November 10, 2011

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REGION 1
2011 NOV 14 AM 11: 05

Ms. Elizabeth Ullrich
Senior Health Physical
Commercial and R&D Branch
Division of Nuclear Materials Safety
Nuclear Regulatory Commission

03001183

Re: Renewal of license 52-01986-04
NRC Control Number 575299

Dear Ms. Ullrich:

Enclosed you will find the explanatory letter is to comply with request on license number 52-01986-04.

Please do not hesitate to contact us should you require any further information.

Sincerely,

Ana R. Guadalupe, Ph.D.
Chancellor

University of Puerto Rico
Río Piedras Campus
Chancellor's Office

PO Box 23300
San Juan PR 00931-3300
Tel. 787-763-3877
787-764-0000, Exts. 2424, 3240
Fax 787-764-8799

575299

NMSS/RGN1 MATERIALS-002

November 10, 2011

Ms. Elizabeth Ullrich
Senior Health Physical
Commercial and R&D Branch
Division of Nuclear Materials Safety
Nuclear Regulatory Commission

NRC Control Number 575299

Dear Ms. Ullrich:

This explanatory letter is to comply with request on license number 52-01986-04.

As mentioned on item 1 of your letter, the address change on the license renewal is due to a change on department within the organization of the University of Puerto Rico-Rio Piedras Campus. The license was first request by the College of Natural Science, however it has been the Occupational Safety and Health Office (OSHO-OPASO) who has manage, inspect and handle all issues related to the license hold by the institution. The RSO, Mr. Jorge Ramos responds to OPASO and therefore the new address is Mr. Ramos direct address, so please issue all license related items to: PO BOX 22785, San Juan, PR 00931-2785.

At the University of Puerto Rico-Rio Piedras (UPR-RP) we are not under the possession of any radium or accelerator that will required to comply with the new regulation under 10 CFR 30.4. Regarding statement 2b on your letter, the instrument is still under our facilities, the instrument on discussion belongs to TSI Incorporated. All TSI instruments are certified under license number 22-12602-03G. Each summer this facility is visit by researcher from around the world to measure aerosols in the Caribbean Region. If the visiting researcher needs to bring radioactive material, your agency (NRC) will be contacted to discuss the protocol in order to obtain your authorization to use the material as needed. Statement 3 emphasis on the use of radioactive material on animal in our facility. As of today, none of our protocols include the use of radioactive material in any animal.

On statement 4.Athe training of Ms. Lymari's Orellana is requested. Ms. Orellana was certified by Radiation Safety Associates, Inc. in November 2003. The training included the following topics, radiation types and decay, units of measurements, radiation interactions with matter, background radiation, applications, biological effects of radiation, personal dosimetry, regulation and guides, external exposure control, air sampling and evaluation, ALARA, waste handling and disposal, and radiation detection and measurements(additional details on each topic is included on Appendix A). Besides her formal training by this company, Ms. Orellana has vast experience on the receiving, handling and disposal of radioactive material since she has been performing this task as part of her duties for the laboratories under Dr. Candelas, former authorized user for this license. As part of her duties Ms. Orellana manages P-32, C-14, H-3 and I-125. Besides

handling the material mentioned before, she knows how to operate the gamma counters and Geiger Instruments.

Names under statement 4.B should be remove from the license, appendix B includes copies of the letters from, Dr. Jose Garcia-Arraras, Dr. Paul Bayman, Dr. Turul Giray and Dr. Gary Toranzos in which they state they are not longer working with radioactive isotopes. Dr. Graciela Candelas and Dr. Fernando Gonzalez retired from the University System, Dr. Owen McMillan resign to UPR. To clarify statement 4.C, Dr. Irvin Vega should become authorized to work will all radioactive isotopes.

Statement 5.A and 5.B is explain as follow; after a change in the facilities, room JGD 213 is not longer in use as the radioimmunoassay room. This room is now an office and radioimmunoassay are perform in room JGD 217. Appendix C shows the diagram of current use of the room 217. The changes mentioned on statement 5.C referred to the facilities where researchers have either retired or resign to the University and now are in use by either new faculty or administrators in which radiation is not in use.

