NRC FORM 313
(1-84)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 5-31-87

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [ ] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER 09-10672-02
- [ ] C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip Code)*

U.S. Environmental Protection Agency, ERL
Sabine Island
Gulf Breeze, FL 32561

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

As per (2)

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Dr. Paul Lefcourt, RSO

TELEPHONE NUMBER

FTS 686-9011

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*

FEE CATEGORY

AMOUNT ENCLOSED $

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE—CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
Paul Lefcourt	Paul Lefcourt	RSO	01/17/86

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

- [ ] <$250K
- [ ] $250K–500K
- [ ] $500K–750K
- [ ] $750K–1M
- [ ] $1M–3.5M
- [ ] $3.5M–7M
- [ ] $7M–10M
- [ ] >$10M

b. NUMBER OF EMPLOYEES *(Total for entire facility excluding outside contractors)*

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION *(Dollar and/or staff hours)* ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? *(NRC regulations permit it to protect confidential commercial or financial—proprietary—information furnished to the agency in confidence)*

- [ ] YES
- [ ] NO

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
		FEE EXEMPT		

AMOUNT RECEIVED	CHECK NUMBER	DATE

PRIVACY ACT STATEMENT ON THE REVERSE

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY**: Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).

2. **PRINCIPAL PURPOSE(S)**: The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30, 32, 33, 34, 35 and 40 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.

3. **ROUTINE USES**: The information may be (a) provided to State health departments for their information and use; and (b) provided to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.

4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION**: Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.

5. **SYSTEM MANAGER(S) AND ADDRESS**: U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

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Attachment (A)

Addition of ^{203}Hg to list of licensed material

Item (5): ^{203}Hg; 10 millicuries

Item (6): Purpose for use of ^{203}Hg

The ^{203}Hg will be used as a radioactive tracer in a study examining the environmental fate and effects of a mercury-reducing bioengineered microorganism in a laboratory scale simulation of a braskish water system. The goal of this study will be to define the inter-relationships that exist between the applied microorganisms and the recipient ecosystem to reveal some of the processes and hazards involved in the release of the genetically engineered organisms.

Item (7): see resume for Dr. Paul Lefcourt given in Attachment (C)

Item (8): see resume for Dr. Tamar Barkay given in Attachment (C)

Item (9): Facilities and equipment to be used is given in our most recent license renewal.

Item (10): Radiation safety program

All handling of samples containing ^{203}Hg will be performed in a dedicated fume hood in the Radiochemistry Laboratory. The Principle Investigator (Dr. Barkay) and one technician (working under the direct supervision of Dr. Barkay) will use gloves while in the Laboratory. At the end of each work day, they will routinely perform skin wipes and wipes of their work area. Records of these monitoring measurements will be maintained in the laboratory's bound monitoring book. All working areas as well as items used during experiments will have the appropriate warning signs.

Item (11): Waste Management

The ^{203}Hg will be consistently handled with disposable labware. Used items will be disposed of in special bags and compacted in the laboratory trash compacter. The bagged waste will be stored in the radioactive waste storage room (room E, Building 39). Liquid wastes will be collected in polyethylene carboys especially designed to handle corrosive wastes. The liquid waste will be stored with the solid waste. Both waste containers will be labelled with radioactive caution signs, identified, and dated. The wastes will be stored for a minimum of ten half-lives ($t_{1/2}$ = 45 days) and then discarded as non-radioactive hazardous waste.

Attachment (B)

Change of Radiation Safety Officer (RSO)

Our current license specifies that Dr. Al W. Bourquin is the RSO. Dr. Bourquin has assumed much additional responsibility since the date of our last license revision and is no longer able to dedicate the time and effort needed for the RSO assignment. Dr. Paul Lefcourt has been named the new RSO. His resume is given in Attachment (C).

Attachment (C)

Additional personnel to be listed as radiochemical users

Attached are the relevant resumes for the additional personnel to be listed as radiochemical users on our license.

1. Paul Lefcourt, RSO
2. Michael Nelson
3. Deb Chatterjee
4. Fred Genthner
5. Tamar Barkay
6. Ron Walter
7. Steve Cuskey
8. Barbara Genthner
9. Tom Maziarz

NRC License Applicant: User of Radiolabeled Material

Name: Paul Lefcourt

Position: Environmental Scientist, Radiation Safety Officer

Education: Ph.D. Environmental Science

Type of Training	Where Trained Radiation Safety Officers	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	Course University of Texas, Health Science Center San Antonio, TX	1/7-11/85		Yes
b. Radioactivity measurement standardization and monitoring techniques and instrument	University of North Carolina	1 Semester		"
c. Mathematics and calculations basic to the use and measurement of radioactivity	" " " "	" "		"
d. Biological effects of radiation	" " " "	" "		"

