NRC Form 374
(3-83)

U.S. NUCLEAR REGULATORY COMMISSION

Amendment No. 8

ORC

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93–438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Kapiolani Health Care System Kapiolani Medical Center	In accordance with letter dated August 29, 1996, 3. License number 53-23297-01 is amended in its entirety to read as follows:
2. 1319 Punahou Street Honolulu, Hawaii 96826	4. Expiration date December 31, 2004
	5. Docket or Reference No. 030-31200

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Any byproduct material identified in 10 CFR 35.100	A. Any radiopharmaceutical identified in 10 CFR 35.100	A. As needed
B. Any byproduct material identified in 10 CFR 35.200	B. Any radiopharmaceutical identified in 10 CFR 35.200	B. As needed
C. Any byproduct material identified in 10 CFR 35.300	C. Any radiopharmaceutical identified in 10 CFR 35.300	C. 3.3 Curies (no single container to exceed 300 millicuries)
D. Any byproduct material identified in 10 CFR 31.11	D. Prepackaged kits	D. As needed
E. Cesium 137	E. Sealed source (Nordion International C-3001)	E. Not to exceed 3048 curies total for Nordion Gammacell 1000 Elite Type II and 1524 curies for the Nordion Gammacell 1000 Elite Type I
F. Phosphorus 32	F. Labeled compounds	F. 5 millicuries
G. Sulfur 35	G. Labeled compounds	G. 10 millicuries

D/1 MC40

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
53-23297-01

Docket or Reference Number
030-31200

Amendment No. 8

9. Authorized use

A. Medical use described in 10 CFR 35.100
B. Medical use described in 10 CFR 35.200
C. Medical use described in 10 CFR 35.300
D. In vitro studies
E. To be used in a Nordion Gammacell 1000 Elite Type I or II self contained research irradiator for irradiation of blood, blood products, cells and tissues.
F. In vitro DNA sample analysis
G. Protein analysis using Methionine for breast cancer testing.

CONDITIONS

10. A. Licensed material identified in items 6.A through 6.D shall be used only at the licensee's facilities located at the Kapiolani Medical Center at Pali Momi, 98-1079 Moanalua Road; Aiea, Hawaii and the Kapiolani Medical Center For Women and Children, 1319 Punahou Street, Honolulu, Hawaii.

B. Licensed material identified in item 6.E shall be used only at the licensee's facility located at the Kapiolani Medical Center For Women and Children, 1319 Punahou Street, 3rd Floor, Honolulu, Hawaii.

C. Licensed material identified in items 6.F and 6.G shall be used only at the licensee's facility located at the Kapiolani Medical Center For Women and Children, 1946 Young Street, Suite 400, Honolulu, Hawaii.

11. The Radiation Safety Officer for this license is Philip J. Manly.

12. Licensed material listed in Item 6 above is only authorized for use by, or under the supervision of, the following individuals for the materials and uses indicated:

Authorized Users	Material and Use
Richard D. Wasnich, M.D.	10 CFR 35.100, 35.200, 35.300, and 31.11 In vitro studies
Michael C.C. Ling, M.D.	10 CFR 35.100, 35.200, 35.300, and 31.11 In vitro studies
Robert A. Nordyke, M.D.	10 CFR 35.100, 35.200, 35.300, and 31.11 In vitro studies
Lynn Derek Madanay, M.D.	10 CFR 35.100, 35.200, 35.300, and 31.11 In vitro studies

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
53-23297-01

Docket or Reference Number
030-31200

Amendment No. 8

(Continued)

Authorized Users	Material and Use
Peter Robbins, M.D.	10 CFR 35.100, 35.200, 35.300, and 31.11 In vitro studies
Monita Yuen-Green, M.D.	10 CFR 35.100, 35.200, 35.300, and 31.11 In vitro studies
Marc N. Coel, M.D.	10 CFR 35.100, 35.200, 35.300, and 31.11 In vitro studies
Jehoon Ko, M.D.	10 CFR 35.100, 35.200, 35.300, and 31.11 In vitro studies
Herbert Uemura, M.D.	10 CFR 31.11 In vitro studies
John Gross	Cesium 137 irradiator
Timothy Donlon, Ph.D.	Phosphorus 32 and Sulfur 35 In vitro DNA sample analysis

13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.

B. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.