Statements 6, the ordering of radioisotopes begin by the authorization request from each authorized user. The authorization is sign by the RSO or RST. Upon arrival the isotope is inspect by the user and report the arrival of the isotope to RSO or RST who immediately add the radiation to the campus inventory kept under the RSO supervision. This inventory is maintained to make sure that we will never exceed the radioactive activity for which we have been granted by your license. Each authorized user creates an inventory for the specific isotope that they order. This inventory is kept in a visible place until the isotopes are completely used or until its decay exceed ten half-lives. Waste inventory is also keep at the decay room and a copy of the individual waste generated is kept at the originating laboratory. Each month these inventories are inspected during monthly inspections. Before waste is finally disposed, a final count is performed to ensure that no radiation is being emitted.

Statement 7, Receiving Order has been updated and changes are show on Appendix D. The proper labeling should be identify upon shipment of the isotope. In our facilities all authorize purchase do not exceed 2ci. Therefore, the label selected by our users should be Type A labeling. The authorized companies from which our users purchase their isotopes pack their isotopes in the proper shield containers. A lead container is provide for almost all isotopes purchase by our users, the exception is P-32 and P-33 which come in an acrylic container. Regarding statement 7.B users are required to quantify activity on the package prior to opening it. The activity found in this survey is record in the receiving form as shown on Appendix D.

Statement 8. The correct amount to perform a weekly survey should 100 microcuries.

Statement 9. Changes were made on the disposal procedure and samples will remain in storage until their activity is below background.

Statement 10. Appendices 8-11 are included with this letter.

Radiation Safety Associates, Inc.
RADIATION SAFETY OFFICER COURSE OUTLINE

Appendix A

THE ATOM
- Atomic Structure
- Elements
- Isotopes

TYPES OF RADIATION
- Radiation
- Alpha Particles
- Beta Particles
- Gamma and X-rays
- Neutrons
- Units of Radiation Energy

RADIOACTIVITY AND DECAY
- Radioactivity
- Decay
  - Half-life: the rate of radioactive decay
  - Decay constant
- Decay Equation
- Conservation of Mass, Charge, and Energy
- Methods of Radioactive Decay
  - Alpha decay
  - Beta decay
  - Beta minus
  - Positrons
  - Gamma rays
  - X rays
  - Isomeric transition
  - Internal conversion
  - Auger electrons
  - Electron capture
- Chart of the Nuclides
- Decay Data Tables
- Radioactive Series

UNITS OF MEASURE
- Radioactivity
  - The curie
  - Sub-units of the curie
- Radiation
  - Radiation exposure vs. radiation dose
  - Radiation exposure: the roentgen
  - Absorbed dose: the rad
  - Dose equivalent: the rem
  - Dose and dose rate
  - Determination of dose and dose rate
- Source Activity vs. Gamma Exposure Rate
- CPM vs. DPM
- Specific Activity
- SI Units

RADIATION INTERACTIONS WITH MATTER
- Charged Particle Interactions
  - Ionization
  - Excitation
  - Bremsstrahlung
- Photons
  - Photoelectric effect
  - Compton scattering
  - Pair production
  - Neutron Interactions
  - Fast/slow neutron interactions

BACKGROUND RADIATION
- Introduction
- Cosmic Radiation
- Radioactivity of the Earth
- Radioactivity of Air
- Radioactivity of Water
- Radioactivity in the Human Body
- Artificial (Man-made) Radioactivity
  - Medical and dental exposures
  - Nuclear reactors
  - Transportation
  - Low level waste storage
  - Nuclear reactor accidents
  - Summary

APPLICATIONS
- X Ray Machines
  - Production
  - Filtering
- Medical Radionuclides
  - Diagnosis
  - Therapy (radiation oncology)
- Linear accelerators
- Nuclear Reactors
  - Boiling water reactor
  - Pressurized water reactor
  - Nuclear fuel
  - Safety
- Radiation Sterilization
- Other Industrial Sources
  - Isotopic neutron sources
  - Oil well logging
  - Level and density gauges

BIOLOGICAL EFFECTS
- Introduction
- Cell Damage
- Acute and Delayed Effects
- Somatic and Genetic Effects
- Linear or Threshold
- Stochastic and Non-stochastic Effects
- Summary

