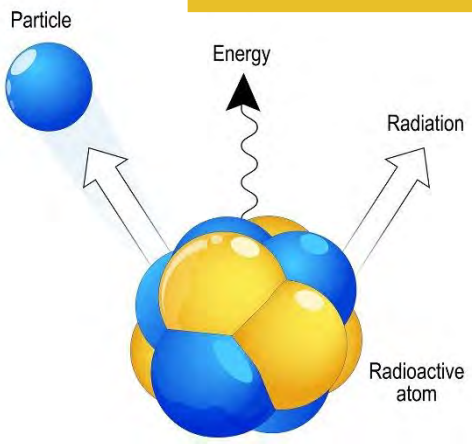
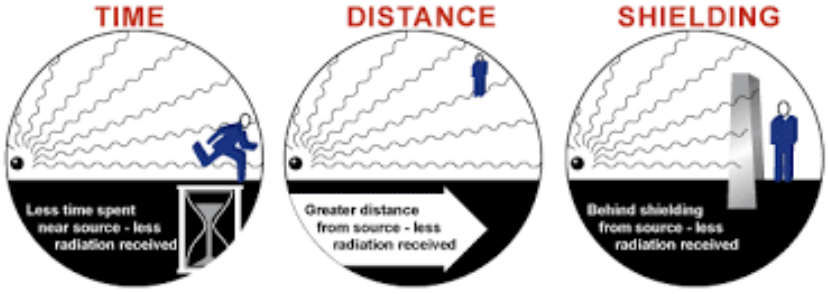
Cal Poly Humboldt.



Radiation Safety Program







Academic License No. 0462-12
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I. Preface

Radioactive material used in biological or chemical research and in instruction can be a very useful tool. These applications of ionizing radiation require that users take proper precautions to prevent the contamination of equipment and facilities, and most importantly, to protect people. Inadequate or careless use can result in unwarranted radiation exposure to individuals and serious repercussions for Cal Poly Humboldt, affecting its ability to use this material.

This manual presents the means of establishing and maintaining a working environment with exposure to ionizing radiation as low as reasonably achievable (ALARA). It is expected that the provisions will be carried out to the fullest extent to ensure the safety of all personnel having access to Cal Poly Humboldt facilities employing radiation source.

II. Introduction

The Radiologic Health Branch (RHB) is within the Food, Drug, and Radiation Safety Division of the California Department of Public Health (CDPH). The RHB has the responsibility by State Law for evaluating and licensing the use of radioactive material in California.

Cal Poly Humboldt has been issued an academic license by RHB-CDPH to possess and use radioactive materials for the purposes of instruction and research. In the licensing process Cal Poly Humboldt has committed to following specific rules as well as general State regulations.

Individual Radioactive Materials Supervisor Users (formerly RUA Holder) must be approved by Cal Poly Humboldt Radiation Safety Officer (RSO). Radioactive materials users working under such *Authorized Users* may be approved internally, as they are under the supervision and responsibility of the *Authorized User*.

This Radiation Safety Program has been established to inform users of radioactive materials at Cal Poly Humboldt of the policies that govern this use, and of the procedures required to obtain approvals. See Appendix A for Standard Work Rules.

This manual covers the possession and use of radioactive materials. A separate X-Ray Safety Manual covers the possession and use of radiation-producing machines. X-ray machines are registered with RHB and subject to its regulations but are not included in the issued radioactive materials license.

III. Policy, Purpose, And Program

1. The President's Policy

The President of Cal Poly Humboldt directs that all radioactive materials shall be handled in accordance with the official policies and protocols established in the Cal Poly Humboldt Radiation Safety Program, and with standards of applicable regulatory agencies.

2. Radiation Safety Program

The purpose of the radiation safety program is to ensure that work with radioactive materials is conducted in such a manner as to protect health and minimize danger to life and property. Use of ionizing radiation is with the purpose of furthering legitimate research and teaching goals while keeping risks and exposures as low as reasonably achievable (ALARA). Each use of radioactive material must be reviewed by the RSO. After this initial review, the RSO will forward the request to the RHB-CDPH for approval and addition to Cal Poly Humboldt's license.

3. Radiation Safety Program Manual

The purpose of the Radiation Safety Program Manual is to set forth Cal Poly Humboldt's policy, organization and operating procedures and standards for conduct of the Cal Poly Humboldt radiation safety program. In addition, the Manual provides a guide to individuals using or having responsibility for the use of radioactive material in complying with Cal Poly Humboldt's policy, with conditions stipulated in Cal Poly Humboldt's license for use of radioactive materials, and with pertinent and applicable regulations of governmental agencies.

4. Distribution and Custody of the Written Radiation Safety Program

Each Radioactive Materials *Authorized User* (RAM-AU) will be assigned a copy of this Radiation Safety Program at the time of his or her initial request to the RSO. This copy shall be kept at all times in the area where the radioactive materials are used, as a reference for persons engaged in the project.

IV. The President's Authority and Responsibility Delegation

The President of Cal Poly Humboldt is vested with the authority and responsibility for ensuring that the campus radiation safety program is effectively implemented and in compliance with all relevant government regulations.

