

*No record of previous license 3/11-Ry + DCF*

FORM NRC-313 I (6-78) 10 CFR 30	U.S. NUCLEAR REGULATORY COMMISSION	1. APPLICATION FOR: (Check and/or complete as appropriate)
APPLICATION FOR BYPRODUCT MATERIAL LICENSE INDUSTRIAL		<input checked="" type="checkbox"/> a. NEW LICENSE
		<input type="checkbox"/> b. AMENDMENT TO: LICENSE NUMBER
		<input type="checkbox"/> c. RENEWAL OF: LICENSE NUMBER
See attached instructions for details.		
Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.		

2. APPLICANT'S NAME (Institution, firm, person, etc.)  Steetley Resources TELEPHONE NUMBER AREA CODE - NUMBER EXTENSION 419 637-2121	3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION  Terence Holland TELEPHONE NUMBER AREA CODE - NUMBER EXTENSION 419 637-2121
4. APPLICANT'S MAILING ADDRESS (Include Zip Code)  P. O. Box E N. Main St. Gibsonburg, Ohio 43431	5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED (Include Zip Code)  P. O. Box E N. Main Street Gibsonburg, Ohio 43431

(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)

6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL (See Items 16 and 17 for required training and experience of each individual named below)	
FULL NAME	TITLE
a. Terence Holland	Project Mgr/ Plant Mgr.
b.	
c.	

7. RADIATION PROTECTION OFFICER  Terence Holland	Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15.
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8. LICENSED MATERIAL				
L I N E	ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source)	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME
NO.	A	B	C	D
(1)	CESIUM 137	Sealed Source	Kay Ray Inc.	500 MC1 (1)
(2)			4800 F Level	
(3)			System	
(4)				

DESCRIBE USE OF LICENSED MATERIAL E	
(1)	The unit will automatically control the product level in an
(2)	indirect lime cooler
(3)	
(4)	

FORM NRC 313 I

Applicant.....  
Check No. 654  
Amount/Fee Category # 110134  
Type of Fee Application  
Date Check Recd MAR 11 1980  
Received By Brown

RECEIVED

90 11 11 01 11 11 00

RECEIVED BY LFMB  
MAR 11 1980  
Date.....  
Log. Mark P. 12 II  
By Brown  
Orig. To.....  
Action Compl. 3/13/80

n.l.

9. STORAGE OF SEALED SOURCES			
LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	Kay-Ray Source Holder	Kay-Ray Inc.	4800 F.
(2)	Model #7063P		
(3)			
(4)			

10. RADIATION DETECTION INSTRUMENTS						
LINE NO.	TYPE OF INSTRUMENT A.	MANUFACTURER'S NAME B.	MODEL NUMBER C.	NUMBER AVAILABLE D.	RADIATION DETECTED (alpha, beta, gamma, neutron) E.	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F.
(1)	Geiger Counter	This unit is being purchased from Kay Ray. At the				
(2)		present time the model # is not available.				
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10	
<input checked="" type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY Kay Ray Inc. 516 W. Campus Dr. Arling Heights Ill	<input type="checkbox"/> b. CALIBRATED BY APPLICANT Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

12. PERSONNEL MONITORING DEVICES		
TYPE (Check and/or complete as appropriate.) A.	SUPPLIER (Service Company) B.	EXCHANGE FREQUENCY C.
<input type="checkbox"/> (1) FILM BADGE  <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD)  <input type="checkbox"/> (3) OTHER (Specify): _____	Personnel monitoring devices not necessary for supporting documentation. See attached response to item 15	<input type="checkbox"/> MONTHLY  <input type="checkbox"/> QUARTERLY  <input type="checkbox"/> OTHER (Specify): _____

13. FACILITIES AND EQUIPMENT (Check were appropriate and attach annotated sketch(es) and description(s).)
<input type="checkbox"/> a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC. <input type="checkbox"/> b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC. <input type="checkbox"/> c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC. <input type="checkbox"/> d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL
a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED Will be returned to manufacturer for disposal
b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE.



