Diamond Light Source

Local Rules for the Protection of Persons from Ionising Radiations

Active Materials Building (AMB)

These Local Rules are important for your safety and well-being. All Diamond Light Source personnel, users, visitors and contractors must follow these Local Rules whilst working in the Diamond Controlled and Supervised Areas.

Disciplinary action will be taken against anyone found tampering with the Personnel Safety System (PSS) or radiation shielding or deliberately failing to follow an effective search procedure.

These Local Rules will be reviewed biennially or whenever significant changes are required.

This issue of the AMB Local Rules supersedes all previous issues.

Document Change Record

Master Copy held by Health Physics			
Issue	Date	Section / Sheet	Comments
1.2	1/6/22	9.3	Information given to the fire service on arrival. (EA recommendation)
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Document Approval:

Health Physics holds the electronic master copy with digitally approval record on the SharePoint.

Name	Position
Adrian Mancuso	Science Director (Physical Science)
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Guy Thomas	Head of Safety, Health and Environment (SHE) Group
Pam Reynolds	Head of Science Infrastructure Group
Fred Mosselmans	Principal Beamline Scientist (I20) & Lab Responsible Scientist (Active Materials Building)

1. Introduction

1.1 These Local Rules are a requirement of Regulation 18(1) of the Ionising Radiations Regulations 2017 (IRR) and they set out the key arrangements for restricting radiation exposure in the Diamond Active Materials Building (AMB) which is designated as a Supervised Area. They define the principles and working procedures to be adopted to ensure safe operations in the Diamond Light Source (DLS) AMB. All Diamond Light Source staff and Users working in the AMB must read these Local Rules before entering those areas covered by these Rules. All persons supervising contractors or guiding visitors in the Supervised Area must ensure that they are familiar with and obey the access conditions described in section 7.

1.2 Separate Local Rules are available for the DLS Controlled Radiation Areas not covered by this document, and links to these documents will be found on the Health Physics: Local Rules area of the Diamond Intranet. Written procedures are provided where appropriate for all Supervised Areas not covered by this document.

1.3 A glossary of Health Physics terms used in this document can be found on the Health Physics intranet page (Radiation Safety FAQs).

2. Radiation Safety Organisation and Responsibilities

2.1 The Chief Executive Officer (CEO) of DLS Ltd has overall responsibility for the health and safety of all staff, users, contractors and visitors at Diamond Light Source. The CEO may delegate authority for certain health and safety functions to other people, however, he may not delegate his responsibility. Safety responsibility then devolves down the management and supervisory chains. The name of the CEO is given in Appendix 1.

2.2 A Radiation Protection Adviser (RPA) has been appointed under Regulation 14 of the IRR. The RPA has been provided with appropriate terms of reference. DLS is obliged to consult the RPA on those matters which are specified in Regulation 14(1) and Schedule 4 of IRR. The RPA's name is listed in Appendix 1.

2.3 A Radioactive Waste Adviser (RWA) has been appointed to ensure compliance with section 1.1.4 of DLS Environmental Permit (EPR/QB3391DZ). The RWA service is provided by Aurora Health Physics Ltd and Aurora have been provided with appropriate terms of reference. The RWA's name is listed in Appendix 1.

2.4 The Health Physics (HP) Team Leader has responsibility for overseeing all aspects of radiation safety. For those matters specified in Regulation 14(1) and Schedule 4 of IRR, the Health Physics Team Leader must consult with the RPA. The Health Physics Team Leader and RPA are currently the same person, name is given in Appendix 1.

2.5 Radiation Protection Supervisors (RPSs) have been appointed by the Science Director under Regulation 18(5) of the IRR. They are responsible for ensuring compliance with the Local Rules

and have been given appropriate terms of reference. The Experimental Hall Coordinators have been appointed RPSs for the Active Materials Building and their names and contact details are given in Appendix 1.

2.6 The AMB is for the users of Diamond Light Source. The Principal Beamline Scientist (PBS) of Beamline I20 has responsibility for liaising with user groups wishing to use the AMB and advising on the technical feasibility of experiments.