To this end, Cal Poly Humboldt has assigned a campus Radiation Safety Officer, who is approved by the CDPH-RHB, to manage and implement the campus Radiation Safety Program.

1. Radiation Safety Officer

The Radiation Safety Officer (RSO) is responsible for the review of campus performance with respect to Cal Poly Humboldt's policies on radiation and radiation protection and for informing the Director of Environment, Health & Safety (EH&S) and Radiation Safety Committee on matters related to radiation safety.

The RSO is responsible for all aspects of radiation control on the campus. Annual reporting requirements include the following:

1. Written review of the radioactive materials program provided to the Radiation Safety

Committee.

2. Inventory update of government-owned sealed sources to the NMMSS On-Site Recovery Program.
3. Reporting to the RHB of any applicable incidents that occur.

See Appendix B for a complete list of RSO responsibilities.

2. Radiation Safety Committee

The Radiation Safety Committee (RSC) assists the RSO with program management and enforcement.

When radioactive materials are in use, the RSC should meet at least once a year for the purposes of reviewing the Radiation Safety Program and to consider matters needing its attention.

1. The Committee members will include the RSO, Associate RSO, Chair (also the RSO), *Authorized Users*, and at least one faculty member.
3. The RSO and Committee Chair shall be present at all RSC meetings.
4. The RSC may institute controls more stringent that that required by the RHB if deemed necessary to protect personnel safety, Cal Poly Humboldt property, or the environment.

3. RAM Authorized User

Each radioactive materials *Authorized User* (RAM-AU) is personally responsible for compliance with campus and governmental regulations as they pertain to the authorized use of ionizing radiation, such as the following:

1. Maintenance of current records regarding:
    - Receipt, use, and disposal of radioactive material.
    - Monitoring of laboratories and workplaces, including, where appropriate, radiation and contamination levels.
    - Personnel engaged in radiation work under his/her supervision.
2. Having required records available for inspection at reasonable times by the RSO or government inspectors.
3. Documented instruction of all personnel under his or her supervision in proper procedures for control of radiation hazards and reduction of exposures.
4. Posting of required warning signs and labels, and for ensuring the proper storage of radionuclide containers.
5. Enforcement of requirements by all individuals on his or her radioactive materials use agreement
6. Disposal of all radioactive wastes in accordance with approved procedures.

4. Individual Authorized Users (students included)

Each *Individual Authorized User* is responsible for keeping all radiation exposures to himself or herself and others as far below the legal limits as practicable; for knowing and observing all precautions required by this Manual and the license; and for informing the RAM-AU or RSO of any unsafe conditions known to exist.

V. Cal Poly Humboldt Radioactive Materials License

Cal Poly Humboldt has a non-medical Academic License from the RHB-CDPH. Copies of this license are available for inspection at the office of the RSO. This license allows use of specific radioisotopes with specific limits of inventory for each.

Each radioactive materials *Authorized User* (RAM-AU) is approved by the RSO. The Radiologic Health Branch (RHB) inspects Cal Poly Humboldt periodically to determine compliance with license requirements, standard work practices, and federal/state regulations.

1. Conditions Requiring Cal Poly Humboldt License Amendments

All requests for additions or changes to license conditions must be vetted by the RSO before being forwarded to the RHB for approval and license amendment.

1. Use of radioactive material not specifically included in the license.
2. Quantities in excess of the maximum stipulated in the license.
3. Use at locations or field stations not authorized in the license.

VI. Obtaining Approval for Use of Radioactive Materials

1. Application Process for New Authorized Users

The RSO collects the necessary documents from the applicant and performs the initial review prior to authorization.

1. Fill out the forms below and add any supporting documentation.
   - RH 2050A form, "**Training and Experience**", from the RHB
   - Cal Poly Humboldt "**Authorized User Application for Radioactive Materials**" (See Appendix C)
2. Provide the completed forms to the RSO for review.
3. The RSO will notify the *Authorized User* of approval prior to start of work with radioactive materials.

2. Process to Modify An Approved Use

Significant changes to the approved project or use of radioactive materials will usually require a license amendment. Any increase in quantity of materials possessed or the addition of a new radioisotope to the project must first be reviewed by the RSO. The RSO will then work with the applicant to submit a license amendment package to the RHB.

1. Fill out the forms below and add any supporting documentation:
    - Request for proposed change in writing to the RSO
    - Cal Poly Humboldt RAD-A form, "**Application to Use Radioactive Materials**"
2. The RSO will submit a signed letter to the RHB requesting the license amendment.
3. Wait for notification of approval and license change from the RHB before implementing the changes.

3. Process to Add a New Location

Adding a new location, whether a new room or off-site use will require a license amendment.

1. Fill out the forms below to add a new room, building, or other on-site location with the same address as the main Cal Poly Humboldt Campus:
    - Request for proposed change in writing to the RSO
    - Cal Poly Humboldt RAD-A form, "**Application to Use Radioactive Materials**"
2. Work at an off-site location, including work done at sea, requires additional documentation:
    - RHB "Radioactive Material License Application" form RH 2050, available on the RHB website
    - Acknowledgement or approval to use radioactive materials from the owner, operator, or responsible entity of the off-site location (if applicable)
3. The RSO will submit a signed letter to the RHB requesting the license amendment.
4. Wait for notification of approval and license change from the RHB before starting work.