C. Sealed sources need not be leak tested if:

(i) they contain only hydrogen-3; or

(ii) they contain only a radioactive gas; or

(iii) the half-life of the isotope is 30 days or less; or

(iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or

(Continued)

(v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer.

No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

D. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(b)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011, ATTN: Director, Division of Radiation Safety and Safeguards. The report shall specify the source involved, the test results, and corrective action taken.

E. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to Perform such services.

14. The licensee shall not perform repairs or alterations of the irradiator involving removal of shielding or access to the licensed material. Removal, replacement, and disposal of sealed sources in the irradiator shall be performed by a person specifically licensed by the Commission or an Agreement State to perform such services.

15. The procedures contained in the Nordion instruction manual for the Gammacell Model 1000 Elite Type I and II device shall be followed and a copy of this manual shall be made available to each person using or having responsibility for the use of the device.

16. The licensee is authorized to hold radioactive material with a physical half-life of less than 90 days for decay-in-storage before disposal in ordinary trash provided:

A. Radioactive waste to be disposed of in this manner shall be held for decay minimum of 10 half-lives.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
53-23297-01

Docket or Reference Number
030-31200

Amendment No. 8

(Continued)

B. Before disposal as ordinary trash, byproduct material shall be surveyed at the container surface with the appropriate meter set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.

C. Generator columns shall be segregated so that they may be monitored separately to ensure decay to background levels prior to disposal.

17. Licensed material identified in items 6.D, 6.F and 6.G shall not be used in or on human beings.

18. The licensee shall maintain records of information related to decommissioning at 98-1079 Moanalua Road, Aiea, Hawaii per the provision of 10 CFR 30.35 (g) or until this license is terminated by the Commission.

19. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in 10 CFR 30.35 (d) for establishing decommissioning financial assurance.

20. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below, except for minor changes in the medical use radiation safety procedures as provided in 10 CFR 35.31. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Letter dated December 14, 1994
B. Application dated March 30, 1995
C. Letter dated April 18, 1995 (signed by Peter S. Robbins, M.D.)
D. Letter dated April 18, 1995 (signed by Frances A. Hallonquist)
E. Letter dated August 29, 1996

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date NOV - 1 1996

By James L. Montgomery
Materials Branch
Region IV, WCFO
Walnut Creek, California 94596

BETWEEN:

License Fee Management Branch, ARM
and
Regional Licensing Sections

(FOR LFMS USE)
INFORMATION FROM LTS

Program Code: 02120
Status Code: 0
Fee Category: 7C 3E
Exp. Date: 20041231
Fee Comments: 3E EFF 5/5/95
Decom Fin Assur Reqd: N

96 OCT -3 AM 11

LICENSE FEE TRANSMITTAL

A. REGION V

1. APPLICATION ATTACHED
   Applicant/Licensee: KAPIOLANI HEALTH CARE SYSTEM
   Received Date: 960926
   Docket No: 3031200
   Control No.: 572412
   License No.: 53-23297-01
   Action Type: Amendment

2. FEE ATTACHED
   Amount:
   Check No.:

3. COMMENTS

Signed J. Garcia
Date 9-27-96

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered)

1. Fee Category and Amount: 7C 3E $440

2. Correct Fee Paid. Application may be processed for:
   Amendment ✓
   Renewal
   License

3. OTHER

Signed Rita Meagher
Date 10/3/96

1996 OCT -2 AM 10:56

Log Oct 1 WCFO
Remitter
Check No. 101528
Amount $590 ($150 Refunded)
Fee Category 7C 3E
Type of Fee Amd
Date Check Rec'd.
Date Completed 10/3/96
By: Ken

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV

Walnut Creek Field Office
1450 Maria Lane
Walnut Creek, California 94596-5368

NOV - 1 1996

Kapiolani Health Care System
Kapiolani Medical Center
ATTN: Frances Hallonquist, CEO
1319 Punahou Street
Honolulu, Hawaii 96826

SUBJECT: LICENSE AMENDMENT

Please find enclosed Amendment No. 8 to License No. 53-23297-01. You should review this license carefully and be sure that you understand all conditions. If you have any questions, you may contact the reviewer who signed your license at 510-975-0249.

NRC expects licensees to conduct their programs with meticulous attention to detail and a high standard of compliance. Because of the serious consequences to employees and the public which can result from failure to comply with NRC requirements, you must conduct your program involving radioactive materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.

