0817			1100	"	
	0815					
	0845		6.9		"	
	0850					
	0850	8.4			"	
	1250					
	1350		6.8		"	
	1440					
	1540		5.7		"	
	1430				Closed	
	1435			5000	"	
	1545					
	1645		11		"	
9/12/58	0820					
	1010		33.0	200	"	

[redacted]

[redacted]

Date	Time	µc/cc x10^{-11}			Isolating valves	Remarks
		Lab	Inlet H. Box	Stack		
9/12/58	1105 1135	12	55.0		Closed	
	1135 1215		25.0		"	
	1220 1305		125.0		"	
	1307 1337	23			"	
	1330			71	"	
	1453 1510		125.0		Open	
	1535 1615		1.85		"	
12/12/58	0955 1300	1.45				
	1300 1445		1.6			
	1445 1645		1.6			
13/12/58	0905			1.8		
	0910 1010	5.8				
	1010 1040		8.4			
	1045 1130	6.1				
	1130 1545		2.7			
16/12/58	1435 1630	0.62				
	1440			1.02		
17/12/58	1405 1605	0.80				
18/12/58	0890 0935	5.3				
	0935 1115		6.2			

[redacted]

It is seen from Table I that the stack activity after the bed filter changes still running at about 0.8 times 10^{-6} µc/cc which represents an improvement by a factor of about 8 or 9. The hot box shows a general level of 100 mr/hr over the welded end using a 1332 inside the box.

Table II shows that it appears at the moment to be quite safe to keep the exhaust fans off with the obvious advantage of a low stack output. In respect to this there are two choices-

1. With the filter valves closed, leaving the filter isolated. The hot box is then only open at the inlet side.
2. With the filter valves open and a certain amount of stack activity which will vary with weather conditions.

[redacted]

Although the former ensures a nil activity stack output there appears a possible danger that on hot days there may be an expansion of hot box gases and a leakage will then occur out of the inlet. Depending on the wind conditions at the time this leakage may be blown into the laboratory via the inlet fans. If parent is associated with this leakage then it is undesirable as there then would be a build up of parent activity in the laboratory.

Consequently, the safest method of operating HC 12 is considered to be with both exhaust fans off and filter valves open.

[redacted]

[redacted]

Ext. 204

JLcC

Health Physics Group,
Maralinga,
SOUTH AUSTRALIA.

6th. December, 1958.

-6 DEC 1958

Director,
Commonwealth X-Ray and Radium Laboratory,
Surry Place,
MELBOURNE. VIC.

ASSESSMENT OF NEW RED BOUNDARY

Attached is a copy of Appendix I, "Assessment of New Red Boundary" for your information.

Any comments which you may wish to make would be appreciated.

[redacted]

HEALTH PHYSICS REPRESENTATIVE

[redacted]

[redacted]

APPENDIX I

ASSESSMENT OF NEW RED BOUNDARY

Introduction:

The criteria for assessing the limits of an active area according to Radiological Safety Regulations, Maralinga are not directly applicable to the situation in the Maralinga Test Area. In the September Health Physics report, an attempt was made to define new criteria for establishing an active boundary. However, it is felt that it is still sufficiently unrealistic and over-cautious, to warrant a further approach to the problem.

[redacted] Report:

Firstly, owing to its limited distribution, it is proposed to reprint an assessment made by [redacted] in October, 1957:-

"Notes on Radiological Safety Regulations, Maralinga in relation to Active Areas and Loose Activity".

"1. Active Areas:

On the edge of the fall-out areas there are regions which according to the Regulations are Red Areas (i.e. regions in which there is some deposited active material) but where the activity is low level and finely dispersed and cannot constitute an inhalation, ingestion or injection hazard or alternatively where the active material is in the form of pellets. In the former case so long as the gamma radiation (or in the latter the pellet concentration) is below a specified level, there is no need for protective clothing to be worn by persons working within these regions. Consequently there is no necessity to mark the boundary between such an area and the non-active approach to it.

2. Activity Levels:

(a) Finely divided soluble fission products.

In deriving the activity level referred to above it has been assumed (a) that Sr^{90} constitutes the limiting hazard (b) that the maximum period during which any one man will work in the area is 100 days (c) that each day the palms of both hands of a man so working become contaminated to the extent of 1% of the level of the ground contamination, area for area, and each day the man ingests all the contamination appearing on his hands (this is a criterion which has also been adopted by AERE Harwell) (d) that the active material is completely soluble (e) that the body retains 100% of that ingested (according to I.C.R.P. a factor of 0.25 should be introduced) and that the total quantity ingested shall not exceed 1/10 μC Sr^{90} which is 1/10 of the permissible body burden laid down by I.C.R.P. The figure derived for gamma activity as an indication of a safe Sr^{90} level is 0.16 mr/hr measured at 1 metre above ground level when the age of the fission products is 3 years and corresponds with 22 $\mu C/m^2$ of which 15% is Sr^{90}. For fission products whose age is less than 3 years this figure should be modified according to the $t^{-1.2}$ law.

(b) Insoluble Material (pellets or finely divided).

Such pellets can be assumed to pass through the body within 24 hours of ingestion, and constitute a hazard only to the G.I. tract. The I.C.R.P. permissible burden within the G.I. tract is 150 μC. Consequently insoluble particles amounting in total activity to this quantity may be ingested daily.

The level derived above for finely divided soluble fission product activity corresponds to 22 $\mu C/m^2$ at 3 years after deposition. Hence in order to ingest 150 μC from ground similarly contaminated, but by insoluble pellets, it would be necessary to ingest daily all the activity covering an area of 7 square metres, which is impossible in practice. There is thus no hazard involved in working in an area in which the insoluble activity does not exceed 22 $\mu C/m^2$.

(c) Soluble Pellets.

Again assuming 100% retention of Sr^{90} and a total of 1/10 μC ingested during a 100 day period, the daily permissible ingestion is 0.001 μC Sr^{90} which corresponds to 0.007 μC of fission products of age 3 years.

The permissible activity level for uncontrolled working in this case may reasonably be taken as 0.007 μC/m^2 of 3 year fission products on the assumption that no more pellets than those existing on 1 square metre will be ingested daily.

Where there is only partial solubility the activity level can be increased accordingly."

Solubility Results:

Solubility has been determined on the basis of strong stomach acid - 0.3N HCl for four hours at 100° F, for the following:-

1. Breakaway and One Tree fall-out pellets.
   (a) Large size (order of 1 mm) about 0.1%
   (b) Small size (order of 0.1 mm) about 0.5%
2. Glazing (Buffalo and Antler)
   From 1% to 4%
3. Biak "ash".
   (a) West of Breakaway and West of Apu (i.e. edge of fall-out).
   Average - 10%
   (b) East of Apu (i.e. centre of fall-out) 80%
4. Biak pellet?

One pellet between Apu and Pon Pon was 27% soluble, compared with the normal Breakaway 0.1 to 0.5%. It is not known why this should be more soluble, but it is considered to be rather unique. It's general appearance was less "glassy" than the others.

5. Tadje pellets and Marcoo fall-out.

Tadje pellets and Marcoo debris have yet to be examined. The solubility value of Tadje fall-out will only affect the Northern boundary.

6. Other fall-out.

Fall-out from Kite and Taranaki do not affect the boundary.

7. Proposed stomach acid solubility figures.
   (a) Buffalo pellets 0.5%
   (b) Glazing 5%
   (c) Biak ash 100%
   (d) Antler pellets - To be determined.

Boundary conditions (as for October, '58) using [redacted] criteria and proposed Solubilities.

Source of activity	μC/m^2	c.p.s. ($\beta + \gamma$) for CV494
Buffalo pellets	2.2	16
Glazing (Buffalo)	0.22	1.6

(Table continued on page 3)

[redacted]

- [illegible] -

Form of Activity	μc/g	c.p.s. [illegible]
Glazing (under	0.42	[illegible]
Disk Ash	65	420

Fresh Assessment:

1. Buffalo fall-out.

A realistic approach to the problem, as it affects the Maralinga Range should consider the nature of the fall-out pellets from One Tree and Breakaway - particularly Breakaway as it determines the Southern boundary from Kite to Nawa. . These pellets are smooth, glass-like objects mostly spherical or near spherical in shape, very much like glass beads. It is extremely difficult for them to be accidentally picked up, let alone ingested. The possibility of even one being ingested is extremely remote. Although the very small ones may possibly be picked up, they are so much smaller than sand grains that they are not so easily touched. However, when one considers that 0.1 μc Sr^{90} requires 220 μc of 2 year old, 0.5% soluble, fission products and that at the moment this would require the ingestion of -

2,200 beads from J 7, or
22,000 " " J 9, or
110,000 " " Nawa,

the impossibility of the situation is self evident.

Hence, one is forced to conclude that the critical hazard is not due to ingestion. If one considers the inhalation hazard from beads pulverised during bull-dozing and grading operations, it is appropriate to recall that on the first day of preparing the Gona site, which was in a field of 40 c.p.s. ($\beta + \gamma$) on the ground, a cascade impactor registered 1.2×10^{-8} μc/cc, only half of which was actually an inhalation hazard. If the tolerance for a 56 hour working week be taken as 10^{-7} μc/cc, and the solubility be assumed to have increased twenty-fold to 10%, then the total airborne activity would require a surface contamination of 3,200 c.p.s. ($\beta + \gamma$) as registered with a CV494 geiger counter, and would represent about 4 or 5 mr/hr of gamma activity. Accepting the new maximum permissible level of gamma radiation as being 100 mr/week, then for a 50 hour week, the tolerance level is 2 mr.

Thus for Buffalo fall-out, it would appear that the critical hazard is the gamma level of 2 mr/hr. In accordance with Radiological Safety Regulations, Maralinga, a non-active area would then be defined as having less than 0.2 mr/hr. The only area outside the crater areas exceeding this value is across Right Street, North of 2nd. Avenue.

2. Glazing.

Assuming a 100 day working period in a glazed area - a highly unlikely proposition - the daily permissible intake of Sr^{90} is 10^{-3} μc, or 0.4 μc of one year old, 5% soluble fission products. The average activity of one year old glazing is about 0.7 μc per gramme, so that the daily ingestion of 0.57 grammes of glazing for 100 days would constitute one tenth of a Sr^{90} tolerance. However, as on an average, 0.57 gms covers about 1 cm^2, the surface activity is about 0.4 μc/cm^2 and the corresponding gamma dose-rate is roughly 50 mr/hr. Thus for glazing, whether one or two year old, the critical hazard is again the gamma hazard of 2 mr/hour, i.e. less than 0.2 mr/hr defines a non-active area.

3. Disk Ash.

The ash is assumed to have been broken up and intimately mixed with the surface soil. Two major means of ingestion are visualised. Firstly, by the permission to eat, drink and smoke in the area, and secondly, by working parties being covered in a layer of dust. It seems to be a reasonable assumption that dropping sandwiches in the dirt, drinking dusty water etc.

[redacted]

[redacted]

would [illegible] of less than [illegible] mg cm^{-2} of soil every day for 100 days. If this were so, assuming 1% solubility and 100 grams of Sr^{90} with the daily permissible ingestion of one year old fission products being 0.02 μc, the equivalent ($\beta + \gamma$) counting rate is 150 c.p.s.

When bulldozer and grader operators are considered, there is the additional risk of ingesting radio-activity directly from the dust cloud or from the layer of dust on the face, arms and body. Remembering that the surface activity being disturbed is diluted by several inches of underlying dirt, on assuming that less than 10 gms of dirt are ingested daily, it is then reasonable to further assume that these 10 gms originated from less than 10 cm^2 of surface area. If the operator is also subjected to the same risk of ingestion from eating, drinking and smoking on the job, then the limit is set by a counting rate of 75 c.p.s. ($\beta + \gamma$).

4. Summary:

Source of radiation	Limiting hazard
Buffalo fall-out	0.2 mr/hr γ
All glazing	0.2 mr/hr γ
Biak ash	75 c.p.s. ($\beta + \gamma$)
Tadje fall-out	To be assessed

Red Boundary:

Biak ash fall-out determines the boundary on the Western side around Breakaway and Apu. It also eliminates the use of 2nd. Avenue and Right Street in the vicinity of the road junction, unless the bead/ash ratio and solubilities prove to be a safe level. Until Tadje fall-out is correctly assessed the Northern boundary will have to remain North of 10th. Avenue, but it is expected that the boundary will be later withdrawn to South of 5th. Avenue. As there is little point in blocking a road halfway along it, the boundary should be at the last road junction. Thus while Right Street is excluded, the boundary should be on the West side of East Street.

The boundary then could be, starting from the North West corner of Nawa, West along the North side of the Nawa - Kite road, South around the Tadje glazing, North to the junction of the Tadje rocket lane and Maru - Pom Pom cable lane, West to the junction of Biak rocket lane and J 7 - Marcoo Road, South-West to Pom Pom, South around Biak glazing, to the West of Tanka where the 75 c.p.s. Biak ash contour follows a line to 1200 feet South of Breakaway, curving around to 2,000 feet East of Taranaki, 2,000 feet towards Murpu from Apu, 1,600 feet towards 2nd. Avenue from Apu, 1,000 feet West of 2nd. Avenue/Central Street, then West side of Central Street to 5th. Avenue, East side of Central Street from 5th. Avenue to 10th. Avenue, North side of 10th. Avenue from Central Street to East Street, and down the West side of East Street to Nawa.

The Northern and Eastern boundaries are quite likely to be retracted further at a later date, but the Southern and Western boundaries should not change.

No action is intended to be taken on this assessment, until assurance is obtained from all interested parties that they are in agreement. No area would be declared non-active without a full assessment having been made of the individual characteristics of the fall-out in that area.

Spread of Contamination:

The above assessment is based on biological hazards only. In addition, there is a hazard to laboratory instruments if contamination is spread into counting rooms. The three main ways that contamination can be spread from forward area operations is from body dirt, clothing and equipment. Dirt from personnel and clothing would normally be

washed down to the sewage farm and filtered. No effect on laboratory instruments can be envisaged - nor can there be any biological hazard from accumulation in pipes, filters etc.

Transport and mechanical equipment always shakes off loose dry contamination within the first mile unless it is inside the vehicle. Greasy and oily points tend to collect small amounts - completely harmless biologically, but perhaps significant if the accumulated cleanings were near instrumentation. However, the design of the Village at Maralinga ensures that all vehicles and plant are well away from laboratory areas, thereby ensuring a low background. It is to be remembered that beads do not spread easily, other than by wind, and that the more easily spreadable ash fall-out is more strictly controlled, so that clean vehicles do not have the same opportunity to be contaminated with this type of fall-out.

Consequently, it is considered that the above recommended boundary will not contribute to the spread of contamination to laboratory areas.

Safety Factors:

1. Beads and Glazing.

On the assumption of a maximum ten weeks work per year alongside the suggested new red boundary, a worker would only receive 100 mr per year. Compared with the proposed annual permissible dose of 5 r per year for occupationally exposed personnel, a safety factor of at least 50 is involved. In actual fact, the safety factor would be normally greater. As the main criterion is time which is simply checked, such safety factors are ample.

The only glazing that would be in a non-active area would be a slight amount of wind-blown material. It will be many years before glazed areas could be decontrolled.

2. Ash.

(a) Body burden of Sr^{90} taken to be 0.1 μc instead of 1 μc.

(b) Sr^{90} uptake was assumed to be 100% instead of 25%.

(c) Solubility was assumed to be 100% instead of 10%, for the edge of Biak ash fall-out.

(d) A total of one kilogram of dirt was assumed to be ingested (over 100 days), whereas it is unlikely that even 10 gms would be ingested.

(e) It was assumed that the dirt ingested came from a layer about 0.5 cm thick, whereas it would come from more than 5 cms thick.

Total safety factor would be therefore 4×10^5.

(f) Eating, drinking etc. in areas less than 75 c.p.s. ($\beta + \gamma$) have an estimated safety factor of the order of 10^5

Because of the various uncertainties involved in this assessment, a large safety factor is advisable.

Ext.28.

[redacted]

AT / 2 / 2

CHT/JMcC

Health Physics Group,
Maralinga,
SOUTH AUSTRALIA.

1st. December, 1958.

-1 DEC 1958

Director,
Atomic Weapons Research Establishment,
Aldermaston,
Berks.,
UNITED KINGDOM.

COBALT 60 PELLETS NEAR TADJE

During July - October, 180 Co^{60} pellets totalling approximately 4.5 curies have been recovered from an area of about 100,000 square feet North of Tadje ground zero. This information is indicated in two attached charts:- (1) A location chart, and (2) a map, showing the general area around Tadje including the search area and the area covered by the attached location chart. A rectangle of 40 x 120 yards as indicated on the location chart contains 95% of the activity found so far. The more active pellets tend to be found on the Western edge of the fall-out. It is possible that some of the pellets located further Eastwards may have been blown there by the dominant South-Westerlies during the twelve months since firing.

The first thirty four beads were compared individually with a 62 mC Co^{60} source at one metre from a 1390, in order to determine the activities. In addition, the strength in millicuries was found to be about 80% of the value in "r"/hr of a 1391 in contact with the pellet - the beta contribution to the dose-rate was low. To reduce the dose incurred in measurement, the strength of all later pellets was estimated from field measurements, using a 1391. The 1391 was preferred to the 1390 as it could localise the pellet more accurately. Whenever the 1391 exceeded the maximum reading of 100 "r"/hr, an absorber of known absorption effect was used to estimate the strength.

There is a tendency for some of the pellets to "explode" into minute fragments when pressure is applied to them. As all work in the field was done at several feet distance, this did not create a hazard. However, when transferring from small source holders to the main transit source holder the accumulated dust can become air-borne and lodge on surrounding material.

Most of the activity left in the Tadje area now appears to be fragmentary in nature, and becomes increasingly difficult to locate. Often the pellets are buried under several inches of wind-blown sand or soil. The difficulties now involved in the collection are such that further collection has been abandoned. Possibly, half a curie is distributed over the area, which could be fenced off.

The pellets collected on various dates are summarised below.

Collection Date	No. of Pellets	Total mC	Average mC
7 July	9	357	37
21 "	10	273	27
25 "	15	407	27
28 August	35	766	20
1 September	39	1058	27
4 "	31	1289	42
15 "	21	227	11
16 "	18	118	7
30 October	2	40	20
	180 [redacted]	4515	

[redacted]

Date	B.C	Distance along Lane 0 (feet)	Distance from Lane 0 (feet)	Direction from Lane 0
28 August	36	600	60	West
28 "	29	600	31	"
28 "	19	600	50	"
28 "	23	570	6	"
28 "	22	600	20	"
28 "	23	680	30	"
28 "	18	675	9	"
28 "	25	600	84	"
28 "	18	660	30	"
28 "	2.8	600	60	"
28 "	44	600	75	"
28 "	22	600	75	"
28 "	16	600	90	"
28 "	13	580	12	"
28 "	8.8	593	23	"
28 "	25	560	8	"
28 "	65	641	41	"
28 "	23	638	38	East
28 "	19	640	7	West
28 "	39	707	70	"
28 "	18	572	33	"
28 "	24	600	23	"
28 "	26	612	8	"
28 "	24	620	58	"
28 "	17	570	9	"
1 September	6.0	620	22	"
1 "	18	660	24	"
1 "	8	660	26	"
1 "	16	666	23	"
1 "	3.2	740	20	"
1 "	33	800	20	"
1 "	1.5	530	0	
1 "	1.6	555	0	
1 "	8.1	575	0	
1 "	52	591	9	East
1 "	12	609	9	"
1 "	4.9	646	20	West
1 "	5.8	611	11	East
1 "	7.3	707	17	West
1 "	9.3	711	11	"
1 "	16	730	12	"
1 "	16	728	28	"
1 "	15	732	32	"
1 "	19	600	56	"
1 "	4.9	607	53	"

[redacted]

[redacted]

A detailed list of the location of all pellets recovered from [redacted] is as follows:-

Date		M.C	Distance along Lane 0 (feet)	Distance from Lane 0 (feet)	Direction from Lane 0
7	July	13	750	12	West
7	"	41	735	38	"
7	"	31	690	75	"
7	"	48	675	90	"
7	"	79	640	6	"
7	"	41	700	0	"
7	"	99	700	3	"
7	"	13	729	31	"
7	"	22	725	19	"
21	"	38	600	75	"
21	"	45	600	60	"
21	"	23	600	50	"
21	"	32	680	0	"
21	"	21	640	40	"
21	"	20	613	42	"
21	"	42	600	66	"
21	"	17	687	13	"
21	"	20	685	17	"
21	"	15	684	5	"
25	"	59	677	25	"
25	"	60	667	66	"
25	"	28	686	28	"
25	"	12	600	40	"
25	"	32	580	20	"
25	"	15	600	60	"
25	"	20	600	25	"
25	"	43	682	27	"
25	"	13	614	42	"
25	"	44	664	64	"
25	"	18	600	45	"
25	"	22	600	52	"
25	"	13	611	35	"
25	"	21	1400	385	East
25	"	7	1400	395	"
28	August	32	600	75	West
28	"	19	540	24	"
28	"	26	600	60	"
28	"	23	600	39	"
28	"	16	581	21	"
28	"	18	579	6	"
28	"	21	660	5	"
28	"	2.4	500	15	"
28	"	8.1	550	10	"

[redacted]

[redacted]

Dat		E.S	Distance along Lon. (feet)	Distance fr Lon. (feet)	Direction fr L.
1	September	24	553	48	West
1	"	36	700	28	"
1	"	76	700	60	"
1	"	24	670	60	"
1	"	18	575	32	East
1	"	19	575	30	"
1	"	14	550	48	West
1	"	50	700	65	"
1	"	63	700	48	"
1	"	18	720	34	"
1	"	52	750	58	"
1	"	40	740	62	"
1	"	32	740	72	"
1	"	85	750	80	"
1	"	61	760	108	"
1	"	79	700	110	"
1	"	89	750	102	"
1	"	75	800	55	"
1	"	47	800	58	"
4	"	28	727	27	"
4	"	60	858	97	"
4	"	52	840	90	"
4	"	39	836	91	"
4	"	16	729	27	"
4	"	248	840	127	"
4	"	28	836	43	"
4	"	24	791	62	"
4	"	17	727	75	"
4	"	34	779	72	"
4	"	100	694	98	"
4	"	36	690	71	"
4	"	45	685	52	"
4	"	54	667	67	"
4	"	45	679	53	"
4	"	57	676	47	"
4	"	24	673	53	"
4	"	36	670	65	"
4	"	24	670	45	"
4	"	47	670	49	"
4	"	57	700	70	"
4	"	33	715	70	"
4	"	70	710	79	"
4	"	543	700	30	"
4	"	16	650	12	"
4	"	28	642	14	"
4	"	16	631	9	"

[redacted]

[redacted]

Date		E.C	Distance along Lon. (feet)	Distance for Lon. (feet)	Direction for Lon.
4	September	18	621	5	West
4	"	13	639	1	"
4	"	13	595	47	"
4	"	36	624	49	"
15	"	31	700	0	
15	"	19	800	100	East
15	"	16	830	230	"
15	"	7.5	800	150	"
15	"	6.5	820	150	"
15	"	14	700	100	"
15	"	4	690	130	"
15	"	6.1	690	136	"
15	"	8.1	670	130	"
15	"	2.6	620	220	"
15	"	2.7	700	225	"
15	"	1.1	700	200	"
15	"	5.7	710	215	"
15	"	3.5	730	135	"
15	"	8.1	702	0	
15	"	16	766	82	East
15	"	34	656	93	"
15	"	2.9	847	125	"
15	"	18	800	254	"
15	"	19	715	30	"
15	"	0.8	708	0	
16	"	9.7	620	5	East
16	"	3.5	570	10	West
16	"	19	560	5	East
16	"	6.5	710	40	"
16	"	4.9	750	45	"
16	"	4.9	740	30	"
16	"	11	970	10	"
16	"	4.0	860	150	"
16	"	.8	840	180	"
16	"	0.8	756	63	"
16	"	6.5	709	0	
16	"	4.0	703	1	East
16	"	13	700	1	"
16	"	15	825	85	"
16	"	4.0	820	80	"
16	"	3.2	700	18	West
16	"	4.0	698	1	"
16	"	2.4	696	1	"
30	October	21	530	16	East
30	"	19	650	30	"

[redacted]

[redacted]

Several pellets similar in appearance to the cobalt pellets even under a microscope, but having less than a microcurie of activity have been found between two and three hundred feet from ground zero in directions between 270 and 300°. These slightly active pellets have been shown to consist of fission products and Co^{60} in roughly equal proportions at 1 year. They respond to a magnet.