4. Process to Add Non-Authorized Users

Adding new radioactive materials users to a project under the supervision and responsibility of the *Authorized User*, does not require a license amendment. The RSO can approve them internally and add them to your project/use.

1. Fill out the radioactive materials "**New User Enrollment Form**" (see Appendix C) for each person and submit them to the RSO.
2. New users must complete a radiation safety training class with the RSO or equivalent.
3. New users must complete and document job-specific training with the *Authorized User* or his/her designee
    - No work with radioactive material is permitted until the "**New User Enrollment**

Form" and initial radiation safety training is finished.

- No unsupervised work is permitted until the job-specific training is complete.

5. Termination of Radioactive Materials Use

An Authorized *User* may terminate his or her approval by making a request in writing to the RSO.

1. RAM-AU must remove all stock vials, sealed sources, and contaminated materials from their space. Unused stock must be returned to the RSO or transferred to another *Authorized User*. All RAM must be accounted for to the RSO.
2. The RAM-AU must wipe down all surfaces and take a final set of contamination wipes (unsealed source use).
3. The RSO will arrange to decommission the space as directed by the RHB and ultimately amend the license to remove the affected spaces.

The RSO may suspend an authorized use if the *Authorized User* is found to be in violation of his/her use agreement or the Cal Poly Humboldt Radiation Safety Program, until the issue(s) are corrected.

In cases where the *Authorized User* is found to be willfully or negligently in violation of his/her authorization or the Cal Poly Humboldt Radiation Safety Program, the authorization may be terminated and radioactive materials impounded by the RSO.

VII. Procedure For Procurement Of Radioactive Materials

All radioactive material acquired must be within the bounds of the radioactive materials license. Prior to ordering from a vendor or obtaining material from another source, *Authorized User* or his/her designee must obtain prior-approval from the RSO.

Authorized Users are required to maintain an accurate log of all acquired radioactive materials in their lab radiation safety documents binder. Copies of the log form are available in Appendix C.

VIII. Delivery And Custody Of Radioactive Materials

1. Receiving Radioactive Materials

The receiving department or staff must inspect each shipping container for damage. If the shipment is in good condition they shall deliver it to the *Authorized User* or designated *Authorized User*. If not in good condition, the RSO will be notified and the package and carrier held at the receiving location.

1. The *Authorized User* or designated *Authorized User* shall inspect the package and complete a " **Radioactive Material Receipt and Monitor Log** " form. A copy must be forwarded to the RSO as soon as possible along with attached wipe test report.

2. The designated authorized radiation user will inspect the radioactive material package using the following standard operating procedure:
   a. Don standard PPE: lab coat, gloves etc.
   b. Check for damage of shipping containers. Notify RSO if damaged or leaking.
   c. Check radiation levels external to the package, if required by DOT regulations (yellow label packages). The RSO or RTC Lab Coordinator must perform this step.

   Note that most radioactive materials ordered by Cal Poly Humboldt are at quantities that do not require the yellow label.

   d. Read supplier's instructions for special operating procedures (if any).
   e. Open package and verify the type(s) and quantities of radioisotopes. If there is suspicion of damage or leakage of primary container, perform a leak test.
   f. Perform wipe test of labeled packages and inner containers to check for contamination.
   g. Initiate decontamination procedures when contamination is found in excess of 200 dpm per l00 square centimeters (cm^2)

      For packages that are contaminated or have excess dose rate, the RSO or authorized designee will notify the shipper and vendor.

      Criteria: External removable contamination >2200 dpm/100 cm^2. For gamma-emitters, contact package radiation level >200 mrem/hr, > l0 mrem/hr at 1 meter.

2. Custody/Inventory Of Radioactive Materials

Once delivered to the *Authorized User*, that user shall become continuously responsible for the proper storage, labeling, inventory accounting, use, and disposal of the material. All material will be stored in secure areas, accessible only to *authorized users*.

The *Authorized User* shall maintain a continuous inventory of these radioactive materials. The radioactive materials inventory shall be available to the RSO at anytime. At lease annually, the RSO will request an updated inventory.

The RSO will track the full campus inventory and provide a summary to the Radiation Safety Committee at least once per year.

IX. Instruction Of Personnel In Radiation Protection

1. Initial Radiation Safety Training

Prior to handling unsealed or non-exempt radioactive materials, all prospective users, including *Authorized Users*, must complete initial radiation safety training from the RSO or other appropriate source. This training includes review of the physics of radioactivity, biological effects, radiation safety principles, and Cal Poly Humboldt radiation program requirements. A written test is required.

Authorized Users must have the following documents on file and may work with radioactive materials unsupervised:

1. Enrollment/Training and Experience Form
2. Initial Radiation Safety Training (written test on file)
3. On-the-Job Training form on file
4. Refresher training documented (when applicable)

2. On-the-Job Training

In addition to the initial radiation safety review, prospective *authorized users* must go through "on-the-job" (OTJ) training with their *Authorized User* or his/her designee. *Authorized Users* must provide specific training for *authorized users* under their supervision regarding hazards, procedures, and requirements of their project and work space. A copy must be sent to the RSO and the original kept in the recordkeeping binder.