2.7 The Head of Science Infrastructure Group is responsible for all operational aspects of safety within all DLS Experimental Areas. The Head of Science Infrastructure Group must be informed of the intention to undertake hazardous operations within the DLS Experimental Areas, and has been authorised by the Science Director to halt any operation which they consider hazardous to personnel or equipment. The Head of Science Infrastructure Group's name is given in Appendix 1.

3. Dose Investigation Level

3.1 If the dose recorded by any DLS employee exceeds 0.8 milliSieverts (mSv) for the first time in any calendar year, the Health Physics Team Leader will initiate a formal investigation to make sure that exposure is being restricted as far as is reasonably practicable. The RPA must be consulted about this investigation.

3.2 If there is evidence to suggest that the dose received by any DLS employee may reach the investigation level before the end of the calendar year, the Health Physics Team Leader will initiate a review of working conditions with the aim of restricting further exposure before the investigation level is reached.

4. Areas to Which These Rules Apply

4.1 These Local Rules apply to work in the following areas of the AMB: Radioactive sample secure store, Sample counting room, Wet lab, dry lab. The areas have been designated as Supervised Areas based on both the potential for radiation dose and radioactive contamination. This is indicated by appropriate signs on the door.

5. Routine Monitoring and Maintenance

5.1 All contamination monitors are calibrated annually and checked weekly by the Health Physics Team.

5.2 Contamination monitoring of the laboratories must be performed after each user session by HP or the RPS, recorded and kept in the laboratory's radiation safety file. AMB record Sheets

5.3 If maintenance is required of any services that could potentially be contaminated, a Permit to Work must be raised and Health Physics contacted to perform contamination monitoring as the service is opened.

5.4 A stock check of all stock solutions and contents of waste bins must be performed by the Health Physics Team before and after each User session and waste records updated on CEO-HP-FRM-0023 for solid and CEO-HP-FRM-0024 for aqueous liquid disposals.

6. Systems of Work

6.1 Detailed procedures covering the use of sources at DLS are given in the document "Use of Radioactive Sources at Diamond", TDI-HP-PRC-0002. This document should be considered part of the Local Rules.

6.2 All persons intending to use DLS owned radioactive sources on the Diamond premises must provide copies of the method statements and risk assessments to the Health Physics Team Leader or Health Physicist at least 15 days before the work is intended to start.

6.3 Users must not bring radioactive material to DLS without prior agreement from the Health Physics Team Leader or Health Physicist. Users intending to bring radioactive material to site must state this in their application for beam time. Radioactive material includes radioactive sources, experimental samples and Naturally Occurring Radioactive Materials (NORM). Copies of the risk assessments and method statements must be submitted to the Health Physics Team Leader or Health Physicist at least 15 days before the sources are required on site. The Health Physics Team Leader or Health Physicist may refuse permission for certain radioactive materials to be brought onto site. Users wishing to work with any radioactive material on site, whether owned by their employer or by DLS, must provide a certificate from their employer indicating their competence to work with radioactive materials.

6.4 Detailed procedures covering the use of user owned sources at DLS are given in the document "Procedures for the use of radioactive samples on the Diamond Beamlines", TDI-HP-PRC-0006. This document should be considered part of the Local Rules.

6.5 No radioactive material or source may leave the DLS site without prior approval of the Health Physics Team Leader or Health Physicist.

6.6 If the person responsible for a source or waste knows or suspects it is missing or damaged, they should immediately inform the RPS, Head of Science Infrastructure Group and the Health Physics Team.

6.7 Working Constraints:

6.7.1 Personal Protective Equipment (PPE) must be worn when working with radioactive material in the labs and sample room. This includes a properly fastened laboratory coat (closed at the neck and elasticated at the wrist) together with laboratory gloves, overshoes and eye protection.