[redacted]

[redacted] HEALTH PHYSICS REPRESENTATIVE

Copy to: Director,
Commonwealth X-Ray and Radium Laboratory,
Surry Place,
Melbourne, C.1,
Victoria,
AUSTRALIA.

(Location chart and map excluded).

[redacted]

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

TELEGRAPHIC ADDRESS
ATEN, ALDERMASTON READING
TELEPHONE READING [redacted] TRUNK SUB 0060
NEWBURY 1800 BASINGSTOKE 1960
OUR REFERENCE
YOUR REFERENCE

Building A2.2.,
ATOMIC WEAPONS RESEARCH ESTABLISHMENT,
ALDERMASTON,
BERKSHIRE.

3rd September, 1956

Dear [redacted]

Please see the enclosed copy of a letter to Titterton.

I'm sorry you have been kept in the dark about DC 12. I had not intended it that way.

Tomorrow I am going to Geneva and it has occurred to me that you might possibly be there too. If not I hope to see you sometime again in Australia, though the political trend at present is tending to make that unlikely.

Yours sincerely,

[redacted]

[redacted],
Director,
Commonwealth X-Ray and Radium Laboratory,
Surry Place,
Melbourne, C.1.

[redacted]

Copy No.) of 4 copies

Building [redacted]

3rd September, 1958

Dear

I think you knew that [redacted] is leaving us to go to the Central Electricity Generating Board at the end of this month. Consequently he is shedding his loads and has asked me to reply to your letter of August 28th.

There seems to have been some misunderstanding regarding DC 12. It was certainly not our intention to keep you or [redacted] in the dark regarding the operations therein. At Antler time I told [redacted] what was going on and asked him to regard it as classified information and he seems to have interpreted this as meaning that he should tell no one else at all.

The purpose of DC 12 is simply to extract Th B from Th^{228} for use as short-lived sources of gamma radiation in conjunction with Minor Trials at Maralinga. There was an accidental release of Th^{228} within the hot box in DC 12 with the result that some Th^{228} was swept out into an extract filter between the hot-box and the chimney. Building and external contamination have been very small.

As regards disposal of waste active material, I have written to [redacted] my views on the various possibilities and he will be transmitting these (or his variant of them) through Wheeler. I have said that the choice between burial in the forward area and near to the village should be left to you, but that if the former site is chosen the fact that burial has taken place there should be disguised in order to avoid attracting the attention of aboriginals or others straying into the area. If on the other hand you favour (as I now know you do and as I do too) the airstrip area I would rather see a number of small holes in the ground than one large pit, since this will make for safer burial and subsequent exhumation if ever re-disposal elsewhere is required.

Yours sincerely,

[redacted]

[redacted],
Research School of Physical Sciences,
The Australian National University.

Copy to: [redacted],
C.S.I.R.O.

JFR/L

950/2

105 1 / 11 18th August 58.

[redacted],
Health Physics Group,
MARALINGA, S.A.

Dear [redacted],

I have your application for leave from 22/9/58 to 3/10/58, which has been completed and sent on for approval. You are not entitled to the Victorian holiday on September 25th and your application form has been completed accordingly (for 70 hours leave).

We greatly regret any inconvenience caused to you or your wife arising from the current arrangements.

Yours sincerely,

Director.

[redacted]

Ex.. CHT/JMcC

Health Physics Group,
MARALINGA. S.A.

1st. August, 1958.

Director,
Commonwealth X-Ray and Radium Laboratory,
Surry Place,
MELBOURNE. C.1.

DISPOSAL OF RADIO-ACTIVE PELLETS

For your information, I am enclosing a copy of a letter given to the Range Commander to assist him in the Board of Management meeting held on July, 29th. 1958.

[redacted]

HEALTH PHYSICS REPRESENTATIVE

[redacted]

Ext. ,

CHT/JMcC

Health Physics Group,
MARALINGA. S.A.

[redacted]

24th. July, 1958.

24 JUL 1958

Range Commander,
MARALINGA RANGE SUPPORT UNIT.

DISPOSAL OF RADIO-ACTIVE PELLETS

It is now known that several hundredweights of lead scrap in the form of shavings and strips are on the Range. As lead is six times more effective than concrete in absorbing the gamma radiation from these pellets, it is advisable to take advantage of our stock of lead scrap. It is therefore proposed to adopt the following procedure:-

As each curie of activity is collected, the group of pellets will be inserted by remote handling tongs into a 1-1/4" diameter, 1-1/2" long steel cylinder which will be pushed into the centre of a 5" diameter, 7" long "sellotape" tin filled with cooling molten lead. The tin will then be placed on several inches of fresh concrete formed with fine aggregate at the bottom of a 7" diameter, 15" long steel cylinder. More concrete will be pressed around the sides and compacted on top of the tin until the concrete is flush with the top of the outer steel cylinder.

A nine inch auger will drill a hole six feet deep in the Maralinga Radio-active Cemetery and the lead-concrete-steel block will be lowered to the bottom. Fine aggregate concrete will then be poured into the hole, overflowing into a wooden former 18" x 12" in area and 12" high. To the smoothed concrete surface will be embedded a phosphor bronze plaque 14" x 9" in area bearing the inscription

"Danger - Buried radio-activity - Do not disturb before the year 2030 A. D.".

So far we have collected 19 pellets totalling 0.64 curies. We use 1391 (beta plus gamma detecting) instruments to locate each pellet, a long handled scoop to remove the pellet from the ground and remote handling tongs to transfer the separated pellet to a lead and steel source pot. I intend devoting one day a week to this task, as with the above technique personnel receive only about 5-10 mr per pellet recovered and it is still possible to maintain my aim of keeping our weekly dose well below the accepted value of 300 mr/week.

The area that has been searched is small compared with the total area in which one could logically expect these pellets to be found. It is reasonable to expect that at least several curies remain to be recovered. It is noted that one curie of these pellets give a radiation dose-rate of 15 roentgens per hour at one foot distance assuming no shielding. With the shielding of the lead in the sellotape tin this figure would be about 0.7 roentgens per hour, whilst the dose-rate at the surface of the ground should be less than 1 mr/hr.

[redacted]

HEALTH PHYSICS REPRESENTATIVE

Copy to Director CXRL

JFR/L

. MAIL)

13th May 58.

950 2

[redacted],
Health Physics Group,
WITWATERSRAND. S.A.

Dear [redacted]

On receiving your telegram message of 12/5/58 requesting information on certain radioactive materials, I obtained from our library the latest available data in the form of two issues of Nuclear Science Abstracts.

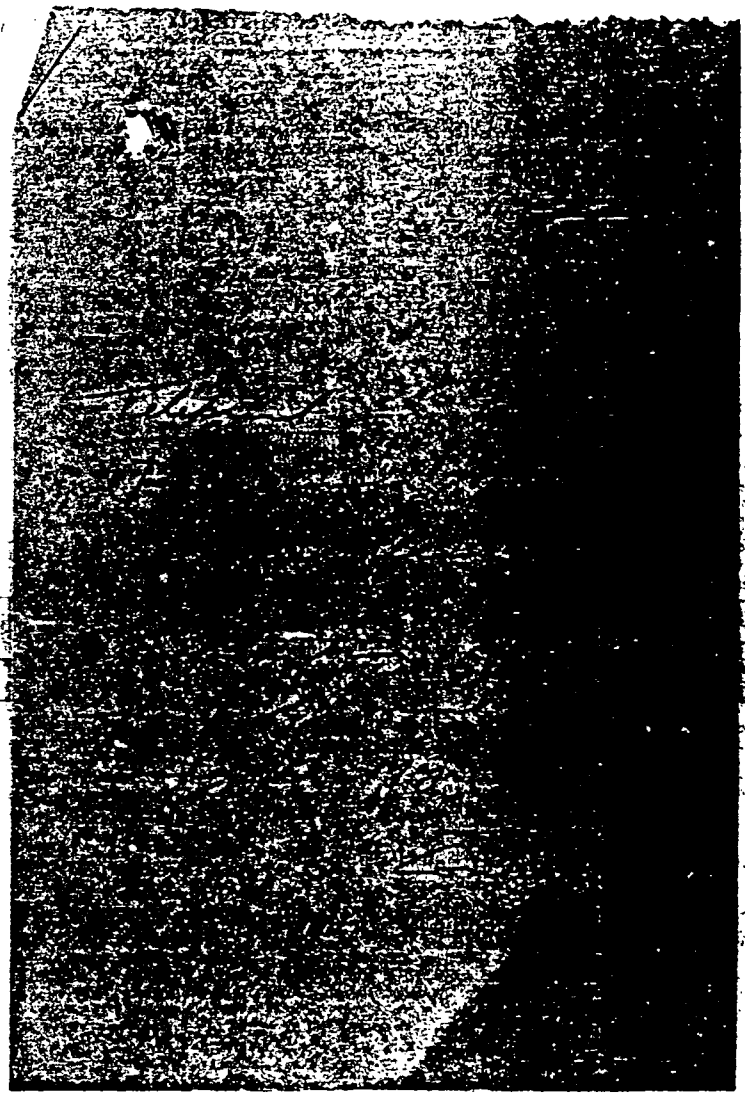
These issues were entitled "New Nuclear Data", and were dated December 31, 1956 and January 15, 1957 - March 31, 1957 respectively. Mr. Keen has kindly checked to ensure that the information you want is contained in these issues and has ascertained that this is the most recent data available to us.

Rather than make lengthy extracts here I have sent you the journals by post for you to extract the information you require, thus saving time. Would you please return the journals as soon as you have finished with them?

Kindest regards,

Yours sincerely,

Director.



Classified [redacted]

[redacted]

CME 199

RR 120950
IK

FROM AWSTAFF

TO COMEXRAY MELBOURNE

BT

CONFIDENTIAL

FOLLOWING RECEIVED FROM MARALINGA

CONFD A279. FOR [redacted] FROM [redacted] PD REQUEST LATEST INFORMATION ON GAMMA ENERGIES AND INTENSITIES FOR 71 DAY COBALT 58, 9.2 HOUR EUROPIUM 152 AND 8.7 MINUTE CALCIUM 49

BT

120959I MAY CAP MS

[redacted]

UNITED KINGDOM ATOMIC ENERGY AUTHORITY.
Building [redacted].
ATOMIC WEAPONS RESEARCH ESTABLISHMENT,
ALDERMASTON,
BERKSHIRE.

[redacted]

24th January, 1958

Dear [redacted],

I have received your letter of 9th January 1958 in which you refer to the question of film badge issues. I am sorry you have been worried with this as [redacted] should, under his terms of reference, have referred this directly back to A.W.R.E. When I wrote my letter to him I was unaware that it had been finally decided not to institute a complete coverage of all personnel employed on the Range and, in considering the question of total coverage of blood counts and deciding in favour of a partial one, [redacted] was undoubtedly influenced by the fact that all Range staff could be issued with film badges if in fact they were not already so supplied. It is unfortunate that it is politically, though not practically, difficult to do this now as it leaves a fair body of people at Maralinga who, although not exposed to any radiation hazard in the course of their proper work, are not covered by any system which can lead to a firm decision, in the case of alleged injury, that radiation exposure has not caused the possible ill health.

However, [redacted] and [redacted] have considered the matter and, whilst holding that a full coverage would be desirable they realise the concern which may arise as to the degree of safety which exists if a change were made now. The position is open to review and it may be that after the next series of trials at Maralinga it will be deemed advisable to continue full film badge issue during the whole year.

There has been no change in the situation at all; nor is one envisaged. This matter of film badge wearing outside the controlled areas is entirely a question of the extent of the provisions advisable to ensure that adequate evidence is available to counter claims of damage having no foundation in fact.

Yours sincerely,

[redacted]

S.R.H.P.

The Director,
Commonwealth X-ray and Radium Laboratory,
Radium Laboratory,
Surry Place,
Melbourne, C.I.,
Victoria.

Copies to: Dr. [redacted],
S.S.H.P.,
Aldermaston.

[redacted],
Box No.1.,
P.O., Maralinga.

([illegible])

Film Badge

[redacted]

[illegible]

[illegible] 2

9th January [illegible]

[redacted]
[illegible],
[illegible],
[illegible] [illegible].

Dear Mr. [illegible],

Mr. Turner has drawn to my attention a comment you made in a letter to him of 28.11.57 relating to film badges. I am informed that you have asked that everyone on the Range should be issued with film badges during the inter-trial period. This suggestion is at variance with the agreed arrangement discussed both at Maralinga and subsequently with Mr. [illegible] in Melbourne. The agreed procedure was set out in item 6 of my [illegible] of 11.11.57 to Mr. Turner, a copy of which was submitted to Mr. [illegible].

Your suggestion was briefly discussed at a meeting of the Safety Committee held today and they concur with the opinion that there is no apparent reason for a change of policy. I believe, and the Safety Committee concurs, that except for the controlled area at the Range, the remainder of Maralinga should, during an inter-trial period, essentially be a safe area and therefore not requiring personnel to wear film badges. It would appear that the introduction of film badges for personnel in such an area, may give rise to concern as to the degree of safety which exists.

Because of this point and because the volume of such would be large particularly if any build-up of personnel occurred, I am writing to enquire whether particular reasons exist, of which we are not aware, for suggesting the change in policy.

With kind regards,

Yours sincerely,

[illegible] [illegible]

[illegible]

[illegible]

Copy for your information.

[redacted]

950/2

[redacted]

EXTRACT FROM LETTER TO [redacted] FROM [redacted]

DATED 28/11/57.

When I left Maralinga as you may remember I was in favour of a film badge issue to all persons on the range. So I believe was the Range Commander. However it was left somewhat in the air between the Board of Management and Safety Committee. [redacted] is at the moment concerned with the question of blood counts and asked me to find out if in fact at present everybody on the Range has a film badge. He is strongly in favour of a 100% coverage even if the blood counts are only partial. In fact it appears that 100% blood counts will be eventually requested. I think, therefore, you should institute a 100% coverage if there is not one in force. For the non-contact people they can wear the badge for as long as a control does not get background fogging greater than 0.3r or so. This is probably 3 months at least.

This letter was received at Maralinga ~~Tue~~ 19/12/57
& was received by [redacted] at CXRL on 6/1/58.
[redacted] had left Mara. before 19/12/57.

[redacted]

[redacted]

4/57

1

Telephone call to the Assistant Manager.

1. Ref. telegram of 17/11/57
2. O.H.T. still officer of A.E.C. — we are trying to hasten his transfer to our staff.
3. Not entitled to warrant of travel to Perth but may recommend — travelling by road to Perth and back as per telegram of 17/11/57 — approx £13/10/-
4. Ask O.H.T. to send letter setting out proposals for [illegible] arrangements & means of his [illegible]

Interviewed
6/12/57
Letter dated
Not rec'd 6/12/57

[illegible]

[illegible]	[illegible]
250 d.	1
1 d.	1·9
3 d.	8·8
5 d.	15
10 d.	22
20 d.	24
30 d.	24
50	22·5
100	17

[illegible] Indian Medical Record 1951

[illegible] [redacted]

Note: Activity at 30 weeks corresponding to 22 μc/cm² at 3 d.

Used graphs S.V.R.

S = activity
R = times

$R = t_2/t_1 = \frac{150}{30} = 5.20.$ $S = 7.20.$

∴ activity at 30 weeks = 7.2 × 22

= 158.5 μc/cm².

γ: Dose-rate = (159 × 10⁻⁴ × 72.) = 1.14 mr/h

Dosage calculation "thymus" at 30 weeks

(Using graphs, volume of activity at 3 weeks = (1·14 × 15·9) = 18·1 mrad/h)

Using calculation, total = 18·0 mrad.

RDU
McIntosh

Spare

1957

[redacted]	T.A. Grade 2 o/c
[redacted]	" " "
[redacted]	" " "
* [redacted]	" " "
[redacted]	T.A. Grade 1.
[redacted]	" " "
[redacted]	" " "
[redacted]	" " "
[redacted]	" " "
[redacted]	" " "
[redacted]	" " "
[redacted]	" " "
[redacted]	" " "

*. special duties

ae 950/1.5
Ltr

TELEPHONE: FB 0261
TELEGRAMS:
"SUPDEF." MELBOURNE.
POSTAL ADDRESS: BOX 2288 U.
G.P.O., MELBOURNE.

In Reply Quote:-

6012/1/141

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF SUPPLY

339 SWANSTON STREET,
MELBOURNE, C.1.

27th November, 1957.

Director,
Commonwealth X-Ray and Radium Laboratories,
Surry Place,
MELBOURNE. C.1.

MARALINGA - HEALTH PHYSICS DURING INTER-TRIALS PERIODS.

You will recall our earlier arrangements that the twelve personnel recruited by the Weapons Research Establishment, Salisbury, and subsequently trained in your Laboratories in Radiation Detection would, at the completion of the Mount Clarence project, be rostered by W.R.E. in groups of four for a tour of duty at Maralinga not exceeding three months.

However, in order to cause the least inconvenience to W.R.E. activities, the Secretary has agreed to the suggestion that their tour of duty be extended to six months for each group.

The first group comprising [redacted] are now at Maralinga and will replace the Service personnel engaged in Health Physics duty under the scientific direction of [redacted]

Salaries and allowances paid to members of the group whilst at Maralinga are recoverable by W.R.E. from the United Kingdom.

[redacted]
Secretary
BOARD OF MANAGEMENT - ATOMIC WEAPONS TESTS.

[redacted]

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

Building [redacted]

TELEGRAPHIC ADDRESS ATEA ALDERMASTON READING
TELEPHONE READING 0850 Ext. 6488
OUR REFERENCE
YOUR REFERENCE 950/2

ATOMIC WEAPONS RESEARCH ESTABLISHMENT,
ALDERMASTON,
BERKSHIRE

21st November, 1957

Dear [redacted]

Thank you very much for the copy of your letter to [redacted] It fits our ideas admirably.

I look forward to seeing you again in the, I hope, not too distant future. Our plans at the moment are somewhat vague.

Yours sincerely,

[redacted]

[redacted]

Director,
Commonwealth X-Ray and Radium Laboratory,
Surrey Place,
Melbourne, C.1.

[redacted]

950 2

[redacted]

11th November 57.

[redacted] Physics Representative,
Maralinga Range Support Unit,
MARALINGA. S.A.

Dear [redacted]

To ensure the smooth operation of Health Control at Maralinga in the inter-trial period several meetings have been held between myself and representatives of A.W.R.E. At these meetings the requirements and responsibilities of the various groups concerned with Health Physics during the inter-trial period were agreed on.

The following is a statement of the present agreed arrangements.

1. Responsibilities

The responsibility for radiological safety at Maralinga is fundamentally that of the United Kingdom with the Commonwealth X-ray and Radium Laboratory supervising on behalf of A.W.R.E. the activities of the Health Physics Representative during the inter-trial period.

The Health Physics Representative has direct scientific responsibility to A.W.R.E. The Commonwealth X-ray and Radium Laboratory will be administratively responsible for the Health Physics Representative and will also be available to him for on-the-spot consultation should this be necessary.

2. Duties

Your general duties in the inter-trial period are those laid down in the Radiological Safety Regulations for both the Health Physics Representative and the Health Physics Advisers. (In section 14.6.4 of the Regulations replace "Trials Superintendent" by "Range Commander".) In addition to these duties, specific items of investigational work have been required by A.W.R.E. These have been detailed and passed on to you by A.W.R.E.

Such other work as you may wish to do must be submitted to A.W.R.E. who must approve it before it is undertaken and this work must be done without prejudice to the defined programme and within the capacity of existing staff and equipment. Should A.W.R.E. be of the opinion [redacted] the extra duties proposed

[redacted]

are of such importance to warrant it, they may authorise that they be added to their own requirements of additional work. Except in the case of an emergency no duties outside those approved by A.W.R.E. may be undertaken by the Health Physics Representative.

3. Staff

It has been agreed that in addition to the Assistant Health Physics Representative supplied by U.K., the immediate programme of work demands that you should have the assistance of 4 members of the Radiation Detection Unit. The members of the R.D.U. are under your direction while at Maralinga but are at all times administratively responsible to W.R.E., Salisbury.

It is understood from Mr. Dale that an additional officer has been made available to assist in the "suitability study" which is to be undertaken.

It should be understood that the Assistant Health Physics Representative will have a part-time responsibility outside the duties mentioned above. Arrangements should be made to relieve this officer as required so that he may be able to discharge this responsibility.

While not wishing to involve you in an elaborate analysis, it would be of advantage if you could keep some simple record of the activities and time spent by your staff within the defined duties.

4. Reporting

You are required to report monthly to A.W.R.E. through the Range Commander sending copies to the Board of Management, The Australian Weapons Trials Safety Committee and to me. The report should be issued as expeditiously as possible each month.

It is suggested that for our mutual convenience you should prepare a standard form of report and adhere to this as far as possible. Where no action has been taken under a particular heading in any month, the heading should still be included with the word "Nil" under it. The paragraphs should be numbered on the same system as before. The classification of these and other reports is at your discretion but the usual practice should be followed of keeping the classification as low as possible consistent with requirements of security. Documents classified as "Confidential" or below should be sent to U.K. by registered air mail, thus saving time.