3. Refresher Training

Annual refresher training is required for all individual *Authorized User* of *unsealed sources* to maintain " *Authorized User*" status. *Authorized Users* using only *sealed sources* may require annual refreshers as directed by the RSO or recommended by the RSC.

Enrolled students using sealed sources in classrooms are exempt from refresher training. Classrooms: Students working with sealed sources and other approved radioactive materials must be physically supervised by the instructor.

Ancillary personnel who will have to work in radiation-controlled areas must be brought to the attention of the RSO so they may be briefed appropriately.

X. Radiation Exposure Limits And Policy

1. ALARA Policy

Cal Poly Humboldt has an aggressive policy to prevent unnecessary radiation exposures to persons and the environment and to reduce all exposures to as low as reasonably achievable (ALARA), in accordance state regulatory requirements.

2. Occupational Dose

Radiation exposure shall be ALARA, but in no case exceed the regulatory dose limits specified below when exposures from external and internal sources are added together. Cal Poly Humboldt has established lower administrative limits as part of our ALARA policy.

Occupational Dose Limits

Category of Dose Equivalent	Regulatory Limit	Cal Poly Humboldt Administrative Limit
Total Effective Dose Equivalent (TEDE):	5,000 mrem/yr	500 mrem/yr
(Eye) Lens Dose Equivalent (LDE):	15,000 mrem/yr	1,500 mrem/yr
Shallow Dose Equivalent (SDE) Skin or extremities (hands and forearms, feet and ankles):	50,000 mrem/yr	5,000 mrem/yr
Total Organ Dose Equivalent (TODE):	50,000 mrem/yr	5,000 mrem/yr
Minors (individuals < 18 years of age)	500 mrem/yr or 10% of NRC limit allowed for adult workers	100 mrem/yr or 20% of CAL POLY HUMBOLDT administrative limit allowed for adult workers
Pregnant workers	500 mrem/9 mos* *gestation period	50 mrem/9 mos*

3. Public Dose

Public radiation exposure shall be ALARA, but in no case exceed the regulatory limits specified below when exposures from external and internal sources are added together. All activities conducted in a controlled area shall limit the exposure of non-radiation users to the regulatory limits for members of the public. Public exposure limits apply to students involved in educational activities (not otherwise qualified as radiation workers), "non-occupationally" exposed staff, faculty, and members of the public.

Public Dose Limits

Category of Dose Equivalent	Regulatory Limit
Annual Limit:	100 mrem/yr
Limit/guideline for dose in unrestricted area (public areas) in any one hour	2 mrem

4. Prenatal Radiation Exposure Policy

All female *Authorized Users* are strongly encouraged to contact the RSO and declare their pregnancy if they are pregnant or are planning to become pregnant. Due to the nature of the work done at Cal Poly Humboldt and the type of radioactive materials, doses and exposures to ionizing radiation at Cal Poly Humboldt are typically far below regulatory or administrative limits. However, there may be some cases where special precautions may be necessary to limit exposure.

- To be identified as officially "pregnant", written notification to the RSO is required. A "**Declaration of Pregnancy Form"** is in Appendix C.
- Once submitted, the RSO will provide information on risks to the developing embryo/fetus from ionizing radiation.
- Options for monitoring and maintaining external and internal doses and exposures as low as reasonably achievable (ALARA) may be reviewed with the RSO.

  Exposures must be maintained below the Cal Poly Humboldt administrative limits of 100 mrem/yr *(body)* or 20% below *skin* or *extremity* limits.
- "Declaring" one's pregnancy is not required. However, if not declared in writing, dose/exposure limits remain at standard occupational levels.
- Discussion of the potential risks with one's doctor is recommended.

XI. Dosimetry and Bioassay

The RSO will require issue of dosimetry or biological sampling of *Authorized Users* if it is likely that an individual will receive greater than 10 per cent of the regulatory limits noted above. In general, body and extremity dosimeters will be required for those handing millicurie amounts of gamma emitting or high-energy beta emitting radioisotopes. If there is a significant risk of internal exposure due to the handling of volatile or dispersible radioisotopes, urine bioassay sampling will be required. This determination will be made by the RSO during the evaluation process of new use requests.

Individuals subject to these requirements will receive an annual report of radiation exposure, and will be immediately notified of any significant exposure (greater than 10 per cent of annual limits during an assay period). Procedure modification and/or work restrictions will be made as appropriate, based on exposures.

XII. Radiation Monitoring and Surveys

Immediately following the use of radioactive materials, users shall monitor the area and equipment for contamination (and for dose-rate if applicable).

Every area in which radioactive materials are used shall have a survey instrument capable of detecting hazardous amounts of radiation. These instruments shall be continuously available for routine monitoring and for hazard survey following a radiation incident. These survey instruments shall be serviced annually.

- At least monthly, or as directed by the RHB, a thorough, documented wipe and instrument survey of all areas used with radioisotopes must be conducted.
- Contamination found outside the controlled work area (usually a papered bench area) identified by reading above background must be investigated, cleaned and retested.
- For designated work surfaces, cleanup criteria are 200 dpm per 100 square centimeter wipe or any reading above 100 CPM on a meter.
- Significant contamination must be immediately reported to the RSO - see EMERGENCIES. All wipe results must be reported in dpm.
- If a project is finished or inactive for a period of time, this must be documented in the survey log in lieu of a monthly survey.
- The RSO shall conduct periodic surveys and compliance audits.
- Survey meters shall be calibrated at least annually by a qualified service provider.