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ITEM 6

/ Item 17

The person responsible for record keeping and implementation of radiation safety procedures etc. during the initial installation and extended commissioning of the operation is Terence Holland.

Mr. Holland has, for several years, been responsible at our site location in Dundas, Ontario for four (4) of these units operating on our Neims - contact coolers. His training in Physics included a three year study of Radioactivity measurement and monitoring technique and instruments at Worksop Technical College in Nottinghamshire, England.

A permanent R.P.O. shall be designated after the commissioning period so the license may be ammended to reflect this change.



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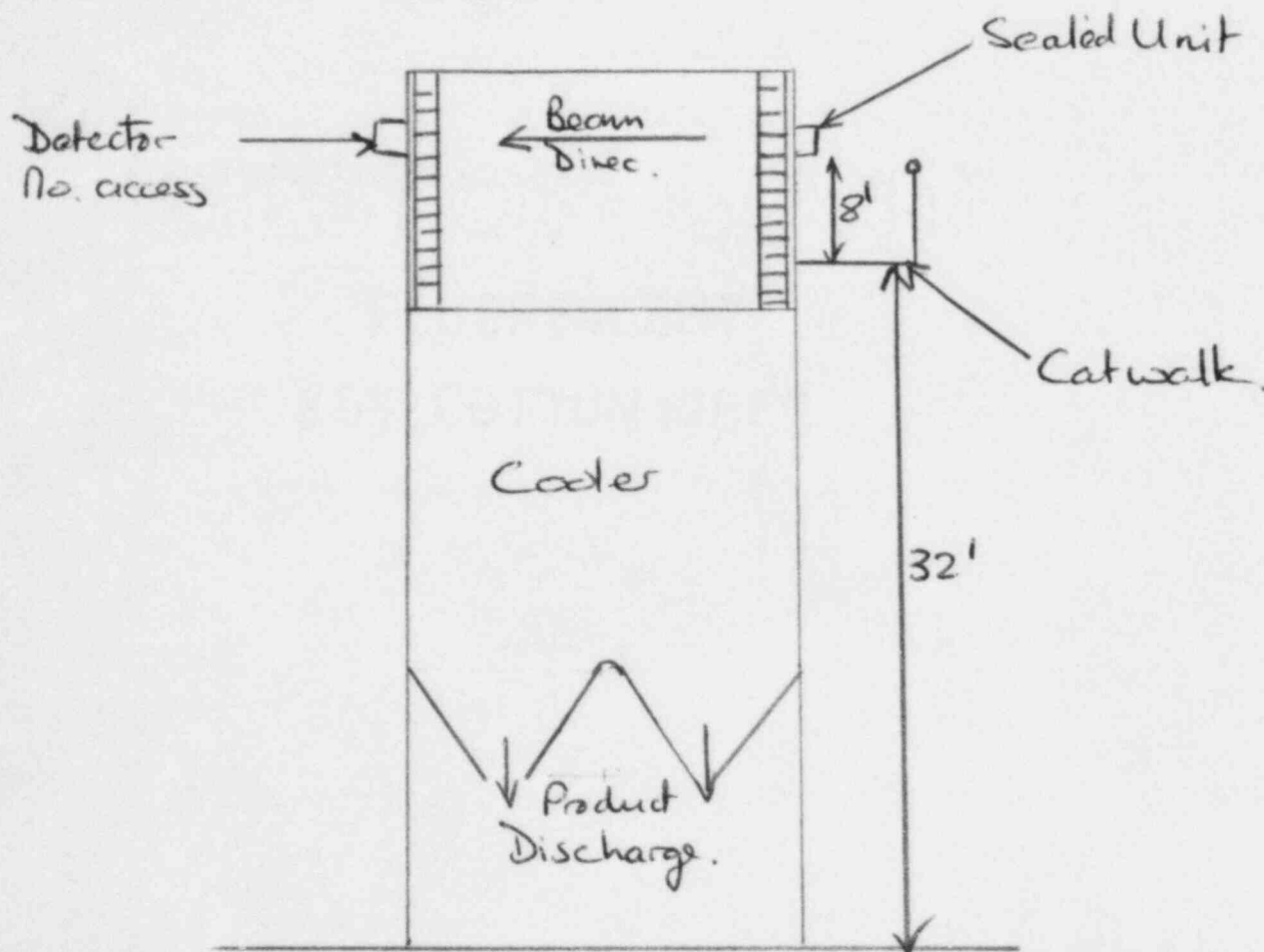