PERSONAL DOSIMETRY
- Dose Limits
  - Definitions
  - 10 CFR 20 occupational dose limits
  - Pregnant workers
  - Minors
  - Non-radiation workers
  - Violations
  - ALARA
- Personal Dosimetry
  - Badge placement
  - Film badge
  - Thermoluminescent dosimeter (TLD)
  - Pocket ion chambers
  - Chirpers and alarming dosimeters
  - Neutron dieters
  - Control badges
  - Regulatory Guide 8.13

RADIATION DETECTION AND MEASUREMENT
- Gas-filled Detectors
  - Pulse size considerations
  - Ionization chambers
  - Proportional counters
  - Limited proportionality region
  - Geiger-Mueller (GM)
  - Continuous discharge region
- Solid State Detectors
  - Scintillation detectors
  - Semiconductor detectors
  - Detector Applications

- Portable survey meters
- Calibration programs
- Laboratory instruments
- Portal monitors
- Personnel contamination monitors
- Whole body counters
- Basic Radiation Spectroscopy Spectrometer
- Single and multi-channel analyzers

REGULATIONS AND GUIDES

- History of Protective Standards
  - ICRU, ICRP, and NCRP
  - Radiation exposure concerns
  - Basic recommendations
  - Federal policy
  - Regulating agencies
- Other Organizations
- Regulations and Guides
  - 10 CFR 19
  - 10 CFR 20
  - 10 CFR 30
  - 10 CFR 40
  - 10 CFR 70
  - 10 CFR 71
  - 10 CFR 74
  - Regulatory guides
  - NUREGs
  - American National Standards Institute (ANSI) Standards
  - Information notices

EXTERNAL EXPOSURE CONTROL AND SURVEYS

- ALARA
  - 10 CFR 20
  - Current ALARA-related regulatory guides
- Radiation Exposure Control
  - Time
  - Distance
  - Shielding
- Administrative Controls
  - Radiation work permits
- Access Control
  - 10 CFR 20
- Posting and Control
  - 10 CFR 20
- Surveys
  - 10 CFR 20
- Survey Form Contents
- Regulatory Guide 8.21

DISTANCE AND SHIELDING

- Distance
  - Point sources
  - Line sources
  - Plane sources
- Shielding
  - Beta
  - Gamma
  - Neutron

CONTAMINATION CONTROL

- Radiation Vs. Contamination
- Survey Methods
  - Loose contamination
  - Total contamination
- Wipe Test Evaluation
- Statistical Considerations in a Counting Program
  - Accuracy and precision
  - Normal probability distribution
  - Standard deviation
  - Confidence levels
  - Minimum detectable count rate (MDCR)
  - Minimum detectable activity (MDA)
  - Changing the MDA
- Survey Frequency and Limits
- Protective Clothing
- Self-Frisk
- Personnel Decontamination
- Skin Dose Assessment
  - Skin dose calculation
  - Documentation
- Survey Documentation
- Posting and Control of Contaminated Areas
- Equipment And Area Decontamination

AIR SAMPLING AND EVALUATION

- Types of Airborne Contaminants
- Sample Collection
- Air Sample Accuracy
  - Total sample volume

Efficiency of collection medium

- Counting efficiency
- Representative sample
- Calculation of Airborne Concentrations
- Lower Limit of Detection (LLD)

INTERNAL EXPOSURE CONTROL AND DOSE ASSESSMENT

ALARA

- Annual Limit on Intake (ALI)
- Derived Air Concentration
  - Derived air concentration-hour
- Assessing Body Burden
- Bioassay Methods
  - Whole body counting
  - Radiourinalysis
  - Fecal analysis
- Bioassay Programs
- Calculating Internal Dose
- Examples of Dose Calculations
- Removing Internal Contamination
- Required Postings
  - Airborne radioactivity area
- Regulatory Guide 8.20
- Regulatory Guide 8.32

SOURCE HANDLING TECHNIQUES/RADIOACTIVE MATERIAL CONTROL AND DISPOSAL

- Definitions
  - Sealed source
  - Source material
  - Special nuclear material
- Regulations and Procedures
  - 10 CFR 20
  - 10 CFR 30
  - 10 CFR 40
  - 10 CFR 70/74
- Exempt vs. Nonexempt Quantities of Radioactive Material
- Responsibilities
- Use and Precautions
- Labeling
- Master Index
- Leak Testing
- Storage Limitations
- Disposal
- Receiving Packages
- Container Labels
- Exemptions from Labeling Requirements
- Disposal of Empty Radioactive Material Containers
- Storage and Control
- Posting
- Exceptions from Posting Requirements
- Loss or Theft of Licensed Material
- Industry Events
- Radioactive Waste - Definition
- Radwaste Minimization