Reports on emergency operations or on very unusual occurrences should be made to A.W.R.E. as was done in the previous inter-trial period. At present A.W.R.E. has no requirement for Biological material.

Copies of all official letters and reports forwarded by you to others should be sent to me. The Range Commander should be kept informed on all administrative matters.

5. Inspection of Health Aspects of Decontamination of Aircraft at Edinburgh

Periodic visits, [redacted] a month, should be made

[redacted] of health control on the
by you to Edinburgh to check that the
above activity do not fall below those laid down in the Radiological Safety
Regulations, Maralinga, or subsequent R.A.F. regulations agreed by A.W.R.E.
You will report your findings to A.W.R.E. in a separate document as soon as
possible after your visit.

You will have no executive authority at Edinburgh.

6. Film Monitoring

The Safety Committee has been informed that there has been some confusion regarding the issue of film badges although Mr. G. Dale informed it that an exact procedure has been laid down. So that there will be no confusion, you are advised that film badges should be issued to all personnel who enter a controlled area at the site and to these only. It is understood that these film badges will be worn for a month after issue and that a re-issue will then be made on the next re-entry to a controlled area.

The regular assessment of exposure from all film badges worn by personnel is considered an important activity.

The procedures and arrangements outlined above supersede all previous requirements with which they conflict.

Yours faithfully,

[redacted]

Director.

Copy to -

Director, A.W.R.E., Aldermaston, Berks., England.

[redacted] A.W.R.E., Aldermaston, Berks., England.

Secretary, Board of Management, Weapons Trials, Department of Supply, 339 Swanston Street, Melbourne.

Range Commander, Maralinga, S.A.

[redacted]

JFR/L

950 2 30th October 57.

[redacted]
A.W.R.E.,
Aldermaston,
Reading, BERKS.

Dear [redacted],

I wish to thank you for giving us the opportunity to comment on "Notes on Radiological Safety Regulations, Maralinga, in Relation to Active Areas and Lease Activity."

After discussing certain points with [redacted] yesterday we agree that these levels are suitable for use in the inter-trial period.

Yours sincerely,

[redacted]

29/10/57

Check on previous limits: BJR (N.S.) 30 (351): 10 1957
(Ref 950, 951 ±).

§ 2(a) (a) Sr^{89}: limiting hazard.
(b) (i) Max. period for one man: 100 d.
(c) failure limit based on contam. of intake 12 — ? based ? ground contam. (aerosol)
all 12 ingested each day.
(d) active material completely sol.
(e) body retains 100% ? all ingested (ICRP → f = 0.25).
Total quantity ingested ≠ 0.1 μc Sr^{90}
(= 0.1 μc. p. l. l. ICRP)

Level ? Sr^{90} estimated from limit ? γ-radiation from associated fission product.
Calc. products for t = 30 mins.
Stated figure based ? γ-emission ? safe Sr^{90} limit = 0.16 mr/h measured at 1m. above ground — corresponds with 22 μc/m² ? rainfall 15% ? Sr^{90}.
If t < 30 min $t^{-1.2}$ law.

Notes: — (1) 15% ? Sr^{90} at 30 — see Stewart Crooks, Tucker; AERE HP/R1707 ("Radiol. Doses to Persons ..... UK — Explosions — p. 18
(Ref. gives 5% at 2y + 15% at 5y + 22% at 10y
Note Cs[137]: 5% 12% 18% respectively)

(2): Graph relating % the per mc/cm² (Pu^{239} 6f) to time after "bomb" (days): p12 (Fig)
— see Data ? J. Bonjer 0-35/58 (X)
("Dose-rate from bomb Contam. — from Atomic Explosions")

Total Sr^{90} ingested (a bull) = 0.1 μc

This is taken up over 100 d. + an uptake per d. is 10^{-3} μc — from bone fed.

Area of feeders = $\frac{3}{4} \times (10 \times 10) \cdot \frac{300}{400}$ cm²

Concentration of Sr^{90} (per kg) = 5×10^{-6} μc/cm²

" " b.p. " " = $(5 \times 10^{-6}) \cdot \frac{100}{15}$

$= 3.3 \times 10^{-5}$ μc/cm²

As this = 1% of ground contam.,

Max g.c. = 3.3×10^{-3} μc/cm² = ~~33~~ μc/m² =

$33 \times \frac{200}{300} = 22$ μc/m²

[— Note: limit 22 μc/m².

γ-Dose from 22 μc/m² at 3 ft.

Ref. O-35/56 (X) p.12:

at 3 ft.: (23) m/h per mc/cm² — Used 72

∴ 22 μc/m² = 22×10^{-7} mc/cm²

will produce

$23 \times 22 \times 10^{-7} \times 10^{3}$ m/h

$= 506 \times 10^{-4} = 0.05$ m/h — at 1 metre

— Note: limit 0.16 m/h] $(0.05 \times \frac{72}{23}) = 0.16$

— Discussed above with Mr Dale, 29/10/57.

His calculations were based on values as shown in red above:

area of 2 feeders = 300 cm²

dose-rate from b.p.: used value of 72

as a mean value for periods < 3 years

— see ref. that part of curve is

O-35/56 (X), p.12.

The value of 152 for Sr^{90} was used as the correct value for b.p. formed from fast n.f. fission of Pu^{239}.

(Hunter & Ballou data refers to ~~slow~~ fission)

Notes on Radiological Safety Regulations, Maralinga

in relation to Active Areas and Loose Activity

1. Active Areas

On the edge of the fall-out areas there are regions which according to the Regulations are Red Areas (i.e. regions in which there is some deposited active material) but where the activity is low level and finely dispersed and cannot constitute an inhalation, ingestion or injection hazard or alternatively where the active material is in the form of pellets. In the former case so long as the gamma radiation (or in the latter the pellet concentration) is below a specified level, there is no need for protective clothing to be worn by persons working within these regions.

Consequently there is no necessity to mark the boundary between such an area and the non-active approach to it.

2. Activity Levels

(a) Finely divided soluble fission products

In deriving the activity level referred to above it has been assumed (a) that Sr^{90} constitutes the limiting hazard (b) that the maximum period during which any one man will work in the area is 100 days (c) that each day the palms of both hands of a man so working become contaminated to the extent of 1% of the level of the ground contamination, area for area, and each day the man ingests all the contamination appearing on his hands (this is a criterion which has also been adopted by AERE Harwell) (d) that the active material is completely soluble (e) that the body retains 100% of that ingested (according to I.C.R.P. a factor of 0.25 should be introduced) and that the total quantity ingested shall not exceed 1/10 uC Sr^{90} which is 1/10 of the permissible body burden laid down by I.C.R.P.

The figure derived for gamma activity as an indication of a safe Sr^{90} level is 0.16 mr/hr. measured at 1 metre above ground level when the age of the fission products is 3 years and corresponds

with 22 uC/m^2 of which 15% is Sr^{90}. For fission products whose age is less than 3 years this figure should be modified according to the $t^{-1.2}$ law.

(b) Insoluble Material (pellets or finely divided)

Such pellets can be assumed to pass through the body within 24 hours of ingestion, and constitute a hazard only to the G.I. tract. The I.C.R.P. permissible burden within the G.I. tract is 160 uC. Consequently insoluble particles amounting in total activity to this quantity may be ingested daily.

The level derived above for finely divided soluble fission product activity corresponds to 22 uC/m^2 at 3 years after deposition. Hence in order to ingest 150 uC from ground similarly contaminated, but by insoluble pellets, it would be necessary to ingest daily all the activity covering an area of 7 square metres, which is impossible in practice. There is thus no hazard involved in working in an area in which the insoluble activity does not exceed 22 uC/m^2.

(c) Soluble Pellets

Again assuming 100% retention of Sr^{90} and a total of 1/10 uC ingested during a 100 day period, the daily permissible ingestion is 0.001 uC Sr^{90} which corresponds to 0.007 uC of fission products of age 3 years.

The permissible activity level for uncontrolled working in this case may reasonably be taken as 0.007 uC/m^2 of 3 year fission products on the assumption that no more pellets than those existing on 1 square metre will be ingested daily.

Where there is only partial solubility the activity level can be increased accordingly.

[redacted]

[redacted]

Health Center Maralinga

Staff. (Nov. 1957)

HQR: O. H. Turner.
Assistant HQR: P. Wood. *

Officer of special project. [redacted]

ARDU [redacted]

Clerk [redacted]

* AWRE: also small no in each trials
+ — T.S. Group

Also, in DC area:

Fowler, Jeffery, Orton. — services

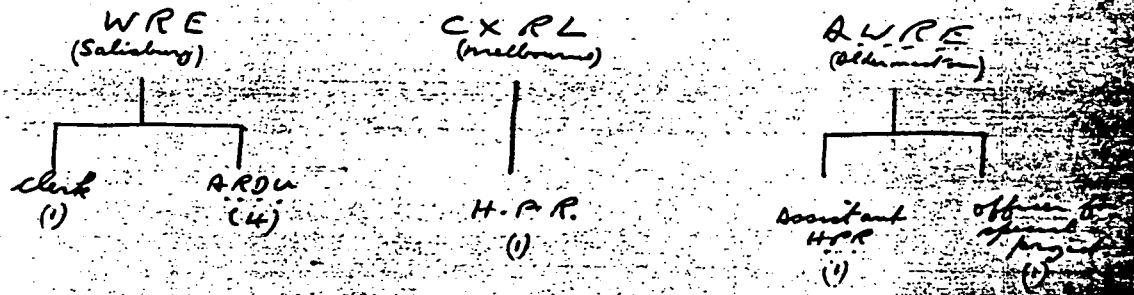
-from personal letter from [redacted]

950/2

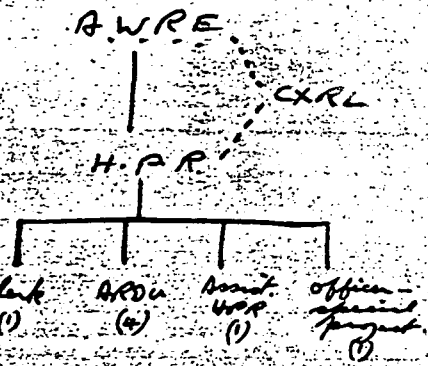
30/10/57

Organisation of Health Control, Maralinga (1957-1958)

(1) Administrative :-



(2) Scientific :-



– see also attached Memorandum (950/2 – 7.11/11/57)

Mara, 8/10/57

[redacted]

MINUTES OF THE 29TH MEETING OF THE
ATOMIC WEAPONS TESTS SAFETY COMMITTEE
HELD AT MARALINGA ON TUESDAY, 8TH OCTOBER, 1957

PRESENT:

[redacted] Chairman
Bureau of Meteorology
C.X.R.L.
Deputy Trials Director
Health Physics Adviser
Secretary to Committee

The meeting opened at 4.00 p.m. and was called to discuss health physics at Maralinga during the inter-trial period 1957-1958.

1. Responsibility for health physics at Maralinga during the inter-trial period

The question of responsibility for health physics at Maralinga had been confused for some time because of a misinterpretation of the original suggestions. There are three bodies whose interests are involved, A.W.R.E., A.W.T.S.C. and the Maralinga Board of Management. [redacted] clarified the issue by reference to correspondence and the minutes of the B. of M. All had agreed that the responsibility for radiological safety at Maralinga is fundamentally that of the U.K. both morally and financially. Australian interest in health physics matters at Maralinga is recognised, and is acknowledged in the terms of appointment of the Health Physics Representative. To facilitate operations during the inter-trial period it would be convenient to have in Australia a body which could supervise health physics matters and advise the H.P.R. It has been agreed that C.X.R.L. would act in this capacity, but clearly understood that the H.P.R. is directly responsible on scientific aspects to A.W.R.E. through the Maralinga Range Commander. He is required to report directly to A.W.R.E. through the Range Commander circulating copies to the A.W.T.S.C., B. of M. and C.X.R.L. So that supervision may be carried out officially copies of correspondence from A.W.R.E. to the H.P.R. should be made available to C.X.R.L.

.../2.

[redacted]

2. Requirement of Health Physics Representative

It was originally agreed by the three bodies that the H.P.R. would be an Australian; his appointment being conditional to a joint nomination by the B. of M. and A.W.T.S.C. with final endorsement by A.W.R.E. acting for M.O.S. [redacted] is the present occupant of the office of H.P.R. Since he is an officer of C.X.R.L. they remain administratively responsible for him but as the H.P.R. he has direct scientific responsibility to A.W.R.E. In addition to his general duties as laid down in the Radiological Safety Regulations for Maralinga a number of specific tasks to be performed during the current inter-trial period were outlined by [redacted] and concurred in by the A.W.T.S.C. He would be assured of adequate staff to fulfil the approved requirements and if at any time this programme was satisfactorily in hand could concurrently institute measurements of his own interest, provided they met with A.W.R.E. approval.

3. Distribution of R.D.U. personnel from Mt. Clarence

During the inter-trial period it would be advantageous to maintain these personnel within the employ of the bodies interested in Maralinga, principally to avoid retraining before the next trial series. It has been agreed by A.W.R.E. and B. of M. to allocate a number to the H.P.R.'s group to bring it to the appropriate strength, and to absorb the remainder into the staff at Salisbury for the period. If practicable a continuous exchange is to occur to give all members as wide experience as possible. An adequate period of handing-over will be necessary.

4. Film Badges

There will not be worn during the inter-trial period by personnel working in areas cleared by the H.P.R.

+ omitted in final form.

checked your minutes in final form 29/10/57

[redacted]

Atomic Weapons Tests Safety Committee

Approved Chairman

Appendix to Minutes of 25th [redacted]

Duties of the Health Physics Representati[redacted]

in the Inter-trials period following Operation Antler

Added to file 17/10/57

His general duties are as laid down in the Radiological Safety Regulations, Maralinga. In addition to those the following specific items of work are required of him.

1. Survey of Taranaki Balloon Site

A regular survey of beta and gamma activities in a circular area of ½ mile radius centred on the centre of the site at monthly intervals for the first three months following the departure of the RM Group at the end of the Antler Trial and then at three-monthly intervals so long as there is measurable activity.

2. Adjustment of Health Control Boundaries

To make such adjustments to the boundaries of the Health Control Region of the Forward Area South of an East-West line drawn through Marcoo as the changing radiation hazards perm[it]

3. Wash-out Effect of Rain on Ground Contamination

Measurements to determine wash-out effect of heavy rain. A small area, the contamination on which was known prior to Sunday, 13th October, 1957, and chosen on the basis of suitable contours in the region between Kite and Waru, to be surveyed immediately.

4. Air Sampling in Forward Area

Air sampling to be carried out in the Health Control regions of the Forward Area whenever work in these areas is in progress in order to relate ground contamination to concentration of activity in the air.

5. Water Sampling

Routine examination for radioactivity of samples of rain water, drinking water, and bore water, particularly those from Forward Area bores. This examination does not require radiochemical or other analysis except in the event of the drinking

/water

water on the Range having activity levels in excess of those quoted in the Radiological Safety Regulations, Maralinga, or in the event of raw water showing and maintaining an activity rise to several times the previous average.

6. Inspection of Health Aspects of Decontamination of Aircraft by RAF at Edinburgh

Periodic visits not more frequently than once a month to Edinburgh to check that the standards of health control do not fall below those laid down in the Radiological Safety Regulations, Maralinga, or subsequent RAF Instructions agreed by AWRE.

950/2.

[redacted]

The Director,
C.X.R.L.

Radiological Safety at Maralinga in the Next Inter-Trial Period.

In my note to you dated 9/9/57 it was stated in Section C that "Various aspects of interpretation and application of the existing regulations are to be the subject of a separate memorandum. These have been discussed previously with [redacted]. The regulations referred to are the Radiological Safety Regulations, Maralinga.

It has been agreed that the proposed memorandum be deferred pending discussions between [redacted] and yourself.

The necessity of discussing the Safety Regulations originally arose last March when one of the employees of the Department of Works became ill after working in an area known to be slightly active, and classified by [redacted] as a "red area". According to [redacted] the medical man at Maralinga considered that the illness may have been caused by exposure to radiation in spite of [redacted] evidence that the exposure received by the man from external radiation was of the order of two millireentgens and that the hazards of ingestion and inhalation of active material were negligible. (The illness, from which the man quickly recovered, seems in retrospect to have been due to his inhaling a considerable quantity of fine dust.)

This incident upset the Range Commander who requested that an investigation be made of the radiological safety of conditions at the working sites. A copy of his memorandum to the Department of Supply on this subject is attached. Apparently the doubt about the interpretation of the Safety Regulations, referred to in paragraph 2 of his memorandum, arose because the loose active material in the vicinity of the working areas was regarded as "loose contamination" and the permissible levels for loose contamination are much lower (by a factor of 3,000 for β-γ contaminants) than those for fixed contamination. In later discussions with [redacted] it was agreed that the low levels for loose contamination were not intended to apply to the forward (test) area but had been adopted to prevent spread of active material into the low-level counting laboratories. This should be re-affirmed and possibly a statement inserted in the Safety Regulations.

The Department of Supply requested that I go to Maralinga to investigate the position, which I did on 24th April.

On returning from Maralinga I sent two memoranda to [redacted]. The first dealt with radiological safety of the working areas and the second with the interpretation of the Safety Regulations. A copy of the second memorandum is attached.

At a short meeting with [redacted] on 13/5/57 the matter of interpreting the regulations was discussed. [redacted] agreed that:-

(a) the classification of areas was necessarily at the discretion of the Health Physics Representative on site ([redacted] has since agreed that it would be desirable to define the boundary of the Yellow Area in concise physical terms if this can be done adequately);

(b) the instructions on the interpretation of instruments be accepted as valid in the inter-trial period and possibly incorporated in the Safety Regulations as an appendix to Section 2.4.2;

(c) the views expressed in paragraphs 3 and 4 of the attached memorandum to [redacted] were correct.

[redacted] considered that film badges should be worn by all people on the range during inter-trial periods as well as trials periods. This is implied in Section 4 of the Safety Regulations. The films, worn for three months (?), would give evidence that no-one had been over-exposed to radiation. (These films are of course separate from those worn by people entering the yellow area.)

[redacted]

[redacted]

In summary, the matters requiring clarification are:-

(1) Classification of areas:

(a) the interpretation of the word "risk" in Section 3.2.2 of the Safety Regulations;

(b) a concise definition of the boundary of the Yellow Area to ensure that its position is correctly marked. (This should enable the boundary to be moved back, as radioactive decay proceeds, to the satisfaction of all concerned.)

(2) Interpretation of instrument readings:

(a) are the Instructions on the interpretation of instrument readings to apply to inter-trial periods? (A copy of these instructions is attached. There is no reason why they should not apply at all times.)

(b) what contamination levels are to be used in the forward area, as distinct from the base laboratories?

(3) The wearing of film badges in the inter-trial period.

Is it reasonable to expect <u>everyone</u> to wear films even though they may no no further north than Iwara? The work in processing and reading these films would be considerable. If each PM1 film is worn for several months (as has been suggested) it would tend to fog anyway. I feel that the existing arrangements for health control in the inter-trial period are such that nothing will be gained by the widespread use of film badges.

[redacted]

<u>Acting Assistant Director.</u>

<u>20/9/57.</u>

[redacted]

950/2

[redacted]

The Director,
C.X.R.L.

RADIOLOGICAL SAFETY AT MARALINGA IN THE NEXT INTER-TRIAL PERIOD

At a meeting attended by [redacted] and myself at Maralinga on 28/8/57 various aspects of the maintenance of radiological safety in inter-trial periods were discussed. Some of these require further clarification and it is suggested that you discuss them with [redacted] while at Maralinga. When decisions on these matters have been made, we shall have to send memoranda to the Health Physics Representative, the Range Commander, the Board of Management and the Safety Committee advising them of the proposed arrangements.

A. Responsibilities for Radiological Safety

(a) Arrangements as understood by A.W.R.E.:

(1) Radiological safety is at all times the responsibility of the U.K. Government.

(2) To assist in the maintenance of radiological safety a set of regulations (the Radiological Safety Regulations, Maralinga - referred to as RSRM/56(5)) has been agreed upon by the U.K. and Australian Governments.

(3) The enforcement of these Regulations is the responsibility, in inter-trial periods, of the Range Commander. (See RSRM, p.1 and p.27.)

(4) [redacted], an employee of our Laboratory, has been seconded to the Range on behalf of A.W.R.E. for the purpose of advising the Range Commander in matters relating to radiological safety (see RSRM, p.8 and p.27).

(b) Arrangement as understood by C.X.R.L. (and endorsed by [redacted], Secretary of the Board of Management - Atomic Weapons Tests):

(1), (2) and (3) stated under (a) above are agreed.

(4) We disagree. Our view is that -

(i) C.X.R.L. is the agent of the Australian Government (through the Atomic Weapons Tests Safety Committee?) acting on behalf of A.W.R.E. in maintaining radiological safety in inter-trial periods.

(ii) [redacted] is a member of our staff, is not seconded to anyone, and is under the direction of the Director, C.X.R.L.

(iii) This is worth considering: if (i) above is agreed, then the Health Physics Representative would be responsible to us as the Australian agent ~~of A.W.R.E.~~ whether he was on the staff of C.X.R.L. or not.

[redacted]

B. Methods of Reporting

The RSRM (see p.27) require that the Health Physics Representative shall make regular reports on conditions on the range to the Range Commander, who distributes copies to relevant people. These reports have been made monthly. [redacted] and [redacted] both commented that although the reports made had been satisfactory in their content, there had been considerable delay in their publication. (Now that a clerk has been provided to assist the Health Physics Representative, however, such delay should not occur in future.) [redacted] and [redacted] both felt that there should be a closer liaison between the Health Physics Representative and themselves during inter-trial periods, and that any unusual or important events relating to Health Physics should be reported to them as soon as practicable. This has not always been the case.

With regard to the routine monthly reports, A.W.R.E. and ourselves differ on how these should be issued and distributed. The U.K. view is that the reports made by the Health Physics Representative should be issued by him through the Range Commander, who then distributes copies to A.W.R.E. (as laid down on p.28 of the RSRM), to the Board of Management, to the Safety Committee and to our Laboratory. If it be accepted that whoever occupies the position of Health Physics Representative is responsible to this Laboratory as the Australian agent acting on behalf of A.W.R.E. in the inter-trials period (see A above) then it becomes a matter of agreement between you and A.W.R.E. how these reports shall be issued and distributed. It is desirable that we should at least see his report in draft before it is issued, and preferably issue it ourselves. This, however, will have to be agreed upon with A.W.R.E. and the Range Commander. In discussion it is necessary to bear in mind that the office of Health Physics Representative may not necessarily be occupied by a member of our staff.