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
^{14}C	1 mCi	EPA, Gulf Breeze, FL	1/82-Present	Microbial Ecology

NRC License Applicant: User of Radiolabeled Material

Name: Michael J. Nelson

Position: Research Microbiologist

Education: B.S., Ph.D.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	VPI and SU Blacksburg, VA	6 hrs. Formal	Yes	Yes
b. Radioactivity measurement standardization and monitoring techniques and instrument	VPI and SU Blacksburg, VA	6 hrs. Formal	Yes	Yes
c. Mathematics and calculations basic to the use and measurement of radioactivity	VPI and SU Blacksburg, VA	6 hrs. Formal	Yes	Yes
d. Biological effects of radiation	VPI and SU Blacksburg, VA	6 hrs. Formal	Yes	Yes

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
C^{14}	1 millicurie	Research, VPI & SU, Blacksburg, VA	2 years	Biological Tracer
H^{3}	1 millicurie	University of Texas	1 year	"

NRC License Applicant: User of Radiolabeled Material

Name: Deb K. Chatterjee

Position: NRC Research Associate

Education: B.S., M.S., Ph.D.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	University of Calcutta; University of Illinois Chicago, Ill.	14 hrs. 10 hrs.	-- --	YES "
b. Radioactivity measurement standardization and monitoring techniques and instrument	" " "	16 hrs.	--	"
c. Mathematics and calculations basic to the use and measurement of radioactivity	" " "	20 hrs.	--	"
d. Biological effects of radiation	" " "	20 hrs.	--	"

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
C^{14}	5 millicuries	University of Illinois, Chicago Research	2 years	Biological Tracer
S^{35}	5 millicuries	University of Illinois Research	3 years	"
I^{131}	1 millicurie	Univ. of Calcutta, India	4 years	"
P^{32}	millicurie	University of Illinois, Chicago	4 years	"

NRC License Applicant: User of Radiolabeled Material

Name: Fred J. Genthner

Position: Research Microbiologist

Education: B.S., M.S., Ph.D.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	Southern Ill. University University of Missouri	12 hrs. Formal	NO	Yes
b. Radioactivity measurement standardization and monitoring techniques and instrument	" "	5 hrs. Formal	NO	Yes
c. Mathematics and calculations basic to the use and measurement of radioactivity	" " " "	5 yrs. Informal	Yes	No
d. Biological effects of radiation	" " " "	20 hrs. Formal	No	Yes

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
C^{14}	5 millicuries	University of Illinois	5 years	Biological Tracer
H^3	1 millicurie	" " "	"	"
P^{32}	1 millicurie	" " "	"	"

NRC License Applicant: User of Radiolabeled Material

Name: Tamar Barkay

Position: Research Microbiologist

Education: Research Microbiologist

BSc. MSc. Ph.D.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	University of Maryland College Park, MD University of California Irvine, CA	20 hrs. Formal	Yes	Yes
b. Radioactivity measurement standardization and monitoring techniques and instrument	" " " "	"	"	"
c. Mathematics and calculations basic to the use and measurement of radioactivity	" " " "	"	"	"
d. Biological effects of radiation	" " " "	16 hrs. Formal	"	No

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
C^{14}	5 mCi	Research, UM, College Park, Md	2 yrs.	Tracer
H^{3}	10 mCi	Research, EPA, Gulf Breeze, FL	1 yr.	"
P^{32}	1 mCi	Research, UC, Irvine, California	4 yrs.	"
Hg^{203}	1 mCi	Research, UM, College Park, Md	2 yrs.	"

NRC License Applicant: User of Radiolabeled Material

Name: Ronald B. Walter

Position: National Research Council, Research Associate

Education: B.S., M.S., Ph.D.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	Florida State University Tallahassee, Fla.	30 hrs Formal	Yes	Yes
b. Radioactivity measurement standardization and monitoring techniques and instrument	Florida State University Tallahassee, Fla.	40 hrs Formal	Yes	Yes
c. Mathematics and calculations basic to the use and measurement of radioactivity	Florida State University Tallahassee, Fla.	30 hrs Formal	Yes	Yes
d. Biological effects of radiation	Florida State University Tallahassee, Fla.	100 hrs Formal	Yes	Yes

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
C^{14}	5 millicuries	Research, Florida State University	5 years	Biological Tracer
H^3	1 millicurie	" " " " "	"	"
P^{32}	1 millicurie	" " " " "	"	"