6.7.2 If the Experimental Risk Assessment (ERA) states the whole body dose rates could exceed 3 µSv/h, personal Optically Stimulated Luminescence (OSL) dosimeters should be worn while working with radioactive materials together with extremity (finger) dosimeters.

6.7.3 Avoid ingestion of contamination; pencils, pens and fingers must not be sucked. Never eat, drink, smoke or apply cosmetics in the radioactive laboratory. Mouth pipetting is NOT permitted. Use paper tissues, not personal handkerchiefs.

6.7.4 Health Physics approval is required for any changes in the techniques from ERA and changes in the methods of storage from ERA or location of radioactive materials.

6.7.5 The RPA needs to be consulted, and approval obtained, for any new procedures involving radiation or modifications to the safety systems.

6.7.6 Keep radionuclide stocks and solutions in a locked cupboard (fire resistant) or locked and appropriately labelled refrigerator (spark-proofed) in the lab.

6.7.7 All radioactive solutions and materials should be clearly labelled with a unique identity including where practicable the radionuclide, activity, date, and owner. Where a User feels it is not practicable to label the material with radionuclide, activity, date and owner, this must be agreed with the Health Physics Team Leader or Health Physicist.

6.7.8 Work with radioactive material must **not** be performed outside of normal working hours (9:00 to 17:00, Monday to Friday).

6.7.9 Lone working in the labs is very much discouraged. It must be authorised in advance and a lone working risk assessment must be completed.

6.7.10 Access to radioactive user samples at all times including outside of normal working hours (9:00 to 17:00, Monday to Friday) must be supervised by an EHC.

6.7.11 If laboratory coats, personal clothing or skin becomes contaminated, the Operations Shift Leader in the Control Room must be informed immediately. Details of the contamination, decontamination procedure adopted and its efficiency must be recorded (see contingency plans, Appendix.3).

6.7.12 If a radiation worker has a pregnancy confirmed she should inform either her Line Manager or the RPA as soon as possible. The working practices of the individual may need to be altered depending on the results of a risk assessment looking particularly at risks to the foetus.

6.8 Purchasing / ordering/ installation.

6.8.1 All purchases of radioactive material must be made by the Health Physics Team. This may require application for an amendment to the Environmental Permit, which can take several months to be granted.

6.8.2 Approval is required from the RPA for changes in the nature or amount of radioactivity ordered, amounts must be within the limits of Diamond's Environmental Permit.

6.8.3 If any person intends to install or use X-ray generators in the lab, they must seek approval from the RPA in advance. They will need to obtain approval for the shielding and interlock systems, showing that they are not susceptible to being circumvented. X-ray generators used at Diamond must comply with the Ionising Radiations Regulations 2017.

6.9 Delivery of isotope:

6.9.1 Only members of the Health Physics Team should pick up radioactive packages from stores/ delivery point.

6.9.2 Users bringing their own samples must present them to the Health Physics Team for contamination monitoring and secure storage as soon as they arrive on site.

6.9.3 User samples delivered to stores must immediately be moved to the AMB for contamination monitoring and placed in the secure store.

6.9.4 An appropriate calibrated contamination monitor should be used to check the contamination (see section 6.10).

6.9.5 Always assume that the contents of radioactive packages arriving from suppliers are contaminated until confirmed otherwise.

6.10 Unpacking of radioactive isotopes:

6.10.1 Choose a contamination monitor and check it is suitable for the intended use, record background response and check that the work area is not contaminated before starting to work and record results.

6.10.2 Place package behind Perspex screen (if required), and:

- Wear PPE (gloves, apron etc)
- Open packaging (bag or can).
- Wipe test interior for leakage.
- Wipe test lead pot or stock solution container.
- If clear, open lead pot / container and monitor inside of lid.
- Using forceps/ gloves, remove vials/ samples and wipe test.
- If contamination is detected, then make safe and investigate. Follow the procedure as detailed in section 9.4.

- If vials/ sample are clean, take a photo of each source for record; store it ready for use either in lead shielding or within Perspex vial shield.