- Radwaste Treatment
  - Storage for decay
  - Evaporation
  - Dilution and release
  - Filtration and deionization
  - Incineration
  - Compaction
  - Solidification
- Waste Disposal
  - Disposal facilities
- Packaging
  - Physical form
  - Strong tight containers
  - Type A containers
  - Type B containers
  - Warning labels on packages
  - Contamination limits on packages
  - Radiation limits during transport
  - Vehicle placarding
  - Other methods
- Source Handling Incidents
- NRC Information Notice 88-32
- NRC Information Notice 90 35

LICENSE REQUIREMENTS AND THE RADIATION PROTECTION PROGRAM

- Notice of Expiration
- Application NRC Form 313
- Radiation Protection Program
  - ALARA
  - Procedures
  - Training
  - Document Posting
  - Surveys
  - Legal Aspects
  - Procedural Compliance
  - Fundamentals of excellence
  - Pitfalls
- Ways for Health Physicists to Minimize the Chances of Being Sued

EMERGENCY PLANNING

- Introduction
- The Emergency Plan
- Emergency Response Organization
- Characterization of Installation and Facilities
- Licensed Activities
- Emergency Plan Implementation
- Response Actions
  - Assessment Actions
  - Protective Access
  - Corrective Actions
- Facilities and Equipment
- Off-site Agreements and Support
- Re-entry and Recovery
- Maintaining Emergency Preparedness
- Notifications

AUDITS

- Introduction
- In-house Audits
- Who Should Audit?
- What Should Be Audited?
- Performing An Audit
  - Audit Preparation
  - Audit Performance
- Audit Follow-Up
- Suggested Audit Finding Format
- Closing Out Previous Audits
- Dealing With Findings
- Handling a Regulatory Audit
- Other Regulatory Action
- General Comments

Course offered at our Hebron, Connecticut facility in rotation with other radiation safety courses. For more information, see our website at http://www.radpro.com/calendar.html, or contact us at 860.228.0487.

CERTIFICATE OF ACHIEVEMENT

This is to Certify that

LYMARI ORELLANA

Has Completed 40 Hours of

Radiation Safety Officer Training

November 17-21, 2003

Radiation Safety Associates, Inc.

K. Paul Steinmeyer, RRPT
Radiation Safety Associates, Inc.

University of
Puerto Rico

Appendix B

May 24, 2011

Río Piedras
Campus

I certify that I'm not interested working with radioactivity and will like to withdraw as a user from the UPR, Rio Piedras Campus, U.S. Nuclear Regulatory Commission Material License.

Signature,

Dr. Tugrul Giray

Environmental
Protection and
Occupational
Safety Office

PO Box 22785
San Juan, PR
00931-2785

University of
Puerto Rico

Appendix B

May 24, 2011

Río Piedras
Campus

I certify that I'm not interested working with radioactivity and will like to withdraw as a user from the UPR, Rio Piedras Campus, U.S. Nuclear Regulatory Commission Material License.

Signature,

Dr. Gary Toranzos

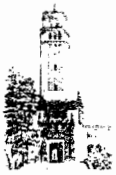
Environmental
Protection and
Occupational
Safety Office

PO Box 22785
San Juan, PR
00931-2785

Equal Employment Opportunity Employer M/W/V/D

Universidad de
Puerto Rico

Appendix B



Recinto de
Río Piedras

May 31, 2011

I certify that I'm not interested working with radioactivity and will like to withdraw as a user from the UPR, Rio Piedras Campus, U.S. Nuclear Regulatory Commission Material License.

Signature,

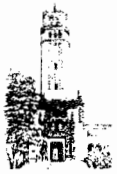
Dr. José García-Arrarás

Oficina de
Protección
Ambiental
y Seguridad
Ocupacional
(OPASO)

PO Box 22785
San Juan PR
00931-2785

Universidad de
Puerto Rico

Appendix B



Recinto de
Río Piedras

May 31, 2011

I certify that I'm not interested working with radioactivity and will like to withdraw as a user from the UPR, Rio Piedras Campus, U.S. Nuclear Regulatory Commission Material License.