2. Possess radioactive material only in the quantity and form indicated in your license.

3. Use radioactive material only for the purpose(s) indicated in your license.

4. Notify NRC in writing of any change in mailing address (no fee required if the location of radioactive material remains the same).

5. Request and obtain written NRC consent before transferring your license or any right thereunder, either voluntarily or involuntarily, directly or indirectly, through transfer of control of your license to any person or entity. A transfer of control of your license includes not only a total change of ownership, but also a change in the controlling interest in your company whether it is a corporation, partnership, or other entity. In addition, appropriate license amendments must be requested and obtained for any other planned changes in your facility or program that are contrary to your license or contrary to representations made in your license application, as well as supplemental correspondence thereto, which are incorporated into your license. A license fee may be charged for the amendments if you are not in a fee-exempt category.

6. Maintain in a single document decommissioning records that have been certified for completeness and accuracy listing all the following items applicable to the license:

   - Onsite areas designated or formerly designated as restricted areas as defined in 10 CFR 20.3(a)(14) or 20.1003.

   - Onsite areas, other than restricted areas, where radioactive materials in quantities greater than amounts listed in Appendix C to 10 CFR 20.1001-20.2401 have been used, possessed, or stored.

   - Onsite areas, other than restricted areas, where spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site have occurred that required reporting pursuant to 10 CFR 30.50(b)(1) or (b)(4), including areas where subsequent cleanup procedures have removed the contamination.

   - Specific locations and radionuclide contents of previous and current burial areas within the site, excluding radioactive material with half-lives of 10 days or less, depleted uranium used only for shielding or as penetrators in unused munitions, or sealed sources authorized for use at temporary job sites.

   - Location and description of all contaminated equipment involved in licensed operations that is to remain onsite after license termination.

7. Submit a complete renewal application with proper fee, or termination request at least 30 days before the expiration date on your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of radioactive material after your license expires is a violation of NRC regulations.

8. Request termination of your license if you plan to permanently discontinue activities involving radioactive material.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation; imposition of a civil

penalty; or an order suspending, modifying, or revoking your license as specified in the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), 60 FR 34381, June 30, 1995.

Thank you for your cooperation.

Sincerely,

James L. Montgomery
Senior Health Physicist
Materials Branch

Docket: 030-31200
License: 53-23297-01
Control: 572412

Enclosures: As stated

bcc:

Docket File
WCFO Inspection File
LFDCB, T-9 E10
State of Hawaii (License Only)

DOCUMENT NAME: G:\572412

To receive copy of document, indicate in box: "C" = Copy without enclosures "E" = Copy with enclosures "N" = No copy

RIV:MB											
JLMontgomery											
10/31/96											

11/1/96

OFFICIAL RECORD COPY

ORC

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV

Walnut Creek Field Office
1450 Maria Lane
Walnut Creek, California 94596-5368

SEP 27 1996

Kapiolani Health Care System
ATTN: Frances Hallonquist
Chief Executive Officer
1907 S. Beretania St., 5th Floor
Honolulu, Hawaii 96826

SUBJECT: ACKNOWLEDGMENT OF REQUEST FOR LICENSING ACTION

REFERENCE: Letter dated August 29, 1996

We have completed the administrative review and initial processing of your application.

Please note that the technical review may identify additional omissions in the submitted information or technical issues that require additional information.

Amendment actions are normally processed within 90 days, unless the technical review identifies:

- Major technical deficiencies
- Policy issues are identified that require input and coordination with other NRC Regional offices, Agreement State offices, or NRC's Office of Nuclear Materials and Safeguards

A copy of your correspondence has been forwarded to our License Fee and Accounts Receivable Branch, Office of the Controller, who will contact you separately if the appropriate license fee has not been submitted for your request, or for billing if your request is subject to full cost recovery.

Any correspondence about this application should reference the Control number listed below.