ITEM 15

This addendum describes the procedures to be followed as part of our Radiation Safety Program. Radiation exposure calculations are based on distances as presented in Section 1 of this addendum. This addendum is sectioned as follows:

1 LOCATION

The enclosed sketch gives the specifics of the installation. All equipment will be located and marked in accordance with the recommendation of the manufacturer.





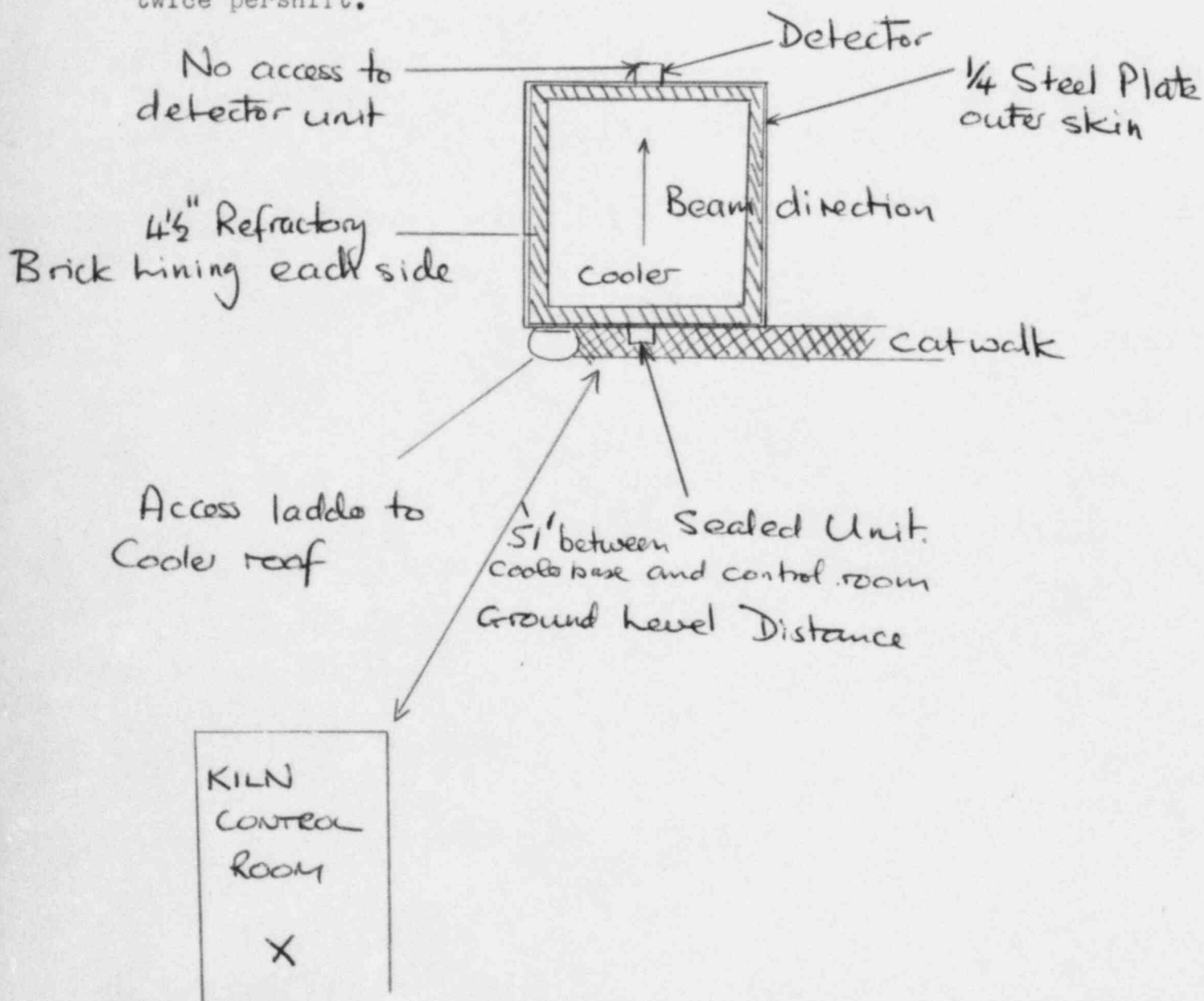
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Item 1 (con't)