6.10.3 Complete log book. The isotope identification number (the same as the order number) must be written on the outer surface of the container.

6.10.4 If you do not plan to use the radioisotope immediately then store it in a locked fridge or other secure location designated for storing radioactivity.

6.11 Preparation

Prior to any work involving unsealed radioactive isotopes.

6.11.1 The following PPE mut be put on at the barrier: Lab coat, gloves, overshoes, safety goggles and if required personal dosimetry.

6.11.2 Check the contamination monitor:

- Is instrument appropriate for isotopes being used?
- Check visually for signs of damage.
- Is the battery charged?
- Is instrument within test date (annually tested and calibrated)?
- Although the monitors are checked weekly, it is advisable to test the instrument is working (function test) prior to use.
- Check background response.

6.11.3 Monitor the work area prior to use to ensure that it is clean and record results on the log sheet. If any contamination is found, make safe and report to the RPS. Contamination should be removed, the cause investigated, recommendations made and incident recorded.

6.12 Working with radioactive isotopes

6.12.1 The appropriate shielding equipment and engineered controls (as indicated in the risk assessment) should always be used to minimise radiation dose.

- Work with liquids over trays (spill tray).
- Use forceps/ tongs to pick up vials/ samples of high-energy beta/gamma emitters. Place unshielded vial in a vial shield for dispensing operations. Avoid handling stock solution directly on bench. Use anaerobic chamber for volatile isotope samples.
- Use high Z, high density materials such as lead to shield gamma emitters.
- Use low Z materials such as Perspex of appropriate thickness to shield beta emitters, bremsstrahlung X-ray production is greater from high Z materials such as lead.

6.12.2 Monitor hands and work-areas frequently and after concluding each specific work period. Always assume that gloves are contaminated during and after handling radioactive materials. Prior to handling items e.g. pens, notebooks, telephones, door handles etc, check for contamination using the nearest contamination monitor.

6.12.3 If contamination is detected, make safe by changing the gloves. If skin contamination is detected wash hands a maximum of 3 times (being careful not to abrade or break the surface of the skin) and investigate the possible location of the primary contamination. Seek RPS's help if required. Follow the procedures for a spill detailed in the contingency plans (Section 9.5).

6.12.4 All apparatus and equipment used with radioactive materials must be clearly labelled.

6.12.5 Monitor all equipment (including stationery) before removing from the laboratory.

6.13 Before leaving the laboratory

- Monitor gloves.
- Monitor work surfaces, equipment and stationary used (record on log sheets CEO-HP-FRM-0025).
- Contact Health Physics, who will Monitor any samples that are being taken out of the lab. (e.g. samples taken to beamline or returned to storage).
- Remove gloves and dispose, wash and dry hands.
- Exit laboratory.

6.14 After exiting the laboratory

- Monitor Hands and feet using the hand foot monitor (leave overshoes on).
- Use removeable paddle to monitor face (safety specs) and front of lab coat, cuffs and sleeves.
- Remove lab coat and safety specs.
- Remove and dispose of overshoes at bench.

If contamination is found at any point stop and follow procedures for a minor spill detailed in the contingency plans (Appendix 3).

6.15 Disposal of solid radioactive waste

- The activity of each item of solid waste must be assessed before being placed in a bin.
- All radioactive waste needs to be disposed of via the designated disposal route using appropriate waste containers.
- Lockable solid waste containers are appropriately labelled. Additional waste containers are available for sharps if required. Non-radioactive waste should be disposed in the provided lab waste bin.
- Record forms (CEO-HP-FRM-0023) accompany each radioactive waste container. It is a legal requirement that all radioactive material can be accounted for at all times, therefore these record forms must be kept accurate with clear writing and up to date. Any error should be rectified by crossing out the incorrect entry making sure it is still readable. Obscuring / overwriting of any, wrong entry is not acceptable. An initial above the crossed

out line should be provided to identify who is correcting the entry. The correct entry should be written in a new line.