Sincerely,

Beth A. Prange

Beth Prange
Sr. Health Physicist (Licensing)
Materials Branch

Docket No. 030-31200
License No. 53-23297-01
Control No. 57412

bcc:
Docket File

To receive a copy of this document, indicate in the box "C" - Copy without attachment/enclosure "E" - Copy with attachment/enclosure "N" - No Copy

OFFICE	RIV:AO:NMLB	N		N				
NAME	J. Garcia JG		B. Prange BAP					
DATE	9/27/96		9/27/96					

Amendment

KAPI'OLANI
MEDICAL CENTER
for Women & Children

August 29, 1996

U.S. Nuclear Regulatory Commission, Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Gentlemen:

Subject: License Amendment Request
NRC License No. 53-23297-01
Docket No. 030-31200

We wish to amend our byproduct materials license to authorize the use of Sulfur-35 in the Cytogenetics Laboratory located at 1946 Young Street #400, Honolulu, HI. Sulfur-35 will be used in protein analysis using Methionine for breast cancer testing.

We have enclosed two copies of the descriptions and procedures that are affected by this change and a check for $590 to cover the category 3M license amendment fee.

Sincerely,
Kapiolani Health Care System

Frances Hallonquist

Frances Hallonquist
Chief Executive Officer

Enclosures

572412

1319 Punahou Street
Honolulu, Hawaii 96826
Telephone (808) 973-8511
FAX (808) 973-3082

Item 5 Radioactive Material

Item 6 Purpose

	Byproduct Material	Amount		Purpose
5.a	Material in § 35.100	As needed	6.a	Medical use
5.b	Material in § 35.200	As needed	6.b	Medical use
5.c	Material in § 35.300	3.3 curies	6.c	Medical use
5.d	Material in § 31.11	Prepackaged Kits	6.d	In vitro studies
5.e	Cesium-137	Sealed Source (Nordion International C-3001)	6.e	In a Nordion Gammacell 1000 Elite Type II (3048 Ci) or Type I (1524 Ci) self contained research irradiator for irradiation of blood products, cells and tissues.
5.f	Phosphorus-32	5 mCi liquid labeled nucleotide	6.f	In development of testing protocols for in vitro DNA analysis and for use in performing in vitro DNA analysis.
5.g	Sulfur-35	10 mCi	6.g	Protien analysis using Methionine for breast cancer testing.

Authorized User	Authorized Use	Record of Training and Experience
Herbert Uemura, M.D.	Item 5.d	Dr. Uemura is currently licensed for these uses under NRC License No. 53-23297-01.
John Gross	Item 5.e	Mr. Gross is currently licensed for this use under NRC License No.53-23297-01.
Timothy Donlon, Ph.D.	Item 5.f, 5.g	Dr. Donlon is currently licensed for the use of Item 5.f under NRC License No. 53-23297-01. Dr. Donlan holds a doctorate in medical genetics. He worked for 6 years at the Stanford Department of Pathology, where he routinely worked with P-32 and H-3.

Blood Irradiator

1. A diagram of the blood bank is shown in the attached drawing. The blood bank is located on the third floor of Kapiolani Center for Women and Children at 1319 Punahou Street, Honolulu, Hawaii.

2. By-product material in the form of a sealed source of Cs-137 in special form packaging, Nordion International C-1000 or C-1001 (when approved), will be stored and used inside the Nordion Gammacell 1000 Elite research irradiator. The Gammacell 1000 Elite design complies with ANSI N433.1 Requirements for the Safe Design and Use of Self Contained, Dry Source Gamma Irradiators (Category 1). See the enclosed product information on the Gammacell 1000 Elite.

3. The source cannot be removed from the irradiator by the operator. In addition, the weight of the irradiator (2,500 lbs) will prevent theft of the entire irradiator by unauthorized persons.

4. The irradiator will be labeled with the "CAUTION - RADIOACTIVE MATERIALS" sign. Information provided by the manufacturer indicates that the maximum radiation levels outside the irradiator are 1 mR/hr at contact and 0.1 mR/hr at 3 feet.

5. Equipment available at the facility (see enclosed itemized list) include:

   a. Survey instrument capable of measuring up to 1 R/hr for evaluation of unusual radiation levels.

Cytogenetics Laboratory

1. A diagram of the Cytogenetics Laboratory is shown in the attached drawing (Item 9 - Attachment 1). The Cytogenetics Laboratory is located at 1946 Young Street #400, Honolulu, Hawaii.

2. By-product material in the form of P-32 and S-35 labeled nucleotides is stored in a refrigerator in the DNA Laboratory room. Other byproduct material in the form of tagged test specimens during processing and counting will be stored on open work benches. These test specimens will be properly disposed of as liquid or solid radioactive waste at the end of the test. The DNA Laboratory will be locked when not occupied.