The unit will be situated remotely from the control room at a height of 40 feet from the ground. The nearest any operator may approach the detector unit is 4 feet and this only in passing twice pershift.





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## ITEM 15

### Section 2

Initial radiation survey, servicing maintenance, and repair of the source holder will be performed by Kay-Ray. The initial radiation will be used to confirm the calculations shown in Section VI of this item.

### Section III

If maintenance is required inside the vessel, a lockout procedure will be employed to prevent personnel access with the source in the measure position.

The single access door to the cooler will be locked at all times when the unit is in the measure position. The key shall be kept by the R.P.O. If entrance to the vessel is required the R.P.O. will be notified and he will make sure the source - heads are locked in the closed positions before the lock on the access door is allowed to be opened.

A warning sign shall be placed at the entrance to the vessel prohibiting access, without first contacting the R.P.O.

### Section IV

Kay-Ray will perform the leak testing on the source holder. The leak-test kit used by Kay-Ray, is either the General Radio-isotope Products WT-4 kit, or Kay Ray, Inc. Model A kit, which have been approved by the NRC for use in the source





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#### Section IV (Con't)

wiping of Kay-Ray source holder.

We wish to have our license worded to allow a 3 year source wipe interval on the device. An extension has recently been granted to Kay-Ray allowing a three year interval for source wiping and we wish to have our license reflect this extended test period.

#### SECTION V

Emergency Procedure to be followed after damage to KAY-RAY source holder.

1. This procedure applies to all instances where damage is incurred by the source holder due to such action as fire etc.
2. Immediately rope off the area around the source holder to a minimum of 15 feet.
3. Inform T. Holland or designated R.P.O. of the situation.
4. Inform by phone or telegram the required NRC of the accident.
5. Notify KAY-RAY at (312) 259-5600 if their assistance is required.
6. Limit access to source head until a radiation survey and source wipe can be performed by qualified personnel or a representative of KAY-RAY.



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## SECTION VI

The attached calculation indicate a worse case operator exposure of 8.125 MR/Yr. This exposure is based on the nearest operation location to the source housing and is less than 500 MR/Yr. which is well below the limits set in 10CFR20 for personnel monitoring equipment. The calculated radiation exposure rate one will receive at the detector is approximately 0.5 MR/W or less. These low levels drop off according to the square law and result in negligible operator exposure a few feet from the detector. These radiation exposures will be verified at the time of start-up. This will include the effects of radiation scattering along the vessel walls if applicable. These provisions will be taken to verify that no one will receive a worst case exposure of 500 MR/Yr. at the detector side of the vessel.

The procedure for performing the above calculation, as supplied by Kay-Ray Inc. has been included for reference,





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PROCEDURE FOR CALCULATION OF WORST CASE RADIATION EXPOSURE TO  
OPERATING PERSONNEL

Step 1

From sketch drawn for item 15-1 minimum distance to source is calculated to be three (3) feet. Maximum time that any person will be in vicinity of gauge is 15 mins/day.