[redacted] has usually prepared his reports in such a way as to keep the security classification low. This has meant that many of his detailed observations have not been published. [redacted] suggested that two reports could be issued each month - one of a general nature and one containing detailed physical results. If this plan be adopted, A.W.R.E. would require that the second be sent in draft direct to Aldermaston for vetting and publication as a classified report. We could suggest a distribution list but A.W.R.E. would have the final decision on it. In any case, [redacted] considers that the results of [redacted] work (which has impressed the U.K. people) could well be published as a consolidated report, but would have to be issued by A.W.R.E., Aldermaston.

C. Interpretation of Radiological Safety Regulations

Various aspects of interpretation and application of the existing regulations are to be the subject of a separate memorandum. These have been discussed previously with [redacted]

D. Continuity on Range

The attention of [redacted] and [redacted] was drawn to the fact that

[redacted]

the Health Physics Representative, as the only scientist to remain on the range after the Buffalo Trials had ceased, was frequently consulted by such people as engineers on matters having no relation to Health Physics. For example, he was called on to advise the engineers of the best site for Round Three of the next series of trials. The authorities who should have been consulted on such matters were not available. This is a matter which could well be taken up with the Board of Management.

E. Assistant Health Physics Representative

The misunderstanding which arose about the provision of this assistant has been resolved. Our original assessment of the position has been agreed upon as correct.

see memo 19/8/57

[redacted]

Acting Assistant Director.

9/9/57.

M^c Comas : 26/8/57 [redacted]

1. M^t/C. — 4 Vit L.R (Long Wheel Base)
+ 1 standby. (also — —)
— Have driven 19/8/57 800 —
to M^t C of V.T.

2. Sheep: well away from road — will have to collect. Transport for V.T. Use of 3 ton L.R
Old sheep rather than young. Some keep young for breeding, etc. Best to keep young. For [illegible] Lambing, May.

3. Rabbit traps supplied — check for ; check — skeletal

4. Strike for fuel — and trap : fuel Not wanted. Huts are. will collect from [illegible]

5. Future ? M^t Comas. Proposal — use to many — [illegible] stage —

6. Tents — adequate no ?
Plastic — bags } many to
containers }
drying area. no

~~[illegible]~~

V^t Mt proposed for V^t:

[redacted]

Visited for reference 6 — to 13/158

A-1/3

[redacted]

A

1. Trials: discussed at meeting of 28/2/57 O.H.T. [illegible] 27/10/57

✓ a). Activities of O.H.T. – forecasts?
(and ARDU from Buffalo 27/3)

✓ – is Ravencraft req'd? – basic Wpns. 278.

(b). Alice Road: – discussed at meeting 27/3/57

✓ i – meeting + Trials?
– arrangements arranging

ii – communications + Maint.

✓ iii – development of programme
O.H.T.'s visit. ✓

→ iv – particular items: – v. light effect

✓ – action by f.o.c. over camp *

– protective clothing: issued

✓ No (+ instruction) issued

✓ – ARDU: to report on local conditions during sorties? (Weather expenditure

✓ – ARDU: "Vet. Tech. – dispersal

✓ – skeletal remains

– samples sent

* protection clothing for V.T.

✓

Notes on meeting with [redacted] at
BL1 Conference Room, Tu[redacted]
Present: [redacted]

Object: discussion of details, Blue Book
plan (Battle J). to ensure all
points clear.

Refer to attached list headed "[redacted]" (A)

1(b)(ii) Signals (main) between Peter Beaver
(Mary)
& L. Davies and de Cure (Mr C)

Code: miles N or S of place
reading 1390 in m/s. The word
m/s omitted.

Radial
Ground
Timing

Measurements transmitted at
intervals of 1 hr (may be too frequent - to
Beaver obtains from T.P. enquire)
points & fill out & subsequently operate from centre
of f.o. outwards +10 miles.

Reference map: "World Beacon
Map 1955" for all purposes (Survey
aerial surveys can be consulted)
Contain strip maps were made
from this.

Task 3: 6+7
1(b)(iv) Skeletons of domestic, if available
Rabbit to be obtained, if poss { bones
Kangaroo - large leg bones. { bones
- bones can be broken if necessary
Sheep - no bones req'd, only skin
Containers: plastic bags of soil taken
tins (Mr Cowan) = 1 x 1 x 1.

skeletal remains
before Battle
Blue Book
soil sampling
before Battle

Herbage collect roots as well

[redacted]

Thyroid program:

I(R)(iv) (Cont.) Thermos. Co[redacted]
vii available.

To take old sheep rather than young.

General plan:

*(1). samples before RI (Shelter J-6) (4th 1st week)

(2) " from three stations in vicinity of fall-out. (after each RI except last one (3))

(3). all stations, previously sampled, after last burst: D3+3, +7, +9+14 — D3+14 considered most important.

*Most likely stations for (1) above:
Mt Weill, Mabel Ck., Jyoma, Allen [illegible]

Vehicles: 2 on ground missions
1 " (R) (1) Canada [illegible]
(2). Thyroid shot mission

To note: time slaughter, place collected

Method: difficult to catch sheep, often county, shot from rifles needed. Long [illegible] + Cave for rifles + 22 long rifle cartridges.

Communications: Long + Dodge

[redacted] 1/2

B [redacted]
11

(1) H.P. ----

BRDU (from Of. Buffalo) ✓
— poss use in i.t.p. (recent) ✓
— activities during strike ✓
Reverse sight, + clerk. — job? ✓
Activities during strike ✓
Report on activities during
strike — Asst. Lyon at Mar
Report July ✓
Mfg — roads, track & Mar — (Bat
excavating

(2) Pers [redacted] 4/37-3/D) 12/

to ag. 3.4 Jan. [illegible] retaining

Must state communication gates (Yard
etc.) in writing

[redacted]

28/8/57

[redacted]

R.R.D.U: 4 combined outputs of OH assistant also present

*Overtime: present R.D.U 8–6 daily + week ends, Sunday included :. need overtime (work from 8:30 am – 5 pm normal day + all day Saturday) often voluntary. Airborn members could raise problem w.r.t. overtime if [illegible] difficult :: not keen to keep together – dispersal necessary (Dept. Works → overtime → induced to stay). Could [illegible] o'time as see. Some Operations during Autumn O.H.T + R.D.U to form sub-group in R.M. Group (Chairman = RM 10) + 2 R.A.F. men. This to [illegible] official time wasting difficulties such as obtaining transport Work: crater survey delay in crater and R.[illegible] – induced cratering

Report: if "RM 10" accepted, O.H.T. could report through R.A.F.E. as part of RM group report (T-series)

*Inter-trial period: all (Aus.) R.R.D.U. for m' C. to move. Poss. then call 4 volunteers for 12 m. tour

Present R.R.D.U from Suffield retained until 30/11/57.

* make memo to B'd record sheet 20/9/57

Clerk: [redacted]

[redacted] [redacted]

Inter – Trial Period

(a). Admin. arrang[redacted]

i – past organisation

ii – present & future – for remt. i.t.p.
HE for. & CXRL [redacted] from AEC to us
assistant of O.H.T. ? –

iii – Communications.

– past

– future, through CXRL

and widening M. Report

– nature ? reprint – [illegible]
approved ? [illegible]

iv – i.t.p. activities: future requirements

① – Y.2. – definition ?

– delineation ?

– shifting ?

② – activities plan for HE
within & outside meeting ?

– continuity ?

③ – info., data on radiological
& radiological safety – [illegible]

④ M.S.R. charg. [illegible] Contr
limits 15 cpl : 10
see 13/5/57

⑤. Data on maps from Ops
– of aerial maps
– anything ? use i.t.p could
be made available for O.H.T.

⑥ O.H.T Reports on Ops – remarks
obtained. DJS has some

⑦. future m.t. classes ? (Comm)

* Col. Owens must be informed of this. (Ref M.S.R)
– ∴ O.H.T now on staff. Will inform when
definite.

C – 2/3

Notes on meeting with [redacted] : 28/9/57.

Meeting in [redacted] Office, 9.30 a.m. 28/9/57
Present: [redacted]

A. Butler

[redacted] + ARDU (at Mare): Confirmed general idea of forming sub-groups – see B – 3/2
ARDU + several UH → 8 operators, +
(ARDU + 2 RAFE) for carter, G2, survey

O.T.P. ORDILY system was reorganised after [redacted] interpretation: [redacted] is CXRL employee but Health Control at Mare is responsibility of Range Commander (see Ref, RSRM).
(Range = Bldg Manager) + [redacted] has been seconded to Mare range on behalf of A.W.R.E. who have responsibility for radiological safety (see RSRM).
This implies that O.H.C. at Mare is a function of CXRL but A.W.R.E. (ARDU) Monthly reports should be vised by H.P.R. Manager R.C. before copies to Bldg Manager & to CXRL who may then comment. Refusal of previous arrangements should stand (see RSRM)

UH concerned at (1) delay in reporting (2) tension between ORD + UH not sufficiently close. Lack of visits last March: not informed of UH for a long time.

[redacted] should stress that this [redacted] outside H.P. is unofficial & should refer people to proper channels.

Ref. our letter 9/57

[redacted]

C-3/3

Monthly Report: may be better to make report in three sections (1) general (2) scientific data (T-series?). The (1) report would go direct to A.W.R.E. for vetting & May would decide the distribution list. But H.S.R. could suggest list.

To present, report produced at Mar. & copies sent to A.W.R.E. (6) Bd. Manager (2?) & Members of Lefty C'ttee — 2 for C.X.R.L. included in the list.

May be desirable to publish all scientific data in a complete report from A.W.R.E. in a T- series

—·—

Assistant H.S.R.: discussed this & found that all concerned have no objection (Ref. minute Bd. Man. meeting) that Peter Wood be nominated (No. 2)

Biological Specimens: reports only required on natural specimen. U.K. have no bio. requirement in c.t.p.

Mr Clarke — future to be discussed in consultation with Lefty C'ttee. (Request a reply re [redacted])

H.S.R.M.: send letter covering points discussed, minutes, etc. 7 Y.2.

— to find in writing important matters to be attended to for next c.t.p. — will then be considered & arrangements made.

18/9/57: Mr Stevens wants memo. on this for discussion between [redacted] & himself. Prepared note 19-20/9/57, attached to file.

DJR/L.

95/2
908

[redacted]

19th August 57.

MEMORANDUM for :-

The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE. C.1.

Attention [redacted]

Health Physics at Maralinga during Inter-trials Period.
Your 6012/1/141 of 13/8/57.

Thank you for your above memorandum.

It is noted that in the decision of the Board of Management, Dr. Wheeler's communication was endorsed. There are several points in this communication to which I wish to refer.

In paragraphs 2 and 3 of [redacted] communication reference is made to an "Assistant Health Physics Officer" to be provided by A.W.R.E. to work under Commonwealth supervision. The fourth paragraph states that the U.K. Authorities "would then suggest that the officer so appointed should report to A.W.R.E. through the Range Commander and in parallel to the Chairman of the Board of Management and the Chairman of the Atomic Weapons Tests Safety Committee." From the context it would appear that the officer just referred to is the previously mentioned Assistant Health Physics Officer.

I understood that the arrangement which was previously made was that the Australian Health Physics Representative should be the senior officer and accordingly I believed that that officer would be responsible for the preparation of monthly reports. As you are aware there is in progress the transfer of Mr. O. H. Turner, the Australian Health Physics Representative now at Maralinga, to the staff of this Laboratory. Accordingly it is suggested that the monthly reports prepared by [redacted] should be forwarded through this Laboratory to the Range Commander, the Board of Management and the Safety Committee.

I would be glad of your clarification of the position. If the Board of Management concurs with my assessment it is proposed that I should advise Mr. Turner to forward his monthly reports to me, in draft, for examination, reproduction and circulation with the distribution that is indicated in your memorandum.

[redacted]

Director.

(AIR MAIL)

JFR/L

950 2

17th July 57.

MEMORANDUM for :-

Health Physics Representative,
MARALINGA, S.A.

Visit of [redacted] Secretary of the Atomic Weapons Tests Safety Committee and of the National Radiation Advisory Committee will be visiting Maralinga for a few days from Monday, 29/1/57.

[redacted] will get in touch with you after his arrival at Maralinga. He is interested in seeing the organisation and operation of Health Control in particular, and will doubtless want to discuss various aspects of Health Physics. You are, of course, free to discuss any relevant matters with him.

Director.

50/2

Telesmit to [redacted]
12.30 5/6/57.

Ravenscroft due Manduja
Thursday sixth. Regret unable replace
Anderson & Smedley. Letter following

---

original
dpo on
950/1.

Ravenscroft left Mara. on 29/8/57. = noon

COPY

SJS:ES

P.M.G. Stores Branch,
Lord Street,
EAST PERTH. W.A.

7th May, 1957.

Staff Clerk,
Research & Development Branch,
Department of Supply,
MARALINGA. S.A.

CLERK (£813-993) THIRD DIVISION, AUSTRALIAN HEALTH PHYSICS GROUP (TEMPORARY POSITION).

With reference to the above position as advertised in the Commonwealth Gazette No. 24, dated 2nd May, 1957, I would be pleased if you would forward to me a copy of the list of duties for the position, and advise the typing speed test to be taken, if any.

[redacted]
CLERK.

*P.1323
£813-993.
3rd Div.
+ 14 PC
(temp).

COPY

950/1

Health Physics Representative
MARALINGA S.A.

20 May 1957

Secretary,
Board of Management,
Atomic Weapons Tests
339 Swanston St,
MELBOURNE

CLERK, HEALTH PHYSICS GROUP, MARALINGA

Enclosed is a copy of a letter received on 11 May from a [redacted] of the P.M.G., PERTH. It was considered more appropriate to make a direct answer rather than forward the letter directly to you. However, the answer was delayed several days whilst I was at WOOMERA - subject of a forthcoming memorandum.

[redacted]

Copy to:
Director
CSIRL
University of MELBOURNE
CARLTON N3
VICTORIA

Mr Rush

[redacted]

TELEPHONE —

Australian Military Forces — Central Command

Please quote this Number when replying

Address Health Physics Representative
MARALINGA S.A.

Date 15 May 57

[redacted]
PMG Stores Branch
Lord Street,
EAST PERTH.

CLERK, HEALTH PHYSICS GROUP, MARALINGA

With reference to your letter of 7th May, the typing speed need only be about forty words per minute, but the main requirement is the presentation, neatness and accuracy.

The duties are

(a) Secretarial – looking after the main office, attending to phone calls and personal callers when the Health Physics Representative is absent on duty.

(b) Typing – various reports, letters, records, also the cutting of stencils and duplicating.

(c) Clerical – filing system. Issue of certain passes.

(d) Computing – compilation of several sets of data for the analysis of radioactive phenomena. Mathematics to Leaving Standard would be desirable but not essential.

[redacted]

Telecon.

For [redacted] from [redacted]

"Do not send militaria as stocks here sufficient"

[redacted] "Omit [illegible] 95/1

4.30 pm 14/3/57

Notes on meeting with [redacted] et al. 13/5/57

1. Maralinga Regulations : R.S.R.M./57/5)
   (a) Levels of contam:
   V. low level for bone contam: required to prevent interference + bone lab. p.8. "all areas" requires modification.
   — No instruction on interpretation of instruments (RL/H&S 20/9/56) may be added as appendix.

   (b) Classification of Areas: to be at discretion of H&SR on site. i.e. H&SR to interpret Regulations + decide "risk". Then to take appropriate action.

   (c) Film badges: all on range should wear film badges all time. One badge for 3-4 months. Liaise with Mines re enforcement.

2. Work in "active" areas.
   Desire to work in non-active areas only in ideal rather than practical. Safety of procedures to be determined on site by H&SR, who makes appropriate arrangements.

3. Health Physics: - All H&SO required for initial period to be at Mara. for this. To decide: how many. Recommend that there should be 2 H&SO at Mara during c.t.p. These H&SO will require training. Liaise with Melb. + at Mara. also (?)

A.R.D.U.

(a) Will not be attached to any U/T Groups, but will operate in two groups A & B:
Group A: based at Mt Clarence + operating in Straits on N/S Rd.
Group B: based in Melbourne + operating at 31 Latitude St.

(b) Two requirements: (1) Straits (see above)
(2) E.T.F.

(c) Proposed functions.
Group A: (15 men?) N/S Rd.
Ground survey: (1390).
Air sampling: ozonde night collection? biological specimens
- met. test. req'd for this
- see summary from Battle I.

Notes. (1) H.C. at Mare. will be operated by W.G. Major (Mc Dougall + U/T air force group
(2) A.R.D.U. has no commitment at Mare. or Luna.
(3) Ground survey, N/S Rd., safety clothing requirement, but will be consulted + aerial survey.

Modification:
Whole A.R.D.U., 13 men, to N/S Rd. Camp at Mt Clarence.
The men required for 31 Latitude St are independent being supplied from D.S.L. for period of trials.

(AIR MAIL)

JFR/L

950/2

23rd April 57.

MEMORANDUM for :-

[redacted],
A/Director-General of Health,
Department of Health,
C A N B E R R A, A.C.T.

[redacted] - Duty Visit to Maralinga

1. The Range Commander at Maralinga has requested, through the Department of Supply, that I should go to Maralinga to confer with him and with the Health Physics Representative [redacted]) on certain matters relating to health control on the range.

2. Arrangements have been made for me to travel to Adelaide on the night of Tuesday, 23/4/57, and to Maralinga on the day following. I propose leaving Maralinga on Friday, 26/4/57, and returning to Melbourne on Saturday, 27/4/57.

3. Owing to the occurrence of Easter and Anzac Day this week, these arrangements ensure that I shall be absent from the Laboratory for only two working days.

4. In my absence [redacted] will be acting as officer-in-charge of the Laboratory.

5. Your approval is sought for these arrangements.

Acting Director.

JFR/L

950 2 1st May 57.

MEMORANDUM for :-

[redacted]

The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE, C.1.

Attention [redacted]

Interpretation of Radiological Safety Regulations, Maralinga.

1. The Radiological Safety Regulations, Maralinga (section 3.2.2) do not specify precisely under what conditions an area shall be declared "Blue", "Red" or "Yellow" but imply this shall depend only on the nature and degree of radiation hazard. The degree of hazard at any place must necessarily be assessed by the Health Physics Representative on the spot using appropriate instruments and having regard to all local conditions and requirements.

2. In order that readings of radiation detectors may be related to the maximum permissible level of fixed contamination as laid down in the Regulations (section 2.4.2) a set of instructions entitled "Interpretation of Instrument (1021, 1027, 1257, 1295 and 1320) β/γ Count Readings" was issued by the United Kingdom Health Physics Group on 20/9/56. The values quoted in these instructions refer specifically to contamination which is firmly fixed on the surface of objects, including that on the skin of people who may be passed through Health Control as "clean" after the usual procedures for decontamination. The maximum permissible level of fixed contamination is 2×10^{-4} µc/sq. cm.

3. When loose contamination is considered the maximum permissible level is very much lower, namely 6×10^{-8} µc/sq. cm. It is probable that this extremely low level has been adopted not so much to protect personnel as to prevent spread of contamination into those laboratories at Maralinga where the level of activity must be kept very low in order not to interfere with radiometric work done there.

4. It is considered that the values given for the maximum permissible levels of activity for loose contamination cannot be used alone to decide whether a site in the forward area shall be declared Red or Yellow as other factors, such as the nature of the contaminating material and the conditions of work, must be taken into account. [redacted]

[redacted]

5. These matters will be discussed with [redacted], United Kingdom Health Physics Adviser, with a view to clarifying interpretation of the Regulations. If, as a result of this discussion, it is considered necessary to amend the Regulations you will be advised of the proposals.

Acting Director.

[redacted]

Original + three
[redacted]

JFR/L

950 2 1st May 57.

MEMORANDUM for :- [redacted]

The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE, C.1.

Attention [redacted]

Work in Maralinga Test Area - Safety of Personnel.

1. I refer to your memorandum 6012/1/141 of 15/4/57. Attached to this memorandum was a copy of one to you from the Range Commander, Maralinga.

2. In this memorandum, the Range Commander drew attention to certain apparent inconsistencies between the Radiological Safety Regulations (RSR4/56(5)) and a supplementary set of instructions issued by the United Kingdom Health Physics Group during Operation Buffalo. Further, the Range Commander asked:-

(a) that he be authorized to proceed with work on sites in the forward area; and

(b) that he be assured that no one was being exposed to radiation hazard at these sites.

3. Comments on the interpretation of the regulations referred to are made in the attached memorandum.

4. After discussion between [redacted] and [redacted] of your Department and [redacted] of this Laboratory it was decided that [redacted] should go to Maralinga to consult with the Health Physics Representative [redacted] on the points raised by the Range Commander and on any other matters relevant to Health Physics and Health Control on the Range.

5. [redacted] was at Maralinga from the 24th to 26th April. During this period he had fruitful discussions with the Range Commander and [redacted]. [redacted] arranged a tour of the forward area and he and [redacted] inspected the various work sites together.

6. As a result of this visit it is considered that:-

[redacted]

(a) Apart from manpower, the arrangements for Health Control both in the forward area and at base are entirely satisfactory. The various aspects of Health Control have been described in the routine reports issued by the Health Physics Representative. Those whose duties take them to the forward area at present cannot proceed beyond Iwara unless in possession of an entry permit issued by the Health Physics Representative. This permit is only issued after appropriate enquiries and instruction. It is considered that in view of the rigorous and adequate control exercised over people entering the forward area, the legitimate possession of such a permit should be sufficient authority for the people concerned to proceed to their work in this area. Once such a permit is issued the Range Commander could be absolved from responsibility for the health of the individual (insofar as this may be affected by radiation alone) if this course was considered desirable.

(b) The degree of hazard which exists at any place can be determined only by Health Physics officers using appropriate instruments. It is considered highly undesirable that work be done in areas which cannot be classified as non-active as defined in RSM1/56(5), section 3.2.1. Unfortunately, owing to the early changes made in the position of barriers defining Yellow Areas (of which change [redacted] was not aware before his visit to Maralinga) work has in fact been proceeding in active areas, for example, at Tadje and Cona. The movements of the Yellow boundary and the action taken for Health Control at Tadje and Cona have been described by [redacted] in his report for March 1957. [redacted] has classed these areas as Red Areas, but as his assessment of conditions indicated that the hazard is slight no special protective clothing has been recommended for people working in these areas. [redacted] supports this decision.

7. Owing to the proximity of the new sites to the Yellow Area it will shortly be necessary for work to be done in clearing lanes lying well inside the Yellow boundary. Mr. Turner has already arranged that this will be a "Yellow Entry" and that the men working in this area will wear full protective clothing, including respirators, and will pass through Health Control in the usual way.

8. It is strongly recommended that every effort be made when selecting future sites that these be in areas which can be classed as non-active in accordance with section 3.2.1 of the RSM1/56(5). It is in accordance with this recommendation that the Buna site has been provisionally moved further east from that originally chosen to prevent work being carried on inside the Yellow boundary near Breakaway.