6.16 Disposal of aqueous liquid radioactive waste

- A sluice is provided in the AMB wet lab for the disposal of liquid waste.
- The activity of the liquid waste must be assessed before being disposed.
- Liquid waste should be poured in the centre of the sluice, the cistern must be flushed following each disposal.
- The sluice must be monitored following disposal and recorded (log sheet CEO-HP-FRM-0018)

Organic liquid waste must not be disposed of via the sluice or sink.

7. Access / Working Instructions

7.1 All staff, users and contractors entering the Supervised Areas covered by these Local Rules are required to attend a Health Physics radiation safety training session dealing with the radiation hazards present around the laboratory and the contents of these Local Rules.

7.2 All staff, Users and contractors are required to obey all safety signs displayed at the doors and inside the laboratory.

8. Classified/ Non-classified Workers

8.1 All classified radiation workers employed by DLS are issued with personal dosimeters. These dosimeters should be worn for the period indicated on the dosimeter. Classified workers in the employment of another radiation employer who are visiting DLS (other than as outside workers) will have appropriate dosimetry issued by their employer. Classified workers must wear their dosimeters at any time that they enter any DLS Controlled or Supervised Areas. All classified workers employed by DLS will receive training in radiation safety before commencing work with radiation.

8.2 Classified workers have a duty of care to their dosimeter – information on use and care of dosimeters is provided to all Diamond staff when they become classified workers – see the DLS Health Physics leaflet "Wear Your Dosimeter".

8.3 Non-classified Workers

Some non-classified workers at Diamond have been chosen to be part of a 'control group'. They are issued with personal dosimeters on a quarterly basis. The purpose of this practice is to ensure that Diamond's working areas have been correctly designated for radiation protection purposes. All workers in the 'control group' must wear their dosimeters at any time that they enter any DLS Controlled or Supervised Areas.

9. Incidents, Accidents and Contingency Plans

Section 9 below covers incidents involving radioactive materials and/or contamination of items or building structures. Personal contamination events are covered in Appendix 3.

9.1 The possibility of radioactive spill, contamination, accidents and incidents involving radioactive samples cannot be eliminated totally.

9.2 If the fire alarm sounds:

- Remove all PPE and place in the Emergency PPE bin. DO NOT MONITOR HANDS AND FEET.
- Exit the building through the swing gates and go the muster point under the link bridge.
- When the all clear is given monitor hands and feet on entering the AMB, contact Health Physics if the monitoring shows contamination may be present.

9.3 If the fire is within the AMB:

- Contact Health Physics (x8605)
- If samples are in use in the labs, tell health physics what samples in use, amount and location.
- Heath Physics will inform the fire service on arrival of the location and amount of all radioactive material in the AMB.

9.4 If contamination is detected when unpacking stock:

- Repack and store securely.
- Ensure contamination has not spread using an appropriate monitor.
- Contact the RPS.

9.5 In the case of a spillage or leak of radioactive solution notify the RPS, if safe to do so or shout for someone else to do so; do not leave the laboratory to contact the RPS. Check for personal contamination and if contamination is not regarded as being significant e.g. only small spots on sleeves or the body of the lab coat, then proceed as follows:

- Examine gloves to ensure they are intact, changing gloves and monitoring hands as necessary.
- Place absorbent material around the spill to contain and absorb the spilled liquid.
- Place soiled absorbent material in designated plastic bags.
- Monitor the affected area and decontaminate using dry or wet tissues.
- Repeat monitoring and decontamination as required until area is below background counts. Use Decon 90 (COSHH assessment), alcohol or detergent if required. Initially use a mild detergent rather than Decon solution (or similar).
- Arrange for disposal of contaminated materials as radioactive solid waste.

If personal contamination is found, follow the contingency plan in Appendix 3.

9.6 If a source is not in the expected location, then proceed as follows:

- Check the source is not currently being used.
- Ask other users if they moved the source to a different location.
- Check other designated laboratories

If the source cannot be located inform the RPSs.