$$D = 3 - 1 = 2 \text{ ft.}$$

$$K = 0.26 \text{ MR/W}$$

$$T = 0.25 \text{ Hrs/Day}$$

$$S = 500$$

$$\text{Therefore } X = K \times S \times T \times 0.25$$

$$= 0.26 \times 0.25 \times 500 \times 0.25$$

$$= 8.125 \text{ MR/Yr.}$$

## VALUES OF D AND K FOR KAY-RAY SOURCE HOLDER

## GAMMA SOURCE HEADS

Model No. 7056

D (ft.)	7057 K (mr/hr)	7050B K (mr/hr)	7051B K (mr/hr)	7062 K (mr/hr)	7063 K (mr/hr)	7063P K (mr/hr)
0	0.63	12.5	3.0	500	50	15.0
1	0.05	0.59	0.17	11.22	2.3	0.82
2	0.02	0.18	0.06	3.31	0.74	0.26
3	0.009	0.09	0.03	1.56	0.34	0.12
4	0.006	0.05	0.02	0.90	0.20	0.07
5	0.004	0.03	0.01	0.59	0.14	0.05
6	0.003	0.02	0.008	0.41	0.09	0.03
7	0.002	0.02	0.006	0.31	0.08	0.03
8	0.002	0.01	0.005	0.24	0.06	0.02
9	0.001	0.01	0.004	0.19	0.06	0.02
10	0.001	0.009	0.003	0.15	0.03	0.01
11	0.0008	0.008	0.002	0.13	0.03	0.01
12	0.0007	0.006	0.002	0.11	0.02	0.009
13	0.0006	0.005	0.002	0.09	0.02	0.008
14	0.0005	0.005	0.002	0.08	0.02	0.007
15	0.0005	0.004	0.001	0.07	0.01	0.006
16	0.0004	0.004	0.001	0.06	0.01	0.005
17	0.0004	0.003	0.001	0.05	0.01	0.004
18	0.0003	0.003	0.001	0.05	0.01	0.004
19	0.0003	0.003	0.0009	0.04	0.01	0.004
20	0.0003	0.002	0.0008	0.04	0.008	0.003

Model No.

D (ft.)	7064 K (mr/hr)	7064P K (mr/hr)	7065 K (mr/hr)	7067 K (mr/hr)	7068 K (mr/hr)
0	15	3.25	120	5	7.5
1	1.02	0.22	5.62	0.48	0.38
2	0.36	0.08	1.77	0.17	0.12
3	0.18	0.04	0.85	0.08	0.06
4	0.12	0.03	0.50	0.05	0.03
5	0.06	0.01	0.33	0.03	0.02
6	0.05	0.01	0.23	0.02	0.01
7	0.04	0.007	0.17	0.02	0.01
8	0.03	0.006	0.13	0.01	0.009
9	0.02	0.005	0.11	0.01	0.007
10	0.02	0.004	0.09	0.009	0.006
11	0.01	0.003	0.07	0.007	0.005
12	0.01	0.003	0.06	0.006	0.004
13	0.01	0.003	0.05	0.006	0.003
14	0.01	0.002	0.04	0.005	0.003
15	0.006	0.002	0.04	0.004	0.003
16	0.006	0.002	0.03	0.004	0.002
17	0.006	0.001	0.03	0.003	0.002
18	0.006	0.001	0.03	0.003	0.002
19	0.005	0.001	0.02	0.002	0.002
20	0.005	0.001	0.02	0.002	0.001

# INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
16. **FORMAL TRAINING IN RADIATION SAFETY.** Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
  - a. Principles and practices of radiation protection.
  - b. Radioactivity measurement standardization and monitoring techniques and instruments.
  - c. Mathematics and calculations basic to the use and measurement of radioactivity.
  - d. Biological effects of radiation.
17. **EXPERIENCE.** Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

## 18. CERTIFICATE

(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our 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.

a. LICENSE FEE REQUIRED  
(See Section 170.31, 10 CFR 170)

\$ 110.00

(1) LICENSE FEE CATEGORY:

3. LEO 11

(2) LICENSE FEE ENCLOSED \$

110.

b. CERTIFYING OFFICIAL (Signature)

c. NAME (Type or print)

d. TITLE

e. DATE

T D Holland

T D HOLLAND

Protect UGR

Feb. 29th 1980