3. A fume absorber will be used when working with quantities of P-32 or S-35 that are near the limit for open bench work (1 mCi). Phosphorus-32 labeled nucleotides containing up to 1 mCi of P-32 per container will be aloquoted into test specimen solutions. The P-32 labeled nucleotide container will be stored in an acrylic shield while being used or in storage. Alternately, the vial may be stored in the original shipping container. It is anticipated that 1 mCi of P-32 will be ordered and used per month. All activity will be disposed of through decay in storage or through sanitary sewer disposal.

4. Acrylic shielding (1/2 inch) shall be used for P-32 waste storage boxes. Separate containers will be available for S-35 waste and P-32 waste. Millicurie quantities of P-32 shall be stored behind 1/2 inch acrylic shielding in the refrigerator. Alternately, the P-32 may be stored in the original shipping container.

5. The dose rate from bremmstrahlung from 1 mCi of P-32 in a glass container is 0.1 mR/hr at 10 cm (Radiological Health Handbook, 1970, p 204). In waste, the dose rate should be considerably less because

the activity is divided into microcurie quantities for each analysis, collected in plastic bags, and stored in an acrylic box. The beta particles also cannot penetrate the walls to an unrestricted area. Consequently, the dose rate from the waste in storage cannot exceed the allowable radiation levels in 10CFR20 for unrestricted areas.

6. Since, by calculation, the dose rate levels will not exceed 10CFR20 limits, we did not include radiation surveys as part of the routine surveys.

7. Equipment available at the facility (see enclosed itemized list) include:

   a. Survey instruments for after-work surveys of work areas and personnel for residual contamination. These survey instruments will also be used for counting wipe samples.

   b. Counting instruments for counting test specimens.

RIA Laboratory

1. A diagram of the RIA Laboratory is shown in the attached drawing (Item 9 - Attachment 2). The RIA Laboratory is located on the third floor of Kapiolani Center for Women and Children at 1319 Punahou Street, Honolulu, Hawaii.

2. By-product material in the form of I-125 in commercially prepared radioimmunoassay kits is stored in a refrigerator in the RIA Laboratory. Other byproduct material in the form of assay tests during processing and counting will be stored on open work benches. These assay tests will be properly disposed of as liquid or solid radioactive waste at the end of the test. The RIA Laboratory will be locked when not occupied.

3. Equipment available at the facility (see enclosed itemized list) include:

   a. Survey instruments for after-work surveys of work areas and personnel for residual contamination.

   b. Counting equipment for counting assay tests. This equipment will also be used for monthly contamination surveys.

Instrumentation for Blood Irradiator, Cytogenetics, and RIA Laboratories

1. Counting Equipment The following equipment or its equivalent will be used to count test samples.

   a. Manufacturer: Organon Teknika
   Model No: Gamma Counter 7000
   Range: laboratory counter
   Detector: NaI scintillation detector
   Detects: x- and gamma rays

   This counting equipment will be calibrated in accordance with the testing protocol. This equipment will be calibrated in accordance with the calibration procedure given below for monthly wipe test surveys.

2. Survey Instruments The following survey meters or their equivalent will be used for area and personnel after work contamination surveys. The Bicron Surveyor M will be used for daily surveys and wipe test analysis. The Gamma Counter 7000 (listed above) will be used for monthly wipe test surveys for I-125.

   a. Manufacturer: Bicron
   Model No.: Surveyor M
   Range: 0-500,000 cpm
   Detectors: plastic scintillator
   Detects: alpha, beta (Cytogenetics contamination surveys, wipe tests)

   b. Manufacturer: Ludlum
   Model No.: 2
   Range: 0-50,000cpm
   Detectors: 44-3 Low-energy gamma scintillator
   Detects: gamma (RIA contamination surveys)

   c. Manufacturer: Ludlum
   Model No.: 14C
   Range: 0.05- 2,000 mR/hr
   Detectors: 44-7 end window GM detector
   Detects: gamma (Blood Irradiator radiation surveys)

   d. Manufacturer: Victoreen
   Model No.: 425
   Range: 0-500,000cpm
   Detector: 425-110 low energy gamma scintillation probe
   Detects: low energy gamma (RIA contamination surveys)

   The survey instruments will be calibrated annually for radiation levels by a facility licensed by the NRC or agreements state to perform instrument calibrations. The Bicron Surveyor M will be calibrated in accordance with the calibration procedure given below for monthly wipe test surveys.