XIII. Posting And Labeling

All rooms in which radioactive materials are used or stored shall be posted "**CAUTION- Radioactive Material**". These rooms will have controls in place to prevent unauthorized access to radioactive materials.

Areas where radiation levels exceed 5 millirem per hour, or greater than 100 millirem in 5 consecutive days must be posted with the radiation symbol and the words, "**CAUTION – Radiation Area**". These rooms will have access controls to prevent entry by unauthorized personnel.

Workspaces, such as bench tops, used for radioactive materials must be delineated with "**Caution-radioactive material**" label tape.

All containers holding radioactive materials for storage, or during processing and use, and equipment that may be contaminated shall be conspicuously labeled "CAUTION- Radioactive Material." Exception: counting samples. Containers with larger amounts of material should have the isotope and amount on the label.

State Form RH2364 "**Notice to Employees**" shall be permanently and conspicuously posted within areas in which radioisotopes are used

XIV. Shipment Of Radioactive Materials

Shipment of radioactive materials must conform to appropriate state and federal transportation regulations. The RSO must be informed prior to any shipment of such materials from Cal Poly Humboldt, in order to insure compliance with these regulations.

XV. Disposal Of Radioactive Waste

Radioactive waste will be collected in specially labeled approved closed receptacles in specific locations in each laboratory. High-energy beta emitters and gamma emitters must be properly shielded. Waste must be segregated by type (LS vials, solid, liquid, stock vials, mixed chemical, mixed biohazard) and radionuclide. Solid waste shall not contain any liquids and shall be contained in transparent plastic bags. Liquid scintillation vials shall be collected in plastic-lined containers or drums. Liquid waste shall be free of solids stored in glass bottles in secondary containment or stored in appropriate DOT collection drums.

During waste accumulation, keep track of the activity and composition so the waste may be properly characterized at pick-up. Notify the RSO prior to the creation of mixed chemical/radioactive waste.

1. When waste containers are 3/4 full, fill out a waste transfer tag with isotope, activity, chemical components, etc.
2. Survey the outer container by wiping. If the wipe is above 220 dpm, re-bag it.
3. Attach the "**Waste Transfer Form**" in Appendix C. Notify the RSO for pickup via Cal Poly Humboldt's Hazardous Waste Pickup Request Form.

A. Decay-In-Storage Method of Waste Disposal

This method involves properly storing the material and allowing the radioactive material to decay while in storage. Only radioisotopes with half-lives ≤ 90 days are eligible for disposal through decay-in-storage (DIS). Examples of eligible isotopes are P-32, P-33, S-35, and I-125

- Only the RSO may store and dispose of DIS material
- Storage must be secure and separate from other activity areas
- Each material in the DIS storage area will be tracked by the RSO.
- Materials must be stored for at least ten (10) half-lives.
- Before disposal as normal waste, materials will be surveyed to determine that its radioactivity cannot be distinguished from background. All radiation labels will be removed or defaced.
- The RSO will maintain records of the disposal of decayed materials for three (3) years.

B. Releases of Effluent

Cal Poly Humboldt does not currently release effluent.

XVI. Animal Use

Cal Poly Humboldt does not currently use radioactive materials with animals.

A complete description of the animal use and the facility will be provided before applying to the RHB for such use in the future.

XVII. Human Use

The administration of radioisotopes, internally or externally, to humans is not permitted at Cal Poly Humboldt. Any such use must be done at a campus or institution where an approved Human Use Committee is constituted, and all work will be under its jurisdiction.

XVIII. Emergencies

For all campus emergencies, call 911. For campus emergencies involving radioactive materials, the following is required.

For any spill or contamination detected outside the papered work area, stop work, cover the area with paper or plastic to prevent spread. Use moist material for dry contamination. Warn others in the area and restrict movement. Call 911 and have the police contact the RSO. Start monitoring personnel and have them remain in the area until the RSO arrives. If there is a potential inhalation hazard assemble in a safe area until the RSO arrives. Turn off the room ventilation, if possible, and close the windows and doors.

For fires and/or injuries involving radioactive materials, call 911 immediately. Advise the Dispatcher of the involvement of radiation. Ask the Dispatcher to contact the RSO. It is the responsibility of the Dispatcher to notify the responding agency (Fire Department and/or ambulance) of the involvement of radioactive materials, however the person reporting the accident should remain near the scene and advise these agencies of any pertinent information concerning this involvement.

For minor spills of radioactive materials with no significant skin contamination or physical injuries (contamination only in the controlled, papered work area), the following procedures should be used to decontaminate experimental equipment and facilities:

1. Monitor to determine the level and location of contamination. Mark off contaminated areas with radioactive caution tape.
2. Remove contaminated clothing then bag as radioactive waste.
3. Wash contaminated skin with a non-abrasive soap and cold water.
    - The sink can be decontaminated later. Focus on gently washing the skin
    - Keep contaminated wash water away from the skin. Abrasive cleaners and hot water

can increase absorption into the skin.