Original + 3 Copies
[redacted] 1/5/57

[redacted]

[redacted]

[redacted]
Acting Director.

[redacted]

Mongite conc.

2½ T. O.

0-02% V_2O_5 to 12 T.

B-M.R. Law reserves right of rejection of this mine: T. this will [redacted] evident. U. presents no trouble

To be left here before Tues. p.m.

B.M.R. [redacted]

Returned after 29/4/15

NOTES ON VISIT TO MARALINGA

24th - 26th APRIL 1957

A. HEALTH CONTROL (see also routine reports)

1. Yellow Zone. The boundary was decided by the U.K. representatives ([redacted] before leaving. They took the southern boundary as the Kite-Nawa Road. [redacted] considers this is too far north. His survey indicates activity across Eagle, Gona and further south and south east (see report for March 1957). The Yellow boundary is well marked. Peace Officers, one in the tower at Eagle, and one in a land rover, keep the area under observation during daylight. The officer on duty in the tower is advised by telephone from Control at Iwara of what vehicles and people are entering the forward area and for what purpose. The movements of these people are followed from Eagle Tower and the patrolling Peace Officer investigates any movements not accounted for (see report for February 1957). No entry to the Yellow Zone is permitted unless all details of entry have been arranged with the Health Physics Representative beforehand. At present, [redacted] looks after Health Control caravan for Yellow entries as required. The Health Control organization is considered to be satisfactory in all respects.

2. Dust. The only bad dust storm occurred on 22/4/57 when Eagle Tower recorded visibility nil. Men working on sites are normally covered in dust and wear only shorts. Eating is done at Mina only but drinking on site is permitted. The surface activity is mainly confined to glass beads about 1 mm in diameter and about 0.5 μc activity. These beads are insoluble in water and H.Cl but at ground zero some surface material is soluble in water. Inhalation hazards are estimated from cascade impactors set up near positions of work as required. The principal active contaminants are the glass beads referred to which are insoluble, hard, relatively large and could not without crushing become air-borne. Some may be crushed during preparation of a site but it is probable that many escape by being pushed in. Those crushed will be well mixed with sand and if air-borne will be diluted by dust and air. At Tadje the area was bull-dozed and surface activity removed before work began. (It was the driver of this bull-dozer who later became ill but it is considered that this was due to dust received possibly days beforehand and had nothing to do with the presence of radioactive material).

3. Smear Test. A smear was taken on filter paper south of Gona. This is to be counted. On the ground a 1320 recorded 20 counts per second with the window open. Contamination appeared to be uniform. No beads were found. The material appears to be finely divided over the surface and is believed to have originated from round 3.

4. Administration. The Range Commander expressed himself as satisfied with arrangements for Health Control and its administration.

B. REQUIREMENTS FOR AUSTRALIAN R.D.U. AT OPERATION ANTLER

1. The R.D.U. should assist with a survey of crater areas shortly after burst of one weapon and certainly before the firing of the next. The area could be pegged out beforehand using suitable stakes. The results obtained would be of considerable use to re-entrants and would be of value in estimating decay rates. These surveys could be made by three parties of two surveyors each approaching ground zero from three different directions and walking across the crater. The results could be related by radio using a special wavelength, if necessary. Crystals are said to be available enabling a change of wavelength to be made. Each pair of surveyors would be equipped with a 1320 [illegible] and a walkie-talkie radio.

2. [illegible] should be obtained, if possible, on the chemical nature of the [illegible] material.

3. North-South Road - Use of Auster Aircraft. A letter on this subject has been received from Mr. Turner. It is suggested that this aircraft would be of value not only for making surveys after a burst, but would be useful for sorties of work previously done using a Varsity which in many cases is uneconomical. It is suggested also that:-

(a) Four members of the R.D.U. with two land rovers should be stationed at Mabel Creek and work in association with the survey aircraft and operate at night when required.

(b) Sticky papers can be set by station people. Advice can be sent by radio when these papers should be exposed. It was found at Buffalo that if left for more than a few hours sticky papers deteriorated rapidly in sun or rain. It is reported that people living on the stations along the north-south road picked up broadcasts between patrolling vehicles and Emu during operation Buffalo and were fully aware of all that went on. The R.D.U. should make reports on any sorties they make. For example, the occurrence of rain, the position of water storages, etc.

4. It is recommended that no members of the R.D.U. should be called on to operate the caravans at Health Control as this is relatively unskilled work.

C. GENERAL

1. Possible Extension of Activities. Information should be obtained in the field of radio-biology and radio-chemistry during the inter-trial period. A considerable amount of information on these subjects is being lost through lack of suitable staff.

N.B.

2. Continuity. There has been little continuity at the Range in that people in charge of activities are changed with very little overlap and newcomers to the Range know neither the Range itself nor the previous histroy. As a consequence those with previous experience, for example the Health Physics Representative, are called on to give information and advice on a wide range of subjects and this tends to interfere with their normal work. If possible, some liaison should be arranged between incoming and outgoing staff in order that a more satisfactory hand-over may be arranged.

[redacted]

No distribution

[redacted]
TELEPHONE FB 0261
TELEGRAMS:
"SUPDEP." MELBOURNE.
POSTAL ADDRESS: BOX 2288 U.
G.P.O., MELBOURNE.

COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF SUPPLY

In Reply Quote:-

6012/1/141.

339 SWANSTON STREET.
MELBOURNE. C.1.

15th April, 1957.

Acting Director,
Commonwealth X-Ray and Radium Laboratory,
Surry Place,
MELBOURNE.

(Attention : [redacted]

WORKS IN MARALINGA TEST AREA - SAFETY OF PERSONNEL

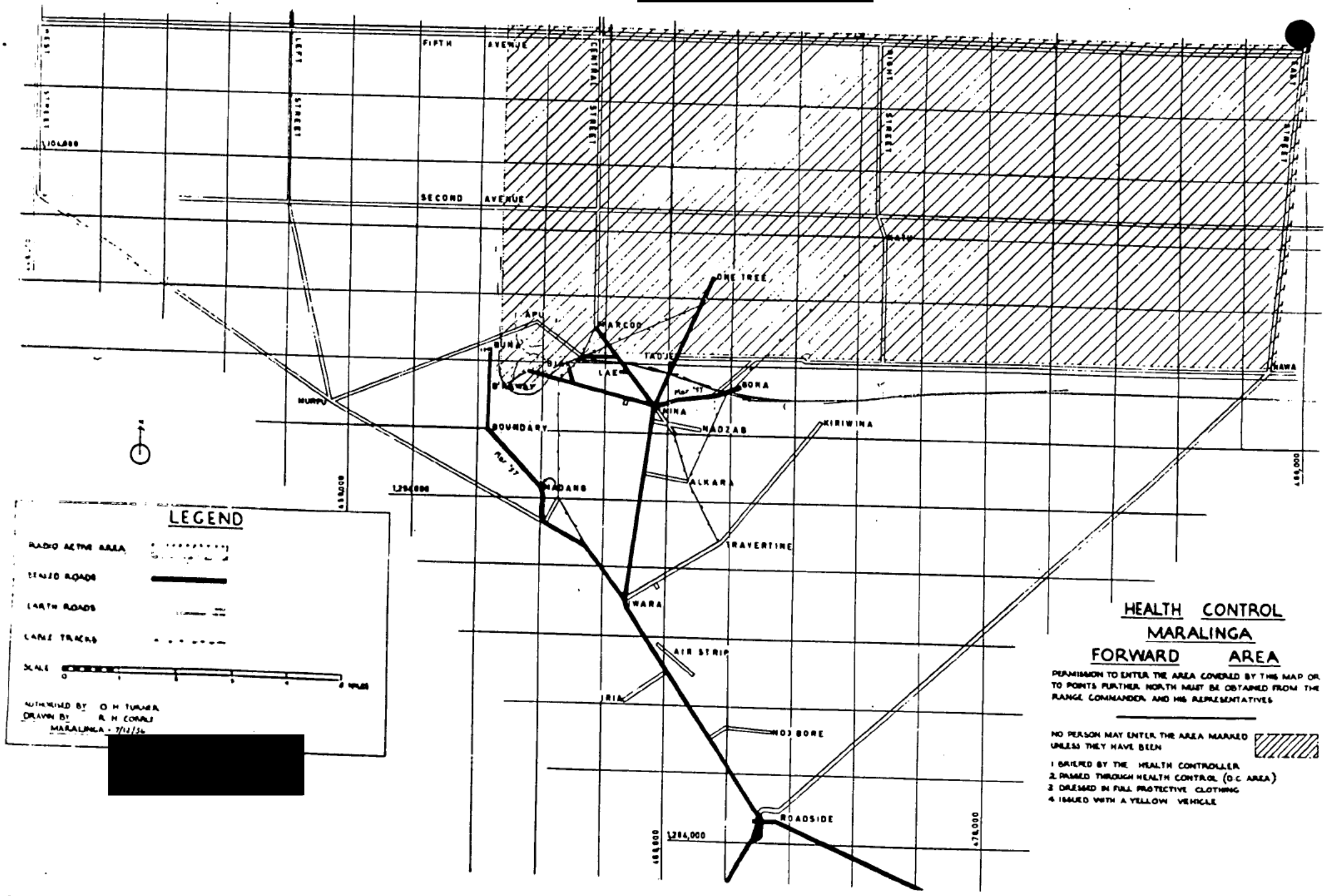
Attached is a copy of the communication from Colonel Durance which [redacted] and [redacted] discussed with you last Friday.

I have asked [redacted] to reserve you a seat in the Dove aircraft leaving West Beach at 8 a.m. on Wednesday, 24th April, and also to arrange your accommodation for a few days at Maralinga. I will confirm these arrangements as soon as possible.

[redacted]

[redacted]

[redacted]



[redacted]

HEALTH CONTROL
MARALINGA
FORWARD AREA

PERMISSION TO ENTER THE AREA COVERED BY THIS MAP OR TO POINTS FURTHER NORTH MUST BE OBTAINED FROM THE RANGE COMMANDER AND HIS REPRESENTATIVES

NO PERSON MAY ENTER THE AREA MARKED UNLESS THEY HAVE BEEN

1. BRIEFED BY THE HEALTH CONTROLLER
2. PASSED THROUGH HEALTH CONTROL (D.C. AREA)
3. DRESSED IN FULL PROTECTIVE CLOTHING
4. ISSUED WITH A YELLOW VEHICLE

[redacted]

Note on phone call from [redacted] of 9.30.

1. Some trouble having been caused by [redacted] worried about possibility of violence to strike material.
2. Regret [redacted] from Unit Govt. & us that, if work to be undertaken in for'd areas the level of activity is insufficient to cause any trouble (esp. fillers etc)
3. Brucano on range ill: local doctor thinks may be due nerve extreme (but H.T. certain it is not)* Records show extreme to date was 2 mr.
4. Drew attention (yes) to need to clarify + reinforcement for Crosby & Anderson.

Note on phone call from H.T. 8.2.57.

1. Saying re. withdrawal - see [redacted]
2. Col. Brucano came on line: talked on subject 2. above: was unable to understand why O was going to ground to inspect it. Talked it over with [redacted] who will see at first opportunity.

6 Apr 57

Secretary
Dept of Supply

Head of Staff
UKMOSS (A)

WORKS IN TEST AREA - SAFETY OF PERSONNEL

1. Radiological Safety Regulations Maralinga lays down the conditions under which an area is declared "Radio-active-Yellow". This area is shown on the attached map as shaded.

3.2.2 (e)

2. Technical instructions left by the Group Leader of the Health Physics Group give a different interpretation to those quoted in the Regulations.

See attached Lett. 20/9/56 from 9.2.2

3. Outlined in red pencil is the southern boundary of what well could be termed "yellow" or "Red" if related to the Regulations, but non-active if related to the instructions given by the Health Physics Adviser, and mentioned in para (2) above.

4. Work in the Test Area, shown as GONA and TADGE has been underway for some time, and recently a workman was admitted to Hospital, with verious vomiting of bright frothy blood.

5. Blood counts from Adelaide disproved the latter, and the man has recovered and is back at work.

6. This incident has worried me, although I have been assured, that the area is safe for men to work in. I consider that if the work at these two points is to continue, then a decision must be made to verify or otherwise, the interpretation of the Safety Regulations. If the United Kingdom Scientific instructions are correct, then the Yellow area as shown, is correct and men may work in safety just South of it. However, if the Safety Regulations are correct, these men should be in protective clothing, which would make their construction task nearly impossible.

7. In the interests of health and safety to Service-men and workmen in this "no-man's land" could arrangements be made immediately to investigate the degree of radio-activity in areas where work is required, with a view to giving me:-

(a) Authority to proceed with such work.

(b) The certain knowledge that no personnel are being exposed to a radio-active hazard.

(sgd) [redacted]

[redacted]
Colonel
Range Commander

JFR:JB

950 2 27th February 57

MEMORANDUM for:-

The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE. C.1.

Attention: [redacted]

Health Control - Maralinga

Inter-Trial Period

Request for Clerk-Typist

In his routine reports and in correspondence with this Laboratory, the Health Physics Representative at Maralinga ([redacted]) has drawn attention to the necessity for a clerk-typist to be permanently attached to his office.

It is clear from [redacted] communications that the amount of work to be done in the field of Health Physics is considerable and is not likely to become less. His most pressing need has been for a full-time clerical assistant to free him for other duties of a more specialized nature. At a meeting with [redacted] of this Laboratory on 10/10/56 the Range Commander was advised that adequate clerical assistance for the Health Physics Representative would be essential in the inter-trial period, and at the time he considered that there would be no difficulty about providing this. In fact, there seems to have been considerable difficulty in this respect and consequently [redacted] addressed a memorandum to you on this subject (Reference his 57/1 of 3/1/57) and also mentioned the matter in his report for December-January (Section 3).

It is considered essential that an appointment for this position be made as soon as possible. It would be an advantage if the person appointed could also assist [redacted] with certain calculations pertaining to the records kept in the Health Physics Office. Ideally, the appointee would have reached Leaving standard in

either Mathematics or Physics.

Acting Director.

JFB/L.

950 2 [redacted] 6th March 57.

MEMORANDUM for :-

The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE, C.1.

Attention [redacted]

HEALTH CONTROL - MARALINGA
INTER-TRIAL PERIOD

It is desired to draw your attention to certain matters on the above subject. These relate for the most part to the provision of adequate staff for the Health Physics Organisation at Maralinga.

The requirements for the control of radiological safety at Maralinga in the inter-trial period were set out in our memorandum 950/2 of 10/1/57. The reports furnished at regular intervals by the Health Physics Representative (at present [redacted] of the Australian Atomic Energy Commission) have indicated the manner in which these requirements are being met. In his routine reports and in correspondence with this Laboratory [redacted] has drawn attention to certain inadequacies in the present [redacted] and also to some future requirements.

You will recall that the Australian Health Physics Organisation at Maralinga during Operation Buffalo consisted of a Health Physics Team of six men, of which [redacted] of this Laboratory was the Leader, and an Australian Radiation Detection Unit (A.R.D.U.) of 21 men, of which [redacted] was (and, as far as we are aware, still is) the officer in charge. During the inter-trial period the Health Physics Organisation has been in the charge of Mr. Turner assisted by five members of the A.R.D.U. These men were selected from members of the A.R.D.U. who volunteered to remain at Maralinga for the inter-trial period, the selection being made by Major Thompson before leaving Maralinga.

[redacted] was originally asked to remain as Health Physics Representative until the end of March this year. It is now necessary therefore to select a replacement for [redacted] from the remaining members of the Health Physics Team. It is possible that [redacted] may

[redacted]

be willing to remain for an extended term if necessary, but this would, of course, be subject to agreement with him and with the Australian Atomic Energy Commission. On the other hand, it is desirable that other members of the Health Physics Team also obtain the valuable experience available to them in the office of the Health Physics Representative. In any case [redacted] successor should be with him at Maralinga for at least three weeks before [redacted] leaves. It may also be desirable for [redacted] to be there for about a week in this hand-over period.

When the plans for the inter-trial period were first made it was intended that they should be reviewed from time to time and modified as experience showed this was necessary. Some consideration should be given at this stage to the desirability of having two members of the Health Physics Team working together at Maralinga in the inter-trial period. This was in fact suggested last November by [redacted] of your Department and it was decided that experience would show whether this was really necessary.

[redacted] formed that the members of the A.R.D.U. available to him require a good deal of supervision, as their educational background in Mathematics and Physics is for the most part inadequate. (It was originally recommended that the men selected for the A.R.D.U. should have reached at least Leaving standard in Mathematics or Physics. This requirement was not satisfied by the majority.)

Of the members of the A.R.D.U. at Maralinga, one, [redacted] wished to be relieved of his duties so that he could return to his unit in [redacted] left Maralinga on 25/2/57. Mr. Turner had no objection to [redacted] but he will require a replacement. Another member, [redacted] will be on leave for about two months from April. [redacted] has stated that he will need a replacement for him and has suggested that this replacement should stay on for the remainder of the inter-trial period after [redacted] returns. As the volume of work is almost certain to increase as Operation Sapphire approaches, this suggestion is supported. The probable necessity of increasing the staff at this time was mentioned in our memorandum 95/2 of 10/1/57.

The foregoing paragraphs have dealt with changes of staff and this raises a question of the procedure to be adopted. It is felt that in matters concerning the A.R.D.U. Major Thompson must be consulted. It is suggested that Mr. Richardson should consult with officers of your Department on this matter as soon as possible. It is further suggested that such consultation should be extended to include the whole subject of the future recruitment and operation of the Australian Health Physics Organisation at Maralinga with a view to planning for Operation Sapphire. Much useful experience was gained at Operation Buffalo in the training, organisation and operation of the Health Physics Team and Radiation Detection Unit and it is believed that considerable improvements

[redacted]

[redacted]

could be made. Future arrangements, however, depend primarily upon decisions yet to be made about allocation of responsibilities, not only in the Australian Health Physics Organisation itself but also between this organisation and the U.K. Health Physics Group.

At the conclusion of Operation Buffalo, [redacted] and [redacted] had a meeting with [redacted] at this Laboratory on 13/11/57 and both expressed useful and definite ideas on future requirements. It is recommended that at a relevant stage both [redacted] and [redacted] should be asked to give their views on the training, organisation and operation of the future Australian Health Physics Organisation. This could best be done at a meeting with officers of your Department which [redacted] could attend.

Another matter requiring attention is the possible need for a Scientific Liaison Officer at Maralinga. [redacted] has reported that, as the only scientist at Maralinga, he is frequently consulted on matters having no relation to Health Control or Health Physics. This Laboratory feels that the responsibility for giving decisions on diverse matters which are outside the terms of reference already agreed on should not be placed on the Health Physics Representative. Accordingly it is suggested that your Department give consideration to the appointment of an officer to assist other groups at Maralinga with their problems.

[redacted]

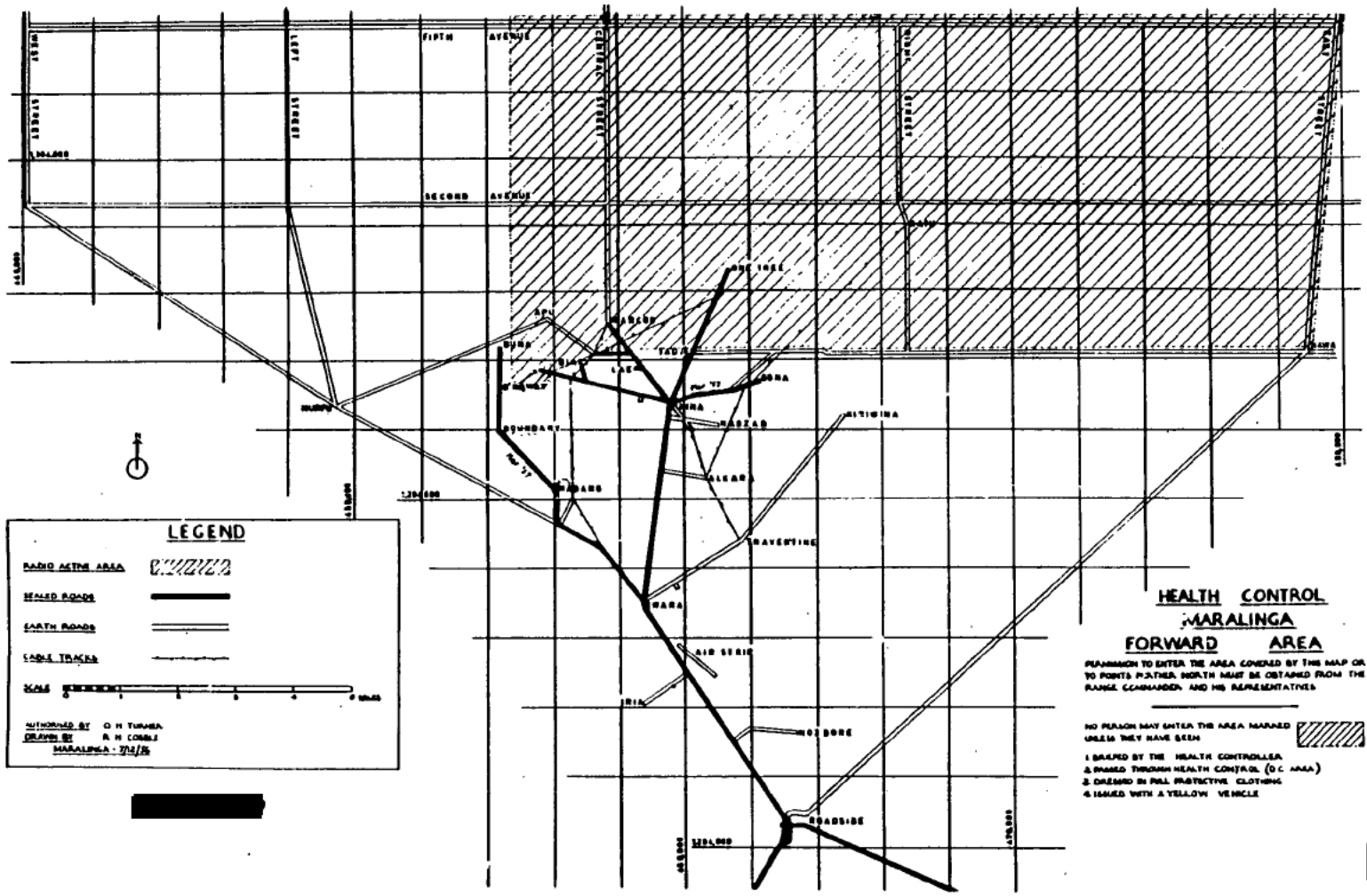
Acting Director.

Copies to -

[redacted]
A.A.E.E.,
Maralinga,
Via Watson, S.A.

[redacted]
School of Infantry,
Seymour, Vic.