Survey Procedures - DNA and RIA Laboratory

1. All work areas will be surveyed when work with the radioactive materials is completed, and at least daily while work with radioactive materials is in progress. The results of the survey will be kept in a survey log book. Surveys in the DNA Laboratory shall be performed with a survey meter and plastic scintillation detector. Surveys in the RIA laboratory shall be performed with a survey meter and low energy gamma scintillation detector.

2. Monthly wipe test surveys shall be performed of the DNA Laboratory and RIA Laboratory. The results of the surveys will be kept in a survey log book. Areas with loose surface contamination levels greater than the trigger levels listed below shall be decontaminated to below those levels.

Nuclide	Trigger level (net dpm/100 cm^2)
P-32, I-125	200
S-35	1,000

3. A permanent record shall be kept of all survey results, including negative results. The record will include:

   a. a drawing of the area surveyed, identifying relevant features such as active storage areas and active waste areas,

   b. the date of the survey,

   c. the person performing the survey,

   d. the equipment used for the survey,

   e. and the results of the survey.

DNA Laboratory Operation Procedures

1. Cover work areas with disposable absorbent material.

2. Laboratory coats and gloves shall be worn when working with concentrated solutions of radioisotopes.

3. No mouth pipetting is allowed. Use only remote pipetting devices.

4. No food, beverages, smoking materials or cosmetics are allowed in controlled areas.

5. Wash hands when completing work with radioactive materials. Monitor hands and clothing before leaving the controlled area with a survey meter and pancake detector.

6. The limit for open bench experiments is 1 mCi of P-32 or S-35. Use the fume absorber for working with samples near 1 mCi of activity.

7. Always discard samples properly as liquid or solid radioactive waste after counting.

8. Surveys shall be conducted at the completion of each use of radioactive materials with a portable survey meter and pancake detector.

9. In addition, monthly wipe surveys shall be conducted in areas where radioactive materials are used. Areas with loose surface contamination levels greater than 200 dpm/100 sq.cm. for P-32 or 1000 dpm/100 sq.cm. for S-35 shall be decontaminated to below those levels.

10. Storage of radioactive materials shall be in the acrylic radioactive materials storage box in the refrigerator in the DNA Laboratory. The DNA Laboratory shall be marked with a "Caution - Radioactive Material" sign and the three-bladed warning symbol. The room shall be kept locked when not occupied.

11. Individual containers with radioisotopes shall also be marked with the three-bladed warning symbol and the words, "Caution - Radioactive Material." In addition, the isotope, activity, and date of activity estimate shall also be shown. Containers with diluted solutions in use or tagged specimens do not need to be marked.

12. An inventory of all radioactive materials in storage shall be performed once every six months.

13. Transportation of radioactive materials within the building shall be in their shipping containers. Transportation of radioactive materials outside the building shall be in accordance with Title 49 of the Code of Federal Regulations.

Waste Disposal Procedure

1. General Guidance

a. All radioactivity labels must be defaced or removed from containers and packages prior to disposal in in-house waste. If waste is compacted, all labels that are visible in the compacted mass must be defaced or removed.

b. Remind employees that nonradioactive waste such as leftover reagents, boxes, and packing material should not be mixed with radioactive waste.

c. Occasionally, monitor all procedures to ensure that radioactive waste is not created unnecessarily. Review all new procedures to ensure that waste is handled in a manner consistent with established procedures.

d. In all cases, consider the entire impact of various available disposal routes. Consider occupational and public exposure to radiation, other hazards associated with the material and routes of disposal (e.g., toxicity, carcinogenicity, pathogenicity, flammability), and expense.

2. Procedure for Disposal of Liquids and Gases

Liquids may be disposed of by release to the sanitary sewer or evaporative release to the atmosphere. This does not relieve licensees from complying with other regulations regarding toxic or hazardous properties of these materials.

a. Regulations for disposal in the sanitary sewer appear in § 20.2003. Material must be readily soluble or dispersible in the water. There are daily and monthly limits based on the total sanitary sewage release of your facility. (Excreta from patients undergoing medical diagnosis or therapy is exempt from all the above limitations; see paragraph 20.2003(b). Make a record of the date, radionuclide, estimated activity that was released (in millicuries or microcuries), and of the sink or toilet at which the material was released.

b. Limits on permissible concentrations in effluents to unrestricted areas are enumerated in Table 2 of Appendix B to 10 CFR Part 20. These limits apply at the boundary of the restricted area. Make a record of the date, radionuclide, estimated activity that was released (in millicuries or microcuries) and estimated concentration, and of the vent site at which the material was released.