4. Dispose of anything that does not need to be reused into the radioactive waste. Clean items to be reused with appropriate decon material. Dispose of cleaning material into the radioactive waste. Wipe items and release only if <200 dpm per 100 sq. cm. and non-detect with a meter.

For assistance with monitoring, contact the RSO.

The Regulatory Agency numbers are 916-327-5106 (State RHB Office) and 800-852-7550 (24-hour radiological emergency number).

APPENDIX A Standard Work Rules

The following rules of good radiation protection practice should be scrupulously observed by all radiation workers to prevent unnecessary radiation exposure and minimize contamination.

1. Wear lab coats and impermeable gloves when working with unsealed radioactive material.
2. Use trays or tubs to store and transport containers of radioactive solutions that will hold the contents of the primary container in the event of breakage.
3. Store and transport liquid forms of radioactive material in securely closed containers.
4. Line trays and working surfaces with absorbent paper that has an impermeable backing.
5. Clearly label all containers of radioactive material and post all radiation and storage areas with the standard radiation warning symbol.
    - Labels on containers should bear the legend, "**Caution - Radioactive Materials**", preferably with an indication of the nuclide and quantity of radioactive material.
    - Placards for posting of radiation and storage areas should bear the legend, "Caution-Radioactive Materials". Areas with a radiation level exceeding 5 mR/hr at 1 foot must have appropriate labeling.
6. Use remote handling tools when needed to reduce hand exposure (P-32, gamma emitters).
7. Shield stored P-32 and gamma emitters appropriately.
8. Always use assigned dosimeters when handling material requiring them.
9. Conduct work with radioactive material in accordance with written radiation safety and operating procedures.
10. Monitor work areas, hands and clothing during procedures and at the end of the day. Perform required periodic documented wipe and meter surveys.
11. Report and/or clean spills and contamination promptly.
12. Do not eat, drink, smoke or apply cosmetics in areas where unsealed radioactive materials are used.
13. Use remote pipettes—Do not pipette by mouth.

APPENDIX B RSO Duties and Responsibilities

CDPH 8243 MRA (04/18)

Duties and Responsibilities of the Academic Radiation Safety Officer and Delegation of Authority (Non-Medical)

Radiation Safety Officer (RSO) duties and responsibilities include ensuring radiological safety and compliance with California and Department of Transportation (DOT) regulations and the conditions of the license. These duties and responsibilities include ensuring that:

1. General surveillance is provided over all activities involving radioactive material, including routine monitoring, special surveys and responding to events
2. Incidents are responded to, investigated, and cause(s) and appropriate corrective action(s) are identified and timely corrective action(s) are taken
3. Proper authorities are notified of incidents such as loss or theft of licensed material, damage to or malfunction of sealed sources and fire
4. Violations of regulations or license conditions or program weaknesses are identified, effective corrective actions are developed, implemented and documented, as needed
5. Immediate termination of all activities following any unsafe condition or activity that is found to be a threat to public health and safety
6. RSO is the primary source of radiation protection information for personnel at all levels of responsibility
7. Radiation exposures are ALARA and ALARA practices are being followed
8. 10 CFR Part 20 and investigational levels are followed
9. Radiation protection procedures in the daily operation of the licensee's radioactive material program are developed, distributed, implemented and are up-to-date
10. Audits of the radiation protection program are performed and documented at least annually
11. Possession, use, and storage of licensed material are consistent with the limitations in the license, the regulations, the NSSDR Certificate(s), and the manufacturer's recommendations and instructions
12. Individuals installing, relocating, maintaining, or repairing devices containing sealed sources are trained and authorized by an NRC or Agreement State license
13. Training is personnel conducted and is commensurate with the individual's duties regarding licensed material
14. Documentation that individuals are not likely to receive, in one year, a radiation dose in excess of 10% of the allowable limits
15. The RSO is to verify that the total effective dose equivalent does not exceed the annual limit

for members of the public. This determination is to be documented by measurement or calculation

16. When necessary, personnel monitoring devices are used and exchanged at the proper intervals, and records of the results of such monitoring are maintained
17. Fume hoods and glove boxes used for volatile radioactive material work are monitored for proper operation
18. The receipt, opening and delivery of all packages of radioactive material arriving at the laboratory are overseen and coordinated
19. An inventory of all radioactive materials is maintained and the types and quantities of radionuclides at the facility are limited to the forms and amounts authorized by the license
20. Sealed sources are leak-tested at required intervals
21. There is effective management of the radioactive waste program, including effluent monitoring
22. License materials is transported in accordance with all applicable DOT requirements
23. Violations of regulations or license conditions or program weaknesses are identified, effective corrective actions are developed, implemented, and documented, as needed
24. Appropriate records are properly maintained
25. Up-to-date license is maintained and amendment and renewal requests are submitted
26. On-site direct evaluations of the Radiation Safety Program are made by the RSO by physically visiting the site on a monthly basis or more frequently as needed
27. Dose records and surveys are reviewed quarterly
28. The qualifications of the new users are reviewed prior to their first use of radioactive materials first use

> In the event of a RSO ending employment at a facility, the licensee must immediately notify the RHB of the event. Additionally, the facility must find a qualified individual to serve as the acting RSO and submit a completed Delegation of Authority to the RHB.