NRC License Applicant: User of Radiolabeled Material

Name: Stephen M. Cuskey

Position: Research Microbiologist

Education: B.S. Ph.D.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	Va. Comm. Univ. Richmond, Va. & Univ. of Mich, Ann Arbor	8 hrs. & 3 hrs.	yes	yes
b. Radioactivity measurement standardization and monitoring techniques and instrument	same as above	8 + 8 hrs. formal	yes	yes
c. Mathematics and calculations basic to the use and measurement of radioactivity	same as above	8 + 8 hrs. formal	yes	yes
d. Biological effects of radiation	same as above	8 + 8 hrs. formal	yes	yes

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
^{14}C	5 millicuries	VCU and U. of Michigan	4 yrs.	Biological tracer
^{32}P	1 millicurie	U. of Michigan	2 yrs.	Biological tracer

NRC License Applicant: User of Radiolabeled Material

Name: Barbara R. Sharak Genthner

Position: Research Microbiologist

Education: B.S., M.S., Ph.D.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	Southern Illinois University Carbondale, Ill.	30 hrs. Formal		Yes
b. Radioactivity measurement standardization and monitoring techniques and instrument	" " "	" " "	Yes	Yes
c. Mathematics and calculations basic to the use and measurement of radioactivity	" " "	" " "	Yes	Yes
d. Biological effects of radiation	" " "	" " "	Yes	Yes

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
C^{14}	5 millicuries	Southern Illinois University Carbondale, Ill	3 years	Biological Tracer

NRC License Applicant: User of Radiolabeled Material

Name: Thomas P. Maziarz

Position: Chemist

Education: B.S.

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
a. Principles and practices of radiation protection	University of West Florida EPA, Gulf Breeze, FL	1 Semester Formal	Yes	Yes
b. Radioactivity measurement standardization and monitoring techniques and instrument	University of West Florida and EPA, Gulf Breeze	1 Semester Formal	Yes	Yes
c. Mathematics and calculations basic to the use and measurement of radioactivity	University of West Florida and EPA, Gulf Breeze, FL	1 Semester	Yes	Yes
d. Biological effects of radiation	University of West Florida	1 Semester Formal	No	Yes

EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience.)

Isotope	Maximum Amount	Where Experience Was Gained	Duration of Experience	Type of Use
C^{14}	5 millicuries	US EPA, Gulf Breeze, FL Bionomics Marine Lab, Pensacola, FL	6 yrs. 5 yrs.	Biological Tracer
N;^{63}	15 millicuries	US EPA, Gulf Breeze, FL Bionomics Marine Lab, Pensacola, FL	6 yrs. 5 yrs.	Analytical detectors
H^3	2 millicuries	US EPA, Gulf Breeze, FL Bionomics Marine Lab, Pensacola, FL	6 yrs. 5 yrs.	tracer
Radiation Safety Officer		Bionomics Marine Lab, Pensacola, FL	2 yrs.	

Attachment (D)

Radiation safety practices in our planned use of ^{32}P

Item (6): Purposes of ^{32}P use.

The ^{32}P will be used in a series of experiments examining the exchange of genetic material amongst microorganisms. The ^{32}P isotope to be used will be cytosine triphosphate. The ^{32}P-dCTP will be used to make radioactive DNA, which will subsequently be used to hybridize with DNA bound to Nitrocellulose paper.

Item (8): The following personnel will be involved in ^{32}P studies:

D. Chatterjee, F. Genthner, T. Barkay, R. Walter, S. Cuskey, and B. Genthner. Their resumes are given in Attachment (C).

Item (9): Facilities and Equipment

All work with the ^{32}P isotopes will be performed in the "Media preparation and incubation room" (see attached floor diagram of the new Biotechnology Laboratory). The ^{32}P isotopes will be stored at - 70°C in a Cryo-Frig, model C-1490, American Scientific Products.

Item 10: Radiation Safety Program

All procedures using ^{32}P will be performed behind a plexiglass shield. All workers will wear lab coats and gloves. Film badges will be worn by all personnel in the Biotechnology Laboratory. Personnel handling the 1 mCi ^{32}P isotope will use a finger badge in addition to the film badge on their lab coat. The personnel monitoring badges will be processed as a service by Siemens Gammasonics Inc., Des Plains, Illinois.

The ^{32}P work area will be covered with an aluminum foil/absorbent paper to avoid contamination of the work bench. Following the use of the ^{32}P isotope, the work area will be monitored with a Geiger counter (Ludlum Measurements, Inc., Model 3 with a Model 44-7 Mica End Window G-M detector).

The Geiger counter window is 1.7±0.3 mg/cm^2 mica. The Geiger counter dial is dual scale 0-2.4K cpm and 0-2MR/hr. with four multiplier ranges on the instrument. Calibration is performed by the manufacturer with planned annual recalibrations.

All monitoring and survey data will be kept in the RSO files.