- The RPS will conduct an investigation and inform the RPA/ Health Physics Team.
- If necessary the RPA will contact the appropriate authorities as required.

9.7 A contingency plan (Appendix 3) has been written to cover reasonably foreseeable accidents involving persons being contaminated with an unsealed radioactive material.

Appendix 1 – Names of Nominated People

Position	Name	Tel Ext.
Chief Executive Officer	Andrew Harrison	8811
Science Director (Physical Sciences)	Adrian Mancuso	8984
Science Director (Life Sciences)	Professor David Stuart	8877
Radiation Protection Adviser & HP Team Leader Health Physicist	Richard Doull Sanjeev Faruk	8269 8875 8605 (HP Team)
Radioactive Waste Adviser	Paddy Copeland (Aurora HP)	01235 820049 07917 804466
Head of Science Infrastructure Group (safety responsible person for AMB)	Pam Reynolds	7517
Principal Beamline Scientist (I20) & Lab Manager for Experiments (AMB)	Fred Mosselmans	8568
Laboratory Instrumentation Technician	TBC	94091
RPSs**: All Experimental Hall Coordinators (EHCs) as listed below have been appointed RPSs:		
	EHC General Number	8787
EHC	Leslie Clinker	8737
EHC	Alistair Donaldson	8751
EHC	Nicholas Gorringe	8732
EHC	Douglas Scott	8724
EHC	Nathan Sear	8733
EHC	Paul Symes	8731
EHC	Nick Franklin-Brewer	8604
EHC	Robert Hailstone	7486
EHC	Steven Beckett	394173
EHC	Adrian Marsh	8682
HP Technician	Anthony Attoe	7698
Operations Shift Leader	Control Room	8899 (01235 778899 from a mobile phone)

Note – At least one RPS required to be present/ available in the working hours on weekdays to fulfil the requirement of IRR, Reg – 18(5), ACOP para-350.