Signature,

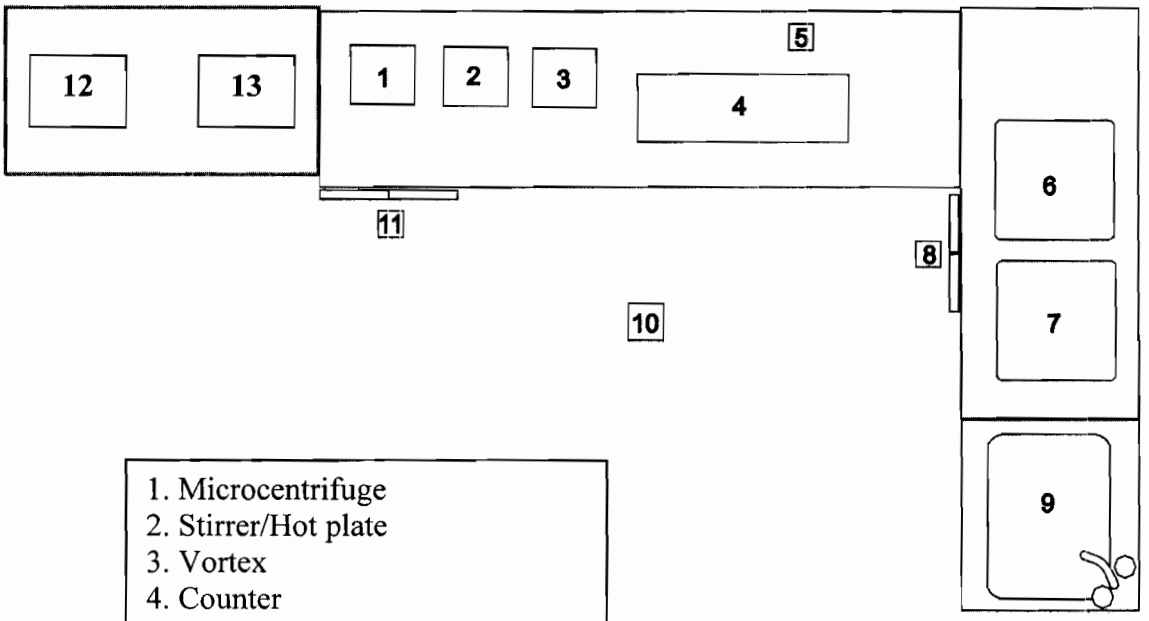
Dr. Paul Bayman

Oficina de
Protección
Ambiental
y Seguridad
Ocupacional
(OPASO)

PO Box 22785
San Juan PR
00931-2785

Appendix C

217 Floor Map



1. Microcentrifuge
2. Stirrer/Hot plate
3. Vortex
4. Counter
5. Solid waste bin
6. Hybridization incubator #1
7. Hybridization incubator #2
8. Storage area #2
9. Sink
10. Floor
11. Storage area #1
12. Liquid Scintillation Counter
13. Gamma Counter

UNIVERSITY OF PUERTO RICO **Appendix D**
RIO PIEDRAS CAMPUS
RADIOISOTOPE RECEIVING RECORD

INFORMATION TO BE FILLED BY THE PERSON RECEIVING THE PACKAGE

ORDER INFORMATION Laboratory_____

Isotope_____ Compound _____ Quantity_____

Reference Date: _____ P.O.#_____

RST NOTIFICATION

Time_____ Date_____

PACKAGE INFORMATION

Please identify the correct labeling of package containing the purchase isotope:

_____

_____

_____

Name of the person who received the package_____

Name of the supplier who shipped the package_____

Arrival Date_____ Time_____ Carrier_____

Package condition: Good ( ) Crushed ( )

Wet ( ) Damaged ( )

If the condition of the package is other than good, place it in a contained environment and report package condition to the RST immediately for appropriate action. (Ext. 7819)

INFORMATION TO BE FILLED BY THE SURVEYOR

MATERIAL'S CONTAINER CONTAMINATION MONITORING

Swab date_____ Time_____

Background_____ DPM Container _____DPM

- Was the container contaminated?
- The material order and received they agree?