NOTE:

In the event of a proposed change in the facility's RSO or license termination, the current RSO must remain in the position until the RHB amends the license to reflect this request.

APPENDIX C Forms

Cal Poly Humboldt.

Authorized User Application for Radioactive Materials (RAM-AU)

Please TYPE or PRINT all requested information in adequate detail. Use full legal names.
Attach RH2050A form "Training and Experience" and sign below.

1. Authorized User Name: _____ Office Phone: _____

   University Position/Title: _____ Lab Phone: _____

   Department: _____ E-mail Address: _____

2. Locations {Provide detailed maps of commissioned lab spaces where radioactive materials will be used and stored}:

Building	Room#	Chem Hood/BSC?	Purpose/Activities to be performed
		□Y□N Cert Date:	
		□Y□N Cert Date:	
		□Y□N Cert Date:	

3. Names of Personnel Working Under the RAM-AU (not including students unless they are working directly on a project under a PI). Please assign a safety supervisor as a primary point of contact for the RUA if not the PI. Indicate if Male (M) or Female (F). {They will need to provide state-issued certifications and/or complete appropriate radiation safety training if they have not previously done so at Cal Poly Humboldt}:

Last Name, First Name	Gender	Date of Birth	Cal Poly Humboldt ID	Role
				Responsible PI
				Safety Supervisor
				Authorized User

4. Radioactive Materials to be Used:

Nuclide	Chemical Form(s)	Physical Form (liquid, etc.)	mCi per Experiment		mCi per Fiscal Year	
			Used for Assays	Removed from Stock	Per Single Purchase	Per Fiscal Year

5. Type of Research {Check type. Please submit separate applications for non-human and human use}:

☐ Non-human Use ☐ Human Use

6.

☐ Iodinations _____ ☐ *In vivo* _____

☐ Chemical Labeling _____ ☐ *In vitro* _____

☐ Uptake Studies _____ ☐ PET Scanning _____

☐ Sealed Sources _____ ☐ Nuclear Medicine _____

☐ Other _____

7. Description of Proposed Uses of Radioactive Materials {Briefly summarize protocols for each radionuclide and procedures to be utilized. For human use, include copies of research protocols approved by the Institutional Review Board and/or clinical protocols for routine medical uses. For nonhuman use, describe experimental procedures. If animals or plants are to be used, identify the amounts of radioactivity to be administered, type of organism, and the number of organisms per experiment, per month and per year. Include MSDS's for any hazardous materials used in experimental procedures. Please attach additional sheets as necessary}:

8. Radiation Monitoring Instruments to be Used:

Portable Survey Meters for Direct Monitoring				Laboratory Counting Equipment for Wipe Tests			
Meter(s)				LSC			
Manufacturer:		Model:		Manufacturer:		Model:	
Serial #(s):				Serial #:			
Probe(s)				Gamma Counter			
Manufacturer:		Model:		Manufacturer:		Model:	
Serial #(s):				Serial #:			

9. Radiation Protection Precautions to be Followed. {Give sufficient information about the administrative and engineering controls used to prevent accidental or unnecessary exposure of project personnel, members of the public and patients}:

10. Description of radioactive waste procedures and estimation of annual volumes. {List amounts of dry solids, liquids [both aqueous and hazardous chemicals], liquid scintillation vials/fluids, and animal carcasses. Please address issues such as sterilization of biohazardous agents, volatility of compounds, and/or mixed waste segregation}:

11. Description of radioactive material containment procedures in case of accidents, spills, or releases to the environment {i.e., available spill containment equipment, PPE, evolution of gases or aerosols, or the volatilization of any compounds}:

I CERTIFY THAT ALL WORK AS DESCRIBED ABOVE WILL BE PERFORMED IN ACCORDANCE WITH ALL FEDERAL AND STATE REGULATORY REQUIREMENTS AND ALL CAMPUS RADIATION SAFETY PROCEDURES.

Signature of Responsible User _____ Date _____

RETURN TO: ENVIRONMENTAL HEALTH & SAFETY/RISK MANAGEMENT & SAFETY SERVICES
STUDENT BUSINESS SERVICES, RM 311
risk-management@humboldt.edu

Cal Poly Humboldt.

NEW USER ENROLLMENT FORM

Registration, Education, and Experience

Complete this form to initiate adding a new user to the *Authorized User's* approved radioactive material protocol/permit. **Until both the new user and the Principal Investigator have been notified by Environmental Health & Safety that the new user has successfully completed below, the individual is not authorized to use radioactive material independently under the Principal Investigator's radiological protocol/permit.** Each new user must register for and successfully complete radioactive material training.