3. Procedure for Disposal by Decay-in-Storage (DIS)

Short-lived material (physical half-life less than 90 days) may be disposed of by DIS. If you use this procedure, keep material separated according to half-life.

a. Consider using separate containers for different types of waste, e.g. capped needles and syringes in one container, other injection paraphernalia such as swabs and gauze in another, and unused dosages in a third container. Smaller departments may find it easier to use just one container for all DIS waste. Because the waste will be surveyed with all shielding removed, the containers in

which waste will be disposed of must not provide any radiation shielding for the material.

b. When the container is full, seal it with string or tape and attach an identification tag that includes the date sealed, the longest lived radioisotope in the container, and the initials of the person sealing the container. The container may then be transferred to the DIS area.

c. Decay the material for at least 10 half-lives.

d. Prior to disposal as in-house waste, monitor each container as follows:

(1) Check your radiation detection survey meter for proper operation.

(2) Plan to monitor in a low-level (less than 0.05 millirem per hour) area.

(3) Remove any shielding from around the container.

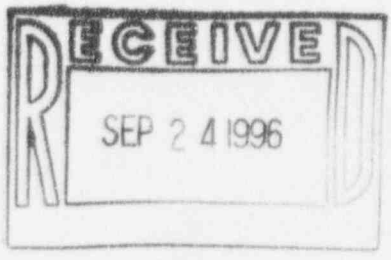
(4) Monitor all surfaces of each individual container.

(5) Discard as in-house waste only those containers that cannot be distinguished from background. Record the date on which the container was sealed, the disposal date, and type of material (e.g. paraphernalia, unused dosages). Check to be sure no radiation labels are visible.

(6) Containers that can be distinguished from background radiation levels must be returned to the storage area for further decay or transferred for burial at an authorized radioactive waste disposal site.

4. Procedure for Disposal of Sealed Sources

Sealed sources from the blood irradiator will be disposed of by transfer to a licensee specifically authorized to possess the sources, such as the original supplier of the irradiator source, a commercial firm licensed by the NRC or an agreement state to accept radioactive waste from other licensees, or another specific licensee authorized to possess the licensed material. Removal of the irradiator source and packaging for shipment will be performed by a facility specifically authorized by the NRC or agreement state to perform such removal and packaging.



DIVISION OF ACCOUNTING AND FINANCE
REQUEST FOR REFUND TO EMPLOYEE/VENDOR

THE EMPLOYEE/VENDOR IDENTIFIED BELOW HAS OVERPAID THE NUCLEAR REGULATORY COMMISSION FOR GOODS AND/OR SERVICES PROVIDED AND IS DUE A REFUND

EMPLOYEE/VENDOR/PAYEE CODE: _____

NAME: Kapiolani Health Care System

ADDRESS: Attn: Frances Hallonquist

ADDRESS: 1319 Punahou Street

CITY: Honolulu STATE: HI ZIP: 96826

TRANS CODE: PX

TRANS TYPE: FE FUND: X5280 JOB CODE: _____ AMOUNT: $150.00

TRANS TYPE: IR FUND: R1435 JOB CODE: INTR AMOUNT: _____

TRANS TYPE: IR FUND: R1099 JOB CODE: ADCH AMOUNT: _____

TRANS TYPE: IR FUND: R1099 JOB CODE: FINE AMOUNT: _____

TOTAL REFUND AMOUNT: $150.00

COMMENTS: Overpmt and Fee
Lic 53-23297-01 CK 1015528
(limit comments to 40 characters, including spaces)

PREPARED BY: Rita Messier DATE: 10/3/96

AUTHORIZED BY: Sandra Lindsay DATE: 10/3/96

ORIGINAL INV. NO: _____ DATE PAID: _____ AMOUNT: _____

REFUND ENTERED INTO COLLECT BY: _____

REFUND DETERMINED BY: _____ DATE: _____

PLEASE ATTACH APPROPRIATE SUPPORTING DOCUMENTATION

TC
AA905 AMD
Oct 1 WCFO
CK# 1015528