Appendix 2 – Designation of Areas

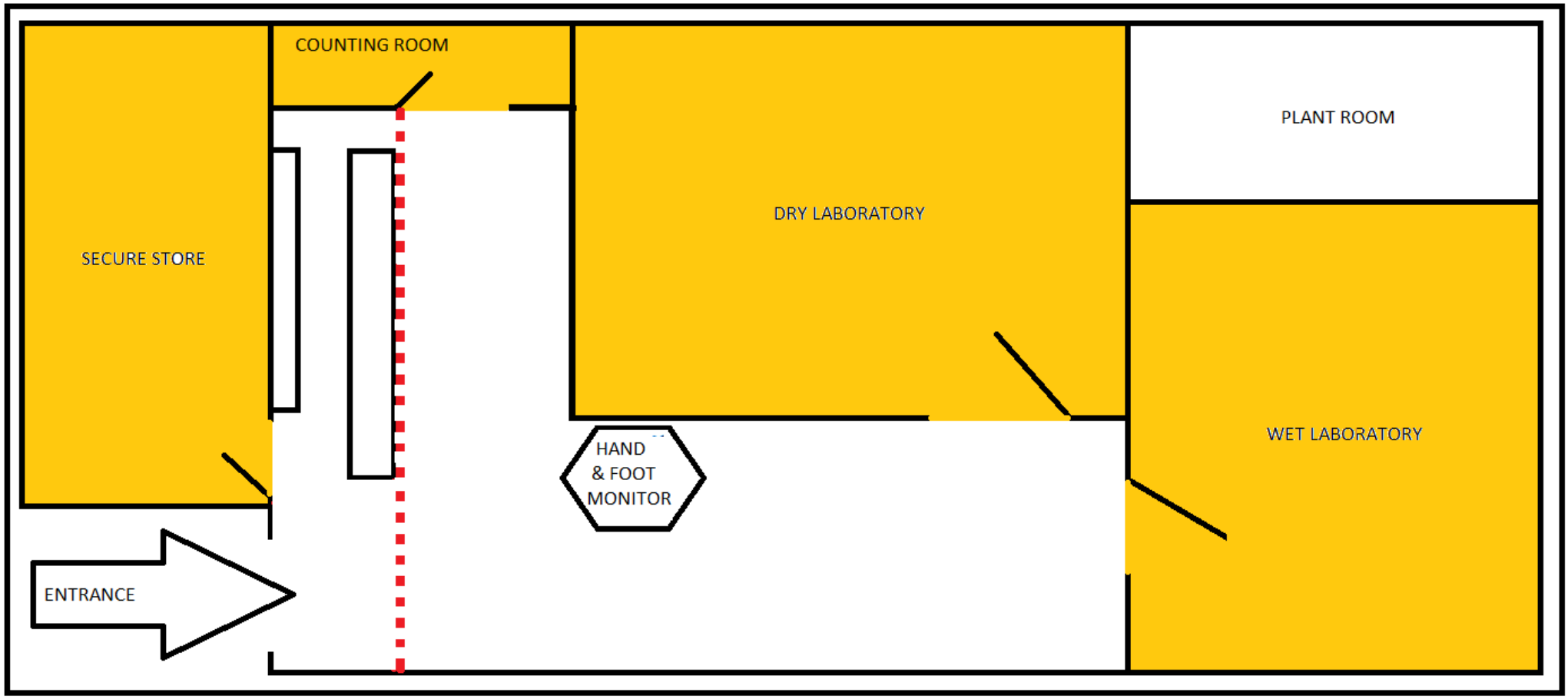

Fig. 1: Layout of rooms within the AMB (Supervised Areas are highlighted yellow).

Appendix 3 – Contingency Plan for radioactive contaminated individuals

Users of unsealed radioactive sources at Diamond Light Source may, as a result of an accident become contaminated. Where a person believes they have been contaminated with unsealed radioactive material, contact Radiation Protection Supervisor (RPS) (8787) or Health Physics (HP) (8605) as soon as possible for advice.

Methods:

Where a person believes that they have been contaminated with the radioactive material, they must seek help for decontamination from RPS, HP or Emergency Controller (EC). Initial advice will help to stop further spreading contamination and decontamination to reduce/eliminate any chance of long term radioactive exposure from a contaminated surface.

Step -1: Provide advice

1. Ask 'not to panic' and tell them someone is on their way to help and ask them not to touch anything else, if possible, stay where they are. Ask about nature (i.e. location, type of isotope, activity, working nature etc.) of the contamination and its location/area (i.e. hand, cloth, shoes or floor etc.). Share this information with the emergency (i.e. EHC, RPS or HP) responder (i.e. EHC, RPS or HP) to alert.

    - If it's skin, advise them to start washing, if there is a sink in that area, with soap and tepid water (do not use hot water, as this opens pores, therefore the contamination is more difficult to remove). Monitor and repat if required, no more than 3 times.
    - If they need to leave that area for washing to go to the nearest sink,
    - If it is, clothes/shoes ask them to take it off and place it in a waste bag (if available) or store it in a suitable place avoiding the contaminated part touching the surface. Ask to cover the shoes with over shoes, if available, if they cannot remove it at that time.