[redacted]



HEALTH CONTROL
MARALINGA
FORWARD AREA

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2. PASSED THROUGH HEALTH CONTROL (D.C. AREA)
3. DRESSED IN FULL PROTECTIVE CLOTHING
4. ISSUED WITH A YELLOW VEHICLE

[redacted]

[redacted]

23/1/57

JFV/L.

950 2 10th January 57.

MEMORANDUM for :-

[redacted]

The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE. C.1.

HEALTH CENTRE, MARALINGA

ARRANGEMENTS DURING INTER-TRIAL PERIOD

Section 14.5 of the Radiological Safety Regulations, Maralinga, of March 1956, states that -

> "The Health Physics Representative during inter-trial periods will advise and assist the Range Commandant in the implementation and interpretation of these and other relevant Regulations and Instructions, and advise him on all matters of radiological safety. He may seek the advice of DAHSR where necessary and should render regular reports on the conditions on the Range to the Range Commandant, who should forward six copies of the reports to DAHSR through the usual channels. He may issue, in inter-trial periods, special instructions on behalf of the Range Commandant."

It has been arranged that the Health Physics Representative will make a report each month covering the activities of the previous month.

Inter-trial Period

The inter-trial period began at Maralinga on 8/11/56, with the departure of the U.K. Health Physics Adviser, [redacted] and responsibility for the Radiological Safety of the Range was assumed by the Australian Health Physics Representative from that date.

Staff

The present Health Physics Representative at Maralinga is [redacted] who will occupy the office until the end of March 1957. To assist Mr. [redacted] five members of the A.R.D.U. have been retained at Maralinga for the inter-trial period. These men, selected from volunteers, are as follows:-

[redacted]

Second Lieutenant [redacted]
Sergeant
Sergeant
Craftsman
Craftsman

[redacted] is the Officer-in-Charge of the Group and it is intended that should [redacted] be temporarily absent from Maralinga [redacted] shall act as Health Physics Representative in his place.

The various routine duties pertaining to Health Physics during the inter-trial period have been divided between these men with the exception of Craftsman Stirling, who has been assigned to the Nuclear Instruments Officer ([redacted]) to act as his assistant.

It is understood that the members of this Group will be stationed at Maralinga for at least the inter-trial period of approximately ten months. These men could later be of value as instructors should the need arise.

Experience alone will show whether the present staff will be adequate to cope with the work likely to be required during the inter-trial period, but in any case it will have to be augmented for the "build-up" period before the next trials.

Requirements of Health Physics in the Inter-trial Period

The requirements of Health Physics in the inter-trial period were discussed with U.K. Representatives at Maralinga on several occasions during Operation Buffalo and reference should be made to the minutes of a meeting held there on 8/10/56.

The commitments of the Health Physics Representative, specified by the A.R.D.U., have been classified for convenience under the headings of Health Physics, Radiation Measurements, and Decontamination. The arrangements currently in operation are indicated below.

HEALTH PHYSICS

The requirements are as follows:-

(i) marking of limits of Yellow Zones in forward areas;

(ii) control of movement of men wishing to enter any of the forward areas;

(iii) control of movement of radioactive sources to ensure that they are used safely and that none are mislaid or used for unauthorized purposes;

(iv) operation of the film-badge service on a reduced scale.

At the conclusion of Operation Buffalo a survey was made by the A.R.D.U. of all exclusion areas. After this survey had been completed the

forward areas were barricaded and marked as necessary. Elen Road, which was closed below 25th Avenue after Round I, is to remain closed.

It was originally intended that the Health Control Centre for men entering the forward area should be established at Elen, but it has been found more practical to establish this Centre at the D.C. area instead. The present procedure is that anyone wishing to enter a Yellow Zone must first obtain a "work permit" from the Health Physics Representative and take it to the Health Control Centre. At the Health Control Centre entrants are issued with the necessary protective clothing, dosimeters, and film-badges. Respirators are supplied when necessary. The entrant then proceeds to the forward area in a Yellow vehicle by way of the "dirty" track. Return from the Yellow Zone to Health Control is made by the same route, the entrants being cleared through Health Control before returning to Marallinga Village. Men wishing to enter a Pink Zone, or a Clean Zone in a forward area, must first apply to the Health Physics Representative for a permit to enter and may be directed to call at the Health Control Centre on the way. Such entrants are signed in and out of Health Control as they pass through. Unauthorised entry to forward areas is prohibited and is prevented by a road barrier at Bunbey (two miles south of Roadside) which is attended by a Fence Officer.

The movement of radioactive sources is restricted. Such sources cannot be removed from the store (X.A.9) without a permit from the Health Physics Representative. A check is kept on these sources to ensure that none is mislaid. Unauthorised use is prohibited.

Film-badges are issued to men entering the forward areas or handling radioactive sources, but the general issue of film-badges to everyone at Marallinga irrespective of their occupation has ceased. Films are to be processed monthly and the usual records kept.

RADIATION MEASUREMENTS

The following work will be carried on during the inter-trial periods-

(a) long-term decay of weapon debris;

(b) occasional crater surveys;

(c) routine sampling of drinking water, raw water, rain water and air;

(d) routine sampling of leaves, Nos. 3, 6, 9, 14;

(e) surveys in the forward areas over weapon debris, following persistent heavy rain, the results to be correlated with meteorological readings from a station in the forward area;

(f) measurement of the change with time of the ratio of the dose-rates due to the beta and gamma radiations;

(g) collection and observation of biological peculiarities.

[redacted]

The long-term decay of weapon debris is being measured at each of the following sites:-

(i) 150 yards North-East of the corner of Second Avenue and Centre Street;

(ii) 50 yards South-East of Apa tower.

The photographic records of these measurements are being sent direct to U.K.A.E.R.E. Aldermaston, England, as they become available.

Routine sampling of air and water is being carried on. The effluents from Moralinga are not being sampled during the inter-trial period.

Such other radiation measurements and surveys as may be necessary will be made from time to time.

DECONTAMINATION

The DI area is being operated as a check point for Health Control, as noted above. Provision has also been made in the DI area for the maintenance of the yellow vehicles and for such decontamination work as may be necessary during the inter-trial period. The laundry is being operated as occasion requires to deal with contaminated protective clothing.

[redacted]

Acting Director.

Copies to:-

Department of Supply (2)

Range Commandant, Moralinga (1)

Health Physics Representative, Moralinga (1)

[redacted] School of Infantry, Singapore (1)

Note on Memo of 10/1/57

A draft of the memo was sent to [redacted] for his comment. He returned the draft with the following annotations.

1. Responsibility for the range was assumed from 8/10/56 but land was leased from 30/10/56, for the former area.

2. Referring to sampling of water. "No 2 bore (previously listed in draft) is really a soak & has run dry. No 3 will be required for Depot. water." "2" was altered to "3" in final memo.

Note - Consider classification to Eight

Reference 57/1

3/1/57

Memorandum for :-
The Secretary
Department of Supply
339 Swanston St.,
Melbourne C.1.

REQUEST FOR CLERK - TYPIST

The Australian Health Physics Group at Maralinga has a definite need for a full-time clerk-typist. The over-taxed resources of the Orderly Room are insufficient to cope with the work required. Most of the typing has been done by a member of the group, [redacted], who is already fully occupied with his other duties. Further, it is not practical to utilise the Orderly Room for clerical duties specifically related to health physics problems.

The duties of a clerical assistant would be to:-

(1) Remain in the office during working hours to answer telephone and personal enquiries i.e. secretarial duties. This would permit the Health Physics Representative a greater freedom to inspect laboratories, the forward area etc. without causing inconvenience to customers. An appointment book would be kept.

(2) Typing, roneoing and filing.

(3) The maintenance of certain records.

It would be greatly appreciated if an appointment for this position could be made as soon as possible.

[redacted]
Health Physics Representative
Maralinga
3 Jan 57

Distribution
Director of CXBL Melbourne.
Range Commander, Maralinga.

DJS/L

950 2 3rd January 57.

[redacted],
Department of Supply,
339 Swanston Street,
MELBOURNE, C.1.

Dear [redacted],

Survey of Vehicle for Radioactivity

At your request a radiation survey was made at the Laboratory on a Landrover, registration number SA.499970 and engine number 865037. No radioactive material was detected during the survey and it is considered that this vehicle does not present a radiological hazard of any kind.

Yours sincerely,

Acting Director.

[redacted]

JFR:HO'C.

950 2

17th December 56.

MEMORANDUM for:-

The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE, C.1.

Survey of Vehicle for Radioactivity.

At the request of [redacted] of your Department, [redacted] of this Laboratory went with him to the R.A.A.F. Station at Laverton to inspect a Landrover at present in the possession of Pilot Officer [redacted]. The Landrover was identified by its registration number, C59900 (now obsolete), its engine number, 864678 and its chassis number, R.8664773. There was reason to believe that this vehicle may have been contaminated with radioactive material when [redacted] acquired it.

A survey was made for the presence of radioactive material by means of a Philips beta-gamma survey meter (type PW4010) supplemented by a more sensitive beta-gamma survey meter of Harwell design (type 1021). Particular attention was paid to those parts of the vehicle which were considered most likely to carry radioactive material, for example, the canvas hood and the oily parts of the engine and chassis.

No radioactive material was detected during the survey and it is considered that this vehicle does not present a radiological hazard of any kind.

A copy of this memorandum has been sent to [redacted] for his information.

[redacted];

Copy for your information:

[redacted],
Acting Director.

3.44/2/7
6012/1/171

The Director,
Department of Health,
CANBERRA. A.C.T.

CONTINENTAL RADIOLOGICAL MEASUREMENTS

For the past year, the Commonwealth X-Ray and Radium Laboratories of your Department in Melbourne, have operated Radiological Counting Equipment for the purpose of assessing the intensity of radioactivity of samples of air, dust, and water taken from points widely distributed over the Commonwealth, before and after atomic weapon trials.

As co-ordinating Department during the last two series of atomic trials, at Monte Bello and at Maralinga, my Department has maintained and distributed the sampling and allied equipment for operation by certain Meteorological Stations throughout the Commonwealth.

This function is now being transferred by agreement to the Australian Atomic Energy Commission. It has been agreed that such a function is appropriate to that Commission in that it enables a continuous survey to be maintained on the radiological background level existing on the continent, together with variations in that level due to natural or man made causes, for example as a by product of atomic reactors, or from atomic weapons tests.

The assessment of such radioactivity insofar as it affects the health of the community is another matter, and one which it is felt, rightly comes within the purview of your Department.

To carry out this function will involve your Department in a continuation of the present work now being done at 31 Latrobe Street, Melbourne. This is at present reducing in volume as the atomic weapons tests recede, but it is almost certain that it will again increase as the next series of atomic weapons trials approaches. As far as is known, the work will be identical in type with that done to date using the existing equipment.

Health Physics Personnel →

An additional function which again appears to be appropriate to your Department concerns the establishment and maintenance of a "permanent" Australian Health Physics organisation at Maralinga, for use both between trials and during trials. For the atomic weapon trials just completed, the Australian Health Physics Team, comprising 6 officers to supplement the U.K. group, was established. The personnel of this team was drawn from

[redacted]

2...../

Departments of Army, Navy, Air, Supply, Health and the Australian Atomic Energy Commission, with Mr. J.F. Richardson of your Department as Senior Australian Health Physicist. This team was backed by an Australian Radiation Detection Unit consisting of 22 men drawn from the Australian Services.

For the present inter-trial period, a reduced Health Physics Organisation is operating at Maralinga and comprises one Health Physics Officer, [redacted] on loan from the Australian Energy Commission, reporting directly to the Commonwealth X-Ray and Radium Laboratory together with a nucleus A.R.D.U. of 3 men and one instrument mechanic.

The functions of this group are primarily :-

(a) Measurements on behalf of U.K. of long term decay of weapon debris etc.

(b) Routine Health Physics cover for personnel at Maralinga during the inter-trial period. (During trials it will be supplemented by additional personnel both from U.K. and Australia and it is anticipated that it will return to its original strength.))

At present the personnel at Maralinga comprise mainly range maintenance staff but a large construction force will arrive shortly and this may approach a total of 750 men during the engineering and logistic build up for the next trials series. Health control is vitally essential in such an area because of the existence of radioactive weapon debris etc. from the previous trials.

All necessary equipment and facilities including laboratories will be available at Maralinga.

Should your Department accept the commitment of providing a Health Physics Service at Maralinga, the A.A.E.C. is prepared to assist by releasing [redacted] for transfer to your Department. [redacted] is held in high esteem by the A.A.E.C. but they consider that his work and interests have taken him some distance from those for which his position was originally created. [redacted] is not aware of these proposals).

With reference to the members of the Health Physics Team at Maralinga for future trials, it is possible that new personnel will be recruited from the Services from time to time retaining [redacted] as Senior Australian Health Physicist.

Accordingly it is likely that your Department will be called upon to provide a short instructional course similar to that arranged during 1956.

I would appreciate your views on these proposals.

[redacted])
S e c r e t a r y.

Rec'd from [redacted] 4/12/56

[redacted]

JFR:HO'C.

950/2 950/3 26th November 56.

MEMORANDUM for:-

Health Physics Representative,
Maralinga,
Via Watson,
SOUTH AUSTRALIA.

Health Control, Maralinga
(Inter Trial Period)

At a meeting held on 14/11/56, at the Department of Supply, Melbourne, procedures to be observed in communications relating to health control at Maralinga were discussed. It is desirable that the necessary procedures be made clear to avoid possible confusion later. The proposed procedures follow and it is requested that you discuss these with the Range Commandant to ensure that they will be satisfactory to him also.

(a) Copies of all letters, reports and instructions relating to health control at the range originated by the Health Physics Representative shall be sent to the Range Commandant, Maralinga, the Director of C.X.R.L., and the Secretary of the Department of Supply, Melbourne.

(b) Correspondence from this Laboratory to the Health Physics Representative will be addressed directly to him and copies sent to the Range Commandant, Maralinga, and the Secretary, Department of Supply, Melbourne.

(c) In Section 14.5 of the Maralinga Safety Regulations of March, 1956 (RSRM/56 (5)), which deals with the functions of the Health Physics Representative, there occurs the following sentence: "He may seek the advice of DAWRE where necessary and should render regular reports on the conditions of the range to the Range Commandant who should forward six copies of the reports to DAWRE through the usual channels."

It is desired that should the Health Physics Representative wish to communicate with DAWRE it should be done through this Laboratory and not directly.

The making of regular reports by the Health Physics Representative is one of his most important functions. In the Section of the Regulations cited above, the word "conditions" is interpreted by us as meaning all conditions relating to radiological safety at the range. We consider that such reports should be made early in each calendar month and should cover the activities of the previous calendar month. The first report, to be issued next December, should also include a concise statement of the facilities available such as office accommodation, clerical assistance, and transport. Copies of these reports shall be distributed as laid down in Section (a) above.

Acting Director.

Copies sent to -

Range Commandant,
Maralinga:

Secretary,
Department of Supply,
Melbourne:

The Director,
A.W.R.E.,
ENGLAND.

JFR:HO'C.

26th November 56.

950 2

MEMORANDUM for:-

Health Physics Representative,
Maralinga,
Via Watson,
SOUTH AUSTRALIA.

HEALTH CONTROL MARALINGA
(INTER TRIAL PERIOD)

You will have in your files a copy of the minutes of the meeting held at Maralinga on 8/10/56, to consider the Health Physics requirements during the inter-trial period. I make the following comments on these minutes.

1. Inter-Trial Period.

The inter-trial period, by definition, began on 8/10/56 and the Health Physics Representative assumed responsibility for the radiological safety of the range from that date.

2. Scope of Work.

The scope of the work required on radiation measurements in the inter-trial period is listed in section 4 of the minutes. To this list must be added the health control of people working in the forward areas, the operation of the laundry as required and all other aspects of health control as set out in the Maralinga Safety Regulations of March, 1956.

3. Staffing.

Considering the amount of routine work to be done (see 2 above) are you satisfied, in the light of experience so far gained, that the proposed staff will be adequate? There will be a much larger population on the range in the inter-trial period than was originally estimated and you may find that you need more

staff. Please let me have your comments.

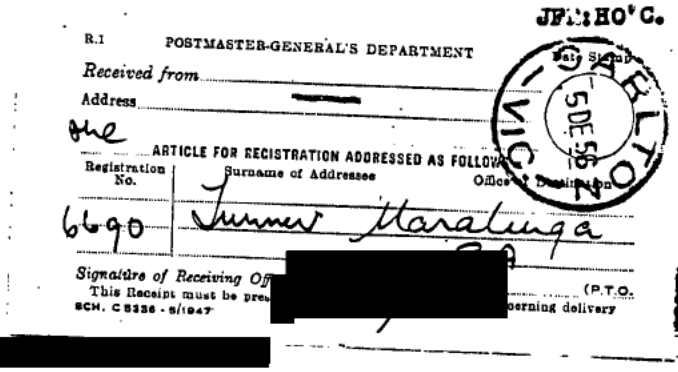
Acting Director.

Copies to:

Range Commandant,

Secretary, Dept. Supply.

JF:HO'C.



950 2

6.

[redacted] T[redacted]
Box 1,
Maralinga,
Via Watson,
SOUTH AUSTRALIA.

Dear [redacted]

I am enclosing a copy of the draft of a memorandum dealing with the arrangements made for the operation of Health Physics services at Maralinga during the inter-trial period. This memorandum will be addressed to the Secretary, Department of Supply, Melbourne.

Would you please comment on the memorandum and expand it in any way you consider necessary? The object of this memorandum is to inform the relevant people of the general arrangements made for the inter-trial period rather than to inform them of specific events or results. These would be better included in your monthly report.

Would you please return the memorandum with your comments as soon as you possibly can as I am most anxious to submit it at least a week before Christmas?

Kindest regards,

Yours sincerely,

Acting Director.

P.S. Thank you for sending us your report on the biological specimen. It arrived this morning.

Memo. sent by registered post (10 + 1/3) air mail, 3/12/56. from Carlton. Memo. — marked secret.

DRAFT: A.P.O./N

[redacted]

Summary of Notes on meeting held at CXRL 23/11/56.

SUGGESTIONS FOR FUTURE OPERATIONS IN HEALTH PHYSICS AT MARALINGA.

1. Health Control.

The United Kingdom has (unofficially) suggested that Australians may take over H.C. and D.C. at the next trials.

It is possible that a permanent base will be established at Iwara. If the caravans are to be used again, suitable sites must be prepared in advance.

2. Staff.

It is desirable that the Representative for the Health Physics Team appointed by the R.A.A.F. should be an Officer.

Arrangements for the A.H.P.T., and the A.R.D.U.

(i) Whose responsibility?

(ii) Are these bodies to be permanent?

(iii) Preferable that these bodies could be made up of Army Servicemen only. An Army Group could be formed which would be attached to the Task Force at Maralinga as the A.R.D.U. is at present for the inter-trial period.

It is considered that it is not satisfactory to have Units consisting of men drawn from more than one Service.

The opinion was expressed by [redacted] that the A.R.D.U. present for Operation Buffalo contained too many Officers. For future Operations attention should be paid to the number of Officers required and their ranks.

A permanent Health Physics Team and A.R.D.U. could be used during Operations at Maralinga and in the inter-trial period could be used for instructing other Groups, for example the R.A.A.M.C. and Civilian Defence.

Courses of instruction for future Groups could be given at Maralinga after a short course in Melbourne.

3. Duties.

No A.R.D.U. should be used in H.C. or D.C., except on work of a specialized nature and in this case the U.K. staff may want to take over. It may be possible to use civilians, forming a separate labour force for such routine jobs. The rotation between Groups was

[redacted]

not satisfactory during Operation Buffalo (after Round 1) and it is considered that a body once trained for particular work should keep to that work.

The A.R.D.U. should be kept for local survey work after each trial, for example surveying all craters and detection of "hot objects". The Unit could be used for Health escort work but such work may not be necessary if good survey maps can be prepared in a short time.

4. Future Operations.

It is suggested that for future Operations such as Emu 2, Mabel Creek could be used as a base rather than Emu.

[redacted]

30/11/56

CXRL file only
No copies distributed

Ref. Line drawn by author on the meeting held at CXRL on 23/11/56: (work-file)

950/2

[redacted]

*

Notes on Meeting Held at CXRL 23/11/56

Mr. O.H. Turner 09.15 – 15.15 (H.P.R.)
Major G.O. Thompson, 11.15 – 17.20 (O/C, R.D.U.)

The first part of the meeting was devoted to discussion between Mr. Marshall, Portland Health Control and the Staff of the ARDU. The following notes have been made from rough notes made during the meeting, and are not in chronological order.

09.15 Hrs. arrived

Mr. arrived at the Staff Office (Reg Carlin) and signed in. Was met by Major Thompson and Mr. Turner. Mr. Turner introduced Mr. Marshall to the Staff. Mr. Marshall explained that he had been detailed to visit the Range by the Chief Medical Officer, Portland Health Control, to investigate the possibility of a health hazard existing from firing on the Range. He had been informed that the Range was used for firing Small Arms ammunition, and that the Range was situated in the vicinity of a Reservoir from which Portland obtained its water supply. He had therefore been detailed to investigate the possibility of a health hazard existing from the use of the Range. He had been informed that the Range was used by members of the Royal Navy, Army and Air Force, and by Civilians.

He asked that Mr. Turner should point out on a map the position of the Range, the Reservoir, and the Catchment Area.

He asked Mr. Turner if present Staff were adequate for Safety. He considered that it was

* See Page under miscellaneous heading.

[redacted]

ARDU. after last round (R4) did survey of crater region at Breakaway, using 1390, 1391, 1392.

ARDU. max dose from whole operation was 20.

[illegible] Officer one member of RDU — [illegible] R. [illegible] full-time — [illegible] [illegible]. On leave from about 10/12/56 to Feb 1957. Will remain at [illegible] for whole inter-trial period.

Mr Kennedy leaves UK [illegible] [illegible] in Feb. 2-year appointment.

ARDU. [illegible] (at present [illegible] [illegible] will be of RDU [illegible]

5 total [illegible] (Health Control — [illegible]) [illegible] Bramley (Decontamination) [illegible] ([illegible]) [illegible] ([illegible] [illegible])

[illegible] may be [illegible] [illegible]

Decontamination: Have been got(?) [illegible] Areas No 3, 6, 9 & 14 [illegible] [illegible] (one only)

Security: [illegible] [illegible] by the planning Office [illegible] staff [illegible] — staff [illegible] [illegible]

Forward Area H.Q.
[illegible] Control [illegible] X → HPR [illegible] personnel taken to Health Control [illegible] where wear protective clothing [illegible] film badges & respirators — [illegible] [illegible] [illegible] [illegible] There [illegible] area along [illegible] track.