If the answer is **NO**, explain_____

- What was the final disposition of the package?_____

CERTIFIED CORRECT

_____ _____

Receiver's Signature Surveyor's Signature

Appendix 7

Rules for the use of the decay-in-storage room for short-lived radioisotopes on the roof of JGD Building.

1. The room is to be used exclusively for the decay-in-storage of short lived radioisotopes such as ^{35}S, ^{32}P and ^{125}I. No long-live radioisotopes such as ^{3}H and ^{14}C may be storage there.

2. Only Low Levels (100 μCi or less) of ^{32} P and ^{125} I waste may be stored in the decay room and ^{32}P must only be stored in the wooden cabinets designated for that purpose by the RSO.

3. No flammable liquids or toluene-base cocktails can be stored in this room. Only aqueous liquid waste may be stored here, and this has to be in a leak-proof container (such as those approved for hazardous liquid waste by the Environmental Protection Office), placed preferably on a containing platform or tray. All liquid waste containers are subject to the same rules and regulations stated below for solid waste.

4. All authorized users are required to store their radioisotopes only in the shelves that have been assigned to them. These shelves are to be labeled with the name of the investigator in charge of the authorized laboratory. Storage of isotopes for decay in an area assigned to another user is not permitted.

5. All solid waste should be placed in strong plastic bags such as Fisher 01-815A, and properly labeled in at least two places with the following information:
    a. name of the user
    b. type and amount of radioisotope
    c. date of storage
    d. date when material should be checked to determine if no significant amount of radioactivity remains before being disposed of in the trash.

6. All users are required to keep an up-to-date inventory of the radioactive waste stored in their areas in the Decay Room's log book. A copy of this inventory should also be kept in the researcher, s lab. The accuracy of these records will be checked during periodic inspections by the RSO or the RST.

7. Prior to disposal in trash, random samples of the contents of the bag will be taken using gloves and counted in the Beckman LS-5000 or LS- 6000LL or Perkin Elmer Gamma (Wizard 2) radioactivity remains. Radioactivity levels 1000 dpm or more above background will be considered contaminated and storage for further decay; a new check date will be fixed according to the half life of the isotope. All of this information will also be recorded in the log book. Once the samples are below background radiation samples will be put in trash and activity quantify, please record the instrument used to quantify radiation.

8. Both the stairway door and the door to the room should be kept locked at all times when not in use.

9. Any violation to these rules will be discussed at a Radioisotope Committee meeting for possible actions to be taken. A copy of these rules will be posted permanently in the decay-in-storage room.

Appendix 8

Record of waste stored in decay-in-store room by the laboratory of:

Lab. Solid waste

Container code	Isotope	Amount	Assay date	Estimated Disposal date	Disposed by: and date:

Appendix 9

Record of waste stored in decay-in-store room by the laboratory of:

Lab. _____ Liquid waste

Container code	Isotope	Amount	Assay date	Estimated Disposal date	Disposed by: and date:

Appendix 10

_____ RECORD OF LIQUID WASTE STORED

Isotope

Laboratory_____ Date_____

Tank ID_____ Capacity_____

DATE	ESTIMATED ACTIVITY (dpm)	VOLUME	ESTIMATED DISPOSAL DATE	FINAL ACTIVITY (dpm)	FINAL DISPOSAL DATE	METHOD OF DISPOSAL	DATE & USER INITIALS

Appendix 11

_____ RECORD OF SOLID WASTE STORED

ISOTOPE

LABORATORY: _____

Container ID	Reference Date	Measured Activity (dpm)	Estimated Disposal Date	Final Activity (dpm)	Final Disposal Date	Method of Disposal	Date & User Initials

- The efficiency for **P-32** using Model 3 survey meter with Beta Scintillator Model 44-1 is **50%**.
- The efficiency for **S-35** using Model 3 survey meter with Pancake G-M detector Model 44-9 is **10%**.
- The efficiency for **I-125** using Model 3 survey meter with Pancake G-M detector Model 44-9 is **0.2%**.

Conversions: $1\mu Ci = 2.2 \times 10^{6}$ dpm