APPLICANT INFORMATION

New User's Name: (Last, First, MI.)	Principal Investigator:	Protocol No.:
CNET ID:	Email Address:	Over 18 years old? ☐ Yes ☐ No
Graduate ☐	Undergraduate ☐	Technician ☐	Faculty ☐	Other ☐ Explain on next line
☐ Check here if this user will be the laboratory designee. **Note**: The lab designee must attend the radioactive material user training and laboratory designee classes.	Explain:	

EDUCATION

College or University	Degree	Major Field of Study

PREVIOUS RADIATION SAFETY TRAINING

TRAINING	WHERE TRAINED	DURATION (Hours)	ON-THE-JOB		FORMAL COURSE	
			Yes	No	Yes	No
Principles and practices of radiation protection			☐	☐	☐	☐
Radioactive measurements: Standardization, monitoring techniques, and instruments			☐	☐	☐	☐
Mathematics basic to the use and measurement of radioactivity			☐	☐	☐	☐
Biological effects of radiation			☐	☐	☐	☐

PRIOR EXPERIENCE WITH THE USE OF RADIOACTIVE MATERIALS

RADIONUCLIDE(S)	LOCATION OF USE	DURATION (YEARS)	MAX. ACTIVITY HANDLED

On-The-Job Training for Radiation Material User

The Principal Investigator (PI) or Experienced Approved RAM User must provide the new RAM User with supervised on-the-job training. Once the new RAM User has demonstrated competency in the areas listed below, they will be added to the PI protocol as a RAM User and allowed to work with RAM independently and supervise other new users.

Training

☐ **Laboratory Safety Practices and Procedures**	☐ **Safe Handling of Radioactive Materials**
☐ **Receiving of Radioactive Materials**	☐ **Radioactive Material Ordering**
☐ **Lab Security of Radioactive Materials**	☐ **Radioactive Waste Management in the Lab**
☐ **Supervised Experiment #1**	☐ **Lab Surveys for potential contamination**
☐ **Supervised Experiment #2**	☐ **Required Radiation Safety Documentation**
☐ **Supervised Experiment #3**	☐ **Instrument Operation**

I hereby declare that I agree to abide by the requirements of Cal Poly Humboldt's Safety Program and the laboratory safety practices. I further confirm that I received and understand the radiation safety practices for working with radioactive materials from both the classroom and on-the-job training.

New RAM User (Please Print Clearly):	Date:
Signature:	

I certify that I have provided supervised On-the-Job training to the above individual and they have demonstrated proper radiation safety practices and responsibility to work independently with radioactive materials.

Principal Investigator or Supervisory RAM User (Please Print Clearly):	Date:
Signature:	

Cal Poly Humboldt.

Radioactive Material Receipt and Monitor Log

Date of Delivery: _____ Time of Delivery: _____ am pm

Date of Survey: _____ Time of Survey: _____ am pm

Survey Model: _____ Serial No.: _____ Probe Type: _____

Background Reading: _____

Radiation Level at 3 feet (1 meter): _____

Radiation Level at Package Surface: _____

	Yes	No
Condition of Package OK	☐	☐
Packing Slip Correlates to Order	☐	☐
Packing Slip Correlates to Package Contents	☐	☐
Integrity of Final Source Containers OK	☐	☐

SCN	Isotope Name	Activity

	Yes	No
Contamination of Packing Materials/Source vials	☐	☐

In no removable contamination is found, obliterate labels and dispose of packing materials in regular trash. If contaminated, treat as radioactive waste.

Comments:

Date_____ Initials_____

Cal Poly Humboldt.

DECLARATION OF PREGNANCY

Instructions: It is our responsibility to ensure that the dose to an embryo/fetus, during the entire pregnancy, due to occupational exposure of a declared pregnant worker, does not exceed 0.5 rem [§20.1208]. Our policy is to examine your work environment and job responsibilities to assure that you will avoid substantial variation above 0.05 rem each month during your pregnancy. If you have questions, please call EH&S at 707-826-3305. Please complete and email this form to risk-management@humbold.ted. We will schedule an interview with you to review safety measures and answer your questions.

LAST NAME	FIRST NAME	MI	DELIVERY DATE

DEPARTMENT-	POSITION*	PHONE	EMAIL:

* POSITION: Faculty, Post-Doc; Visiting Scientist; Student; Staff

Describe the sources of radiation that you personally work with day to day. For radioactive materials, describe the radionuclides and activities, and hours of use each day. For devices, identify the type of device and hours of use each day. Also describe the level of use for other individuals in you work area

_____

_____

_____

In accordance with 10 CFR 20.1208, I am voluntarily declaring, in writing, that I am pregnant. I understand that it is my sole and fundamental responsibility to inform Stanford Health Physics, in writing, of my pregnancy, if I choose to do so. I also recognize that I am now subject to dose-limit restrictions to ensure that occupational prenatal radiation exposure does not exceed 0.5 rem during the duration of the pregnancy. I understand I can rescind this pregnancy declaration.

_____ _____

Signature **Date**

Review 10 CFR 20.1208 and Radiation Safety Manual, Part 1.

Office Use Only: **Attach Wearer's dose for the past 12 month's**	**Health Physics Name (Print):** _____ **Signature:** _____
Workplace interview scheduled for: Date: _____ Time:_____ Room: _____	**Questions:** Do you anticipate a change in your workload or uses? _____ Will there be a change in co-workers' workload or uses? _____
	Other Questions or Concerns: _____

APPENDIX D Review and Amendment Log

Date	Amendments	Pages/Sections	Initials
5/6/2025	Amended previous plan (dated 2-2-2009) to reflect current regulatory requirements and designations.	Multiple	TKN