Film badges are issued at [illegible] only to those moving to the forward area: these badges are processed [illegible]

[redacted]

"Blue" Control: Road barrier at Bushey, 2 miles South of Roadside. Police officer in attendance. All forward areas are controlled. Entry permit from H.Q. necessary for entry. Entry to some parts of blue area regardless in Blue Special & these people are monitored at (H.C.) A.C. on way back. These are signed in & out at (H.C.) A.C.

Barriers: H.Q. considers barriers to [illegible] for few [illegible] – will set back of [illegible]

[redacted] [illegible] annexed [illegible]]

UK people suggested that Aust. [illegible] take over DC & HC (Canberra) [illegible] trials. The idea would be to have [illegible] force NOT the RDCU for the [illegible] attack. This body would be [illegible] of whole trials [illegible]

ARDU: All [illegible] returned to their [illegible] [illegible] H.Q. considers the RDCU [illegible] [illegible] could be used for [illegible] of [illegible] [illegible] trials. [illegible] UK [illegible] [illegible] not satisfactory for H.Q.

[illegible] suggested that Aust Defence [illegible] RDCU [illegible] for trials. If Army [illegible] RDCU [illegible] people [illegible] Possibly some of [illegible] could be from [illegible] the Navy, Air Force?

[illegible] agrees training could not [illegible] take place at Maralinga, but considers [illegible] could not be planned [illegible] [illegible] required for ARDU [illegible] may not be released for the [illegible] job again as he is an instructor [illegible] & instructors are short.

[redacted]

L.T. Considers there are too many officers in the RDU

C.T. - Civil Defense organized State by State - no Co-ord. body Nationally difficult? But C.D. could provide RDU as well

H.D. If Nuclear weapons are to be used must have an efficient defense body and for that energy & maintenance

C.T. yes - but control remain at

H.T. RDU for many only?

L.T. Nations task are to be body for them to train Civil Defense Officers should not be armed personnel could perhaps be trained

H.T. and perform one of the

coast Marsh

C.T. RDU - a body [illegible] formed from people attached to permanent body of men

H.T. Present enlistments are for [illegible] in list of REAP, Many left [illegible] a regular [illegible] Army. Of the [illegible] Army ARDU in a body from

C.T. Army term [illegible] Army ARDU [illegible] RDU [illegible] Nations [illegible] Civilian [illegible] to be responsible for ARDU?

C.T. Reason No ARDU in Canada as [illegible] specialist jobs & the [illegible] may want to do it themselves [illegible] possible to use civilians? If people for factories could be employed [illegible] people to ARDU for training, but this would form a reserve [illegible]

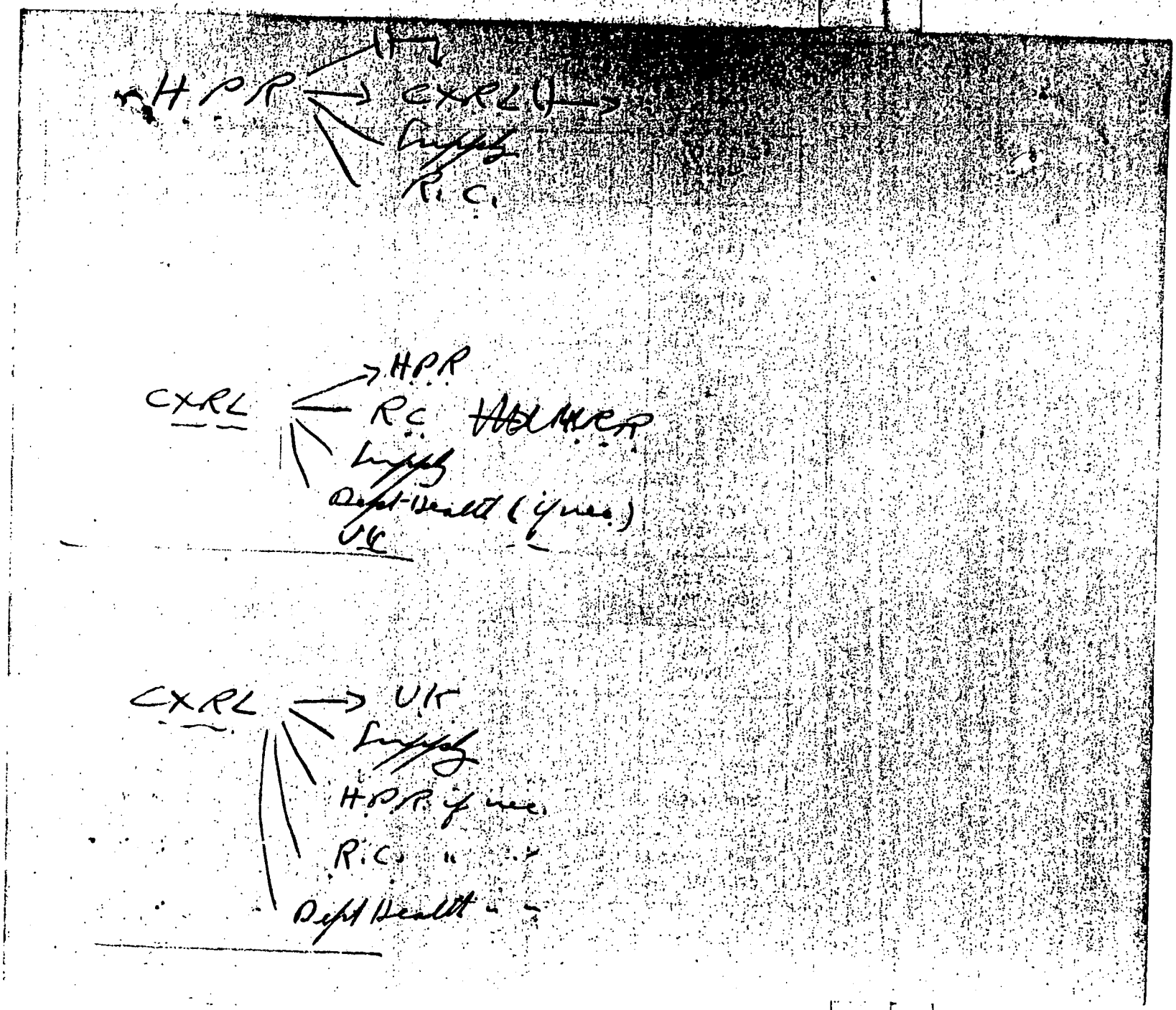
[redacted]

ARDU to be survey & detection work (Ch
Hydro) - this their basic work & duties at
Lake - such survey can be done by Sau
(NWR - and Government Dam)
Local survey by ARDU
but Consider this time & Expert in each
will be Model Check & not Enough for
work in field - out of Lab. Committee
Observing field - Lab work from
and 2

[redacted]

Sampling of air/water has not yet begun

Records kept by A.T. No air, water sampling
land except rain water. Land among
tests at only Trinity Film badges
Pattern of Use of
Films during test are saved and
likely to be entered to evaluate
should that each be
about


HPR
CXRL
R.C.
CXRL
HPR
R.C.
Dept-Health (yucca)
UK
CXRL
UK
HPR yucca
R.C. "
Dept Health

BAY MEASUREMENTS

INDIVER

Conversion = Factor = $\frac{13.20}{2062} \times \frac{1.00}{4724}$

Disintegration factor K =
Sensitivity factor a. = 1.351×10^{-2}
Absorption factor b_1 b_2 =
Scatter factor c_1 c_2 =
Geometrical factor G =
Decay factor T_1 to T_2 e =
Gamma ray factor k =
Conversion factor $\frac{4.62 \times 10^{-7} \text{ a } b_1 \text{ } b_2}{K \text{ k G } c_1 \text{ } c_2 \text{ e}}$ =

otal
as T_1 =

T_2 =

= 10.29 cm.

c/min.	Resolution corr. c/min.	Net c/min.	c/min. at T_2	Source diam. cm.	Diam. corr. factor d	Diam. corr. c/min.	c/min. per gm.	Mean	Total weight g	Total c/min.	Total strength µC at T_1
127	127	127			Fixed cc				Factor		
131	131	131									
6447	6318	6178	6164								
2216	2233	2096	2091								
975	977	841	8446								
1534	1537	1410	1411 - 303 = 1108				1026		13.89 g		
1103	1105	974	975								
1549	1552	1424	1425 - 291 = 1134				1050		14.20		
848	849	768	769								
1532	1535	1408	1410 - 295 = 1115				1033		13.98		
1080	1082	1001	1002								
1594	1598	1471	1474 - 337 = 1137				1054		14.26		
1146	1148	1017	1019								
1578	1582	1456	1458 - 340 = 1118				1035		14.00		
1146	1148	1011	1019								
1645	1649	1522	1525 - 336 = 1189				1100		14.89		
1125	1127	996	998								

(AIR MAIL) JFR/L

950 1 15th November 56.

[redacted]

Department of Agriculture,
University of Oxford,
O X F O R D, ENGLAND.

Dear [redacted]

At a meeting held at Maralinga on 8/11/56 to discuss the Health Physics requirements during the inter-trial period, it was decided that one of the duties of the Health Physics Representative would be the "collection and observation of Biological peculiarities".

Last Saturday (10/11/56) the present Representative, [redacted] reported to [redacted] of this Laboratory that he had secured a rabbit in a condition indicating that it had received a considerable dose of radiation (from ingestion of fission products?). This rabbit is at present in a refrigerator at Maralinga, but, at the request of [redacted], arrangements are being made to send it to you by air. I have asked [redacted] for a report on the circumstances of the discovery and will send this on to you as soon as it arrives.

I hope you had a pleasant journey back.

Yours sincerely,

[redacted]

Acting Director.

[redacted]

Copies to -

(1) Range Commandant, Maralinga, Via Watson, S.A. (Box 1).
(2) The Secretary, Department of Supply, 339 Swanston Street, Melbourne.
(3) [redacted], Box 1, Maralinga, Via Watson, S.A.

The original [illegible]

SALISBURY/MELBOURNE/LONDON CIRCUIT

OUT-GOING TELEPRINTER MESSAGE

Important: Classification must be given. Messages not bearing precedence will be transmitted as "Deferred."

GRADES OF PRECEDENCE	Message No.	Classification	Precedence	Originator's File Reference
Emergency Operational immediate Priority Routine Deferred	13882	UNCLASSIFIED	PRIORITY	950/2

FROM : [redacted] CXRL

TO : [redacted] MARALINGA

REPEAT :

RECIPIENTS REF. No. :

TEXT OF MESSAGE

DEPARTMENT OF SUPPLY ARRANGING TRANSPORT BIOLOGICAL SPECIMENS TO U.K. THROUGH SECURITY. PLEASE SEND FULL REPORT OF CIRCUMSTANCES OF DISCOVERY TO [redacted] FOR TRANSMISSION TO U.K. PLEASE ASK [redacted] CONTACT [redacted] ON RETURN TO MELBOURNE.

A.P.C.—S.S.I. (OCT. 1955) J.R.S.

(Continue overleaf if necessary)

Signature of Sender [redacted] Date 14-11-56 Branch or Section R. & D. Tel Extn.

NOTES ON DISCUSSION HELD 13/11/56, MELBOURNE

PRESENT:

[redacted] Department of Supply

A.W.R.E.

C.X.R.L.

C.X.R.L.

Department of Supply

Department of Supply

1. FUTURE PROGRAMME OF CONTINENTAL AIR SAMPLING

[redacted] said that U.K. has now no further interest in Continental Air Sampling. Sufficient data had now been accumulated to establish the relation between the radioactive contamination of breathed air and the ground contamination and further air sampling was now not required.

U.K. was still interested in "ground sampling", i.e. by sticky paper method, but only during the period of fallout.

[redacted] said that the Safety Committee had not yet expressed its views on this question, but it was probable that air sampling would be required during the next atomic trials series and for a short time after.

The Australian Atomic Energy Commission was interested in continuing the air sampling programme both with air pumps and sticky paper, and had nominated 20 stations at which it would like observations to be made.

[redacted] said that as the air pumps were now no longer available in U.K., A.W.R.E. would like to recover some of the air pumps from Australia if at all possible, for use at Maralinga.

[redacted] said that a total of 240 pumps had been received of which 94 had been issued. The principal causes of failure had been (a) big-ends and (b) rubber diaphragms. Some internal rubber items had also perished and needed replacement. The big-ends had been redesigned and 12 of the new design were now in service. The diaphragm failed after a period of operation, but we now held 490 spare diaphragm - sufficient for several years operation at the present rate.

It was agreed that 40 units be allocated for the reduced continental sampling network, 100 be held in store at Salisbury pending further advice from the Safety Committee and 100 be made available to the A.W.R.E. for delivery to Maralinga.

Regarding filter paper, [redacted] said that there was no difficulty in obtaining further supplies as long as it was kept in mind that about 6 months delivery time was involved. Regarding sticky paper, locally sticky paper

was now being used and was apparently satisfactory. [redacted] said that A.W.R.E. were interested in an improved sticky paper, in particular with a non-drying adhesive, and he would advise uf of any further developments in this direction.

2. COUNTING EQUIPMENT

[redacted] said that U.K. required more counting equipment at Maralinga and if any of the equipment at present at C.X.R.L. would be released it would save time and money and obviate the manufacture of new equipment.

[redacted] said in view of the reduced sampling programme some of this equipment could obviously be released. However, there was also the counting of samples of rain water, and reservoir water to be considered and these were best handled on automatic type equipment. It was of course impossible to say exactly what would be required until the Australian Safety Committee had stated its requirement.

[redacted] said he thought that sticky paper counting would tend to increase during the next trial, and filter paper counting reduced. After some discussion it was agreed that the following equipment would be retained at C.X.R.L. and the balance forwarded to Maralinga:-

1. Automatic Beta Ray counter
2. Manual Beta Ray counter
3. Scintillation counters

Gas flow equipment would not be required during the inter trial period as the scintillation counters have proved to give all the information required. As U.K. was short of Methane equipment it was agreed that C.X.R.L. should retain it until the present counting programme was complete and that it should then be made available to U.K. in good time for Sapphire trials.

Regarding the iodine counting equipment in Marston's laboratory, [redacted] explained that it was necessary that the equipment be left undisturbed until Marston had completed the preparation of his report. He assured [redacted] that when this was completed he would arrange the transfer of it to Maralinga in sufficient time for servicing by Crabtree for the Sapphire trials.

3. FUTURE POLICY

[redacted] said that discussions were still proceeding on the future allocation of this work. The Atomic Energy Commission had expressed its willingness to take over the responsibility of Continental Air Sampling primarily as a continuous check of background level of radioactivity in Australia. He felt that the counting and interpretation of the results from a health point of view was logically a function of the Commonwealth X-Ray and Radium Laboratory, Department of Health. Similarly the establishment of a Health Physics Group at Maralinga in the first place is likewise a function of that Department in that it provides an assessment and advisory service on health hazards. He said that although negotiations were taking place on the official level in respect to these matters he would like to have some indication from [redacted] as whether the proposals were feasible.

I+C
Mara

As regards Health Physics, the Atomic Energy Commission had agreed that [redacted] could be made available, in fact they would agree to the transfer of this officer to C.X.R.L. for this purpose. [redacted] said that he thought the proposals were feasible although he expected some difficulties in obtaining approval for the appointment of additional staff. It was agreed that a suitable letter* be prepared by Supply in conjunction with C.X.R.L. for forwarding to Department of Health.

Some discussion was held on the proposed Health Physics arrangements at Maralinga and it was agreed that one health controller assisted by three R.D.U. and one instrument mechanic would be adequate as far as could be seen at present.

It was agreed that [redacted] could write direct to U.K. on strictly technical matters, but in all general correspondence he should give copies to Range Commandant and Department of Supply.

Regarding improvements to equipment, [redacted] undertook to keep C.X.R.L. advised and send out the necessary parts required to incorporate these improvements.

[redacted] said he would endeavour to arrange a meeting of the Safety Committee at an early date.

[redacted]

19-11-56.

* see letter rec'd CXRL 4/12/56. - 950/2

[redacted]

Notes on Meeting with [redacted] 14/11/52

This meeting (attended also by Mr. [redacted]) was arranged by me to discuss [redacted] relating to H.C. at Manchester.

[redacted]

2

(b) To UK — to CXRL
CXRL to forward to UK
Copy to Range Commandant

(c) To Range Commandant.
— the applicant report on Range
Relevant part to Range
and a copy to HQ RE Com
Main Supply Route (MSR)
Copy also to Supply & CXRL

[redacted] 3

Members:
H.S.
A.R.D.U.

Arrangements can be made through Marching Committee for sending people to Mess as required & for changing them about as required. Adjutant Intel

[redacted]

[redacted] Present [redacted]

Notes on meeting with [redacted] 13/11/56

This a short meeting subsidiary to the one on Continental Sampling + Health Control Etc. at Mera - see attached [illegible] minutes of meeting held 26/10/56 [illegible] formal terms of reference.

Points discussed.

Found before the Ork left many of the [illegible] refuse. 1 H.C. Officer
1 Sanitary
3+ RDE

If more people present for next [illegible] would be better to be in [illegible] though in Rembok more [illegible] (HC Team + RDE). Might [illegible] Timetable - see notes of meeting [illegible]

Work can't be [illegible] minutes of meeting 26/10/56.

Comments -

(a) Decontamination [illegible] must start before [illegible] to Khemanta Rd &c.

(b) Sampling [illegible]

(c) [illegible]

(d) [illegible] if a NZ unit [illegible] found in Labs [illegible] Rembok complete [illegible] Embalm [illegible]

(e) Sanitary Corps

Also Laundry to be operated

[redacted]

Equipment:

(1) Two 1395 units as to be [illegible]
each look to UK
the same lot for [illegible]
[illegible] RFC, billed
[illegible]
[illegible] — two [illegible]

(2) [illegible]
[illegible]
[illegible]
[illegible]

[redacted]

Note. (1) mess workings on new
towers commd. mess
protective clothing

(2) H.C. to at DC 5 and Mess
vehicles must use
duty track

(3) Commns are [illegible]
[illegible] been altered
Log things to be done

1. Correspondence with UK

UK to Amt sent to W/Ops
Executive, Master Copies
Copy for me when returned
Amt to UK. addressed to D. Amt
marked attention Comm
H.C. office at Mess to buffer for UK

1. Rabbit [redacted] reported running [illegible]
by telephone to me from mess on
10/11/56. Reduction ordered. (Comm
Report for guidance. Rabbit being [illegible]
freezer at Mess
[redacted] wants rabbit sent to Scott Comm
- me to see [redacted] about this

Suggested arrangement for Australian Health Physics team.

1. At present, it would appear that apart from participating in the recent nuclear trials and fulfilling a term as the Inter-Trials Health Physics Representative, members of the Australian Health Physics team will not be actively engaged on matters appertaining to Maralinga. It is suggested that possibly some advantage may be gained if the individual members were to -

(a) Specialise in a definite branch of Health Physics applicable to nuclear tests.

(b) Devote more time to extending their knowledge in their chosen branch.

(c) Act as a team, rather than individuals.

2. As an example of specialisation, the present Health Physics team could easily be assigned the following sections as in every case they have had already had considerable experience in their particular category.

[redacted] - Administration and Co-ordination
[redacted] - Radio-chemistry
[redacted] - Chemical and physical protection against nuclear explosions.
[redacted] - Decontamination
[redacted] - Meteorology and Theoretical Prediction
[redacted] - Nuclear Physics

3. Under such an arrangement, it would probably be desirable for team members to have an opportunity to extend their knowledge of their specialised facet of Health Physics at times other than periods actually spent on the range, and also to periodically meet as a group to extend overall team knowledge.

[redacted] have indicated their personal interest in the above suggestion and consider that such an arrangement would generally enhance both the value of the team and and their individual value to their respective services. Mr. Hemmy's agreement is dependent on his other commitments.

[redacted]

MINUTES OF MEETING HELD ON FRIDAY, 26TH OCTOBER, 1956, TO DISCUSS RESPONSIBILITY FOR FUTURE CONTINENTAL SAMPLING AND HEALTH PHYSICS IN AUSTRALIA

26/10/56

PRESENT

[redacted]

At the commencement of the meeting it was made clear by both [redacted] and [redacted] that the meeting was of an exploratory nature only and they were not in a position at this stage to commit their respective Departments to any firm decision.

[redacted] outlined the purpose of the meeting and said there were 2 matters to be discussed, one was the Continental sampling in respect of air, water, etc. and the other was health physics.

Continental Sampling

[redacted] outlined the arrangements made in Continental sampling during both Mosaic and Buffalo tests and expressed the view that A.A.E.C. should undertake the general organisation and operation of the sampling system throughout the country, but that the actual measurements and assessments of measurements reside with the Department of Health. The Department of Health and C.S.I.R.O. to continue to advise the Safety Committee on the actual levels and their biological significance.

[redacted] said that this was how his Commission envisaged it although he did not think the Commission was very keen to undertake maintenance and distribution of equipment.

At this stage, [redacted] tabled the following letter from the Minister in charge of C.S.I.R.O., The Right Honourable [redacted] to the Honourable [redacted] Minister for Supply.

"My dear Minister,

I wish to thank you for your letter of 24th September in which you indicate that you believe that the Atomic Energy Commission should be designated as the authority responsible for the overall planning, co-ordination and executive action in connection with the assessment of radiation hazards due to radioactive fallout and associated matters. C.S.I.R.O. is naturally neither in the position to undertake this responsibility nor wishes to do so. I have been informed by the Executive of the Organisation that it would willingly collaborate with the Atomic Energy Commission if this is desired.

It seems to me that your decision in this matter is correct and I therefore agree that the Atomic Energy Commission should be given this responsibility, particularly as the building up of its health physics section will provide the facilities f

for the biological as well as the physical assessment of these potential dangers.

I am,

Yours sincerely,

(sgd) [redacted])

The Hon. [redacted], Q.C., M.P.,
Minister for Supply,
Parliament House,
CANBERRA.

Since the meeting the following letter has been received from the Secretary, A.A.E.C. to the Secretary, Department of Supply:-

"Dear Sir,

I refer to the discussion which I had with officers of your Department in Melbourne, on the 26th October, concerning long term continental radiological measurements and related matters.

I have now had an opportunity of discussing the whole matter with the Chairman of this Commission, [redacted]. He has asked me to complete arrangements with the Meteorological Bureau and the Commonwealth X-Ray and Radium Laboratory for the collection of samples and their radiometric examination.

The Commission would like to use the existing air sampling units, as supplied by the U.K. authorities through your Department. The units would be those installed at the score or so stations listed on the attachment hereto. I would be grateful if you would confirm that this arrangement would be acceptable to your Department and the U.K. authorities.

At this stage, the Commission is more interest in long term trends rather than short period variations. Consequently, it is probable that the samples will be collected not more frequently that every day or two. The Director of the Meteorological Bureau has been asked to indicate whether this frequency can be achieved without imposing an undue burden on his staff or overtime.