Step -2: Provide assistance

2. Upon receiving a call for help due to radioactive contamination, following steps must be taken:

- Inform an RPS (8787) and Health Physics Team (8605) for assistance. More contact details in Table 1.
- On your way, pick up the 'Grab BAG' from the emergency response kit location (in each zone in the diamond ring). It contains useful items for dealing with radioactive contamination incident including a set of procedural steps and signs (detail of list of items in Table 2).
- On arriving, the attendees must don a lab coat or coverall (disposable), gloves (double), safety glasses and over shoes (double) (available in grab bag).
- Before entering the room, use a radiation monitor to access the extent of the contamination (radiation monitors are kept by the Radiochem lab door entrance or each beamline have a radiation monitor).
- If there is contamination on the floor, bench coat/ incosheet (in grab bag) can be laid (absorbent side down) to stop the contamination being spread.
- The contaminated individual shall now be monitored, with the assistance of the RPS. Clothing/shoes must be removed and placed in a bag, labelled with a trefoil and the words 'RADIOACTIVE' (available in grab bag).
- If the person's hands are contaminated they shall be washed with soap and tepid water (do not use hot water, as this opens pores, therefore the contamination is more difficult to remove) or use radiacwash wipe gently (in grab bag). Help turning on taps and applying soap may be required to avoid spreading contamination.
- Monitor the hands after washing and repeat as necessary, do not wash more than three times.
- If contamination to the skin is widespread, dress the casualty in a disposable coverall and overshoes (in grab bag), and escort them to the nearest showers (DR Zone 10 or ground/1st-floor diamond house).
- A sign must be placed on the ***shower cubicle*** (**Appendix 1** for sign/ grab bag) and be put out of use until it can be decontaminated.
- A sign must be placed on the ***laboratory door and locked & if left unattended***. (**Appendix 2** for sign/ grab bag)
- If the contamination on the floor of an open space (i.e. experiment hall or Beamline floor) mark the area with a marker pen in grab bag and raise a boundary. A sign must be placed on the ***contaminated area boundary*** (**Appendix 3** for sign/ grab bag) to prevent spreading contamination until it can be decontaminated. Use radioactive tape (in grab bag) for the boundary.
- Clean up of the laboratory can be carried out by Health Physics and the RPS.

Where a member of staff is discovered injured and has been working with unsealed radioactive material in addition to the above the following steps must be taken:

- Contact a first aider as well as the RPS and Health Physics
- The first aider shall attend to the casualty using standard first aid practice and taking advice from Health Physics as to the radiological hazard. (In this situation life-saving measures take precedence over radiological concerns).

If the casualty is unconscious not all the steps above can be followed, it is important to remember that in most cases life-saving measures take precedence over radiological concerns, but take advice from the RPA/RPS.

If an ambulance is required:

- Follow standard first aid practice.
- When the ambulance arrives to give them all the information including the nature of the radiological hazard. (Some ambulance services have been trained in dealing with radioactively contaminated casualties and have procedures in place).
- A member of staff with some radiation protection training shall accompany the casualty to hospital, during office hours this would preferably be the RPA. Out of office hours, the EHCs (who are all trained as RPSs) could accompany the casualty.

In the case of skin cut or puncture wounds internal exposure is a hazard for the casualty:

Minor injury (if puncture wound)

- Directly monitor the wound and the article causing the injury for contamination.
- Encourage bleeding and irrigate the wound with clean water.
- Cover the wound after a few minutes irrigation and seek medical advice.
- Arrange for analysis of the injuring article or a wipe taken from it. This will help determine if there has been any significant internal radiation exposure to the individual.

Major Injury

- Immediately summon first aid assistance (see emergency contacts below) and treat any life-threatening condition with priority. Lifesaving measures take precedence over radiological concerns.
- If puncture wound, directly monitor the wound but in any event, arrange for a wipe to be taken from the injuring article. This will later help determine if there has been any significant internal radiation exposure to the individual.
- If the person requires removal to a hospital and he/she is heavily contaminated then, provided medical considerations allow for it, attempts shall be made to remove any contaminated clothing from the person. Subject to medical advice, contaminated areas of skin shall be cleaned with moist swabs

- Place contaminated clothing in a plastic bag and arrange for the bag to be marked with a trefoil and the words 'RADIOACTIVE'.
- If the person requires removal to a hospital then a member 0f staff (preferably the RPA) shall accompany them with a suitable radiation monitor to advise hospital staff of the circumstances of the accident.
- In the case of an emergency occurring out-of-hours, Activate the DLS emergency plan, notify RAL security (see below) and the RPA.

This contingency plan is intended to cover only the emergency phase of the incident. The plan will end when the Operations Shift Leader has formally declared the situation safe and is satisfied that in the short term a repetition of the incident is not possible. The Science Director(s) will then decide if an inquiry should be established to investigate the incident.