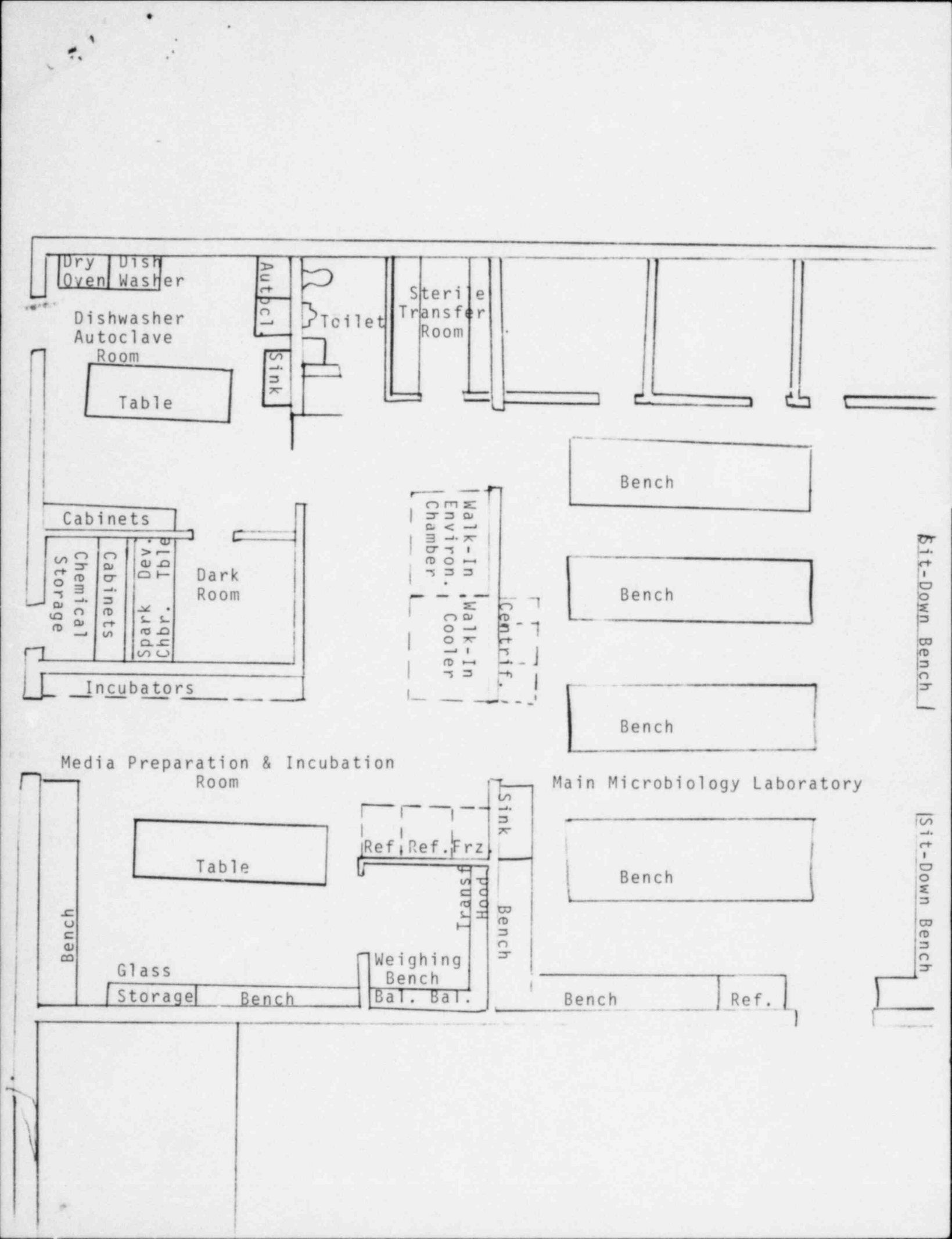
Item 11: Waste Management

Small amounts of both solid and liquid waste are produced in the ^{32}P isotope procedure.

Liquid waste will be stored in glass bottles contained in an unbreakable carrier. The date and quantity of ^{32}P placed in the bottle will be recorded. Full bottles will be stored in the Radioactive Waste Room E, for a minimum of ten half-lives (~ 145 days). Following the decay period, the liquid will be discarded and the bottles reused.

Solid waste will be placed in 20 gauge steel 55 gal drums lined with 40 mil thick polyethylene. The solid waste will also be stored in Room E and disposed of in a conventional manner following a minimum 145 day storage time. All radioactive material deposited in Room E will have the following information displayed on the containers:

- date deposited
- date to be discarded
  10 half-lives
- isotope
- amount of isotope (liquids)
- description of non-radioactive material.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Transfer
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Room
Main Microbiology Laboratory
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Ref.
Ref.
Frz.
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