The operation of the air sampling units will involve a certain amount of maintenance and repair as well as the provision of filter papers and sticky papers. I would be glad if you would let me know as soon as possible whether you will be able to provide the two types of paper in quantities sufficient for the programme.

In connection with the maintenance and repair of the air sampling units, it would be helpful if your Department could continue to carry out this work as it has been done up to the present. I would be glad to have your comments on this suggestion.

I understand that the U.K. authorities have shown an interest in the possibility of returning some of the counting equipment (now held by the

.../3

Commonwealth X-Ray and Radium Laboratory) to the United Kingdom. I have asked the Acting Director of C.X.R.L. to let me know whether he will still have sufficient equipment should the U.K. withdraw some units. I would be pleased however, to receive your comments on this matter.

It is important that we should make proper financial provision for this work. Consequently, I would be pleased if you would let me have estimates of the costs which may be chargeable to this Commission as soon as may be convenient.

Yours faithfully,

(sgd) [redacted])
for Secretary.

Air Sampling Stations

Sydney	N.S.W.	Onslow	W.A.
Canberra	A.C.T.	Port Hedland	W.A.
Melbourne	VIC.	Broome	W.A.
Adelaide	S.A.	Darwin	N.T.
Woomera	S.A.	Daly Waters	N.T.
Woodnadatta	S.A.	Doncurry	Q.
Alice Springs	S.A.	Cairns	Q.
Kalgoorlie	W.A.	Townsville	Q.
Perth	W.A.	Charleville	Q.
Geraldton	W.A.	Brisbane	Q.

Plus probably Bourke, N.S.W.

It was agreed that a further meeting be held when [redacted] was in Melbourne to ascertain the U.K. requirements regarding retention of the counting apparatus at both C.S.I.R.O., Adelaide, and 31 Latrobe Street, Melbourne.

HC

Health Control and Radiological Measurements at the Range

[redacted] said the Maralinga range required continual service of a health control and R.D.U. regardless of whether major trials are in progress or not. It had always been understood that Australia would contribute some personnel to the health control and radiation measurements during the trialsand would undertake the corresponding duty in the inter trial periods. The present arrangements are for [redacted] of A.A.E.C. to be available till the end of March, 1957 and for 3 R.D.U. and a Nuclear Instruments Officer to be available until such times as Cabinet decides what, if any, contribution should be made by Australia to the Task Force. Whatever arrangements are made it would appear that Australia has a 10 year commitment in the health control at the range and the question is which Department or Departments should accept responsibility of providing the service and how it should be done. His own view was that it should lie with C.X.R.L.

After some further discussion [redacted] said he saw no objection to this providing he could call on the Maralinga Committee for assistance should this be necessary.

.../4

Since the meeting the following letter has been received from the Secretary, A.A.E.C. to the Secretary, Department of Supply:-

"Dear Sir,

I refer to the discussions which I had with officers of your Department, in Melbourne on the 26th October, concerning the provision of health control and radiometric services at Maralinga in the inter-trial periods. One of the aspects discussed, was the provision of a health physicist to act as the officer-in-charge of the [redacted] section. In this connection, it was agreed that [redacted], an officer of this Commission, would be available until the 31st March, 1957. This agreement was in accordance with earlier discussions and correspondence between yourself and the former chairman of this Commission, [redacted].

The Commission's new Chairman, [redacted] has now asked me to advise you that the Commission would be prepared to make Mr. Turner available indefinitely, for the type of work mentioned above. In fact, it has occurred to us, that you may care to consider offering [redacted] an appointment within your own Department. If so, the Commission would give favourable consideration to a request by Mr. Turner to be released for work in the radiological field as a member of your Departmental staff. As an alternative to this suggestion, the Commonwealth X-Ray and Radium Laboratory might like to offer Mr. Turner a permanent position. I suggest that you may care to discuss this point with the Acting Director of C.X.R.L.

I should make it clear that [redacted] is, of course, held in high regard by the Commission, but his work and interests have now taken him some considerable distance from those for which his position was originally created. [redacted] has not been made aware of these suggestions.

I would be glad to have your views on the above proposals as soon as may be convenient.

Yours faithfully,

(sgd) [redacted],
for Secretary."

Also since the meeting the following letter has been received from the Director of Meteorology:-

"The Secretary,
Department of Supply,
339 Swanston Street,
MELBOURNE. C.I.

Air Sampling Observations

Instructions have been issued for air sampling observations with both filter papers and fall out trays, to cease as from 5/11/56, at the stations in the network controlled by this office except for at the following locations:-

.../5

Port Moresby	Adelaide
Townsville	Oodnadatta
Rockhampton	Alice Springs
Brisbane	Darwin
Sydney	Onslow
A.M.C. (Sydney)	Broome
Melbourne	Perth
Hobart	Charleville
Cloncurry	Forrest

(sgd) [redacted])
Director of Meteorology."

1 * sending through met. stations

Thomas had map from Dugan showing 20 stations.

Ref (Dugan) 56/1201
27/4/56

HQ

Health Physics, Nauru

Roster to be arranged for
- HQ — 1 civilian + 1 service officer
- RDU — 5
- Dust-Track — 1

Proposed 26/6/56

1 civilian HQO + 1 service HQO

5 RDU

1 with track
— + one man from RDU to be trained as assistant.

Proposed H.T stays until end March. Thomas said RSEC could use him if wanted earlier. Felt personal to long To take into account when fixing roster. Roster — Monthly.

CRL explosions. 2 ongoing. HQ at Nauru.

On range in intermittent periods there will be ~300 Australians + ~ 200 civilian Gilbertese Ellice people.

RADIOACTIVE ASSAY MEASUREMENTS

Material :
Radio-element :
Sample mounting :
Shelf position :
Filter :

Measured by .....

Date :
Instrument :
Reference time for total strength calculations T_1 =
Measurement time for decay corrections T_2 =

Disintegration factor K =
Sensitivity factor a =
Absorption factor b_1 b_2 =
Scatter factor c_1 c_2 =
Geometrical factor G =
Decay factor T_1 to T_2 e =
Gamma ray factor k =
Conversion factor $\frac{4.62 \times 10^{-7} \; a \; b_1 \; b_2}{K \; k \; G \; c_1 \; c_2 \; e}$ =

Source	Time of day	Weights g			Register readings			x Scale	Add	Total counts	Time min.	c/min.	Resolution corr. c/min.	Net c/min.	c/min. at T_2	Source diam. cm.	Diam. corr. factor d	Diam. corr. c/min.	c/min. / g	Mean	Total weight g	Total c/min.	Total strength µC at T_1
		Total	Mount	Sample	Stop	Start	Diff.																
			3																				
			8																				
			10																				
			21																				
			25																				
			29																				

~~AAEC~~

Sampling

1. Letter from Thomas, Smith raised Thomas, 26/10/56, Cost to AAEC ? our work or country, answer. To decide this.
Query – do we charge them?

---

meeting held with, Thomas O'Connor, Cook, Sell.
26/10/56 :-

(a) L.R. fall-out sampling.

AAEC. to undertake organisation, co-ordination & operation. (Weapons Met. Bureau ?) ? sampling. (Air, water)
Frequency of sampling ? (Rf + pz)
CXRL to assess results & advise safety committee.

AAEC → Dwyer for operation & equipt.

United Nations : AAEC & CXRL Govt interested directly.

Water sampling — Dept Works
— Snowy Mts Authority
— Bulfinch Ltd
— meteorology.

Hybrid sampling — ACTR – Melbourne (CSIRO – university) Rd system) – closed
— Mera – Emu – N.S. Rd.

Equipt. 31 Cat rolls Sh
— some equipt. may be available

11/9 received copy of plan for sampling of Wilis meeting on 13/11/56

Lateral Displacement 2 cm
Depth beneath skin 1 cm
Distance above S.N 4 cm
Lateral neck 10 cm

RADIOACTIVE ASSAY MEASUREMENTS

Patient : Mrs Florence BROWNSEA

Material :
Radio-element :
Sample mounting :
Shelf position :
Filter :

Measured by ... GR.....
Dose 6mc
Ref Sheet 6/7

Date : 21.4.53
Instrument : G.10 PB
Reference time for total strength calculations T_1 =
Measurement time for decay corrections T_2 =

Time of Injection 10 10 a.m.

Disintegration factor K =
Sensitivity factor a =
Absorption factor b_1 b_2 =
Scatter factor c_1 c_2 =
Geometrical factor G =
Decay factor T_1 to T_2 e =
Gamma ray factor k =
Conversion factor $\frac{4.62 \times 10^{-7} \; a \; b_1 \; b_2}{K \; k \; G \; c_1 \; c_2 \; e}$ =

9.62 x 9.60
20.14 x 1.26.
2626.

Source	Time of day H.M	Weights g Total	Mount	Sample	Register readings Stop	Start	Diff.	x Scale	Add	Total counts	Time min.	c/min.	Resolution corr. c/min.	Net c/min.	c/min. at T_2	Source diam. cm.	Diam. corr. factor d	Diam. corr. c/min.	c/min. / g	Mean	Total weight g	Total c/min.	Total strength µC at T_1
High	10 11½				7722	7714	8		39	839	2	420	420	302									
Nick	10 13½		21		7714	7723	21		88	2188	2	1094	1096	972	874 − 111			= 761					20.04
High	10 15½				7754	7745	9		67	967	2	484	484	366									
Nick	10 17½		7		7718	7755	23		12	2312	2	1156	1158	1034	1034 − 116			= 918					24.20
High	10 20				7788	7779	9		5	905	2	452	452	334									
Nick	10 22		11		7813	7789	24		4	2404	2	1202	1204	1080	1081 − 114			= 967					25.47
High	10 24				7823	7814	9		40	940	2	470	470	352									
Nick	10 26		15		7847	7824	23		91	2391	2	1196	1198	1074	1075 − 118			= 957					25.22
High	10 28				7858	7848	10		21	1021	2	510	510	392									
Nick	10 30		19		7884	7859	25		70	2570	2	1285	1287	1163	1164 − 118			= 1046					27.57
High	10 32				7894	7885	4		32	932	2	466	466	348									
Nick	10 34		23		7921	7895	26		15	2615	2	1308	1310	1186	1188 − 115			= 1073					28.27
High	10 37				7931	7922	9		46	946	2	473	473	355									
Nick	10 39		28		7958	7932	26		66	2666	2	1333	1335	1211	1213 − 114			= 1099					28.96
High	10 41				7967	7959	8		88	888	2	444	444	326									
Nick	10 43		32		7996	7968	28		28	2828	2	1414	1412	1293	1296 − 110			= 1186					31.24
High	10 45				8005	7997	8		80	880	2	440	440	322									

11.09

1783 = 1190.

0.7.10

[redacted]

HEALTH PHYSICS AT MARALINGA
DURING INTER TRIAL PERIODS.

A meeting was held on Monday, 8th October, 1956 at Maralinga to discuss Health Physics requirements at Maralinga in Inter Trial periods.

The following were present:-

[redacted], SPT/AWRE, Trials Co-ordinator.
[redacted], (SHPR)/AWRE, Health Physics Advisor
[redacted], GL/Health Physics Services Group
[redacted], CX-RL., Senior Australian Health Physicist.
[redacted], Range Staff Officer.
[redacted], (SPT)/AWRE, GL/Range Facilities

The following were unable to be present:-

[redacted], (SCEM)/AWRE, GL/Decontamination Services
[redacted], A.A.E.C., Health Physics Representative designate.

1. Inter Trial Period

The Inter Trial Period was defined as the period between the departure date of the Health Physics Advisor at one major trial and the arrival date of the Health Physics Advisor for the next major trial.

2. Area of Responsibility

The area of responsibility of the Health Physics Representative in Inter trial periods covers the whole area for which the Range Commandant is responsible, except that during minor trials series the localised areas of the trials concerned will be covered by the U.K. Health Physics Officers accompanying the trials teams.

It is envisaged that these areas will be as follows:-

(a) NAYA ("Kittens/TIM/Rats" Area)

All that Area lying to the North and East of the Security Hut at Naya, shown on SPT/RF/ 8

(b) KULI (Tim Area)

All that area lying to the East of the security barrier at TM/1 and within an area of radius 2500yds from TM/5, shown on SPT/RF/ 8

(c) ROTTEN ROW (XA Area)

The buildings XA1.1, XA1.2, XA3.2 and when completed XA2.1 and XA2.2.

(d) DC/RB AREA

The building KA/21 ("RATS") when completed.

3. Staffing

[redacted] stated that the Inter Trials Health Physics commitments were placed before the Maralinga Committee in November, 1955 as:-

"Item 20 : Radiation Surveys at Future Trials"

Min. [illegible] : see also 950; 11/55.

In this paper it was submitted that there should be continuously available at Maralinga the following staff:-

1 Health Physics Officer
1 Nuclear Instruments Officer
At least 3 members of the Australian R.D.U.

4. Measurements Required in Inter Trial Periods

[redacted] outlined the long term measurements which A.W.R.E. would request should be carried out during the Inter Trials periods.

These are:-

(a) Long Term Decay of weapon debris.
(b) Occasional Crater surveys.
(c) Collection and observation of biological peculiarities.
(d) Drinking Water, Raw Water, Rain Water and Air sampling on routine basis.
(e) Routine sampling Bores 2,3,6 and 14.
(f) Surveys in forward area over weapon debris following persistent heavy rain; to be tied to meteorological readings from a station in the forward area.
(g) Measurement of the change in β/γ dose rate ratio with time.
(h) Health Physics to cover the above work, together with cover for maintenance in Active Laboratories of active equipment and vehicles, etc.

5. Equipment Servicing.

The equipment in current use for the above measurements would be serviced by the Nuclear Instruments Officer and an RDU assistant.

The bulk remaining RM and HP stores will be serviced under arrangements made by [redacted].

6. Use of Buildings

It was agreed that the right hand (North) side of BL/5 would be made available to the Inter-trial H.P. force, together with a counting room in BL/6. BL/5 includes 2 offices which will also be made available. A darkroom in BL/6 will also be available.

The laundry will be required to operate on a small scale, and clothing be held until there is a sufficient quantity to justify running the main laundry plant.

All Yellow vehicles it was agreed must be confined to the DC Area and the "Controlled" tracks. For this reason servicing and maintenance facilities would be necessary at the DC Area, in the first place at the wash-down area, and, when completed, in the Garage DC/2.

One van from the Health Physics Circus together with water trailer, effluent trailer and generators will be retained at Mina for use as a Health Physics control point.

The remaining vehicles will be returned to the Village for servicing and maintenance according to instructions left by [redacted].

7. Maintenance of Active Buildings

It was agreed that all Active Laboratories should be left in a condition where they will require only routine occasional turnover of ventilation plant and can be entered for normal fabric maintenance and repairs.

8. Commitments during Phase 1 of the next trials series

It was stressed that during the engineering and logistic build up for the next trials the commitments on the Health Physics unit would increase and it would be necessary to increase the number of H.P. staff at the Range to cope with the added responsibilities.

9. The meeting closed, after agreeing that [redacted], accompanied by [redacted] and [redacted] would ask for an interview with the Range Commandant to discuss the implications of this meeting.

GL/RF
for Trials Co-ordinator

MARALINGA.
10th October, 1956.

Distribution: Director
Deputy Director
C.T.F.
Range Commandant (4)
Trials Co-ordinator (3)
[redacted]
D.C.R.E.
E & M. Officer
Tnpt Officer.

Copies to:
[redacted] (2)
[redacted] (1)
[redacted] (1)
[redacted] (1)

Range Commandant

Wed 9/10/51 0830

~~Relt~~ HQ. Rate limit period.
Report + [illegible] routine reporting. ✓
Instruction HQ → RC. ✓ [illegible]
Staff requirement. RDU to be used ? + Number [illegible]
✓ Clerical assistance ✓ - for + Rc.
✓ Office HQ. B/S ? or B/S
✓ transport

✓ General [illegible] of instructions [illegible]
[illegible] instructions [illegible]
Any return known
[illegible]
[illegible] Range
Tele HQ
HQ RDU [illegible]

9 Nov Mon
Wed 10/10/51

[redacted]

[redacted]

Tues 9/10/56.

H.S. Mara. Inter-trial period.

Entry to areas. These to be marked.
Labs. to be open, besides B4/5, part B4/6

Monitoring
air water sampling. Techniques, rec
effluent.
emerging? Labs?
film badges → (details?)

Air flow
air filters
Canaries (clean?)
N.I.S. — survey Fab. Dress
— spare
— Rig Cubicles +?

446 D.C. area =
equipment. (mess for long Tr.)
vehicles (yellow to remain
Protective clothing: laundry
Radiation measurement: beacons, phones? cat
— Equipt available for all above

Hosp. { Records
clearance (work certs.)
Reports to R.C.
Instructions to staff R.C. } R.C.

+ Written note

Interpretation of Instrument (1021,1027,1257,1295 & 1320)

β/Υ Count Readings

1. The Maralinga Range permissible levels of contamination are laid down in Radiological Safety Regulations, Maralinga, R.S.R.M./56(5). This note is to assist interpretation of β/Υ counts measured on the 1021,1027,1257, 1295, and 1320 instruments, the probes of all of which are essentially similar.

2. The basic conversion will be that the Geiger β/Υ probe with the window open gives a count of 15 per second when the contamination is 400 disintegrations per minute per square centimetre, i.e. 2 x 10-4 μc/cm^2 of Fission Products. A useful rough rule is that for Υ only 100 counts per second are equivalent to 1.5 milliroentger per hr.

3. For monitoring of unclothed personnel, count rates of 16 or more above background disqualify, irrespective of time of measurement.

4. The 1027 hand apertures are adjusted for the R.S.R.M./56(5) tolerance level of 6,000 dis/minute/both sides of one hand, i.e. 2 x 10-4 μc/cm^2. Readings in excess of tolerance will be obtained with the '10x' range switch.

5. For monitoring of Blue vehicles, count rates of 16 or more above background disqualify, irrespective of the time of measurement.

6. For small objects to be released for use in clean conditions on the Maralinga Range count rates of 16 or more above background disqualify, irrespective of the time of measurement.

7. The following table shows permitted decay equivalences over twelve weeks for application in specified circumstances to objects being decontaminated:

Time after firing	Counts on β/Υ Probe β Window Open
1 day	1,000
2 days	1,000
3 days	800
4 days	600
5 days	450
6 days	370
1 week	300
2 weeks	135
3 weeks	80
4 weeks	60
5 weeks	45
6 weeks	37
7 weeks	30
12 weeks	15

Fact 4:2

In general this table is of direct application to large objects to be shipped as clean to U.K. ex Maralinga after three weeks.

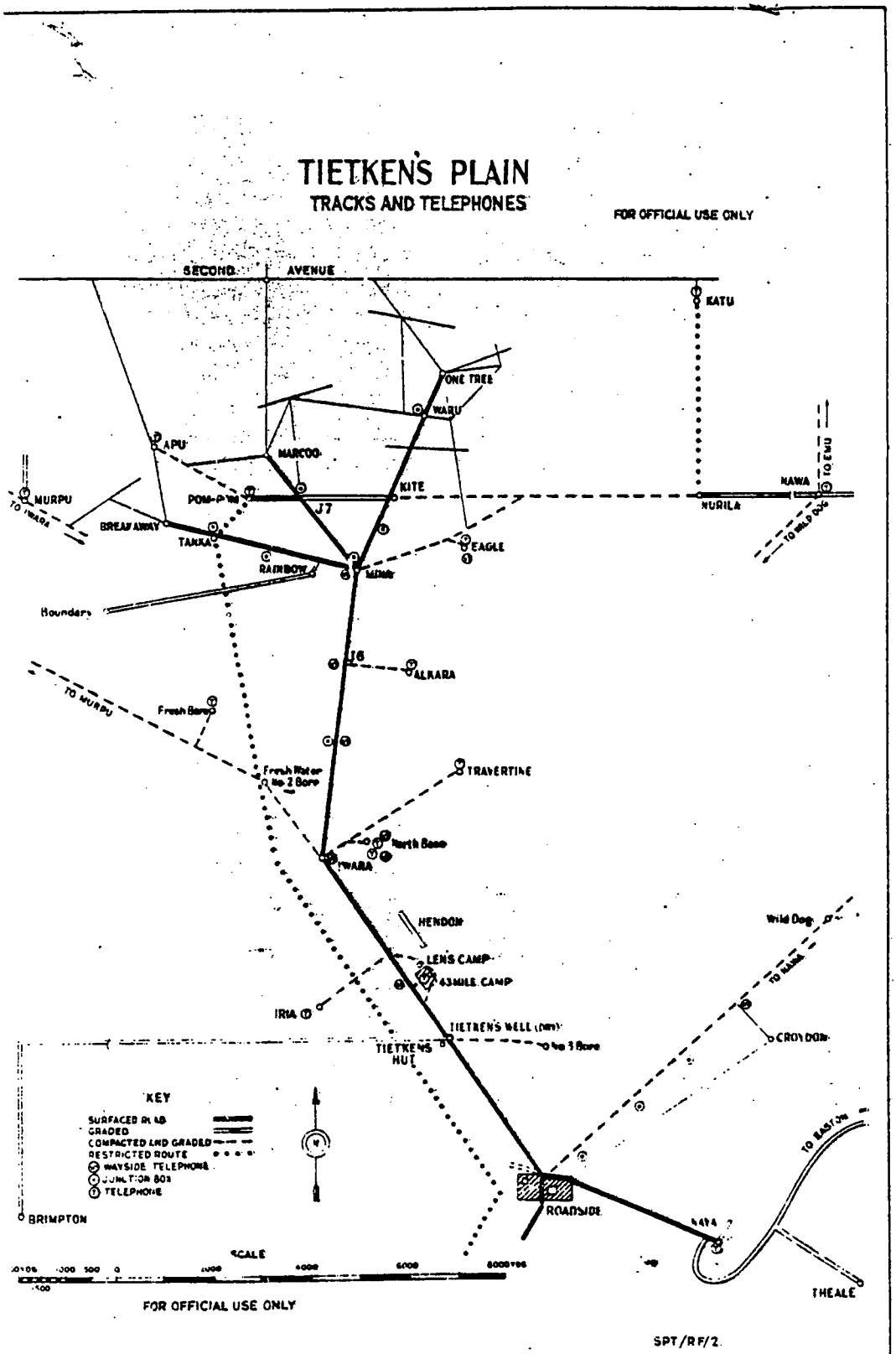
8. Permitted decay equivalences for smearable activity on large objects to be shipped as clean from Maralinga will be obtained from equating 20 d/m for a 200 square centimetre (roughly 4" diameter) smear taken at 21 days to the day of smearing by direct proportionality according to the number of days.

9. Clothing from the active laundry will be re-usable at the following levels or less:

Day	Counts on Υ/β probe, β window open
2	100
3	80
4 onwards	60

Where clothing is re-laundered the 60 c.p.s. level applies.

Maralinga,
20th September. 1956



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